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SUPPORTING PROBLEM-SOLVING SKILLS THROUGH STRATEGIC DESIGN TOOLS: AN EXPLORATORY STUDY

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Abstract

Strategic Design is nowadays a very important lever for companies that want to innovate in the market. This is possible thanks to its ability to observe the problem from different perspectives and give unconventional answers, leveraging on problem-solving skills. The above activities are possible also thanks to the adoption of several tools on a daily base. However, what Strategic Design tools are the best to fully explore the problem-solving attitude? Are they existing tools or tools that are created ad hoc by organizations? Through an interview with 20 companies, an investigation was performed on which tools are best suited for the work of the Strategic Designer by allowing the application of problem-solving. The study also offers a reflection on which strategies companies should perform to define new tools that are in line with the logic of problem-solving and the relative benefits that they can achieve.

Keywords: Strategic design, tools, problem-solving, innovation.

1 INTRODUCTION

Contemporary society features a rapid evolution and change in demand that require new solutions, different from those created in the last years [1]. Companies cannot continue to work and produce within their own perimeter: it is necessary to consider the collaborations among different disciplines and players. In this panorama, in recent years, Strategic Design has played a key role in enabling various companies to differentiate themselves in the market. Strategic Design aims to define, through a design approach, the strategy embracing product, service and communication elements that a company uses to create an identity, define itself on the market and shape its mission [2]. The use of Strategic Design allows the company to develop a set of specific strategic results [3]. These results are also the outcome of the multinature of Strategic Design that spans the worlds of Management and Design.

Strategic designers to train their problem-solving skills, as well as to manage their daily work, bring to bear various skills and tools. In fact, tools are one of the aspects that support the method employed by strategic designers. However, in order to be able to best field this problem-solver capacity, it is often necessary to "hack" conventional tools that rely on linear logics of problem analysis and resolution.

The article therefore analyzes the tools (standardized and non-standardized) fielded by companies that employ Strategic Design. The purpose is to highlight how these tools serve to train critical skills, acting as problem-solvers. The article is divided into four parts. The first part of the article analyzes the increasingly central importance that Strategic Design has for companies today, emphasizing the ability of Strategic Designers to act as problem-solvers. The article continues with the methodology where it explains how the interviews were set up and the sample analyzed. The third part deals with the results, divided into two macro areas. The first lists the different "standardized" tools that emerged most from the interviews to support problem-solving. Instead, the second highlights three different strategies that emerge from companies that adopt Strategic Design when they need to design (/"hack") new tools. The last part of the article explores the benefits that emerge for companies that decide to adopt Strategic Design, being supported from both standard and "hacked" tools, reflecting on the importance of adopting and mastering problem-solving skills.

2 THEORETICAL BACKGROUND

Innovation is nowadays a key aspect to be implemented in organisations, taking a central role in the development of strategies by those who manage them [4]. But innovation is difficult to perform, requiring time, dealing with money limitations, performing consumer demands analysis, and managing creative problem-solving to succeed [5] [6] [7].

To differentiate oneself in the market and explore a competitive advantage, one of the strategies that is succeeding for some organizations is represented by the adoption of Strategic Design [8]. Strategic

Design can be understood as the activity of designing integrated systems of products, services, and solutions that, through a systemic vision, can formulate new business ideas or sometimes alter the business model itself [9]. For Meroni [10], Strategic Design is about conferring to social and market bodies a system of rules, beliefs, values, and tools to deal with the external environment, thus being able to evolve (and so to survive successfully), as well as maintaining and developing one's own identity. The clearer the identity, the more the company will be aligned, enabling a better positioning in the market. A strong positioning means being recognizable with a higher chance of being different from competitors. Differing from other's offerings and bringing more value to the customer is what lets a firm move away from commoditization, shifting away from the battle on prices [9]. However, the scope of Strategic Design is not limited to organisations. Strategic Design can support enterprises, consultancy firms, institutions, governments, regions, and associations [11].

