Emilio Faroldi (1961), architect, is Full Professor at Politecnico di Milano. Designer and awards winner, his works have been published in the main architecture magazines. Among the areas of interest as designer and urban planner, stands out the sports architecture for which he has developed various researches, projects and buildings. He authored several publications and for over a decade has chaired and coordinated the degree courses in *Scienze dell'architettura* and *Progettazione dell'architettura* at Politecnico di Milano. Currently, he is Editor in Chief of the *TECHNE Journal of Technology for Architecture and Environment*, and Director of the I and II level Master in *Sport Architecture* formerly Master in *Design Construction Management of Sport Infrastructure*. Professor of the *International Academy of Architecture*, since January 2017 he has been Vice Rector of Politecnico di Milano.

The history of civilisations and places conveys the importance of the role the culture of sport and a cultivated management of leisure play in the definition of the identity of peoples and communities. Elevating such realms to the status of cultural assets to be shared and enhanced by analysing the dynamics of transformation of the city and territory related to them is a sensible, necessary and ethically correct action. The context of European architecture shows an increasing number of plans that both transform existing facilities and create new ones with a defining and strategic role in the development of urban and landscape fabrics. Activating a basic and permanent theoretical discussion is a fundamental and strategic action for the credibility and professional values of a sector that powerfully conveys the need to update and retrain its technical, executive and managerial personnel through a renewed cultural approach. The goal of this book is promoting awareness about the design enhancement of sport infrastructures as collective assets capable of developing identity and citizenship, through the analysis of both physical and immaterial factors and of the personnel charged with their conception, construction and management. Within contemporary architecture, the design of facilities for sport practice provides an extraordinary opportunity for the adaptation and strategic re-evaluation of the environment and its paradigmatic places. At the same time, sport infrastructures provide a crucial opportunity for architectural, design and technological experimentation – exploring their core features and enhance their potential is the main goal of this book.

ISBN 978-88-6242-426-4

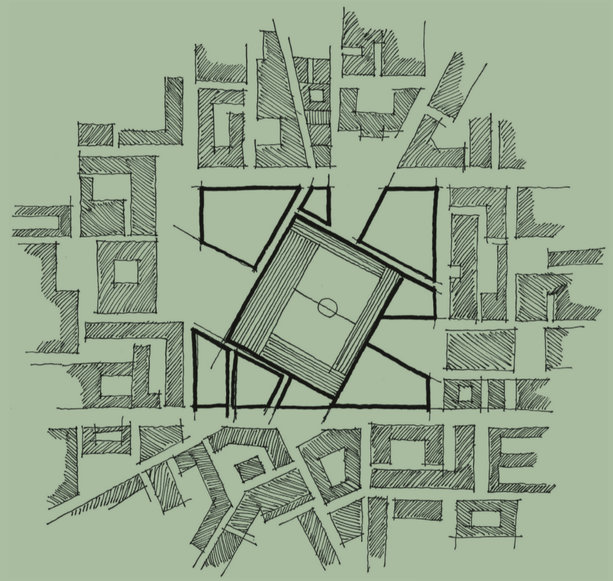
Emilio Faroldi

SPORT ARCHITECTURE

edited by Emilio Faroldi

SPORT ARCHITECTURE

Design Construction Management of Sport Infrastructure



LetteraVentidue

«Only one thing is more exciting than reading a book: writing it».

Emilio Faroldi, 1999

Since a book is a narrated architecture, it is always the result of a collective action.
This book is the outcome of the teamwork of people who believe that architecture, any architecture, has a primarily social value.
The more the programs it accommodates have a collective and educational value, the more such architecture becomes the primary form of connection between human beings and space. Sport architecture certainly belongs to such category.

In copertina:
Maria Pilar Vettori, Urban S-Composition, 2020

This book is for Luca
and his dreams.

ISBN 978-88-6242-426-4

First edition December 2020

Book design: Francesco Trovato
Layout: Stefano Perrotta
Translation: Antonella Bergamin
Sketches: Davide Allegri

LetteraVentidue Edizioni S.r.l.
Via Luigi Spagna 50 P
96100 Siracusa, Italy

www.letteraventidue.com

edited by Emilio Faroldi

SPORT ARCHITECTURE

Design Construction Management of Sport Infrastructure

LetteraVentidue

Since a book is a narrated architecture, it is always the result of a collective action. This book is even more the outcome of the teamwork of people who believe that architecture, any architecture, has a primarily social value. The more the programs it accommodates have a collective and educational value, the more such architecture becomes the primary form of connection between human beings and space.
Sport architecture certainly belongs to such category.
The book – a collection of essays by researchers, academics and experts who believe in the value of sport and its infrastructure – reflects some of the lessons, seminars and workshops held over a decade within the *Design Construction Management of Sports Infrastructure* program organised within the final year of Politecnico di Milano's Architecture Degree. In particular, I am grateful to all the people who, in different ways and periods, contributed to the success of the teaching program, starting with the students and assistants who participated over the years. Besides the authors of the essays that compose the book, without whom it could not exist, my gratitude particularly goes to Davide Allegri, Dario Cea, Pietro Chierici, Maria Pilar Vettori who have always stood by me in this theoretical mission complemented by a prolific and exciting design activity that still goes on with vibrancy and continuity. Without them, I would have missed the stimuli and cultural insight concerning the underlying issue of this book. I also thank all the graduate students, now architects, who, over time, have decided to address issues and designs pertaining the discipline, in order to complete their educational path with dissertations about sports and the facilities designed to host them. In particular, I thank Silvia Battaglia who worked with dedication, competence and seriousness to organise the materials in the book.
I am also particularly grateful to my friend Michele Uva who, since 2001, has provided an innovative and pioneering contribution to my meditations and experiences about the complex management of the sports-football relationship, connected to places designed to host this sport, and to the architect/businessman Giovanni Valentini who helped redefine the design approach to this issue.
Finally, the book is designed as a knowledge platform for whoever intends to explore the design and management of sports infrastructures with awareness and a full grasp of the discipline, as well as for all the students of the I and II level Master in *Sport Architecture* formerly in *Design Construction Management of Sport Infrastructure* held at Politecnico di Milano.

Emilio Faroldi

CONTENTS

Prologue

Sport Architecture

Design Construction Management

by Emilio Faroldi

In the history of civilisations, the meaning of sport and its venues is a fundamental element of intellectual manifestation and representation that effectively reflects the importance the culture of sport and the cultivated management of leisure have had in the definition of the identity of peoples. There was no age when entire communities did not use sport activity, and more in general ludic-recreational activity, in order to stage either material or immaterial iconic manifestations of their own identity.
The relationship between such activities and the definition of the venues designed to host them within anthropised contexts represents the barometer of the cultural expression and intimate soul of a collectivity. Such spaces structure themselves starting from the *genius loci* existing within the memorial structure of their communities that, as such, project such places to identify eloquent and evocative realms of the anthropological experience, representations of material and identity culture that impress a symbolic imprint in the surrounding territory. It is important to remark how, during the evolution of the history of architecture, sport venues always had the distinctive character Norberg-Schulz also identified in *existential space*, or the realm that effectively embraces the fundamental relations among human beings, environment and landscape. The relationship between sport and culture remains as easily recognisable as it was two millennia ago, and is so unchanged in any realm of contemporary society that it often affects its preferences and costumes.
Consider the role sport architecture played in the foundation of Western civilisations, from ancient Greece to Rome – those architectures were the metaphors of the evolution of building techniques, of socio-political organisation, of the urban planning vision of a civilisation and of the cultural supremacy of a cultural group over the others.
In Greece, sport venues, along with the delicate as much as complex orography of the territory, helped to establish a coherent and seamless landscape system within which the consistency of symbolic, cultural, political and physical aims of spaces is clearly perceivable. In Rome, the "functionalist" and urban imprint of large containers of crowds is still visible, for example in the *Amphitheatrum Flavium*, or in the "insertion" of the Stadium of Domitian within the dense urban fabric – one of the most extraordinary squares created over a succession of historical layers.
The infrastructural meaning of sport architectures has become stronger since the twentieth century in coincidence with the emergence of *modern sports*, the mass diffusion of which implied a concurrent requirement for adequate sport venues.
At the same time, sport competition, often a metaphor of political and military competition, has its highest expression in the organisation of the great sport events in the early twentieth century – veritable physical and media showcases of the new modern and society and of mass consumption.

Consider the infrastructural works promoted between the 1920s and 1940s in Italy, or the organisation of the Berlin Olympic Games of 1936 in Nazi Germany; or even, although founded on different cultural principles, the building program implemented for the 1960 Olympic Games in Rome where the extraordinary structural gestures designed by Pier Luigi Nervi still represent recognisable signs permeating the urban landscape. As paradigms of physically tangible infrastructure, permeated with powerful symbolic messages, they were designed to represent political, cultural, social meanings due to their particular status as major objects at the urban scale, as such capable of amplifying the power and effectiveness of communication.

Since ancient times, sport infrastructure has also provided an excellent ground for the experimentation of innovative techniques and building systems designed to address the size of such buildings and the issue of extraordinary spans. As preferred opportunities for technical research, sport venues have historically represented a "pioneering" engineering approach in the application of experimental systems, especially studied and eventually reproduced with industrial technologies.

It was, however, at a relatively recent time, since the 1990s, that sport buildings fully acquired their status as infrastructure, thereby entering the descriptive palimpsest of the contemporary city. Fans started the genetic mutation that would turn them into "customers", thereby upturning and shattering the relationship between sport club and spectators. Clubs choose their headquarters as the very first asset and foundation of stable and economically sustainable projects in the medium-long term and thus increasingly try to dissociate themselves from the sport performance. The "house-stadium" becomes a veritable hub designed to provide customised and flexible services to a generic larger audience, which now exceeds the world of "loyal fans" to conquer a global community.

In the contemporary age, with the process of dematerialisation of information and its easy socialisation, major sport events become mass-media models of extraordinary social-cultural value on a global scale.

A new generation of sport infrastructure projects an iconic value for the new millennium: containers with values in terms of symbols and media image that exceed those of the content. New "museums" of the contemporary age and hyper-technological symbols of our society. A further element is the emergence of an increasing and permeating "culture of sustainability" that prizes the ecological paradigm as a guiding principle for any anthropic transformation. In the context of sport venues, this culture translates into paradigms of virtuous behaviours aiming at wellness and physical health.

In such socio-cultural context, the major events organised between the late 1990s and early 2000s – summer and winter Olympic Games, World and European Football Championships, World Swimming Championships – represent

actual testing grounds for research and innovation on multiple levels: from the most strictly technological and productive level, to the economical-financial and social-urban planning levels. Hosting nations try to outdo each other to "showcase" their technological, economic and political power similarly to what happened for the great world exhibitions in the early twentieth century.
A common element emerges in such examples whose genesis is rooted in ancient times – their immanent infrastructural character, which creates a continuous flow between memory and present. Like other building works such as bridges, roads, aqueducts, the Flavian Amphitheatre and its towering arcades that refer in their sign and structural concept to a common building tradition is the ultimate urban and multifunctional infrastructure, a hub for social gathering and an organisational element of the city. The careful intersections between the natural orography of Greek landscape and the steps of theatres or Olympic stadia similarly represent refined harbingers of modern territorial infrastructure works.
In synergy with morphological aspects, different meanings of a more "immaterial" nature make the definition of *sport infrastructure* even more meaningful and effective: from the symbols underlying the representations to the artistic, narrative and generally cultural references expressed by the buildings themselves.
Today, writing about or discussing of "sport buildings" or "sport architectures" in exclusively morpho-typological terms or in terms of requirements and performance amounts to a sterile and narrow-minded exercise. The themes and disciplinary realms directly affected by everything that turns around the world of sport, leisure, healthy living are multiple and multi-faceted.
The sport facility in its terminological meaning refers to a self-referential object of which one assesses the performance qualities as intrinsic and dissociated from its context.
The concept of sport infrastructure, instead, expresses qualities pertaining to its being an interactive hub in a given territory, of which it becomes an engine and dynamic expression.
In this sense, the word infrastructure, traditionally associated to mobility, should be considered in its material meaning as an element of connection between urban functions and its being an icon of the relations established between such functions. Sport infrastructure identifies the most effective social, functional, morphological glue combining the multiple and complex relationships operating within the urban organism, and as such represents a constantly changing dynamic system.
Unlike the words sport "facility" or "installation", a sport "infrastructure", as such not referable to an exclusive typology of buildings, fully expresses the role these architectures have acquired in the evolutionary dynamics that structure the contemporary city.

Considering sport buildings and architectures as equivalent to infrastructures in the traditional meaning means placing them within the complexity of organisation of the contemporary space around us.
The word infrastructure evokes the dynamic concept of "integrating" (or integrated), from the Latin completing, adding something in order to obtain a complete and functioning system. Adding the word "sport" means, from the semantic and operational point of view, defining a new approach aimed at reaching a global rethinking of the role of sport facilities within society. It also means integrating and connecting currently isolated spaces and places, defining new settlement systems, re-ordering scattered fragments of the city, creating new experience levels.
What emerges is the intention to define an overarching organisation and the functional performance of a *city system*, in turn recognisable for its high architectural quality: an overall vision where design and process, form and function, construction and familiarity of places coalesce in one system characterised by hierarchies and, as a consequence, by infrastructuring actions.
Thought, research and development trends point towards an integration of architecture and urban planning in order to achieve a high quality and environmentally sustainable planning. At a policy level, this approach translates into processes that promote sustainable urban development – *Horizon 2020*, *Urbact*, *SI-Drive Europe, Transit* – and encourage cooperation among sectorial policies that decisively affect the territory.
In some respects, the concept of infrastructure applied to sport venues opposes a "thematised" city shape hinging on the model of centre as a unique and catalysing commercial park. Sport infrastructure, on the contrary, establishes strategic clusters in order to manage the complexity of changes through connected poles of polycentric attraction that structure a system.
In this sense, sport emerges as a variable of even physical sharing and inclusion of the city and its new use opportunities.
The evolution and complexity of architectural reality and its management, economic and social processes has promoted the propagation of a new generation of multi-functional facilities designed to guarantee environmental quality, safety and multi-functionality. Especially when associated to major size, the concept of sport infrastructure is increasingly comparable to that of a complex system in the multiple meaning of places for well-being, performing arts, social activity and production within the larger scenario of the "panoramas of the contemporary".
In its updated cultural character, the football stadium implies an additional complexity, in terms of technology, product and process, underlying the integrated processes that, throughout the concept- programming-design-construction-management phase, affect all the scales of intervention and thereby extend their influence to the entire lifecycle of the building.

As the established paradigms of the current concept-construction scenario, multiscalarity and multidisciplinarity are unavoidable references for an innovative design approach.
The articulation of processes is particularly complex in the realm of sport infrastructure due to the multiplicity and type of involved stakeholders whose interests are often divergent in legal, social and cultural terms. The social, cultural, identity, environmental, public health and political consensus issues involved in this process typically promote integrated forms of public-private partnership.
This scenario necessarily relies on a constant update and refinement of increasingly sophisticated instruments of integrated governance and complex processes of data gathering, management and sharing.
The variety of players involved in the transformations that affect entire communities at the territorial scale has implied a rethinking of the *nodes* and *networks* of decision processes thereby introducing new statutes that regulate the planning decisions, in parallel with the emergence of advanced technologies for an ever-faster analysis, organisation and sharing of an increasingly large amount of information.
In an age when resources are increasingly scarce, the *management phase*, when ideally considered within the circular scheme of a building's lifecycle, inevitably becomes a priority since the beginning of the concept process, as it already contains in embryo the project's critical elements.
Such reversed approach, appears even more important in the case of sport infrastructure where the actual and fixed management costs are on average higher than in other architectural typologies and technological systems often play a primary role. An integrated *multi-sectorial and multi-disciplinary* management, never considered as an independent phase separated from the entire design process but as an engine of that very process, is necessary for all of such reasons.
Traditionally considered as opportunities for technological innovation, sport installations have even emerged as the symbols of an actual architectural *New Deal* during the last few years. Up until the 1990s, sport installations typically reflected a mono-functionalist approach and a marked indifference to language and landscape. Now, the close connection among sport, leisure, wellbeing and environmental quality, and the substantial "opening" of the infrastructure to the context and its social communities through the extensive use of the media and the network of social relations a sports and entertainment hub may activate, have encouraged a radical rethinking of these architectures.
Over the last three decades, a new generation of advanced infrastructure has emerged in which the system and technological components have grown increasingly complex and dense and as equally important as strictly

functional and structural values. Technological flexibility, safety, enjoyment, sustainability and comfort are the parameters of a radically new cultural approach and as such implies new and higher levels of technological, socio-functional and urban resilience.
The "sport system" – especially the football system, given the scope of this phenomenon –currently highlights a structural debt towards its competing systems: such criticality threatens to manifest itself in negative expressions in sport, property, financial, and legal terms. The renovation of the sport world must necessarily come about through interventions aimed at providing a system of modern facilities, in line with the most current concepts of enjoyment, safety and environmental compatibility for the public and the citizenship. While insights and suggestions from the international scene are welcome, a specifically Italian model must emerge in order to address the territorial, social and cultural requirements by nurturing organisational solutions aimed at guaranteeing economic productivity, visibility and political satisfaction to the implementing bodies in the respect of history but with an eye to the future.
In light of such considerations, the complex and multifaceted scene of sport infrastructure clearly expresses the need to provide an adequate role for high-level education as a necessary investment and the foundation, in a virtuous chain reaction, of the policies of enhancement and renovation of sport facilities through a systemic vision of disciplinary contributions. Such actions must point to the propagation of the adequate knowledge and skills in order to address the processes of promotion and management of the venues for sport, social activities and leisure in an effective and proactive way.
The specialisation and complexification of such processes seems increasingly evident within the dynamics that affect the entire sport industry in all its declinations. Consequently, the requirement for multi-disciplinary operatives who can interact with multiple public and private stakeholders and players of the governance processes involved becomes increasingly urgent. This perspective frames the multiple actions involving second- and third-level university education undertaken by Politecnico di Milano in close synergy with and relevance to the institutional system[1].
In particular, these include the I and II level Master in *Sport Architecture* formerly Master in *Design Construction Management of Sport Infrastructure*, established by Politecnico di Milano in cooperation with the main stakeholders of the Italian sport system: FIGC, Sport e Salute Spa (formerly CONI Servizi Spa), Istituto per il Credito Sportivo (ICS) and Lega Serie A. Due to quality of the study plan and the profile of the speakers involved, the Master is undoubtedly the main educational platform in Italy for sport installations, as well as one of the most appreciated educational programs within the international scene of educational offers on sport infrastructure.

Its aim is training high-level professionals who can successfully operate in the realm of concept, programming, design, construction and management of sport infrastructure, according to transversal and cross-disciplinary logics and skills and in alignment with the recent legislative measures in this area. The curriculum offers the opportunity to acquire all the technical and management skills required to define a highly specialised professional who can easily fit into the multiple economic-productive, institutional and professional sectors connected to the macro area of sport facilities. The Master addresses the issues connected to the sport-infrastructural area by bringing the organisational and management aspect to the centre of the design-concept process as the first and foremost element for an informed and sustainable development of any infrastructural development and enhancement process.
The program comprises three macro modules: *design, construction and management*. Each includes thematic under-modules and different teaching methods: lectures, seminars and monographic meetings, focus-groups, visits and study trips, applicative project-work, intensive courses during the program (at the FIGC Federal Technical Centre in Coverciano, the main training facility for national football teams, and at the CONI technical training centre "Giulio Onesti" in Rome), final apprenticeships within companies, partners, major architectural and engineering firms, sport institutions.
The program's faculty includes high-level representatives of the university, research and professional worlds operating within the design and management of sport infrastructure and economic and financial management applied to the disciplinary sector of reference. The modules established within the curriculum are directly under the responsibility of the institutions involved. Sport e Salute Spa (formerly CONI Servizi Spa) is responsible for the design and management of small- and medium-sized facilities hosting all kinds of sports besides football. FIGC organises the "management" module focusing on the principles of management and project financing applied to the sport-infrastructural sector by exploring the main national and international case histories and best practices. The "management" module is also aimed at training a new kind of professional for sport facilities – the "*stadium manager*". The module is available as a stand-alone educational offer even for humanities and economic schools' graduates.

In short, this book is intended as a small but significant contribution to knowledge in this cultural context: the students, young architects, engineers, designers of today will be the designers of tomorrow, through the establishment of a network of mutually interactive and complementary professional figures who will effectively respond to the challenges proposed by the current and future scenario.

The world of infrastructure, in the wider sense of the word, and of sport infrastructure, in particular, requires the establishment of design, construction and management rules and models capable of encouraging believable forms of both cultural and economic investment.
The evolutionary dynamic of the contemporary city suggests, along with the values of solidarity, culture, knowledge and innovation, also the principles deriving from the coexistence of multiple and qualitative elements: hospitality, multi-directionality of purposes, richness of diversity, interdependence, interpretation of the context as the foundations of contemporary knowledge.
Cities and territories are firmly anchored to the society that lives and uses them, by enjoying their spaces and enhancing their resources through layered processes and dynamics. For this reason, sport infrastructure should be viewed as a widespread territorial product, an element related to others within a multilayered system, potentially able to contribute actively to the enhancement of a specific space. In fact, recent architectures structure and de-structure the environment by activating processes connected to different territorial dimensions.
The places of contemporary use of the new functions expressed by the society increasingly incorporate as their model the archetype of sports and events venues that materialise the time of social gathering, of ludic moments and of the hybridisation of the spheres of action by confirming the transversal meaning that consumption, recreation, leisure, communication, information, tourism and sport acquire today.
Through its spaces, sport plays a fundamental role as social activator, capable of incorporating and interpreting effectively the requirements of the collectivity, by highlighting the relation with its reality, by enhancing the perceived value and the level of enjoyment of the facility itself.
The sport architectures of the future will aspire to become sport infrastructure for the *Community*, conceived, designed and built in a converging and inclusive, innovative and multimedia form. At the same time, they will carry a meaningful architectural sign of a local and at the same time global matrix, capable of affirming itself at the same time as an experiential place and a territorial icon. Moreover, the design realm will have to pursue constantly new formulas designed to conceive increasingly less rigid and extremely flexible structures even in the medium and long term.
The issue of resilience, applied to complex sport infrastructure, reveals the lack of organic and systemic investigations on this matter. However, the social, economic and environmental implications such architectures have at the urban and territorial scale mean that this sector has strategic importance, when and if it is viewed in synergy with the practices of sport, health and wellbeing.

Symmetrically, one can recognise innovative trends that introduce a widespread focus on the issues of the urban and social resilience of these infrastructures. If, on one side, existing facilities appear clearly inadequate to adaptation due to their high morpho-typological rigidity, on the other side, they substantially channel the strategies of planning and transformation of places on a wide scale. Emerging suggestions and design trends encourage the adoption of new approaches aimed at modularity and dimensional flexibility so that these facilities may change their original programs in case of changing scenarios.
Therefore, sport would become a promoter of attractive hubs that cluster and catalyse human and economic resources united by the same spirit of cultivated use of time and emotions, as well as able to transform the established catchment areas by transforming traditional geographic and geopolitical boundaries into actual districts based on the values, rules and rites that sport has always dictated.

Notes

1. The range of educational initiatives undertaken by Politecnico di Milano include: the *Football Stadiums. Design, Construction, Management* Continuing Education program, Centro per la Formazione Permanente del Politecnico di Milano, Lega Calcio, Intesa BCI, Milan, academic year 2000/2001 (director: Emilio Faroldi); the *Design Construction Management of Sport Infrastructure* program, active since the academic year 2007-2008 within the Master's Degree in Architecture of Politecnico di Milano (Professor Emilio Faroldi); the activation, during the academic year 2017-2018, of a I and II level Master in *Sport Architecture* formerly Master in *Design Construction Management of Sport Infrastructure*, involving the main institutions of sport governance (Sport e Salute Spa, formerly CONI Servizi Spa, Federazione Italiana Giuoco Calcio, Istituto per il Credito Sportivo, Coni Lombardia, Lega Serie A). Again, in a synergic-implementing frame of educational initiatives, Politecnico di Milano coordinated for four years the Kick-off event organised by FIGC, the Stadiums and sport infrastructures multi-disciplinary panel, by helping with the preparation of FIGC development programs on this issue.

Incipit

Sport as a Cultural Right

by Michele Uva

A sport event conveys emotions. Everyone has a right to experience it by practicing it, breathing it, watching it on TV or the Web, and more importantly by experiencing its beauty live. Football is made of unique and unrepeatable events that capture the love and passion of millions of fans every day. The stage of such emotions is the stadium, the place that represents football history in every corner of the world. The over one hundred million people who watch the eleven thousand matches played all over Europe are well aware of this. Such figures are constantly on the rise thanks to over three hundred next-generation stadiums built over the last ten years. If you add the matches played in every league all over the world, this figure grows to about one billion viewers of live events. An amazing movement.

The message UEFA conveyed through its rules about Financial Fair Play is very clear. The investments on sport installations – either training centres or stadiums – are still excluded from the cost/income calculations European clubs are so concerned about. An investment is not a cost and represents, instead, the launchpad for the system's present and future growth.

Sport installations are strategic assets for the sport business. They are crucial for the creation of new and stable revenue sources, new jobs, a home where fans may find the images, colours, emotions of their team, hence of their passion. Finally, they are crucial for the creation of a civic identity only a stadium can provide with its extraordinary iconic power and ability to narrate places and stories.

Over the last few years, attendance has been on the rise in European football stadiums, although certain countries report a 95% attendance rate – which actually means sold-out stadiums for all the matches – and others lag behind with a 50% attendance rate. The reason for such gap is simple and lies in the comfort, services, mobility, attractiveness and modernity standards each stadium can offer its fans. All of these features are notably missing in facilities built during the 1990s – or earlier.

In order to grow and preserve the kind of preeminence it has achieved in the entertainment industry over the last two decades, football – although this applies to other sports as well – needs modern installations. Such facilities must necessarily be planned, designed and built and eventually managed in a way that reflects the evolution of social growth and the inclination to a mature experience of passion.

Investments are a cornerstone in the evolution and construction of new facilities. While it seems all too obvious that there is no future without investments, unfortunately there are still people who fail to grasp this notion. In terms of the strategy used by different countries in the world for the development – or sometimes even the "involution" – of sport facilities, one recognises four groups, with different specificities and within the same category. The first group includes the countries that lag behind due to insufficient

resources. In such countries, building hospitals and infrastructures is certainly more important than building stadiums. The second group includes the countries – Germany, France, England, Poland, Russia, Austria, Switzerland, Portugal, Australia – that, thanks to a programmed legacy, wisely used the organisation of major international events to build a new generation of stadiums that in turn are creating added value in economic and sport terms. The third group includes the countries that undertook the construction of facilities as a strategic factor in their countrywide system even in absence of major events: United States, Hungary, Turkey, Canada, Sweden. The last group includes the countries that organised major events but, due to a lack of vision and to mismanagement, failed to study and program their legacy, as well as the economic management of their facilities for the decades to come. Three cases are more emblematic than others – Italy with the 1990 World Football Cup, Greece with the 2004 Olympic Games, and Brazil with the 2014 World Football Cup. Such events are still memorable for their future-less installations, out-of-control budgets, corruption and debt load inherited by taxpayers.

The development trends, as well as the ability to increase attendance even in a period of general and deep economic crisis, are directly proportional to the construction of new facilities or to the modernisation of existing ones. These factors are far more important than the transfers of football players. The cases of Germany, France, England, Spain, Turkey, United States are there to prove it, although such notion is still far from widespread in Italy, which is perhaps the tail light in Europe in this respect.

Two major alibis are usually invoked to explain low turnout in stadiums. One is the ubiquity of TV and the other is the high price of tickets. Neither is actually a good reason. Starting with the overriding presence of TV – we know that in Germany, England, France, Spain, Russia, Holland among others, all the parameters – audience, live viewers and economic value – are on the rise. In Italy instead, the first two parameters are decreasing and the third one is stable. Second alibi. The supposedly high price of tickets, which actually has a minor impact on attendance. Some years ago, I created an index (Indexuva©), which compares the average incidence of ticket price on the average wage in different countries. Well, while England is the country with the highest incidence (61.5%), the average attendance to Premier League installations reaches 92%. In Italy, such index is remarkably lower than in Spain and Germany, and obviously England.

However, in order not to oversimplify, let's say that there is no direct connection between ability to attract spectators and private ownership of stadiums, as many argue. Only in the UK, do football own 100% of the stadiums they use. In Germany and in France, there are models of mixed partnership – some stadiums are privately owned, others are owned by public bodies.

In Italy, public ownership applies to 99% of stadiums. This said, there is no perfect model. Each country, each city must find its own winning formula based on its specific, even incidental, historical, social, cultural, financial and economic conditions.
Coming back to the argument I started with, I think each citizen has a right to enjoy sport events in modern, accessible, comfortable and, more importantly, safe environments, as it happens anywhere else in Europe. Even without referring to American installations, there is no doubt that Germany and England, along with Spain, France and Poland, are already aware of the importance of creating modern sport installations. In so doing, they have gradually transformed the stadium into the "house of fans", with a marked focus on fan-related services.
The resulting equation is quite clear – more services, more safety mean more revenues for clubs. The evolution of unit revenue per spectator is also a result of such policies that brought Bundesliga to double its match-related revenues over the last twelve years.
The different approaches applied by the main European clubs to the stadium issue over the last decade have obviously affected their revenues in major ways. The comparison between Barcelona and Roma is particularly enlightening. During the 2002-03 season, the two clubs had virtually the same match-related revenues: €41.8 million for the Catalan club, €41.2 million for the Italian club. Currently Barcelona earns five times as much as Roma: €159.2 million against €31.8 million in the 2018-2019 season. It's got to mean something.
A modern stadium means growing business and growing fan loyalty. Starting from the idea that, as an experiential moment, the match is deeply connected to passion, the path to follow is combining the ticket with strong CRM strategies, increasing services, attracting other businesses and applying marketing to ticketing. The English motto *You feel at home* is the core of strategies already implemented across the world and in all the other sports. The experience of NBA in the early Nineties, when sport halls were certainly not as crowded as they are today, is a case in point. They calculated the percentage of unsold tickets and studied new policies in order to increase fan loyalty and sales. This process led to what are now constantly sold-out matches (and the consequent increase in the value of tickets).
While there is no winning model of stadium indifferently applicable to any country and city, there are certain macro models that can provide a point of departure for any sport installation and, more importantly, for the programs that need to be implemented eventually. Starting from the designers is a massive mistake, and the best way to create stunning, expensive and uneconomical cathedrals in the desert, as the above-mentioned case of Italia 90 clearly proves. Instead, one should start from the requirements and sport

prospects of the client, from a geo-marketing analysis, from the social peculiarities of fans-users and of the city and district where the facility will be built, from the economic potentials of the territory. More importantly, one should start from a clear business plan in order to create a contemporary stadium capable of bringing benefits to all the parties involved and of operating for at least thirty years with no further interventions required. This is no utopia. Smart administrations and clubs have almost invariably made it happen.

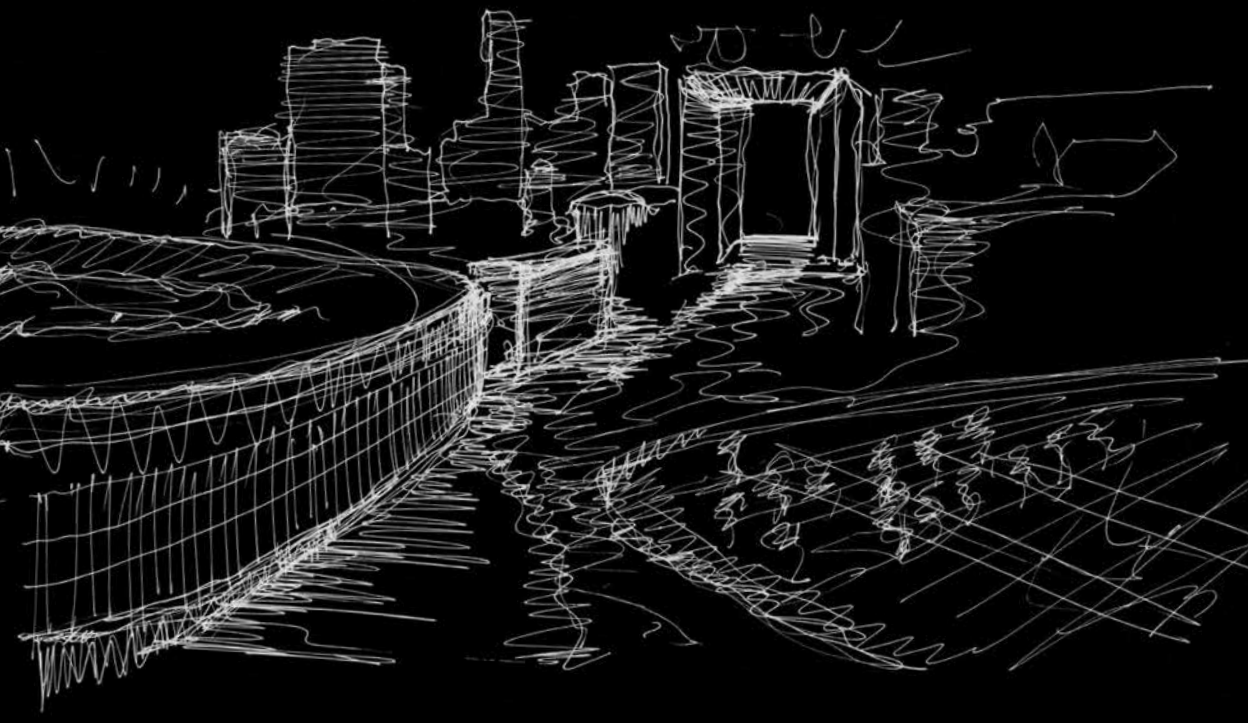
Because building the future means relying on skills, ideas, facts... and, obviously, investments. For this reason, the "homes of sport" must always be the starting point for the history of tomorrow we all want to build.

ESSAYS

Contemporary Project and Technological Innovation

Architecture, engineering, design

by Davide Allegri



«I was sitting on a parapet among the trees. I pictured the location of the central arena, the swimming pools and the courts. I seemed to hear the shot of the starting pistol, the splashing of greenish water, the sound of rackets hitting the ball. I took a sheet of paper out of my folder and made a sketch of the future stadium. Someone looked over my shoulder and told me proudly: "You know? Here a city will be wrought!". And I exclaimed with enthusiasm: "Sure! And what a city!...a city of sport!"».

Vasily Polikarpov, 1956

For a generational theory: technological, material and functional evolution of football installations

«[...] Architecture cannot be satisfactorily described by means of geometrical or semiological concepts. Architecture ought to be understood in terms of meaningful (symbolic) forms. The history of architecture is a history of meaningful forms. As such, it is part of the history of existential meanings [...] it deals with things beyond practical needs and economy. It deals with existential meanings [...] that derive from natural, human and spiritual phenomena»[1]. Norberg-Schulz wrote these words about the *genius loci*, a concept he masterfully described. Starting with this assumption, one may state, metaphorically and without fear of contradiction, that the *stadium* as a morpho-typological category (currently better described by the definition of *sport infrastructure*[2]), represents one of the *meaningful forms* mentioned by the historian. The brief evolutionary cue introducing this essay under the form of *Generational theory*[3] – a sort of *Baukunst* of the "stadium type" – confirms Norberg-Schulz's preface through the clarification of some of its main points. These are a) the high symbolic and iconic value conveyed by sport venues in general since ancient times; b) the reiteration of a spatial and typological model that has remained basically throughout over history in its essential components and is ultimately referable to the *archetype* of the *enclosure*[4]; c) the strong identity connotation of the sport and competition function with its diverse, more or less direct connections with and influences on political and socio-cultural aspects of society.

Highlighting some invariants within the historical-construction scenario of sport architecture may help to better understand some currently occurring phenomena. From a strictly typological point of view, the modern stadium differs very little from the Colosseum designed two thousand years ago by the Romans as the ultimate expression of the constructive culture of their

civilisation. The foundational elements of stadium architecture basically remain the same: the stepped stands, the spaces below the stands, the large void at the centre of the arena.
On the other hand, what the "evolutionary theory" highlights is a more immaterial transformation deriving from how this object is perceived by the community through its renewed symbolic and functional values and its relationship with landscape in a wider sense. The constitutive elements – physical, structural elements, the *skeleton* of the stadium – remain, while the *skin* (the envelopes), the *midsection* (the belly of the stadium, which incorporates its functions) and the immaterial aspects (the message, the symbol) acquire new meanings.
Therefore, a *generational* sequence of sport infrastructures is recognisable, starting with the late nineteenth century, along with some construction-technological characters shared by each generation. All of these aspects can be found, with different declinations and obviously updated canons, even in contemporary arenas, along with, in only relatively recent times, additional elements that rightfully shape them as the symbols of an architectural super-humanism unparalleled in the current scenario of architectural and engineering culture.
With reference to the concept of *stadium as architectural type*[5] in ancient times, in symbolical and abstractly spatial (archetypal) terms, here we only intend to address briefly some considerations Norberg-Shultz made about the relationship between space, existence and the landscape of man. «In terms of spontaneous perception, the space of the individual is centred subjectively. The evolution of the schemata does not mean, however, that the notion of centre is established only as a means of general organisation but only that some centres are externalised into the environment as points of reference»[6]. We may apply the spatial concept of centre as a focal point of the archetypal stadium-space of the Greek civilisation and later of the Roman civilisation, through the centuries to our time: «The notions of proximity, centralisation and closure therefore work together to form a more concrete existential concept: the concept of place, and the places are the primary elements of the existential space»[7].
Given this brief but necessary premise, the generational succession of football installations follows this temporal evolution. First generation (1880-1920)[8], birth of modern football and mass sport (a sport sociology); second generation (1920-1960/1970)[9], large arenas as representations of power; third generation (1960/1970-1989)[10], low-technological value metal sheet and concrete architectures; fourth generation (1992-2002)[11], the *New Deal* of stadiums in the post-Taylor Report age[12]; fifth generation (2002-2016): sport infrastructures and major events, emergence of the stadium as a high technological-value identity icon on a global scale; sixth generation (2018-):

design and technology for *theme parks-stadiums* and virtual mass-media events.

In general terms, this sequence shows how, basically up to 1989 – the year of the Hillsborough tragedy and, following that event, of the approval of the *Taylor Report* with the birth of the well-known "British model"[13] – stadiums were, except for rare cases, huge bulks of brutalist concrete, self-imploding vertical *enclosures*, out-of-scale urban grafts expanding over endless horizontal asphalt parking surfaces, spaces of critical discontinuity and sources of urban and social decay, often the scenes of the territory of urban guerrilla groups.

Therefore, the stadium was a *closed entity*[14] in strictly perceptive terms and, even more importantly, in terms of the programs it accommodated[15]. In 1989, a new generation of sport infrastructures emerged to reflect a culturally new model, more so in terms of architecture, engineering or urban planning. That year, walls fell down – the Berlin Wall physically disappeared, while the stadiums' walls metaphorically shattered, and broke down[16] in a way that ultimately opened them to the city and to new groups of users, in a hybridisation with new programs, forms, technologies and services for urban communities. Between 1992 and 2002[17], the paradigm of functional *mixité* began to affect these facilities and consequently shaped the model of the "stadium for everybody" and the "stadium for families". Besides the clear improvement in terms of safety and accessibility, the new sport facilities highlight a "supremacy" of engineering[18] and a basic lack of aesthetic research or symbolic connotations typical of the eye-catching design that would characterise the latest-generation of arenas.

The emergence of sport infrastructures – in particular football stadiums – as global-level icons was decisively launched by the global *Big Events*[19] – showcases for the demonstration of the socio-political and economic power and even more so of the technological superiority of the hosting countries and, in this sense, comparable to the twentieth century World Exhibitions.

In parallel with the generational development of football installations, it is possible to recognise some features shared by the facilities designed for the Big Events in the context of their geographical location and of the technological and architectural culture of hosting countries.

Just to mention a few examples, the 2002 FIFA World Cup hosted by South Korea and Japan[20] featured the use of technologically advanced materials – in particular high-performance light composite textile fabrics (Teflon, EFTE, PTFE), applied with easily interchangeable and recyclable modular systems – and shapes directly influenced by building tradition on one side, and by the experimental research of 1970s Metabolism[21] on the other, as well as by an approach that embraced the issues of the insertion of these mega-facilities within the Japanese-Korean landscape.

The 2004 UEFA European Football Championship hosted by Portugal[22], on the other hand, featured the contemporary-style use of traditional materials and building techniques rooted in the material culture of the hosting country, such as stone envelopes, coloured tiles (*azulejos*), or "rough" cast-in-situ concrete frames, although skillfully embedded in the delicate morphology of the Portuguese landscape. There is a clear reference to a certain building tradition of a *regionalist* type that Portuguese architecture, through the prolific output of some contemporary masters, constantly relies on[23].
The 2006 FIFA World Cup hosted by Germany[24], on the other hand, symbolises an "eco-technological" turning point for large football installations.
In Portugal, environmental compatibility emerged through the materials-morphology-landscape relationship. In Germany, instead, an environmentally sustainable management of buildings through the production of energy from renewable sources, rainwater harvesting (soon to become an established technological and design model for large facilities in general) and the reuse-recycling of materials emerged for the first time as a guiding paradigm for the organisation and communication of events. The cultural and political-social awareness of the energy and environmental sustainability issues shown by Germany at the time facilitated the achievement of such a goal.
The infrastructural experience of the UEFA European Football Championship hosted by Switzerland and Austria in 2008 followed the same model and reflected a "techno-environmental" approach. Although smaller, the installations show a high technological value in terms of refined detail solutions and an extensive use of energy production systems from renewable sources and of traditional and low environmental impact materials such as wood.
The Swiss approach also relies on the typological-functional model of the urban stadium (or neighbourhood-stadium).
The 2010 FIFA World Cup hosted by South Africa offers a different scene, less coherent from the point of view of policy goals, also reflecting a certainly less manageable cultural and political context. The installations built in South Africa oscillate between demonstrating hyper-technological ambitions and "rougher" and more traditional solutions merely relying on the adaptation of existing stadiums in terms of safety and occupancy or, at most, on a cosmetic restyling aimed at making them more attractive to the media.
The same considerations roughly apply to the 2014 FIFA World Cup hosted by Brazil – both events share a self-celebratory attempt at *bigness*[25] that implied the construction of mega-stadiums hardly manageable and usable in the post-event phase[26]. The 2018 FIFA World Cup held in 2018 and the forthcoming Qatar 2022 edition reflect a different approach. In both cases, the facilities (belonging to the sixth generation according to the evolutionary theory) are conceived as media icons, the symbols of new geo-political and economic balances more than technological power, not necessarily directly

referred to an established sport context.
To some extent, they convey a two-fold risk implied by self-celebration and hyper-technological exaltation. On one side, it may lead to the excesses of a "*Disney World* effect" (the ultimate symbol of Marc Augé's non-places and "ready-to-wear" architecture). On the other side, it may generate a "tabula rasa" effect that, in the case of the Qatar event, resulted in the creation of *Stadium-City*[27], a newly founded city in the middle of the desert, in a sort of duplication of the "Dubai effect".
Both models[28] contrast with the concept of sport infrastructure and stadium as places rooted into their respective contexts, reiterated across the entire generational theory and that, even more so today, becomes crucially important to make sure that these buildings become fully integrated sections of the city.

Fifth and sixth generation sport infrastructures: Technological paradigms and new models

From the point of view of architecture, engineering and design, and more generally, of technological innovation[29], the latest-generation sport infrastructures reveal some models basically resulting from two evolutionary trends. On one side, the trend associated with major events and a sort of "gold rush" to the most *innovative* stadium; on the other side, the trend associated with an additional architectural quality expressed by a new and unprecedented aesthetic immanence. Architecture and technology come together to define new aesthetic-experiential canons that interact with landscape in its holistic meaning[30] according to renewed relations, at the different design scales and in accordance with the concepts of environment, territory and identity of the local community[31]. The mere engineering or functional contribution (understood as a hard multi-functionality shaping the new cathedrals of consumption) is not enough anymore[32] – latest-generation infrastructures acquire new levels of identity at the global scale through complex and persuasive morphologies.
Contemporary arenas result from a new vision of spaces and their usability according to which the venues for sport, wellness and leisure become new paradigms of the society.
During the 1980s and 1990s, every city had to have its own museum as a cultural and identity symbol (beyond the relative importance of the exhibits), aesthetically valuable containers (cultural monuments) that ultimately overcame the meaning of the content. Likewise, today stadiums often become sport monuments with a powerful and dazzling image, as containers with a glittering technology that ultimately become the theatres of empty and hardly meaningful shows[33]. Advanced technologies and materials,

a renewed concern for ecological-environmental aspects based on deep meditations on the lifecycle and use of buildings; pseudo-organic architectural morphologies that interact with the surrounding landscape by acting as elements of territorial reorganisation rather than triggering a critical discontinuity; oversized *design objects* with "skins" that become sensitive and ever-changing optical and aesthetic elements, the (physical and sensory) perception of which far exceeds the physical materiality and scale of the building; new complex relationships with the audience (the user now being not only the supporter), attracted by a "dreamlike symbolism" of which stadiums are now more than ever the ideal embodiment.
Since the early 2000s, arenas have proliferated across the globe and towered as symbols each country boasts of with national pride; all the elements that had to be hidden or erased in such facilities up until the third generation – peeling concrete bowls covered with graffiti and surrounded by asphalt and concrete expanses of invariably empty parking areas – are now worth seeing. The top brands of the architectural and design star system and the main engineering firms in the world vie with one another to win commissions for the new arenas as the media exposure guaranteed by these works is unparalleled and the glory and prestige associated with the design of these memorable buildings will be perpetuated by equally memorable sporting achievements[34]. In the contemporary age, sport infrastructures are complex objects by definition, just like the technologies underlying the entire (*ex-ante*) process from concept to programming, design, and construction at all the scales of intervention, and eventually (*ex-post*) down to management, during the entire lifecycle of the building, and to its decommissioning and/or re-adaptation. As the ultimate testing grounds for engineering and technical experimentation[35], these macro buildings are now more than ever the natural contexts for the sublimation and refinement of technological innovation and transfer[36].

Paradigm/01: integration in the natural landscape.
Designs that relate the sport infrastructure with its context through an *anamnesis* process[37] by exploiting the bowl's shape on one side and the technologies associated with the nature-manmade interface on the other side (for example, in vertical surfaces). Examples of such approaches are the Estadio Chivas in Gualajara (VFO, Studio Massaud Pouzet, 2010), the Rock Stadium in Dubai (MZ Architects, 2017) or the less recent Estadio Ciudad de La Plata (Roberto Ferreira Arquitectos & Asociados, 2003) and Zentralstadion in Leipzig (Wirth & Wirth Architekten, 2006). The ultimate example of this approach is undoubtedly the new stadium in Braga (Eduardo Souto de Moura, 2004) for which its Portuguese designer proposed a new typological model of a facility dug into the rock with only two stands (basically eliminating

the two curved stands) based on an extraordinarily powerful and evocative relationship with landscape. Interestingly, a further connotation even more directly based on the Landscape Urbanism approach relying on a direct integration between the green infrastructuring of urban public space and the stadium building has emerged very recently within this paradigm. Examples of such an approach are the design for the adaptation of the Hongkou Stadium in Shanghai (Sasaki Associates, 2019), or the new Oakland baseball stadium (BIG, Gensler and Field Operations, 2019)[38]. They reflect an attempt to hybridise the stadium building not only through a mere "greenolatry maquillage" but with substantial overlapping of natural and manmade elements, thereby defining complex interface areas, high density and technological condensation points. More generally, this paradigm clearly "opens" the sport infrastructure towards the (urban/outer-urban or natural) context in order to establish an actually physical rather than just perceptive dialogue. For this reason, the sections of the stands dissolve into horizontal planes that become wide terraces and *rue interiors* open onto the surrounding landscape (planes that destructure the traditional image of vertical compactness and closure of the concrete "walls" of the stands described by Canetti). The designs for the new Tokyo Olympic Stadium (Kengo Kuma, 2015-2019) – where wide cantilevered floors embrace actual urban avenues brimming with luxurious vegetation – or design for the new Camp Nou in Barcelona exemplify this approach.

Paradigm/02: integration in the urban and peri-urban landscape.
This design paradigm directly expresses the new concept of stadium as both connection and infrastructural and logistic interchange hub and as an element that reorganises, regenerates and rehabilitates on an urban and outer-urban scale[39]. In design terms, its expression is a hybrid and multi-functional platform model – a complex architectural and functional element as the interface and connection between public urban and outer-urban green and transportation systems and the new programs of the stadium building. Several examples of next-generation facilities adopt this model and still highlight, similarly to the first paradigm but at the scale of the urban section, the theme of the hybridisation between natural and manmade elements. These include the Allianz Arena in Munich (Herzog & de Meuron, 2006), with a public park/multi-level parking area developed in alignment with the paths accessing the stadium; or, more recently, the Estadio Mineirão (BCMF Arquitectos, 2013), where the rehabilitation plan for the 2014 World Cup left the powerful brutalist reinforced concrete frame of the original building intact and worked instead on the interface space between the city and the stadium by generating an expansive urban square developed on multiple levels with several programs, thereby reorganising a large section of the

South-American city. Other examples are the Moses Mabhida Stadium in Durban (GMP Architeckten, SBP Architect, 2014) and the Nagyerdei Stadion in Debrecen (BORD Építész Stúdió, 2014). The latter clearly reveals a vision for new parameters of environmental integration and quality of public spaces through a seamless connection between soft transportation based on cycle and pedestrian paths, the park and the urban vegetable gardens surrounding the stadium.

Paradigm/03: technologically advanced and porous skins.
This design paradigm relies on an *open stadium* concept antithetical to the ante-1989 closed idea, already in itself well established since the fourth generation, which later integrated the aesthetic, symbolic and identity element as the generational-based added value characterising the stadiums of the last fifteen years. Next-generation advanced technologies and hard engineering solutions, combined with the main international-level architectural firms, have transformed sport installations from non-descript and anonymous concrete and iron boxes into attractive objects with highly sophisticated morpho-typological contents on one side, and an extraordinary media-communication potential on the other side. This approach, in turn, offers four further sub-models.
a) *identity and symbolic metaphor*: in this model, the technologies applied to skin and roof become a communication vehicle for identity – and tradition – related themes, in other words the cultural and material landscape of a territory. One example is the Soccer City Stadium in Johannesburg (Boogertman Urban Edge and Partners in partnership with Populous, 2014). The shape of its new roof and façade made of thousands of fibre-reinforced concrete (GRC) panels produced in eight different colours (with hues evoking the warm colours of African regions), and two patterns composing the outer façade so that it remains porous and permeable to light, is inspired by *calabash*, a symbol of African rural life. Another example is the Energa Arena in Gdansk (Rhode-Kellermann-Wawrowsky, 2011), covered by 18,000 polycarbonate modules in six colours that evoke the hues of amber, the prized material for which Gdansk is known all over the world. Yet another example is the Arena de Amazonia in Manaus (GMP Architekten, 2013). The complex engineering of the three-dimensional steel box girders of its frame evokes the Amazonian forest that surrounds the city of Manaus and the weaving pattern of the traditional baskets produced by the local population. Other examples include the Hazza Bin Zayed Stadium in Al-Ain (Pattern Design Ltd, Schlaich Bergermann und Partner, 2014) where the fractal geometry of the complex system of adjustable "curtains" designed to achieve maximum shading evokes the patterns of palm trees' trunks[40]; or the Al Bayt Stadium in Al Khor (Maffeis Engineering, COX Architects, Perkins + Will, 2015-2018)[41].

