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Leveraging GIS to Enhance Real Estate and Urban Areas performance

The contribution highlights the need for the connection between urban transformation assessment and real estate assessment, noting that there is a mutual influence (now rarely seen) between the parameters involved. For this purpose GIS serves as a tool by which to achieve this liaison. The list of applications for real estate conducted through the use of GIS, its strengths and weaknesses and fields in which applications are still pioneers, argues in favor of the hypothesis outlined and give to the assessor a key role in its implementation.

Key words: *GIS, Real Estate, Urban quality*

1. Combining Real Estate, Urban Performance and Geographical Information Systems

This contribution is part of the broader study about the assessment's role in the promotion of policies and actions for improvement of the urban transformation practices. This assumption builds on the need to make economically viable and attractive choice for the market-oriented reuse and improvement of existing assets in order to counter growing phenomenon of urban sprawl. It is therefore proposed as a reflection, albeit partial, in the context of the application made in years using the common 'language' of Geographic Information Systems (GIS). A more proactive dialogue is needed between the evaluator and other makers of the changes (local authorities, institutional investors, private developers and bank foundations to name a few) so that the impact of their choices does not continue to adversely affect future generations.

Geographic data allows us to view our traditional information by assigning the two dimensions of reference and placing them on a space. Space is usually the earth, everyday use, and many territorial applications, but it could be anything (such as in medicine or in planetary studies). Geographical Information Systems is a complex set of activities, organization, procedures, equipment resources and humans (Poletti 2001) who enable us to solve simple and complex problems that have to do with the 'geography'. In the case of the real estate market, GIS allows us to find relationships between the properties and information about what might be near. The market analysts provide data and information to investor, buyer, sellers, financiers, planners, as funding for developments (or purchase) falls upon lending institutions requiring commitment to funding market analysis. Each of these subjects requires a scale of information, characterized by more and more specific details. Real Estate market analysis is the end of processes designated to document multiple factors; in fact the buyer follows his own needs. The needs are specific to the individual. The smallest nuances in a market can produce a success or a loss in urban transformation, especially in the current difficult economic climate. Talk of the seller's point of view, but there is also the point of view of the occupier and its requirements to meet. It should even take into account the environmental performance.

The transition to a complex building, such as an urban transformation area, produces more people with problems to be solved which can be connected to geography: designers who want to avoid the mistakes of the past; educators in search of the winning elements to be transmitted to students; building owners and prospects who want information on air quality, developers and managers, and politicians exploring how best to proceed. That encourages the use of mapped data, data analysis procedures, and the uses of maps, fostering an appreciation of GIS as an effective analytical tool in many complex assessment processes.

GIS applications for real estate started to be used among developers in the early '80s (Thrall 1998); in those years the software called Desktop GIS have emerged with reduced costs for access to technology and ease of use compared to workstation platforms, even the vector map data with socio-economic information have become widespread and distributed more easy to find, making these systems increasingly used to support strategic decisions (mapping of the census was made available in the late 90 'in Italy, at the same time, SEAT has started to offer products business to business and one to one based on over 1600 socio-economic indicators). The Real Estate sector was involved in a second boom in early 2000 when the explosion of the net economy gave impetus, sometimes uncontrolled, new ideas and new applications: citing the site map data for U.S. National Association of Realtors (who at the time was just released online over 3,000,000 properties throughout the U.S.) and Casaclick (who was the first such structure designed in Italy) less fortunate from the point of view of GIS technology.

Almost in the same year early urban renewal projects had evolved. In 1980, redevelopment projects were primarily focused on the physical and economic renewal of decayed urban areas. However, since 1990 across the EU, this approach has been replaced by a more integrated approach to urban regeneration, linking stimulation of economic activities and environmental improvements with social and cultural elements.

We adopt a broader definition of urban regeneration according to which regeneration consists of 'a comprehensive and integrated vision and action which leads to the resolution of urban problems and which seeks to bring about a lasting improvement in the economic, physical, social and environmental conditions of an area that has been subject to change' (Roberts 2000, Colantonio - Dixon 2009).