The strategic designer acts as a crucial bridge between business and design within organizations while striving to discover opportunities to improve the company's offerings. Strategic Designers can perceive what's happening in society, outside the organization, and share inside the organization to influence decisions that can have a long-term impact on organizations. Complex, open, and Ill-defined problems are the main objectives of strategic design that are capable of giving sense to complexity, thanks to design-native characteristics, rapid prototyping, the use of canvas, and the use of scenarios, just to mention a few [12] [9]. The Strategic Designer is capable of achieving these results thanks to a set of capabilities such as the capacity to create dialogue between different actors, managing complexity, and teamwork through the capacity to speak different "languages" [13].

The debate on what skills a strategic designer should possess is still vibrant and ongoing. However, the literature already agrees on some. A strategic designer must possess a "systemic perspective". Those mastering this discipline should be able to create tangible objects that should be integrated with intangible offerings (such as services and experiences) [14], integrating different artefacts that should be coherent among them [15]. Other two well-established skills that a Strategic Designer should manage are represented by "problem setting" and "problem-solving". Strategic Designers should be able first to redefine how problems are approached and then deliver original solutions responding to user problems [16].

Problem-solving is a key characteristic associated with Strategic Design, but it embraces many more disciplines and contexts. Problem-solving represents a significant human activity in high-technological society [17]. One definition of Problem-Solving, which contributes particularly well to the scope of this study, reports that it is "the self-directed cognitive-behavioral process by which a person attempts to identify or discover effective or adaptive solutions for specific problems encountered in everyday living" [18].

Studies on the topic originate in the past, coming from the discipline of psychology. Psychologists such as Karl Bühle, Oswald Külpe, and Otto Selz focused their studies in understanding what mental processes come into play when practicing problem-solving. Later studies conducted in the Gestal school of Psychology, between 1940 and 1950, and focused on how people solve complex problems showed how solvers gain "insight" into the problem. In 1958, Sir Fredrick Bartlett in his book "Thinking" talks about problem solving as a form of exploration. But the real focused research on problem solving comes from 1960 with Herbert Simon and his colleagues, in which problems that did not have immediate and obvious solutions were offered and the resolution process adopted was observed. Newell and Simon [19] proposed that problem-solving consists of a search in a problem space. A problem space has an initial state, a goal state, and a set of operators that can be applied that will move the solver from one state to another. Humans are problem solvers if they operate and think in a broad framework of ambiguous, dynamic goals and adaptable methods. If people already have in mind how to get from point A to point B, this does not involve problem-solving skills. There is no formula for true problem-solving, but it is stated that it requires a heuristic moment [20]. In their initial conceptualization, D'Zurilla and Goldfried [21] envisaged problem-solving as a progression through five stages. They were delineated as:

- Problem orientation or 'set';
- Problem definition and formulation;
- Generation of alternative solutions;
- Decision making;
- Solution implementation and verification.

Thus, from this theoretical overview, it is even more possible to understand how the inherent characteristics of problem-solving are central to the landscape of Strategic Design and its purposes, outlined at the beginning of this section.

For Strategic Designers to cultivate and apply problem-solving daily, they need to take a nonlinear approach, which, as mentioned earlier, has a heuristic moment within it. For this reason, it is necessary to provide Strategic Designers with a "toolbox" that can support them day-to-day in their problem-solving activities. In this landscape, tools play a key role. Managing effective tools is a key requirement to support the Strategic Designer's activity by cultivating problem-solving ability. However, considering the mentioned need not to operate in a linear mode, it is often necessary to develop ad hoc tools that go beyond the linear logic that very often underlies the design of tools.

This study conducts an investigation of what are the main tools that Strategic Design firms employ to cultivate and boost problem-solving. Considering the multi-disciplinary nature of Strategic Design, which draws on both the management and design worlds [8], a review is offered on tools from both sectors as well as those created ad hoc. The study then answers the following questions: what are the tools that a strategic designer needs to master in order to cultivate problem-solving? Are they all existing tools or are there ad hoc created tools? If the latter, what are the strategies that are adopted in order to create new tools that boost problem-solving?

3 METHODOLOGY

This paper aims to demonstrate which tools are most effective in using Strategic Design and how new ad hoc tools are created to stimulate and practice problem-solving.