Its state-of-the-art PTFE envelope directly evokes the Bayt Al Sha'ar, the figurative image of the typical tent traditionally used by the nomadic population of Qatar, as a metaphor for the message of hospitality and open and "evolved" society the Qatari government wishes to convey to the world through the 2022 World Football Championship. The design is defined as an entirely *Qatari concept*, reflecting the culture and historical pride of Qatar. The design of the Al Thumama Stadium is inspired to the *gahfiya*, a traditional woven hat worn by men across the Middle East for centuries. The intricate design of the Al Thumama Stadium's "skin" represents an ideal red thread linking past and future in Qatar as well as in the entire Arab world. The (product and process) technologies applied to the envelopes of these next-generation sport infrastructures have a two-fold function. On one side, defining new global icons featuring a "unique design" and attractive aesthetics through the adoption of highly complex solutions for façades that are less and less similar to the "concrete wall" model typical of fourth generation facilities. On the other side, the new installations – particularly in countries that need to project a positive political and social image on a global scale (what better way to achieve that goal than sport and its architectures?) – are identity symbols, the expression of the "cultural landscape"[42] of a territory, a community and its traditions, namely of its material and immaterial culture.
b) *Greenolatry and naturalistic metaphor*: this model refers to the latest trends of a certain landscapism and cosmetic *camouflage*[43] according to which landscape design and the most advanced technologies of connection between manmade/structural and natural finishing elements find a successful convergence in some designs for sport infrastructures. Several designs exemplify this approach. The Bamboo Stadium (GMP Architekten, 2009-2011), an identity-related allusion to the typical landscape of marshes and bamboo woods in Shenzhen, and the Manè Garrincha Stadium in Brasilia (in both cases, the large exterior peristyle creates a metaphoric and abstract forest of pilasters, coloured in the former case, made of raw concrete in the latter); the large petals of the Sport Park Stadium in Hangzohou (NBBJ, CCDI, 2013); the Timsah Arena in Bursa (Sözüneri Mimarlık, 2016) with its greenish crocodile-shaped PTFE envelope[44].
c) *porosity and transparence*: these models use new composite high-performance materials (with high energy, thermal, acoustic and lighting efficiency), sensible and adjustable skins that become multifaceted and interactive big screens due to the dynamic action of advanced LED technologies, urban-scale landmarks, porous, translucent or transparent surfaces that transform these buildings into highly sophisticated, refined, perceptively unique objects. Materials like PTFE, EFTE, Teflon and other complex polymers – the heirs of Frei Otto's experiments – find an ideal application in the large curtain-walls of arenas. The countless examples[45] of this model include the highly interesting

Aviva Stadium in Dublin (Populous and Scott Tallon Walker Architects, 2010) and the very recent Stade Jean Bouin in Paris (Rudy Ricciotti, 2018). The Dublin installation is the first example of the application of parametric software technologies (BIM) on the design and management of a stadium – from the beginning through to the end of the process. In particular, the morphology of the skin (with glass façades and polycarbonate roof) was developed parametrically from a complex matrix of data input drawn from the geometry of the panels and their structural system, from the exposure and reaction to climate and from the overall shape of the arena in relation with its impact on the urban landscape. The stadium designed by Ricciotti in Paris, instead, pushes the concepts of porosity and façade design to the extreme by using next-generation prefabricated fibre-reinforced concrete (super-GRC) panels.

d) *New skins for the enhancement of iconic stadiums*: over the last few years, the use of technologies for high-performance skins with high aesthetic and symbolic value has helped rehabilitate and enhance sport infrastructures that, being historically recognised icons and identity symbols, cannot simply be demolished. These are mostly second – and third– generation installations, huge bulks featuring a generically brutalist architectural language that have been going through a process of semantic re-actualisation through eye-catching design makeovers and the implementation of additional services (for supporters-users and the city at large). Two stadiums in Spain exemplify this model. The Bernabeu Stadium in Madrid (GMP Architekten, L35 Arquitectos, Ribas&Ribas, 2018) has a new steel and titanium envelope and a new retractable roof inspired by the Colosseum's *velarium*. The design for the Camp Nou in Barcelona (Nikken Sekkei, Joan Pascual i Ramon Ausió Arquitectes, 2018) deconstructs the original concrete bulk of the stadium into a sequence of "green balconies". Similarly, the Amsterdam Arena (currently Johan Cruijff Arena), the ultimate metaphor of the stadium as an urban "functional machine" à la Archigram, has recently undergone a restyling of the envelope and service areas in an attempt to enhance the aesthetic quality of its overall design and integrate new programs[46]. Another third-generation "ferrous" stadium – the Stanford Bridge in London – is now undergoing a thorough redesign starting with the introduction of a new "identity diaphragm" conceived by the Swiss architects Herzog & de Meuron in the traditional red brick of typical late-nineteenth century English districts (and stadiums) (Herzog & de Meuron, 2018). Recently, even the Bombonera in Buenos Aires – the ultimate iconic symbol of South-American football – has been the object of a restyling involving the rehabilitation of the entire district surrounding the Boca Juniors stadium. Here too, the definition of a new diaphragm had the two-fold function of increasing its media appeal and obtaining new spaces of connection between the internal and external.

Paradigm/04: sustainability.

The latest-generation projects interpret this paradigm essentially according to two models. One (roughly starting with fifth-generation installations) exploits the generous surface and skins these buildings as major energy hubs. Again, innovative technologies enhance the façade and roof with integrated systems for the production of energy from renewable sources. Examples of this paradigm include the Stade de Suisse in Bern (Lusche, Schwaar und Rebmann, 2005), the National Stadium in Kaohsiung (Toyo Ito, 2009) and the Adalia Arena in Antalya (AZ Aksu, 2015). The second model is closer to a certain line of environmentalism that largely relies on traditional and eco-compatible materials adapted in light of contemporary standards and issue. One example of this model is the Eco Park Stadium in Forest Green (Zaha Hadid & Architects, 2018), the first facility in the world to be entirely built of wood, along with it associated *Ecotricity* sport centre (also entirely in wood), a sort of sport citadel providing additional facilities, offices and services for the community all around the stadium. In general, over the last few years, a «green reawakening in sport architecture»[47] has been closing a somehow paradoxical gap between health/sports culture practiced by people who use these facilities and the almost total lack of environment-friendly solutions for these concrete machines and the appalling amount of waste they produce[48]. The issue of sustainability is certainly a design paradigm in terms of the stadium's morphological layout (considered in the landscape-physical/cultural entity relationship) as well as of the more "immaterial" questions involved in the management of these buildings.

Paradigm/05: resilience.

The issue of resilience in relation to the social, economic and environmental implications deriving from these macro architectures has now become strategically important[49]. While historically hardly resilient – in terms of layout, structure, function – latest-generation designs attempt, on the contrary, to provide models to address such concerns and guarantee a degree of adaptation and transformation in the face of multiple variables and exogenous/endogenous factors[50]. Recent examples of such an approach include the large-scale plan called *Casa Futebol*, included in an even wider project called *1 Week 1 Project* (De Stampa and Macaux, 2015), which relies on prefabricated 105sqm modules to be inserted within the existing structures of the twelve sport facilities used for the 2014 World Championship held in Brazil (*ex-post* introduction of resilience levels). An *ex-ante* case might be, instead, the new "temporary" facility Ras Abu Aboud in Doha (Fenwick Iribarren Architects, 2018-2020). Designed for the 2022 World Cup in Qatar and conceived to be fully dismantled and reassembled elsewhere at the end of event (by using old shipping containers transportation), it reflects a general

concern for the recyclability and renewability of the building at the end of its lifecycle.

Paradigm/06: the total machine.

The paradigm of the stadium as a total machine – evoking the concepts proposed by Archigram – has recently emerged in terms of both theory and actual feasibility. Once again, the sport infrastructure provides an ideal opportunity for the development of new functions and innovative ways of using contemporary spaces. On the other hand, it offers a context for the sublimation of the state-of-the-art technologies currently available in the field of construction and deriving from other sectors through the above-mentioned *technological transfer*. *The Stadium of Tomorrow*, a project developed by the engineering and architecture firm Populous in partnership with National Geographic, is particularly interesting in this sense as an exploration of how the stadium of the future will be or will have to be and on how technology will change the experience[51] of the audience. According to the authors, the stadium will be «highly connected and versatile, a self-sustaining eco-village, a multi-use, multi-experiential ecosystem with a plethora of sports and recreation opportunities ranging from traditional field sports such as athletics, football to non-typical stadium sports such as sailing and e-sports. The vision extends as far as the stadium of tomorrow being a place where people live, work and play»[52]. A paradigm where the *sections* of the building acquire new values and additional technological complexity, from those of the pitch and roof to the envelopes, with staggering degrees of interactivity, flexibility, adaptability and resilience[53]. «The viewing experience within a stadium environment has not fundamentally changed since Vespasian ordered the construction of the Colosseum almost 2,000 years ago. Technology and information technology is literally changing the playing field and providing an opportunity to create a new vision for both the experience of watching and playing sports but also for the role a stadium can play as a significant urban influencer»[54].

The Tottenham Hotspurs Stadium recently completed in London (Populous, 2018) is perhaps the first actual materialisation of the "stadium of the future". A facility with an extraordinary technological complexity where many of the above-mentioned innovations are now a reality. While it has already become a global media icon, it remains an "urban" stadium with a strong identity and the expression of a historical club, a district, a community, and an entire city.

Postilla. Herzog & de Meuron's four landscape-stadiums

We mentioned before the renewed relationship, within the design paradigms of the latest-generation stadiums, between sport infrastructures and landscape, understood not only as a physical and perceptive relationship but also in terms of cultural identity and symbolic and iconic immanence. When considered together, some designs by the Swiss architects Jacques Herzog and Pierre de Meuron represent interesting examples of a category of *landscape-stadium*. These are the designs for the Allianz Arena in Munich (2005), the Olympic Stadium in Beijing (2008), the Matmut-Atlantique Stadium in Bordeaux (2015) and the redesign of the Stanford Bridge in London (2018). These designs share some features, such as: a) the relationship with the physical – urban, outer-urban, natural – landscape mediated by sophisticated interfaces between natural and manmade elements (the hybrid infrastructural connection/public green areas platform in the Allianz Arena, or the "forest" of slender white pilasters in Bordeaux); the use of technologically advanced, porous, translucent, permeable and adaptable LED envelopes (the EFTE "pneumatic cushions" in the Allianz Arena, the complex pattern of box girders in the *Bird's Nest* in Beijing or the new Gothic structure in the London facility); c) the reference to the cultural and identity landscape (the spontaneous architecture of terraced houses along the Stanford Bridge or the hints at Chinese contemporary architecture for the Olympic Stadium in Beijing).

In conclusion: after the renaissance and the New Deal of the early twenty-first century, we are now witnessing a further metamorphosis in the design and technological culture of sport infrastructures, which propels them rightfully among the "new landscapes of the contemporary age", as ideal and innovative embodiments of the newest evolutionary trends of contemporary society.

Notes

The quotation at the beginning is from Vasily Polikarpov's book Cetralnyi Stadium. Polikarpov was one of the architects responsible for the construction of the Luzhniki Stadium in 1956.

1. Norberg-Schulz C., 1974, *Il significato nell'architettura occidentale*, Electa, Milan, p. 5.
2. Faroldi E., Allegri D., Chierici P., Vettori M.P., 2007, *Progettare uno stadio. Architetture e tecnologie per la costruzione e gestione del territorio*, Maggioli, Santarcangelo di Romagna.
3. The "Theory" explores the different points of convergence between the historical-generational development of sport infrastructures since 1880 and the historical-architectural and technological development, by highlighting how this issue is poorly, if at all, analysed by specialised manuals.
4. Jung C.G., 1964, *L'uomo e i suoi simboli* (*Man and His Symbols*, with J.L. Henderson, M.L. von Franz, A. Jaffé, e J. Jacobi), J. Freeman, ed., Casini, Rome, 1967.
5. About the concept of technological archetype in architecture, see Guido Nardi's essays. In particular, Nardi G., Campioli A., Mangiarotti A., eds., 1994, *Gli elementi costitutivi del progetto: genealogia degli archetipi del costruire, Frammenti di coscienza tecnica. Tecniche esecutive e cultura del costruire*, FrancoAngeli, Milan, pp. 13-28. See also Guastamacchia I., 1992, «L'archetipo junghiano e l'architettura», in Bertoldini M., Zapelli M., eds., *Atti tecnici e cultura materiale*, Città Studi, Milan, pp. 27-44.
6. Norberg-Schulz, *op. cit.*, p. 32.
7. Ibidem, p. 32.
8. The modern version of football, and consequently the stadium as the venue for a game with pre-determined and shared rules, originated in the Anglo-Saxon region. The stadium configures itself as a *spontaneous architecture* (see Rudowsky B., 1964, *Architecture without Architects. A Short Introduction to Non-Pedigree Architecture*, MoMA Press Release, New York, (It. transl. 1979, *Le meraviglie dell'architettura spontanea*, Laterza, Bari. Original English edition in MoMA Press Release, New York) and an urban *iconeme* (see Jodice M., Turri E., 2001, *Gli iconemi: storia e memoria del paesaggio*, Electa, Milan) seamlessly embedded in the surrounding fabric; strong social identity of local proximity, poor technologies and materials even salvaged from building sites; wood and cast iron (in few lucky cases) for stands or embankments, very rare roofs. About this generation of stadiums, see: Dietschy P., 2010, *Storia del calcio*, Paginauno, Monza; Lanfranchi P., ed., 1992, *Il calcio e il suo pubblico*, Edizioni Scientifiche Italiane, Naples; Hobsbawn E.J., 1975, *Il trionfo della borghesia 1848-1975*, Laterza, Bari.
9. There are three main models for the stadiums of power and political propaganda. The German-Nazi model with few, large buildings concentrated in Berlin and Nurnberg; the Italian-Fascist model with widespread construction across the country of small – and middle – sized iterations of the multi-functional "Littorio stadium" (for the "national" sports of the regime: velodrome for cycling, football stadium, running track and, in many cases, even gym, fencing court, Greco-Roman wrestling court and swimming and diving pool); the Eastern bloc model with the proliferation of large installations with a running track. About this generation of stadiums, see: Bolz D., 2008, *Les arènes totalitaires: Hitler, Mussolini et les jeux du stade*, CNRS Editore, Paris; De Finetti G., 1933, *Stadi. Esempi, Tendenze, Progetti*, Hoepli, Milan; Scarrocchia S., 2013, *Albert Speer e Marcello Piacentini,* Skira, Milan.
10. Two basic tendencies are recognisable. 1) Stadiums mainly featuring the use of low-cost metalwork – for both coatings and lattice roof structures – based, on one side, on *cheap architecture* and, on the other side, on Fuller's and Frei Otto's researches that would find their ultimate expression in the Munich stadium. 2) *New Brutalism* stadiums (Team X), with a massive use of exposed reinforced concrete. The main examples of this model are the Parc des Princes Stadium in Paris (1972) and the Olympic Stadium in Montreal (1976), both designed by Roger Taillibert. Within these two trends, there is a *fil-rouge* connecting these experimental mega sport infrastructure projects to the proposals of complex urban mega-facilities developed during the 1960s and 1970s by cultural avant-garde groups such as Archigram and Team X (UK), the Metabolists (Japan), and Superstudio (Italy).
11. The paradigm for this generational phase is a "stadium for everyone" operating all year round. Safety became – and still is – a crucial parameter in order to achieve this goal. From the point of view the architectural culture's advanced research about sport facilities, the most

notable experiences are, besides the Amsterdam Arena, now Johan Cruijff Arena, the designs for the Stade de France in Paris (Aymeric Zublena, 1998) and the new Euroborg Stadium in Groningen (Wiel Arets Architects, 2006), the competition entries for the new Saitama Super Arena in Saitama (1994) and the one for the new Olympic Stadium in Stockholm (1996), both by OMA.

12. Contrary to what one may think, the causes for the vast majority of "stadium casualties" were historically inadequate infrastructure and poor management of safety in critical circumstances (exits, crowd flow, etc.). Although the phenomenon of violence in stadiums and of *hooliganism* in particular triggers disorders and fear in the areas surrounding the stadium during match days across Europe, it usually amounts to acts of vandalism and intimidation but is rarely the actual cause of fatalities. About this phenomenon, see De Biasi R., ed., 2008, *You'll never walk alone. Mito e realtà del tifo inglese*, ShaKe, Milan. At a certain point (since the 1970s and 1980s), third-generation stadiums, almost invariably featuring first – and second – generation materials and structures, came to host increasingly larger masses of people due to the exponential growth of football's popularity. This phenomenon was responsible for a collapse often degenerating into disastrous events and in the loss of many human lives.

13. The *Taylor Report* is a document issued by the commission chaired by Lord Justice Peter Taylor of Gosforth. Its main recommendations included the conversion of stadiums into all-seated facilities, containment of the number of spectators in each sector, distribution of identity cards to every football fan attending the matches, removal of perimeter and lateral fencing between pitch and stands, installation of video surveillance systems.

14. Elias Canetti, sociologist and anthropologist, explored the concepts of "closed crowd" and "open crowd", which can be used as references to explain the evolution of the concept of infrastructure from "closed stadium" (from regime installations through the 1970s) to "open stadium", open onto the landscape. See in particular Canetti E., 1981, «La massa come cerchio», in, *Massa e Potere*, Adelphi, Milan, pp. 33-34.

15. These activities basically included mere sport practice with a ritual bi-monthly interval and only involved supporters and fans.

16. Since the 2000s, even sport infrastructures, once granitic iron and concrete monoliths, have been affected by a phenomenon of "liquefaction" and fragmentation both in physical-material and in virtual terms. See: Bauman Z., 2011, *Modernità liquida*, Laterza, Bari.

17. The design for the Amsterdam Arena, now Johan Cruijff Arena, inaugurated in 1996, represents the transition from third to fourth generation. Already projected towards the new model of facility recommended by the Taylor Report, it is at the same time the materialisation of the visions of experimental groups like Archigram and Superstudio. A comparison between the sections of projects like *Plug-in City* with those of the Dutch stadium clearly show direct analogies in this sense.

18. In general, one should note the historical "monopoly" over the stadium issue by an engineering culture essentially concerned with structural and functional issues, notably the large spans of roofs, with only few and hardly successful forays in the aesthetic-symbolic realm. The only exceptions are recognisable within second-generation installations. Notably, Pier Luigi Nervi's neo-gothic experiments in Italy (Berta Stadium in Florence, 1931, and later the facilities designed for the Rome Olympic Games in 1960), and José Luis Delpini'designs in South America (Estadio Alberto José Armando of Boca Junior, aka the "Bombonera" of 1940 and the model of the "turbine stadium" of 1956). Both use the *bigness* of sport installations to push the new static and technical potentials of reinforced concrete to the extreme.

19. In particular, we refer to the major events of the new millennium, such as the World Football Cup (South Korea and Japan, 2002; Germany, 2006; South Africa, 2010; Brazil, 2014; Russia, 2018; Qatar, 2022); the European Football Championship (Portugal, 2004; Austria and Switzerland, 2008; Poland and Ukraine, 2012; France, 2016); the Summer Olympic Games (Beijing 2008, London 2012).

20. See the "Metabolist" installations, such as the Sapporo Dome in Sapporo (2001) and the Oita Stadium in Oita (2001) or the organic shapes delicately embedded in the Japan-Korean landscape of the Niigata Stadium (the "Big-Swan") and the Daegu World Cup Stadium in Daegu.

21. Prestinenza Puglisi L., undated, *La storia dell'architettura. 1905-2008*, free on-line publication, pp. 188-191.

22. See the "regionalist" designs for the Do Dragao Stadium in Oporto and the Municipal in Braga, or the "glocalist" pattern of the one in Aveiro.

23. Just consider the work of Masters such as Alvaro Siza Vieira and Eduardo Souto de Moura (the latter designed the stunning stadium in Braga).
24. See, in particular, the Allianz Arena and the installations in Gelsenkirchen and Frankfurt as models of outer-urban park-stadiums. The facilities built in 2002 and 2006 coincided with the emergence of some now well-established technological paradigms, such as the recovery of rainwater from roofs and its reuse for sanitation and irrigation of the pitches, as well as for local phytodepuration.
25. Koolhaas R., 2006, *Junkspace*, Quodlibet, Macerata.
26. See, further on, the design paradigm of *resilience*.
27. I created the definition of *Stadium-City* as I think it conveys the settlement and social-urban planning model conceived for Qatar 2022. Here, eight major facilities featuring hyper-technological solutions for the extreme desert climate (thermal shocks and sand storms) will be erected over an area of about 30 km. A full-scale model of a small stadium was built (by the engineering firm ARUP) in order to test all the technologies developed for the eight installations.
28. The 2010 South Africa and the 2014 Brazil events also partially saw the construction of media icons exclusively designed to offer a fleeting as well as virtual experience for broadcasting purposes for the duration of the event, only to be progressively abandoned and deserted once the event was over. In general terms, this issue relates to that of the legacy of major events understood as what actually remains on the ground in the hosting country in terms of rehabilitation and social and infrastructural enhancement.
29. Schumpeter J., 2002, *Teoria dello sviluppo economico*, Rizzoli-Etas, Milan.
30. Today, the new debate about landscape has ceased to be the exclusive proficiency "hard" sciences or of exclusively humanistic approaches. A new and constant rethinking process promotes a unified experimentation that breaks free from sterile specialism and segmented knowledge to embrace the totality of meaning and integrated realities represented by landscape (Kroll L., 1999, *Tutto è paesaggio*, Testo & Immagine, Milan; *Lotus,* n. 101, Electa, Milan, 1999).
31. See the holistic vision of landscape in the «European Landscape Convention», Florence, 2000.
32. The Amsterdam Stadium is essentially a machine; one Reyner Banham would have gladly referred to in his essays – an iron and concrete mega-structure that, however, is devoid of any aesthetic and symbolic content (Biraghi M., ed., 2005, *Reyner Banham. Architettura della prima età della macchina*, Electa, Milan).
33. AA.VV., 2000, *The Stadium. Architecture of mass sport*, NAi Publischers, Rotterdam.
34. The motto *major firms for major stadiums* would well describe latest-generation infrastructures: Herzog & de Meuron, GMP Architekten, Populous, HOK, Sports, Kisho Kurokawa/Associates, Nikken Sekkei Ltd., Arup, Zaha Hadid Architects, to mention just a few.
35. In each generation, there is a project that emerges as a "first experiment". The Colosseum had the *velarium*; the second generation, in the first half of the twentieth century, had large reinforced concrete spans (Speer, Nervi, Delpini among the others); the third generation had new "synthetic" materials (Frei Otto, Taillibert); and the fourth generation had complex conveyor systems in stadiums like the Amsterdam Arena, the Gelredome Stadion, the Saitama Super Arena, the Millenium Stadium. «The design for the 1972 Munich Stadium is a refinement of the construction technology developed in Montreal, as well as the first project where the static analysis empirically derived from physical models is enhanced by electronic calculation systems [...] in the Munich Olympic Stadium we may certainly recognise the first large span example where pre-tensioned wires are not intended simply to provide structural stability but are integrated in the design to the point of becoming its architectural expression and very essence [...]. The new expression "Form-Finding", created on this occasion, would actually become a design technique that, combined with the synthetic skills [of some designers], would shape highly expressive and technically daring architectural works» (Capasso A., ed., 2013, *Architettura atopica e tensostrutture a membrana. Segno e segni del nuovo archetipo costruttivo tra etica e forma*, Clean, Naples, p. 290).
36. About technological transfer, for example from the aviation industry, see the designs for the roof of the Big Swan Stadium in Niigata or the conveyor systems for the Saitama Super Arena that rely on technologies of system connection for air refueling (Mangiarotti A., *La questione del trasferimento: il discorso intorno all'architettura*, in Nardi, Campioli, Mangiarotti, *op. cit.,* pp. 63-70).

37. The *anamnesis* process (Marot, 1999) harkens back to Landscape Urbanism's landscape theories and methods: *Process over time, The staging of surfaces, The operational and working method. (an operative strategy), The imaginary*. Several latest-generation stadium designs are comparable to this theoretical and operational approach, which relies on an increasingly bold and "fluid" integration between city and country, natural and manmade structures (Waldheim C., 2006, *Landscape Urbanism Reader*, Princeton Architectural Press, New York; Repishti F., 2008, «L'estetica della sparizione, in "Green Architecture. Oltre la metafora"», in *Lotus*, n. 135, Electa, Milan, pp. 34-41).
38. The presence of James Corner&Field Operations (specialised in landscape design and integration between natural and built landscape, and responsible for the High Line project di New York, an iconic achievement of Landscape Urbanism) in the design team for a sport infrastructure clearly confirms the importance of this recently emerged design paradigm.
39. About the urban planning theme of the hybrid interface between areas with different functions, see Ellin N., 2006, *Integral Urbanism*, Routledge, Abingdon-on-Thames. In particular, see the definition of *ecotone* derived from biological sciences, to describe urban planning cells with characters similar to those immediately preceding and following them. The contemporary stadium is certainly an ultimate paradigm of technologically advanced *ecotone* due to its potential in terms of infrastructural, logistical, functional, immaterial connections (of information and meanings) and of the condensation of different cells of the natural and man-made landscape.
40. Also consider the Al Wakrah Stadium (Zaha Hadid Architects, 2014), again in Doha, the design of which is inspired by the Dhow, the traditional Arab sailing vessel used for fishing.
41. Italian expertise made a remarkable contribution to the design and construction of the Al Bayt Stadium: the Maffeis Engineering firm based in Bassano del Grappa, the general contractor Salini Impregilo Group based in Milan and Armando Cimolai Spa based in Udine, a world leading company in the production of steelworks.
42. The notion of cultural landscape as an expression of identity encompassing the history and traditions of a community now exceeds the obsolete idea of "picturesque landscape", as confirmed by its inception in the guidelines of the 2000 European Landscape Convention (ELC) (Paolillo P.L., Venturi Ferriolo M., 2015, *Relazioni di paesaggio. Tessere trame per rigenerare luoghi*, Mimesis, Milan).
43. Repishti, *op. cit.*
44. Already dubbed as the Crocodile Stadium, the Busan facility is an exemplary model of identity (referring to the history of the club) even more than commercial symbolism.
45. Another example is the new St. Mames Stadium in Bilbao, with its "dynamical wrap" envelope and container-shaped *skyboxes* that evoke the logistical activity in the harbour of the Basque city.
46. Rather than a simply superficial *maquillage*, all these processes entail a functional implementation and new levels of quality for the spaces.
47. Pfahl M., undated., *Environmental Awakening in Sport*, in https://.thesolutionsjournal.com/article/theenvironmental-awakening-in-sport/.
48. Several national and international certifications (ISO 50001, LEED, *Green Sport Alliance*) now provide well-established parameters of reference for the achievement of high levels of environmental quality and sustainability even for sport infrastructures.
49. Allegri D., Vettori M.P., 2018, «Infrastrutture sportive complesse e resilienza urbana. Tecnologie e paradigmi», in *TECHNE Journal of Technology for Architecture and Environment*, n. 15, Firenze U.P., Florence, pp. 165-174.
50. Functional and technological flexibility is, instead, an already well-established design parameter starting with fourth-, and in some cases even with third-generation, stadiums. The presence of movable elements of all kinds – stands, pitches, roof – is now widely practiced and essential in order to address adequately the increasingly complex management challenges aiming at ensuring different uses of the facility at different times of day and night (not even in different days or weeks). This is, in turn, a necessary step to address an increasingly differentiated and articulated demand for spaces and events for shows, sport, pure entertainment and leisure.
51. «To deliver an effortless experience for all visitors to the stadium, Populous' design predicts the rise of automated amenities including the drone-delivery of refreshments to your seat and the use of robots to serve food and drink and take rubbish away. Automation will also extend

to electro-magnetic hospitality pods that will move along rails within the stadium, allowing fans a view from anywhere they like. Such ambitious interactive technology will require a step-change in the computer power a stadium will need at its disposal, meaning an on-site server farm is a necessity» (For further reading, see: Lee C., *Populous,* in www.populous.com).

52. Lee C., *op. cit.*

53. «Employing a LED surface, the pitch changes texture and materials for different sports. The lines marking the area of play are projected onto the field, allowing the field to vary in size and shape and there is even scope to make the field transparent, opening up possibilities for an underground viewing area to enable fans to watch the action from a whole new angle» (Lee C., *op. cit.*).

54. Ibidem.

The Spaces of Sport

Cultural heritage between memory and future

by Silvia Battaglia

Today, the rehabilitation and enhancement of built heritage plays a particularly important role in the processes of governance of the contemporary city, and sport infrastructures are currently strategic assets in this perspective.
In Italy in particular, sport facilities (at any level, from those devoted to competition sports down to neighborhood gyms), are widespread across the territory and almost invariably in advanced stages of deterioration if not of actual abandonment in social and urban planning terms. Paradoxically, many of these facilities also qualify as cultural heritage. As complex and layered buildings, they unavoidably require a multi-disciplinary approach involving a variety of aspects – purely sport issues (and their related cultural and social impacts); social-economic issues (involving public and private stakeholders), historical-cultural and identity issues (principles of conservation), architectural-urban planning issues (building over and within existing fabrics and regenerating strategic urban sectors).
Such issues become even more complex considering the scale and size of these buildings in light of the resulting criticalities: difficulty in funding their enhancement, necessity of defining functions and activities compatible with the morpho-typology of the stadium-building and for economically viable guidelines for their management in the middle and long term.
In this sense, developing actions for a so-called *Italian third way* for the enhancement of sport infrastructures is strategically important. Such process would provide both sport clubs and the cities involved an actual opportunity for revival, thus promoting the growth of the infrastructural profile of the entire Italian sport system, starting with small/middle-sized facilities often located in strategic areas of many provincial-level cities.
The typological and architectural specificity of stadiums, in particular, has always been a unique asset for the city in terms of both function and size. Now more than ever, cities require multi-functional and dynamic public facilities available for extended periods within which the differentiation of activities accommodates a diverse target of users.

In its contemporary meaning, the stadium combines such features and emerges as a primary asset within the urban context as a venue where catalysing activities that may generate renewal processes for entire urban sectors concentrate[1].
In this perspective, it should be noted that A-League Italian stadiums are on average 68 years old, while B-League stadiums are 65. 42% of these installations were built between 1911 and 1935 (coinciding with the Fascist era and its intense campaign for sport infrastructures); 30% was built between 1946 and 1970; 17% was built between 1970 and 1990, and only 11% dates back to the period between 1990 and today[2].
During the early 1900s, sport facilities were built, for practical reasons, in

close proximity to historical centres as «foundational elements of new sectors of the city»[3]. Only later in the century, in the aftermath of WWII and the ensuing urban development, would they become part of the urban fabric and appear, as they do now, embedded in the established urban structure.
During the Fascist period, each city built its own sports field; the cities outdid each other in the construction of massive stadiums and considered it necessary to erect grand facilities that would convey an idea of power and efficiency.
The academic world of architecture was ill prepared to address the design of stadiums: «when [...] the requirement of building these large facilities emerged, [...] academic architecture simply avoided the issue, and let specialists – engineers – handle the matter as it had nothing to say about it»[4].
The classical world became the source of inspiration for the architectural models of reference, since that was the last time large crowds had actually assembled to attend an event, except for rare occasions. Ancient *gymnasia* are «the architectural blueprint for future stadiums»[5]: the new Athens Stadium built for the 1896 Olympic Games was horseshoe-shaped like the one built in 180 CE over which it would be erected.
In Europe, the horseshoe shape would be replaced by two straight lines linked by two symmetrical curves only after WWI. The new shape could accommodate all the sport disciplines – athletics, cycling and horseracing – that require a circular development, apart from football[6].
In Italy, the stadium of Bologna[7], inaugurated in 1927 in an enthusiastic atmosphere celebrated even by the poet Ungaretti[8], is the typological model of the *littorio stadium*[9]: an amphitheatre-shaped multi-sports facility with a rectangular pitch surrounded by multiple concentric rings for all the sport activities practiced at the time. The Littoriale's football pitch is surrounded by a six-lane running track and complemented by two swimming pools and four tennis courts. It differs from previous facilities in that it is a multi-functional structure including, besides the sports program, services for the athletes, gyms, restaurants and a sport medicine centre[10].
If stadiums often stand out as «conflictual representations of past and future»[11], at the same time they emerge as key elements for the identity of several Italian cities and their architecture represents a symbol of the modern city.
Starting with the 1930s until the 1960 Olympic Games in Rome[12], Pier Luigi Nervi[13] conducted the most significant experimentation on sport infrastructures. His work «stood out in front of the entire world as the synecdoche of modernity and the Italian economic and technological miracle during the post-WWII boom»[14]. The design and technical research about football stadiums is the red thread running along the entire career of this engineer, with twenty-two designs developed since the very first stadium in Florence down to the last one built abroad[15]. These were steps in a continuing path

that would project him as a leading figure in the formal and construction research on this type on the international scene.
Only since the 1990s would a certain interest develop around the *stadium type* in Italy within the larger debate about the rehabilitation of existing buildings and the issue of "building within built fabric".
The opportunity arose with the 1990 World Cup held in Italy. All of the twelve cities involved – Cagliari, Florence, Genoa, Milan, Naples, Rome, Bologna, Verona, Palermo, Udine, Turin and Bari – except for the latter two, had to deal with the enlargement, adaptation and updating of existing installations. While a major event is an extraordinary occasion for a systemic intervention on some of the main infrastructures, Italy wasted that opportunity for a number of reasons. For example, the absence of a middle-long term strategic vision for the "post-event" life of the involved facilities, or the lack of innovative guidelines designed to provide efficient and "socially active" solutions to the complex relationship between stadium and urban context.
Italy has an impressive past – its cultural heritage[16], the foundational element of its national identity, includes the extraordinary material and immaterial heritage layered over the centuries.
Cultural heritage[17] is one of the reasons for the universal fame our country enjoys. Italy has 53 sites recognised in the UNESCO *World Heritage List*; the preservation areas listed in the *Code of cultural heritage and landscape* cover almost half the national territory (46.9%), and over 100,000 architectural, landscape and archeological assets are registered by the Ministry of Cultural Assets and Activities and Tourism[18].
The vast cultural heritage of sport infrastructure is part of the listed properties. Sixty-three stadiums over 111 in the Italian provinces are listed and protected by the respective Superintendencies[19]. Different preservation regimes expressed by several possible definitions cover the Italian sport built heritage: "of artistic or historical interest", "of cultural interest" (sometimes concerning a portion only of the building), "by decree", "indirect", "landscape" and "copyright".
Sport facilities protected due to their "artistic or historical interest"[20] include the Renato Dall'Ara Stadium in Bologna (1927), the Sinigaglia Stadium in Como (1927), the Franchi Stadium in Florence (1931). All of them are public properties, and their historical-artistic relevance was recognised fifty years after their construction, in the 1980s.
Listed since 1986 because «its construction was a remarkable achievement for the time due to its design concept»[21], the Littoriale, now Renato Dall'Ara Stadium in Bologna is considered as the most important and symbolic building since the beginning of the "new era"[22]. It deeply changed the image and perception of the city by moving its centre of gravity from the historical core of medieval porticoes and towers towards the suburbs where the

Fascist regime built its main architectures. The eighteenth-century Portico di San Luca – with its sequence of 666 arches, the longest portico in the world – is the urban planning axis that connects the historical core of the city to the stadium and further on to the Sanctuary of San Luca (the original core of which was built in 1194). Both the overall structure with its rigorous elliptical geometry and the individual architectural elements reveal explicit references to classical style and great Roman works such as the Baths of Caracalla and the Colosseum. Iron, concrete, four million bricks and eighteen kilometres of steps[23] – the Bologna Stadium boasts avant-garde architectural solutions. The bleachers are entirely in reinforced concrete but, unlike the stadiums in Florence and Turin where the material is left exposed, here a brick cladding covers it throughout the perimeter of the elliptical shape in a way that hides the load-bearing structure. With its seamless façade where a sequence of layered arched openings follows a regular rhythm that organises cornices, openings, pilaster strips, entrances and overhangs, the stadium conveys the image of an architecture deliberately and fully embedded within the urban fabric, history, architecture and materials of Bologna. Giulio Ulisse Arata[24] clearly wanted the building to show features that would connect it with the city's porticoes, regardless of the actual impact made by Leandro Arpinati[25] on the final choices. The building was designed to fit into the urban fabric as the «first amphitheatre of the Fascist revolution [...] that deliberately connected imperial past and Fascist modernity by combining traditional and modern architecture, old building materials and innovative techniques [...]»[26]. Across from the stand, the 42m Maratona Tower occupies the empty space between the stadium's perimeter walls and the portico of San Luca in a way that projects it as a part of the existing architecture, an actual architectural addition that would constantly herald the advent of a new era to the old city.

The stadium in Como was recognised as a historical-artistic asset in 1989 due to its «[...] presence within the surrounding context, to the developments that connect it to an exciting period for the city of Como, to the vibrant presence in the memory of the collectivity and to its being an integral part of an urban planning complex that, although developed without a precise preordained program, successfully emerged as a unified and highly qualified organism»[27]. Located in one of the most suggestive spots of the city, the Giuseppe Sinigaglia Stadium stands within the urban sector that looks out onto the lake and boasts several relevant examples and expressions of twentieth century architectural culture. A fascinating layering of architectures projects this area as a *sport citadel*, a part of the historical city that, through the hinge of the Volta Temple, reconnects to a unique itinerary that over the years would become a sort of open-air museum of rationalist architecture. Its jewels include Giuseppe Terragni's Monument to the Fallen[28]

(1931-1933), based upon a drawing by Sant'Elia, Pietro Lingeri's headquarters of the Motonautica Italiana[29] (1927-1947) and Gianni Mantero's headquarters of Canottieri Lario[30] (1930-1931), as well as Terragni's Casa del Fascio (1928-1936) and Asilo Sant'Elia (1935-1937). Gianni Mantero, who designed the stadium, pursued a unified definition of the building and achieved its skillful insertion within the urban fabric without recurring to the symbolism of the Fascist era, in alignment with Terragni's cultural approach. Built at the same time as the Novocomum (1927), the new façade replaced the existing one built by Greppi according to the constraints dictated by the structure of the stadium, namely the absolute essentiality of the overall composition where some major elements stand out, such as the entrance and the large central tri-partite portal that synthesises the entire composition, the grey Musso marble elements that contrast with the dark red hues of the plastered walls. Listed since 1983, the Giovanni Berta Stadium, now Artemio Franchi Stadium, in Florence represents, along with the Santa Maria Novella Station[31], one of the most tangible and enduring landmarks of an urban image where modern architectures exist side by side with elements still closely connected to tradition. The design for the Florence stadium was commissioned to Pier Luigi Nervi, the top Italian expert of reinforced concrete. When the scaffolding came down, the entire city understood the impact of a work worthy of the Renaissance tradition. In a less than "noble" architecture like a stadium, Brunelleschi's lesson – combining form and function, technique and beauty in the same building – found an unexpected and ideal sublimation. The words of a twentieth century master like Giovanni Michelucci sound emblematic in this sense: «With this straightforwardly modern stadium, the city has achieved a work that reflects the awakening of Italian energies»[32]. Located in Campo di Marte, the Florence stadium represents the main example of an urban system with a strong sport character. Pier Luigi Nervi's design immediately emerges as one of the most advanced achievements of its time, a true engineering paradigm due to three main elements – the futuristic roof of the stand and spiral stairs and the slender Maratona Tower, conceived individually and recomposed within the stadium, which emerges in its overall structure as the symbol of reinforced concrete's expressive potential. As Giovanni Klaus Koenig would write a few decades later: «Very few, however, were aware of the tribulations the young engineer had to endure to complete his stadium. Rumors about the certain collapse of the canopy ran from mouth to mouth until they became a certainty, so that poor Nervi found himself in an empty building site the day the scaffolding was dismantled»[33]. With its «creative and plastic use»[34], the entire structure represents the actualisation of what Nervi himself considered as «the most difficult and at the same time most elevated aspect of architecture», which is «the synthesis of conflicting factors, such as formal harmony and technical requirements, the

warmth of inspiration and the coldness of scientific reasoning, the richness of imagination and the rigid laws of economy»[35].

Due to its well-established qualities as a Cultural Asset, the entire complex of the Foro Italico in Rome, including the Marmi Stadium, currently owned by Sport e Salute Spa (formerly CONI Servizi Spa) and often the venue for a variety of sport, theatrical and musical events, was listed as a monument in 1989[36]. The entire complex, a veritable "textbook" for twentieth century Italian architecture, maintains an eerily fascinating aura, a metaphysical atmosphere associated with Giorgio de Chirico's landscapes[37], and typical of most architecture of the time, although most successfully achieved here.

All the elements carefully align along the axis that leads to the stadium in a perfect symbiosis between stone architecture and natural scenery. Strict symmetries, backdrops framing the landscape, points of view that multiply the perspectives, pure volumes, surfaces and artworks create a game of constant references between natural and manmade elements. Rather than the warm hues of a traditionally Roman material like travertine, Enrico del Debbio[38] opted for the purity and refinement of Carrara marble that dominates the entire scene in a rich variety of light tones deriving from the different processing techniques of the material.

The recent debate about the possible future options for the Atleti Azzurri d'Italia Stadium in Bergamo (1928), the Vesturi Stadium in Salerno and the Olimpico Grande Torino Stadium (1933) activated the procedure for the assessment and possible assignment of the "cultural interest" preservation status as mandated by Law Decree 42/2004, which replaced Law 1089/1939 concerning the procedure required by works by no longer living artists produced more than seventy – rather than fifty – years ago. For the same reason, the assignment of the cultural interest status to the Adriatico Stadium in Pescara (1955), designed by Luigi Piccinato, and to the Flaminio Stadium (1957) in Rome, designed by Pier Luigi e Antonio Nervi, addresses a wider action of preservation and enhancement of twentieth century architectural culture, decreed with reference to the historical and contextual aspects of even more recent works.

For example, the stadium of Pescara, the recipient of the prestigious "INARCH Domosic" award in 1961, was recognised in 2015 for its «particularly important interest [...] due to its exemplarity for architectural history and building technology, for culture in general as well as for the history of the public and collective institutions of the city of Pescara»[39]. The words Bruno Zevi wrote in January 1957 clearly describe its architectural quality: «In a type like the stadium, urban planning insight comes together with creative brilliance applied to structural design [...]. No one could find a better location for the facility than the master planner [...]. As it rarely happens, architectural design and urban planning were fully concurring: an added historical value

that makes this work even more at home in the city»[40].
With its 92 structural frames articulating the curve of the outer envelope, the dynamic profiles of the structures designed to host the service areas in the under-stands and the slender overhanging serrated canopy, made possible by the *Nervi System*[41], the Flaminio Stadium becomes the image of modernity and represents the highest, most complete and final achievement of Pier Luigi Nervi's research on interior spatiality within two-dimensional elements. It was recognised as «an extraordinary work that successfully and most originally combines form and structure, architecture and engineering, exemplifying a fortunate moment in Rome's, and generally Italy's architectural culture in concurrence with the economic boom that characterised the productive rebirth of the country in the post-war period». In spite of its undisputed architectural value, the stadium is currently in a state of disconcerting abandonment: «the protection status assigned by the Special Superintendence for the Archaeological Heritage of Rome is aimed at ensuring its rehabilitation according to quality standards and within a controlled restoration process, as the full respect for Nervi's design will be guaranteed although within a perspective of innovation and adaptation to contemporary use»[42].
In some cases, the *cultural interest* status only covers parts of the building rather than its entirety. For example, it exclusively applies to the stands of the followings stadiums: Gabrielli in Rovigo (1913), Zini in Cremona (1929), Druso in Bolzano (1930) and Piola in Vercelli (1932) and to the façades of the Moccagatta Stadium in Alessandria and of the Ferraris Stadium in Genoa, as well as to the Fascist-era monumental entrance of the Picco Stadium in La Spezia, «built during the 1930s [...] as an interesting example of the architecture of the time, as well as an important vestige of the city and its football club»[43].
The protective measures decreed by the Code of Cultural Heritage and Landscape concern thirty-seven stadiums "ope legis" ["by decree"]: movable things, public property, the works of no longer living artists produced more than seventy years ago, pending verification of "cultural interest"[44].
The Martelli Stadium in Mantua is the only case subjected to "indirect protection"[45] due to its spatial relationship with the monumental area of Palazzo Te[46]. The aim of such protective measure is to guarantee the preservation of the characters of the context and of the asset subjected to direct protection by ensuring, through provisions concerning the surrounding areas or buildings, the preservation of the integrity of the perspective and of environmental conditions.
A number of stadiums enjoy a "landscape protection" due to their location in geographically particular contexts. These include the Penzo Stadium on the Island of Sant'Elena in the Venetian lagoon, the Franchi Stadium in Siena

(1938) and the Curi Stadium in Perugia (1975) – both surrounded by the Tuscan-Umbrian hills – the Esseneto Stadium (1952) due to its proximity to the Temple Valley in Agrigento, the Barbera Stadium in Palermo (1932) – due to its proximity to the Parco della Favorita –, the Picchi Stadium in Leghorn (1934) due to its proximity to the sea.

"Copyright"[47] concerns the authors – or their heirs in case of no longer living authors – rather than the works themselves, as the sole holders of the right to alter or reject any proposals that might compromise the work's characters and original quality. One such case is the San Nicola Stadium in Bari (1990) designed by Renzo Piano[48]. «A clam shell suspended on vegetation»[49]. These are the words used by the designer to describe the project for the Bari stadium, designed for the 1990 World Football Cup and protected by copyright for its «undisputed architectural quality» and because it represents «an evolution of its building type both for the study of the planimetric shape and for its structural solutions»[50]. Here, Piano had no intention to surprise. Instead, he enhanced the primary features of the stadium-architecture by transforming their typically engineering immanence into aesthetically "active" elements. The San Nicola Stadium is defined as an extra-urban stadium. Its less than ideal position outside the city is the result of urban planning choices dictated by the 1968 City Master Plan developed by Ludovico Quaroni. A further issue that increases its "cathedral in the desert" effect is the fact that the plan, which prescribed the implementation of several services associated with the stadium, was never completed.

The chronic lack of public investments, as well as the absence of a long-term vision, result in a disastrous management of mainly public-owned sport infrastructures in Italy. As it is well known, there is a cause-effect relationship between the juridical nature of the ownership structure, the lack of investments for the renovation of facilities and the low revenues generated by footballs clubs from this revenue item.

The absence of adequate funds, the lack of interest for the improvement of burdensome and under-used facilities, furthermore perceived by the collectivity as a cost rather than an asset, are responsible for the current critical condition of Italian sport installations.

That said, there are indeed some good examples that may inspire models, strategies and tools for a radical renewal of this sector.

In Udine, for example, the stadium designed by Giuliano Parmigiani and Lorenzo Giacomuzzi Moore[51] urgently required a renovation plan. An icon of reconstruction and return to normal life after the disastrous earthquake of 1976, it was a contemporary facility open to athletes, fans and the citizenship at large. With the aim to enhance the arch that soars over the stand and «rises from the ground but does not touch the sky, folds unto itself as to protect the people underneath [...]»[52], the new volume is not connected to

the existing body but barely touches it so as to ensure a continuity between past and future through an addition. While preserving its previous formal features, the Friuli Stadium also projects a new image aimed at increasing comfort and introducing innovative processes of social integration. Designed as a landmark for sport, and an identity icon for the entire region for the entire range of sport activities and sport-associated programs, the new facility offers 20,000sqm of indoor surfaces for daily activities and responds to the function of an actual hub for integrated services designed to operate independently of the football activity.

The so-called *Italian third way* may represent an alternative – for sport infrastructures – to a basic indifference to historical-identity values, widespread in many European contexts, as well as to an attitude of passive preservation often associated to the Italian cultural context. Rather than uncritically adopting European models, certainly successful in their respective contexts but hardly adaptable to Italy, it proposes a vision that is specifically tailored on the historical-social and landscape peculiarities of our country.
For this reason too, the *Italian model* cannot translate into univocal technical-architectural and morpho-typological guidelines. As suggested by Ernesto N. Rogers[53], it is necessary to define a DNA of the sport infrastructure that may provide a red thread connecting the individual designs in the different contexts that make up our country.
The stadium as a *place* integrated in its own context (rather than a facility exclusively conceived as an *abstract object*), or as an infrastructure that connects the urban *continuum* in a way that increasingly expresses an architecture, a functionality and a spatiality by enhancing its presence on the territory, the recognisability, sense of belonging and identity.

Notes

1. Faroldi E., Allegri D., Chierici P., Vettori M.P., 2007, *Progettare uno stadio. Architetture e tecnologie per la costruzione e gestione del territorio,* Maggioli, Santarcangelo di Romagna.
2. Data derived from: Battaglia S., *100+11 infrastrutture sportive e Beni Culturali. Strategie e lineamenti per la "terza via" italiana tra riqualificazione urbana, memoria e identità, School of Architecture Urban Planning Construction Engineering* at Politecnico di Milano, Master's Degree dissertation, supervisor prof. Davide Allegri, a.a. 2016-2017.
3. Romagni L., 2010, *Lo stadio nella città*, Alinea, Perugia, p. 6.
4. Koenig G.K., 1968, *Architettura in Toscana 1931-1968*, ERI, Turin, p. 17.
5. Vercelloni M., San Pietro S. eds., 1990, *1990. Stadi in Italia*, L'Archivolto, Milan, p. 10.
6. Picchi S. ed., 2007, *Firenze. Lo stadio racconta. Oltre 75 anni di storia cittadina nella memoria del Franchi*, Giunti, Florence, p. 40.
7. The project of the stadium was commissioned to Umberto Costanzini for structural design and to Giulio Ulisse Arata for architectural design, although the latter would not appear officially as the author. For further reading, see: Quercioli G., 2006, *Bologna e il suo stadio. Ottant'anni dal Littoriale al Dall'Ara*, Pendragon, Bologna.
8. The poet composed an ode: *Palestra Novella* [*The New Gym*] for its inaguration, on October 31, 1936. «Ordunque che è? / Mutata tu sei civiltà? / Questa palestra novella / è la sede più bella / di te, Verità?».
9. *Stadio littorio* was the definition adopted for a variety of Italian stadiums under the Fascist regime: Riva in Albenga, Moccagatta in Alessandria, Dorigo in Ancona, Fattori in L'Aquila, Simeone in Barletta, Dall'Ara in Bologna, Fanuzzi in Brindisi, Monterisi in Cerignola, Comunale in Chiavari, Paschiero in Cuneo, Candrida in Fiume, Zaccheria in Foggia, Miramare in Manfredonia, Collana in Naples, Patti in Novara, Colbachini in Padua, Ranchibile and Renzo Barbera in Palermo, Giuseppe Lopresti in Palmi, Comunale in Piacenza, Bottecchia in Pordenone, Viviani in Potenza, Arena Garibaldi in Pisa, Neri in Rimini, Vestuti in Salerno, Zanutto in San Donà di Piave, Comunale in Sanremo, Colombo in Saronno, Nicola de Simone in Siracusa, Mazzola in Taranto, Tenni in Treviso, Grezar in Trieste, Ossola in Varese, Pedroni in Verbania, Menti in Vicenza, Rocchi in Viterbo.
10. De Finetti G., 1934, *Stadi. Esempi, tendenze, progetti*, Hoepli, Milan.
11. Martin S., 2006, *Calcio e fascismo*, Mondadori, Milan, p. 102.
12. *DOCOMOMO Italia*, n. 23/2008.
13. Pier Luigi Nervi (1891-1979), engineer and builder, designed and built a variety of sport facilities: stadiums, sports halls, swimming pools, hippodromes and velodromes.
14. Antonucci M., Trentin A., Trombetti T. eds., 2014, *Pier Luigi Nervi. Gli stadi per il calcio,* Bononia U.P., Bologna, p. 97.
15. Besides the best known examples, such as the Giovanni Berta, later Artemio Franchi Stadium in Florence (1929-1932, enlarged by Nervi himself in 1951), and the Flaminio Stadium in Rome (built between 1957 and 1959 for the 1960 Olympic Games), the Nervi Archive holds documents about six more designs in Italy (a design for the stands of a 100,000-seats stadium in Rome, 1935; the design for the Palme Stadium at the Parco della Favorita in Palermo, 1954; the Taormina Stadium, built between 1955 and 1959; the enlargement of the National Stadium in Rome, built between 1956 and 1958; the design of the reinforced concrete stands for the sports field in Cuneo and the project for the competitive tender for the construction of the city stadium in Salerno), as well as four designs abroad (the indoor sport facility of the Dartmouth College in Hanover, New Hampshire, USA, 1960-1961; a design for the stadium of Swindon in the UK, 1963; a design for a 150,000 – seats stadium in Rio de Janeiro in 1964 and a design for a fully covered stadium in the Kuwait Sport Centre, 1968). All of these designs are featured in Antonucci, Trentin, Trombetti, *op. cit.*
16. «The cultural heritage consists of cultural property and landscape assets» (Code of the Cultural and Landscape Heritage, Legislative Decree n. 42/2004, art. 2).
17. «Cultural property consists in immovable and movable things belonging to the State, the Regions, other territorial government bodies, as well as any other public body and institution, and to private non-profit associations, which possess artistic, historical, archaeological or ethno-anthropological interest» (Code of the Cultural and Landscape Heritage, Legislative Decree n. 42/2004, art. 10).