From an operational point of view, the assessment of the areas of urban transformation is based on the use of integrated and multi-level indicators. The number of methods used is very high (for their classification, also based on what aspect of sustainability are capable to catch, see Gasparatos 2008).

The aggregation of indexes and individual size presents several difficulties. Although the data can be standardized and weighted aggregate proves difficult social, environmental, economic and institutional metrics into a composite index that can be compared on both a spatial and temporal level. The monitoring of the impacts resulting from the process of regeneration may be hampered mainly due to: the large amount of data to collect and analyze, the lack of human resources to be allocated for this task, and the urgency of the execution of daily operations, which prevents the allocation of time and personnel for this operation. In addition, another major obstacle may be the lack of statistical data which are not routinely collected from the statistical office of the local city and of the project. The last observation relates to the greater or lesser emphasis in considering the sustainability of buildings: the situation depends in part on the initial complexity of the case of regeneration (i.e. more or less by the presence of social or economic issues) in part by the maturity of the context and greater or lesser strength of the framework used. It should relate to the larger scale of the city to prevent the benefits of the same area not going beyond.

Measuring universally 'softer' aspects of sustainability, as some components of social sustainability (the well-being, happiness and satisfaction of the district) is difficult. At the moment the only effective way to measure these dimensions of social sustainability is through the use of surveys and other qualitative research methods such as interviews and focus groups, which can be costly in the long term.

On the other hand social preconditions, social relations, housing quality and equitable distribution of housing resources and assets are key components of sustainable housing development (Chiu 2003).

No special GIS applications are used in assessing the sustainability of transformation areas; GIS is used to manage and archive extensive data (specially in brownfield), to guarantee a complete traceability of operation (e.g. site demolition), to carry out constructive discussion with the redeveloper, to optimize parameters at stake, to map the indicators in the evaluation.

It should be noted that there is a kind of disciplinary boundary that separates the assessment of sustainability at the level of urban transformation (which still belongs to the system of assessments of actions, projects, plans, programs) and assessment of real estate within which the sustainability is interpreted as a determinant of the evaluation (characteristics of the environment and buildings that may affect its value).

2. Features and applications of GIS in the evaluation field

The new approach by which they are seen GIS is based on a model-prescriptive information that highlights "what and why" (as opposed to a descriptive model of the past) that can provide its services through the management of spatial data. The complex set of activities, organization, procedures, equipment resources and human (as defined above) are more specifical: Knowledge encompassing map data, alphanumeric data, multimedia data, raster data, network data. Promotion encompassing metadata (data representation using standardized descriptive coding systems based on internationally recognized models), distribution (to distribute the information according to mechanisms and multi technology platform, each time enriching the data with additional attributes), limit use (statement of limitation of use of profiling patterns of the target distribution policy), processing (table describes the processing based on logical combinations of spatial and related operations), marketing (any activity which aims to find and promote new layers information and applications to be returned to the end user). Procedures to the definition of information flows, with their descriptions, all critical aspects of the flow can be highlighted, and technical and organizational elements that are crucial to the orderly flow of information can be isolated.

The resources involved and used can be divided into three main categories: 1. technological resources (the set of technologies that must be used efficiently - to design and calibrate performance requirements according to the described real use - Scalable - must allow the ability to run the same software on different computers, and power means the ability to adapt of users increase, the increase and diversification of data required functionality. The scalability hardware must provide for the possibility of increasing the performance and computing power without having to change the architecture and technology platform designed and built the start-up the system - Interoperable - the system must be based on internationally recognized technical standards and all the descriptions of the individual components must be designed for the most common synergy between applications-Central - centralizing technological solutions and information repository to perform overseeing and monitoring the operational activities related to the flow of information - Standardized - organized according to recognized standards at national and international). 2. human resources (meaning all of the specific professional and multi-disciplinary skills). 3. financial resources.