This paper bases its analysis on an exploratory analysis. In situations when there is a lack of knowledge regarding a phenomenon or a restricted body of literature on the subject, exploratory studies are meant to look into the matter and raise questions. According to Yin [22], "how" and "what" are the questions that are answered in the exploratory case study. It is a valid approach to employ when investigating presumed connections that cannot be explained by a simple survey or experiment [22]. Given the paper objective, and the subsequent need to address "how" questions, the proposed methodology is the most suitable one.

From an empirical perspective, the investigation was conducted on 20 organizations operating in the Strategic Design field, operating in Europe and America.

One person from each organization was interviewed. All the people interviewed were in managerial roles, engaged in following up with customers daily and setting up the methodology adopted in the company. The interview questions mainly covered between areas:

- Which tools do they use the most in their work and which stimulate problem-solving the most;
- Whether the tools are pre-existing tools or whether they are created ad hoc;
- What strategies are implemented in the creation of new tools;
- What are the benefits that are experienced by clients when Strategic Design is applied, through even these tools that offer the possibility of applying problem-solving, offering unconventional results.

Each interview was conducted by two researchers and lasted approximately 1 hour. All interviews were analysed by three researchers. Once all the interviews had been carried out, the data were fully transcribed, allowing the researcher to fully immerse in the data [23]. Moreover, full transcription is essential to start an accurate analysis [24]. Based on the interview transcripts, it was possible to find some common application methods and benefits among the participants. As suggested by Miles and Huberman [25], the involved researchers separately analysed the transcripts. The final results were discussed by a team consisting of two professors and three researchers.

4 RESULTS

The first result from the interviews conducted with companies that practice Strategic Design on a daily basis both internally and with external customers showed a tendency to use tools mainly from the fields of design and management. This is in line with the very nature of the discipline, which, based on literature findings, integrates design principles with a business mindset, combining long-term strategic directions

with short-term tactical decision and implementation actions in order to hit both long-term and short-term performance goals [12] [26] [27].

The analysis performed, showed a first part of "standard" tools, which are widely documented in the academic literature. Those most used, with a strategic aim, from the field of management are represented by:

- SWOT Analysis: The SWOT Analysis is a strategic planning tool used to identify and evaluate the Strengths, Weaknesses, Opportunities, and Threats related to a business or project. By systematically analysing internal and external factors through these four key areas, organizations can gain a comprehensive understanding of their internal capabilities and external environment, enabling them to make informed decisions and strategic plans. The SWOT analysis is particularly useful during the initial strategic planning of a project, as it helps to understand the organisation's current position and identify areas of potential growth or risk mitigation, guiding the development of actionable [28]. The analysis also serves as an ongoing evaluation tool, allowing organisations to adapt their strategies in response to changing internal and external conditions.
- Business Model Canvas: The Business Model Canvas provides a visual framework for developing, describing, and analysing a business model, reflecting on the different aspects of a business. It is designed to capture the fundamental aspects of a business on a single page, allowing stakeholders to see how various components interact and contribute to the overall business strategy [29]. The canvas is divided into nine key building blocks: Customer Segments, Value Propositions, Channels, Customer Relationships, Revenue Streams, Key Resources, Key Activities, Key Partnerships, and Cost Structure. Each block represents a crucial element of the business model, from the target customers and the value offered to them, to the revenue generation mechanisms and the resources and activities required to deliver the value.

The Business Model Canvas is most effective during the initial stages of business planning or when re-evaluating an existing business model, as it helps map out the business concept and structure and supports alignment of resources and activities with strategic goals for the identification of potential areas for development. The canvas is also useful for iterative development, as it allows for continuous refinement and adjustment based on feedback and changing market conditions.

Positioning Map: A Positioning Map is a visual tool used to identify and analyse the competitive positioning of products or services within a market. It maps the relative position of various competitors based on key attributes or dimensions that are important to consumers, such as price, quality, or features. This graphical representation helps businesses understand their market position and identify opportunities for differentiation [30]. Positioning maps typically feature two axes representing different attributes or dimensions, with each competitor's product or service plotted based on its performance or perception in these areas. This helps in visualizing how products or services compare against one another and where there are gaps or overlaps in the market.