18. *Paesaggio e patrimonio culturale,* in www.istat.it.
19. Data derived from: Battaglia S., *100+11 infrastrutture sportive e Beni Culturali. Strategie e lineamenti per la "terza via" italiana tra riqualificazione urbana, memoria e identità*, *School of Architecture Urban Planning Construction Engineering* at Politecnico di Milano, Master's Degree dissertation, supervisor prof. Davide Allegri, a.a. 2016-2017.
20. «The present law concerns immovable and movable things, which possess artistic, historical, archaeological or ethno-archaeological interest, including: a) things which pertain to paleontology, prehistory and primitive civilizations; b) things of numismatic interest; c) manuscripts, autographs, papers, incunabola, as well as books, prints and engravings and their relative matrixes, of a rare of precious nature. They also include villas, parks, roads and other outdoor urban spaces of artistic or historical interest. The things which are the work of living authors or which were not produced more than fifty years ago are not subject to this law» (L. 1089/1939, art.1).
21. Stadio Comunale di Bologna, protection decree, November 15, 1986.
22. Saitta G., 1927, «Fascismo Bolognese», in *Littoriale*, Bologna, May, p. 22.
23. Luminasi I., 1925, «Il Littoriale», in *Il Comune di Bologna*, Bologna, July.
24. Giulio Ulisse Arata (1881-1962) was an architect who combined Liberty-style imagination with even diversified elements drawn from his eclectic education and in particular from his experience as a decorator and restorer. For further reading, see: Mangone F., 1993, G*iulio Ulisse Arata. Opera completa*, Electa Napoli.
25. During the second half of the 1920s, Leandro Arpinati (1892-1945) became the most powerful and glorified man in Bologna. As a co-owner of the newspaper *Il Resto del Carlino*, he built the largest football stadium in Italy, became the chairman of the Italian Football Federation, as well as the chairman of CONI, and gathered all of the city's sport associations within the glorious Bologna Sportiva. For further reading, see: Gallian M., 1928, *Arpinati politico e uomo di sport*, Casa Editrice Pinciana, Rome.
26. Ibidem, p. 4.
27. Complesso Stadio Sinigaglia, protection decree, September 21, 1988.
28. Cani F., Rostagni C., Mantero D., 2004 *Oltre Terragni: la cultura del Razionalismo a Como negli anni Trenta*, NodoLibri, Como, p. 101.
29. Cani F., Rostagni C., 2004, *op. cit.*, p. 103.
30. Cani F., Rostagni C., 2004, *op. cit.*, p. 104.
31. Designed by the Gruppo Toscano (Nello Baroni, Pier Niccolò Berardi, Italo Gamberini, Sarre Guarnieri, Leonardo Lusanna) led by Giovanni Michelucci, the building triggered a heated debate. Inaugurated on October 30, 1935, the same day of the inauguration of National Library of Florence (1911-1935) designed by Bazzani, it has been since recognised as a seminal work of modern architecture. The unusual volumetry of the asymmetric and horizontal building becomes the backdrop of the square; the stone envelope includes dazzling coloured marbles, shiny glasses and metals; the design skill and modernity of the building also emerge in the aesthetic treatment of its technical systems. For further reading, see: Conforti C., Dulio R., Marandola M., Musumeci M., Ricco, 2016, *La stazione di Firenze di Giovanni Michelucci e del Gruppo Toscano 1932-1935*, Electa, Milan.
32. Michelucci G., 1932, «Lo stadio Giovanni Berta in Firenze dell'Ingegnere Pier Luigi Nervi», in *Architettura*, n. 3, March, p. 105.
33. Koenig G.K., 1968, *Architettura in Toscana 1931-1968*, Eri, Florence, *op. cit.*, 15.
34. Vercelloni, San Pietro, *op. cit.*, p. 32.
35. Nuti F., Isola G., Cozzi M., Carapelli G., 1994, *Edilizia in Toscana tra le due guerre*, Edifir, Florence.
36. DOCOMOMO, *op. cit.*, p. 1.
37. Giorgio De Chirico (1888-1978), Italian painter and writer, and the main representative of Metaphysical Painting. For further reading, see: Trione V., 2005, *Atlanti Metafisici. Giorgio de Chirico. Arte, Architettura, Critica*, Skira, Milan.
38. Neri M.L., 2002, *Enrico del Debbio. Opera completa, 1909-1973,* Idea Books, Milan.
39. *Note di apprezzamento e sostegno vincolo Stadio Cornacchia Pescara*, in www.sbapabruzzo.beniculturali.it.
40. «A wonderful position in landscape, in close proximity to the sea, visible from the higher stands, and from the vast D'Avalos pinewood [...] 11 rings slightly develop into wider arches [...]

to shape the lower bleacher. The main element, however, is the raised stand with its 17 steps [...] a sequence of powerful reinforced concrete trestles supports the beams over which the curvilinear and ascending ribbon of steps develops [...] a work with a dramatic architectural value: trestles, beams, stairs, recessed floors overlay along the curved axis of the stand in an extraordinarily successful perspective sequence» (Cocchia C., «*Stadio Adriatico a Pescara. Architetto Luigi Piccinato*», in L'architettura – Cronache e Storia, n. 15, January 1957, p. 634).

41. «The Nervi System is cost-effective because it does without expensive and non-recyclable wood formworks and reduces the costs for material expenses by limiting the depths of resistant elements. At the same time, it is time-effective because it implies that the building site can be organised in two independent locations where builders work at the same time. On one side, the building site proper for excavations, foundations, and the pouring of pilasters and other elements; on the other side, the prefabrication site for the construction of roof elements». Iori T., 2012, «Il Sistema Nervi» (Bianchino G., Costi D. eds., *Cantiere Nervi. La costruzione di un'identità*, Skira, Milan, pp. 51-54).

42. *Press Release about the protection of the Flaminio Stadium*, in www.flaminio.org.

43. Picco Stadium in La Spezia, protection decree, September 24, 2015.

44. Data derived from Battaglia S., *op. cit.*, p. 58.

45. «The Ministry shall have the power to prescribe the distances, measures and other regulations aimed at preventing that the integrity of immovable cultural property be put at risk, that their perspective or natural light be damaged or that conditions of the setting or decorous aspect of the buildings be altered», (*Code of the Cultural and Landscape Heritage,* Legislative Decree 42/2004, art. 45).

46. Bazzotti U. ed., 2005, *Palazzo Te a Mantova*, Skira, Milan, p. 42.

47. «Works of the mind having a creative character and belonging to literature, music, figurative arts, architecture, theatre or cinematography, whatever their mode or form of expression, shall be protected in accordance with this Law» (L. 633/1941, art. 1).

48. Two Italian architects, Vittorio Gregotti and Renzo Piano, designed two projects of key relevance for the 1990 World Cup in Italy. Gregotti designed the renovation of the Luigi Ferraris Stadium in Genoa, originally inaugurated in 1911 and therefore considered as the oldest stadium in Italy. His project called for the entire reconstruction of the historical facility, which only preserves the entrance to the stands. Renzo Piano designed the San Nicola Stadium in Bari, and drew inspiration – as he explained – from another major architectural landmark in the Apulia region: Castel del Monte, the hunting residence of the emperor Fredrick II of Swabia, built in the 13th century. The cost of the facility rose to 123.5 billion liras. For further reading, see: San Pietro S., Vercelloni M. eds. 1990, *Renzo Piano. Il nuovo stadio di Bari*, L'Archivolto, Milan.

49. Piano R., 1987, «Dalla relazione del progettista», in *Domus* n. 684, giugno, p. 5.

50. *Elenco decreti riconoscimento particolare carattere artistico ai sensi della L. 633/41*, in www.aap.beniculturali.it.

51. «During the early 1970s, architect Giacomuzzi Moore and I won the competitive tender launched by the City administration. I would define it a team rather than a personal work – about twenty people worked at the project», Cescon M., 2013, «Così nacque l'arco famoso in tutta Italia», in *Messaggero Veneto*, May 10.

52. *Nuovo Stadio Friuli*, in www.udine20.it.

53. «Against the cosmopolitanism that works in the name of a shallow universal sentiment, and erects the same architectures in New York, Rome, Tokyo, or Rio, in the middle of the countryside or in cities, we must try to harmonise our works with environmental preexisting conditions, both with those of nature and with those historically created by human ingeniousness» (Rogers E. N., 1958, *Esperienze dell'architettura*, Einaudi, Turin, p.149).

The Stadiums of the Future

A competitive factor for Italian football

by Marco Brunelli

It is widely believed that the backwardness of sport facilities in general – and of stadiums in particular – is one of the main reasons why the Italian football system is less competitive than other contexts comparable in social, economic, demographic and cultural terms.
Just think, for example, of the infrastructural level reached by sport facilities in some European countries such as Switzerland, France, Germany and England and, to a different degree, Spain and Portugal[1]. One could think, with good reason, that an actual "stadium factor"[2] as a new paradigm of reference may play a strategic role in the process of modernisation and rehabilitation of the Italian system of sport infrastructure within the now undelayable effort to fill a dramatically evident infrastructural gap. A rapid survey of the development models of football movements in the most advanced European contexts highlights the issue of sport infrastructures as an unavoidable starting point. The construction of new modern installations and the update of existing ones have been the object of a radical rethinking in terms of both programming and management on a both architectural and figurative level aimed at defining new parameters of quality and technological innovation on the process and product levels. Within the European context, sport infrastructures are considered as strategic elements for the promotion of policies aimed at the improvement and implementation of the cultural and entertainment offer directed at a wide audience (well beyond that of football fans). On the other side, they are considered as indispensable factors in the achievement of economic viability levels for football clubs.
There are some assessment methods and "units of measurement" one could use to "measure" the competitiveness of a sport system as they allow comparing even not necessarily homogeneous data. The sport results a certain football system can express is the first and most obvious parameter of reference. The tool currently used to gather this kind of data is the UEFA ranking[3], which shows a weighted average of the European results of football clubs as a constantly updated situation of the actual status of teams and at the same time indicates the evolution of such results over time.
Another parameter of reference is the *size* of "football companies"[4] in terms of the overall turnover they can produce. This factor, perhaps more than any other, clearly mirrors the current situation at the European scale. If, until ten-fifteen years ago, the gap between England and other nations (including Italy) was limited, the English football system has since confirmed its primacy in terms of turnover, while Italy, Spain and Germany remain at a lower level.
A third parameter is available to interpret the economic dimension of the European football system and consists in considering the ranking of the twenty most affluent football clubs in terms of the turnover they generate according to four factors: profits resulting from stadium management (tickets and subscriptions), broadcasting rights, sponsorships and merchandising.

During the 2004-2005 season, three Italian clubs (AC Milan, Juventus FC and Inter 1908) ranked in the first ten positions, at a short distance from the top-ranking European clubs. According to a Deloitte & Touche report, only one Italian club (Juventus FC) ranked in the first ten clubs during the 2014-2015 season, at a dramatically increased distance from English clubs (five of which, Manchester United, Manchester City, Chelsea, Arsenal and Liverpool, dominated the ranking).

A fourth and final – and more recent – assessment method of the football system's condition considers sport results, economic performance, as well as the condensed indicator of social impact and sustainability of this business. The weighted average of all of these data offers a more complete and articulated indicator through the integration of different elements.

Even in terms of this indicator, Italy is the taillight within the so-called "big powers of football".

In addition, the system of revenue appears to be well balanced in England where receipts come equally from broadcasting rights, stadiums and merchandising, while in Italy the by far largest portion of profits comes from the transfer of broadcasting rights, basically the only "important" client of Italy's football market.

The situation emerging from the critical interpretation of all of these indicators is clearly one of inferiority, increasingly evident every year, of the Italian system compared to its European competitors. The structural nature of this gap also implies a substantial redefinition of the overall sport sector, precisely starting from a radical and widespread re-infrastructuration on a national scale. The situation described above is responsible for an unavoidable loss in terms of competitiveness of the national football system. The very first and marked critical element is clearly the complete inadequacy of Italian stadiums in terms of the current requirements for the management and economic and functional exploitation of such facilities.

First of all, it is necessary to clear the field from a widespread as much as unjustified cliché, or the fact that the exponential increase of football offer on TV is – or was – the primary reason why the "paying audience" is gradually deserting or abandoning Italian stadiums. It would be enough to counter that the TV offer in other European countries is the same (if not even higher), while their stadiums are consistently "sold out".

The explanation for the negative peculiarity of the Italian situation is that, while the quantity and quality of the TV offer have grown over the last decade (while remaining in line, or even surpassing, that of other countries), other European countries have instead developed their infrastructures with an increase in terms of quantity and quality of services to the audience, activities, functions and entertainment for different social groups (families among others), and hyper-technological arenas.

In Italy, the dramatic increase of broadcasting rights gave football clubs the means to operate without feeling the need to launch a systematic intervention on their facilities. This, in addition to the public ownership of the near totality of Italian sport facilities, has created a sort of still unresolved political-economic short-circuit on a decision-making level. Other European countries have focused on stronger policies aimed at "serving the audience" with an increasingly diversified and multi-faceted entertainment offer tailored on different socio-cultural targets. On one side, this has basically allowed to address the requirements of all user groups and, on the other side, to maximise the profits coming from sources other than football. This is precisely the paradox – on one side, the interest and passion for football have never been stronger in Italy (there is no other country in the entire world where football has a higher following and mass-media influence – just think of the extraordinary spin-off associated with the publishing business). Such interest is transversally shared by the most diverse social groups and, precisely for this reason, potentially expresses a requirement for just as diverse services. On the other side, precisely in Italy, stadiums – and more in general sport and leisure facilities – are in such condition that they cannot satisfy, if not in minimal and insignificant ways, the users' "hunger" for facilities and services associated to the football phenomenon.
More in general, the same paradox is recognisable in the management of cultural heritage in Italy where political and strategic guidelines fail to exploit the extraordinary value of the country's artistic heritage in a way that would optimise it and create potential downstream activities. Going back to the issue of football stadiums, while abroad the *Stadium Experience*[5] has emerged as a range of diverse entertainment offers allowing to access a unique experience that only stadiums (and that specific stadium in particular) can provide, in Italy we still contend with issues that have already been brilliantly addressed abroad, and the stadium bill is still trapped in uncertain parliamentary procedures. In Italy, only the Olympic Stadium in Rome and the San Siro Stadium in Milan would be equipped to host a Champions League or Europa League final. Some clubs[6] have not even obtained the mandatory *UEFA license* required to host European competitions in their facility, precisely for the inadequacy of their stadium in terms of the minimum safety, capacity and services standards required by UEFA.

English stadiums and the Taylor Report

The loss of competitiveness of Italian football within the European context may be analysed by using two main factors: UEFA ranking and average attendance.
While until the 1990s, Italy was at the top of both average attendance and

UEFA ranking (and England ranked as low as twenty-first and was even out of the European cups competitions for reasons associated to the well-known hooliganism phenomenon), today the situation is exactly the opposite. Italy now ranks third, while England is second (with Spain occupying the top spot)[7]. How is it possible that a country only a few years back involved in one of the most catastrophic tragedies in the history of football has now become the symbol of fair play and of stadiums as new venues for social recreation for all, families included? Unfortunately, as it often happens, a dramatic event of extraordinary emotional impact triggered the definition of a new concept of football stadium. An actual revolution – in cultural even more than sport terms – encouraged England to become the model of absolute excellence for football facilities. The notorious 1989 Hillsborough disaster with its 96 casualties marked the beginning of a new deal for football in Anglo-Saxon countries.

The emotional impact and backlash of the first days after that absurd as much as, somehow, preventable event gave the British government the latitude to launch a pragmatic action that eventually led to the preparation and approval of the well-known Taylor Report within a few months.

The document soon became a legal and regulatory model for a new way of conceiving the overall stadium experience. The main points of the Taylor Report concerned the collection of fans' data, the mandatory introduction of numbered seating in stadiums, the removal of the infamous terraces and of the barriers between pitch and spectators with the introduction of pitch side stewards, and a modernisation plan for all football facilities including those of minor leagues. The report also entailed the creation of the Premier League[8], now the most evolved football league in terms of commercial activity and global-scale appeal. It also introduced terms like *safety and security*, not only in terms of safety factors associated with the presence of police officers but also and foremost in terms of the new perception stadiums had to elicit as places where spectators may feel at home – totally safe and enjoying all the possible comforts and services.

The Anglo-Saxon cultural approach has certainly emerged as the most adequate to rapidly implement the guidelines the Taylor Report recommended in order to trigger a radical change of course for the English football system. Indeed, fans understood, certainly with full responsibility, the gravity of the issues associated with violence and the inadequacy of stadiums. The "revolution" entailed by the Taylor Report has only been possible thanks to a bottom-up approach without which any attempt at reforming the overall football entertainment would have been fruitless. As a result, the investments made by clubs primarily targeted more than (and not just) the acquisition of new players and rather entailed infrastructural improvements. During a first phase, such modernisation only addressed existing stadiums but, over few

years, it increased its scope to the point of becoming a full-fledged model of intervention that promoted the construction of a number of new state-of-the-art facilities. However, it must be noted that the Anglo-Saxon model is not applicable to the Italian situation as it implied (and still implies, in almost all cases) the demolition of existing facilities and their entire reconstruction (often in different locations). Such approach would not be feasible in the Italian context due to the presence of a high number of partially protected facilities as well as a quite problematic public ownership.

A paradigmatic case study: the Emirates Stadium in London

The Emirates Stadium[9], the new Arsenal stadium in London, is an interesting case study of reconstruction-modernisation. The Lancers' "old house" was located in the characteristic English district of Highbury, featuring low residential terrace blocks. The London club decided to build a new multi-functional facility (with about 70,000 seats), because it considered it would be primarily important to invest in a new facility as an unavoidable starting point for the definition of new middle-long term financial, economic and marketing strategies. The process that led to the construction of the Emirates Stadium was highly complex in the programming and design phase as it defined a decision-making structure that involved, through the ensuing steps, all the public and private stakeholders: football club, fans, residents of the Highbury and Ashburton Grove districts, the London city administration, the British government, as well as committees and private investors.

It was only through an action of gradual persuasion aimed at fans and through the promise that the memory of the historic stadium would be somehow protected that the club managed to convince the public opinion of the soundness of its urban planning proposal. Another critical point the Arsenal managers had to explain to supporters concerned the club's investment policies and the fact that – at least for a decade – they would cease to target mainly the acquisition of new players and would instead channel resources into the new half billion euros-stadium. Such policy inevitably entailed a decline in the club's sport results. Yet, even such resistance was overcome; the club's fans accepted the idea of a new innovative, safe and multi-functional major stadium (a few hundred metres from the old one). More importantly, they accepted the idea that, precisely thanks to the new facility, the club and its team would firmly rise in the middle term to become one of the wealthiest clubs in England (after deducting the capital increases due to private portfolios, see for example the case of Manchester City). In addition, the complex real estate operation of the new Emirates Stadium entailed the transformation of the old Highbury stadium into duplex apartments with a view on what used to be the pitch and now is essentially a

system of gardens and urban vegetable gardens available to residents. Having shouldered a €430 million investment, the club now earns £3.1 million – including tickets and other direct and indirect spin-offs – per event as well as £42 million from its contract with Fly Emirates for naming rights. The new stadium nets the Arsenal club a total of about £200 million yearly, while the Highbury only reached £140 million.

European experiences – England, Germany and Spain

Apart from the examples of the Emirates and New Wembley Stadiums in London and the Etihad Stadium in Manchester[10], English stadiums are among the "oldest" in Europe (dating back to the birth of modern football in England in the late nineteen century). In spite of their "history", these stadiums were progressively demolished and rebuilt (either on the same sites or in new locations). Today, the Anglo-Saxon context offers a new generation of modern stadiums conceived to cater to social needs and generate substantial revenues required to support new investments. In this sense, they provide a model that both large and middle-small clubs can replicate. In addition, the English model is characterised by a solid rooting of football in the widespread social culture. Here, the stadium is experienced as a home and, even from the typological point of view, is physically perceived seamlessly with the typical terraced housing. Being historically embedded in popular districts, in close proximity to housing, it is part of an indivisible whole with the material, sport and social culture of its surroundings.

While in England policies mainly focused on the stadium structure, in Germany, they additionally aimed at improving the quality of the relationship with fans. As early as the 1990s, the German football system was considered as an advanced expression of wise medium-long term policies and programs. On the other hand, the clubs' sport performances were rarely successful. Long-term policies aimed at promoting the growth of young players and an increasing loyalty of spectators-fans have propelled the German league to become a major European tournament (in terms of both revenues and cost-income compared to investments). The policies adopted in both England and Germany provide a clear answer to problematic existing situations. While in the English case the crisis stemmed from dilapidated facilities and widespread hooliganism, in the case of Germany the main reason was the low competitiveness of its clubs. The clubs' poor performance due to their technical weakness had necessarily to be compensated by initiatives aimed at encouraging the public to go to the stadium anyway.

Therefore, during the 1990s, Germany adopted some solutions aimed at meeting the requirements of fans as well as of other users. For example, standing places preserved in curved stands at least for domestic matches

(while Cup matches only allowed for seating places as mandated by UEFA regulations); in agreement with major clubs, reduction of the average price of tickets and introduction of a range of tailored packages aimed at different users (families, young people, etc.). *Supporters liaison offices* were created precisely in Germany in the early 1990s as a bridge between club and fans in order to help them buy tickets or organise their attendance to away matches[11]. It was the first step in the gradual transformation from the social status of *fan-spectator* through *fan-generic user* and finally to the now widespread concept of *fan-customer*, according to which the concept of fan entirely lost its merely sport meaning and acquired a wider and more purely commercial connotation. The 2006 World Cup definitely marked a turning point for sport infrastructuring in Germany. Unlike England, Germany used the opportunity provided by the world cup event to show the world its technological supremacy on one side, and the deep environmental awareness of its people on the other side. Germany certainly invested huge capitals in the general modernisation of its sport installations as well as, and more importantly, in the construction of new infrastructure and redesign of entire urban and outer-urban sectors. The new stadiums for the 2006 World Cup became actual urban regeneration triggers, as well as magnets for a remarkable social and economic spin-off – from the construction of new urban mega parks (Frankfurt, Leipzig, Munich, Stuttgart, Hannover), to the experimentation of new energy saving technologies (Allianz, Gelsenkirchen) to the design of visionary mobile architectures (Gelsenkirchen, Frankfurt) or interactive envelopes (Munich).

During the post-2006 years, Germany, like other countries had done before, launched a widespread renovation plan extended to several "minor" facilities (for football as well as for other sports).

The development model of the Spanish football system differs from both the English and the German ones. To some extent, it is comparable – as a cultural model of "Latin" football – to the Italian context, although, unlike the latter, it successfully addressed the renovation and modernisation of its sport infrastructure due to a smarter and managerially more advanced governance.

No major events seem to have triggered this process, only partially encouraged by particular safety concerns. It was rather the result of the awareness that existing stadiums were no longer adequate to cater to the fans' increasing requirements of services and facilities (football traditionally has a huge following in Spain). As a result, the top Liga BBVA clubs (Real Madrid, Barcelona, Atletico Madrid, Atlethic Bilbao, Valencia, etc.) made agreements with private investors and started building new stadiums or radically renovating existing ones. The positive example set by major clubs encouraged even less important ones to follow, although there was no "bottom-up"

infrastructuring process as a result. Although the Spanish model has mainly betted on an up-down approach so far, it was nonetheless successful in freeing the football scene from the backwardness that, unfortunately, still and deeply plagues the Italian context.

Fan membership cards, a boost for stadium competitiveness

The fan membership card was created in order to encourage a relationship between sport clubs and the variety of users who, more or less frequently, go to the stadium. In particular, it was introduced as a way of addressing some of the issues associated with *named tickets*, in order to allow fans to register once only without having to repeat the same procedure for every new ticket. A useful tool first and foremost to improve safety in stadiums by acquiring the details of the individual buyers of each ticket, the fan membership card can become an actual "rewards card" providing the fan with a number of services and benefits. Even on this issue, it should be noted how the various English clubs show a different culture of service compared to their Italian counterparts. For example, the *Football League* (which combines the three professional championships except for the *Premier League*) coordinates, oversees and supports all the clubs in the development of policies aimed at nurturing "future fans" through benefits, interactive programs, services, discounts, entertainment at the stadium, etc. These strategies may encourage the emergence of new professional profiles associated with stadium management, such as the *stadium-manager* (a now well-established profession abroad even in middle/small-sized clubs), obviously responsible for the overall management of the facility, from the organisation of events to the relationships with fans.

The situation of Italian stadiums since 1990.
Present and future scenarios

At present, the development and management models implemented in England and Germany for sport infrastructure represent the ultimate benchmark not only in terms of purely economic aspects but also for their success in creating highly innovative and competitive management models of the football system and stadium structure starting from critical conditions.

With its chronic crisis and situation of decade-long infrastructural emergency (in the sport sector as in many others), Italy has been unable to define its own model of long-term development. The Italian context differs from the English, German and Spanish ones for obvious and different (economic, cultural, geographic) reasons. One of these is the close relationship between existing facilities and different protection regimes associated to

cultural heritage. In our country, authorising repeated programs of demolition and reconstruction like those adopted, for example, in England, would be unthinkable.
The current model – almost exclusively relying on broadcasting rights for its economic viability – has clearly become unsustainable, as clearly demonstrated by the first signs of overall collapse of the Italian football system – bankruptcy of "glorious" clubs with potentially huge catchment areas; declining sport performances at the European level; average turnover, etc. The last campaign for the construction of new stadiums was launched in Italy back in 1990 for the World Cup. If compared to other similar experiences at the European or world level, the 1990 World Cup was by far the most negative. The World Cup hosted by France in 1998, the European Championship hosted by Holland and Belgium in 2000, the World Cup hosted by Germany in 2006 – these and other similar events were extraordinarily successful for the economy of their hosting countries and for the infrastructural modernisation of football and sport facilities in general. The "ruins" left behind by the 1990 World Cup are still visible on our territory. Stadiums too big for their local sport and social and demographic contexts; facilities already dilapidated and obsolete due to their old typological and design models (just think of the distance from the pitch; the unwise use of materials like reinforced concrete; uncovered bleachers, etc.); unsafe and unwelcoming structures with no additional service offered to football fans except for the obvious refreshment posts located in inconvenient and/or poorly connected spots. In many ways, the 1990 World Cup could have been a crucial opportunity for the implementation of a general modernisation plan of sport facilities – a boost for the definition of long – and medium– term programming and planning policies that could have projected Italy, within 25 years, to compete with other European nations on equal terms. None of this happened. Even then, the public was beginning to shy away from stadiums, perceived as unsafe and unwelcoming venues (particularly for women and children).
Statistical surveys conducted over the last few years on a significant population sample (about twenty million Italians define themselves as football fans) show an increasingly unbalanced relationship between those who follow the events on the media and those who physically go to the stadium. Paradoxically, the only significant investments made in Italy targeted precisely the "safety" issue, with the installation of turnstiles, cameras, and regulated accesses. Currently, Italian stadiums may be reasonably considered as safe places, although they preserve an image of inaccessible fortress, particularly when observed by people who do not follow footballs as fans. Making sure that a stadium is safe and "up to standard" in order to encourage public attendance is necessary but not enough. A cultural awareness campaign combined with a major modernisation plan are required. Only a

handful of cases exemplify such approach in Italy. Bureaucracy and legislative uncertainty often discourage initiatives of this kind. New constructions only include the Juventus Stadium (Turin, rebuilt as Allianz Stadium in 2011) and the Dacia Arena (Udine, 2016, modernisation of the existing facility).
Another reason for the backwardness of our football system directly results from the impact broadcasting rights have had since the 1980s and 1990s on the budgets of A and B League clubs. The latter saw their profit grow exponentially with no need to engage in any actual improvement of their facilities. In addition, while some Italian clubs listed their companies on the stock exchange purely based on football results, the English clubs tied that decision to believable sport and real estate projects according to which the modernisation of their real estate assets is inseparable from the results achieved by the team.
The Stadiums Bill[12] is supposed to regulate and accelerate the renewal process by finally defining and prescribing clear steps within the complex and intricate programming and planning procedures associated with sport infrastructures. Aside from the legislative frame, it should be noted, once again, that only a radical change of cultural attitude could really and actually transform the football system in its entirety.

A stadium "must primarily be a stadium"

A *stadium must primarily be a stadium* and attract as many people as possible, fill the house, because it is the only way to make sure that even all the other accessory activities are sustainable.
The following schematic list details some features a stadium should offer in order to *be a stadium*. One of the key elements is the *importance of sold-out events*. The Arsenal stadium, for example, can count on a £3 million income, including ticket and other activities, per event, which means 40 events a year. English stadiums have a 92% average attendance, sometimes rising, for example at the Emirates, to peaks of 99%. In Italy, such average is about 50%. Therefore, a modern stadium is a stadium that fills up (sometimes beyond 90%) and has many subscribers. This means that the clubs may count on sure and immediate revenues at season start, and on a cash flow available for immediate reinvestment.
Another issue is the *renewal and modernisation of facilities.* Considering the average age of European stadiums, the stadiums in the United Kingdom, along with those in Italy, are the oldest ones, while the countries that hosted recent sport events, such as Russia, Germany, France, Poland, Ukraine, have younger stadiums. Even the average years of renewal are comparable between Italy and England. However, while the latter invested £3 billion in the construction of new stadiums or in the modernisation of existing ones,

and £150 million a year in continuing rehabilitation and modernisation programs, the only significant investments made in Italy concerned safety and never addressed the poor attractiveness of stadiums.
Quality of service is a core issue: the assessment of ticket cost depends on the value people associate to the services represented by the ticket itself. An analysis of relevant data shows that in Italy tickets are on average less expensive in low-cost sectors such as curved stands. Abroad, however, curved stands offer a range of services. On the other hand, the prices of sectors such as stands and "distinti" are on average among the highest in Europa, all while offering less services and comfort. It follows that in Italy the relationship between quality of service and ticket cost is unbalanced.
Interpreting the *management of stadiums as an opportunity* would mean improving safety, reducing the costs of public real estate (which are still very high today), rehabilitating blighted areas in strategic urban and outer-urban sectors, creating new economic activities and new jobs.

Conclusions

The current gap between the football system in Italy and in other European countries is likely to grow wider. Without a modernisation plan for the huge real estate heritage represented by stadiums, Italian football is bound to lose further ground, as broadcasting rights – after a decade of exponential increases – are likely to stabilise. Therefore, new infrastructure will play a key role in boosting, finally, clubs' commercial revenues.
Fans are deeply involved in everything concerning *their* football clubs and the brand loyalty of a customer-fan is unimaginable in any other kind of company. If the loyalty of customers is a primary goal for other companies, in football such result is sure and taken for granted since the beginning. If, in a first phase, broadcasting companies tried to bring the stadium experience in every home, now, on the contrary, stadiums – in the rest of Europe – are trying to incorporate the experience of television.
The stadium embodies the physical materialisation of a global experience. In the near future, Italy will hopefully excel once again in the architecture of sport infrastructure as it did at the beginning of last century.

Notes

1. The models of the quoted countries differ, even substantially, in their approaches. What they do share is the political will to define middle – and long – term strategic visions based on organic and system-wide programs and on bottom-up approaches preferably relying on widespread structural investments starting with facilities for non-professional sports.
2. This expression embraces the range of economic-financial, socio-cultural, political, architectural, territorial features that define the *stadium-system* as a key factor in the growth of the entire football movement.
3. For further reading, see: *UEFA club rankings* in www.uefa.com.
4. "Football company" is used with reference to the socio-cultural transformation from the traditional figure of "fan" into that of "fan-user", or simply "user", regardless of a direct interest in sport events.
5. These "programs" effectively create in fans-users the *feeling* and sense of belonging and involvement towards the stadium and the football club. From this point of view, Italy has made no progress, while in other countries new stadiums have had a highly positive impact in the growth of their companies' turnover.
6. The UEFA ranking assigns European stadiums a different assessment depending on their features. See the UEFA Guide to Quality Stadiums.
7. For further reading, see: https://it.uefa.com/memberassotiations/uefarankings/index.html.
8. The *Barclays Premier League* is the top level of the English football league system and is overseen by the *Football Association*.
9. The Emirates Stadium is Arsenal's home-stadium. Located in Ashburton Grove, north of London, it was inaugurated in 2006. Its capacity is 60,260 all seats.
10. The Etihad Stadium, the commercial name of the City of Manchester Stadium, is a city-owned multi-functional sport facility and Manchester City's home-stadium. Originally designed for the 27th Olympic Games for which Manchester presented its bid, it was built in 2002 for £110 million in order to host the Commonwealth Games. Eventually restored as a football venue, it became the home-stadium for Manchester City, which left its previous facility in Maine Road. It is 106 m long and 71 m wide, with a capacity of 47,726 seats.
11. UEFA later made this service mandatory (Italy implemented the measure by creating the figure of "fan relationship manager").
12. The Nardella Legislative Proposal was approved on December 27, 2013 (with effect since November 12, 2014), within the Law n. 147, art. 1 commas 303, 304, 305. For further reading, see: CONI Servizi, 2014, «Guida all'applicazione della Legge dello sviluppo dell'impiantistica sportiva», in *Spazio Sport*, n. 28, January-February.

Football Facilities in Italy and Europe

Prospects for growth

by Guglielmo Cammino, Niccolò Donna

Introduction

A football stadium is the house of supporters, a place that symbolically connects citizens to sport. Stadiums have a primarily important function, as they represent a point of reference for millions of people who devote time every week to their favourite team in the pursuit of a unique emotional experience.

Therefore, adapting sport installations to the requirements and needs of supporters by focusing on services for them is certainly fundamental. Indeed, any citizen should be entitled to attend sport events in modern, enjoyable, comfortable and, more importantly, safe venues. Creating such a context, particularly in an extremely delicate economic juncture, unavoidably relies on the construction of state-of-the-art sport infrastructure or on the modernization of existing facilities, which, in the Italian context, are often outdated and dilapidated. In other words, only modern and enjoyable sport facilities can actually attract both enthusiasts and supporters. In addition, planning, constructing and managing a new generation of sport infrastructure for Italian football may encourage the growth of business by boosting the income of top clubs, now excessively dependent on broadcasting rights, with additional and diversified activities along with matchday revenues. This essay analyses the differences between economic parameters in professional sport in Northern America, currently considered the primary benchmark, and in European football. It will also address the best examples of German and English football stadiums, as well as the critical issues in Italian football facilities. The final goal is, on one side, suggesting the possible creation of a business model designed to further increase the supporters' interest in Italian football and, on the other side, to enhance the huge (as testified by international best practices) but as yet unexpressed potential of this sector.

European vs Northern American sport model

Infrastructure issues are increasingly relevant in the current scenario of the global sport system, and their relevance has a major impact on the industry's economic dynamics. The still unexpressed potential of part of European football appears as particularly significant. Indeed, there is a huge gap between professional sports in Northern America and the 54 European Football Top Divisions in terms of gate receipts including matchday and season ticket sales. In 2017, the 122 North-American franchises (associated to NFL, NBA, MLB and NHL) generated €6.9 billion (an average of €56.2 million per company) in matchday revenues. The 713 clubs playing in the 54 Top Divisions of European football, on the other hand, had a revenue of about €3 billion (€2.2 billion of which from the so-called "Big 5" European Leagues – English Premier League, German Bundesliga, Spanish Liga, Italian Serie A

and French Ligue 1, or an average of €22.1 million per company).
A comparison between the revenues generated by the 20 main franchises in the 4 American Leagues and the Top 20 Clubs of European football shows that the former are more successful in optimising matchday revenues. The Top 20 American franchises reported revenues of this kind for €1,928 million, over 600 million (+ 45%) more than the 1,326 million earned by the Top 20 Clubs of European Football.
The top 5 positions in the 10 highest-grossing sport companies for matchday revenues are held exclusively by MLS-affiliated baseball franchises including the New York Yankees (at the top position with €224.5 million), followed by the Chicago Cubs (172.8), the Boston Red Sox (155.0), the Los Angeles Dodgers (151.8) and the San Francisco Giants (145.3). The top ranking club in European football, FC Barcelona, only comes in sixth (with matchday revenues of 137.2 million).
The difference between North-American sport and European football also emerges in terms of attendance (also due to the different number of matches). In 2017, 133.8 million supporters attended the matches played by NFL, NBA, MLB and NHL, while "only" 98 million spectators attended the matches of all the 54 Top Division football teams in Europe in the same period.
Such crushing supremacy of American franchises mainly results from the huge investments deployed on sport facilities. According to a PwC Consulting report, the investment for the construction and modernisation of 83 different stadiums since 1996 exceeds $32 billion, with a remarkable increase of private capitals over public ones. Over the last twenty years, the North American Football franchises alone invested almost $14 billion in the construction of 22 new stadiums, with an increase of private capitals over public ones from 36% in the 1997-2002 period to 73% between 2003 and 2017. The remarkable increase in investment for sport facilities resulted in the creation of architectural jewels equipped with the most advanced technological solutions and designed to provide a unique fan experience and attract a wider target audience. The new Atlanta Falcons Stadium and the future Las Vegas Raiders and Los Angeles Rams stadiums, which required an overall investment of over $6 billion, are the most recent examples of this trend.

European football: evolution of attendance and matchday revenues
An analysis of the evolution of attendance and match-day revenues over the last few years must consider the particular historical phase European football is going through, with an overall stagnation of attendance. Over the last 12 years, aggregate attendance for the 54 European Top Divisions has always remained, with minimal variations, at about 100 million spectators. The impact of matchday revenues on the aggregated turnover of European

clubs, instead, has decreased from 23% in 2006 to 15% in 2017 (against an increase in absolute terms of €0.7 billion). When narrowing the scope to revenues earned by the Top 20 European clubs, such impact has decreased from 29% in 2006-2007 to 17% in 2016-2017. The data show how sales of matchday and season tickets have ceased to represent the main source of revenue for football clubs, which currently earn more from commercial activities and broadcasting rights.

As further proof of this scenario, 11 out of 20 Premier League teams in the 2016-2017 season would had a profitable financial year without the selling of a single ticket. Such situation is mainly due to the remarkable increase of earnings from broadcasting rights on a both national and international level, currently the main source of income for English clubs (61% against 13% from matchday revenues).

A comparison of the Big 5 European Leagues offers a quite diversified scenario. The evolution of matchday revenues from 2003-2004 to 2016-2017 shows a 143% increase for Bundesliga (from €207 to €504 million), followed by Liga (+97%), Ligue 1 (+52%), Serie A (+26%) and Premier League (+22%). An analysis in absolute terms, however, shows that the Premier League is the one that best maximised its revenues from matchday and season ticket sales. During the 2016-2017 season alone, the amount reached by the main English championship was €718 million, against €544 million for Liga, €504 for Bundesliga, €217 for Serie A and €182 for Ligue 1. What emerges in particular is the difference in the evolution of Bundesliga and Serie A. While in the 2003-2004 season the difference between the two championships was rather minimal, with the German clubs earning 20% more, during the 2016-2017 season such gap rose to 132%, or almost €300 million.

A club-related comparison makes the growing gap between Italian football and its foreign competitors all the more evident. Between 2002-2003 and 2015-2016, the evolution of top Italian clubs' matchday revenues compared to that of European top clubs shows an opposite trend. AC Milan, Inter and AS Roma earn less than thirteen years ago, while Juventus is the only club to have increased its revenues after the inauguration of the Juventus Stadium in 2011. Other top European clubs, instead, generated higher revenues mainly from the stadiums they own. Arsenal is the club with the highest increase in matchday and season ticket sales in the considered period (+€93.5 million), while Manchester United generated the highest revenues of this kind on an aggregate level over the last 13 years (€1,665.6 million). Taking the *Red Devils* as a benchmark, the comparison with Italian football is all but crushing. AC Milan, the Italian club that reached the highest revenues for home-matches on an aggregate level over the same period, had an overall turnover of €418.1 million, or a quarter of the English team.

Obviously, the dynamics of matchday revenues result from the trend of

spectators attending stadiums. Considering the average attendance in the Big 5 European Leagues between 1996-1997 and 2016-2017 seasons, Serie A is the only championship showing a decline (from 29,500 to 21,300 average attendance per match), against the increases reported by Liga (from 24,200 to 27,600), Premier League (from 28,400 to 35,800), Bundesliga (from 30,900 to 40,700) and Ligue 1 (from 14,200 to 21,100). In absolute terms, Bundesliga consistently occupied the top position during the last decade with a peak in the 2014-2015 season of 42,685 average spectators per match. A comparison considering the average attendance in the second, third and fourth-tier divisions makes the alienation of Italian fans all the more evident. Even this ranking shows how Germany (Bundesliga 2, 2nd division) and England (EFL Championship, 2nd division) report considerably higher attendances than the lower divisions of other leagues, respectively with an average of 21,739 and 20,084 spectators per match, even comparable to Italy's Serie A. The average attendance for a Liga Adelante (2nd division) match in Spain in the 2016-2017 season was 7,617 spectators, while Italian Serie B had an average of 6,545 spectators per match.

"Costly" stadium and "profitable" stadium

The data and trends described in the previous chapter reflect the difficulties in the Italian context and its growing distance from foreign models. Such gap results from a different concept of "stadium model" in the Italian sport system and in that of the other main countries.

While it is impossible to define a perfect model indifferently applicable to all the football and sport contexts on the planet, it is still possible to classify stadiums according to two macro-models: "costly" stadium and "profitable" stadium.

In general, a costly stadium is a public-owned facility implying rental costs for the football club and maintenance costs for the public institution. An almost never sustainable facility in financial terms, it offers fans low comfort, safety and attractiveness standards. The so-called "white elephant" lacks all the services that would make it accessible and usable – as a result, it is only used during matchdays. Such "non-model", typical of Italian stadiums, is responsible for the public's gradual alienation, which translates in an increasingly declining attendance and in the resulting negative impact in economic terms.

The opposite is true for the "profitable stadium" model, the management of which is almost invariably under the control of football clubs, which either own them or are shareholders within public-private companies.

Generally new or radically modernised, it is obviously a modern, comfortable, safe and, more importantly, financially sustainable installation. It offers all the services required to make its management profitable, including a range of activities (concerts, shows, exhibitions, guided visits, meetings and

corporate events) in addition to football matches. Germany and England boast the best examples of this model of sport infrastructure, the economic potential of which attracts public and private funds. Indeed, the financial success of Bundesliga and Premier League clubs results from their ability to exploit their facilities and the commercial activities related to brand promotion.

The "English model"

In England, the process of infrastructure renewal has a precise starting date – the enactment of the *Taylor Report* in 1989. Over the previous five years, the disastrous events of Heysel (1985), Bradford (1985) and Hillsborough (1989) had claimed an overall number of 191 casualties among fans. Following those tragic events, resulting both from hooliganism-related disorders and from the below-standard infrastructure of English stadiums, the UK government established a parliamentary committee chaired by Lord Justice Peter Taylor with the task of preparing a report about safety in sport facilities. The publication of the Taylor Report at the end of the study phase entailed a range of recommendations. These included the removal of perimeter and lateral fencing between spectators and pitch, the elimination of terraces and the conversion of stadiums to all-seated and entirely covered facilities, the introduction of CCTV cameras in order to identify potential threats, the creation of stands for the different groups of fans (such as the family area) in every stadium, the increase of the number and quality of services provided to fans (such as the creation of VIP areas and Hospitality), as well as the general obligation for clubs to invest in the enhancement of facilities' quality. Football clubs had 18 months to implement the Report's recommendations under penalty of exclusion (without exception) from the championship.

Thirty years after the enactment of the Taylor Report, its effects are clear. 85% of Premier League Stadiums are now privately owned and provided clubs with an average of €36 million in matchday revenues during the 2016-2017 season (over three times as much as Serie A clubs). The fact that 8 English clubs rank in the Top 20 European clubs in terms of matchday revenues clearly confirms this situation. Between 1992-1993 and 2016-2017, English professional football invested an overall £4.9 billion in stadiums (3.6 billion of which in the Premier League), which resulted in the construction of 32 new stadiums with an overall capacity of 763,000 seats. The English example shows how clubs owning a stadium are better equipped to increase their revenues resulting from the facility itself, mainly due to a better ability to introduce functional improvements aimed at making the facility more comfortable, customised and attractive for fans and their families. Being able to modernise a facility by adapting it to the changing requirements of the public translates, in the middle and long period, into a stabilisation and potential

increase of matchday and commercial revenues.
One of the best examples is the Emirates Stadium, the new Arsenal home-stadium since 2006, when the *Gunners* left the historic Highbury Stadium after selling its site and making it available for the construction of 700 apartments. Arsenal made high profits from that real estate deal. In particular, the club's financial statement between 2001-2002 and 2016-2017 received additional revenues for £466.9 million and 69 million of profits. The construction of the Emirates Stadium cost €564 million, covered by an entirely private project-financing model; the transfer of naming rights to Emirates for 15 years brought a revenue of 100 million. With an overall capacity of 59,867, the stadium also features 150 skyboxes with a yearly cost ranging between £65,000 and £150,000 each, as well as restaurants, bars, a museum, offices and other infrastructures. All of these services imply higher costs for fans whose average yearly expenses increased from £480 required to access the Highbury to £2,387 for the Emirates Stadium. In turn, this entailed a remarkably higher matchday revenues for Arsenal, with an increase from €63.8 million in 2005-2006 to 134.6 million in the following season.
The modernisation of English football stadiums is a dynamic and continuing process, as testified by the numerous investments and projects including the plan for the expansion of Anfield Road (the historical Liverpool stadium) to increase its capacity to 58,800 seats. Recently completed works developed the Main Stand with additional 8,000 seats and a current capacity of 20,000. Manchester City also expanded the capacity of the Etihad Stadium to its current 61,000 seats, while West Ham left Upton Park after 112 years to relocate in the Olympic Stadium built for the 2012 Olympic Games.
On April 2019, Tottenham inaugurated its new stadium, built close to its previous White Hart Lane facility. An investment of about £800 million allowed for a capacity of 62,000 (with a 68% increase from the previous stadium's 36,284). The facility is equipped to host different kinds of events. Within the frame of a 10-year agreement with the NFL, its retractable grass football pitch can be rolled away beneath the south stand to reveal an artificial turf NFL American football field designed to host two games a season. The contract requires the new Spurs stadium to implement the strict NFL standards in terms of IT architecture, developed in partnership with Redstone Connect and Hewlett Packard. Besides American football, the club management also opened to concerts and eSports events, a booming market attracting crowds of 50-60,000 spectators in the USA and South Korea. A state-of-the-art stadium since its construction phase with video updates every ten minutes and the development of the SPVRS App allowing a 360-degree Virtual Reality experience, the facility also enhances the corporate experience. The pitch-side Tunnel Club offers fans a closer look to players accessing the pitch through the tunnel as well as a wine and cheese bar, gourmet

restaurants and the longest continuous bar in the UK (86.6 m). The use of creative innovation benefits enthusiastic fans as well as the wealthiest customers – most seats are heated and equipped with USB ports to charge electronic devices. The aluminum roof, built by the Italian company Radaelli Tecna SpA, prevents the interruption of sound waves and reflect the sound towards the audience, while the Sky Walk created at the top of the facility creates a unique fan experience.
An additional interesting aspect is English football's ability to create tourism-related opportunities. According to a report presented by Visit Britain and updated to 2014-2015, over 800,000 foreign tourists (including 40,000 business travelers) attended at least one Premier League match, with an overall expense of £684 million (about €770 million). In particular, 40% of visitors stated they chose England precisely to have the opportunity to attend a Premier League match. A tourist visiting the UK spends an average £636, while a tourist who decides to attend a football match will spend up to £855. The success of football-related tourism in the UK mainly results from the wide international fan base of Premier League, which attracts up to 1.2 billion fans on a global level, with an overall tv audience of 4.8 billion. The busiest stadiums include the Old Trafford in Manchester and the above-mentioned Emirates Stadium in London, which attracted almost 110,000 tourists each.

The "German model"

The success of the process of renovation of football facilities in the "German model" has different reasons than the one applied in the UK where change mainly happened for public safety- related concerns. Germany, on the other hand, took the opportunity of the 2006 World Cup to renew its existing facilities and build new ones, with a €1.4 billion investment for 12 different stadiums aimed at obtaining a remarkable enhancement in terms of economy, sport and image.
The German Federal government contributed with €196 million (14% of the total), while the central government contributed with additional 85.5 million (6%). The city administrations involved in the plan invested 259.7 million (18%), while football clubs invested 412.2 million (29%). The remaining funds (€447.7 million, or 32% of the total) came from other forms of investment. Besides the investment for sport facilities, 3 more billion euros were required for the construction and modernisation of infrastructure, particularly railway lines, stations and highways.
The renewal process in Germany is as dynamic and continuing as the one occurring in the UK, as testified by the construction and modernisation projects of 7 facilities related to clubs that played in the Bundesliga after the 2006 World Cup, for an investment of €425 million, and resulting in 19 sta-

diums either built or renovated over the last 16 years.
Such facilities were built by keeping into consideration their local contexts, and by addressing the requirements of local fans and citizens. These investments helped the Bundesliga become the championship with the highest average attendance in the world – 40,693 spectators per match in the 2016-2017 season.
German football's low-price policy, aimed at encouraging less affluent customers and families to attend through low-priced matchday and season tickets, helped achieve this result and protect revenues in a phase of financial crisis. Between 2006-2007 and 2016-2017, matchday revenues increased by 62.5%, while the higher-priced Premier League shows a 10.5% decrease. The average cost of tickets for Bundesliga matches (€36.8) ranks only third in the Big 5 European Leagues (Premier League's tickets are the most expensive with an average cost of €56.4). Such low-price policy is further demonstrated by the standing areas strategy, aimed at bringing the largest number of fans to stadiums by offering accessible prices and, in so doing, encouraging the creation of a participated sport and social model, as well as maximising retail areas within the facilities. The best example is Borussia Dortmund's stadium, which offers as many as 27,589 entirely covered standing places out of an overall capacity of 81,359, or a third of the total (the price for this sector never exceeds 17 euros/ticket); similarly, the Allianz Arena, home to Bayern München, offers as many as 17,794 standing places out of 75,024. Such provisions are only available for Bundesliga matches, as UEFA expressly prevents them during international matches for safety reasons.
The case history of the Allianz Arena, inaugurated in 2005 and home-stadium to Bayern München and München 1860, particularly represents the excellence of German facilities, with a capacity of over 70,000 and the development of 6,000sqm of retail, restaurants, offices and meeting halls. The commercial potential of the stadium asset helped Bayern München become one the most profitable football clubs in the world in terms of sponsorship contracts and commercial activities with a turnover of €343.4 million for the 2016-2017 season.
The €346 million required for the construction of the stadium were entirely covered by private capitals, with €277 million deriving from the partial transfer of the club's shares. Adidas and Audi acquired 9.09% of its block of shares, while Allianz acquired 8.33% and additionally signed a 90-million euros contract for 30 year naming rights. The loan required for the remaining part of capital was paid off within 9 years only, or 16 years in advance (2014 rather than 2030), with a significant saving in terms of financial costs (about €13 million).
German football boasts an advanced approach even in terms of environmental sustainability encouraged by the Government's national energy

plan, which led to the approval of over 10 bills over the last few years. Its ambitious goal is increasing the production of clean energy from 17% to 35% between 2010 and 2020, and at the same time decreasing energy consumption by 10%. According to the general plan, renewable energy should cover half the country's energy demand within 2030 and reach 80% by 2050. Germany's political vision obviously encouraged the increase of investments by green economy companies. From this point of view, football is one of the most significant examples. As of today, about 17 PV industry companies invest in 12 top football teams. The peculiarity of these agreements lies in the fact that the relationships between football clubs and companies may extend beyond the mere sponsorship and translate into a much deeper cooperation involving joint investments aimed at maximising environmental sustainability in stadiums. Every Bundesliga club undertakes about 3 environmental sustainability projects a year, mostly aimed at improving energy efficiency and retrieving rainwater. These plans result in a 14,000 ton reduction of CO2 emissions a year – Wolfsburg's Volkswagen Arena alone reduces its emissions by over 2,000 tons and saves over 16 million litres of drinkable water. Besides sponsoring Borussia Dortmund, Q-Cells installed a range of PV panels on the Signal Iduna Park's roof and replaced the pitch's heating system to achieve a 70% energy saving. Similar initiatives were undertaken by Bayern München (with Yingli Solar), Hoffenheim (Suntech), Werder Bremen (SIG Solar) and Bayer Leverkusen (Jinko Solar) for their stadiums. German stadiums are also highly multifunctional, a feature that keeps them open 365 days a year and therefore highly profitable in terms of returns on the investments for their construction. Movie theatres, restaurants, supermarkets, retail areas, offices and meeting halls are only some of the additional activities available within the facilities. The case of the Commerzbank Arena in Frankfurt certainly represents one of the best practices. Against a €126 million investment, the stadium hosted 200 major arena events (such as concerts or festivals) and 1,000 corporate events with an attendance of over 7 million spectators during its first five and a half years.

The "Italian non-model"

The transition from the "costly" stadium model to the "profitable" stadium model certainly represents one of the main goals for the Italian football system. Over the last few years, many factors slowed down this transition, starting with the complexity and extensive timeframe of the bureaucratic procedures required to undertake the different projects for the construction or modernisation of sport facilities, and both public and private investors' general unwillingness to engage in this sector.

While Germany successfully seized the opportunity provided by the 2006

World Cup, Italy failed to do the same and never managed to develop its major events into an enduring legacy. The 12 stadiums built or modernised across the country for the 1990 World Cup are still mostly under the responsibility of public city administrations. In addition, such facilities (the construction or modernisation of which entailed extra-budget costs to the tune of €558.9 million and 2,129 days of delay, as of July 2018) were not designed specifically for football. Many are equipped with an athletics track, which makes football matches less enjoyable to spectators. A case in point in this sense is the Delle Alpi Stadium in Turin – a facility that costed 187 billion Italian Lira against the estimated 60, only to be demolished 19 years after its construction.