Following are the main activities of the GIS technology and related activities which the assessor may carry out through them, the main advantages and possible problems linked to each activity are highlighted, based on direct experiences or case studies. The result is a comparative review of factors for and against the use of GIS in Real Estate.

2.1 GIS data collection and creating maps

Geographic location is the element that distinguishes geographic information from all other types. Therefore, any data that is entered into a database must be assigned triple of location and attribute (any time). The data acquisition (already structured) or new data is a fairly critical part of real estate, not only for the costs.

There are applications to the corporate real estate portfolio management for the systematic planning, and control of a stock of land and buildings with the aim to develop its potential[1].

Other times the return of GIS maps (Maps value) is used to spatially represent the results of analysis of change in property values generated by particular situations[2], not necessarily developed in a GIS environment.

More GIS based applications nowadays are available online that distribute data to all users. Through open innovation, data, tools and information can be combined to create new ventures which generate social and environmental value, web-map builder design the maps.

It goes from applications presenting the list of properties and connecting them to street network, to more complex applications with information related to the presence of facilities near the property; this information may be attached to images, numerical data on income, price and mortgage calculation starting from information entered by the customer. The user is largely unaware of the technology used (it can deal with a broker who represents buyers and potential tenants looking for specific information for their customers or end users).

There are more advanced applications, for a fee, where marketing assessments are offered that place georeferenced socioeconomic data (broken down to the census sections in Italy) and proprietary databases - for example, the mapping of the streets of luxury - on free smart GIS-based maps (Google, Bing). Users are more advanced (retail investors and appraisers), but they rely on the available parameters to obtain initial information or findings assessment.

Although the discovery of knowledge is a quiet and well established in its conventional databases application in spatial datasets is a new area, but far promising for research (Ester et al, 2001). The complexity of geographical phenomena (Gahegan 2001) together with the large size of spatial data sets justifies the application of knowledge discovery in spatial data sets.

Finally, investors[3] and fund managers may decide to design a proprietary sys-

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1 The cadastral registers, where they exist, were born prior to the emergence of GIS technology, so even where currently developed in a GIS environment many difficulties in use are present. In the specific case of Italy cadastral information (not endorsed in GIS environment) are seen as one of the data bases of territorial government. Many projects (one in every 'Servizi Integrati catastali e Geografici per il Monitoraggio Amministrativo del TERritorio – SIGMA TER) have been conducted to transform cadastral information into geographic information: the two major technical difficulties have been encountered regarding the projection system and the symbolism that goes wrong with the logic of object-oriented GIS.

2 Such as the Value Maps produced by OTP Mortgage Bank in Hungary, built on the basis of the detailed database of the National Tax and Customs Office (NAV), representing the Regional Impacts of the crisis on the property market. The minimum units of representation have been the 161 postal code zones of the Budapest area, whereas in the rest of the country - including the capital - 174 statistical micro-regions

3 This is the case of ASSIMPREDIL the Association of the builders who created in Milan, thanks to its research centre, a system called e-Mapping to identify the most significant areas for development in this period of severe economic crisis

tem in which to converge their knowledge (such as locating the yards of the activities taking place) and data from public datasets (such as information about the rules of the urban plan or the existing brownfield sites, projects related to roads and transport,...) as well as the traditional socio-economic data.

To say that the data is not available (because unstructured or paid) in alphanumeric format are hardly made available in geographical size is superfluous.

The use of geographic datasets and/or GIS (simply to construct and interpreting maps to free systems, or to draw knowledge from more complex systems, but born for other purposes) presents some issues to point out: GIS skills and knowledge requirements, accuracy issues in datasets, availability and accessibility.