Positioning maps are particularly useful during market analysis and strategy development, as they help in identifying the competitive landscape and understanding consumer perceptions, guiding decisions on positioning, branding, and differentiation. They also assist in tracking changes in market dynamics and adjusting strategies to maintain a competitive edge.

On the other hand, the result of the study also underlined some "standard" tools associated to the Design world. The most recurring include:

 System Map: The system map is a visual description of all the exchanges occurring within a service among the main stakeholders [31].

System maps are particularly useful in complex projects where multiple stakeholders and interactions are involved. By mapping these relationships, designers can identify key areas for further exploration and experimentation, ultimately leading to more informed and effective design decisions.

This tool can be used at different stages of the design process. During the research phase, system maps help designers understand the current landscape, identify key stakeholders and discover relationships and dependencies within the system. This comprehensive overview is crucial for identifying gaps and opportunities for innovation. In the design phase, system maps guide the development and implementation of solutions, highlighting the necessary connections and interactions to be managed. They are also valuable for continuous evaluation and iteration, as

they provide a clear picture of the impact of changes on the entire system and help refine strategies and processes.

Journey Map: A journey map provides a visual representation of the user's experience, detailing
their actions and interactions with the service at each step [31]. To do so, this tool also highlights
all the touchpoints where the user engages with the service during different stages of their
journey.

While often known as the "customer" or "user" journey, this mapping tool isn't limited to just clients; it can represent the interactions of any actor within the service. Thus, to create an effective user journey map, it's essential to first identify the specific actor being analysed, outline the actions they undertake within the service, and pinpoint the touchpoints where these interactions occur.

The user journey map is typically used during various stages of the design process. It is particularly useful in the early phases, where it helps articulate user needs and challenges, forming a user-centred problem statement. During the design and implementation phase, it guides brainstorming by providing insights into user behaviour and interactions, allowing to create user-centric solutions and refine them based on user feedback.

• User Persona: User personas are fictional but realistic representations of the different types of users who might interact with a service or product, based on research about actual users [31]. A user persona typically includes demographic information, such as age, occupation and education level, along with psychographic details such as their behaviours, needs, motivations, frustrations and challenges. These profiles might also include specific scenarios or use cases that illustrate how the persona interacts with the service or product in various contexts. By embodying these characteristics in detailed profiles, user personas help designers and stakeholders understand the diverse range of perspectives and requirements that the service or product must address.

The depth and breadth of information included in user personas make them a valuable tool for guiding design decisions throughout the design process, ensuring that the solutions developed align with the needs and expectations of real users. In the research phase, they help in synthesizing user data and segmenting the target audience into distinct groups, each with unique features and needs, so that the design is informed by a clear understanding of the different user types. During the design phase, they guide the creation of features and functionalities that cater to the identified needs and goals of each user type. They also assist in prioritizing design decisions and validating solutions through user testing.

Despite the importance of these two groups of tools was confirmed by practitioners, findings from the interviews underscored how the most common tools used to carry out Strategic Design projects are represented by a set of "hacked" tools, which consist of reinterpreting, adapting and/or combining standard tools from the world of management, design or even other fields in order to make them more sector-specific and tailored to the specific application context. Indeed, multiple interviewees emphasised how the use of any tool without its adaptation to the context of use risks to oversimplify the complexity of the challenge to be tackled, resulting in a pure exercise in itself. What practitioners suggest is the contextualized use of tools through a "playful approach", which allows to try different ones, to modify or simplify them always for the purpose of supporting and improving a certain process, methodology and approach.