The data about Italian football highlight a critical situation. The average age of professional clubs stadiums in 2016-2017 is particularly high (about 60 years), while the figures concerning average percentage occupancy show how only Serie A matches guarantee that attendance fills stadiums by slightly more than half (54%), while Serie B matches only achieve 40% and Serie C matches a bare 30%. The main reason for this is the facilities' inadequacy in terms of infrastructure and level of services provided. For example, the official data published by the FIGC ReportCalcio 2018 show an occupancy rate in Serie A stadiums of 71%, a percentage that is even lower in Serie B (47%) and in Serie C (36%). All the facilities considered in the report are owned by public bodies, except for the Juventus Stadium in Turin, the Dacia Arena in Udine, the MAPEI Stadium in Reggio Emilia and the Olympic Stadium in Rome – the latter being owned by the Italian National Olympic Committee (CONI). In the case of Serie A, 23% of stadiums cannot be used for purposes other than football matches (which excludes the possibility of profits unrelated to matchdays), a percentage that rises to 77% for Serie B, while 82% of Serie A stadiums and 95% of Serie B stadiums lack renewable energy systems. An athletics track is present in 41% of Serie A stadiums and in 27% of Serie B stadiums.

Infrastructure criticalities and the poor level of services offered by Italian stadiums are responsible for an increasing alienation of spectators. Currently, Serie A is only ninth in the average attendance per match ranking of the main sport championships with 21,262 spectators (or sixth when considering only football competitions, therefore after the Mexican and American Top Divisions). The average 69,487 spectators achieved by the NFL and the 40,693 spectators attending Bundesliga matches, the leading football League in this ranking, are far away indeed.

While the cost of tickets is often seen as the reason for the public's unwillingness to go to Italian stadiums, Italy ranked only seventh in Europe (behind England, Spain, Germany, Switzerland, Turkey and France) in absolute terms, with an average price of €23.4 for Serie A matches in 2016. With ref-

erence to the impact of such cost on the average daily salary (*Indexuva*©), such percentage in Italy is barely 32.6%, which means that Serie A ranks fifth in Europe, at a great distance from Turkish Super Lig (65.7%) and other Top Divisions: Premier League (56.0%), Liga (53.3%), Bundesliga (39.9%) and Ligue 1 (34.1%).

The untapped potential of the 1990 World Cup, the infrastructurel deficiencies of stadiums and the continuing alienation of the public are the combined reasons for the loss of competitiveness of Italian football, which is currently way behind its European competitors, in particular Bundesliga and Premier League. During the 2016-2017 sport season, these championships' stadiums were 93% full (considering national championships and cups as well as Europa League and Champions League matches). In this respect, worse results were achieved by Liga (72%), Ligue 1 (64%) and, precisely, Serie A (52%). In terms of general attendance, Premier League had 17.1 million spectators (in 467 matches) against almost 15 million for Bundesliga (352), 13.5 for Liga (463), 9.4 for Serie A (444) and 9.5 for Ligue 1 (447).

In other words, the 8.5 million tickets the Serie A championship failed to sell would have resulted in additional matchday revenues of over €193.2 million had the stadiums been sold out (which rise to 291.8 with the additional potential revenues from Serie B and Serie C).

A case in point that demonstrates the failure to tap into potential revenues is the San Paolo Stadium in Naples. According to a report published by CONI Servizi Spa (nowadays Sport e Salute), SSC Napoli "would lose" about €14.5 million in potential additional revenues every year due to the inadequacy of its stadium. Over the last few years, the club only earned an average of about 18 million per season, while an optimised management of the stadium would generate revenues for over 30 million. Missed revenues from matchday and season ticket sales due to the poor conditions of the stadium's third ring, the appalling conditions of toilets and catering services in terms of quality/ quantity, as well as the difficult control of spectators during the entrance phase are estimated at about €5.5 million per year. Although 21 refreshment posts are available within the stadium, not all of them are reachable or up to standard with UEFA requirements and expectations. There is only one gadget and merchandising shop, only open during matches, which also accounts for about €350,000 in foregone earnings.

An additional issue worth considering in general terms is the impact the above-mentioned decline in attendance has on the home team's performance, as the waning turnout led to a declining relevance of the home field advantage. A study conducted by the FIGC Study and Research Division analysed the correlation between attendance and sport results between 1978-1979 and 2016-2017. Against a 35.3% decline in average attendance in Serie A, wins in away matches increased from 17% to 31% of the total. Therefore,

an average decrease by 1,000 spectators resulted in 3 more wins in away matches per season, with an even more relevant impact on the lower Serie B and Serie C. With regard to Serie B, a decline in average attendance of 47% led to an increase in away matches wins from 12% to 21%. In the Serie C, wins in away matches increased from 14% to 27% as a result of a decline in average attendance of 5.7%.

FIGC strategic programmes

FIGC (Italian Football Federation) plays a primary role in the transition from "costly" to "profitable" stadium model – a mandatory requirement for the Italian football system, as extensively described and contextualised in the previous chapters. The Federation launched several programmes in order to achieve this goal in the near future.

FIGC - Politecnico di Milano Agreement

On September 30, 2015, FIGC and Politecnico di Milano signed an operational agreement for the creation of a permanent technical think-tank involving FIGC managers, academics and industry experts as a key consultancy and support for all the stakeholders who intend to invest in a new stadium or modernise an existing one in a perspective of excellence and continuing education. A more efficient management of sport infrastructure necessarily relies on an equally adequate ability in terms of design and construction of such facilities. In this sense, along with Politecnico di Milano, Sport e Salute (formerly CONI Servizi Spa), Lega Serie A and Istituto per il Credito Sportivo (Sports Lending Institution), FIGC helped establish the first Master's program in *Sport Architecture* formerly Master in *Design Construction Management of Sport Infrastructure* on September 2017. The program's goal is training highly qualified professionals who can successfully contribute to the conceptualization, planning, design, construction and management of sport infrastructure according to cross – and multi-disciplinary principles and skills. FIGC developed the scientific programme of the sport infrastructure (stadiums and training centres) management module and selected its lecturers within European best practices: UEFA, Barcelona, Ajax, Benfica, Espanyol and Galatasaray, as well as the Italian clubs Atalanta, Cagliari, Frosinone, Juventus and Udinese.

In the past, FIGC had already undertaken initiatives about education on sport facilities in order to integrate the managerial skills of the different stakeholders involved. These included the organisation of Stadia Management (10 sessions organised between 2011 and 2014, with over 100 students and top international-level lecturers), and the *Stadia Tour* with guided visits to state-of-the-art football venues in the UK, Germany and Spain.

FIGC - Istituto per il Credito Sportivo (Sports Lending Institution) Agreement

The goal of the FIGC-ICS Agreement, established in 2015, was the creation of a €90 million-funding programme (with funds directly provided by ICS) for infrastructural measures concerning Italian football stadiums and sport facilities based on preferential interest rates (or interest rates-subsidy in many cases). Such resources may be allocated to FIGC and its affiliated companies, to the city administrations owners of the facilities used by clubs, or to other private owners or licensees of the facility, in accordance with the sport clubs using the stadium.

The goal of the funding programme is the implementation of plans for the upgrade of stadiums' ranking according to UEFA quality requirements, as well as other works aimed at adapting Italian facilities to the country's hosting the final phase of the 2019 UEFA European Under 21 Championship. Part of the funds is allocated for other kinds of infrastructure and/or energy efficiency measures, as well as for the construction and modernisation of federal technical centres, FIGC centres and offices and additional investment programmes concerning the Museum of Football Foundation (Fondazione Museo del Calcio).

The programme's resources were recently used for the renewal of facilities in Trieste, Cremona and Foggia with an overall investment of €7.7 million. The works implemented within this frame increased the number of seated places according to UEFA guidelines, enhanced safety measures and improved sanitary facilities, media centres and dressing rooms.

UEFA Guide to Quality Stadiums - Italian version

FIGC also completed the Italian translation of the *UEFA Guide to Quality Stadiums*, a highly valuable report that reflects UEFA's extraordinary international- level experience about sport infrastructure and represents a key point of reference for all the industry stakeholders including all the subjects involved in the design and construction of a new stadium or in the modernisation of an existing one.

The legacy of a new generation of sport infrastructure: employment and respect for local contexts

The legacy of the urgently needed new generation of sport infrastructure and the associated programmes for the renewal of stadiums may be a growth of the football system and its economic competitiveness as well as a positive impact on the employment system with the creation of new jobs for the construction of facilities and for their maintenance and management.

In particular, the construction of a new stadium would imply the requirement of workers both directly (as staff directly and/or permanently involved

in the activities of renewal and management of the stadium) and indirectly (staff employed in the activities and services generated by spin-off associated to renewal projects).
Regarding direct effects, the management of a modern stadium normally requires between 15 and 30 employees with a high level of specialisation in several areas (stadium manager, administration, marketing, events, matchday and no matchday commercial activities, communication, human resources, etc.).
In addition, international experiences show that the construction/modernisation of a sport facility implies other employment benefits associated with three different aspects. One job for four years per 100 spectators for the construction of the facility, one job and a half per 100 spectators for the development of a multi-functional facility, one permanent and fulltime job per 200 spectators for the use of various kinds of sport, social, cultural, recreational and hospitality structures and services associated with a multi-functional facility.
According to a simulation based on the infrastructural renewal undertaken by English professional football (which, as mentioned above, built 32 new stadiums for an overall investment of £4,9 billion and a total capacity of over 763,000 seats over the last 25 years alone), shows that a similar renewal of football facilities in Italy might generate an employment benefit of about 24,000 new jobs. An organic and wider renewal program extended to the entire sport sector (sport halls, arenas, multi-sport centres) might generate an even more significant impact on employment.
A case in point is the construction of the Nouveau Stade de Bordeaux, started in 2013 and completed on April 2015, which generated 63,000 hours of work, preceded by 8,300 hours of professional training. The project was developed in partnership with a range of local operators, and the selection of the workforce favoured local candidates as well as their skills and experience.
In addition, the design and construction of new stadiums will have to consider the requirements of fans within the next 10-15 years. The stadium of the future should cater to those requirements in terms of its architecture, technology, connectivity, fan-related services, multi-functionality, environmental sustainability, and development of *no matchday* activities, diversification of sources of revenue, expansion of commercial activities, dematerialisation of tickets, transportation/accessibility and integration within the social context.
With reference to the latter item – adaptation of sport facilities to the urban and local context – the Aviva Stadium in Dublin is one of the top state-of-the- art stadiums in Europe precisely for its successful relationship with the historical houses surrounding the site.
The stadium (built for €365 million for a capacity of 51,700 seats) is located

in Lansdowne Road, close to the railway station, 2.5 km from of the city centre. Its most notable feature is its shape, designed to make sure that the surrounding houses get enough sunlight. The stadium's shell adapts to its surrounding urban context – a district close to the city centre but typical for its Irish stone houses. The reason for its peculiar "bowl" shape is the minimisation of the shade the building may project over the houses adjoining its northern section.

The Aviva Stadium (which features several additional activities including 3 restaurants, 69 bars/refreshment points, 36 corporate boxes and several meeting halls) is particularly advanced for its environmental impact. Rainwater is harvested, treated and stored for use in the pitch irrigation system. An energy recovering system recycles heat and energy, a sound reduction system minimises acoustic pollution, and the waste management system is designed to recycle and reduce waste. For these reasons, Aviva is the first ISO 50001-certified stadium in the world, due to its advanced energy management system allowing for a reduced environmental impact, reuse of energy and a considerable improvement in financial management.

Another key peculiarity, which best explains the synergy between facility and hosting urban environment, is the Local Community Fund Scheme, which supports deserving projects in the area immediately surrounding the stadium (within 1 km) with a €100,000 annual fund. Created in 2007, the Fund Scheme has since supported about 80 local projects including the upgrading of swimming pools, the acquisition of IT hardware and the organisation of summer camps. In addition, the stadium management consistently launches health campaigns encouraging responsible drinking, an active lifestyle and giving up smoking.

The stadium's architecture and the promotion of such plans result from a constant cooperation between management and local community. When the municipality approved the construction project in 2006, it required the establishment of an *Environmental Monitoring and Management Programme* (EMMP), which would monitor the impact of the stadium within a 1 km-radius. The municipality also required the creation of a *Project Monitoring Committee* (PMC, consisting of representatives of the company owning the stadium and of local associations), which would meet regularly to study the stadium's impact on the surrounding area and send a written report with its assessments to the relevant authorities every 6 months.

Relevant areas: from "costly" to "profitable" facility

Investments

An analysis of the Italian situation within the European context in the 2007-2017 decade shows how backward our country is in terms of both construction of new stadiums and of investment. Only 3 new top football installations were realized in Italy, compared to 139 built in Europe, with an investment representing a bare 1% of the €13.7 billion spent altogether by the other European countries. Besides the above-mentioned examples in the UK, France and Germany, even countries like Poland (26 stadiums for an investment of about €1.6 billion), Turkey (13 stadiums and over €804 million) and Russia (over €2.2 billion for six new facilities) are well into this renewal process.

Based on this analysis and the considerations in the previous chapters, Italian football urgently requires the construction of an entirely new generation of sport facilities, which in turn obviously imply new investment plans aimed at creating a significant middle-to-long term legacy. The issues this plan will have to address are safety, urban renewal, sociality, positive economic impact for both companies and public finances, environmental sustainability and training of new professional experts. As a result, it is important to note that, from this point of view, Italy represents a market with remarkable potential. Based on the results of a Deloitte survey, a bare 18% of football fans currently go to the stadium, a venue that has lost its attractiveness in terms of services and *match-day experience*. At the same time, 86% of fans declare they would change their mind should stadiums start offering new services (even on weekdays), while 69% of fans would gladly pay for more expensive matchday and season tickets, should stadiums offer better infrastructure and services.

The main international experiences show that the investment for a new, adequately designed facility generates remarkable economic impacts. Over the last 15 years, the 20 main new stadiums built in Europe generated an average 53% increase in attendance and almost a 104% increase in matchday revenues during their very first year of activity.

The implementation of a new generation of advanced sport installations obviously depends on several investment plans the success of which is guaranteed by the cooperation among sport companies, funders and institutions. The Juventus Stadium is the most significant Italian example of investment. It required €145 million mostly recouped over the following 6 seasons through matchday revenues: €31.8 million (2011-2012), €38.0 million (2012-2013) €41.0 million (2013-2014), €51.4 million (2014- 2015), €43.7 million (2015-2016) and €57.8 million (2016-2017), a huge difference from the €11.6 million grossed during the last year of activity at the Olympic Stadium in Turin (2010-2011).

Project financing

Project financing is the long-term financing plan of projects based on the projected cash flows the project will guarantee in the future. The example we propose here is the San Mames Barria Stadium in Bilbao, new home to the epitome Basque football club. In this case, a mixed public-private investment financed the construction, while a limited liability company (San Mames Barria SL) was responsible for the construction project. The company is jointly owned by the football club, the Diputacion Foral de Bizkaia (an executive regional body), the Basque government and Kutxabank, with a 23.58% block of shares each, and the remaining 5.68% owned by the city administration (Ayuntamiento de Bilbao), for a total share capital of €140.9 million. The total construction cost was covered by the investment provided by San Mames Barria SL plus about €33.6 million from the value of the areas of the old and new facilities allocated to the club and the Diputacion de Bizkaia and €12 million released in licenses from the Ayuntamiento de Bilbao, for a total of €186.5 million. About €60 million less than the estimate of the original project, a reduction imposed by the economic crisis and obtained by eliminating the third ring.

Athletic Bilbao pays a €500,000 yearly rent (under a 50-year lease) for exclusive use, with a €66 million option to acquire the facility. The involvement of the public administration in the project-financing plan is part of the wider context of urban renewal of the San Mames district the goal of which is the creation of public facilities for sport practice such as the 5,400 sqm *polideportivo municipal*, which includes state-of-the-art equipment as well as an athletic facility and a sport medicine centre.

The renewal of the city's sport facilities for both professional and recreational practice reflects a vision shared by the club and the public administration, which established a mutually rewarding relationship in order to achieve their goals. However, the European Commission found the cooperation between club and public institutions suspicious and decided to open an administrative investigation about any improprieties in the use of public funds. The case was closed on July 2016, while the same kind of procedure led to a disciplinary action against Real Madrid over illegal public funds allocated for the Valdebebas training centre.

Naming rights

Naming rights define a financial transaction and form of advertising whereby a sponsor purchases the right to name a facility. In the context of North American professional sports, 105 of the 122 franchises playing in the 4 main leagues made a deal to transfer their *naming rights*. The main business sector interested in investing in this kind of advertising is the "bank and insurance" industry, which ensures 37% of these sponsorships. With

only 43 *naming rights* deals established within the Top 10 European Football Leagues, European football is way behind Northern American leagues in this kind of partnership. To get an idea of the turnover involved, 40% of Premier League clubs may count on this kind of revenue, with an aggregated income of £135.6 million in 2017 and an 80% increase in the commercial value of this kind of sponsorships over 4 years. While in Italy they are still underdeveloped, a potential additional turnover of about €70 million per season may be estimated with a yearly average of €3 million per Serie A club and €500,000 per Serie B club.

Business diversification

Business diversification is a key element in the transition from "costly" to "profitable" stadium. Investing in the differentiation of income and multi-functional features is key to guarantee a facility functioning 24 hours a day and 7 days a week rather than only during football events and achieve profitability. Housing, restaurants, movie theatres, bars, museums and offices are some viable examples of the activities a club may implement in order to achieve a maximised exploitation of its stadium and obtain additional revenues. The Ricoh Arena (home to the Coventry City FC) is an example of such diversification with only 15% of revenues resulting from football matchday, against 42% from conferences-exhibitions and 18% from other sponsors.
In a further development of the diversification scenario, stadiums should also be used for the organisation of sport events other than football. Successful examples include the Camp Nou in Barcelona, which hosted the final of the 2016 French rugby Top 14 (99,354 spectators), and the Pierre Mauroy Stadium in Lille, which hosted the final phase of the 2015 European Basketball championship, as well as the 2017 World Handball Championship and the final of the 2014 Davis Cup. The Lille stadium has a groundbreaking system whereby the northern half of the pitch is designed to lift up and slide over the southern half. Thanks to its retractable roof – a particular system including curtains and temporary mobile stands replacing the existing ones – it becomes a 30,000 seats indoor arena.

Innovation and technology

The market of *smart stadiums* (next-generation facilities equipped with technological features designed to enhance the fan experience, increase usability of services and improve management efficiency) is on the rise. According to estimates presented in the *Smart Stadium Market by Software* report, it is expected to increase from $4.6 billion in 2016 to $17 billion in 2021. The use of technology introduces the concept of *smart structures*, or structures that can "heal" and report potential inefficiencies. Currently, they are still in the experimental stage, and only include the introduction of sen-

sors for structural monitoring that prevent risks without excessive costs. The Amsterdam Arena, owned by a public-private partnership with over 11,000 events and 35 million visitors, is a case in point. Thanks to the agreement established by the City of Amsterdam with Huawei and other telecommunications companies, the stadium is equipped with an *Innovation Center* that guarantees the highest technological standard in the facility and provides a technological consulting service to 10 other countries. In addition, the *Innovation Center* is designed to increase the efficiency of some of the stadium's operational functions such as the signal sent by the turf itself to switch on and off the sprinklers based on the temperature of the pitch. All the American professional leagues jointly developed the concept of shared growth and in so doing shaped a new trend. In order to bring younger generations to the stadium, it is increasingly important to provide free, fully functioning and uninterrupted Wi-Fi. For this reason, precise standards of Internet connectivity were established for stadiums.

The provision of state-of-the-art technologies obviously increases the potential revenues generated by the facility. At its Veltins Arena, Schalke 04 recently introduced the possibility for fans to buy items and merchandising with a payment chip embedded in the sleeve of the jersey so that they can make their purchases at the stadium and have the amount deducted from a connected bank account. Another example is the Rugby Football Union, which equipped Twickenham, the home of England Rugby, with a tablet-based payment system for spectators in its corporate hospitality boxes. All of these features would be unthinkable without an efficient IT system. Again, the best practices in this field are available in American stadiums.

The Mercedes-Benz Stadium in Atlanta is equipped with a PON, energy-efficient fibre-based passive optical network enabling 75,000 spectators to plug into the system, while the San Francisco 49ers' Levi's Stadium is equipped with 400 miles of fibre and offers 40 Gb/s of available internet bandwidth. Such technological investments played a key role in changing the trend of attendance to stadiums, as testified by the Kansas City Stadium where 25% of spectators use the Uphoria app and average attendance increased from 10,000 to over 18,000. Through the app, users may share opinions about the ongoing match and upgrade their seat. Technological innovation also provides a better fan experience and higher safety standards.

The 51st Super Bowl was defined as the "most connected" event in digital history with 11 TB of data going over Wi-Fi (49% of spectators) at the NRG Stadium in Houston (12% on the social networks) and a peak of over 27,000 users connected simultaneously. Providing efficient IT platforms also means competing with the services offered by TV networks by replicating them and making them available within the venue. A case in point is the stadium of the Sacramento Kings NBA franchise, equipped with a connection 17,000

times faster than the average home network and able to handle more than 225,000 posts on Instagram every second. Through the stadium's official app, fans may foresee the result of the next action through the in-app game, constantly access stats and view multi-angle replays on their devices.
The website of the London-based Saracens rugby team features a 3D virtual stadium providing ticket-buyers a high-quality panoramic view of the stadium, while the NFL Atlanta Braves established a partnership with Waze and Uber in order to improve accessibility to the stadium through their app.
Technology is increasingly adopted within sport facilities also to improve safety standards. During the 2016 UEFA EURO, French police used drones equipped with HD cameras for video surveillance and identification of car plates. The use of devices like biometric scanners, adopted also at the Olympic Stadium in Rome, or digital fingerprints, used at the Groupama Arena in Budapest, generated twice as much matchday revenues in the season following the implementation and eliminated disorders.

Training

As explained in the previous chapters, a new generation of sport infrastructures is inextricably linked to the study and analysis of the requirements of the urban and social context such facilities will benefit with their additional value, as well as the requirements of the club itself. To this end, training qualified experts who may plan and build adequate facilities, as well as successfully optimise the functional features and management of this asset, is fundamental. The Stadia Management courses and the academic support for the organisation of the Master's program in *Sport Architecture* formerly Master in *Design Construction Management of Sport Infrastructure* at Politecnico di Milano testify to the extensive effort FIGC put into the training of field experts.

Football museums

Football fans are increasingly interested in visiting European stadiums. The arenas of top football clubs, as well as their museums, have become part of international tourist itineraries and provided an additional source of income for such clubs. The world-level best practices in this respect are Real Madrid and FC Barcelona. With 1.2 million visitors every year, the museum of the Madrid-based club, located within the Santiago Bernabeu Stadium, has recently become the third most visited museum in the city, behind two institutions like the Museo Reina Sofia (2.6 million visitors) and the Museo del Prado (2.5 million visitors).
With 1.9 million visitors, the FC Barcelona museum has also become the most visited exhibition venue of the entire Catalonia region, followed by the Museo Dali in Figueres (1.3 million visitors) and the Museo Picasso in Barce-

lona (920,000 visitors). The only European club that keeps up with the two Spanish clubs is Bayern München, with 1.3 million people visiting the Allianz Arena and the FC Bayern Erlebniswelt, the museum located within the stadium, every year. Again, Italy lags behind its European competitors. Juventus is the only club with a museum within its stadium, visited by about 181,000 people every year. In South America, the most visited football museum is the Boca Juniors' Museo de la Pasion Boquense, with about 300,000 visitors every year, followed by the Museo River with 125,000 visitors.

Conclusions: the stadium of the future

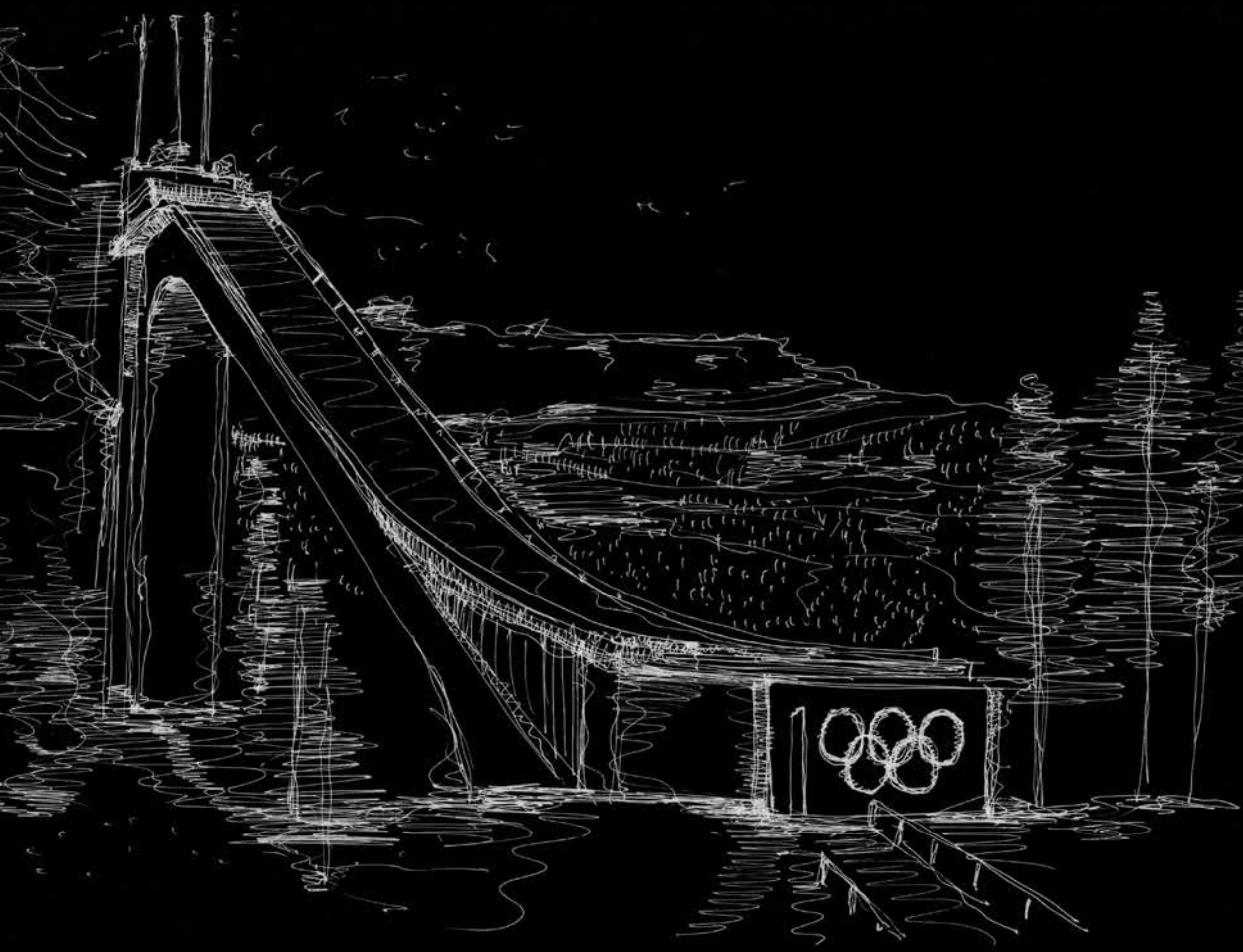
During KickOff 2017, an event supervised by FIGC as a think-tank of ideas, contents and projects for the innovation and enhancement of Italian football assets, the panel devoted to the development of sport facilities and infrastructures was intended to anticipate the trends and functions required within stadiums over the next 10-15 years through an analysis of the society of tomorrow. Sociology and psychology of consumption are key in anticipating the future requirements for goods and services, as well as the technology required to address the customers' increasing needs – from safety to comfort and entertainment; from multimedia to capture future ways of enjoying the event and increasing fan engagement, to environmental, economic and social sustainability. A stadium conceived as a venue rather than an object. Indeed, stadiums will be increasingly required to express an architecture, a functional layout and a spatiality that may enhance their presence and recognisability on the territory, the sense of belonging and educational impact that space has always had on behaviours and habits.

Starting from this perspective, the goal of this text was to describe the national and international best practices in order to define the different frameworks of reference of the most advanced modern stadiums with the aim of broadly sketching the main evolutionary lines that will characterise the stadium of the future.

The Total Stadium

Architecture between urban landscape, hybridisation and utopia

by Dario Cea



Over the past few decades, a radical transformation of stadium architecture resulted from the gradual transition from a non-descript container of crowds, morphologically comparable to a closed enclosure isolated from its surroundings, to a facility designed to host diverse programs sometimes only distantly associated to sport but still complementary to it. With its increasingly clear passage from a "closed" model – where the inflexibility of typically huge mono-functional facilities led to their sporadic use – to an "open" matrix – where widespread flexibility implies a continuing and diversified operation, the new generation of stadiums is rightfully part of a larger debate about transformations in the contemporary city.

Indeed, modern sport installations emerge as larger-scale territorial entities, a system potentially catalysing the endogenous development of an entire geographical area. Thinking of stadiums within such perspective means conceiving an actual territorial landmark, a sign identifying territory and city, a magnetic pole capable of attracting investments, resources, and interests. At the same time, it also means conceiving a public space with its own peculiarities and an ability to activate sociability and, at the same time, to trigger aggregations and establish life experiences where recreation combines with entertainment.

As one of the multiple nodes of public spaces, the contemporary stadium becomes part of a widespread infrastructural network potentially able to define new geographies – sport in itself is merely one of the many variables at play. On the other hand, interpreting the architectural project of a stadium as the mere expression of linguistic and technological values is simply not enough, as its social and urban planning value may be even more important than its architectural and functional features.

While the design challenge of a new arena represents an opportunity to overturn the inclusion and closeness typical of a stadium, and transform the rigid and compact enclosure into a flexible and expansive platform, the pursuit of a harmonious dialogue with the surrounding landscape must consider the footprint an object of such size inevitably implies. Indeed, the dimensional scale entails remarkable repercussions on the urban landscape. The construction of a stadium often subverts the pattern of the fabric and reveals a clear discontinuity or marginalisation resulting from the bulk of an object that clearly does not belong due to its size. Besides, opposition, conflict, complexity and contradiction[1] are typical features of every facet of contemporary culture. Modernity opposes integrity with fragmentation, contemplation with dynamic use, structural honesty with separation of inside and outside. In other words, modernity generates a combination of dynamics and issues that are quite the opposite of a unifying ideal. As a result, new approaches to the city and architecture emerge in this debate, following ideals and principles that are more distant than ever from the Vitruvian tenets of *Utilitas*, *Firmitas* and *Venustas*.

A nostalgic vision of the past, like that of Marc Augé and his *non-places*[2], would induce a certain anxiety towards the incontrollable nature of our cities and a desire to imagine islands of perfection. By following in Robert Venturi's footsteps, Rem Koolhaas proposes, instead, a different vision of the contemporary condition. In 1995, he recognised the unavoidable changes of daily life's dynamics, and theorised the concept of *Bigness*[3], an actual reality in the "generic city"[4]. «Beyond a certain scale – he argues – architecture acquires the properties of Bigness. [...] Bigness is where architecture becomes both most and least architectural: most because of the enormity of the object; least through the loss of autonomy – it becomes instrument of other forces, it *depends*». Shopping malls, stadiums, airports, railway stations, fairgrounds, large sport arenas reflect this architectural genre, characterised by a variety and mix of activities and uses as well as by sheer size. Their ability to attract a multitude of users is such that they represent, within certain events, entire cities or territorial sectors. In fact, «only Bigness can sustain a promiscuous proliferation of events in a single container», and at this point, «Bigness no longer needs the city; it competes with the city; it represents the city; it preempts the city; or better still, it is the city»[5].
Based on such premises, the five theorems of *Bigness* defined by Koolhaas may emerge as an insightful analysis system for the architecture of the contemporary stadium.
1st Theorem: «Such a mass can no longer be controlled by a single architectural gesture, or even by any combination of architectural gestures. This impossibility triggers the autonomy of its parts, but that is not the same as fragmentation: the parts remain committed to the whole». Many recent arenas reflect a clear autonomy of their elements, and show, for example, a structural, technological and material independence between bowl and roof. In most cases, the roof stands out from the monolithic structure of the bowl, often built in reinforced concrete with almost sculptural elements such as arches, pylons, stays, lattice frames. Even the spaces under the stands emerge as independent elements enclosed in gleaming, variously articulated curtain-wall rings and often creating a basement over which the bleachers stand.
2nd Theorem: «The elevator – with its potential to establish mechanical rather than architectural connections – and its family of related inventions render null and void the classical repertoire of architecture. Issues of composition, scale, proportion, detail are now moot. The "art" of architecture is useless in Bigness»[6]. On the heels of his statements in the acclaimed *Delirious New York*[7], Koolhaas confirms that mechanised movement led to an abatement of walkable distances and by consequence to an almost (or seemingly) uncontrolled enlargement of buildings. Retractable roofs, pitches that can be lifted, sliding and mobile stands, flexible bowls are highly

technological mechanical devices that become construction and architectural solutions perfectly compatible with the *Bigness-Stadium*. Therefore, the introduction of mechanical elements disrupts architecture's classical repertoire and at the same expands its compositional and expressive range, and paves the way for hybrid and highly innovative solutions.

3rd Theorem: «In Bigness, the distance between core and envelope increases to the point where the façade can no longer reveal what happens inside. The humanist expectation of "honesty" is doomed: interior and exterior architectures become separate projects, one dealing with the instability of programmatic and iconographic needs, the other – agent of disinformation – offering the city the apparent stability of an object»[8]. Now that the age of the stadium as an exclusive preserve of engineering expressionism where the load-bearing structure coincided with a proudly exhibited architecture is over, the next-generation stadium reveals the potential generated by having its own façade, or even better, skin, as demonstrated by some highly successful experiences such as the Allianz Arena in Munich. In most cases, the stadium's envelope is entirely independent from its core, and fully hides any relationship between interior and exterior. Highly iconic technical and expressive solutions so recognisable they became actual territorial landmarks, mediate the building's relationship with the context without revealing the spaces it contains.

4th Theorem: «Through size alone, such buildings enter an amoral domain, beyond good or bad. Their impact is independent of their quality»[9]. Koolhaas suspends his aesthetic judgment and invites us to accept *Bigness* for what it is, as, if a good architecture has the power to influence human behaviour, that does not mean that such behaviours necessarily result from good architecture. Rather than from its architectural value, the success of *Bigness* results from its connection with the infrastructural network, from its competitiveness within the market and from the quality of the products and services offered to investors and users. Stadiums built for World Football Cups (from Italy 1990 to Brazil 2014) often failed to become a new attractive feature in their context once the event was over precisely due to the lack of a vision broader than the mere contingency of the major event. On the other hand, there are as many examples of facilities that, while lacking particular architectural qualities, successfully generated positive territorial development dynamics.

5th Theorem: «Together, all these breaks – with scale, with architectural composition, with tradition, with transparency, with ethics – imply the final, most radical break: Bigness is no longer part of any urban tissue. It exists; at most, it coexists. Its subtext is *fuck* context»[10]. With the eclipse of formalism and, more in general, of architectural language, the context has lost its power of constraint architecture should necessarily submit to by following

its rules. It is simply an either fruitful or sterile ground. Precisely in this scenario, as it draws from a wide range of disciplines, *Bigness* has the potential to remediate a context unfit to accommodate it. In this way, the stadium, embedded within an integrated infrastructural system, can potentially be an active factor in territorial enhancement through the implementation of new diversified programs more in tune with its surrounding context.

Therefore, *Bigness* is the exception breaking into the urbanised context without bothering about its surroundings, or a context made of a shapeless, random, undesigned amalgam, also known as *Junkspace*[11]. «If space-junk is the human debris that litters the universe, *junk-space* is the residue mankind leaves on the planet»[12]. Koolhaas describes the built product of our age more as a residue, a hunk of junk, a fragment of what remains of the action of modernity, rather than actual architecture.

The form of the contemporary city appears as a patchwork, a mosaic of incongruous remains at the fringes of properly designed compositions. Such residues become all the more evident the farther one gets from the city centre where the established fabric of dense and compact patterns is replaced by urban sprawl, or where the city invades the countryside and the countryside wedges into the buildings or the urban voids typical of *drosscape*[13]. Therefore, *Junkspace* explores the architectural nature of the *generic city*, the city liberated from the «captivity of centre» and from the «straightjacket of identity»[14], where buildings may have no architectural value but are fraught of economic and financial importance. In other words, the city where the new stadiums try to fit in as new attractive hubs and cores of alternative social life.

In antithesis to architectural composition, *Junkspace* generates seamlessness, equality and a buildup of products. Where architecture separates spaces, dictates rules and establishes relations, *Junkspace* unites, endlessly aligns units. The width of the building is not a boundary anymore because air-conditioning and artificial light successfully erase it. As an emanation of high-tech, it adopts its systems and exhibits its aesthetics in the form of language, by revealing once hidden structure and systems. Everything is conceived in a provisional perspective, a vision where everything can be changed, replaced, and additional parts may be added to existing ones. Whereas the joint combined, and firmly united building elements, the structural joint of *Junkspace* always allows for a reopening, a replacing of elements, and an addition of parts. For this reason, transformation is constant: partitions, standardised and modular solutions generate a flowing change of scene, so much so that «architecture has turned into a time-lapse sequence to reveal a "permanent evolution"»[15].

Junkspace is the direct expression of big corporations. It is the result of real estate speculations, redevelopments; indeed, its associated brand

(brandnaming) becomes its identity, its name. It is, though, a tenuous identity, ready to change when a new sponsor replaces the previous one.
Therefore, the scene of Italian stadiums would rather seem to belong to this latter category of *Junk-Stadium* rather than to that of *Stadium-Bigness*, if not else for the condition of precariousness and transience the majority of facilities have acquired in order to respond in a contextual way to the requirements emerged over time. Think of the enactment or the update of safety regulations following "hooliganism-related" disorders or the adaptations of capacity in response to the football teams ascending to higher leagues. In these cases, the works implemented on the facilities look more like chaotic additions than well-devised interventions within the existing architectural body.
In the perspective of a possible and necessary modernisation of our stadiums as an opportunity for the recovery and development of landscape, we should wonder whether the direction, in some ways already decided, of the *Junk-Stadium* is actually the most viable one. Although located in outer-urban areas, the stadium implies solid and firm bases. As the heir of illustrious ancestors[16], it preserves their typological features and unavoidable identity. On one hand, a *Junk-Stadium* would be the expression of a constantly changing and expanding society; on the other side, it would imply a denial of architecture precisely where its roots lead back to well-established typologies. One may welcome the intervention of real estate companies for the investment of capitals in the construction and sponsorship of major multi-functional facilities because such capitals are essential to their management. On the other hand, private stakeholders cannot be the only subjects responsible for the provision of spaces for recreation and sociability for the collectivity, and public space programs cannot be reduced to and compressed in a themed container space. A *Junk-Stadium* would give up on its unity, identity, physicality in the name of adaptability. Over time, it would become a shapeless organism, the result of cuts, additions and unacceptable extensions. Rather than a regulating organism, an urban landmark, it would become a helpless victim of unplanned changes, the spawn of our chaotic time.
However, we must confront the situation of our contemporary age, even though this appears in the shape of hunks of garbage and debris, and not delude ourselves into thinking we can work on a blank page. What we should do is probably gather and reuse the spaces of the city, the places of work, leisure and sport, by reinventing them and moving into the *Junkspace* of post-modernity, by regenerating a landscape and building a montage precisely starting from now discarded fragments. We should build an evolutionary process capable of establishing relationships, new identities and meanings among those fragments similarly to a hypothetical *Merzbau*[17] of

our time. The German artist Kurt Schwitters worked at his *Merzbau* from 1919 to 1937 (when it was destroyed by Allied bombing) by transforming some rooms in his studio-house in Hannover into a total artwork where the original space was deeply transfigured by the aggregation of materials, sculptural objects, gashes and cutouts hung onto the walls, floor and ceiling. It was a constantly evolving project; day after day, he cut small openings into a larger mass and closed others, thereby sealing some objects within. «The intersection of material accretion – including bodily, industrial, and artisanal production – with the endless flux of Schwitters' process [is the most striking dimension of *Merzbau*]. The only principle to which the project adheres is that of continuous fluid production, a dynamic additive and subtractive process of connecting and cutting»[18]. Besides, as Schwitters himself stated, the *Merzbau* is «unfinished out of principle».

By embracing the spatial qualities inherited (or borrowed) by their new programs, our sport infrastructures may similarly and actively integrate the landscape conceived as a *palimpsest* to be written, erased and rewritten, and from which the traces of the past emerge and represent the heritage of our contemporary age. Rather than a denial of architecture, the *Junk-Stadium* may thus become a *total artwork*[19], an interpenetration of function, structure, place, aesthetics, and symbolism. For Peter Eisenman, total artwork is not an all-embracing discipline, which may mean the loss of autonomy of other disciplines, hence their colonisation. The main issue is the relationship between the autonomy of a discipline when compared to the all-embracing nature of total artwork. «Autonomy does not mean the self-referentiality of a closed system and therefore of a totality, but rather the explication of the issue of an open system. Basically, the autonomy of a discipline is necessary to preserve integrity and diversity; the problem arises when [autonomy] becomes self-referential, a closed system, and therefore considers itself as another form of totality»[20].

Producing a total artwork *by means* of architecture, whether it is a stadium or any other large-scale project, does not mean considering architecture as an all-embracing discipline (as even *Bigness* shows). In fact, architecture cannot colonise other discourses but rather use them as an opening for its own discipline, by meditating on the unavoidability of its own foundations, when it is appropriate. «Our projects try to open the field of architectural knowledge through a fluidity, an immersion in other ideas, other possibilities that question dialectic foundations like form and function, figure and ground, particularly when a building is necessarily expected to look like its function»[21].

Therefore, considering the architectural discipline as an open system means establishing a relationship with history and the places by suggesting not only geometrical and proportional relations but also by opening to

expressions that transcend the functional meanings and suggest new and multiple readings.
In this sense, the *Merzbau* may be interpreted (as Schwitters himself suggests) as a metaphor of the metropolis: «it is the total artwork of the civilisation of consumption, made of waste and the (war) residues of a society that finds its achievement in the metropolis as a rhizome or constellation of planes combined in a constantly changing process»[22].
By using the previously mentioned metaphors and procedures of assemblage, architecture incorporates in its products the themes of unfinishedness and growth by combining its individuality with a representation of the whole. This trend results from the assemblage of urban elements such as the square-atrium or the street-gallery, as well as from the assemblage of building and technological elements, such as curtain-walls, escalators, elevators, floors, partitions that may constitute a new library for architects as the creators of *hybrid* organisms, half-way between building and landscape, nature and manmade, architecture and urbanism.
Similarly to what happens in the *Merzbau*, private space opens and becomes a public space (the work, laid out within his house, was open to visitors) even in major urban plans where the boundary between public and private realm is increasingly fleeting and dissolves into navigable, semi-open spaces similar to thoroughfares. The telluric actions that translate into major suspended volumes, bold folds in originally horizontal or vertical surfaces, wide openings in the blocks, generate architectural-metropolitan-landscape hybridisations potentially capable of instilling life in otherwise bleak areas. Similarly, the stadium, inherently a place where public and private cohabit, may allow for this *permeability*, whereas its compactness used to characterize it as a closed structure. Precisely through the combination of previously separated spaces or entities (interior/exterior, closed/open, building/city, building/landscape, nature/manmade), a *Merz-stadium* may actually represent a total artwork of our time, and colonise the forgotten areas at the fringe of the established city or remediate the voids in the compact urban fabric. Its presence may reveal a different order, or bring order where chaos prevailed, as it contains the premises for a new formalised and aestheticised order.
Eisenman Architects' design for the Estadio Municipal de Riazor (2003) may serve as a good example of application model of the arguments here presented. The stadium occupies the urban fabric in part through a large square that extends until the harbour and offers a range a new spaces and activities to the city. It is conceived as a civic centre where several facilities for leisure as well as cultural and retail activities are available besides football-related spaces in order to integrate architecture with the environment – man and the sea. Not only does the huge sculptural structure of the roof rises to embrace two stands – it also becomes a backdrop of the square by becoming

one with the facilities for the new programs. The resulting image transfigures the functions in the stadium and the combination of several urban and architectural objects generates an urban icon integrated in the city. Such integration does not result from the use of typically urban morphological and formal principles – it materialises the intention to weave the different programs of stadium, hotel, retail, and the square into a *world-building* capable of shaping a new and vital urban fabric.

In conclusion, the result is a rethinking of the idea of stadium that, for purely synthetic reasons, we may define as "Total Stadium", two terms that express the stadium as a total albeit not self-sufficient system – an infrastructure that exceeds the building scale to operate directly at the scale of landscape. This idea evokes the experiments conducted during the 1960s, along semi-utopian lines, by Richard Buckminster Fuller, Frei Otto, Alison and Peter Smithson, Archigram, Superstudio, where a science-fiction atmosphere and the Pop environment provided the cultural backdrop for technological and mega-structural performances that radically rethought living conditions.

Finally, we may try to define some qualities of the Total Stadium, including:

1. a large scale that places it on a plane different from the merely urban one;
2. advanced technology, essential to create complex and bold facilities, for the operation of systems, to implement energy saving strategies, for the use of new-concept materials;
3. flexibility, in both technology, in order to obtain mobile building sections (roof, stands, pitch, etc.), and functions, in order to accommodate different kinds of events in the same facility;
4. functional hybridisation, as a typical feature of an arena adaptable to different programs at the same time, which would integrate and offer users a variety and articulation of activities for a daily use of the facility;
5. architectural hybridisation that, as a result of the previous hybridisation, allows for a deep alteration of the traditional typology and opens to new spatial experimentation in order to interact with and transform landscape, and accommodate new elements and fragments capable of generating a new integrated structure;
6. interchange hub, in order to facilitate transportation and the movement of goods and people through an integration with infrastructures and public and private transportation systems;
7. the main cornerstone: the role played by the total stadium in landscape is such as to dictate the rules to its surroundings by defining trajectories and establishing connections. Moreover, it is a catalyst for social and economic life and potentially able to promote social and urban rehabilitation.
8. territorial landmark: as a point of reference at the territorial scale, the

total stadium is so recognisable it stands out within the context;

9. entertainment understood, as the experience of users who go to the stadium and enjoy the relationship between the event and its container with an intense and all-embracing sensory commitment;
10. building-event: the very construction of the stadium becomes a key element in the programming of an event such as the Olympic Games, the World Cup, fairs and world exhibitions. On such occasions, the stadium also becomes a symbolic image for a territorial marketing policy aimed at attracting economic and social productive activities.

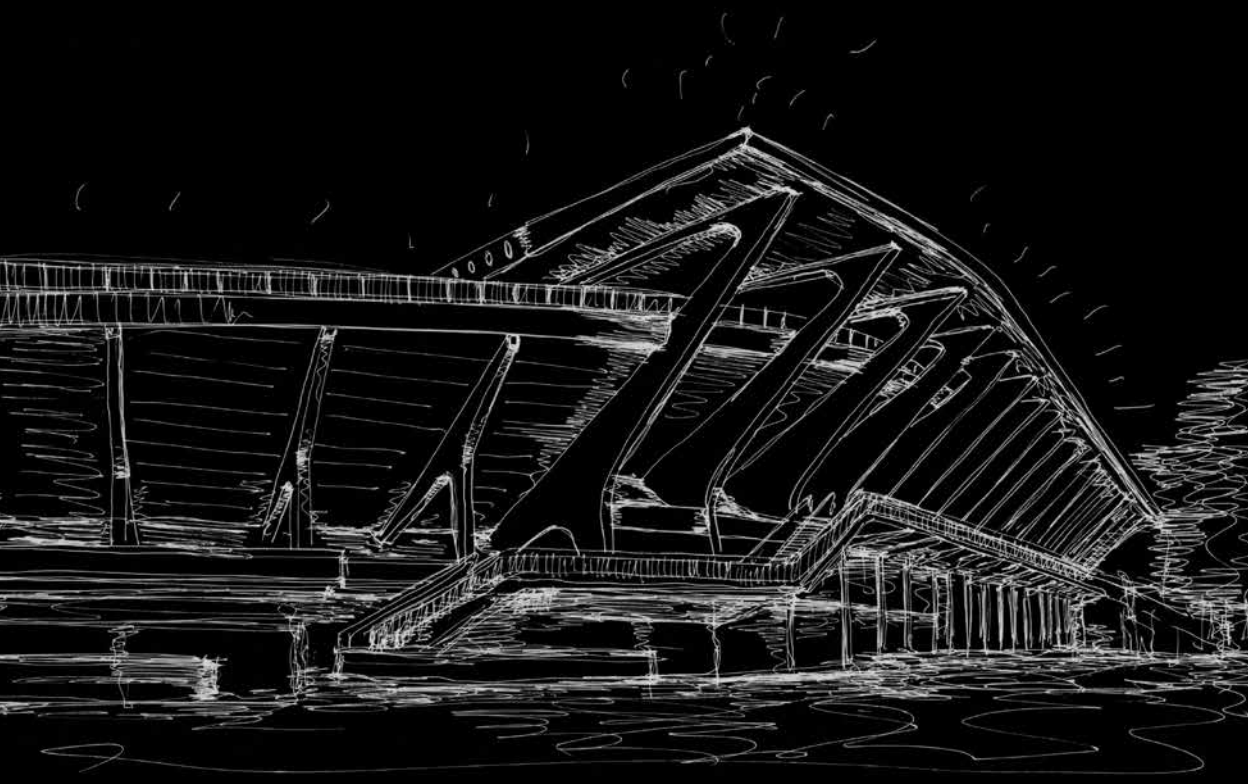
Notes

1. Venturi R., 1966, *Complexity and Contradiction in Architecture*, Museum of Modern Art, New York.
2. Augé M., 1992, *Nonluoghi. Introduzione a una antropologia della modernità*, Elèuthera, Milan.
3. Koolhaas R., 1995, «Bigness or the Problem of Large», in OMA, Koolhaas R., Mau B., *S, M, L, XL*, The Monacelli Press, New York.
4. Koolhaas R., 1995, «The Generic City», in OMA, Koolhaas R., Mau B., *op. cit.*
5. Koolhaas, 1995, *op. cit*.
6. Ibidem.
7. Koolhaas R., 1978, *Delirious New York*, Oxford U.P., New York.
8. Koolhaas, 1995, *op. cit*.
9. Ibidem.
10. Ibidem.
11. Koolhaas R., 2006, *Junkspace*, Quodlibet, Macerata.
12. Ibidem, p. 61.
13. Berger A., 2006, *Drosscape: Wasting Land in Urban America*, Princeton Architectural Press, New York.
14. Koolhaas, 1995, *op. cit.*
15. Ibidem.
16. Archetypes of the stadium may be found in Greek stadia, hyppodromes, theatres or in Roman amphitheatres and circuses.
17. Also known as *Kathedrale des erotischen Eldend* (the Cathedral of Erotic Misery-KdeE); the word *Merzbau* literally means "Merz construction" where Merz is all that remains of a Kommerzbank (a private bank) advertisement used by Schwitters for a collage.
18. Mansoor J., 2004, «Il Merzbau di Schwitters», in *Lotus International*, n. 123, pp. 42-59.
19. Richard Wagner created the notion of total work of art in his essay *Gesamtkunstwerk* (1850) when he undertook the construction of "the art-work of the future" in order to establish an alliance of the three forms of art: plastic, literary, musical, and to create life.
20. Eisenman P., 2004, «L'opera totale come sistema aperto», in *Lotus International,* n. 123, pp. 22-27.
21. Ibidem.
22. Nicolin P., 2004, «Merzbau», in *Lotus International*, n. 123, pp. 8-17.

The Multi-Functional Urban Block

Strategies, models, procedures for the contemporary stadium

by Pietro Chierici



The evolution and complexity of the management, economic and social processes in the international urban scene over the last decade has resulted in a new generation of multi-functional stadiums designed to guarantee environmental quality, safety and financial revenues.
For many years, the concept of stadium has been undergoing a transformation from a mere container of events into an infrastructure designed to promote and produce services, and to generate financial, locational and professional opportunities.
In Italy, the long-overdue modernisation of sport facilities needs new management approaches and new ways of interacting with the context in order to address the requirements for dynamism of the market and of the policies of local development and solve the long-standing issue of the relationship between stadium and city. In particular, the modernisation and redesign of Italian stadiums, currently under-used and in precarious conditions of maintenance, emerges as the strategic core of interventions aimed at improving the functional condition of existing facilities, enhancing their relationship with the surrounding communities and promoting new management models.

Strategic approaches to territorial competitiveness

A territory that is modernly interpreted as a «competing system»[1] rather than delimited by institutional boundaries requires new models of intervention for the development of adequate strategies of performance offer based on local system players and on the enhancement of their economic, social and environmental identity according to typical territorial marketing strategies.
The inevitable interdependence between localism and globalisation has generated a neologism – *glocalisation*[2] – that effectively reflects both the local and the global dimensions within an overall vision and, in so doing, focuses on the peculiar identity of a geographic area.
Such approach has generated multiple phenomena of territorial aggregation, a widespread and diversified performance offer and the definition of districts that can trigger inter-sectorial market dynamics.
Housing, work, sport, leisure, production and culture interconnect in the urban space according to differentiated timeframes and result in reduced movement, energy consumption and pollution. More importantly, they reconnect the city sectors within an interacting system of urban life in response to diversified requirements of city concepts[3].
Enhancing local peculiarities becomes an instrument potentially useful in rediscovering a territory as a context equipped with identity and awareness through a multi-scalar strategic vision.