The effective use of GIS is closely related with the understanding of the nature of spatial data and how data quality might influence the final results. The lack of clear understanding of data usability and limitations may lead to inappropriate data use or incorrect GIS applications, which could render inconsistent or inaccurate results. The minimum mapping unit is the preferred measure for the level of detail in a map or in classes of type of representation (land use, crops,..).The problem with unit area refers to the situation in which the different ways that the study area develop into sub-areas produce different results of the analysis. Data aggregation removes the individual characteristics of measurements (Sheng Han 2006).

In Europe, although the INSPIRE[4] Directive will improve data quality and availability, the lack of geographic data preparation and management guidelines can provide false or misleading spatial information. Digital datasets may, in some cases, contain errors. Therefore, data quality must be controlled to ensure that information is fit for its purpose. Similarly, data input and analysis processes must be monitored and any issues reported to ensure that results are valid and applicable. For instance the representative fraction (also often known as the scale) is defined for a paper map, but it is not well-defined for digital data. The scale of digital data can be regarded as an indicator of both spatial detail (the level of detail available for map making) and positional accuracy (the possible difference between the true real world coordinates and the coordinates of the data). determines both the minimum mapping area and the number of coordinates used to describe an element. Scale determines the level of detail in analysis, which may change the interpretation of data. Any correction of data and its ability to improve implies, time and additional costs, which are taken into consideration. A number of authors (e.g. Lillethun 2002, Bartley 2007) have revealed that data sources are inconsistent across the EU.

Availability and accessibility: Data may be available (i.e. gathered, compiled or created) but may not be accessible. Copyright and confidentiality constraints and costs may limit data sharing/acquisition. In the cases where particular datasets are not available/accessible.

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[4] INfrastructure for SPatial InfoRmation in Europe; INSPIRE Directive 2007/02/EC aims at establishing an infrastructure for spatial information in the European Community

Accuracy and completeness: measurements, location on a map and feature boundary definition must be precise to ensure spatial meaning. Certain datasets may not overlay properly on space, may not be spatially accurate or may contain spatial gaps, leading to assessment inaccuracies and miscalculations. Likewise, non-spatial information associated with the functions represented/objects by attribute tables must be correct, complete and accurate to ensure the reliability of results. These tables contain attributes and inadequate information that must be completed and/or decrypted for clear understanding and appropriate use.

Furthermore, using data at different scales in the same GIS project can be problematic as measures and positional accuracy may be affected. Therefore, scale considerations must be acknowledged in the assessment process for validity of results. The age and currency of datasets vary and their usability depends on their purpose or on when they were updated last. Data updates largely depend on data type and the organisation in charge.

Projection: a common spatial reference system projection is critical in a GIS project to ensure correspondence between layers. Data in different projections do not adequately overlap and slight inaccuracies may be obtained when changing from latitude and longitude to another projection. Where datasets are not up to date, they can provide misleading information by not addressing the current state of the environment. Therefore, the most up to date datasets should be acquired and applied. The date of the last update must be taken into consideration for an appropriate use and interpretation. The temporal variations can be illustrated by data sets in sequence, provided that the modes of representation do not change.

Metadata is defined as information describing the characteristics of spatial datasets, which allows discovering and inventorying them, as well as establishing their suitability for use (i.e. quality) and their fitness for purpose (i.e. usability). Therefore, metadata is determining the usability and characteristics of a spatial dataset, its quality and the means to access and successfully transfer it. The existence of metadata for datasets can help to rapidly identify their availability and determine their readiness, relevance and usability for integration in the real estate study. Metadata implementation rules were launched as part of the INSPIRE Directive, and were officially published as European Regulations in 2008 (CEC, 2008)[5].

2.2 *Spatial analysis/assessment*

GIS allows further processing and manipulation of stored data by spatial analysis. GIS can be done using GIS query that select objects based on certain crite-

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5 Such rules establish requirements for the creation and maintenance of metadata for the themes listed in the Annexes of the Directive (Appendix C) to ensure that the Spatial Data Infrastructures (SDIs) of European Member States are compatible and usable in a community and transboundary context.

ria, measure lengths, perimeters, areas, directions and distances; transformation from raster to vector given date; descriptive summaries including the mean and standard deviation; optimization techniques like the location of an object based on predefined criteria; the point in polygon, polygon overlay; spatial interpolation; density estimation and potential.