Modifications to standard tools can obviously vary in their nature. During the interviews with companies, three main approaches emerged:

• The first and most intuitive option involves retaining the structure of the tool and instead modifying its content, adding or subtracting sections and/or interpreting the original content in a way that is more suited to the sector in which it is to be used. An example that emerged from the interviews concerns the use of a model from the field of anthropology, Maslow's Hierarchy of Needs, for the creation of a tool suitable for identifying and categorizing the core attributes that drive consumer value and loyalty. This new tool expands on Maslow's original framework by breaking down consumer value into 30 distinct elements grouped into functional, emotional, life-changing, and social impact categories. These elements provide a more granular and practical approach to understanding what consumers value in products and services, enabling businesses to tailor their offerings more precisely to meet customer needs and enhance loyalty. The use of this tool, therefore, provides a comprehensive and actionable picture that goes beyond traditional metrics and superficial understanding of consumer needs, allowing to design more effective marketing strategies, develop products that resonate better with their target audiences, and ultimately create

a stronger bond with consumers, thus ensuring a lasting competitive advantage. By addressing the diverse and multifaceted elements that contribute to consumer value, it enables holistic strategies that integrate product development, marketing and customer experience.

- The second way of "hacking" standard tools involves retaining the structure of the tool while altering its purpose to better suit specific needs. An interesting example of this approach concerns a tool derived from the User Personas model, which leverages its fundamental principles to study target groups and create comprehensive and detailed business profiles. By examining the desires and pain points of target categories according to the user personas model, this method facilitates the holistic definition of the entire offerings to be designed, including marketing strategies, customer engagement practices and long-term business planning, all specifically tailored to the target audience. Thus, the User Persona transcends its traditional role as a mere design tool for product or service development based on a pre-defined brief and evolves into a tool of strategic orientation from which an entire business strategy can be crafted. This revisited way of using the User Personas model ensures a cohesive and targeted approach, enabling businesses to develop strategies that are intimately aligned with the needs and preferences of their target market, thereby fostering deeper customer engagement and sustained competitive advantage. By addressing the intricate and varied aspects that influence corporate strategy, this approach promotes integrated planning across product development, marketing, and customer experience.
- The third approach to tailoring standard tools to the context of use aims to combine several tools together to build a toolkit created ad-hoc for the design challenge at hand. In this case, the chosen tools can be left in their original version or modified/adapted, for example by combining a few of them to create a new one or by selecting only those parts of each tool that are considered most suitable to support the design process. A practical example of such an approach reported during the interviews concerns the creation of a toolkit for the redesign of the digital retail strategy of a large multinational company. The challenge was to support the company's customer experience team in designing the future user experience in order to make it more in line with new technological and sustainability drivers and, consequently, with possible future customer needs. In this case, a series of tools typical of management and service design were chosen and reelaborated to guide the team in the process of creating a new retail experience. In particular, the first phase used the North Star Vision as both a guide and the output of an initial research on the company, the customer, technological trends, etc., resulting in a textual and visual summary of the key elements that would characterise the customer experience within a co-created future scenario. The North Star Vision was then used as a basis to translate the identified key elements into a Roadmap, which was used to define what each element should mean to the customer and what currently missing capabilities should be implemented to deliver that experience. The next and final step was the detailed study, through Consumer Lifecycle Maps and Consumer Blueprints, of all the possible journeys the customer might experience when interacting with the brand, thus further increasing the level of detail.

This way of using different tools to create an ad-hoc toolkit enables the creation of a structured but flexible process capable of engaging the different stakeholders and strategically guiding the project by maintaining a holistic view and delving into details when necessary. Furthermore, the coexistence of tools from different disciplines avoids the risk of working in silos, promoting instead a systemic perspective that takes into account multiple aspects, all relevant to the success of the project.

It is also worth noting the difference in the positioning of these "hacked" tools with respect to the relationship between management and design: while standard tools such as those mentioned above tend to focus on aspects strictly peculiar to their field of origin (management tools focus on business aspects such as market positioning, the business model, operational efficiency, financial performance etc., while design tools pay attention to the communication and branding of products and service, the experience of the users, the touchpoints they interact with etc.), the examples provided by interviewees clearly show how the tools most typically employed in Strategic Design projects tend to combine management and design considerations, thus proving particularly useful in taking both aspects into account throughout the process.