As core issues of urban renewal, the preservation and protection of resources imply the creation of new environmental and social opportunities as well as the mere conservation of assets.
Over the last few years, innovative territorial promotion strategies have emerged such as *city marketing* and *event marketing,* or processes based on national – and international – level high competition for the acquisition of events, fairs, exhibitions, major sport and cultural events.
Therefore, the "competitive strategy" of a territory pursues a precise model of sustainable development. In this perspective, it promotes the enhancement of "competitive ability" as the enrichment of the material and immaterial resources heritage that the subjects operating in a certain territorial sector may exploit according to inter-sectorial logics.
In the current scenario, the *major innovative projects*, in turn belonging to the categories of *flagship projects* and *major events*, are among the most relevant and complex components of the offer development policy. Such projects are a driving force for the evolutionary processes of a wide area system as they are a significant strategy for the enhancement of the local identity of a context.
Major infrastructural projects pave the way for the planning and implementation of the new events a territory intends to promote. At the same time, the organisation of national and international events implies the construction of new venues for such events, and generate a multiplicity of repercussions on the hosting geographic and environmental system. Metropolitan regions and areas use such major innovative projects as opportunities for international repositioning, visibility and tourist-economic development by promoting cultural consumption and a qualified and socialising use of leisure.
Multi-functional sport installations are rightfully major innovative projects as well as *flagship projects* – or logistic plans that, due to their economic and material complexity, extensively affect the surrounding territory and urban fabric. They are "structuring" projects as they reorganise the overall territorial system by generating a network of connections that redesign the city by enhancing its emerging qualities.
Being closely related to flagship projects, major events represent a driving force for their hosting cities and the relaunch of their image by renewing and optimising their resources. A major event becomes an innovative project, as it is a relatively unique opportunity that requires the construction of functional installations and attracts significant financial flows towards the territory with the involvement of multiple players.
Since the early 1980s, major events have emerged as a pretext for addressing critical situations in the territory. As demonstrated by the plans launched in several European countries, their impact remains limited when are

considered merely in their physical dimension rather than a strategic instrument for political governance. The complexity of such processes requires innovative approaches to a range of issues through the adoption of flexible and incremental process technologies, which effectively interact with a multiplicity of players according to multi-scalar procedures (strategic planning, complex programs, project cycle management, logical frame, etc.).
Implementing policies for the promotion and restructuring of areas play a key role in the physical and social transformations of a territory, in particular in the case of urban areas, by defining the dynamics of demand for public services, namely for transportation.
Therefore, such interventions must fit within a precise "vision" for the orientation of the territorial market. The urban plan defines goals, underlying values and binding factors that guide the evolutionary strategy of the territory and the use of spaces, within the perspective of a sustainable development aimed at enhancing its level of attractiveness for inner and outer economic players[4].
Within this scenario, the sector of sport installations emerges as a key factor in the development of the urban fabric and of its guiding business as a driving force for an economy that interprets the individual as central component of social dynamics.
Welfare, competition, ethical values and market integrate within a process of territorial enhancement that originates from a rethinking of the relationship among sport, infrastructure and city. Sport installations and the organisation of side events represent, consequently, a prime territorial marketing tool.
Indeed, each strategic action involving sport infrastructure pursues the promotion and organisation of interventions aimed at structuring the territory by focusing on the enhancement and strengthening of the existing infrastructural grid, and improving the urban sectors' accessibility and flow levels. The creation of a first-rate sport offer, integrated with the local environment and culture in order to achieve a widespread enhancement of both sport and the territorial system implies the goal of generating an organic and functional cluster deeply structured in its performance articulation by developing specific strategic areas into actual sport and entertainment districts.
The enhancement of the sport system within precise integration frameworks fits into a vision of the city articulated by superposed and interacting relationships rather than by functions, where the functional mix becomes a prerogative for a successful integration between building and community.
The entire transformation process generated by the sport infrastructure clearly requires the development of multi-level operational tools that imply the adoption of memoranda of understanding, program agreements, intervention planning and steering committees aimed at ensuring the integration

among the different players involved and a flexible and incremental project-oriented approach, capable of managing the city in its different aspects. Criteria and procedural models should guarantee the coherence and adequateness of the interventions to the achievement of goals, as well as the commitment of local players directly involved in the intervention in terms of their financial responsibility in case of public-private partnership.

For these reasons, sport facilities may represent a prime opportunity for territorial development from several points of view provided their planning smartly and innovatively relies on a marketing activity based on the most successful experiences achieved by other sectors of activity[5].

A sport installation is an aggregation and socialisation hub – as such, its development may follow the lead of the trends developed in advanced countries where leisure and entertainment are strongly growing factors. Sport facilities are highly interesting projects for public administrations, as they become an infrastructural component of the territory, as such increasingly focused, on a both local and central level, on strategic territorial marketing policies in the context of an increasing competitiveness among local governments[6].

Stadiums have always been located in proximity with the established urban fabric or in the immediate outskirts of the city, often within sport complexes equipped with accessory facilities. As such, they always represented hubs that could reconnect fringe areas to the historical core and infrastructural systems.

That was not the case in Anglo-Saxon countries where stadiums were generally built within the established city *scale*[7] as urban blocks closely related to the district level, and as such redefined the skyline of the city proper.

Therefore, the city *scale* becomes the boundary, dimension and typological reference for the sport facility, as it integrates it within its existing grid and footprint with the goal of affirming a both morphological and functional urban continuity.

A successful relationship between building and context primarily relies on a correct superposition between building and public spaces where the stadium elevation represents the element for the solution and integration of the multiple issues a building of such size implies within a compact urban system.

This approach currently plays a clear strategic role in the regeneration and enhancement of the built fabric as it guides the design of sport buildings towards the construction of compact, multi-functional average-capacity complexes by strengthening their urban character, levels of accessibility and enjoyment and by equipping them with new standards of resilience at the urban and architectural scale[8].

Comparing European experiences

The European stadiums that best reconnect with the urban system and different sectors of the city include the Johan Cruijff Arena (Amsterdam, Netherlands), the Stade de Suisse (Bern, Switzerland), the Stade de la Maladière (Neuchâtel, Switzerland), the Emirates Stadium (London, UK) and the recent Estadio San Mamés Barrìa (Bilbao, Spain).

These sport facilities are top-quality experiments and paradigms from the point of view of urban and financial planning. They confirm that the market of sport infrastructure is currently one of the most interesting and promising sectors within the processes for the enhancement of territory and infrastructural services, as it combines collective and private requirements and emerges as a prime ground for strategic planning and for the production of brand identity in the global scenario of territorial competition.

The above-mentioned European paradigms provide an opportunity to interpret some paradigmatic approaches to project organisation and to the articulation of the process of programming and management of complex facilities within the urban context.

All the facilities, except for the Johan Cruijff Arena – the driving force for the development of a new district – and the Emirates Stadium, replaced existing stadiums, demolished to make room for updated multi-functional facilities aimed at activating new logical and functional synergies with the established city, defined by a structural continuity that binds every part with the whole.

Such enhancement of the city and its inner places provides a strategic opportunity for the activation of new forms of urban coexistence as it triggers new ways of living and working within regenerated spaces, and, in so doing, produces transversal flows and dynamic relations between public and private space.

Arena Boulevard, Amsterdam (Netherlands)

The Arena Boulevard in Amsterdam is one of the most developed areas in Netherlands and represents an example of integration of different programs (shopping, sport, entertainment, housing, advanced services) within a fully-fledged innovative entertainment district. The public administration played a key role in its funding process in order to encourage its construction and sustainable development.

Banks and businesses also participated in the financing process of the public-private partnership activated for the occasion.

The result for the city of Amsterdam was an increase in the area's commercial value and substantial revenues from the concessionary charges paid by businesses located around the Arena and from real estate developments. The sport facility turned out to be a driving force in attracting businesses

and in creating a busy tourist destination for entertainment[9].
In other words, besides providing the city with a modern, multi-functional and comfortable facility, the construction of the Arena was a catalyst for the economic and social development of the area.
Not only did the stadium boost real estate development, it also encouraged the construction of new hospitality, sport and retail facilities and results in an enhancement of the entire urban sector[10].

Stade de Suisse, Bern (Switzerland)
Made possible by funds allocated for the 2008 European Championship hosted by Switzerland and Austria, the construction of the Stade de Suisse (Bern, 2005) was part of the Development Plan for the promotion of the hosting context as an area of excellence.
Following a popular referendum in 1997, 72% of Bern citizens voted for the amendment of the Master Plan and approved the construction of a new stadium[11]. The existing facility was demolished on August 2001 in order to make room for a new multi-functional stadium built on an area owned by the city administration.
The construction of the new building is part of the Bern-Wankdorf area development plan, an integrated development program for the promotion of the area as the ideal venue for exhibitions, sport events, congresses and offices resulting from the synergy among several public and private institutions. The main goal of the plan, besides equipping the Wankdorf district with a stadium designed according to the new European standards, was the creation of a new urban centre for the community including neighbourhood services such as an important education and administration hub. The company obtained a 99-years surface lease from the City.
In order to cover the financing for the construction of the stadium, which required considerable investments, some private institutions, including pension funds and insurance companies, joined forces and created a co-ownership consortium. In this way, they reached the investment capital required for the construction of the facility.
In order to strengthen the environmental protection process, the Stade de Suisse consortium promoted three projects, in particular focused on solar energy production, heat recovery and development of public transportation. As a result, the stadium can count on a PV system of about 12.000sqm (the first of its kind in this type of building) built over the stadium's roof and designed to cover its entire energy requirement as well as part of that of the adjoining districts.

Stade de la Maladière, Neuchâtel (Switzerland)

The multi-functional La Maladière complex (Neuchâtel, 2005) addresses the two-fold challenge of creating a large-scale design element in the core of Neuchâtel all while pursuing a balanced integration in the city's historic fabric.

With its compact and contoured shape defined by a continuous but variegated profile, the building features a seamless envelope articulated along elevations with different profiles, which reflect the variety of programs it accommodates, designed to interact with the multi-faceted realities of the district.

The Maladière development includes a football stadium, a fire station, six gym halls and a 24,000sqm shopping mall. Entirely covered by private funds, the building replaced the previous stadium in a strategic area of the city centre.

Its construction required the city administration to sell the area to investors who took entire financial responsibility for the operation. The sale price of the area included the value of the existing stadium and its annexes, as well as the cost of the provisional stadium's installations.

The city administration of Neuchâtel obtained a long-term lease for the Fire Station and the multi-purpose sport halls. Given the financial, management and real estate complexity of the operation, the administration developed a special procedure for the plan, supported by an environmental and landscape impact study with a particular focus on public and private transportation, parking areas and landscape design, as well as on the relationship between the building and the historical context of Neuchâtel[12].

As a result, the amenities offered by the plan complement those of the city centre.

The construction of the stadium contributed additional dynamism to the city and expanded its entertainment and sport offer.

Within the urban context of Neuchâtel, the Stade de la Maladière represents a highly popular facility with a remarkable emotional meaning for the entire region and its residents. This is, indeed, a city sector with highly meaningful and valuable historical layers. The construction of the stadium effectively brought several benefits to the entire region as well as to the city.

In particular, the process enhanced the La Maladière district's role as a conurbation centre and projected it as the actual gate to the city centre.

Therefore, the stadium resulted from the operational and decisional dynamism of a small group of operators, and reflected the perfect harmony and a successful sharing of diversified interests and requirements.

The general interest program promoted by La Maladière led to an intensive use of the urban surface and to a successful approach to multiple issues still requiring satisfying solutions – the requirement for a stadium as well as for

a civil protection station, multi-purpose sport hall and a large parking area, and the creation of 440 jobs.
La Maladière represented a remarkable driving force for the relaunch of Neuchâtel, in particular for the reorganisation of its infrastructure and public transportation, and provided a new stimulus to the entire surrounding region[13].

Emirates Stadium, London (UK)
The Emirates Stadium (London, 2006), home to the Arsenal Football Club, is an excellent example of incremental enhancement of the urban and built fabric.
The infrastructural investment resulted from the English club's requirement to replace its existing stadium, no longer adequate to professional football, and from the opportunity to develop the new facility within the same district, due to the close relationship between the latter and the sport club.
The urban transformation strategy followed three interdependent lines of intervention:

a. finding a surface twice the previous one close to the existing Highbury stadium (a site previously acquired by the city administration and originally devoted to a waste treatment facility) for a next-generation facility equipped with multiple entertainment services;
b. developing some residential complexes over the demolished Highbury stadium. Inaugurated on September 2009, the Highbury Square project – an apartment complex that partially reuses the stadium's stands by organising its open spaces through a system of vegetable gardens and parks – represented a major part of the real estate redevelopment plan;
c. rehabilitating a then dilapidated third area within which a public service system was developed to enhance the existing network in the area hosting the new facility[14].

This model of network planning undoubtedly generated a remarkable impact on the local community. It fully demonstrates how the construction of a new sport facility may successfully trigger a widespread rehabilitation of the context by generating parallel and related intervention plans within a vision of overall redesign of the city starting from primary and localised requirements.
An improved transportation system and the creation of new jobs made the relationship between sport club and local community even stronger through the definition of a functional and management program, which effectively complemented the purely economic and financial purpose of the development with social concerns. These included the obligation of keeping at least 25% of the apartments at accessible prices and the creation of public services and facilities such as a kindergarten, a secondary school, a library

and a football training facility integrated with the school system.
The city administration funded its share of the development with revenues from transfer of public areas and lotteries. Other funds came from private investors (namely, the Emirates airline, already the club's sponsor, which associated its name to the new stadium based on a multi-year sponsorship contract), and directly from the club.
In order to obtain the building permit, Arsenal had to sign a Stadium Management Plan that bound the actuator of the plan to provide the London Islington Borough with constantly updated progress reports and to limit the impact resulting from the development.

Estadio San Mamés Barrìa, Bilbao (Spain)
The Estadio San Mamés Barrìa (Bilbao, 2014) is a most recent demonstration of how a sport infrastructure successfully combines urban planning requirements and private interests.
Located outside the centre of Bilbao as the terminal section of the Ensanche district, the building respectfully interacts with the existing context by completing the urban fabric and by addressing the river upon which it fronts as a meaningful landmark on the Nervión estuary.
The facility is easily accessible through public transportation and its logistics is strategic due to the widespread presence of hospitality and retail facilities that effectively support and integrate the new activities planned within the sport complex.
The new building is located close to the previous one, which was demolished after a referendum among the sport club's shareholders resulted in a 70% approval rate.
The project of the new building followed two sequential phases. First, three quarters of the building were erected, including two main stands and a curved stand, close to the previous facility, so that the team could play its home matches within the existing stadium even during the construction phase.
During the second phase, the second curved stand was built and physically replaced the old Catedral stand, demolished in spite of its centuries-old history.
Capacity and size of the facility (about 53,000 spectators) were decided based on the city's size and number of residents by pursuing a modern, efficient facility fully adequate to national and European guidelines and regulations.
The facility, fully respectful of local requirements, includes a University technological hub and a state-of-the-art water sports centre with a multi-functional Olympic swimming pool for both competition and recreational

swimming, as well as other fitness and wellness facilities. The construction of a new dedicated access road made several interconnected retail activities easily accessible.
The result is a sort of urban-scale "repair-replacement" program that effectively replaced an entire block by equipping it with new economic and relational opportunities.

Perspectives

Over the last decade, the relationship between stadium and city has evolved on a physical-geographical level and even more in terms of the functional synergies the new facilities can generate with their context.
The stadium emerges as a strategic element that can activate new urban planning, functional, economic and social patterns by pursuing and reinforcing a compact and inclusive idea of city.
Enhancement of urban areas, reduction of land consumption and environmental and economic sustainability are the necessary tenets for the development of safe, welcoming and enduring cities as places for the production of services and the creation of value.
In such context, the construction of new sport installations must necessarily entail the creation of smart hubs within the city fabric in a perspective of service to new lifestyles.
Accessibility to such facilities will necessarily rely on their strategic location close to road infrastructures and on an increased use of public transportation or of soft mobility, which will obviously decrease urban traffic and emissions in the atmosphere.
For all these reasons, stadiums become new urban condensers – rather than cost centres, infrastructures that produce new services, resources, relations and economies of scale.
As a contemporary block, the stadium is the driving force of new district-scale dynamics, which will generate a fertile environment for exchange, learning and cooperation, a smart platform capable of enhancing the development and growth of an environmentally and socially sustainable district.

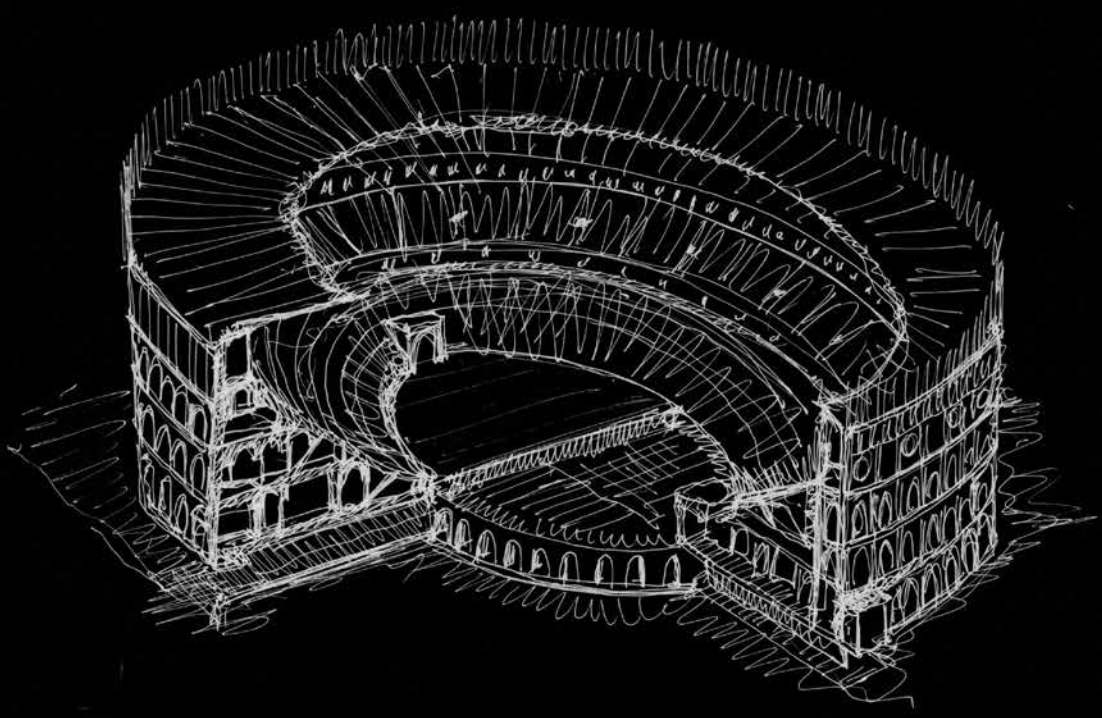
Notes

1. Caroli M.G., 2006, *Il marketing territoriale. Strategie per la competitività sostenibile del territorio*, FrancoAngeli, Milan, p. 15.
2. Susio B., Ceschin F., Montanari S., 2007, *Territori strategici. Modelli di pianificazione per lo sviluppo dei sistemi locali*, FrancoAngeli, Milan.
3. «The multi-functional city is mainly a multi-centre city – a city of networks and hubs; a city, for example, that pursues the rehabilitation of existing facilities as an opportunity for diversification; a city that pursues urban regeneration in order to encourage diversified centralities; a city of social regeneration and a multiplier of economic vibrancy» (Carta N., 2004, *Next City: Culture City*, Meltemi, Rome).
4. «This not only highlights the requirement for serious feasibility and convenience studies but also for the functional optimisation of existing infrastructures (with interventions on equipment, systems and supplies, and not necessarily construction works). One example is illuminating in this sense. When trains leave the two high-capacity/high-speed rail lines inaugurated between 2005 and 2006 (only passengers trains and only two couples of trains a day between Milan and Turin and 14 trains between Rome and Naples) for the old rail lines (which the Milan-Turin-Paris high-speed train covers anyway because it is "incompatible"), they slow down before entering the cities». (Norsa A., 2007, *Le infrastrutture per la competitività*, Milan, October).
5. Cherubini S., Canigiani M., Santini A., eds., 2003, *Il co-marketing degli impianti sportivi*, FrancoAngeli, Milan.
6. «A significant case is Caracas, Venezuela, a city where over a million people live side by side in three – or four– story buildings often with neither drinking water nor sewers, which is developing many remarkable experiments in social and spatial inclusion in order to make these barrios more hospitable. The construction of a vertical gym, the Gimnasio Vertical, a prefabricated sport facility, which can be installed in the inner courtyards of the city where people play basketball, has successfully engaged young people and reduced crime rates. Such initiatives highlight the awareness of the fragile as well as significant connection between the design of buildings and its impact on society» (Burdett R., Kanai M., 2006, *City-building in an age of global urban transformation,* from the catalogue of the 10th International Exhibition of Architecture, Venice).
7. Romagni L., 2010, *Lo stadio nella città*, Alinea, Florence.
8. Allegri D., Vettori M.P., 2018, «Infrastrutture sportive complesse e resilienza urbana: tecnologie e paradigmi», in *TECHNE Journal of Technology for Architecture and Environment*, n. 15, pp. 165-174.
9. Cuzzupoli L., *Il marketing degli stadi di calcio in Europa: il caso dell'Amsterdam Arena*, Università degli Studi di Roma La Sapienza, Facoltà di Scienze della Comunicazione, Master's Degree dissertation, supervisor prof. Marco Castellet, a.a. 2003-2004.
10. Markerink H.J., Sanyini A., 2004, «Stadi e grandi aree di intrattenimento. Il caso Amsterdam Arena», in *Sport Management e mercati globali*, n. 2, ISTEI – Istituto di Economia d'Impresa, Università degli Studi, Milano-Bicocca.
11. Its current name is Stade de Suisse Wankdorf Nationalstadion.
12. Ville de Neuchatel, 2003, *Rapport du Conseil communal au Conseil général concernant la réalisation de La Maladière*, Dossier de presse, March 14.
13. Geninasca Delefortrie SA, 2007, *Complexe de La Maladière, Neuchâtel,* project report, Dossier de presse, Press Conference, February 13.
14. Steer Davies Gleave, 2006, *Emirates Stadium Local Transport Operation. Information Brochure*, London.

Sport Infrastructure

Origin, evolution, transformation

by Emilio Faroldi



«For the first time in the history of humankind, at regular intervals and at fixed times, several millions of people sit down in front of their TV to watch and, in the fullest sense of the term, participate in the celebration of the same ritual».

Marc Augé, 1982

The sport infrastructure represents an important opportunity for architectural, design and technological experimentation – highlighting its potential is the main goal of this essay[1].

Exploring the paradigms of the design, construction and management of *sport architecture* by extracting their values in terms of innovation, multidisciplinary and inter-scalar approach, means pursuing an undoubtedly topical research branch and contributing to a critical dimension of the debate concerning the role such infrastructures play in the contemporary age, either in continuity and/or in discord with their history.

Their territorial and urban relevance suggests the adoption of a broad approach to this issue, unlike the no more tenable vision that used to consider stadiums merely as objects and in terms of their performance. Now, instead, it is necessary to extend such scope to the entire "process-project-product" realm by involving since the early explorations the management matrix indicators associated with the concepts of compatibility, functionality, maintainability, durability, usability, safety underlying a demonstrable assessment of the economic and financial feasibility extended to the entire lifecycle of the infrastructure.

The realm of environmental planning and the instrumental, regulatory and procedural framework represent, in complementarity with the functional and morphological-linguistic aspects, the cultural field within which the planning and construction of sport facilities develop themselves.

Similarly to the action of rehabilitation and enhancement of the built heritage, the integrated strategies of new construction applied to sport infrastructures define the realistic margin of critical, cultural and design exploration of the potential sport architecture can offer in terms of urban and social regeneration.

The actualisation of the urban space and the development of an organic system of public spaces functionally integrated with major sport events is a recent phenomenon that guarantees a certain success when developed in favourable and positive political and structural conditions.

The pioneering practices developed by some European countries since the

1980s demonstrate that such events only have a limited impact when they exclusively focus on physical and object planning. A now widespread approach, instead, considers them as the instruments of political planning.
The latest Olympic Games (Barcelona 1992, Atlanta 1996, Sidney 2000, Athens 2004, London 2012); and of the World Expos of Seville 1992, Lisbon 1998, as well as the 2015 Expo held in Milan – an opportunity of revival and international rebranding for the city – are successful examples of this approach.
In this perspective, urban landscape requires new and flexible organisational principles. Multifunctional facilities become new venues for urban life, capable of influencing the mobility patterns by attracting remarkable flows of citizens across multiple time segments.
New sport infrastructures play a role in this cultural context by stimulating a modern response that effectively combines functional, morphological, political, social and economic-financial issues.
Sport architecture, and its design, inevitably address the variety and ramification of the issues that embody the rethinking of collective spaces, their forms and paradigms. Today, designing a sport infrastructure means interacting with some precise variables besides taking care of its specific technical, functional, distributional and linguistic aspects. These include the rituality and symbolism this typology implies, the meaning of sport infrastructure as a place, the concepts of *sustainability* and *safety*.
Stadiums, and sport facilities in general, tend to interact with the city and territory as urban facts, "primary elements", "city parts"[2] – closely associated to the urban form and its evolutionary dynamics. This element, and the persistence of these building typologies' formal reasons described by De Finetti as «final and exemplary architectures, used for centuries on end, typical for their admirable harmony between necessity and form»[3], provides an opportunity to review some periods in the history of anthropised territory and to propose some possible perspectives for the transformation such buildings can generate.

The stadium as a symbol of the sport infrastructure. Origin, evolution and models

The origins of the stadium[4] – here instrumentally considered as a primary paradigm of the sport infrastructure – coincide with the concept of sport practice associated with its role of theatre for sport events and not exclusively with the concept of leisure.
The terminological transition, during the Greek-Roman age, from its meaning as a unit of length[5] to an *architectural type*, in turn associated to a particular kind of running race that took place on a specific length in ancient Greece[6], occurred simultaneously with the functional transformations of this building.

Over time, stadiums incorporated particular performances that, over the centuries, provided and still provide the fundamental frame of its concept and design development. These invariant features, although adapted to the requirements of the different ages, characterise the *stadium type*.

In ancient Greece, the *Hippodrome* and the *Stadium* were the key architectural complements, associated by the urban layout to the systems of gymnasia where the population constantly and methodically practiced an athletic activity. Competitions and events, followed by an increasingly larger audience, required new and adequate facilities. In 180 BC, the stadium of Miletus, with a capacity of about 15,000, was an essential architecture comprising two long rectilinear stands facing each other with the arena at the centre.

The Flavian Amphitheatre in Rome was the symbol of the power of the Roman Empire, and the historical example of an architectural and organisational ability resulting from a variety of technical and distributional devices and from the innovative and original solutions provided to issues of visibility, access and exit of spectators. Designed to accommodate about 50,000 people, the huge arena featured an awning installed at the top of the building and operated by specific machinery that protected it against the weather. This demonstrates the fact that, even at the time, the standards of comfort and quality of vision of the show guaranteed to the audience were primary and widespread goals.

The very first facilities designed to host football games were still some urban areas. In Italy, a country with a long and established tradition of public games, several activities involving the use of balls, with well-known rules and roles, popular since the Early Middle Ages took place in urban squares and in the courtyards of noble palaces[7].

The evolution of the game and its transition from "Florentine kick game" to the so-called "gioco del pallone"[8], originally played in the courtyards of Renaissance palaces resulted in its relocation in larger venues such as urban squares also due to the violence of blows. Such relocation of sport practices from the walled spaces of palaces to the open-air venues of the city reflected more than the requirement for a more adequate facility for aerial play. It also reflected a process of "democratisation" that involved the game during the eighteenth century when, with the increase of attendance and the crowding of squares, the games became more frequent and crowded.

The *stadium-square* during the Enlightenment age became the focus of a debate about the educational function of the game as the main ground for the enactment of recreational activities and of popular sociality, versus the theatre as the primary symbol of aristocratic *loisir*[9].

In the nineteenth century, the venue for football games underwent a radical and final transformation that triggered the modernisation of the

construction process of new and specific facilities. Problems of public order and safety and the awareness of the disruption such activity created for the urban population invited the establishment of new public facilities designed to accommodate growing interest from increasingly diversified users.
The nationwide emergence of the *sferisterio*[10] in Italy during the nineteenth century provided an adequate response to the issues of safety that urban squares were unfit to guarantee. It also defined and codified football within the urban and social context in the Italian cities.
Among the main reasons for the widespread construction of *sferisterio* arenas, a primary role was the social function the game itself had in the organisation of pre-unification Italian states. As the official venues for football, they were fundamental aggregation hubs within the urban context.
A widespread building program for such facilities occurred precisely during the early decades of the nineteenth century, in a period of deep economic crisis for Italy. This highlights the important role both public institutions and the Papal State attributed to the *sferisterio*, considered as an opportunity for recreation and for keeping young people away from vice and discontent resulting from growing unemployment, the dreaded source of popular anxiety and torment.
Sferisterio arenas soon attracted large crowds, so much so that in 1786, the celebrated German writer Wolfgang Goethe, having participated in a football game in Verona, reported that between four and five thousand spectators attended the event. For example, the majestic and monumental *sferisterio* in Macerata accommodated between 2,000 and 3,000 people. Due to its remarkable capacity, the *sferisterio* may be rightfully considered as a sort of ancestor of modern football stadiums and, in general, of sport arenas, as it was one of the main and most crowded venues of urban social recreation of the time. Such facility was not exclusively devoted to *historical football* games – something different from modern football. At the same time, it was the venue for a variety of games and entertainments previously organised in urban squares[11].
The emerging concept of professionalism and the radical social metamorphosis of the game, along with the implicit transformations of the venues designed to accommodate it, amplified the evolutionary process started in the late eighteenth century that also marked the decline of historical football. There were many and complex reasons for this. The games became increasingly less frequent and *sferisterio* arenas ceased to be used to make room for new urban planning and social requirements triggered by the evolution of taste and lifestyle of the new century.
Their final act[12] would coincide with the emergence of a new phenomenon in England: *foot-ball*. At the time, football was played with the hands and was more similar to rugby – as such, it was the actual ancestor of

modern football. The dissemination of the sport effectively occurred in the Anglo-Saxon educational environment, namely schools and universities, so much so that it actually became one of the main distinctions and qualifications for the schools themselves, as it invited the investment of remarkable resources for the construction of modern sport facilities. The prestige of university institutions resulted from their sport achievements.

Large arenas and, in particular, contemporary football stadiums have their origins in the ascent of modern football[13], in the early nineteenth century, mainly in the contexts of urbanised and economically developed English regions. Indeed, it was not popular in the rural and extra-urban areas and thrived instead in city contexts boosted by the economic impulse of the industrial revolution.

The facilities built within what many defined as the "first generation"[14] of modern stadiums, based on the principles of industrial culture, have a *multi-functional* character resulting from the coexistence of multiple sport practices, or a *poly-functional* character with a monumentality associated to actual sport parks.

The emergence of the first *clubs*, established and attended by workers associations[15], promoted the process of association of a place and its sport club with a district, a city or, more in general, with the very working-class culture that had generated them. Until the mid-1980s, English stadiums were mainly attended by the working class[16]. To get an idea of the interpenetration between football and working-class culture in England, think of the architecture of some stadiums that, through their forms, materials and specific technologies, evokes the image of industrial plants in stylistic and not just metaphoric terms.

Between 1880 and 1890, the improvement of living standards of the English working class, associated with the introduction of the concept of *leisure*, promoted the process of rooting of sport deep in collective imagination.

At the time, the general concept of stadium and of sport architecture in Europe still evoked a place modelled over the Napoleonic arenas built for civil and patriotic events.

In Italy, football was first played on parade grounds and hinterland *esplanades*. It was only since the late nineteenth century that emerged the use of velodromes through a process of adaptation. Between the early twentieth century and the post-WWI period, in Italy and in Europe stadium design was still inspired to classical, Greek-Roman models[17] for the construction of monumental stadiums mainly used for athletics rather than football. Notable examples include the Stadio dei Marmi at the Foro Mussolini – now Foro Italico – in Rome, inaugurated on October 1932; or the facilities built for the fiftieth anniversary of the Unification of Italy.

The football stadium, instead, was not part of the repertory of "academic"

typologies yet[18] and, consequently, had not overstepped the limit between *spontaneous action* and *codified action.* Only in the 1920s, would football stadiums actually begin to emerge with a process through which the technical question catalysed the design and constructional effort, nurtured by the Italian structural engineering school and by its main exponents.
Between the 1920s and 1930s, modernist philosophy and an attempt at freeing the linguistic repertoire from the codes of decorativism led the new "stadium" typology to be involved in some relevant episodes. The Colombes Stadium (1925), built for the 8th Olympic Games in Paris, the stadium of Florence (1929), the stadium of Vienna (1931) and the stadium of Turin (1933) are only some of the most relevant paradigms of a new generation of sport facilities involving a technical and constructional experimentation aimed at a linguistic and formal renewal.
In Italy, the first football stadium, promoted as a public initiative, was the Littoriale Stadium in Bologna[19], the construction of which started in 1925 to be completed in May 1927. The Littoriale marks the beginning of a new season for Italian sport facilities[20]. The years between 1926 and 1937 were an *epic* age for stadiums, built in a great number all over the country, similarly to what was happening in many other European countries[21].
Even when invested of intense rhetorical or celebratory emphasis, the linguistic and morphological expressions applied to the stadium still convey mainly functional concerns: «a building that [...] for its function required a specialised architecture featuring its own constructional elements»[22].
The stadiums of the following generation mostly feature radial layouts with full or partial reinforced concrete roofs. While their integration with the landscape, their roof's shape and the interface between technological systems and settlement typology were core concerns for architectural meditation, only few exponents of the specialised cultural debate actually addressed them[23].
Nonetheless, the design research conducted in Italy did provide an important benchmark for the design and construction of several sport facilities abroad. The deep transformations in construction and architectural culture during the post-war period, as well as the transition from traditional to modern construction, the technological innovations brought by modernisation, the dissemination of reinforced concrete technology, the renewal of building elements and materials promoted by industrialisation made Italian structural engineering a star in the international scene, and triggered a fruitful debate against an exclusively technological vision of innovation.
The Olympic Games hosted by *Rome*, *Tokyo* e *Mexico City* during the 1960s[24], and the economic development of the following decade promoted the adoption and inherent development of large reinforced concrete structures. Several sport and performance facilities, as well as infrastructural

works, reflected this trend with large roof spans and a most fortunate alliance between architecture and engineering.
The continuous thread of experimentation in Italy started, as early as 1929, with the construction of the City Stadium in Florence by Pier Luigi Nervi[25] who, along with Riccardo Morandi[26], worked on infrastructures and large-scale public works as original grounds for his innovative experimentation. In such context, sport architectures reacquire an essential role within the research about new building techniques as typological paradigms in which building and structure almost invariably coincide and, at the same time, similarly to the projects for highways, railways and gas stations, airports, supermarkets, parking areas, anticipate the interest for some typically modern places and spaces. These same places and spaces are main topics for the current socio-cultural debate and unavoidable issues for architectural design.
Besides the celebrated and significant role played by Pier Luigi Nervi[27] in this context, a few major masters of modern architecture such as Giuseppe Terragni, Le Corbusier, Oscar Niemeyer among others ventured, although infrequently in this realm, mostly through abstract sketches, perhaps produced with the awareness they would remain on paper[28].
During the years of the debate about the fate of cities and the articulation of their parts, stadiums ended up at the fringe of architectural research, and remained the domain of structural and engineering disciplines. Stadium architecture becomes an accessory to its mechanistic and purely functionalist nature.
«Oddly enough, the most popular and spectacular of games fails to offer an adequate image of itself to whom watches it in large stadiums or at home on TV in terms of its graphic and plastic-aesthetic quality». Vittoriano Viganò, who wrote these words, proposed a design program provocatively entitled "A design for the goal" within his educational activities at the Faculty of Architecture of Politecnico di Milano, in the late 1980s. A research about new signs for a game, football, still anchored to its traditional and unchangeable "environment"[29].
During the 1990s, Italy created an opportunity for an experimentation about the "stadium type", in particular on a now particularly topical design issue – the adaptation, expansion and modernisation of existing facilities[30], by highlighting the difficulty and criticality of the relationship between stadium and urban fabric in a both design-performance and management perspective.
As demonstrated by specialised literature, it was a wasted opportunity due to the inadequate design solutions adopted at the time, which fully reflected the flaws of Italian architectural design and, more importantly, to the political and strategic planning of an event, resulting in a marked gap between goals, available resources and ability to control complex systems.

Changes and conceptual refinements between functional hybridisations and semantic contaminations

The sociological debate considers the stadium as a ground for primary sociality used by a collectivity that exists and acts in other spaces of the city besides the facility. «For this social, cultural, and consequently territorial articulation, the football stadium is no longer an isolated building around which other buildings casually articulate themselves but an object of programmed reconfiguration coherent with the territory that can catalyse diversified social users with times and rules of use even quite different from each other. Not an object but a place: this is the paradigm»[31].

Within the stadium, football, and sport, interprets and conveys, through its rites and unchangeable codes, the dramas, aspirations, repressions of a society increasingly suffering from an identity crisis.

The transformation of "sport theatres" in the early 1990s underlies social roots. While up until then the stadium had been a venue almost exclusively used by pure fans, who attended it in order to watch the game, now it represents a system of particularly complex and articulated functions and relations so that the sport and competition event remains in the background. Gives this situation, the stadium reacquires its meaning as a "building", or a complex element designed to host activities closely related to the requirements of the modern society.

Having lost its nature of mere "container" where "the mass releases its tensions", its design required and still requires deep and continuing changes in terms of concept, functions and performance, as it has to address the requirements of different groups of public and of a dynamic society in terms of its essence and habits. Across history, stadiums, and sport infrastructures in general, represented a place of aggregation devoted to a defined and limited timeframe. Now, the times and ways of being at and using such facilities, as well as the groups of users, have expanded considerably.

These facilities have become constantly accessible in terms of times and ways of use, and incorporate the activities that allow for their operation, thereby promoting a more intense action of socialisation and a correct use of leisure the post-industrial and post-modern society has achieved and tends to enhance.

For a long time now, stadiums have ceased to be merely stadiums. They are more than that, with all the potentials and criticalities such condition entails. This factor is radically transforming the cultural meaning of these buildings. It implies an articulated and multiple use, particularly by the groups of users who are not directly involved in sport events and rather pursue the new and diversified relational opportunities these facilities offer besides public utility services. As a result, they interpret the sport infrastructure as a fully-fledged contemporary urban block, the modern reinterpretation of well-established

and historicised aggregation models.
Some designs built over the last two decades promote socially relevant spaces and functions besides entertainment and leisure programs. This shows how the possibility to expand and renew the functional system of such massive and highly complex facilities is closely connected to the opportunity to improve spaces and services in a way that encourages the focus on the requirements and primary needs of a community. The stadiums recently built in England and Germany as some of the best examples in the world appear as global, radically modernised buildings when compared to similar designs built fifteen years ago.
The concern for safety, sustainable mobility, a responsible management of resources, the territorial marketing processes generated by the models of urban development that guide the interventions of spatial and functional reconfiguration of the facilities, currently actual *cultural infrastructures*, is supported by an entrepreneurial approach fueled by a pressing pursuit of economic opportunities.
Only a deep rethinking of the facility, based on the transition from a "control culture" to a "safety culture", for a long time recognised as an example of unwritting translation of the "prison" architecture, led to the replacement of the traditional building with the modern multifunctional stadiums, now proudly exhibited by English, Anglo-Saxon, European football clubs.
Recently, the concept of stadium has undergone a deep physical and symbolic modification. As a safe place, it now attracts new groups of users and increasingly emerges as a venue for urban sociality for families and their renewed requirements.
Understanding and exploring this change means studying the process that recently affected the realm of public spaces more in general.
The ways of experiencing space have undergone deep evolutions, also due to the propagation of new aggregation modes. There is still a significant influence of the way of living *outside* rather than *inside*, according to the logic of a public-private space *continuum* that blurs the boundaries between spaces of different nature.
Open and public spaces define and guide new residential models generated by the relevant role *strategic design* plays in the definition of public places, and in their resulting attraction on younger generations.
Our interpretation of phenomena changes, and in so doing influences the act of metabolising new space forms in terms of social attraction within environments such as shopping malls, multimedia libraries, media stores, clubs, gas stations, railway stations, airports and all those facilities that, like stadiums, hold new captivating forms of attraction on users.
As anthropic forms that place a high value on serving or general collective spaces, outer spaces convey and influence the residential models through

their own morphological identity. From this point of view, the new environments emerge as fully-fledged media that can captivate and attract the new customers of the architectural product.
Traditional or "closed" stadiums are normally conceived as "containers" of spectators, exclusively operating during the sport event through a direct space-temporal relationship. For years, they exclusively resulted in mono-functional buildings for temporary use. Their presence within the urban context failed to consolidate its image – to the contrary, their looming, oppressive and often devalued presence and their concentrated and fragmentary use often contributed to its degradation. The facility failed to generate services or benefits for residents – on the contrary, it resulted in discomfort associated to public disturbance, overcrowded parking areas, pollution and, obviously, vandalism. The traditional stadium provides no benefits to the city and only highlights the most ambiguous and gloomy aspects of its presence.
In spite of this, in the UK most stadiums were – and still are – located within residential districts, mostly built during the 1920s. Their renewal represents a momentous turning point for such contexts. Similarly, an "open" model of stadium necessitates an articulated and balanced design with an ability to consider the transition from the generic user-fan to a diversified range of new both social and time entities. The marked change in the structure of stadiums, and in the composition of football users, underpins a reconfiguration of the architecture-sport-culture relationship. Primarily, with the foundational intention of pursuing the elimination of *un*-sport support, associated with phenomena that damage the image of the club and its home. Secondly, through the replacement of the traditional *user-fan* with the new figure of *user-customer*.
The change in the composition of football crowds, resulting from the new concept of "total stadium", is one of the unavoidable steps in the complex evolution of sport practice and implicitly of its associated venue over the last decade.
Today, stadiums, arenas, sport palaces emerge as urban infrastructures offering a higher potential in terms of usability, compatibility, adaptability and ability to generate attractive events for the entire city. In other words, actual flywheels for the concentration of catalysing activities capable of generating sustainable economic opportunities aimed at the feasibility of the interventions.
The building is increasingly an urban element – a facility designed, built and managed precisely for the new spectator-customer, in line with the main standards of comfort, quality and safety.
The renewed management culture associated to such facilities incorporates the role that new tools for the propagation and perception of performance

and sport events play within the football organisation structure. The emergence of the new media overturned the centrality of the stadium and necessitated its opening to outer systems and networks. Such process of de-contextualisation and globalisation of information generated a renewed relationship between sport infrastructure and city. The new facility acquires a role larger than that of the traditional model, as it represents an active element in the process of renewal and enhancement of the urban infrastructural system. The relationship between the city and the recently emerged "stadium market" inspired by shopping malls propelled a sort of overturning of the values at stake.

In the past, the market and the places for commercial exchange were public venues and their integration with other activities resulted from the dynamic typical of the urban system. When the new *shopping malls* emerged and thrived, the market became a sort of square, a "conditional-access *agora*" that mimics the city by reflecting an explicitly *artificial* interpretation. «Thus, we witness an evolution of the relationship between market and urban system whereby the latter operates a "selective imitation" of the former; an imitation also experienced through a particular symbolic contamination, a fusion between reality principle (transactional activity as resource supply) and pleasure principle (consumption as a pretext for a pleasurable experience)»[32]. Social requirement exceeds all this and focuses on the redesign of the sport facility as a key moment in the life of the city in terms of value of the activities organised and planned within the facility as well as of the resulting communication.

Multiple issues converge in sport infrastructures because they offer highly specialised, articulated and complex functional programs – hospitality, restaurants, spas, multiplexes and theatres, meeting centres, as well as the headquarters of public and cultural institutions. In other words, activities that effectively challenge the widespread idea of a marginalised and *dangerous place*, and instead project actual service and socialisation hubs. A noteworthy aspect is the changing idea the collectivity has of sport and all the activities aiming at nurturing physical and psychic well-being, and responding to marked enhancement of the pleasurable and socialising values of sport activities. Consequently, a sport facility necessarily emerges as a chameleon-like venue daily hosting a variety of activities traditionally established within the post-modern city. A container with a highly competitive *mass-media* potential also due to the relevant position it occupies within the city and the resulting social demand.

Such potential comes across on different levels. The facility may become a sponsorship vehicle for multinational corporations, or more simply, emerge as a recognisable aggregation space in its territory by enhancing the identity of a culturally homogeneous district. The diversification of activities is

pursuable through a requirement program aimed at guaranteeing a constant operation of the facility and its accessibility all day and all year long.
Besides concurring remarkably to the regeneration of the physical and social surroundings of the building, such functional rhythms and articulation pursue the goal of reaching out to potential new users who can benefit from such differentiated accessibility. In other words, the facility becomes multi-functional and multi-time, in line with the modern usability trends in the emerging city.
Developing an economic performance as separated from the sport performance, and generating a new user base capable of interacting with the entertainment offer available in stadiums, means that in the future sport clubs will be able to manage their revenues independently from sport results and performances by investing in the promotion of service and real estate activities.
In line with their history, stadiums and sport infrastructures claim a specific role within society as they emerge as primary sites of urban centrality, effectively attracting users from different social and cultural groups in the name of a shared value – sport, or the fact of being part of a community – where technology and the architectural sign are at the service of an experience of cohesion and recognisability.
«From a cultural point of view, the aspect that most characterises a sport facility is the monumental role it plays within social imagination and therefore the social unconscious. Arenas and stadiums, like spas and swimming-pools, always represented and still represent a point of reference that far exceeds the mere functional program and pertains, instead, to the representation of the symbolic contents of the entire social and collective structure»[33]. Sport facilities are increasingly emerging as changing systems. Firstly, by allowing access to multiple sections of the building, it is possible to increase its flexibility – therefore its adaptation to every single event – and, secondly, extend and differentiate its lifecycle. The influence of communication technologies, and their impact on the concept of space-time relationship, have become primary elements in modern life.
Therefore, since the early twenty-first century, such facilities have changed their configuration, also due to the constant emphasis on electronic billboards, multi-media entertainment areas and different seating solutions for each kind of ticket. The evolution sport infrastructures have experienced over the last decade is closely related to the changes their related functions have undergone concurrently.
Such transformations are mainly related to the *spectacularisation* of the event and to the new marketing strategies that guide the intention to market a territory, a system, and the districts that define it[34].

Sport infrastructure – paradigm of a complex planning process

In brief: sport infrastructures are a challenging opportunity to experiment on and integrate the different functional, morphological and technological components that characterise architectural production in recent years.

The main variables of the concept-design-construction relationship converge in these buildings with a high degree of specificity on a two-fold ground – *exogenous*, in terms of relationship with the surrounding context, its connections, accessibility, integration with the existing conditions, values of environmental impact; *endogenous*, in the aspects of architectural, structural, functional, distribution, system nature of the design and building event.

Two main lines are recognisable in the recent history of *modern stadium* architecture. One is "the challenge" of the major engineering work that prevails over other architectural values through symbolic, building and contextual solutions of high technological, often self-referential, value, in part with a future-related approach. The other approach is rather focused on local concerns and aims at interacting with a productive world and a language rooted in their relative contexts, all while expressing its "systemic" potentials through large-scale networks and relations that pursue new centralities.

The requirement of flexibility, often constrained by existing regulatory frameworks, provides a perspective for an optimised use of large-scale facilities potentially capable of addressing multiple, both programmed and unplanned needs also and particularly of a public nature[35].

The sport infrastructure has always provided an outlet and a shelter in case of dramatic and unplanned events, such as the evacuation of population following natural disasters, the relocation of refugees or illegal immigrants, the requirement of large venues in case of exceptional events. Such issues require the architectural culture to reclaim such «large-scale technical object»[36] and turn it into a valuable opportunity of interaction between design and construction world, thereby rejecting a cultural position that simplistically relegates *sport architecture* to a mere event theatre.

«Besides addressing a technical problem, a sport facility must be, at the same time, accessible even in functional and perceptive terms, and interact with the cultural and physical features of the site. In other words, a sport facility is an architecture and, consequently, its design must address at the same time cultural and aesthetic concerns. The solution to this kind of problem can only be a rapprochement with the skills traditionally associated to engineering. Constructive innovation and formal evolution are only two aspects of the overall response to the problem of building a sport facility»[37], in the attempt of reconquering the theme of stadiums to the cause of architecture.

«In the common conscience, a stadium has, indeed, become a sort of fixed image. A little like a technical object, a tool or a bicycle, it apparently results

from simple, fixed and easily understandable inherent rules – capacity, distance, visibility, shape of the pitch and tracks. The rest is a matter pertaining the engineers who calculate, and often exhibit, structures, frames, powerful jumps, roofs as the only elements that allow the inventive abilities of design to emerge. The interiors similarly comprise spaces that merely provide the necessary service areas by exploiting the unfortunate triangular space underlying them. Such distributive and typological model can only offer few alternatives resulting in very few successful expressions within modern architecture – the stadium designed by Garnier in Lyon, Lindegrend's stadium in Helsinki, Nervi's stadium in Florence, and few other examples. The rest usually reflects a solid triumphalist professionality, often tinted with a governmental rhetoric but almost never with an architectural intention»[38].
Sport infrastructures provide a real opportunity for the architectural and urban planning discipline to address complex issues pertaining to tradition with the goal of reclaiming the meaning of architecture and bring it back at the centre of the collective need for transformation. At the same time, this would save architects from the danger of playing a role of "cultural organisers" rather than that of intellectuals devoted to the development of methods and tools inherent to their discipline.

Notes

The quotation at the beginning of the text is from Augé M., 1982, «Football. De l'histoire sociale à l'anthropologie religieuse» in Le Débat, n. 19, pp. 59-67.

1. This text is loosely based on Faroldi E., 2017, «Le infrastrutture culturali. Architetture e tecnologie emergenti per lo sviluppo territoriale», in Faroldi E., Allegri D., Chierici P., Vettori M.P., *Progettare uno stadio. Architetture e tecnologie per la costruzione e gestione del territorio*, Maggioli, Santarcangelo di Romagna, revised, extended and updated with reference to the evolution of the theoretical debate about this issue over the last few years.
2. «[...] By architecture of the city we mean two different things: first, the city seen as a gigantic manmade object, a work of engineering and architecture that is large and complex and growing over time; second, certain more limited but still crucial aspects of the city, namely urban artifacts, which like the city itself are characterized by their own history and thus by their own form» (Rossi A., 1982, *The Architecture of the City,* The MIT Press, Cambridge, Massachusetts, and London, England).
3. De Finetti G., 1933, *Stadi. Esempi, Tendenze, Progetti*, Milan.
4. «Stadium: *Lat*. stadium from the *Gr*. stàdion (...) Enclosure that combines broad space for athletic games and other exhibitions with large seating capacity for spectators. The name derives from the Greek unit of measurement, the stade, the distance covered in the original Greek footraces (about 600 feet [170 metres]). The course for the footrace in the ancient Olympic games at Olympia was exactly a stade in length, and the word for the unit of measurement became transferred first to the footrace and then to the place in which the race was run. The first Greek stadiums were long and narrow, in the shape of a U or a horseshoe. The design of the Greek stadium was taken over and improved upon by the Romans, who built two types of stadium: the circus and the amphitheatre» (https://www.britannica.com/technology/stadium#ref100143).
5. Approximately 177 metres in the Attic system and about 185 metres in the Alexandrine system. Such difference results from the different descriptions made by Polybius and Strabo.
6. The oldest known stadium is the Stadium of Olympia, in the western part of the Peloponnese in Greece, where the Olympic Games of antiquity were held from 776 BC.
7. The most famous among these games was the one practiced, ever since the early fifteenth century, in several cities in Tuscany. Particularly popular in Florence during the sixteenth and seventeenth centuries, it was called "Florentine kick game". Each team had 27 players, laid out on three lines, who fought for the ball with hands and feet, in order to get the ball into the opponents' goal. Unlike hurling, Florentine kick ball did not have rural origins – it originated in the urban areas of Italian cities among aristocrats. Its main features were the feudal-style detailed choreography and a chivalric code of values.
8. Played during the fifteenth century, it was originally a court game: two teams of three-four players exchanged the ball on a rectangular pitch divided by a string.
9. Because, as argued by the French intellectual Jean Jacques Rousseau, if the idea of festival was traditionally conceived as a blurring of the separation between actors and spectators, now it translated in the idea and in the practice of public powers. The ball game effectively projected the recreational activity as an event that overcame social inequalities, so that some lower classes could compete on an equal footing with their masters.
10. The *sferisterio* (from the Latin *sphaeristerium*, in turn from the Greek σφαιριστήριον, *sphairisterion*) or *sferodromo* (from the Greek σφαος, *sferos*, ball, and δρόμος, *dromos*, run) is a sport facility devoted to various ball games apart from football. In many countries where ball games are played, the definitions of *sferisterio* change but the meaning of the term always describes the venue devoted to such games.
11. Before and after the matches, there were equestrian shows, launches of hot air balloons, raffles and lotteries, opera recitals and circus performances. There were often political upheavals, like in Rimini, on September 1845, when half the population gathered in the *sferisterio* in order to conspire against the government – a fact that testifies to the social importance of this venue, selected for its high capacity.
12. The decline started in the late nineteenth century, when the growing popularity of cycling certainly helped divert football fans' interest towards this sport.
13. Football originated in England, at first as a game practiced by aristocrats. Its popularity,

though, emerged during the Victorian era, when the sport was advertised as conducive to social health and solidarity.