For more advanced users knowledge can be drawn in a large databases available (data mining). It can be calculated sums of multiple series of descriptive attributes, find dependencies between multiple spatial scales, fragmentations and fractional dimension; we can solve optimization problems (point location, routing problems, optimum paths). Databases can be treated by a frequentist interpretation and in a fuzzy logic in which an object's degree of belonging to a class can be partial.

These technologies have contributed to the emergence of new approaches in urban studies and in the field of real estate. Real estate markets can be analysed in greater detail, thanks to computer-assisted mass appraisal (CAMA) relying on the combination of large databases with effective statistical and spatial analysis methods. Nowadays the integration of CAMA and GIS is a common and integral process[6], but these approaches could not capture the many complex, interrelated and significant micro-variations within any given neighborhood, and could not reduce the determination of location value to an objective process (German, Robinson, Joungman 2000).

Hedonic modelling is part of the prevalent statistical analyses used for analysing housing market components. A hedonic model expresses the market value of some composite good as a function of its various intrinsic and environmental attributes and reflects the envelope function of both supply and demand sides (Can 1990, Can 1992, Dubin 1992). This approach is derived from the consumer theory that states that the characteristics of any commodity determines its utility (Lancaster, 1966). Applied to the housing market, the coefficients of the house-price function reflects the probability distribution of the combined buyers and the sellers' willingness to pay and be paid for the defined attributes, as an expression of their own utility level.

Furthermore, a GIS also helps correcting the spatial discontinuity problem when the spatial dimension is incorporated to the analysis more explicitly than in the standard hedonic model. (Orford 1999, Wyatt, 1995).

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[6] The Standard 2011 on Mass Appraisal of Real Property of International Association of Assessing Officers states 'Maps become especially valuable in the mass appraisal process when a geographic information system (GIS) is used. A GIS permits graphic displays of sale prices, assessed values, inspection dates, work assignments, land uses, and much more, in addition, a GIS permits high-level analysis of nearby sales, neighbourhoods, and market trends; when linked to a computer-assisted mass appraisal system, the results can be very useful. For additional information on cadastral maps, parcel identification systems, and GIS, see the Standard on Manual Cadastral Maps and Parcel Identifiers (IÀAO 2004), Standard on Digital Cadastral Maps and Parcel identifiers (IAAO 2003), and Procedures and Standards for a Multipurpose Cadastre (National Research Council 1983), and GLS Guidelines for Assessors (URISA/IAAO 1999)'.

In this context, it appears that the analysis of housing markets and location choices may contribute to a better understanding of people's preference and the impact of certain urban externalities. In order to do so, appropriate space-sensitive tools need to be developed and validated through empirical studies. Understanding the links between residential location choice, preference, residential market values and externalities, may contribute to shape adapted policies concerning tomorrow's planning decisions.

To the best of knowledge in current research, there is a need to better analyse the impact of locational externalities on real estate markets. Combining the efficiency of GIS, remote sensing and multiple regression analysis, it was proposed as a straightforward and easy-to-use method in order to integrate land-use locational externalities in hedonic property models.

One of the most basic techniques in site selection is to find sites that are just like existing sites. This technique involves running radii or drive-time reports around a chain or franchise's existing sites to establish some baseline demographic measures. Which variables, such as age, income, ethnicity, traffic, daytime population, etc., are considered keys to success are determined by the real estate department of the chain. Each time a new site is considered, reports are run on the site and the key variables are examined or compared to those of existing sites. Many commercial Realtors also include these reports in their property marketing literature for prospective lessors.