5 CONCLUSIONS

This article aims to contribute to the literature dedicated to Strategic Design, in particular shedding light on how it fosters the development and management of problem-solving skills. Firstly, it is possible to highlight how the discipline of Strategic Design is configured as a bridge that connects managerial and

design disciplines by bringing together business strategy with design principles, with the aim of creating innovative and sustainable solutions and positioning companies competitively in the market. This duality of Strategic Design is particularly evident when examining the tools typically used by this discipline. Through an initial analysis of the literature and subsequent empirical investigation with companies, this article shows that these tools are mainly represented by re-elaborations of 'standard' tools from disciplines such as management, design and others.

The aim of the article is also to demonstrate how precisely the tool-hacking activity typical of Strategic Design is essential for the development and reinforcement of problem-solving skills, as it fosters a flexible and adaptive mindset that is crucial for tackling complex and dynamic challenges. By modifying and combining existing tools to suit specific contexts, practitioners are encouraged to think creatively and critically, leading to more innovative and tailored solutions. This process of adaptation ensures that the tools are always relevant to the particular problem at hand, thus enhancing their effectiveness and utility. Moreover, the reworking of tools promotes a deeper understanding of both the problem and the solution space. It requires practitioners to thoroughly analyse the nuances of the challenge, the needs of the stakeholders, and the potential impacts of different approaches. This comprehensive understanding is essential for devising strategies that are not only effective in the short term but also sustainable and beneficial in the long run. Furthermore, engaging in tool-hacking encourages collaboration and interdisciplinary thinking. By integrating elements from various disciplines, such as management and design, practitioners can leverage diverse perspectives and expertise, leading to more holistic and robust solutions. This collaborative approach also helps in breaking down silos within organizations, fostering a culture of teamwork and continuous improvement.

The problem-solving skills fostered by SD (and partially boosted through tools as previously explained) also bring multiple benefits to companies, with a positive impact on the design outcome, the stakeholders involved (including the designer himself) and the surrounding environment.

A first benefit emerged from the study, concerns the possibility of managing challenges characterised by a high level of complexity and uncertainty, which are particularly frequent in the contemporary landscape. Indeed, the multi-disciplinary nature of Strategic Design and the consequent emphasis placed on looking at these challenges in their entirety allow this discipline to adopt a highly flexible approach that is particularly well-suited to uncertain scenarios [16] [32] [33] [34]. By engaging in a continuous "zoom in" and "zoom out" activity, SD is able to maintain a systemic perspective and to remain consistent throughout the entire process.

Another advantage of adopting Strategic Design in the corporate environment is its ability to foster innovation. Because of its positioning at the interface between managerial and design activities, the Strategic Design approach is particularly well suited to intercept environmental changes and emerging trends, harnessing them to push the organisational system forward through radical innovations. Such innovation intentions are supported by a proactive response to environmental changes [8], which can be achieved through future visioning activities. Indeed, the imagination and creation of shared and desired scenarios, typical of Strategic Design, supports companies not only in anticipating emerging trends, but also in aligning stakeholder aspirations with strategic goals, resulting in breakthroughs that give companies a competitive advantage [11] [10] [35] [36].

Finally, another significant benefit of adopting Strategic Design, emerged from the study, is its contribution to building resilience within organizations. By fostering an adaptive and iterative problem-solving culture, Strategic Design equips organizations with the agility to navigate disruptions and rapidly changing market conditions. This resilience is further enhanced by the emphasis on stakeholder engagement and co-creation, which ensures that diverse perspectives and insights are integrated into the design process, leading to more robust and inclusive solutions [37] [38]. The collaborative nature of Strategic Design also encourages knowledge sharing and collective learning. By bringing together diverse teams from different disciplines, Strategic Design facilitates the exchange of ideas and expertise, leading to a richer innovation ecosystem. This collaborative environment not only drives creative solutions but also cultivates a sense of ownership and shared purpose among team members, which can significantly boost morale and drive organizational success [39] [40].

In conclusion, the flexible and adaptive approach of Strategic Design enhances problem-solving capabilities and, in doing so, brings multiple benefits to organizations, including improved resilience, increased innovation, enhanced user satisfaction, and a collaborative culture. By integrating strategic foresight with design principles, organizations are better equipped to navigate complexity, anticipate change, and create sustainable value for their stakeholders.

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