14. Frank B. Lowe, a designer with the London branch of the HOK Sport design practice, divided modern stadiums into three categories. See Nixdorf S., 2005, «The Composition of Stadiums. Between Multifunctionality and Reduction», in *Detail*, n. 9, pp. 916-925.

15. «Sheffield United, for example, was established by a group of craftsmen, knife makers who worked in small workshops in Sheffield, an origin that reflects their nickname, "The Blades"; West Ham United was established by a group of workers at the Thames Iron Works and the Manchester United by workers at the Lancashire and Yorkshire railways» (Taylor I., 1971, «"Football Mad". A Speculative Sociology of Soccer Hooliganism», in Dunning E., *The Sociology of Sport*, Cass, London).

16. Even the professional figure of the football player was traditionally considered as "working-class". The player was classified as a manual labourer who used his feet as working tool. Lanfranchi P., 1998, «I Calciatori e il People's Game», in De Biasi R., ed., *You'll Never Walk Alone. Il Mito del Tifo Inglese*, ShaKe, Milan.

17. The reconstruction of the Panathenaic Stadium of Athens for the first modern Olympic Games of 1896 would strengthen such trend during the following decades; see De Finetti G., 1933, *Stadi. Esempi, Tendenze, Progetti*, Milan.

18. Del Fante L., 1988, «Lo stadio Comunale di Firenze di Pier Luigi Nervi», in Aa.Vv., *Tre architetture degli anni Trenta a Firenze*, Fondazione Callisto Pontello, Florence.

19. Designed by the engineer Costanzini and by the architect Giulio Ulisse Arata, the stadium, featuring a clearly Fascist image but a style inspired to Imperial Rome, differed from previous designs in that it was a multifunctional facility built in the suburbs with a football pitch surrounded by a six-lane running track. Surrounded by two swimming pools and four tennis courts, it was an actual *sport citadel*.

20. Up until that the time, Genoa was one of the few Italian cities with a football stadium, built in 1911.

21. Koenig G.K., 1968, *Architettura in Toscana 1931-1968*, Florence.

22. Giulio Ulisse Arata wrote this statement for the presentation of his project for the new stadium of Rome in Arata G.U., 1942, *Costruzioni e progetti; con alcune note sull'urbanistica e sulla conservazione dei monumenti*, Milan, p. XVI. Besides the Maratona Tower of the stadium in Bologna, completed in 1928, and the Stadium of the One Thousand (the nickname of the new stadium of Rome) in 1932, Arata also worked for the Ansaldo company at the project for a covered stadium in the early 1940s, a sort of circular building with a metal and glass frame featuring a markedly modernist style.

23. In Italy, there was a cultural change: after a period entirely dominated by private initiative, there was an important phenomenon of municipalisation of stadiums. In 1930, there were as many as 2,405 sport grounds built and managed by city administrations: the 100x60 pitches were up to FIFA standards and adequate to host international competitions. Some of the main Italian stadiums, still operating today, although modernised, date back to that period: Arena Garibaldi in Pisa, 1929; Giovanni Berta in Florence, 1932; La Favorita in Palermo, 1932; Littorio in Trieste, 1932; Benito Mussolini in Turin, 1933; Cibali in Catania, 1935; Menti in Vicenza, 1937; the stadium in via Vesuvio in Naples, 1930.

24. Rome 1960, Tokyo 1964, Mexico City 1968.

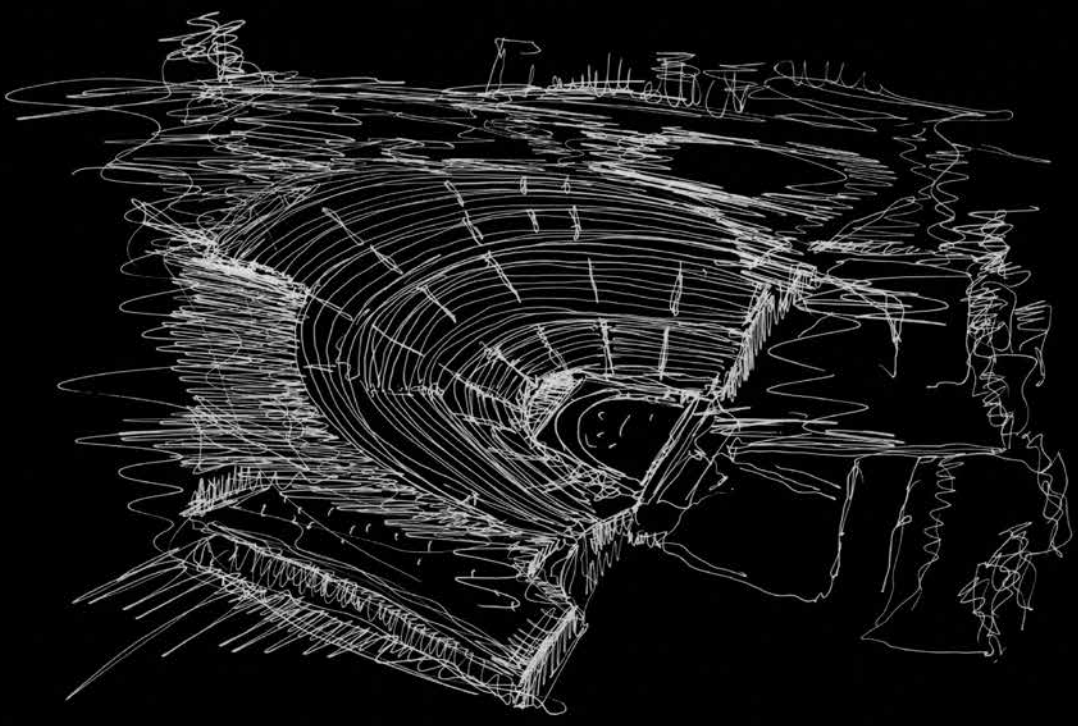
25. The construction of stadiums, one of the most explicit manifestations of the close connection between aesthetics and structure, reflects the paradigmatic expression of Nervi's poetics. An engineer and builder, Pier Luigi Nervi designed and built several sport facilities. Besides the Giovanni Berta later Artemio Franchi Stadium in Florence (1929-1932, expanded by Nervi himself in 1951) and the Flaminio Stadium in Rome (built between 1957 and 1959 for the 1960 Olympic Games), the Nervi archive holds documents for six more projects in Italy (a project for the stands of a stadium for100,000 spectators in Rome, 1935; the project for the Palme Stadium at the Favorita in Palermo, 1954; the Taormina stadium, built between 1955 and 1959; the expansion of the National Stadium in Rome, built between 1956 and 1958; the project for the reinforced concrete stands of the sports ground in Cuneo and the project for the contract competition for the construction of the city stadium of Salerno), as well as four projects abroad (the vaulted field house for the Dartmouth College in Hanover, New Hampshire, 1960-1961; a project for the Swindon Stadium, UK, 1963; a project for a 150,000 seats stadium in Rio de

Janeiro, 1964, and a project for an entirely covered stadium at the Kuwait Sport Centre, 1968).
26. During the 1960s, Riccardo Morandi also designed two sport facilities: a 100,000 seats stadium for the Citadel of Sports in Teheran (with A. Zavitteri) and a proposal for the Olympic Stadium in Munich.
27. Nervi's architecture, based on the aesthetics of structures and developed according to calculation diagrams, clearly emerges here too – from the solutions adopted for the Stadium of Florence in 1930, to the studies for the Great Stadium of Rome in 1935, to the Stadium of Taormina in 1956. All of these designs feature different solutions also dictated by the different conditions Nervi had to address. However, in spite of the differences typical of each disciplinary field, a constant element clearly recurs in all his stadium projects: the pursuit of a combination between aesthetic sensibility and statics. In these "essential" works, this combination is all the more evident. We find it in the helicoidal stairs of the Florence stadium, in the canopy of the Flaminio stadium in Rome, in the studies for the 100,000 seats stadium when Nervi designed the second level of the overhanging stands, or again in the vault of the field house for the Dartmouth College. Another factor, less evident but still recurring in these works, is the constant study for structural prefabrication, which allowed for a faster and less expensive construction of structural solutions than the traditional building procedure. At the same time, they express a constant innovation in Pier Luigi Nervi's design and building activity.
28. At the end of his brief career, Giuseppe Terragni (1904-1943) worked at the project for a partially covered stadium (attributed to Enrico Mantero from 1941): the few drawings (5 sketches on paper) show a careful approach to integration and orientation as well as some hints at building solutions for the partial roof. See Mantero E., 1983, *Giuseppe Terragni e la città del razionalismo italiano*, Dedalo, Bari, pp. 212-213.
29. Viganò's proposal for the introduction of technological and perceptive innovation and for a more cultivated participation emerged from the Department of Design of the Faculty of Architecture of Politecnico di Milano (Professors Vittoriano Viganò, Valsecchi, Mascazzini, Occhini, Palavezzati). «[...] However, what is required in such a context of deficiency, which is all the more evident given the equally evident potential offered by game and popularity? What is required is a study that, precisely by exploring such data and potential, opens to a more evocative and even more structurally innovative football design in figurative and spatial terms. [...] Is this a theme for architecture? It certainly is because, with all its particularity, it implies an intent, requires a critical approach, introduces unexpected and plausible proposals for renewal and improvement through an aesthetic contribution. In other words, it is a solid prerequisite for an experience of imagination and graphic restitution». (Viganò V., 1988, «Un Disegno per il goal. Progetti e avventure creative per un gioco del calcio più...», in *T-SPORT*, n. 8-9, August-September, pp. 581-595).
30. Ten of the twelve stadiums involved in the 1990 World Cup were existing facilities modernised for the occasion.
31. Faroldi E., 2016, «Un luogo chiamato stadio», in Marchesi A., *Un luogo chiamato stadio. I teatri dello sport tra divertimento, aspetti sociali, tecnologia e business*, Maggioli, Santarcangelo di Romagna, p. 36.
32. Magnier A., Russo P., *Sociologia dei sistemi urbani*, Mulino, Bologna, 2002, p. 235.
33. Nardi G., 1990, «La tecnica nell'architettura per lo sport: note intorno all'auspicata fine di un culto monumentale», in Aa.Vv., *Impianti sportivi. Parchi e giardini*, Electa, Milan, p. 53.
34. «*Territorial marketing* is an expression that may have at least three different meanings – promotion of a territory, and its characters and perspectives [...]; finalisation of territorial and urban policies [...]; overall organisation of administrative procedures based on a tighter focus on the clients of the local system product» (Schiaffonati F. et al., 2005, *Marketing Territoriale. Piano, azioni e progetti nel contesto mantovano*, Clup, Milan, p. 17).
35. On this issue, see the research conducted by Sonja Dümpelmann on how sport facilities have changed and shaped the form of natural and urban landscapes and how, conversely, technological and urban evolution has changed sport facilities. Dümpelmann S., 2018, «Big sport for big landscape», in *Topscape Il progetto del paesaggio contemporaneo*, n. 31, pp. 49-53.
36. Gregotti V., 1990, *Cinque Dialoghi necessari*, Quaderni di Lotus, Electa, Milan, p. 7.
37. Campioli A., 1990, «L'innovazione tecnica nella costruzione degli impianti sportivi», in Aa.Vv., *Impianti sportivi. Parchi e giardini*, Electa, Milan, p. 67.
38. Gregotti, 1990, *op. cit.*, p. 27.

The Social Role of Sport

Historical evolution of sport installations between marketing and communication

by Roberto Ghiretti



The social, civil and economic relevance sport has achieved is such that, today, approaching this world as a professional entails acquiring skills from different disciplinary fields. In our society, what generally goes under the name of "sport practice" implies a fundamental element of shared values and socio-cultural interrelation for each community.
In turn, this means that discussing sport requires a considerably wider perspective in order to include social, educational, economic, health-related, as well as marketing and communication issues. For the same reason, a sport facility has now ceased to be a mere container of activities and has rather emerged as the venue where all of these issues may find a full expression and a very important bet may be won for the entire country.

Origins

For a long time, sport has been considered as a mere spectacular event for a limited group of fans revolving on the display of muscular prowess (physical ability)[1]. Until the 1960s-1970s, sport was an almost exclusively male activity. During that period, there was virtually neither a social policy for sport, nor the most basic provision of so-called district gyms (except for the G.I.L. or former G.I.L. installations)1. The requirement to provide "containers" specifically designed and built for the different sport practices – originally called *performance gyms* rather than "sport palaces" – has slowly and gradually emerged only since the mid-1970s. A turnaround occurred when Sport e Salute Spa (formerly CONI Servizi Spa)[2], with support from Istituto per Credito Sportivo and revenues from the Totocalcio football lottery, started to invest in new facilities for sport and leisure extensively built across the entire country. The first Giochi della Gioventù (Youth Games) were organised in the late 1960s as a political and social initiative that would make sport practice attractive for millions of young people. Such positive trend of propagation of sport as a recreational and amateur activity has continued and grown exponentially since the 1980s. Sport/leisure, sport/entertainment, sport/wellness, etc. are all facets of the same phenomenon – extraordinarily important social and cultural dynamics in the growth and emergence of a *healthy* and *virtuous* idea of the contemporary society. More or less directly, these dynamics generate strategic (political and urban planning) policies for the organisation and planning of the facilities devoted to such practices. These activities revolve around the more general (and universally recognised, regardless of ethnic origin, culture and geographic location) theme of psycho-physical wellbeing and of a better relationship with the environment around us. These are extraordinarily important and all-embracing issues in today's evolved society where *leisure* is more and more relevant both in terms of the time an average Western resident devotes to such practices during a normal day and

of the definition of new consumption trends. When leisure ties in with well-being, sport – along with nutrition – obviously represents the first and most strategic element subject to consideration, study and monitoring.

A new view of sport

A new scenario finally opened recently, due to a new view of sport the collectivity has developed as something more than a performance or a display of physical prowess. Indeed, when we observe the current reality carefully, besides the obvious competitive component, sport practice has benefitted from a cultural revaluation, and achieved an unprecedented consideration. Sport has become highly important for the entire civil society, and has emerged as a strategic asset for the development of new social policies aimed at the growth and improvement of the territory and the population that lives and works there. The sport policies implemented by Cities and Regions in order to encourage underprivileged boys and girls to embrace sport practice, or the use of sport and its events in order to rehabilitate the suburbs or decommissioned areas of large cities are two good examples of such approach. In a slightly wider perspective, sport activity clearly appears as a fundamental element in the development of tourist and territorial marketing plans or as an environmental and sustainable mobility issue (cycle tracks, for example, obviously support a sport activity). Last but not least, there is the impact physical activity has on the wellbeing of citizens. In some Italian regions (inspired by the good practices of Northern European countries), sport activity is now normally prescribed to patients just like a drug or a medicinal product for its benefits in physical, relational and psychological terms. With reference to this new consideration, it should be noted that an increasing number of subjects try to analyse the social and economic impact of physical activity. Most recently, a research conducted by London Sport shows how every £1.00 invested in physical activity in London creates £1.48 of social value.

The new value of sport originally emerged in the White Paper on Sport the European Commission published in 2007, which defines sport as a most relevant activity in cultural and social terms: «Sport includes all forms of physical activity which, through casual or organised participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels»[3]. Such definition offers some interesting insights.

A new concept of sport practice emerges. Indeed, sport activity may be either *organised* or *unstructured*. The former term includes all the practices that, either competitively or not, imply organised games (referee, regular field, team, match, calendar, etc.). Unstructured activity (about which more

to come later on), which has been constantly and markedly increasing over the last few years, instead, requires no organisation as it relies exclusively on the individual's temporary will (times, ways, company and place). This means that even sport facilities should adapt to such new trends in order to enable both types of practice through multi-functional layouts. The second part of the definition mentions, instead, *physical fitness and mental well-being, social relationships* and *results in competition at all levels*. In this historical age, even the concept and way of practicing sport have changed with remarkable impacts on the quality of life, the political and economic situation of a country, and on education and health. Sport plays a core and strategic role in a variety of realms – from social responsibility to well-being[4] and quality of life; from cultural tourism to innovation applied to nutrition, volunteering, employment in a constantly evolving and expanding sector.

Sport as an educational tool

One of the most meaningful values of sport is certainly its educational aspect. Thanks to its "transversal access" and success in reaching out to multiple subjects, sport becomes a key social connector, and an extraordinarily important pedagogical and educational tool in the evolution of a civil society. It is an actual *cultural generator* in that it makes no distinction of ethnic group, religion, language, and age. Sport is a formidable container and generator of passions and emotions. It brings people together and encourages them to share by creating emulation drives – in other words, an extraordinarily powerful tool also on a communication level.

For these reasons, sport can and must be used by public institutions in order to develop social programs and policies that encourage territorial growth and development by relying on physical activity. Which is why it is necessary to maximise the potential educational value resulting from sport in general. Sport practice encourages young people to grow in a healthy environment based on clear and certain values. By learning team and fair play and the respect for rules and opponents, they will become well-balanced adults in both physical and relational terms. The sport environment is often one of the social realms, besides school, where kids spend most their leisure. For this reason, sport associations must take a primarily educational responsibility because, along with families and school, they play a key role in the training of young people.

Therefore, both society and families should be mutually aware of their role through a coordination that should not be temporary, and rather aim at the development of an actual *educational pact*, by subscribing a shared project proposed by society for the human and sport growth of kids. Such relationship between associations and the families of athletes is, instead,

non-existent, as the former are unable to integrate and involve families, while the latter tend to consider the associations as a sort of *baby parking*. Therefore, improving the model of sport companies seems fundamental in order to find rules that may be shared and used for mutual benefit[5].

In this sense, sport facilities and gyms symbolically become also *schools of life*; the individual figures in sport (such as the trainer, the captain, etc.) can be found in everyday life, similarly to the situations encountered in sport life (such as the retreat, the away game, the win, the injury, the defeat, etc.). A prime example of the positive impact sport values have on the education of young people results from the following data – 95% of kids who practice a sport fail to be involved in bullying, as they understand and share a behavioural code within precise value rules. In this sense, the trainer's role also takes a new and relevant value because how he/she creates and guides the group reflects on the athlete's choices and behaviours. The trainer is a sort of leader for the group – someone the kids usually listen to and rely on for advice even on issues they confront outside the playing field. Therefore, the priority for a sport club should not be having the best trainer on the market but rather having the right trainer at the right place. A sport club should not pursue a trainer whose sole goal is winning at any cost – on the contrary, it should look for a person who can put the educational growth of kids before results, being aware that the development of a "good human" value may inherently generate a "good player".

Sport clubs

These considerations make it clear how all-embracing sport is within the more general issue of *welfare*, as it is a fundamental asset for the development of successful social policies[6]. The sport club is a primary subject that more than others can effectively optimise the value of sport as well as successfully interact with its surrounding context. Indeed, the sport club occupies a central role within communities in the territorial system of relations that involve public institutions, private companies, different segments of socially active subjects. The ability to interact with all the main territorial players is the real strength of a sport organisation that, in this way, can generate a culturally virtuous circle. The mix of technical skills and socially positive human relations, along with the adoption of adequate communication strategies, are the winning cards the club has at its disposal to obtain a positive response from its context. Such positive response promotes a firmer territorial rooting, a fundamental premise for the activation of more profitable relations and for the development of more efficient marketing strategies, for example to define adequate sale products (sponsoring contracts) and to obtain a self-enhancement/funding of its own activity, which represents

the last segment of this virtuous circle. Obviously, there are different kinds of clubs that, quite simply, may be categorised as follows: professional clubs and non-professional clubs mainly operating for aggregation purposes.
Not all of these clubs have the strength, ability or interest to activate growth mechanisms. However, it is clear that an increasing portion of such clubs is striving to become fully-blown *social businesses*, as such able to manage family policies, multi-functional facilities, and to organise exceptional events at all the territorial levels[7]. Unfortunately, given the multiple activities and initiatives sport clubs may generate in order to create rooting and consensus, the threshold of perception and assessment of the sport performance is still currently too important, with a 90-95% impact at all levels (for example, when a team loses a match, it is considered as a loser; fans continue to support the team but the club loses a good deal of its credibility). In the United States, this percentage is as low as 60%, and I believe that an adequate work on the community of reference may lead to a decrease of such threshold of perception in Europe too, so that sport performance does not impact on the actual perception of the work a certain sport club develops.
Therefore, the fact that sport has acquired a strategic role in the life and planning of our society is quite clear. Such role may become even more important once sport clubs and their managers become aware of such relevance and of the impact their activity may have in the implementation of a new model of territorial policy.

A new phenomenon – unstructured sport

One of the key transformations that affected the sport world over the last few years is the emergence and development of unstructured sport activities, particularly due to new technological and communication devices that mainly resulted in an increased withdrawal and individualism. This, combined with the waning ability of traditional aggregation hubs (political parties, parishes with their social centres, even sport associations and/or recreational centres) to attract social gatherings, has deeply affected even sport practice.
A new approach to physical activity, unrelated to any network or association, has emerged from such conditions. The idea is precisely that sport may be practiced in whatever conditions an individual finds most appropriate. Whenever I want, wherever I want, with whomever I want and, most importantly, however I want. This is *unstructured sport*, in other words sport practiced outside the rules and specialised facilities, which is on the rise across our country. While the passion and interest for sport grows, the number of members of sport associations decreases. It might seem a paradox but this is actually a grassroots sport offer, generated by the very practitioners who

cannot find adequate solutions for the new logics imposed by society.
The awareness that the individual is at the centre of sport activity and able to choose the kind of practice he/she prefers has actually triggered the emergence of new sport disciplines. In this process, easy communication had a fundamental impact, as it helped to propagate in a fast and interactive way the development of sport disciplines or practices that, until then, had been limited to certain geographic areas or to not particularly large groups. While the list of such disciplines would be quite long, there are certain new sports that, although only recently discovered in Italy, already attract a very large number of practitioners. New sports (or rather new ways of practicing physical activity) that exist well outside the boundaries of structured activity (facilities, rules, events) but, at the same time, are on the rise and attract new fans every day. A recent research conducted in the US has demonstrated how *Generation Z* (the next generation after the Millennials, with the mid- to late 1990s as birth years) shows an approach to and consideration of sport quite different from the previous generations. Besides "viewing" non-traditional sports as more creative, young and innovative, the majority of these young people considers them as more relevant for people of their age, and practice them more frequently than traditional sports.
Sport is a free and independent practice now more widespread than organised sport, and projected towards a daily lifestyle that can capture a multiplicity of users.

The role of marketing

The transformations that affected the sport world did not alter its essence – the ability to excite and thrill those who experience it (players, practitioners, managers, experts). An ability to reach directly both the head and the heart in a way that makes it a unique tool in the world of personal services. An unfailingly strategic tool in the marketing and communication vision of companies and public institutions. While, until a few decades ago, the sport-marketing connection translated into nothing more than the display of advertising bans or brands on athletes' jerseys, now this connection has become much stronger and closer and aims at reaching the emotional level rather than mere visibility.
Sport marketing can be defined as the approach a sport company implements in its daily management. In this age, the definition and actual meaning of *sport marketing* – which, as underlined before, concerns the *entire life* of a club – has been misinterpreted and often fragmented in a way that exclusively projects it within speculative commercial areas such as the pursuit of sponsorship. While this is certainly part of the larger world of marketing, it is precisely this – a mere part.

Marketing reflects a general approach, in turn conveying an orientation that guides all the strategies of the sport club – from the relations with its direct interlocutors (families and members) to its fans, spectators and readers in order to define customised packages for members/fans/customers. This kind of approach is also defined as *legacy*[8], or the ability to create a positive heritage in terms of values to the young people who will be the adults of the future in its surrounding context. A successful marketing strategy must develop wide-impact initiatives designed to promote activities by tapping into the right resources. The success of an event is not measured on the mere relevance of participants but on the number and satisfaction of those participants[9].
Companies use the emotions sport can generate in its spectators in order to convey their message as not related to a product and its features but to the company's or the product's own values and to their connection and closeness to the value of sport or of the team the company works with. Therefore, sport is used for its ability to communicate with people by reaching their deepest passions and emotions. For this reason, its communication modes (from technical expression to proverbial phrases) have now become of common use – the attempt is getting closer to the sport world. One example is the use of the expression "zona Cesarini" in the common language, meaning "to get down to the wire", or reaching a goal at the very last minute. Another example is "andare KO", meaning a knockout experienced in any kind of situation. People use such expressions in daily life even without knowing who Cesarini was or that KO is a boxing term.

Sport and sport facilities

Sport is a constantly evolving challenge. We live in an age when technology and communication change on a daily basis, and new habits and renewed requirements change the lifestyle of the entire population due to the introduction of devices designed to improve the quality of services.
In this scenario, there is reason to question how the sport world is reacting to such changes and how the physical-sport activity may and must adapt to such social evolution.
Such aptitude to change aimed at adapt to the new transformations in daily life requires two different subjects – on one side, the provider of sport services (Association, sport club, Federation and/or Promotion Body), which must be able to improve its sport offer by adapting to new age groups, new timetables and renewed ways of practicing sport. On the other side, the either public or private operators who manage and/or own sport facilities must recognise the need to change in order to build a synergic network that can successfully promote the growth of the entire territory.
Change can only happen within this two – fold perspective – it would be

unthinkable for a *sportmaker* to develop new strategies without a facility that can adequately host them.
Likewise, a modern and multi-functional facility would be useless if sport clubs or associations were unable to exploit its potentials fully. Such change and an increasing synergy between sport world and public world appears increasingly urgent and stringent.
The constant growth of unstructured sport is one clear example of such necessity. Another example is the development of sport for disabled people, facilitated by the creation and development of projects and itineraries – promoted also with the support of private subjects – designed to promote Paralympic sport and the benefits sport can offer to differently able subjects. However, should such projects become a desirable reality, are we certain that existing facilities are adequately equipped to host such sport practices? Such reasonable questions result from a prerequisite – are the sport world and public administration aware of the real needs of citizens (be they sport, economic or promotional needs)? Given the fast evolution of our society, are we certain these subjects are able to understand such changes and, therefore, able to operate in order to provide a timely response?
Based on the answers, it is possible to delineate a direction for the sport-sport facilities combination. A reliable analysis on this issue should start from some elements we try to summarise.
A first point of reflection about new facilities is the analysis of the reference context – are we aware of the primary requirements of the territory? Are we able to understand which sport disciplines are more "neglected" in our territory and would require new spaces and/or facilities in terms of numbers and requirements? This kind of analysis is too often neglected, either due to an underestimation of the sport innovations emerging in the web or coming from abroad, or to a mistaken and obsolete view that considers a sport facility as the home of classic disciplines.
Indeed, when we discuss sport facilities, we tend to think about gyms, football fields or tennis pitches, swimming pools or other facilities designed to host indoor sport disciplines.
Social and technological change and the new lifestyle of the population require more than those traditional facilities. The city itself – its parks, roads and streets – may become a sport facility in its own right.
So, are we ready to address the requirements of the territory by using existing facilities and providing a new and modern response to the sport demand expressed in the contemporary age? Are we equipped to offer a solution to the lack of sport offer (be it due to an absence of sport facilities or to the presence of facilities that are either too small or too big for the current market)? Are we ready to build toilets and lockers in the parks of our cities in order to create "outdoor" gyms?

The second question certainly concerns the social and value aspect that sport and physical activity inherently carry, which must be enhanced and promoted on the entire local context. In this sense, sport facilities should represent the practical expression of such aspect – it is desirable and necessary that the sport facility becomes a meeting point for the community, a tool for the propagation of sociality that allows the public administration to use it not just as a venue for sport offer but also as a place of gathering and development of social policies activated through sport.
While the facility should represent a point of reference for the local community, it is equally important to establish a ground for consultation and dialogue with the community itself so that the facility may be viewed as a driving force for the growth of the entire social context. Today, "consumers" have an extraordinary power in the choice and development of services (be they restoration, hospitality or product services). Therefore, it is important that even in the realm of sport practice, and particularly for territorial-scale facilities, consumers may have a say and be involved in all the concept and implementation phases.
The third question concerns the reference framework (be it the city, district or province), or the possibility, for the appointed subjects, to use sport as a tool for the rehabilitation and regeneration of decommissioned or blighted areas with the aim of promoting their rebirth thanks to the presence of young people and athletes.
In our cities, there are too often abandoned or decommissioned buildings, facilities or sites that imply a cost for the community and become breeding grounds for crime and degradation. Sport may be a tool for public administrations and offer its professional skills and know-how for the modernisation of such facilities, which could be adapted for either collective or individual physical activity. There is an increasing number of examples, at the national and international level, of local situations that found a new life through sport or of private subjects who decided to offer new sport facilities to their communities thereby obtaining remarkable results in terms of visibility and social responsibility.
The underlining principle of such achievements is always the will to establish a dialogue, and to create a cooperation between two worlds (sport and institutions) that have much to offer to their communities.
Although illustrated briefly, these three issues must represent the foundations for the construction and planning of any strategy associated with sport facilities.
We should restart from the ground, listen to local communities, study the new disciplines now flourishing – only in this way, we will be able to provide adequate and modern answers.

Some international examples

The following case studies have an absolute international relevance and may be considered as positive models.

Located in Innsbruck, Austria, *Innsbruck InnMotion*[10] is a 158km long network developed within the city and in some suburban areas with several jogging trails of varying length. Its website contains all the information about routes, medical and sport advice, and how to approach the trails. Along the perfectly traced routes there are several refreshment posts and playing grounds where it is possible to experiment several sport disciplines (such as ice skating and five-a-side football). The entire project relies on precise environmental sustainability parameters in order to encourage a high awareness level in users, among other things.

In Dorset, England, the local government activated the *Outdoor Education Service*[11], a project based on the use of some centres where students may practice outdoor activities in *productive* contexts for their school education. They may practice rowing and other water sports along the Jurassic Coast, a site for the study of prehistoric species. Or they may practice cross-country race in archeological sites, and experience orienteering and other outdoor activities in the Wareham Forest, an ideal site for environmental studies and outdoor activities. The project was activated for the 2012 London Olympic Games in order to combine sport practice with sites with high cultural and educational value.

The City of Miami, Florida, organises an *After School Program*[12] – a safe space where kids can practice physical and sport activities under the guidance of experience instructors. Every afternoon, kids aged between 7 and 13 can visit several parks indicated on a website where they can attend a number of programs based on their specific interests. Each park offers a different sport discipline – the program is highly successful due to its widespread diffusion and high level of customisation.

Other sport-based examples in Europe and across the world are organised within specialised facilities, often developed in readapted buildings. In Koprivnika, Croatia, the new *Gymnasium 46º09'N-16º50E* school complex, designed by Studio UP[13], promotes a high integration between sport and education in an area located at the fringe of two districts featuring different programs and urban morphology – an industrial area and a London-style residential suburb. Here, the architectural project has a marked political and cultural connotation as its spaces use education and particularly sport to encourage integration and interaction between different social groups. Besides the cooperation between public and private subjects in the construction of the school and sport complex of Koprivnica, the project relied on the idea of creating an architectural system designed to embrace two complementary urban sectors.

Hybrid facilities are complementary with the idea of public-private partnership as the hybrid complex is leased and managed independently from the just established institutions. Studio UP deliberately used the hybridisation of the sport and education complex with other services as basic elements for the organisation of the entire building. The spatial and visual superposition of programs and the synergy of their use are the building's key operational principle. In the project report presented for the competition, Studio UP elaborated on the conceptual dualities that define the plot of land (a tabula rasa) in the perimeter of Koprivnica. They established a particular relationship between the section of land looking towards the city and the one looking towards the residential district. The designers use such dualities in their expressive vocabulary – black and green, solid and void, cold and hot, spiritual and physical. This opposition of force lines is precisely what defines the final result – one enigmatic and compact volume, which combines school and sport complex through intricate spatial relations, in turn contrasting with the flat landscape.

In Beijing, the *Olympic Green Convention Center*, built for the 2008 Olympic Games, is a facility devoted to fencing, and the shooting and fencing competitions of modern pentathlon. In addition, it operates as international broadcasting and press centre (during meetings and exhibitions).

Once the Olympic Games were over, the 270,000sqm facility was partially redesigned[14] into a multi-functional meeting and conference centre. The adaptation project particularly worked on the issues of energy sustainability and containment of management costs[15].

Some examples in Italy

Unlike Europe and the rest of the world, Italy is a country where a whole range of so-called "minor" sports lack adequate facilities. The main reason for such inconvenience is the fact that such sports are mostly neglected by the media and, as a result, are less attractive than others for potential sponsors. Obviously, this situation translated into less resources for the construction of facilities devoted to these sport disciplines. In spite of their quality, they are not affected by certain "careerism"– or "performance"– oriented attitudes. Being less contaminated, they come across as more genuine and valuable in terms of youth education. This said, there are some interesting programs in our country. One of these is in Bologna where a valuable initiative called "Un chilometro di salute" ["One kilometre of health"] was promoted by "UISP". The initiative, implemented in several parks of the area around Bologna, is a test for the calculation of step speed in terms of health, or the speed advised for each individual for one kilometre of brisk, slow or combined brisk-slow walking. The goal is the activation of homogeneous

walking groups adopting different step speeds (an evolution of exercise trails), so that each individual may practice physical activity at the right pace and in tune with his/her habits. Two more noteworthy programs – designed by the Bologna-based firm Teco+ – are the rehabilitation of the Dozza Sport Centre in Bologna, and the redesign of a sport centre in Carugate near Milan. Located within an extensive park, the Dozza Sport Centre is one of the main multi-purpose sport facilities in Bologna. It is mainly devoted to football, with three football pitches and one seven-a-side artificial turf football pitch. Additional areas are now available for both unstructured sport practices and for other activities not related to sport required by the local community. The centre includes several kinds of equipped spaces for a variety of sport activities – a skate park, an (indoor and outdoor) archery court, a cricket court, a basketball playground, an ice skating and/or rollerblading rink, car models track, gym/physical activity room, multi-purpose halls, refreshment post, playground, paintball field, bowls court. The site of the Dozza Centre is a typical outer-urban area between the established and dense fabric of the city and the first countryside and semi-natural areas beyond the ring road belt. The project exploited such location and its potential for recreational-sport activities by optimising its connections with the city through a soft mobility system based on a network of new cycle-pedestrian paths connecting the site with the central urban areas and other adjoining facilities. A redesign and adaptation of the existing buildings to recreational, educational and restoration purposes allowed for their enhancement and rehabilitation. This two-fold plan (enhancement and diversification of existing sport programs) translates in a decrease of the area devoted to traditional sport activities, as well as in their rehabilitation in order to provide high-level structures and related services.

The project for the Carugate sport centre demolished the existing swimming pool and replaced it with a new building based on the "Swim, Run, Bike" principle prescribed by the World Health Organisation. The plan mainly focuses on facilities where physical exercise combines with well-being and health. The idea is promoting activities that may improve functional abilities without straining the health of practitioners, in order to encourage an active lifestyle based on daily physical exercise. The facility includes an indoor swimming-pool (water gym); an outdoor swimming-pool (for summer use); an ecological gym (multi-purpose gym).

The case history of Palazzo Wanny

The new Palasport in Florence, to be completed in 2020, is certainly a positive example in the Italian context. Palazzo Wanny – named after the patron who is developing the project – clearly exemplifies the possibility of

developing a facility designed to cater to the sport and social requirements of a city like Florence. As a large palace, similar to many other architectural landmarks in this area, Palazzo Wanny is designed to fit in the cultural history of the city. Wanny Di Filippo is a Florentine businessman and the patron of the Azzurra Volley Firenze club (a women's volleyball team playing in the A1 Series). Due to the difficulty of finding adequate facilities for the team's training activity and matches, he decided to build a new sport palace as a remarkable contribution to the city.

The new sport hall will be the "home" of the Azzurra team as well as of other competitive teams. At the same time, it will offer the surrounding district and the city at large a wide and diversified range of activities including sport events, shows, social gatherings and aggregation venues. The facility – a daily gathering spot for people of every age group with diversified interests – will be located in the San Bartolo district in Cintoia, in the western sector of Florence. As such, it will jointly address the requirement for sport facilities and the need for new development in the north-west sector of the city.

PalaWanny is a modern facility – a sport hall with a medium, flexible capacity between 2,000 and 5,000 spectators, and a multi-functional program designed to cater to currently unsatisfied needs. At the same time, it will be a gathering venue for the entire citizenship due to its particular architectural layout.

The idea is having several fully operating buildings designed to create an urban space fully integrated in the San Bartolo Sport Park in Cintoia, which will be the new *agora* the large indoor square of the Palazzo's foyer will look onto. With its three buildings, Palazzo Wanny will be a unique facility rather than a traditional sports hall. A multi-functional facility used for training and including gym, lockers, fitness and wellness areas, offices and conference hall. The sports hall, which will host major indoor sport events such as volleyball, basketball, boxing, gymnastics matches among others. And the Foyer adjoining the Sport Palace, and including refreshment area, conference hall and press room. The three buildings will coexist as fully independent facilities and offer users programs well beyond mere sport activities in order to create synergies with the local context and become a reference venue for sport, recreation and public service during the entire week.

This facility addressed the requirement of providing a new "home" to the Florence-based volleyball club and, as a consequence, to the entire local context. As such, it successfully captured the requirement to rehabilitate an entire suburb of the city by turning it into a point of reference and an aggregation hub for the citizenship through a wide offer of sport and social events.

Final considerations

It is quite clear that a sport facility should be able to comply with three key criteria – (environmental, economic, energy and social) sustainability; functionality (an adequate ability to accommodate practitioners and spectators); beauty (in both architectural and structural terms). A sport facility should enable its users to practice their sport activity in the best possible way, i.e. by providing high comfort standards and competitive economic, environmental and energy sustainability levels.

Over recent decades, sport centres in Italy have often reflected a sort of "cathedral in the desert" syndrome, with all the implications one might imagine. Otherwise, the construction of sport centres has often resulted in inflexible facilities clad in metal shells that make any new reuse or adaptation virtually impossible. New design paradigms should, instead, pursue multi-functional, flexible, adaptable models, allowing for a fast reassembling in case of different use, and the possibility to host several activities at once so as to address the requirements for facilities operating seven days a week and 24 hours a day. Since the beginning of the concept phase, designers should work with experienced experts specialised in this kind of facilities and fully aware of sport and its dynamics. Integrated thinking and designing with the needs of sport users in mind are fundamental aspects in order to provide all customers with a venue they may use extensively every day. A functional and well-designed facility makes the city a better place for its residents as it creates a remarkable connection among several realms of everyday life – environment, sport, culture, health.

Such considerations do not apply exclusively to stadiums, sports palaces or swimming pools – they concern every socially active space used by different groups of citizens (streets, squares, parks, etc.) – the actual building blocks of the social, urban and cultural context of which sport is an essential medium. Just consider all the fringe, abandoned or degraded, fragmented or improperly used areas in Western urban and territorial contexts that residents (almost) always use for sport activities. Or consider under-developed countries where sport facilities are driving forces for urban and social regeneration in so-called informal contexts. Architectural designs for sport facilities should be part of a global growth and development vision in the contemporary society. Indeed, the reappropriation process of public space in our cities cannot disregard the promotion of outdoor physical activity and exercise, not just within gyms and sport facilities. In order to achieve this goal, urban planning policies should acknowledge and implement the design criteria for sport facilities and the regulations for the use of public space in order to prepare our cities to host sport events and activities.

It is necessary to encourage the dialogue between different subjects in the sport world who often have a hard time considering themselves as carriers

of shared interests. Some of them are extremely open to innovation, propose new modes and visions, and redefine their action strategies. Think, for example, of grassroots sport associations that promote pure sport practice such as Unione Italiana Sport per Tutti (UISP) and Centro Sportivo Italiano (CSI). With their widespread presence in the entire country, they play a key role in promoting and raising awareness about the social value of sport practice. Along with Sport e Salute Spa (formerly CONI Servizi Spa) and the Committees in the individual regions, they played and still play a relevant role in the country, particularly towards the institutions, about the right to sport for everyone, whereby sport is the expression of a new right to citizenship and active participation.

Notes

1. G.I.L. or Gioventù Italiana del Littorio, was a Fascist youth organisation. Established on October 29, 1937 (XVI year of the Fascist era) to replace the Fasci giovanili di combattimento (for young people of 18-21 years of age), it pursued the spiritual, sport and military training of Italian young people based on the ideological principles of the regime.
2. «CONI forms the Confederation of Sports Federations and Associated Disciplines and adheres to the principles of the international sport order, in line with the guidelines issued by the International Olympic Committee. CONI organizes and promotes national sport, in particular the training of athletes and the preparation of facilities for the Olympic Games and all the other national and international sport events» (articles 1 and 2 of the Legislative Decree n. 15, 8 January, 2004, n. 15 Amendments and additions to the Legislative Decree 23 July 1999, n. 242 about the "reorganization of the National Olympic Committee – Coni" pursuant to the article 1 of the Law 6 July 2002, n. 137).
3. European Commission, *White Paper on Sport*, in www.ec.europa.eu.
4. The fact that sport is associated with wellbeing and health is an acknowledged and widely shared concept. Several researches demonstrated the remarkable positive impact sport has on physical and mental health and, as a consequence, on the reduction of health – and assistance – related costs, which dramatically decrease as soon as physical activity increases. This means that an adequate and continuing sport practice (under the fundamental guidance of a doctor who may "prescribe" the right amount of physical exercise based on the individual's health) would have a measurable and quantifiable positive impact in terms of reduction of health spending both for the State and for the individual Regions. In this sense, sport might be considered as an actual therapy.
5. «Gianni Rivera, football champion, Member of Parliament and Chairman of the FIGC Youth and School Sector, said: [...] Today, material and economic interests come before sport. Football players are small enterprises, wide-ranging centres of interest. [...] Today, society considers money a goal rather than a mere tool, and even football clubs play a key role in this phenomenon» (Uva M., Vitale M., 2011, *Viaggio nello sport italiano*, Esd, Bologna).
6. Sport is also a reliable "barometre" of cultural evolution in any country.
7. One example, in this sense, is the "F. Anderlini" volleyball school, established in Modena in 1985 – an amateur club having as its primary goal the propagation of volleyball among young people from 3 to 20 years of age.
8. Meaning literally *heritage*, in a wider sense legacy reflects the ability of a certain (government, planning, etc.) action to leave a positive foundation for future generations to build their own projects.
9. Clearly, *sport marketing* has an additional function in terms of *social network*. In this case, the role of designers becomes fundamental. The functionality of the installation in all of its parts (in particular, those associated with communication processes) reflects the success of its management, of the sport club working there and, finally, of sport itself in consideration of the multiple resulting potentials it can generate.
10. For further reading, see: www.run-walk-innsbruck.at.
11. For further reading, see: www.dorsetforyou.com.
12. For further reading, see: www.miamidade.gov.
13. Koprivnica Gymnasium and Sports Hall, Studio UP, Zagreb, 2003.
14. The *Water Cube* in Beijing is a positive example of conversion. The building includes the main Olympic swimming pool, diving pool, warm-up pool, water polo and synchronised swimming pool, as well as the accessory services for athletes and spectators, and a lounge bar. 11,000 seats of its overall capacity of 17,000 are designed to be removed and recycled. Once the Olympic event was over, the surface occupied by surplus seats has been converted into offices and refreshment posts. All of these transformations were planned since the design stage. Reopened in 2010 as a water park, the facility is still used as a venue for national and international events.
15. The usefulness of facilities once a major event is over is indeed one of the key problems for local administrations and the governments of hosting countries. Often, such infrastructures are simply abandoned. For example, the installations planned for the 2004 Olympic Games in Athens were built with no reuse plan in mind, as Spyros Capralos, Chairman of the Greek Olympic Committed admitted. The current trend is more focused on a careful management of major sport events in terms of installation design. The post-event future is decided since the design stage.

The Social Stadium

Football venues between identity, space and society

by Chiara Manzoni

«At the stadium, passion does not change».

Pier Paolo Pasolini, 1969

Sport installations, in particular football stadiums, are certainly prime representations of our time, as well as the most significant and symbolic buildings of the contemporary age. The ultimate purpose of these architectures is – and always was – accommodating the crowds coming to watch a spectacular event, be it a sport match or another kind of performance.
The origin of modern stadiums coincides with the transformation of sport into a competitive and spectacular activity with a professional nature. In Italy, the propagation of football as the most popular sport only started in 1920. Since then, the growth of the football phenomenon has been exponential while, conversely, the situation of Italian sport installations still discounts a dramatic backwardness compared to Europe, Northern America and Asia.
In the globalised and virtual era of the contemporary society, the reorganisation of sport, consumption and leisure facilities directly involves the issue of stadium design. Designing stadiums exclusively in terms of their formal or functional aspects is now simply impossible – deeper considerations, involving social, political and cultural issues are necessary. First and foremost among such issues is the direct impact a stadium may have, in terms of urban planning, on the city.
A sport installation, like any other public work, plays a role as a *social catalyst*. Stadium users have increased and changed since the past from a *passive* to an *active* kind of audience. Multiple *players* now use this installation. Athletes and technical staff during the sport event, or artists, for example for music concerts or other performance events; mass-media professionals who report and broadcast the spectacular event – press, cable TV, Internet (social networks), and Web TV reporters; direct insiders (managers, sport club staff, sports agents, etc.) and other professionals, such the (increasingly numerous and more qualified) service and support staff working inside the stadium (associated with the wide range of activities now available in next-generation stadiums: shops, movie theatres, bars, restaurants, gyms, etc.). New-concept stadiums are used by a new kind of user compared to the dichotomous supporter/stadium dimension – the user/customer who does not go to the stadium to attend a match or another event but rather and equally uses the facility for the collateral services it provides (shopping mall, bars, restaurants, gyms, etc.), even during the so-called *no-match-days*.

The supporter between identity and space

The stadium is increasingly a place where another match – the one played by the audience – is visible alongside the football match itself. According to the French ethnologist Christian Bromberger[1], the social geography of the city is mainly projected within the stadium. The spaces of the bowl divided into stands, bleachers, curved stands highlight in this sense social differences. Therefore, each sector of the bowl coincides with the social group one belongs to[2], and represents a sort of territorial portion where a shared identity is rooted. The anthropologist and sociologist John Bale[3] associates this concept with *topophilia*, a notion fraught with social values.

The stadium is, or at least was, a place where such celebration was identified. The very fact that the match is experienced in different ways in a various sectors gives an idea of how the stadium has nothing in common with the concept of *non-place*[4]. On the contrary, it can reflect several places at once. Even the individual segments within the stadium are places of ultimate identification where the personal identity of a supporter and the collective identity are celebrated at the same time. The sociologist and writer Elias Canetti[5] reflected on the *stadium crowd* and on the fact that the size and ring shape of the stadium implies a mirror effect on the crowd, thereby leading the crowd to identify itself and become aware of itself *as a crowd*. The stadium is a place that encourages identification, identity, a place of cyclical, regular gathering that, besides being *several places in the same place*, can also host different events.

There are aspects in the different sectors of the stadium that clearly reflect certain religious rituals. For example, the sequential reiteration, the permanence of idols, which are fast renewed in the world of football[6]. In this respect, John Bale insists on the concept that football may be considered, with no exaggeration, as a sort of surrogate of religion, and as such it should be analysed and studied[7].

Already associated to the term *topophilia*, or the sense of place introduced first by Yi-Fu Tuan[8] and later by John Bale, and to the Latin *genius loci* (identity-spirit of the place), the stadium can conversely represent a landscape of fear, or a source of *topophobia*[9]. Such concepts, related to the stadium theme, explain how football may combine the feeling and the spirit of belonging with a place. For John Bale[10], attachment to a place or the sense of place increase the quality of life, while Edward Relph[11] highlights the importance of landscapes and places. Rather than casual visual backdrops for other social concerns, they are part of our being, have a direct impact on the quality of our life, and offer multiple small pleasures.

«Like human beings, places acquire unique features across time»[12]. The Chinese-American geographer Yi-Fu Tuan noticed how many football fans have an emotional bond with their club's stadium, which closely recalls the

attachment we all have for our *home*[13]. Such intense identification between people and places is the reason why, as Relph writes, football fields are "authentic places" towards which fans had an unwitting sense of place; «besides the removal of place, there is a removal of identity [...] the stadium is far from a "non-place", it is a piece of territory that incorporates an identity, even moving from one stadium to another in the same urban context implies a redefinition of such identity in another place, and it is a far from easy transition. One has to get used to other conditions, socialise again, re-establish rites in a context that is still cold, still requires to be symbolically invested, it is a process that requires time but, at the same time, it is interesting in sociological terms, with which many squares will have to come to terms with [...]. There is the case of the historical Wembley Stadium in London, demolished to be replaced by a new one [...], which will be a different place and, while it occupies the same space in topological terms, it is not and never will be the same thing [...]»[14].

From closed stadium to open stadium

Shape and features of the stadium have evolved over several generations. The first generation developed between 1880 and 1920, while the second generation covers the period between 1920 and 1960-1970, and the third generation the years between 1960-1970 and 1989. The stadiums of these first three generations featured a closed and inward-looking layout, with a bowl designed to accommodate as many spectators as possible. In the late 1980s, following the social transformations commonly associated with the enactment of the Taylor Report[15], a radical process started for the definition of a new cultural model of *stadium for families*. Since the 1990s, football installations *have started to communicate*, by opening up towards the city and addressing even groups of users who are not interested in football as supporters.

The "closed" stadium of the early generations mainly addressed families who went first to Mass and then to the stadium on Sundays, and payed a more or less fixed admittance price regardless of the sector they chose within the stadium. The stadium was a family place, a library, a sort of house of affections. With the "open" stadium of the fourth generation, the family becomes larger, it *opens up*, and offers additional activities – restaurant, gym, hotel, shop, bar – besides the ones associated with the sport event. The modern stadium now guarantees indirect revenues unrelated to the sport event itself.

Therefore, the fourth-generation stadium (1992-2002) has effectively become similar to a shopping mall, as it aims at creating an experience for its consumers. In the shopping mall-stadium, the relationship between the city

and the market ends up creating a sort of reversal: shopping malls effectively become the artificial version of the square, the agora, the marketplace[16].
A fifth (2002-2016) and a sixth generation (since 2018) of stadiums eventually replaced the ones built between the 1990s and the 2000s[17].
The next-generation stadium can accommodate a multiplicity of subjects, particularly including the so-called *millennial fans*[18]. They are hyper-connected spectators for whom social networks and selfies, or virtual reality, are more important than actual reality, in spite of their being physically present at the stadium during the event. «The protagonism of the players who live in the football world has changed and become closer to American-style show business. Attending the most important events and making selfies is all that matters. Thus, the gap between the football that matters, the unmissable matches and the rest is growing. There is a new audience that participates in the event but is not really interested in football and/or in the match and wants to be there through social networks like Facebook, Instagram, Twitter [...]. Although the stadium and the passion of fans seem quite fake, this does not affect the choices of top football clubs [...]. Fans are always connected and communicate through the social networks. They are increasingly disconnected from the territory [...]»[19]. The contemporary stadium becomes a high-quality multi-purpose facility that invites its use not just due to its media transposition, all without ignoring the now unavoidable aspect that in almost all public spaces and even more in the stadium (the place where ultimately a show has no time and no place), whoever is physically there has a perception of events that is entirely different from that of others who are thousands of kilometres away. Several European, North-American and Asian stadiums covey the concept of *connected stadium*[20], or the possibility for fans to be connected with the stadium through personal devices – smartphones or others – at any time through an either free or paid wi-fi and hi-fi system, depending on the occasions.
In its complexity, the next-generation stadium mainly displays three features. The first is its *physicalness*, which is a value in itself, as opposed to the immaterial nature of the contemporary society. The second is its *symbolism* through which the stadium very easily appears as a symbolic place within the collectivity. The third feature is its *polyvalence* as an articulation in terms of segmentation of users, mixed marketing tools depending on the rhythms and social segments, times and modes of the advertising space. Polyvalence is the core of the reversal process towards the *stadium crowd* described by Elias Canetti, which implies an opening to the city in terms of communication of the image towards the organic construction of the city and not just in physical, technological and infrastructural terms. This said, the stadium as a container of multiple functions still preserves the strong institutional and public character this place intrinsically has within the city.