As a further refinement to site comparison, companies will use site scoring models to rate potential sites. Site scoring models use correlation between existing sites' sales revenues and the demographic, business, and other variables in their market areas. Careful consideration is given to factors such as store age, concept, and square footage to ensure that the sites in the sample are as similar as possible. The results of the analysis usually yield a set of between 6 and 10 report variables that have either a highly positive or highly negative correlation to the sales revenues of a company's existing locations. Sites scoring well 'pass', and sites scoring poorly 'fail' the test. Site selection becomes even more complicated when a company begins inserting new sites into a market that already has existing sites. Not only must competition be considered, but cannibalization of existing store trade areas becomes an issue as well. The use of gravity models can to address such issues. Gravity modelling is the idea that the probability of a given consumer visiting and purchasing at a given site is some function of the distance to that site, the site's attractiveness, and the distance and attractiveness of competing sites. Attractiveness is typically defined by size but may also be defined by a store's merchandise mix and its appeal to a certain lifestyle. Gravity models, enabled in a GIS, provide users with the ability to do what-if analyses for prospective site locations. They quantify the extent of a new site's share of a market as well as provide a vivid, visual picture in the form of a map of the impact of a new site location. Gravity models have proved to be a durable tool in evaluating new site location. Searching for a way to predict store sales has led to the use of multiple regression analysis in site selection. This technique seeks to identify how all the variables at a site interact with one another to produce a specific sales outcome.

The success of this technique depends on the practitioner's ability to accurately quantify all the factors—operations, site, and location—that can affect sales. It can be problematic to quantify subjective variables such as customer service, merchandise mix, landscaping, and signage. But when applied correctly, this technique can accurately predict, to a given margin of error, the expected revenue of a potential site. These models may be loaded into a GIS and used to predict the sales potential of prospective sites.

However, multiple regression models have their drawbacks. They can be expensive; take a long time to develop; and be compromised by the introduction of a new concept, merchandise mix, or competitor. Time, or change, is the worst enemy of a multiple regression model. These models must be rebuilt at least annually to retain their predictive capabilities. Changes over time in any of the variables affect the overall interaction of all the variables and, thus, the predictive power of the model. They also suffer from being a 'black box' that many in an organization will not understand or trust.

Most retailers have little customer information available because of the cash-and-carry nature of their businesses or the lack of systems to collect customer data. Consequently, the preceding site selection tools rely wholly on factors that do not include actual customer information. However, customer profiling is, perhaps, the foremost tool for finding that next successful site. Where customer addresses can be collected—whether through surveys, delivery records, credit card transactions, loyalty programs, etc. the foremost geo-demographic segmentation system, to profile their customers.

GIS can be incorporated in the valuation process to give appraisers a spatial perspective of data. Assessment offices have used GIS in tandem with computer-assisted mass appraisal analysis to deliver more accurate values for tax purposes. The natural integration of modelling techniques in real estate and GIS is demonstrated by the core data elements that each requires. The concept that GIS is 90% data is explored and used as a starting point for understanding how spatially enabled analysis provides analysts with a greater understanding of data, and more importantly, the markets that data represents from an entirely new perspective.

Weighted-overlay mapping techniques combine multi-criteria analysis (MCA) and GIS. This technique is based on the ability of GIS to combine multiple datasets in a spatially-specific manner, and their capacity to integrate relative values of significance into each of the datasets/layers. They allow for the systematic aggregation of co-occurring environmental factors and their weights.

The combination of the Analytic Hierarchy Process (AHP, Saaty 1981) method with GIS is an exercises in land use planning and could be a powerful combination to apply for land use valuation.

Analytical functions and conventional cartographic modelling techniques in GIS are based on Boolean logic, which implicitly assumes that objects in a spatial database and their attributes can be uniquely defined. The inherent constraint of the classical set theory does not allow for partial set membership conditions and imprecise information in GIS. The usefulness of fuzzy theory in GIS modelling for urban land evaluation has been tested (Sui 1992). The results indicate that incorporating fuzzy theory into GIS modelling can provide more details about the gradual transition of urban land value than the traditional cartographic modelling approach. Fuzzy GIS modelling can also reduce the information loss by obtaining membership grade for each individual land parcel. The membership function allows identification of the extent to which a particular area belongs to a valuation class based on given criteria.