The next-generation stadium

What happens today in the relationship between spectator and stadium from the sociological point of view? Which sources of topophilia and topophobia are still present? First of all, the stadium may still be considered as *a tourist place*. This place undoubtedly remains a recreational and entertainment attraction. Such value is fundamentally important whenever the sport club is also the owner of the facility. In addition, the stadium may be still considered as *a sacred space and a home*: the connections the spectators who go to the stadium have with their team's facility are comparable to the ones they have with their home. In spite of this, modern stadiums require time to create *genius loci* and therefore identity.

Here, we propose four sociological combinations concerning the next-generation stadium based on the opinions of leading contemporary writers, journalists, sociologists and architects (Augé, Russo, Lanfranchi, Nora, Koolhaas, Eisenman), in order to reach the conclusion of a stadium as *utopia* of the global society.

Leisure place – consumption place. The stadium gives us the possibility to spend time with other people sharing a common pleasure. The stadium conveys the principle of fun and entertainment. It may become a prime place for urban invention, the venue for new programs more or less directly associated with the sport event. There is a ritual realm that is still closely related to direct participation and the need to mingle, to be a crowd. More importantly, fans need a collective identity they still find in certain rites. Team sports, in Italy mainly football, still offer identification and participation models that no TV simulacrum can ever replace[21].

The model of city produced by the stadium looks like a shopping mall, a place of exclusive exchange where nothing is produced except for shows. American culture is already well into this trail, while the current generation of stadiums in Europe, Asia and the Middle East confirms such trend. While we should not surrender completely to the economic drives of spatial organisation and functional distribution, we should be aware that those same drives are fundamental for the development and success of a stadium project. The goal is trying to incorporate such drives within a larger architectural debate that should not and cannot be only and exclusively formalistic and self-referential[22].

Memory place – place for the invention of tradition.

«The stadium is also the place where the rite of passage from childhood to adult age is performed. At the beginning, you go with your dad, then with your classmates, team-mates, friends from the community centre, then you go with girlfriend/boyfriend, and eventually with your children and

grand-children. The stadium is a place of memory where you make your good memories as a fan, player, reporter. The stadium may very often be the symbol of a city, a sort of modern cathedral people may be very proud of, be it in Dakar and Port Elizabeth, in Africa, in Cairo, Egypt, in Florence, Italy, etc.»[23].

The fact that fan clubs often refuse to relocate into new facilities means that existing stadiums may be considered as actual places of memory. According to the French historian Pierre Nora's theories, «There must be a will to remember for a site to acquire the actual meaning of "lieu de mémoire": in order to provide the place with an actual and vibrant meaning, its raison d'être, a soul. Therefore, "lieux de memoire" become "direct sources", intentionally produced by society with a view to their future reproduction, unlike the "indirect sources", comprising all the testimony an epoch inadvertently leaves to historians»[24].

Will Italian fans insist on defending a losing model? The new model is that of a fan committed to several activities. *Millennial* fans are still developing their identity – they are a new reality and only time will reveal how they are going to evolve[25].

The stadium, conversely, may represent *an invention of a tradition*. The theories developed by Eric J. Hobsbawn and Terence Ranger in 1983 show that traditions are invented and reinvent, like the reinvention of Welsh language, of the Scottish tradition of the Highlands or, the reinvention of Florentine football in Italy[26]. The concept of the invention of tradition may seem interesting as opposed to that of memory site, and aims at arguing that «traditions which appear or claim to be old are often quite recent in origin and sometimes invented»[27].

Place of cohabitation – place of segregation.

The stadium is a testing ground of peaceful coexistence for different age groups, genders, ethnic groups and social and economic groups. When we go to the stadium, we may happen to chat with our neighbour who may belong to a group we never encounter in our daily life. The stadium may accommodate thousands of spectators like other transition spaces such as the airport and the shopping mall. Unlike these *non-places*, however, the stadium can elicit – and that is a fundamental difference – a strong sense of belonging to a nation and a team (just consider the thousands of fans of any social group who follow their national team at the World Cup, or the local team in away games for the Champions League or Europa League). In spite of the strong economic impact that tends to transform fans into customers, this aspect has remained unchanged.

Since 2010, a crisis of organised fan clubs has emerged in Italy. Recent regulations (Daspo[28] and Fan Membership Card[29]), which actually limited the

freedom of action of fans within stadiums and changed the sense of the fan experience in stadiums, have been major reasons for such crisis. A new social and collective movement is emerging that is not favourably inclined towards the current evolution of sport business and projects a sort of *regressive utopia*[30].

At the same time, the stadium is also a potential concentration camp (see the cases of Santiago de Chile during the coup on September 11, 1973, Bari during World War Two and the Vélodrome d'Hiver in Paris[31]) where protesters can be easily "contained" and secluded.

The recent terrorist attacks at the Saint-Denis Stadium in Paris on November 2015[32] confirm that the football event and the stadium may offer a huge opportunity for mass murderers (the ultimate example of *Topophobia*). With their VIP boxes, lounge bars, restaurants and exclusive areas – actual hyper-protected zones[33], stadiums also represent places of exclusion and economic segregation.

Place of invention of new urban forms – simulacrum place and TV set.

The stadium may be considered as an ideal site of freedom and invention of particular urban forms and technological experiments, a sort of testing ground due to its nature of exceptional facility. The multiplicity of functions and opportunities the facility offers beyond its specific use are essential features that only become positive when such plurality is actual rather than metaphorical.

A danger inherent in radicalising the concept of multifunctionality is the thematisation of spaces and, worse still, using such radicalisation for cultural purposes. In other words, such operations would threaten the aura of authenticity of the reality they thematise. The simulacrum, or simulation, created with such pre-packaged spaces impacts on our way of perceiving reality and nullifies the authenticity of the phenomenon.

Another negative aspect may be the fact that the stadium, like the theme park, projects a sometimes purely broadcasting model of differentiation. The media have a growing influence on the expression of the sport event. Broadcasting rights are the main sources of revenue for the football movement, particularly in Italy where other sources of revenues for football clubs have a negligible impact. They dictate the football season's schedule and decide how football is narrated, thereby obliging traditional media to tag along. The consequences of such situations also reverberate on the relationship even other sport disciplines have with the mass media so that they sometimes are in danger of extinction. In addition, new interesting media systems are now emerging such as streaming, which promotes the *glocal* nature of football by enabling its *global* experience and encouraging fans to follow their teams even when they play in lower series; «there is a streaming platform that offers the possibility to follow even lower series teams on the

web wherever you are – a very interesting phenomenon that may compete with the broadcasting monopoly. On the other hand, the 2018 World Cup played in Russia reminds us of how the global event is important for the media, as well as to promote the various channels, sell merchandising and even generate revenues for FIFA, UEFA and the clubs. The influence of mass media on sport events is clearly still very strong»[34].

The stadium as utopia of the global society.

Designers, and in general all the subjects involved in the design of a stadium, have an extraordinary opportunity to build an infrastructure that may actually represent the future expression of the global society without losing sight of the utopias and critical approach of design[35]. The very concepts of memory site, *glocal* and development play a major role in sport and in particular in the studies for football stadiums[36].

In the introduction to his celebrated *Non Places*, Marc Augé writes that architects have some loopholes and one of these is the opportunity to approach *empirical non places*[37]. In other words, they may directly address the spaces of communication, circulation and consumption, which make up the leading landscapes of our new world. At the same time, we can imagine the contemporary stadium as the possibility for designers to work on the quality of users – fragments of *utopia* reflecting our age divided between passivity, anguish and, in spite of everything, hope or at least expectation. Building a stadium means working on this utopian dimension made of new forms by hinting at a global society still to come. After all, architecture is the expression of the system of a changed context. The context has become global and the stadium may represent something that alludes by broadly tracing a time yet to come, which may not even come at all, and remains in the range of possibilities.

The list of some case studies shows that some utopias are possible. The case of the Emirates Stadium in London is a far-sighted example of social and urban rehabilitation that involved a London district, its residents and the supporters of the Arsenal football team by enhancing both the existing context (the old Highbury Stadium, transformed into a housing complex with vegetable gardens and gardens on the former pitch) and the futuristic new stadium located not far from the old one. An example of local identity and respect for the history of the club and the old installation, which was not demolished but preserved and enhanced.

Other examples of urban regeneration are in Switzerland. The Stade de la Maladière in Neuchâtel includes 54 shops on a 28,000sqm retail area, 930 covered parking spaces, the central fire station and six gyms, while the St. Jakob Park in Basel has a shopping mall and a retirement home besides the sport facilities. Both stadiums are equipped with key social facilities (a fire

station and a retirement home) and as such act as urban regeneration driving forces for their districts.
What about Italy? The Allianz Stadium in Turin, the Dacia Arena in Udine, the Benito Stirpe Stadium in Frosinone are three examples and possibly models for other Italian clubs[38]. Although belatedly, they reflect the awareness that economic revival can only happen through the construction of a new stadium designed to attract fans who may finally experience it as a place of *topophilia* rather than a landscape of fear. «Several common players, residents, sponsors, environmentalists, architects, etc. are necessary for the successful design of a stadium. One example is Zurich. Although Zurich is far from a problematic city, it lost a legendary stadium – the Hardturm Stadium (home to the Grasshoppers) during the organisation phase of the 2008 European Championship when a petition presented by local residents stopped the redevelopment project. Since then, the stadium lies in a state of abandonment. Football stadiums are okay but a parallel vision for the city is necessary as well»[39].
Countries like Germany, Great Britain and Spain experimented models of participation of fans in their clubs' lives.
The participation of fans is now the only antidote to the transformation of football into a purely financial enterprise.
In order to work, stadium design must now combine the opening to new groups (women, senior citizens, wealthy people between 35 and 50 years of age) and innovation.
The current evolution of *sport-business* implies changes that in turn carry major contradictions that architects must address with coherence, passion, critical spirit and, as advised by Pierre Lanfranchi[40], without fearing utopias.
The contemporary stadium will be exclusively yet another stimulating opportunity for a complex and multi-function design activity or we may remember that it also incorporates its own identity, a *genius loci*, and, more importantly, that sport is a matter of passion that, without the presence of a participating audience, is bound to lose its meaning completely.
Designing a stadium will still mean conceiving a place for social consensus or will it mean exclusively conceiving the set for a television show?
In 1967, Jorge Luis Borges wrote prophetically with Adolfo Bioy Casares: «There is neither score, nor composition of the teams, or matches. All the stadiums fall apart. Today, things only happen on TV and at the radio. Hasn't the false excitement of speakers ever made you suspect that it is all a swindle? The last football match was played in this city on June 24, 1937. Since then, football, like the entire range of sports, is a drama genre, interpreted by one man only in the control room and by actors in jersey in front of a cameraman»[41].

Notes

The quote at the beginning is from Pasolini P.P., 1969, «Riflessioni dopo aver visto una partita allo stadio», Il Caos n. 1, January 4.

1. In his essay, Bromberger illustrates four mediating terms, which describe the pattern of the processes of participation in spectacle: identifications, territorialisation, symbolisation, ritualisation. While the first three are purely sociological, related to space and the stadium only in a passive way, the latter two express the place of football-spectacle, the site of a spectacle within the spectacle that puts one protagonist – the audience – at centre stage (Bromberger C., 1992, «Lo spettacolo delle partite di calcio. Alcune indicazioni di analisi etnologica», in Lanfranchi P., ed., *Il calcio e il suo pubblico*, Edizioni Scientifiche Italiane, Naples, pp. 161-182).
2. «Like in the past, during the Roman Empire, the circus was the scene of a triangular drama, at the same time political and bloody, involving the emperor, the senate and the populace, now the football stadium frames a complex spectacular event directly involving the teams, the referee and the spectators» (Dal Lago A., 1992, *Descrizione di una battaglia. I rituali del calcio*, il Mulino, Bologna).
3. Bale J., 1992, «Il calcio come fonte di topofilia. Il pubblico e lo stadio», in Lanfranchi, *op. cit.*, pp. 183-220.
4. Augé M., 1992, *Non-Lieux. Introduction à une anthropologie de la surmodernité*, Seuil, Paris (It. trans., Rolland D., 1996, *Nonluoghi. Introduzione a una antropologia della surmodernità*, Elèuthera, Milan).
5. Canetti E., 1974, *Potere e sopravvivenza,* Adelphi, Milan.
6. According to Bromberger, there is an observation – the scene of an encounter, the symbolic figures standing on that scene, the behaviours, the conversations, the propitiatory practices of the supporters show clear similarities with the religious rituals of the Christian tradition.
7. «Football may be considered as something similar to a religious ritual, or a surrogate of it; and the stadium, which contains its spectacular development, may be considered as a sort of cathedral with its rites and actors. In this respect, it is interesting to report the statement of the fan of a far from important team [...] playing in the Fourth Division when the plan for the relocation of the stadium (*Sealand Road*) and its shutting off was presented: Sealand Road has been part of my life for 30 years; it's more than a football ground, it's a way of life not just to me but to thousands of people [...] whose life has revolved around a match at the Stadium. It's more than bricks and mortar, it's almost something spiritual» (Bale, *op. cit.*, pp. 183-220).
8. Topophilia, from the Greek *Topos* (space) and *Philia* (love for), expresses a strong sense of place, which often mingles with the sense of cultural identity for certain individuals and love for certain aspects of a place (Bachelard G., 1957, *La poétique de l'espace*, Presses universitaires de France, Paris (It. trans, 2006, *La poetica dello spazio*, Dedalo, Bari); Tuan Y.F., 1977, Space and Place. The perspective of Experience, University of Minnesota Press, Minneapolis; Tuan Y.F., 1974, *Topophilia: A Study of Environmental Perception, Attitudes and Values*, Prentice Hall, Englewood Cliffs).
9. Tuan Y.F., 1979, *Landscapes of Fear*, Pantheon Books, New York.
10. In his essay, Bale cites five sources of topophilia in the British model of stadium involving both physical (buildings and spaces) and mystical (almost religious) aspects: the stadium as sacred space; the stadium as home; the stadium as tourist attraction; local pride and patriotism (Bale J, 1992, *op. cit.*).
11. Relph E., 1989, «Responsive methods, geographical imagination and the study of landscapes» in Kobayashi A., MacKenzie S., *Remaking Human Geography*, Unwin Hyman, Boston.
12. Tuan Y.F., 1978, «Spazio e luogo. Una geografia umanistica», in Vagaggini V., ed., *Spazio geografico e spazio sociale*, Franco Angeli, Milan.
13. In England, there are several examples of the deeply sentimental relationship between stadium and supporters. One of these is the Charlton Athletic, home to the Crystal Palace, in London. For many supporters, its relocation 11km away, in 1985, was the end of a dream.
14. Pippo Russo interviewed by the author, June 2004.
15. The *Taylor Report* prescribed the following guidelines – elimination of any barrier between pitch and spectators, elimination of terraces, the installation would be managed by owning clubs, strict control of in and out flows, electronic system for monitoring and recognition of every supporter.

16. Magnier A., Russo P., 2002, *Sociologia dei sistemi urbani*, il Mulino, Bologna.
17. For further details about the different generations of stadiums, see Davide Allegri's essay in this book.
18. *Millennials* identifies the generation who came of age since 2000. Also known as "Generation Y", they are more numerous than the previous "Generation X" (born between 1965 and 1980). In Italy alone, millennials are about 11.2 million, while they are about 2.3 billion worldwide. As the very first generation of hyper-connected individuals, *Millennials* are also defined as the "three C" generation: *Connected* (to the network and the world); *Open to Change* and *Confident* (self-confident and eager to emerge).
19. Pierre Lanfranchi interviewed by the author, June 2018.
20. The stadiums of Barcelona, Real Madrid, and Liverpool already provide an either free or charged Wi-Fi connection.
21. Russo P., 2004, *Sport e società*, Carocci, Rome.
22. In his *Consumo dunque sono* [*I Shop Therefore I Am*] (2007), the Polish-born sociologist Zygmunt Bauman refers to the inhabitants of Leonia, one of Italo Calvino's invisible cities, to describe the relationship between consumers and consumerist society, for their ability to throw away things in order to make room for the new.
23. Pierre Lanfranchi interviewed by the author, June 2018.
24. Nora P., 1997, ed., *Les lieux de mémoire,* Gallimard, Paris.
25. Pierre Lanfranchi interviewed by the author, June 2018.
26. Historical Florentine football is a well-established tradition in Florence where a tournament is played every year in June in Piazza Santa Croce by the teams of four neighbourhoods of the city (Whites of Santo Spirito, Blues of Santa Croce, Reds of Santa Maria Novella, Greens of San Giovanni). Unsurprisingly, the tradition of Florentine football is largely used by the ACF Fiorentina football club in its season ticket campaign and merchandising (jerseys with the same colours of the four historical Florentine football teams are on sale).
27. Hobsbawm E., Trevor-Roper H., Morgan P., Cannadine D., Cohen B.S., Ranger T., 1983, *The Invention of Tradition*, Cambridge U.P (It. trans. Hobsbawn E., Ranger T., 2002, eds., *L'invenzione della tradizione*, Einaudi, Turin).
28. Law n. 41, 4/4/2007.
29. Directive 14/8/2009.
30. «An utopia that foreshadows a future that is a return to the past, the achievement of an ideal state of things, reflecting an image of how things used to be, which is often just an idealised image, although it is believed as true anyway. Therefore, the major transformation of hooliganism should mainly be viewed in this perspective – sharing an image of the current condition of football the environment of stadium radicalism does not like and against which it is necessary to organise and promote actions to be shared as a fully-fledged collective movement» (Pippo Russo interviewed by the author, June 21, 2004).
31. During the coup staged by Pinochet in 1973, the Estadio Nacional de Chile was used as a concentration camp. About 40,000 prisoners were held there between September and November, 1973. The pitch and gallery were used as prisons for men, while women were kept in the swimming pool, lockers and other buildings. Some rooms within the stadium were used to torture and execute the prisoners, while interrogations were held in the velodrome.
In 1940, during World War Two, an infantry regiment with a certain number of mules waiting to embark for Greece was lodged within the Stadio Della Vittoria in Bari. One night, the straw used for the mules caught fire. The fire destroyed all the interiors, doors and wood fence built in 1934 as a temporary enclosure of the facility. In addition, two bombs hit the stadium during the tragic bombing over Bari on December 2, 1943. The Velodrome d'Hiver, a stadium and cycling track, was the theatre of the largest roundup of Jews in France during World War Two. The French police conducted such mass arrests in the entire city of Paris on July 16 and 17, 1942.
32. On November 13, 2015, Paris was hit by a series of Islamic terrorist attacks including three explosions near the Saint-Denis Stadium during the friendly football match between France and Germany, and six shootings in as many different public venues in the French capital. The bloodiest of these was at the Bataclan Theatre where 90 people were killed.
33. «It was far ago when Jackie Milburn, the Newcastle captain, took the bus home after the match along with his supporters. Racism and sexism are still too widespread in stadiums, and I don't even like the English – or American – style stadium with the anchormen, music concerts

and people always telling you what you must or must not do» (Pierre Lanfranchi interviewed by the author, June 2018).

34. Pierre Lanfranchi interviewed by the author, June 2018.

35. Eisenman P., 2000, «Lo spettro dello spettacolo», in *Casabella*, n. 673-674, December-January, pp. 84-85.

36. «The works I would recommend include those by Julio Frydenberg, an Argentinian historian who studied the relationship between football and community in Buenos Aires. He has worked for over twenty years on the parallel development of city and football and on how clubs are part of this process, as well as on how the stadiums of megalopolises are still places of identification often replacing the institutions. Frydenberg, as well as other experts, underline the combined importance of stadiums and clubs. In addition, there is an alternative literature (for further reading, see: www.11freunde.de, www.sofoot.com and www.ballesterer.at) whose goal is to combine an insightful vision of football passion and a social, political and environmental commitment. It is perhaps in this field that the most significant innovations have emerged over the last twenty years» (Pierre Lanfranchi interviewed by the author, June 2018).

37. In the 2009 introduction to *Non Places,* Marc Augé included this third element, alongside "place" and "non place" – "empirical non place", or the spaces of circulation, consumption and communication. According to Augé, the place/non place combination can measure the degree of sociality and symbolism of a certain space.

38. While in Italy only two stadiums are directly owned by clubs (the Mapei Stadium in Reggio Emilia and the Atleti Azzurri d'Italia Stadium in Bergamo) and three more clubs acquired the surface rights for their stadiums from the City administration (the Allianz Stadium in Turin, the Dacia Arena in Udine and the Benito Stirpe Stadium in Frosinone), in Germany and UK, all the clubs playing in the two top leagues own their own stadium.

39. Pierre Lanfranchi interviewed by the author, June 2018.

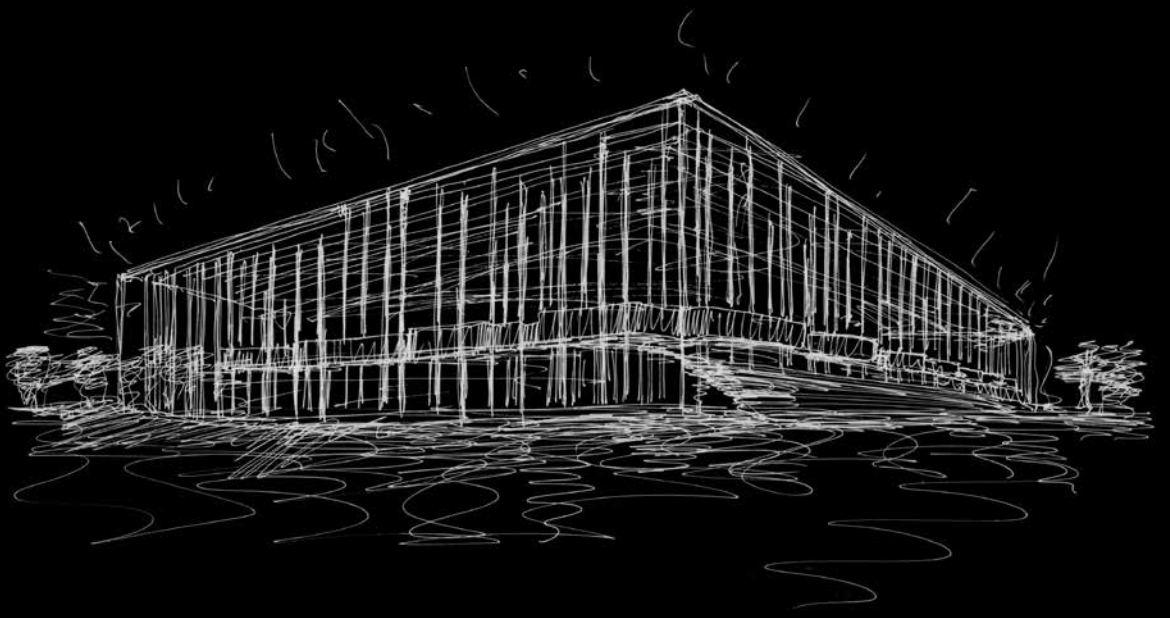
40. «My recommendation to supporters is to use public transportation to go to the stadium, and enjoy the match with their friends, siblings, children or grand-children, and share their passion with them. While my recommendation to architects is to design stadiums for everyone – children, adults, seniors, women and men, and stadiums that should be open as long as possible. My recommendation to all designers is to dare and not be afraid of utopias for their stadiums. I would say to the chairman of a sport club – look around, talk to everyone and give (or give again) your stadium the central role of a healthy and highly civilised place of memory» (Pierre Lanfranchi interviewed by the author, June 2018).

41. Borges J.L., Casares A.B., 1967, «Esse est percipi», in *Cronicas de Bustos Domecq* (It. transl., 1975, *Cronache di Bustos Domecq*, Einaudi, Turin).

Value the Values

Sport between spaces and community

by Antonio Marchesi



The Pleistocene. A bunch of *Hooliganopitecus* specimens hang around in the bush looking for something to do. Early afternoon, in the sweltering heat, an inviting grove with a clearing at the centre. The hominids venture into the clearing and form a circle under the acacia trees – a couple of grunts, an amicable delousing and boredom galore. Suddenly, one of the hominids, Alfa, sees a large ball of droppings at the centre of the clearing. He gets up and, with a perfect instep kick, throws the ball between two trees placed eight yards away from each other. Brushing against one of the slender trees, the ball rolls through the gate into the bush right in the back. The pack of hominids gasps – an adrenaline rush, shouts, hugs, and jumps up and down. Even Alfa rejoices and runs across the pitch with his arms in the air, winking at his companions. Then, he stops in his heels and has an unprecedented feeling, he understands he really messed up big – he invented football, something that would change the fate of his species forever. Since then, he would indeed pass the *Homo Ludens* gene on to all of his descendants.

Therefore, plays originates with humankind itself. Perhaps it is even intrinsic to our very DNA. This is the object of an interesting book – *Homo Ludens*[1] – written by the Dutch philosopher Johan Huizinga about ninety years ago. He argues that human civilisation emerged and developed *through play* and *as play* through a cultural and sociological integration, which defined an unbreakable bond between the earliest human behaviours and play. For Huizinga, play exceeds biological activity as it contains a value that it is quite difficult to explain in logical terms. People do not play in the same way everywhere – different civilisations express different ways of playing resulting from their habits although people have always played everywhere. Precisely like *our* Alfa who feels pleasure for himself and for others without an apparent rational reason. Huizinga also extends his analysis when he considers play as a free, not urgent, unnecessary act unrelated to primary needs like reproduction or feeding. Finally, play is limited in time and space and is selfless. His analysis is entirely acceptable except for his statement about the fact that play does not carry other interests as well. Probably it was so originally but almost immediately, it was the object of various kinds of manipulation and contamination. Ever since the age of Olympia, the notion of challenge, of the test of strength or of ability have triggered different kinds of interests. Showing one's superiority over competitors in order to convey the message *I am very strong, don't even think about it*; sedating the people with "panem et circenses" in ancient Rome, down to racial supremacy in the Berlin Olympic Games, and the current contamination "pure" sport receives from socially widespread and emerging concerns like those related to wellness, entertainment, communication and business. Extracting a fundamental observation from all this, although concisely, is not always easy.

Play – from now on, *sport* – in its feminine interpretation form, cannot disregard the relations among individuals or groups of individuals, the spaces, or places where it is practiced and a goal, be it health-related, social, political or economic. In the current vision, all of these elements are closely integrated, almost inseparable in any kind of sport competition.

For example, let's analyse the four types of sport defined by Gianfranco Piantoni[2] – amateur sport, localist sport, highly intensive business sport and specialised sport. Clearly, each category addresses its own forms of enjoyment, social integration and communication, which in turn require sophisticated and complex management systems. The America's Cup (sailing, a specialised sport) and the donkey race in Bereguardo (localist sport) have the same matrix – very complex and sophisticated for the former, less so for the latter. Yet, both require means and places with unique features and peculiarities. The same applies to classifications of sport based on different criteria, with the resulting endless combinatorial mixes. For example, tennis – single or double; indoor or outdoor; on clay, artificial grass or grass surfaces; men, women or mixed doubles; amateur or professional. There are endless potential formats, which may alter the spirit or goals although the value of integration and of the place remains the same.

Alfa, the droppings kicker, unknowingly opened a trail that, in all the imaginable directions, is still related to the values resulting from his idle companions who cheer and to the clearing surrounded by acacia trees. The knight in shiny armour who launched his horse towards the royal stand and against the competing knight in medieval jousts according to the rules of courtly love was basically interested in putting up a show in order to collect a reward – glory, and perhaps even a kiss from the princess. Paradoxically, the audience is sometimes even more spectacular that the match itself – the ladies' charming hats at Ascot, strawberries and cream at Wimbledon, *You'll never walk alone* at Anfield[3]. What would an "All Blacks" test match be without the "Haka" at the beginning, or the Super Bowl Half Time show without the traditionally catalysing rock star? All of these behaviours, which are the show for both the spectators and the protagonists, are part of a quite interesting sociological realm defined by Pierre Lanfranchi as the «laws of spectacle»[4]. Lanfranchi details them as Identifications; Territorialisation; Symbolisation; Ritualisation. *Identifications* define a quite diversified range of projections articulated by the *habitus* of the different groups of spectators, who may identify with a city, a region, a corporation through the style and composition of the team. Identification with this or that kind of player according to his specific qualities[5]. Finally, identification with the drama played out during a match, with the season of a team, or the history of a club. *Territorialisation and theatralisation*: as the venue of a practice, the stadium is also the venue of a spectacle, the spectacle staged by the

audience. Due to its size and shape, such space is one of few venues where a typical modern age society may express a sensible image of its own unity as well as of its own differences. One may certainly say that the social geography of the city finds a mostly accurate reflection in that of the stadium, with its spaces divided in stands and bleachers as visual projections of its differences. *Symbolisation*: with its dramatic development, competitive features, instrumental devices, the football match is an ideal ground for the emergence of a certain number of values, expressed by supporters in highly ritualised forms. *Ritualisation*: to a certain extent, the performance ritual in a football match and all its implications are comparable to a religious ritual. They have more than one thing in common. The presence of congregants expressing their emotional exaltation according to a strict gesture and vocal codification; officiants who are responsible for the sacrifice and with whom the congregants communicate; a strictly hierarchical organisation, the club, and universally valid laws; a "liturgical" calendar (regular and independent from the civil calendar); a *theatralisation* of social relationships within the stadium[6]. I think the writer Nick Hornby, and in particular the movie drawn from his *Fever Pitch*, is one of the most brilliant and insightful interpreters of all this. In just a few words, Paul, the Arsenal supporter who lives 100m from the Highbury stadium, conveys the idea, the magic and at the same time the simplicity that this cluster of values may express. «But... I don't know, perhaps, it's something you can't understand unless you belong? ...The whistle blows and everyone goes to spare, and just for those few minutes, you're at the centre of the whole world. And the fact that you care so much, that the noise you have made has been a crucial part of it all, is what makes it special. Because you've been every bit as important as the players, and if you hadn't been there, then who'd be bothered about football, really?»[7].

Value the values may be the leitmotif for a new and truly efficient policy for sport installations. This can and obviously must apply in general terms both to the America's Cup and to the donkey race. Easy to say, quite more difficult to implement.

Just to be clear about the terms, *value* is a concept of the either explicit or implicit desirable, which characterises an individual or a group, and guides the selection among the possible modes, means and goals of the action. Values vary both historically and geographically because they do not belong to the absolute world of ideas – yet, they are deeply rooted in social reality. As mentioned above, the relationship binding player/team/community/place should be as balanced as possible in order to enhance the value of any form of sport – the place where sport, any kind of sport, is performed plays a crucial role in this.

Indeed, with a meteoric journey across time, we travel from the clearing surrounded by acacia trees where our hominid was playing, to the medieval

tournament, and reach the venue of the final match of the very first Italian football championship: Genoa, January 6, 1898. According to the chronicles of time, 22 players of the Genoa and Internationale Torino teams and a referee played that match on a grassy field close to Ponte Galliera in front of 292 spectators, some insiders and various staff members. A unique event for the time. Gianni Brera, who details a financial account of the event in his book[8], provides an opportunity to understand many things about the context of the theme we are discussing here.

Let's analyse it with a critical spirit – 154 tickets, 84 leased chairs and 31 people admitted at various title. From the description, one may derive the creation of different areas in terms of comfort and visibility of the pitch, although all the tickets had the same price, 1 lira. Either it makes little sense or the idea of "who cares?", come what may, let's not make our life difficult, was already prevailing back then? Even at the time, the State wanted a slice of the pie. What about the 25 liras required for lawn mowing? And the 16 more required to fix the ground? Even in this case, it makes little sense, although nothing beats the cost of the stamp and whistle, which, combined, are eight times the cost of the keeper. The costs required to put the pitch into operation are such that it must not be a random choice – a space large enough to play one football match, to be left to other uses afterward. Refreshments cost 1.4 liras. Probably on January 6 (the Day of the Epiphany), nobody would need too many refreshments – still, hospitality does not seem to be a primary concern for the organisers. Anyway, they were good, because in the end, thanks to the pure amateurism of the protagonists, the event turned out a profit of over 100 liras. Today, with such a harebrained management, and the cost of players at the levels we know, that same event would be all but profitable. What has changed since then? Much and little or nothing, it depends on one's point of view. If we travel forward in time and look at the chronicles of the time after the First World War, we learn about a project (luckily remained on paper) for the enlargement of the San Siro Stadium. Franco Brera reports on the project on the pages of *Tuttosport* on June 10, 1949: «Capacity of the stadium: 150,000 seated spectators, 200,000 including standing places. The enlargement relies on 126 reinforced concrete load-bearing elements supported by a bedplate, also in reinforced concrete, adjoining the outer ring of the stadium and flanked by a drainage tunnel that will improve the conditions of the playing field [...] The public will access the stadium through twenty entrances at the base of twenty 150m long, 2.50m large reinforced concrete spiral ramps intersecting the load-bearing elements».

They forgot nothing – there would be even room for pumpkin seeds and peanuts vendors, and more importantly for countless spectators, since the safety margins for the load were very comfortable. I brought up these

intentionally provocative examples in order to stress how very little or nothing has changed in the approach and way of thinking about the relationship between place and community over the last fifty years. They would also pour tons of concrete instead of numbered seats and little else. In the transition from about 300 to 200,000 spectators, hospitality went from a miserable 1.4 liras refreshment to pumpkin seeds and peanuts. Perhaps to attract apes, like in the Pleistocene.

The 1990 World Football Championship required new installations and the improvement of some facilities but the basic concept did not change – the stadium remained, in its perception and actual implementation, a huge concrete building, only accessible to few daring fans, closed to the exterior and inward-looking, in a sort of social implosion. Since then, the world has evolved exponentially but many thought that sport in our country was immune to all this. A total eclipse of the political-strategic vision with respect to one of the most socially relevant sectors in the country.

A gradual change has emerged in the way of thinking, consuming, feeding and having fun in the population of every country. Until the mid-1990s, this change was slow and imperceptible. The sport community, both active and passive, had well-established habits in terms of the time allotted to hobbies practiced through almost ecumenical association and social forms. A quite predictable routine. In fact, people enjoyed their leisure – through social rites (friends, the movies, pizza parlours, family trips), attitudes designed to express and confirm one's social-economic status (bowls/tennis/golf), and a repetitive and habitual management of leisure mainly prefabricated by others, although resulting from free choice.

The football match seen at the stadium or on TV was part of the group of social rites to be enjoyed according to codified and standardised, or *passive*, modes of participation and fruition. Always at the same time and on the same day – Mass, family lunch and football match. The evolutionary dynamics of recent years have deeply redefined both patterns and fruition. Indeed, today there is a very strong requirement for an enhancement of leisure, expressed through the pursuit of intense, rewarding, proactive and, whenever possible, customised emotions for an enrichment made of unique experiences (rather than repetitive rites), in the pursuit of values and intensity, in the use of one or more multimedia devices even for the most basic activities.

Whereas the passive approach allowed *sport-makers* to adopt a *marketing pull* strategy (I am here, you come here where the customer as loyal fan comes), the new trends imply a reversal of such approach into a *push* dynamic. In other words, maximised efforts in order to keep up with the change of values and the new formulas of competition. Each sport has to struggle and adapt in order to preserve its current market share and possibly

increase it, or to find virgin areas untapped by the global offers of that specific industry.

The *place*[9] embodying the values, emotions, quality of services and opportunities for integration becomes fundamental. I am not happy with the goal excitement experienced by the "Hooliganopitecus" – I want to experience it in a particular way. I want to *share it* with others, *comment and consume it* in a place that makes me feel special. The goal is now creating a place with its own spirit, noises, and a specific and strong *identity*. A place equipped for the services that best identify modern necessities, which elevate the quality of life of the contemporary human being. A place where you feel at ease, meet your friends, identify rather than exclude, communicate and share, like the neighbourhood where we were born and grew up. The streets, noises, the people, the gardens, the bar with friends. In short, the goal would be the creation of a modern *genius loci*. In architecture, this expression identifies the set of socio-cultural, architectural, language and habit features characterising a place, an environment, a city. A transversal expression that describes the characters of a physical environment, or the anthropological, cultural, identity elements through which human beings, with their habits and traditions, live in the environment itself. It signifies the character of a place. The clearing and the acacia trees where Alfa played had a *genius loci*. Many Italian sport installations, instead, seem to result from concepts quite unlike the one described above. Obviously, the *genius loci* is something you neither create in a day nor design preemptively. Here, we just want to argue how the design for a new sport installation and a stadium in particular, must consider the notions of place and *genius loci* since its early definition, while it is necessary to create strategically the technical, logistical and cultural premises for this to happen.

The following model illustrates the process adopted by recent experiences in order to delineate the basic concept for the design of a sport installation reflecting the above-mentioned principles. Indeed, the very first input elements include the values we are supposed to inject in the design. Note that the choice of the site is, for consistency, a consequence of the process of elaboration of the input in the spinner of the business model.

Obviously, the paradigms required to develop such concept are not the same in every case and result from a contextualisation. However, a general line may derive from the consideration and assessment of the following elements. *Interactivity:* attractive, fun, surprising; *Innovation:* multimedia, convergent, flexible, customised; *Sustainability*: environmental, social, economic, job creation; *Communication:* global, visible and recognisable platform, amplifies the brand value; *Integration:* enhances territorial and city values, fits in, avoids isolation; *Diversification:* innovates constantly, surprises, attracts, conveys energy; *Relation and opening to the city*: it is part of the city,

it communicates, it is open to everyone; *Sociality:* it aggregates rather than divide, it is the home, it conveys values and culture; *Wellbeing:* you should feel at ease, experience positivity and safety; *User-friendly:* tickets, services, logistics, indications, routes, accessibility; *Iconicity:* source of urban pride, you cannot not see it, tourist attraction.
In conclusion, a short sentence by Eugenio Montale: «From the football stadium, the fan goes back to another stage – that of his childhood»[10]. Precisely, the stadium should convey the magic we all perceived as children in the place where we grew up and first kicked a ball or played "Lippa".

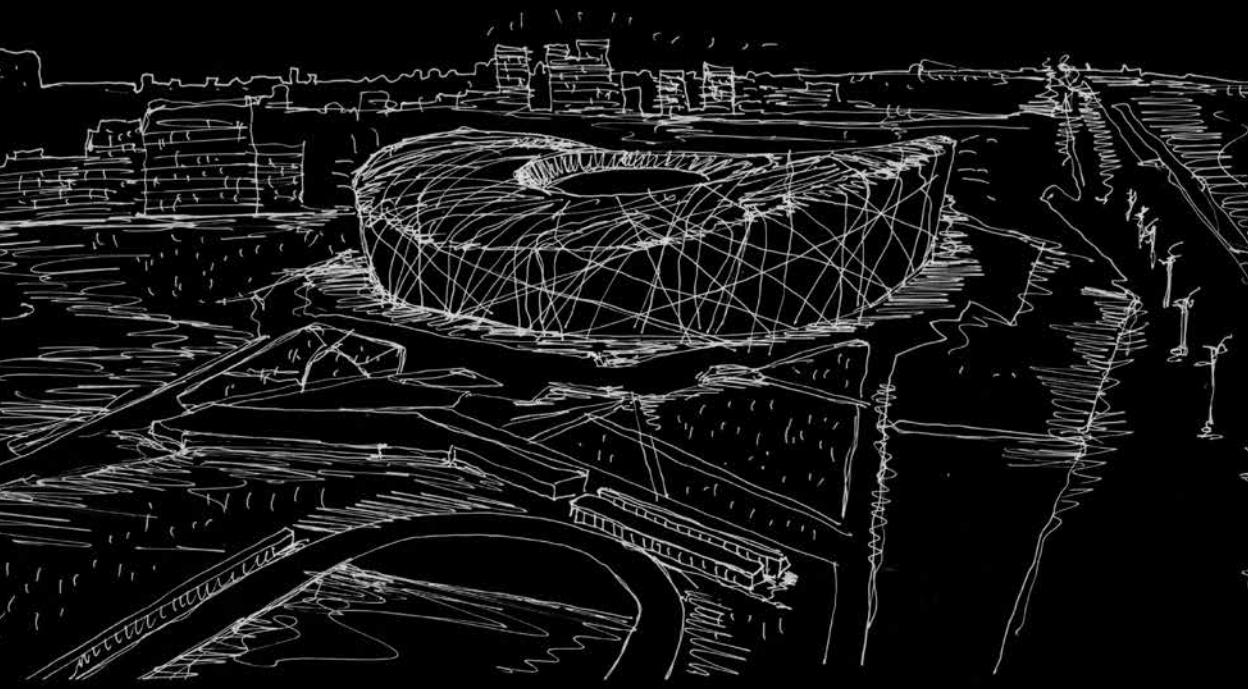
Notes

1. First published in German in Amsterdam in 1939 and later translated into Italian in 1946, *Homo ludens* discusses two concepts we are familiar with today but had to be quite challenging back then – a notion of *culture* as a set of social phenomena including art as much as sport, law as much as funeral rites. Although this notion of *cultural invariant* is not new for cultural anthropology in this century, it was radically alternative to the principles of the idealistic philosophies of history. «Related to the suggestions of positivism, from Spencer to Lalo's "sociological" aesthetics, the notion of play as the origin and constant of cultures did fascinate at least because it was outrageous: it seemed indeed a "pseudo-concept" that was violently grasping the power, and conquering the Winter Place arrogantly inhabited until then by Aesthetics, Metaphysics, Ethics, Economy» (U. Eco, «Homo ludens oggi» in J. Huizinga 2002, *Homo Ludens*, Einaudi, Turin, pp. IX-X).
2. Piantoni G., 1999, *Lo sport tra agonismo, business e spettacolo*, ETAS, Milan.
3. The reference is to the song, and the official anthem of the Liverpool football club, which inspired the title of the book De Biasi R., ed., 1998, *You'll Never Walk Alone. Il mito del tifo inglese*, Shaka, Milan.
4. Lanfranchi P., ed., 1992, *Il calcio e il suo pubblico,* Scientifiche Italiane, Naples, 1992.
5. A number of researches conducted about marketing applied to football clubs argue the idea «of creating, starting from the idea of identification, some leading figures within the football show business, defined as All Stars. In the hyper-spectacular American sport, such figures have existed for decades, precisely with the purpose of increasing the personalisation in the identifying will of individual spectators» (Slack J., 2001, *Gli scenari del calcio: idee a confronto,* proceedings of the conference, Milan, December 18).
6. Fans experience the pre-game, during-game and after-game moments intensely. A research conducted by OM, the main football club in Marseille, over a sample of supporters in the mid-1980s shows how as early as two days before the match there is a remarkable expectation and interest around it. If this is the case in France, it must be even more so in countries like the United Kingdom and particularly Italy. This concept of ritualisation of the sport event could materialise in a place that could accommodate crowds of supporters even two days before and after the actual event.
7. Hornby N., 1992, *Fever Pitch, A Fan's Life*, (It. transl. 1997, *Febbre a 90*, Guanda, Milan).
8. Brera G., 1976, *Storia critica del calcio italiano*, Bompiani, Milan.
9. Marchesi A., 2016, *Un luogo chiamato stadio: i teatri dello sport tra divertimento, aspetti sociali, tecnologia e business*, Maggioli, Santarcangelo di Romagna.
10. Montale E., 1987, *Trentadue variazioni*, Libri Scheiwiller, Milan, p. 80.

Quality and Safety in Sport Facilities

Organisation, management and control of Media Marketing through the evolution of Ticketing

by Fabio Verga



In the world of sport events and entertainment in general, the application of evolutionary ticketing technologies, or the use of the media for access control, is fast evolving.

The notion of tickets exclusively used for access control is largely a thing of the past, bound to be replaced by a system with larger implications, concisely defined as *media marketing.* The ticket is a commonly accepted tool even in collective imagination. Used by millions of people, it implies a variety of aspects concerning safety, economy and marketing development. Ticketing generates countless job opportunities – it covers a sector now in remarkable development thanks to the use of new technologies – such as *Social Media Marketing*[1] – which expanded its potential for growth.

In order to analyse development scenarios, we will use the definition of "access code" rather than the traditional "ticket". The notion of *ticket* is closely related to the physical existence of a piece of paper, while the access code evokes the concept of media and virtuality and, while it retains its purpose of monitoring the access of people to certain events by development, it additionally includes a range of other functions. The access code mainly incorporates three functions – purchase price, user services and safety.

Purchase price defines a function of access validation the provider uses in order to collect the money paid by the spectator who wants to participate in an event.

User services include both the ownership of an access code (which grants a range of benefits including the possibility of participating in the event), and a guaranteed numbered seat. This category also includes the possibility of purchasing the ticket online in advance[2].

Safety defines the precise correspondence between the number of people at the event and the number of people admitted per regulation. This is an essential condition for the audience to enjoy the event without any risk. Unfortunately, we are well aware of the tragedies the lack of such correspondence may and actually did engender in the past. A dramatically clear example in this sense is the 1985 European Cup final played by Juventus and Liverpool at the Heysel Stadium in Brussels when 39 people lost their lives before the match started[3]. That tragedy was mainly the result of a management mishap in the ticketing system. Since there were no systems for monitoring the number of accesses through the gates, certain sectors became overcrowded. A minor clash between supporters ended up in a massacre. More recently, in 2010, a similar tragedy was going to happen during the warm-up match (with free admission) between Nigeria and North Korea played at the Makhulong Stadium in Johannesburg (South Africa). A hasty organisation resulted in serious flaws in ticketing management. Many thousands of people with no ticket showed up at the entrances and created serious disorders[4]. Therefore, ticketing organisation is an essential process as

it covers the safe management of events and their hosting installations. In Italy, ticketing activities have an additional function due to existing legislation on the subject: providing tax authorities with the certainty of collecting what is due by law over the revenue. In Italy, public entertainment is one of the rare businesses where tax evasion is almost non-existent. The set of rules its accounting system is based on guarantees a mathematic and watertight correspondence between number of sold tickets and sale price. Tax authorities record such correspondence and collect certain percentages established by law for public entertainment events. Unfortunately, due to a weak regulatory framework and conflicting laws, the practical application of the system is far from easy. Each entertainment category is associated to a precise VAT rate, which varies from event to event (museums, movie theatres, concerts)[5].

A public event for which an admission fee is required implies that a percentage of the money paid by each spectator be transferred to tax authorities. In order to guarantee the certainty of obtaining such amount and preventing any kind of fraud, the Revenue Agency requires the use of "certified ticketing systems". Such ticketing systems comply with a set of electronically defined parameters developed by the Revenue Agency, and record every operation elaborated by the system. After conformity clearance, the legal entity submitting for certification receives a set of smart cards[6]. The technical staff of the company who want to certify their software must apply to the Revenue Agency in order to ascertain the presence of any flaws that would allow for the release of tickets outside the registration system. As soon the system passes this kind of control, it receives the required certification and the smart cards released by the Agency are registered in the Revenue Agency's central server. From then on, the company may use such ticketing system. When the turnover goes through a certified ticketing system, it records every operation and calculates the amount due to tax authorities in a way that guarantees the taxation prescribed for that activity. The reason why there are companies such as "Ticketone"[7] and organisers do not create their own certified ticketing system is the high complexity of the ticketing system in terms of software, management and reporting. It is far easier and cheaper to license a certified ticketing system rather than owning one. As a result, in Italy and in the rest of the world, several ticketing companies[8] sell user licenses for their certified ticketing software to major event organisers.

Remote Frequency IDentification

In Italy, the failure to develop the notion of *customer satisfaction*[9] for ticketing resulted in the failure to develop efficient accessory services for users. When we visit a theme park, the ticket we buy only provides access to

the park – we should pay separately for any additional purchase within the park. This is a seriously damaging issue for marketing as it is an obstacle to consumption.

In other countries, sport and entertainment facilities generally tend to encourage customers, perhaps unwittingly, to spend more. In ethical terms, this action does not translate in higher prices, as customers are free to buy whatever additional services or goods they desire. RFID-related (*Remote Frequency IDentification*[10]) systems and the use of ticketing as *media marketing* encourage customers to spend more only if they want to. Originally developed in the United States and Middle-Eastern countries, this system has its main proponent in the Walt Disney Company that applies it to all of its theme parks.

Another example is the Yas Waterworld water park in Abu Dhabi[11]. The park provides visitors with electronic RFID wristbands they can charge on money. The entry fee as well as payment for additional services or merchandise purchased within the park are charged on the wristband. Visitors may require a refund for unused credit when they exit the park.

The Johan Cruijff Arena in Amsterdam uses this system for food and beverage purchases wherever cash payments are not available.

The introduction of such ticketing technologies opens to multiple possibilities for commercial and marketing exploitation of sport and entertainment events. It is essentially the concept of prepaid cards that usually imply discounts related to the value of the card itself. For example, Arena Advisory, the company managing the Johan Cruijff Arena, had a 70% increase in purchases thanks to the prepaid card system and RFID chips in grandstand seats. Almost all the seats in the stadium are equipped with RFID chips associated to seasonal or occasional tickets. The access code contains the same chip that triggers the seat's opening/closing mechanism every time the customer draws close to or away from it. This easy system encourages an increase in food/beverage purchases because spectators do not need to worry about their seat being occupied by others. Additional services (such as lockers or baby stroller lease[12]) can be associated to the access code as well as the credit available for purchases within the facility. From an emotional point of view, there is a huge difference between increasing the ticket price by providing additional benefits and the systems based on this kind of cards, which allow for different configurations and service packages designed for different user groups, with high levels of on-demand customisation[13].

Access monitoring

Access monitoring is a second functional aspect worth analysing. Once the ticket has been issued, access codes must be controlled or validated. The easiest system is the one used in movie theatres. A certified model records the operations and eventually a ticket officer physically rips the ticket. This is only possible where the flow of spectators is very low (200-300 people). No theme park, sports hall or stadium could ever use this system due to the crowd of people and the ease of circumventing control.

Any large facility uses an access monitoring system that authorises valid access codes in order to guarantee fraud prevention as well as safety. The valid ticket becomes null once access is granted.

The supporter card[14] and "DASPO"[15] systems generate so-called *white* and *black lists*, as they rely on monitoring systems that can block undesired accesses. Voiding an access code upon entrance might seem trivial – actually, tickets for multi-day events are equipped with algorithms that only make them valid for a certain day so that the illicit reuse of the ticket becomes impossible. These are crucial issues in terms of functionality, space management and design of the location and types of the different gates, also and particularly for the planning of visitor flows.

"Paperless tickets" – a notion introduced by a Revenue Agency measure on March 4, 2008[16] – which allowed the liberalisation of paperless tickets, not contemplated up until then, represent the major development for the future. This measure allows for the dematerialisation of tickets, which are associated to a digital entity. The system issuing these tickets is duly certified by the Revenue Agency. The hand-held code scanner used by train controllers, for example, is a certified access monitoring system. Once the ticket becomes void, Trenitalia pays the taxes corresponding to the collected amount. Such technology allows for the development of further marketing – and ticketing – related approaches.

As a result, it is now possible to sell a ticket that includes a coffee, a drink that would cost 90 cents if prepaid rather than 1 euro. From the point of view of service providers, this is an advantage. Every ticket guarantees an additional 90 cents to the cost of the ticket itself. The result is a positive cash flow – the money prepaid for coffee can be used to create cash flow for investment and to generate interest income. This trivial example illustrates the opportunities ticketing systems offer by relying on mostly simple technologies already widely used in other sectors.

Since there are two systems – access monitoring and ticketing system – the easiest solution implies that both be managed at the same time in an integrated frame. An example is the San Siro Stadium in Milan, used by both Inter and Milan football clubs, where a certified ticketing system incorporates the access monitoring function. Conversely, at the Monza Circuit, the

venue for several events including Formula 1 and Superbike races respectively managed by F.I.A[17] and FG-GROUP[18], the ticketing and monitoring systems are not necessarily integrated. Both the Monza Circuit and the event organisers have applied for certification from the Revenue Agency of an integrated system for a better service to both spectators and tax authorities. Otherwise, the paradox would be that the tickets issued by a system would not be compatible with the other system, or that the monitoring system would not be able to interact with the ticketing system. Once the system becomes integrated or the *bridge* (interface between two different systems) is certified, the dialogue with the Revenue Agency becomes possible.

Specific regulations for football stadiums and dematerialisation of tickets

In Italy as well as in many other European Union countries, football has a major peculiarity – it is the most popular sport event in terms of ticket-buying spectators, for either one-time or seasonal tickets. For this reason, there are specific regulations for football, some of which are quite interesting in light of the issues discussed in this book.

It all began in 2007, in the aftermath of a tragic crime – the murder of police inspector Filippo

Raciti during a football match in Catania. In the aftermath of that event, the government enacted a set of measures in order to curb violent episodes usually occurring in stadiums. A specific regulation – MD. 15/8/2009[19] – introduced mandatory personal tickets as well as a recognition system based on supporter cards. The main goal of such measure was preventing the sale of tickets to people barred from accessing the stadium – the so-called DASPO. The introduction of personal tickets was the first step to create black lists of such subjects.

The measure is incomplete due to a jurisdictional conflict between the MD and the Italian law concerning the protection of sensitive data, commonly known as privacy law, according to which private companies (including all sport clubs) cannot access the criminal records of individual citizens. The question is – how can a sport club create black lists of individuals subjected to DASPO if it cannot access their criminal records? As of today, all the Prefectures in Italy that provide sport clubs with data about banned individuals based on the DASPO measure are in gross breach of the law. While they comply with regulations about safety in stadiums, at the same time they breach the law on the protection of sensitive data. A possible solution to this issue was the enactment of MD. 15/8/2009, which created the State Police central server for data processing. This database requires all certified ticketing systems to interface with the central service in order to check the name of every individual purchasing a ticket. Unfortunately, since this tool remained on

paper and never became operational, all the related issues remain pending.
The following step was the creation of the supporter card, an ID card every fan wanting to purchase a seasonal ticket or follow the team in away matches must necessarily have. Unlike the above-mentioned decree, the card has had a very positive – and, curiously enough, unplanned impact. In fact, its creation implied the definition of a measure about dematerialised, or paperless, tickets. "Telepass" is the most obvious example of paperless ticket – although it is a perfect profiling system, it did not appear as controversial as the supporter card upon its introduction. While such tools provide huge benefits, their flaw is that they generate a remarkable amount of sensitive data and therefore encourage a more general meditation on the issue of privacy and on whether it is the case to propagate sensitive personal data.
In general, the system's goal is developing the notion of *customer care*, which is still far from established in Italy. Once you purchase your ticket, the manager/organiser's relationship with you as a customer is over. The systems illustrated above, instead, make the principle of *customer care* entirely possible and easily implementable through the extrapolation of individual data, even through the knowledge of customers' tastes (*social media marketing*). To go back to the example of possible use, if a customer habitually drinks coffee during sport events, it is possible to create a commercial relationship and establish sponsorships based on the exchange of information about preferences. Obviously, the boundary between opportunism and virtuous use of personal data aimed at customer satisfaction and commercial development is quite blurry.

Conclusions

Over the next decade, ticketing-related technologies and commercial approaches are bound to change the way people experience an event by redefining the relationship between spectator and show, between user and venue. Not only major installations – stadiums or sports halls –, every place of social gathering in the contemporary city – universities, stations, airports, museums will be affected by this change. The utopian – but not so much – goal is creating a sort of customised event for every single spectator, who would be actively, rather than passively, enjoying it – an actual subject known for his/her tastes, preference and habits rather than a number printed on the ticket and on the seat.
While in Italy the definition of such event-related digital and virtual infrastructures still lags behind, our country is bound to address this compulsory and unavoidable transition in order not to fall too far behind more technologically and commercially evolved contexts.

Notes

1. The purpose of *Social Media Marketing* is generating visibility on *social media*, virtual communities and 2.0 aggregators. *Social Media Marketing* relies on a set of practices including management of online relationships (PR 2.0) and SMO-Social Media Optimisation. Social Media Marketing commonly denotes the management of integrated communication on all the platforms Web 2.0 has made and constantly makes available (social networking sites, photo-video- and slide-sharing, 2.0 communities, wiki, etc.). The peculiarity of such platforms is that they are not owned by the company (or the individual) who wants to establish such relations. The goal of *Social Media Marketing* is creating conversations with users/consumers. Through its corporate blog or social networking sites, the company has the opportunity to establish a one-on-one relationship between sender and receiver. The viral marketing action developed on YouTube or other video-sharing websites is a common example of Social Media Marketing.
2. Resulting in the paradoxical phenomenon of on-line queues.
3. The Heysel disaster – where 39 people (including 32 Italians) died and 600 more were injured – occurred on May 29, 1985, shortly before the start of the Europe Cup final between Juventus and Liverpool at the Heysel Stadium in Brussels.
4. «The Makhulong Stadium in Johannesburg where the disorders occurred, has a capacity of 10,000 seats, which remained mostly unoccupied. When the match was going to start, thousands of mostly Nigerian supporters tried to push through at the gates. The match resumed regularly after the incidents» (www.repubblica.it).
5. For some of them, however, it is difficult to establish the actual nature. In the case of the Harlem Globetrotters, for example, it is unclear whether it is family entertainment or a sport event.
6. A smart card is an electronic device with an internal chip used for identification services and designed to process and store high-security data of various kinds.
7. With several million tickets sold through its multi-channel platform, TicketOne (established in 1998) is the top company for integrated ticketing, e-commerce and marketing services for music, cultural and sport events in Italy.
8. In Italy, the best known ticketing and online providers of tickets for any kind of event (sport, cinema, theatre, concerts, conferences, etc.) are TicketOne, Vivaticket (Best Union Company), ticket.it, mailticket, ticketclick.it, ticketitalia.com, among the others.
9. The set of methods and models implied by this economic term measures the degree of customers satisfaction.
10. RFID (*Remote-Frequency IDentification*) denotes the technologies for the automatic identification of data from electronic tags or transponders through radiofrequency.
11. The Yas Waterworld water park in Abu Dhabi is close to Ferrari World and the Yas Island entertainment centre. With a 15-hectare surface, it is the largest water park in the capital and features a thrilling experience including 45 rides, slides and attractions. The Yas Waterworld theme is inspired to a legend that represents the culture of the Arab Emirates and of local heritage.
12. A service provided, for example, by Ferrari World in Abu Dhabi, the first Ferrari-related theme park. It offers a racetrack, a theatre, 20 attractions, 3D movie theatres, a gallery of historical models, a reproduction of the paddock and a miniature Italy, as well as Formula Rossa, the world's fastest rollercoaster with a speed of 0 to 240 km/h in less than 5 seconds. Aldar Properties, the main real estate developer in Abu Dhabi, owns the park, while Farah Leisure Parks Management LLC, a joint venture between Aldar Properties PJSC and ProFun Management Group Inc. (international entertainment facilities) is responsible its management.
13. The reactivity of these systems, as far as marketing is concerned, is endless. Should you want to advertise a restaurant within a theme park, you may offer a 50% discount for that restaurant directly on the RFID card. Adding or removing such promotions is a fast and flexible process.
14. The supporter card is a fidelisation and identification tool introduced by Italian football clubs since the 2010-2011 season in order to make their relationships with fans more transparent and to improve safety in stadiums.
15. DASPO (acronym of Divieto di Accedere alle manifestazioni SPOrtive) is a measure introduced by Italian legislation in order to curb the growing phenomenon of violence in football stadiums. It results from art. 6 of Law n. 401, 13/12/1989 (ban from any sport events in sport installations).

16. On March 4, 2008, the Revenue Agency issued the measure n. 2008/22799 (c.d. *dematerialisation of tickets*) "Disciplina delle modalità di controllo accessi automatizzato per i titoli di accesso emessi anche in forma digitale e di trasmissione telematica dei documenti riepilogativi dei sistemi di emissione e di controllo accessi". Through the introduction of digital tickets, it allows to streamline ticket sales and speed up the flow of spectators by interacting with the electronic systems placed at entrance gates.
17. F.I.A., or *Fédération Internationale de l'Automobile*, is a federation of about 150 *Automobile Clubs* from over 100 countries across the world representing almost 100 million drivers.
18. Established in 1975, FG-GROUP operates in the sport, events (concept and organisation), marketing and communication sectors. It also provides architectural, engineering and technological services. With over 35 years of activity, FG-GROUP has created over 1,000 programs in five continents with over 30 million paying spectators.
19. DM. 15/8/2009, "Accertamento, da parte delle questure, della sussistenza dei requisiti ostativi al rilascio di accesso ai luoghi ove si svolgono manifestazioni sportive".

Sport and Public Space

The role of sport infrastructure in the evolution of the city

by Maria Pilar Vettori

Sport infrastructure and open city

Since the very beginning, sport practice has represented one of the main indicators of social progress. Likewise, its related infrastructural system currently represents an increasingly relevant parameter of urban quality in terms of programs, actions and strategies and not only at a material level.

While the discussion promoted by urban sociology as early as the 1970s already indicated leisure as a right to aspire to, now the use of places and spaces for its practice is an integral part of such right as well as a foundational element of an «ethics for the open city»[1].

Within such scenario, the recent evolution of sport infrastructures has emerged as a ground for experimentation through the implementation of social-environmental policies and urban rehabilitation programs aimed at promoting new and high wellbeing and sociality standards.

Over the last few decades, the focus on health issues, closely related to the quantity and value increase of leisure, has affected the perception and configuration of the infrastructural system devoted to recreational-sport activities in a way that has put it at the centre of a wider meditation on the new roles and meanings of public space.

The recent strategies for the implementation of urban livability, mentioned by specialised literature as a substantial contribution to urban regeneration and territorial marketing actions, involve policies and actions about sport installations by highlighting their paradigmatic impact on the debate about the city and the quality of its spaces.

The overall picture, easily perceivable at a media level, which characterises the sport/society relationship, currently a rapidly evolving context with a growth in the demand of spaces and services for sport practice at every level – from recreational to professional levels, is equally meaningful.

The requirement to create venues for sport practices is matched by the requirement for spaces where leisure is dedicated to self-care, wellbeing and health. Just consider the recent marked increase of some expressions of recreational and semi-competitive sport, which have redefined the city as an open and widespread system – informal, urban sports positively affecting and redefining problematic areas. The city becomes the scene for daily and spontaneous events and is positively affected by this phenomenon. In the age of social networks and constantly shared information flows, sport events can attract thousands of people on a daily basis and thereby affect the reference contexts and the habits and customs of the collectivity at every level.

The counterpart of the global and globalising dimension of sport and its representation, which requires increasingly complex and integrated facilities, is a capillary and widespread dimension of sport practice. Starting from the same cultural assumptions and thanks to the virtual sharing of information, this dimension is equally if not more relevant for the sport and leisure

industry as it involves increasingly larger market shares. Spectators are increasingly active players in the sport event and physical activity is now a widespread and inclusive practice for every age, social, cultural and geographic group[2].

Such ongoing dynamics reveal that the way people participate in the sport realm is changing and is increasingly becoming an unstructured practice, something that avoids the traditional procedures of federal membership. Sport is increasingly perceived as a tool for widespread mental, physical and social wellbeing rather than a merely competitive activity.

In several urban open spaces, a growing number of people practice widespread and easily activated sport activities such as yoga, fitness, skateboard, as well as more specialised activities such as climbing or more traditional ones such as basketball and golf. Sport identifies the micro-event of daily life, a factor that powerfully promotes social cohesion and is accessible in unregulated ways, as there are no physical boundaries between actor/spectator and playground/public space. The boundary between content and container becomes blurred, fleeting, often provisional and temporary, although not for this less important for the dynamics of urban transformations[3].

On one side, the rise of *sport-business*, triggered by the general transformation of entertainment as leisure, is the reason why sport events have become a commodity to be placed on the market. On the other side, sport installations, not only during major events, have become more visible thanks to the new media that push them as relational hubs and places within the city for the establishment of bonds that go beyond the spatial and physical definition of one's own identity.

Such interpretation of sport infrastructure as an element that can improve the quality of life in a city sector more than a mere container of events or activities expresses its essence in the notions of proximity and compresence by introducing the idea of "social responsibility" in its performance parameters. Developing countries or highly problematic and blighted urban contexts where the facility designed to facilitate sport practice for every user group is one of the centres of gravity of urban regeneration processes are paradigmatic in this sense. A pioneering example is Lina Bo Bardi's project for the SESC Pompeia in Sao Paulo, Brazil[4], where sport facilities (playing grounds, gyms, equipped areas) are the flywheel of the physical regeneration of a former factory and of the social revival of a neighbourhood. Another example is the idea (remained on paper) for a stadium-city in Bari designed by Gianfranco Dioguardi for the 1990 World Football Cup[5]. The proposal intended to make the most of a huge and expensive installation once the sport event was over by developing a network of neighbourhood workshops connected to the stadium's main core. The idea was creating an interaction between hinterland and central core, attracting young people to

competitive sport and rehabilitating Bari's urban blighted areas.
Practicing sport in facilities that, while unconventional, effectively help practitioners find and recognise their own identity, increasingly becomes a key social factor in the evolutionary logics of lifestyles. Designing the city as a huge "outdoor gym" through the rehabilitation of abandoned buildings or entire urban sectors in order to make them once more available to the community is a highly topical issue.
Widespread sport is an effective way of injecting regenerating tissue within the urban interstices with social impacts in both socio-economic terms and on the quality of open spaces. Such processes evoke what Renzo Piano defined as «urban mending»[6] or, in sociological rather than just morphological terms, as «urban acupuncture»[7].
Thanks to such practices, which exist alongside large – and middle – sized installations, the city and its urban voids become the ideal venues for parks, equipped areas, biking tracks, etc.
Within this perspective, a major event is simply an element within a movement whose boundaries are not easily definable. *Street* sport, *spontaneous* sport, *widespread* sport is reclaiming the shapeless and informal, abandoned and blighted spaces of urban and outer-urban landscapes, in turn defined as the «third landscapes»[8] of this age. In this way, new ways of practicing sport and physical activity emerge through a direct interaction and interface between physical space and place of movement.
These new-concept "minor", and even major", sports are active elements in the modelling of the new public open spaces. Sport programs, integrated and reframed with wellness and leisure activities, are increasingly at the core of the system as the backbone of complex functional programs for urban rehabilitation.
On one side, major infrastructural plans related to global sport events characterised by *specialised* approaches; on the other side, specific and widespread actions based on a *participatory* approach. Both share a high level of multi-disciplinarity and complexity.

Public space for a healthy city

According to recent research about the relationship between built environment and healthy living, it is urgent to reverse the prevailing tendency to inactivity and a sedentary lifestyle through governance-level actions and strategies within urban systems in order to reduce health, economic and social hazards as well as the negative impact on the environment. Obviously, the system city generates an antithetical duplicity that may at the same time encourage or discourage physical activity in all the population groups. The role of space infrastructure was recognised as essential as early as about

ten years ago, when the European Union's *Sport & Health* Working Group defined the principles of the *EU Physical Activity Guidelines. Recommended Policy Actions in Support of Health-Enhancing Physical Activity* (2008)[9]. According to one of the principles underlying current strategies, it is important to bring sport installations to the people rather than bringing the people towards sport installations.

According to such approach, public space is the core of any action as the urban element closer to society. The vision now propagated is that the city may become a collective playground in response to the fact that «Life in the city is always evolving and it is our job as architects to make sure that our opportunities for expression aren't limited, and that our cities match the life we want to live»[10].

Even the current economic situation plays a substantial role in the reconsideration of the management of shared resources by generating a fully-fledged demand for public equipped spaces by the citizens, which guides urban planning[11] and concretely affects the urban ecosystem regardless of the scale of interventions.

The evolutionary dynamics of the programs promoted in terms of enhancement of the infrastructural system highlight an approach to such issue mainly viewed as equipment and enhancement of public space. The sport infrastructure becomes a space related with other spaces rather than an independent element that does not interact with the urban system.

This approach is perceivable on a double level. On one side, the design of stadiums and sport installations that interprets their accessory equipment as outer parking and connection areas based on the complementarity with the urban system so that they integrate and replace rather than add to the city's functional framework. While such actions must necessarily come through as the result of highly integrated policies based on multi-scale plans affecting different socio-economic fields, on the other side they are necessitated by a vision that aims at curbing land consumption and enhancing a territory like that of the historical European city. The other level is represented by public space that, as a functional, service, integrated and multiple space increasingly incorporates installations for sport practices in synergy with the social role such practices may play. Such management of the sport system at the different scales relies on an interpretation of the environmental issue based on more than mere containment of energy and natural resources consumption and rather focused on the issues of urban compactness and of a correct balance between place identity and use of public spaces[12].

Urban density currently represents a top indicator in the definition of performances of the new city. Just consider all the urban regeneration programs that successfully connect a multiplicity of functional sectors. In this perspective, the creation of new sport installations is based on the two-fold

goal of enhancing a range of well-established central areas and at the same time activating new ones by providing responses and at the same time creating new issues and reconnecting the different performance requirements in an interacting community system. On the other hand, if the compactness of the built fabric and the articulation of its networks contain sprawl and promote actions in favour of a sustainable mobility, several actions show how the sport infrastructure becomes a substantial system that structures the productive dynamics of the city rather than a parallel and integrative one.

Assuming that the city, in its different dimensions, currently represents the model with the highest concentration of factors with a critical impact on the health and wellbeing of people, the system of sport services is the main element in the pursuit of efficient and dynamic solutions for the rebalance of its propagation. The architectural debate in the European context is currently offering important contributions in terms of innovative design and implementation of plans aimed at combining urban development issues and essential institutional-level sustainability policies.

Programs like Urbact 2017's *Health in Public Spaces* emerge as different declinations of one innovative approach that, particularly in Northern European and Anglo-Saxon countries, guides the strategies for the urban regeneration and construction of new parts of the city by simultaneously involving the realms of digital innovation, social cohesion and evolved infrastructural design.

Based on the assumption that, as defined at the Community level, physical activity is «any bodily movement produced by skeletal muscles that results in energy expenditure above resting level»[13], several studies and researches explore the relationship between the benefits resulting from physical activity and urban environment, and recognise the key role the city and its elements play in the improvement of the quality of life.

A cross-disciplinary and integrated approach is an essential operational condition. Researches promoted in cooperation with the corporate sector such as *Active Cities Designed to Move*[14], or European-scale networks such as *Vital Cities*[15] confirm the relevance of a program that must rely on public/private partnerships at every level and on the principle according to which the urban environment and its planning must create opportunities for physical activity.

The technological networks and the performance they offer emerge as an additional tool for the shaping of such infrastructure in synergy with mobility networks and the development of structured public open spaces in order to guarantee comfort, safety and environmental quality as well as time and space flexibility.

Beyond the media coverage they attract, large-scale programs promote the perception of places as sequential spaces of the collectivity organised within a flexible system, mutually connected as required by the changing needs

and diversified goals of urban transformation. Infrastructure design redevelops urban space by enriching its identity, quality and representation value in order to project it as a reference realm for public life and to engender a sense of belonging in its users within an idea of a cohesive and safe city.
One of the missions of the World Health Organisation, as stated in the document *Physical Activity Strategy for the European Region*, is ensuring «an enabling environment that supports physical activity through engaging and safe built environments, accessible public spaces and infrastructure»[16]. This means a development of urban districts aimed at promoting small-scale programs for the encouragement of sport activity as complementary with the general redesign and rehabilitation of blighted public spaces inspired to successful examples of the feasibility of such policies. For example, there are several European cases of social regeneration programs aimed at the construction or modernisation of public outdoor playing fields integrated within parks, squares, common grounds, such as the *Merida Youth Factory*[17], or at environmental regeneration such as the Benthemplein Water Plaza in Rotterdam[18]. Beyond the European context, a multitude of actions that project sport and its facilities as the core of socio-urban regeneration includes the *Gymnasio Vertical* in Caracas[19], or the programs promoted by the "*love. fútbol*" non-profit organisation, established in Brazil and currently operating in several cities across the world[20].
Therefore, the main element in the redesign of new infrastructural models is the citizen, who gets to play an active and independent role in local participation processes designed to generate solidarity and social responsibility, traditionally related to the programs for the development and enhancement of public services and social spaces.
In particular, several ongoing policies intend to make the most of available human resources by involving different social and age groups and by promoting the interaction between different population groups – residents, workers, seniors, young couples, and children.
Besides there is the major role the promotion of an accessible and shared sport infrastructure plays within the range of topics related to a healthy city. The variables of safety and its protection, as well as the promotion of a culture of health and psychophysical well-being are transversally featured in the different programs proposed, which imply an articulated chain of services and solutions for different age groups as a structuring element of the entire strategy.
Over the last decade, the example of Copenhagen represents a benchmark index. In the Danish capital, the partnership between research institutions and the third sector has resulted in the definition of guidelines for the integration of sport within the urban environment with positive outcomes in the general balance resulting from the gradual investment in public space since the 1970s. Beyond the well-known results in the implementation of soft and

sustainable mobility and in the marked decrease of car traffic with objectively quantified benefits in terms of even economic prosperity, the Danish city addressed the social inclusion of minority ethnic groups and blighted areas marginalised by the economic transformation of port and industrial sites through the integration between public space and collective (cultural, sport, social) programs.

Besides the well-known *Superkilen Park*[21] that, through a public participation process, redesigned a large area as a sequence of public spaces where sport activity plays a key role at the service of the local community and as a tool for social inclusion of over 60 different ethnic groups living in the area, several redesign programs of public areas rely on sport facilities as a foundational element of sociality. Linear parks, squares, equipped itineraries, waterfronts.

Such programs necessarily depend on overall governance guidelines. In 2014, in the UK, a committee about physical activity was established based on the *Design to Move* program in order to encourage new cross-disciplinary approaches to the national-scale issue of physical inactivity. One of the many initiatives was *Active by Design*[22], the goal of which was the development of studies and researches on the design of new urban spaces and the redesign of existing ones.

The Italian program SMAR-TRACK promoted by FIDAL (Federazione Italiana di Atletica Leggera) shares the same strategic vision. Its goal is encouraging policies for the modernisation of sport installations based on the concept of *athletics playground* and "zero-mile installations", in order to promote socialising activities, and for the acknowledgement of the high social and environmental value of sport disciplines as a potential tool for the rehabilitation of blighted urban areas[23]. A close spatial integration can create new ideas, products, services and institutions and thereby contribute to the economic success of the entire, either new or regenerated, urban sectors. A layered multi-functionality offers the availability of a range of easily accessible daily public services for leisure and retail.

The design of a sport infrastructure, and therefore the design of a sector of urban landscape, develops a system of relations and multi-scale dynamics inherent in the definition of collective space. The design approach expressed by recent experiences reflects an innovative idea of city that focuses on multiplicity, heterogeneity, contrast, combination of layered elements – urban space is conceived as a ground for the interaction of diversified design methods including the cultural and identity experiences expressed by its residents. In this perspective, the space of sport event and practice plays an increasingly important role in the process of use of the city viewed as a place of activity as well as of encounter.

Beyond the relevance of the theme as an aggregation of social and anthropological representations, there is a more practical aspect related to the

rethinking of the relationship individuals have with space and the territory. This issue necessarily relies on a systemic vision, although with extremely diversified solutions and scales of intervention. At the same time, it must rely on a cross-disciplinary, participated approach based on a collective culture of responsibility and on the recognisability of places that exceeds the real measures and the understanding of the reasons for its implementation. The examples of some European contexts may offer, even to other situations like the Italian one, a possible trajectory, although with different levels of specificity. Starting with a new approach to design, hopefully focused on multi-disciplinary teams and on participation processes involving the different stakeholders; the promotion of new forms of public-private participation and organisation of decision processes; the application of innovative management models focused on a rational management of economic and energy resources; the definition of targeted strategies of procedural, financial and implementation feasibility. Such strategies may be shared by different situations by incorporating the social and environmental sustainability guidelines issued by the European governing bodies and by strengthening the role of sport infrastructures as the actuator of «social maintenance»[24] that, through the involvement of the users of buildings, should be hopefully implemented on the architectural heritage and environment.

Sport infrastructures between education and training

Access to sport practice has always reflected the social values of democracy, equality, sharing and social cohesiveness. The sense of "belonging" it generates by creating new aggregation principles in the logic of a spatial public-private *continuum* often erases the boundaries between spaces of different nature, promotes a sharing of services and the enhancement of a self-centred system that generates a widespread sense of "community" against the processes of material and immaterial deterritorialisation that negatively affect the territory.

The emergence and propagation of mass media increasingly tend to subvert the traditionally central role of the sport venue, be it a stadium or a sport hall, and promote their opening towards the surrounding context. Therefore, it is essential to recognise and interpret the relational system that deconstructs the new forms of centrality and defines new development modes in favour of urban marketing initiatives, renewed economic investment models[25], and new aggregative forms based on adequate models of user mobility and enjoyment.

In an age of increasing fragmentation and disintegration in physical-architectural and urban terms and from the social and cultural point of view, the educational role of sport and of the aggregation spaces where sport itself

acquires a foundational aspect, becomes central[26]. The cultural aspects underlying the sharing of sport-related values are directly connected to educational and recreational facilities in general. Just consider the widespread sport activities practiced in church recreational centres, which represent actual cells of social regeneration at the neighbourhood and district scale.
However, despite the value of pioneering or spontaneous experiences, the main obstacle to the development of such approaches is the lack of resources for non-organised sport activities.
The extensive body of literature on this issue reveals a general awareness of the influence sport may have on several social problems as well as on the quality of life and health[27]. At the same time, a lack of systematic monitoring of the phenomenon also due to a difficult quantification of the benefits resulting from spontaneous or short-term activity also emerges. It would be necessary to understand the relationship between participation processes in sport and the use of existing infrastructure in order to define the potential for new interventions. In this sense, public institutions play an essential and irreplaceable role as they support the construction and maintenance of sport infrastructures and are aware of their meaning and relevance in social terms. The relationship between education and sport has always been synergic and mutual in the promotion of a culture of health and in the development of the civic sense of a community and the culture of a society.
It is no coincidence that public space in university campuses currently represents the filter of the relationship of the city with the institution, its players and users. In a way that increasingly involves different scale relationships, university sport installations and their related open spaces emerge as urban and social regeneration tools. At the same time, sport practice is increasingly an integral element even in the university educational path as it plays a role as a tool for sharing, social integration and health promotion.
The dynamics resulting from such situation may be direct when the very physical presence of installations and their programs already acts as a qualifying factor in the urban sector. They may be also indirect when the intervention results in an enhancement of infrastructural equipment, in the development of a new local identity and social and health-related initiatives.
There are several examples in this sense both at the European and at the global scale. The most relevant include the recent programs developed within the campuses of the Columbia University in New York (Campbell Sports Center, Steven Holl); the Paris-Saclay campus (multi-functional building, Studio Muoto); the Jacobs University in Bremen (Sports and Convention Center, Max Dudler); the University of Birmingham that invested £55 million in a Sports Center open to the population as well as to its students and scheduled to host some of the events for the 2022 Commonwealth Games; or, to show that the relevance of this issue exceeds the intervention scale or

economic investment, the Universidad Francisco de Vitoria in Madrid with its recent multi-sport pavilion designed by Alberto Campo Baeza.
Besides the often multi-rather than mono-functional building complexes – due to the large surfaces that may be used even for events other than sport competitions, such as conventions and educational programs – there are multiple re-infrastructuring programs of open spaces, which, thanks to the promotion of institutionalised policies for soft mobility and synergy with public transportation, are redesigned and equipped for outdoor activities, rest, prolonged enjoyment, sociality.
The programs currently under development in Italy, where the issue of the intensive use of urban areas is very important although there is an unquestionable need for the adaptation of university facilities to international standards also in structural and infrastructural terms, involve several large universities and related urban campuses. These include, for example, the campuses of major Milan-based universities such as Bocconi, Università degli Studi di Milano, Politecnico di Milano, within a scenario of multiple initiatives for the enhancement of existing sport installations and open spaces for sport practice. The programs involving material facilities are complemented by the initiatives for institutionalised promotion of sport through specialised educational programs, incentives for competitive-level practice, promotion of events and competitions according to principles that encourage the development of an identity and sense of belonging as qualifying actions for high-profile universities.
Polytechnic culture, in particular, offers a remarkable potential also for the development of research and education. Similarly to what happens in European contexts, such as the Technische Universiteit in Delft with the establishment of a Sport Engineering Institute, which develops research and education at various levels[28], Politecnico di Torino activated a Sport Engineering Master program focused on management, while during the last decade Politecnico di Milano has increased its educational offer in the field of sport infrastructure through second – and third – level programs and masters[29], which complement the research programs established with the main institutions in the sport sector (Sport e Salute Spa, formerly CONI Servizi Spa, FIGC)[30].
Hopefully, in Italy too, the enhancement of university sport installations, the promotion of which is still based on legislative measures enacted in the 1970s[31], may find developments and perspectives in current urban renewal policies, and contribute to the redesign of the city and to the development of its society.
The meaning of sport installations as places of sociality has deeply changed in terms of its perception, due to the current opportunities for technological, economic, sociological and cultural development. The social and

cross-disciplinary processes triggered by the planning of complex multi-functional sectors fit into the scene of a general change that, in more or less radical ways, affects the majority of the urbanised territory.
Given its historical role, sport should not refrain from adopting an ethical approach in terms of social protection by developing guidelines and codes that may reaffirm the educational impact this realm has always incorporated.

Notes

1. Sennett R., 2018, *Costruire e abitare. Etica per la città*, Feltrinelli, Milan.
2. According to a 2015 estimate, over 20 million people aged 3 and over practiced one or more sports continuously (24.4%) or occasionally (9.8%). The rate of those who practiced sport on the total population of 3 years and over was 34.3%. 26.5% of the population did not practice a sport but did a physical activity like long walking or cycling, gardening, etc. (15 million 640 thousand). Data from ISTAT, *Anno 2015. La pratica sportiva in Italia*, October 19, 2017.
3. The anthropologist Marc Augé also studied sport. In his book about football, the most popular mass sport, he highlights the two-fold nature of sport as a practice and a spectacle, and its nature of social phenomenon between professionalism and recreational practice (Augé M., 2016, *Football. Il calcio come fenomeno religioso*, EDB, Bologna).
4. Lina Bo Bardi's design (1977) was part of a national-level social program promoted by SESC (Serviço Social do Comércio) with the goal of developing adequate facilities for sport practice and cultural activities for disadvantaged residents and, at the same time, providing physical regeneration for their surrounding context – an old metal drum factory transformed into a 16,000sqm social attractor and "leisure container". The Italian-Brazilian designer applied a "global" approach to the project by studying it throughout, from the urban plan to the architectural design, from the interiors and furniture to the teams' jerseys. The "vertical" sport centre is developed within two of the three towers of the complex. Gyms and a swimming pool occupy five stories in one tower, while dance halls, gyms, bars and lockers occupy eleven stories in the second tower.
5. Faroldi E., Allegri D., Chierici P., Vettori M.P., 2007, *Progettare uno stadio. Architetture e tecnologie per la costruzione e gestione del territorio*, Maggioli, Santarcangelo di Romagna.
6. The term "mending" evokes the practice of "re-stitching" the existing urban fabric by working on all the currently problematic spaces and the parts of the city where there is a lack of relationship between services and people. «Ours is an extraordinary and beautiful country, although at the same time very fragile. Its landscape is fragile, and its cities, in particular their suburbs, are fragile. In fact, the suburbs are precisely the city of the future. The city that will be, the one we will bequeath to our children. A giant re-stitching work is necessary, and we need ideas for that» (Piano R., 2014, «Il rammendo delle periferie», in *Il Sole 24 Ore*, January 26).
7. The term uses the metaphor of acupuncture, a practice of Chinese medicine, in order to signify micro-interventions for the regeneration of critical, albeit strategic, spots in the city, to trigger a renewal process that will affect the wellbeing of a community. Jaime Lerner, an urban planner and three-term mayor of the city of Curitiba, was one of the early proponents of urban acupuncture in theoretical-scientific terms and based on his hands-on experience described in the book *Acupuntura Urbana*, published in 2003 (Record, Rio de Janeiro) and subsequently translated in Japan (2005), Spain (2005), France (2007), USA (2014) and Russia (2016).
8. The reference is to the well-known notion described by Clément G., 2005, *Manifesto del terzo paesaggio*, Quodlibet, Macerata.
9. *EU Physical Activity Guidelines. Recommended Policy Actions in Support of Health-Enhancing Physical Activity*, approved by the EU "Sport & Health" Working Group on September 25, 2008, and confirmed by the EU Member State Sport Ministers on November 27-28, 2008. It should be noted that *Transport, Environment, Urban Planning and Public Safety* is one of the six *Policy Areas* described in the document.

10. *My Playground* is a 2009 documentary produced by Bjarke Ingels, a main proponent of urban design processes in Denmark, one of the most paradigmatic contexts for such policies. It questions architects, philosophers, urban planners, politicians and other experts on the relationship between movement and urban space in order to demonstrate how new and emerging sport practices are changing the conditions and boundaries of the city.
11. Specialised literature illustrates the significant phenomena of groups of citizens who are playing an active role in reclaiming public spaces as a way of compensating for the privatisation of public areas. Such "space reclaiming" involves, for example, "active" transportation (*Critical Mass movements*, *No Car Days*, *PARKing Days*, *Ciclovias*), urban guerrilla gardening, the spontaneous use of small fringe areas for independent sport activities, or the programmed transformation of brownfields into recreational facilities such as the well-known case of the Tempelholf airport in Berlin. Closed in 2008, it is currently the largest urban park in the German capital (300 hectares of open spaces for sport and leisure activities).
12. Faroldi E., 2016, «Infrastruttura. La metafora organica tra fenomenologia del sistema urbano e opportunità», in *TECHNE Journal of Technology for Architecture and Environment*, n. 11, pp. 6-11.
13. For further reading, see: *EU Physical Activity Guidelines. Recommended Policy Actions in Support of Health-Enhancing Physical Actuvity* in www.ec.europa.eu.
14. The goal of *Design to Move* is raising awareness on the benefits of physical activity in relation with the urban environment. Promoted by The American College of Sports Medicine (ACSM) and by The International Council of Sport Science and Physical Education (ICSSPE), it relies on the collaboration with NIKE Inc. (www.designedtomove.org).
15. *VITAL CITIES. Urban Sports Promotion for Social Inclusion, Healthy and Active Living* is a network of European cities established by the European Union within the URBACT III program (2014-2020) with the goal of improving social inclusion through the redesign of public spaces in blighted areas by relying on the common language of sport and new actions of urban sport. It works both on the material (installations) and immaterial (IT and services) levels. The network's key topics are the reinforcement of community identity; "IT-based" actions in the redesign of public spaces for leisure; promotion of a healthy lifestyle; design of new physical activities aimed at promoting sport in public spaces; organisation of new events for sport practice and a healthy lifestyle.
16. World Health Organisation, 2015, *Physical Activity Strategy for the WHO* European, Region 2016-2023. World Health Organisation Regional Office for Europe, Copenhagen.
17. The Merida Youth Factory is often referenced in this context. Promoted by the city administration, this low-cost plan for the regeneration of a blighted area in Merida, Spain, was designed by the Selgas Cano firm and called for the introduction of sport installations for various practices – from skateboard to basketball.
18. Developed in Rotterdam in 2015, the Benthemplein Water Plaza in Rotterdam resulted from concerns about climate change. "Water square" defines an urban space for play and recreation that changes due to climate conditions. Equipped with volley and basketball playgrounds and football pitches, as well as a stepped stand in case of rain, it is designed to allow for a "disciplined collection" of rainwater in order to avoid flooding.
19. The plan for the *Gimnasio Vertical* transformed a football installation into a vertical fitness facility at the centre of a high-density slum in the Venezuela capital. Developed on several levels, the complex includes basketball courts, dance studios, a fully equipped gym, running tracks, climbing walls, and attracts an average of 15,000 visitors monthly. Since its inauguration, the crime rate in the neighbourhood has decreased by 30%.
20. For further reading, see www.lovefutbolbrasil.org.
21. Designed by Bjarke Ingels Group (BIG), Topotek and SUPERFLEX Studio, the Superkilen Park is part of a large regeneration program for the Nørrebro district in Copenhagen. Its participated design process involved the local community and over 60 ethnic groups. The users were involved in the definition of the requirement frame in terms of functions, facilities, urban furniture. The park provides facilities for various forms of physical activity – from boxing rings to children slides, skateboard ramps and basketball courts. A biking infrastructure that crosses the entire site and connects it with the city Green Path complements the offer of the linear park.
22. The *All-Party Commission on Physical Activity* was created in Great Britain in 2014 in order to develop new approaches to the inactivity issue at a national level. Its goal is promoting "cross-sectional working" methodologies and participation levels over the national territory

in cooperation with third-sector organisations including the *British Heart Foundation* or the *Young Foundation*. Along the same lines, the Design Council launched the *Active by Design* program in order to encourage designs for new spaces and the rehabilitation of existing ones.

23. Launched in 2015 by FIDAL with funds from the Istituto del Credito Sportivo, the SMARTRACK program pursues the specialised and performance adaptation of athletics installations starting from the awareness of the high social and environmental values this discipline has and of its potential for the renewal of depressed urban areas through the increase of socialising activities. A recent initiative promoted by the program was the Nelson Mandela Park in Sestri Levante, inaugurated on April 2018. A former industrial area was transformed for recreational-sport activities (athletics track, swimming pool, bike park, Nordic walking, fitness), within the perspective of *athletics playground* or "zero-mile installations" promoted by the Federation.

24. The notion of "social maintenance" was introduced by Gianfranco Dioguardi in 1990s. He describes it as providing «actual "procedural plans" with enhanced functions that imply more than mere indications about what and where it is possible to build [...], or tools that can even program the management of what has been built» (Dioguardi G., 2003, *Il Museo dell'esistenza*, Sellerio, Palermo).

25. Given the impossibility for public resources to cover the costs for the variety of required interventions, multiple models are currently under experimentation for providing plans with financial support: from fiscal incentives to the establishment of "*crowd-sourced capitals*" and dedicated funds.

26. Hofmann S., 2014, «Spaces as the Third Education», in Ferguson F., ed., *Make_Shift City. Renegotiating the Urban Commons,* Jovis Verlag, Berlin.

27. Giles-Corti B. *et al.*, 2015, «The Influence of Urban Design and Planning on Physical Activity», in Barton H., Thompson S., eds., *The Routledge Handbook of Planning for Health and Well-Being. Shaping a Sustainable and Healthy Future the Built Environment*, Routledge, London.

28. The *Sports Engineering Institute* established by the TU Delft is active in five fields straddling engineering and biomedical research as well as on "Sports Infrastructure and Facilities".

29. Besides the first – and second – level programs established by the *School of Architecture Urban Planning Construction Engineering*, the I and II level Master in *Sport Architecture* formerly Master in *Design Construction Management of Sport Infrastructure* involves the main institution of sport governance (Sport e Salute Spa formerly CONI Servizi Spa, Federazione Italiana Giuoco Calcio, Istituto per il Credito Sportivo).

30. Agreement between the Federazione Giuoco Calcio (FIGC) and Politecnico di Milano (scientific director Prof. Emilio Faroldi, 2015) established in order to create "Study and research laboratory for the design, construction and management of sport infrastructure, in particular football installations"; Framework Agreement between CONI Servizi and Politecnico di Milano (scientific director Prof. Emilio Faroldi, 2017) aimed at establishing a cooperation among education and research activities about sport installations.

31. L. 394, June 28, 1977, "Potenziamento dell'attività sportiva universitaria".

Biographies of the Authors

Davide Allegri (1974) architect, graduated with honours from Politecnico di Milano in 2002. He received his PhD in *Design e Tecnologie per la Valorizzazione dei Beni Culturali* in 2009 and his specialisation in *Beni Architettonici e del Paesaggio* in 2016 from the same University. Formerly a guest lecturer at Politecnico di Milano, he works as an architect and researcher particularly on sport infrastructure issues. He has written several publications, articles and essays and is scientific coordinator of the I and II level Master in *Sport Architecture* formerly Master in *Design Construction Management of Sport Infrastructure* at Politecnico di Milano.

Silvia Battaglia (1990) graduated with honours in Architecture from Politecnico di Milano. She mainly focuses her research on sport infrastructure and cultural heritage. Her interest in the rehabilitation and enhancement of the built heritage led her to work with several architecture firms. He attended the second edition of the I and II level Master in *Sport Architecture* formerly Master in *Design Construction Management of Sport Infrastructure* at Politecnico di Milano. After collaborating with ABC Department she is currently pursuing a PhD in *Architecture, Built Environment and Construction Engineering* at Politecnico di Milano.

Marco Brunelli (1963). Following his graduation from the University of Bologna, he started to work as a senior economist at Nomisma. Later on, he would become responsible for the study centre of Lega Calcio. Since 1996, he has been Director of the International Master in *Strategia e Pianificazione delle Organizzazioni, degli Eventi e degli Impianti Sportivi* at the universities of Parma and San Marino. As a professor and a coordinator, he is involved in the FIFA Master in *Management, Law and Humanities of Sport*. He was a member of several UEFA and FIFA committees, General Director of the Lega Serie A, as well as member of the governing body of European Leagues and of the World Leagues Forum. Currently, he is director general of FIGC.

Guglielmo Cammino (1988). After working as a corporate consultant, in 2015 he obtained the FIFA Master in *Management, Law and Humanities of Sport* from CIES. Following his experience with UEFA during EURO 2016, he started to work for the FIGC Study and Research Division. He co-wrote the latest four editions of FIGC ReportCalcio and Integrated Report, and contributed to the publication of several articles about sport facilities for "Spazio Sport", the Italian National Olympic Committee (CONI) official magazine.

Dario Cea (1983) studied at Politecnico di Milano and Technische Universiteit Delft. He particularly worked on issues related to morpho-typological innovation in sport installations about which he has lectured at Politecnico di Milano and Università degli studi di Parma within the International Master in *Strategia e Pianificazione delle Organizzazioni, degli Eventi e degli Impianti Sportivi* since 2009. In 2012, he won the international competition for "Urban Planning Rehabilitation of the former Annonaria, currently Cremona City Hub Transformation Sector" with Jacobs Italia e Pietro Chierici.

Pietro Chierici (1971), architect, guest lecturer at the *School of Architecture Urban Planning Construction Engineering* at Politecnico di Milano, he mainly focuses his theoretical and applied research on the multi-scalar declinations of architectural design. As the coordinator of design programs related to the transformation processes of multi-functional areas, he explored issues related to leisure, culture and sport facilities. In his research, he works on the role played by sport infrastructures within urban rehabilitation processes.

Niccolò Donna (1986), following collaborations with Juventus and Lega Serie A, since 2011 he has worked for the FIGC Study and Research Division. He was Bid Dossier Coordinator for the UEFA EURO 2020 bid and Project Manager for the 2019 European Under 21 Championship bid. He is a member of the UEFA HatTrick Committee and in 2019 became director of the Italian FA's Research and Development Area. He co-wrote the book "Il Calcio Conta" with Michele Uva and Gianfranco Teotino, and contributed to the books "Il Calcio ai tempi dello spread" and "Viaggio nello sport italiano".

Emilio Faroldi (1961), architect, is Full Professor at Politecnico di Milano. Designer and awards winner, his works have been published in the main architecture magazines. Among the areas of interest as designer and urban planner, stands out the sports architecture for which he has developed various researches, projects and buildings. He authored several publications and for over a decade has chaired and coordinated the degree courses in *Scienze dell'architettura* and *Progettazione dell'architettura at* Politecnico di Milano. Currently, he is Editor in Chief of the *TECHNE Journal of Technology for Architecture and Environment*, and Director of the I and II level Master in *Sport Architecture* formerly Master in *Design Construction Management of Sport Infrastructure*. Professor of the *International Academy of Architecture*, since January 2017 he has been Vice Rector of Politecnico di Milano.

Roberto Ghiretti (1955) Chairman of SG Plus Ghiretti & Partners, he acted as volleyball manager at the national and international level. He supervised bids for international events. He was manager during the 1993 Ice Hockey World Championship and supervised communication for the 2013 Track Cycling World Championship. He is a professor within the sport organisation, communication and marketing areas for the CONI Central Sport Schools as well as at the main Universities and Masters programs in Italy. He is a professor and member of the Scientific Committee of the International Master in *Strategia e Pianificazione delle Organizzazioni, degli Eventi e degli Impianti Sportivi* at the University of Parma. As a top national sport expert, he has authored several publications. He is vice national director of Special Olympics.

Chiara Manzoni (1979), architect and journalist. Since 2004, she has worked for a number of architecture firms mainly on public works and sport installations. She published several articles for online publications, *L'Eco di Bergamo* and the architectural magazine *Ark*. As a researcher, she worked for the Department of Science and Technologies of the Built Environment at Politecnico di Milano. Currently, she is involved in studies about the relationship among Space, Society and Sport Architecture, notably the technology and accessibility for the deaf people and disabled.

Antonio Marchesi (1946), as a corporate expert, he established and managed Deloitte's *Sport Industry* department. For about a decade, he directed the *Management of Sport Businesses* department at the University of Turin and was a member of the AC Milan Board of Directors for three years. Currently, he is a strategy and sport innovation consultant at P41. He is a member of the Scientific Committee of the I and II level Master in *Sport Architecture* formerly Master in *Design Construction Management of Sport Infrastructure*.

Michele Uva (1964) is UEFA Vice-president, sports leader with remarkable skills in company restructuring and development with a strategic focus on processes of transparency and accountability. He has devoted his entire career to professional sport in several contexts, disciplines and environments. He was CEO in sports organisations such as the Italian Football Association (FIGC), the Italian Olympic Committee (CONI), professional football clubs (Parma and Lazio), basketball club (Lottomatica Roma) and volleyball clubs (Bologna, Treviso and Matera), as well as international consultant expert in sports management and company reorganisation.
He was elected as a member of the UEFA Executive Committee in April 2017, and became UEFA vice-president in September of the same year. Chairman of Club Licensing Committee and member of several Uefa Committees: Finance, Club Competition SA, Strategic Steering, Professional Football Strategic, Women. He authored six books on sport and football industry, and is currently a lecturer for several masters organised by international and Italian universities.

Fabio Verga (1963), after his Law Degree, he worked as an executive planner first at the Forum Sport Hall in Milan, and later at the San Siro Stadium as a vice commercial director for the management company. He was director of a company specialised in safety systems for sport installations before starting a long experience in the Arabic region where he designed and managed monitoring systems for public facilities. Currently, he is Outsourcing Division Manager at the multinational company Adecco, professor at the I and II level Master in *Sport Architecture* formerly Master in *Design Construction Management of Sport Infrastructure* and a commentator for sport broadcasting programs.

Maria Pilar Vettori (1968), architect and Phd, is Associate Professor at Politecnico di Milano. She teaches at the *School of Architecture Urban Planning Construction Engineering* at Politecnico di Milano in the field of technological design. She participated in research and consulting projects, in particular on structures and infrastructure for health, well-being, sport, research and production. She participated in and organised meetings, seminars and workshops, and consistently authored studies and publications. The works she designed and built in Italy and abroad have received awards and been featured in publications at a both national and international level.

Bibliography

Design

Books

- Bale J., 1993, *Sport, Space and the City*, Routledge, London.
- Bale J., 2002, *Sport Geography*, Routledge, London.
- Richards J., 2004, *Stadium and Domes*, Smart Apple Media, North Mankato.
- Broto C., Krauel J., 2005, *Architecture on Sports Facilities*, Links Internacional, Barcelona.
- Sheard R., 2005, *The Stadium: Architecture for the New Global Culture*, Periplus, Singapore.
- Paramio Salcines J.L., 2013, «Sport and Urban Regeneration», in Henry I., and Ko L.M. (a cura di), *Routledge Handbook of Sport Policy*, Routledge, London.
- Faroldi E., Allegri D., Chierici P., Vettori M.P., 2007, *Progettare uno stadio. Architetture e tecnologie per la costruzione e gestione del territorio*, Maggioli, Santarcangelo di Romagna.
- Marchesi A., 2016, *Un luogo chiamato stadio*, Maggioli, Satarcangelo di Romagna.
- Flowers B. S., 2018, *Sport and architecture*, Taylor & Francis Ltd, London.
- Faroldi E., (a cura di), 2019, *L'architettura dello sport. Progettazione costruzione gestione delle infrastrutture sportive*, Maggioli, Santarcangelo di Romagna.
- Sheard R., Powell R., Bingham-Hall P., 2005, *The Stadium. Architecture for the New Global Culture*, Periplus Editions/Berkeley Books Pte Ltd, Singapore.

Articles

- Sheard R., 1999, «Regeneration-Sport in the City», in Aa. Vv., in *Stadia and Arena 2000: Developmental, Design and Management*, The Concrete Society, Slough.
- Chierici P., 2016, «Development and enhancement of football stadiums. Strategies, tools and opportunities for establishing an Italian model» in *TECHNE Journal of*
- *Technology for Architecture and Environment*, n. 11, pp. 165-171.
- Allegri D., Vettori M.P., 2018, «Complex sports infrastructure and urban resilience: technologies and paradigms», in *TECHNE Journal of Technology for Architecture and Environment,* n. 15, pp. 165-174.
- Faroldi E., 2020 «Sports architecture. Influences and contemporary codes of urban regeneration», in *Area*, n. 169, pp. 14-21.

Construction

Books

- Crane R., Dixon M., 1991, *Indoor sports spaces. Architect's data sheets*, Architecture Design and Technology Press, London.
- John G., Sheard R., 1994, *Stadia: A Design and Development Guide*, Butterworth-Architecture, Oxford.
- Aa.Vv., 1997, *Guide to Safety at Sports Grounds*, The Schottish Office, London.

- Sturzebecher P., Ulrich S., 2002, *Architecture for sport. New concepts and international projects for sport and leisure*, Wiley-Academy, Chichester.
- Trumpbour R. C., 2006, *The New Cathedrals: Politics and Media in the History of Stadium Construction*, Syracuse University Press, Syracuse.
- Dixdorf S., 2009, *StadiumAtlas: technical recommendations for grandstands in modern stadia*, Ernst & Sohn, Berlin.
- Hardin B., Mccool D., 2015, *BIM and Construction Management. Proven Tools, Methods and Workflows*, Wiley, New Jersey.
- Wimmer M., 2016, *Construction and Design Manual. Stadium Buildings*, DOM Publishers, Berlin.
- Lewis P., Lewis J.L. Tsurumaki M., 2016, *Manual of Section*, Princeton Architectural Press, New York.

Articles

- Mazumdar S., Geis G., 2003, «Architects, the Law, and Accessibility: Architects' Approaches to the ADA (Americans with Disability Act) in Arenas», in *Journal of Architectural & Planning Research*, n. 3.
- Liang Lu S., Peng Wang S., Lei Shi X., 2014, «The Application of Digital Technology in the International Design Competition of Large Sport Center», in *Applied Mechanics and Materials*, n. 507.

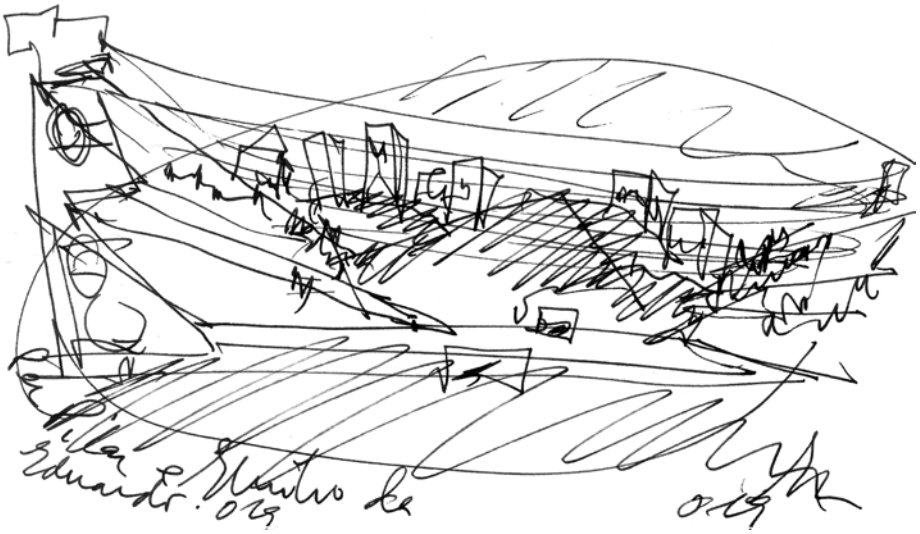
Management

Books

- Slack T., 2003, The Commercialisation of Sport, Routledge, London.
- Wimmer A., 2008, *Stadiums: Market Places of the Future*, Springer, New York.
- Teotino G., Uva M., 2012, *Il calcio ai tempi dello spread*, Il Mulino, Bologna.
- Guenzi P., Ruta D., 2013, *Leading Teams: Tools and Techniques for Successful Team Leadership from the Sports*, Jossey-Bass, San Francisco.
- Corbett B., Edwards A., Skinner J., 2014, *Research Metods for Sport Management*, Routledge, London.
- Masterman G., 2014, *Strategix Sports Event Management*, Routledge, London.
- Veal A.J., Dancy S., 2014, *Research Methods in Sport Studies and Sport Management. A Pratical Guide*, Routledge, London.
- Hole R., Smith A., Nicholson M., Stewart B., Westerbeek H., 2015, *Sport Management: principles and applications*, Routledge, Abingdon-on-Thames.
- Foster, G., O'Reilly, N. and Davila, A., 2016. *Sports Business Management. Decision Making Around The Globe*. Routledge, London.
- Fried G., Kastel M., 2020, *Managing Sport Facilities*, Human Kinetics, Champaign.

Articles

- Churchman C., 1995, «Sports Stadia and the Landscape: a Review of the Impacts and Opportunities Arising as a Result of the Current Redevelopment of Football Grounds», in *Built Environment*, n. 1.
- Malcom D., 2000, «The People's Game? Football Crowds and the New Marketing of the Game», in *Singer & Friedlander Football Review*, University op Leichester.
- Lee D., Schoenstedt L.J., 2011, «Comparison of eSports and traditional sports consumption motives», in Journal of Research, n. 2, pp. 39-44.



Estádio Municipal de Braga,
sketch by Eduardo Souto de Moura,
Porto, 22 February, 2019