The use of GIS systems and complex patterns of interaction involves appropriate knowledge both a technological nature or of a disciplinary nature and the ability to transfer parts of the whole application processes either internally or externally to the GIS. Skilled analysts are usually able to generate more realistic models based on potential as well as technological expertise gained through their experience. Incorrect assumptions produce wrong results. Appropriate training and experience is required before work on these models. This is a key factor in explaining why many companies do not push the use of these models in their real estate services, limited to simple representations of spatialized information.

2.3 Modelling

Modelling attempts to replicate a real-world situation and, thereby, allow experimentation with the replica in order to gain insight into the expected behaviour of the real system under different scenarios. GIS is a technique of good flexibility and precision for the planning and assessment in urban areas. One of the main difficulties and challenges in the modelling of urban phenomena is to manage and integrate the spatial dimension. Property values are considered by many authors as the result of complex and intricate combination of externalities and position rents (Can 1992, Dubin 1992, Waddell et al 1993, Krantz et al, 1982).

The construction of evaluative scenarios using GIS data bases allows connection between the practice of urban transformation assessment and assessment of real estate.

2.4 Visualisation and Participative GIS

Since real estate brokerage is a service industry, its product is not tangible. Quality service in the business equates to knowledge, experience and reputation.

GIS is a technical tool, but it is very flexible in the production of maps, this potential can be harnessed to propose appropriate maps from the person with whom you must deal with.

GIS focuses on the development of user-friendly GIS interfaces, to promote GIS use within more inclusive participatory decision-making processes.

3. Some further step to understand GIS

The results of the survey show that the spread increased use of GIS is limited to the use of databases and the construction of maps. The use of GIS for the assessment is still quite modest and it is due, in part, to the whole body of knowledge required, but mainly to the unavailability of ad hoc geographic systems.

The use of GIS for the construction of scenarios is even being a pioneer. The dimension of participation through the GIS has not yet been explored.

We must take into account the fact that GIS is increasingly present in our daily lives almost unnoticed, but, for example, the completeness of the information leads to problems of competitiveness and competition.

We can list a few items that have slowed the construction of such systems: one problem, and perhaps the most difficult, is the lack of uniform information, current and reliable to feed any of the technology used by local real estate companies. The lack of information or the monopoly of it by some agencies are common and frequent problems in the real estate sector of many countries (Kummerow and Chan, 2004); The second problem is time-consuming construction and advantages of systems visible only in the medium / long term. And then the difficulty of accepting the proposed conceptual model, if not properly; centrality of the instrument instead of the object i.e. the assessment; researchers and funders almost always underestimate how much effort is required to maintain the metasystem. This is the reason why many database initiatives fail in the long term.

Business operators, in general, do not offer products and services of appropriate quality and against the application (appraisers) is often not able to evaluate / appreciate the quality of products and services, so demand is weak and unable to govern the process of building the system.

The data component requires more thought to the purpose to be achieved both in terms of selection of data both useful in relation to the characteristics that must be. Sometimes the same spatial phenomena can be interpreted according to different points of view, with the no collimating generation of information assets, in this sense we must pay attention (especially in the acquisition of new databases) methods of classification and their degree of universality.

However, cost data is much harder to pin down: they tend not to be stored in standard ways (or even at the individual building level), money comes out of different pockets, and organizations are often reluctant to provide or release it.

Moreover GIS combines multiple datasets in a spatial specific manner and integrate relative values of significance into each of the datasets or layers. It allow visual representation of the spatial distribution of environmental information. It improved information delivery, time and resources optimization, building of spatially-specific indicators; making systematic, replicable transparent spatial assessment multiple factors, definition of precise and spatially-specific measures, visual comparison of changes over time. It identifies general site suitability for development, including area which sever development constraints – where construction costs will be higher – as well as sensitive environmental areas. It documents factors considered in selecting design. It allows creation of virtual models of the site which can be seen in 3D, rotated and overlaid with theme information to discover relationships otherwise hidden to the assessor’s eye. It can be integrated with other technologies (web, wireless, RFid).

It allows evaluations of the relationships of individual dwellings to the surrounding site from a neighbourhood or site perspective. It takes advantage of high resolution imagery available a both town and regional scales. Buildings are self-evidently settings or 'contexts' for human activity and behaviour. Activities can be studied at different levels of spatial resolution from individual behaviours at one end of the scale through to society at the other.

In this context, GIS appear to the right environment to find (or put) environmental and social considerations about commercial property that is more closely aligned with economic return.

The real estate appraisal should also consider the buildings according to the categories of quality based on performance use. It refers especially to designing for manageability and to the classification provided in Soft Landing Methodology[7].

Widespread use of information that promotes the implementation of sustainability principles in property development and construction close the virtuous circle of the assessment on the scale of urban transformation.

The simultaneous consideration of economic, environmental and social issues can provide a more profound knowledge about property characteristics and associated performance. In principle, we arrive at an argument in a holistic way [exceeding the Triple Bottom Lines (Pope J, Annandale D, Morrison-Saunders A 2004) in the sense of separateness of the three components] in the city government and the territory.

Nonetheless, many major banks are currently trying to develop their own rating systems. This offers the opportunity to foster sustainable development among real estate projects of every type and scale. As banks become more aware of the risks (and opportunities) associated with sustainability issues, it is likely they will be willing to integrate corresponding performance criteria within their real estate rating systems

Assessors[8] have the role of 'information managers' in a market where the distribution of information is traditionally considered asymmetrical.

4. Conclusions

A comparative review of factors for and against the use of GIS in Real Estate stands for the previous. When comparing two properties that have similar physical makeup, aspects of the property context may provide useful information regarding differences in value. Geographic Information Systems allows us to explore these relationships visually by making maps, and more systematically through as-

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[7] The Softh Landings Framework for better briefing, design, handover and building performance in use by Usable Building Trust. There are 4 categories of buildings in terms of their manageability derived from devices that are istalled.

[8] TEGoVA's rating system includes the rating criterion 'sustainability' (TEGoVA, 2003). Sadly, the TEGoVA approach fails to define or specified sustainability.

sociative operations that we can use to add new information concerning the context of properties that we may be interested in.

This may help us in our work and in promoting a quality Real Estate for a city on a human scale, once considered the strengths and weaknesses.

The current regeneration model can not deal with exceptional conditions affecting the sector now. The circumstances require a new approach and a willingness to be innovative.

A good investment should look to the long term, if cultivated. In the built environment, we need to invest for the long term. It is more sustainable, creates activities that people grow to love and avoid the cost of bad design.

The model Assimpredil, though not intentionally, was built to provide a service to members to help them reduce business risk (given the characteristics of the real estate market will not absorb the surplus of supply in a short time), moves in the same direction: to identify those most suitable investments with greater ability to succeed.

In addition, a urban transformation process is aimed at building sustainable quality (due to its characteristic to consider the entire life cycle). The valuation of real estate assets and investments to be allocated in areas of transformation assessment, must be addressed, increasingly necessarily, in the presence of a system of decision unencumbered by the rules.

Geographic Information System is conceptualized to allows for the description, measurement and assessment of various aspects of building and urban performance . The use of performance indicators are identified in the tested sustainability assessment models to be transferred along the life cycle. The environmental research community and the building has a central role in determining the standardization of terminology and improving the exchange of ideas between financial and environmental research disciplines. The simultaneous consideration of economic, environmental and social is able to provide a deeper knowledge on the properties and characteristics associated with performance.

This will create a more robust assessment approach and lead to greater reliability of assessment results.

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