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VCW—Value Creation Wheel: Innovation, technology, business, and society<sup>☆</sup>

Luis Filipe Lages

Nova School of Business and Economics, Portugal  
 Massachusetts Institute of Technology, USA

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## ABSTRACT

Similar to animal and plant species, companies and society also need to adapt to the environment or they disappear. This adaptation process implies solving paradoxical problems, overcoming crises, and addressing constant challenges. The Value Creation Wheel (VCW) helps to identify, analyze, and solve problems by providing a step-by-step dynamic process for creating value for society and all the stakeholders involved in the value chain (e.g., customers, employees, suppliers, distributors, investors, and shareholders). Two decades of cooperation with companies, executives, scientists, academics, and students across the world have provided ample opportunity to test and refine the VCW.

The VCW has two major components: DIANA and TIAGO. After the 20-year journey of applying the principles of Darwinism to companies and society, the DIANA theoretical framework provides a holistic approach to problem-solving, which supports scientific, technological, managerial, and societal advancements. The TIAGO tool appears as a chameleon framework, completely customizable to each specific case and problem. The 15 Is of innovation and the input provided by a wide range of stakeholders help to customize the TIAGO tool.

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## 1. Why the VCW?

Henry Ford said “most people spend more time and energy going around problems than in trying to solve them”. The nature of problem-solving decisions and the interrelatedness of those decisions remain vague. This is surprising, considering that the choice of a particular decision to solve a specific problem affects organizations' survival and society's well-being.

An MIT Professor who is an inventor, co-founder, and board member of three venture-funded companies, mentions that the VCW can solve problems in many different fields because life is about making constant choices. For example, the VCW can help to decide how to start searching for a lost airplane in the ocean and addressing other problems, crises, challenges, and paradoxes across a host of areas, such as aerospace, astronomy, biotechnology, business, chemistry, decision-making, design, energy, engineering, healthcare, finance, NGOs, personal life, physics,

public policy making, strategy, and tourism services. The VCW has two major components: DIANA and TIAGO. The DIANA theoretical framework creates a bird's-eye view of how to solve problems. TIAGO is the applied tool, which helps to develop a customized solution for a specific problem and supports the implementation of the DIANA framework.

## 2. What is the VCW?

Frameworks popular in the 20th century (e.g., Ansoff Matrix, BCG matrix, Business Plans, Cooper Stage–Gate Model, McKinsey matrix, Porter Generic Strategies), use triangles, squares or matrices to give an illusion that the world is stable and that organizations and individuals control uncertainty, change, and reality. These frameworks classically consist of trade-offs, autonomous steps, and linear decisions that no longer adjust to the 21st century's business environments, because today's dynamic markets require experimentation, interaction, improvisational change, and managing the paradoxical tension between strategic focus and flexibility (Bingham, Furr, & Eisenhardt, 2014). In a time of paradoxes and global markets, we must think not only “within the box” and “outside the box” but also “with no boxes.” The either/or option is not necessarily the right approach (Lewis, 2000; Lewis, Andriopoulos, & Smith, 2014).

Theory and traditional frameworks often focus on “convergence”, namely analyzing input-, behavior-, and outcome-based control (Anderson & Oliver, 1987; Hayes & Abernathy, 1980; Hirst, Van Knippenberg, Chen, & Sacramento, 2011; Jaworski, 1988; Snell, 1992). The VCW builds on the idea that in addition to the control system, experts require both “boxes” and “no boxes”, both “flexibility and structure”, both “converging and spreading”, and both “trade-off and paradoxes” to

<sup>☆</sup> During the past two decades many contributed to this research. I acknowledge FCT Research Grants for my Doctoral (Warwick University, 1996–2001) and Post-Doctoral (MIT and Stanford University, 2000–2001) studies, MIT-Portugal program funds while a Visiting Scholar at the MIT Deshpande Center for Technological Innovation (2007, 2015), and the Lisbon MBA while a Visiting Faculty at MIT Sloan School of Management (2010). I acknowledge the countless professionals, executives, scientists, professors, researchers, and students for their useful insights during the past two decades. Special thanks to S. F. Jahanmir (Nova SBE, MIT) for her continuous feedback and countless reviews of the VCW. Finally, I have no words to thank my family, particularly Carmen, Diana, and Tiago, for helping to keep the VCW boat floating during the numerous stormy times. Send correspondence to Luis Filipe Lages, Nova School of Business and Economics, Universidade Nova de Lisboa, Faculdade de Economia, Campus de Campolide, 1099–032 Lisboa, Portugal (lflages@novasbe.pt) Phone: + 351.21.3801.600. <http://www.lflages.com>.

manage uncertainty. This explains why, contrary to other existing market solutions, the VCW does not impose its control formula. The VCW is customizable, accepting the input of solutions and control systems that are already solving problems. Some examples of existing solutions are: a) indoor solutions (e.g., banks of ideas, complaint and suggestion boxes, and solutions developed in-doors or outdoors); b) established tools (e.g., ABC, Balanced Scorecard, Business Model Canvas, Business Plans, Cooper Stage-Gate Model, Design Thinking, Lean Manufacturing, TQM, SERVQUAL, and Porter's 5 Forces); and c) tools that a wide range of inherently solution-driven companies develop (e.g., Big 5 Consulting Firms, Bain & Company, BCG, Booz Allen, Everis, Google, McKinsey, SAP, and Microsoft Solutions). For example, the VCW and the Lag-User Method, a seven-step process to generate and implement laggards' ideas (Jahanmir & Lages, 2015), can work as independent tools or complement each other. This is the case of a project with a leading global financial institution where the VCW and the Lag-User Method are applied simultaneously to complement each other and optimize results. VCW is specifically addressing the broad challenges regarding increasing revenues and acquisitions of new customers. Additionally, we are applying the Lag-User Method to involve late-adopters in the new product/service development process and solve VCW challenges because many of these customers have the profile of late-adopters, i.e. are skeptical toward financial services and resistant to the firm's innovations.

The A.G. (After Google) world is both flat and spiky, requiring new frameworks (both structured and flexible) to incorporate previously accumulated knowledge to deal with change and solve complex paradoxes. As such, the VCW is not another competing tool, but a tool that embraces partners that contribute toward a stronger solution for problems and challenges. While applying Darwinist principles to increase the chances of survival of companies and society, the VCW considers constant change and is a highly interactive circular framework. The theoretical literature rarely addresses this type of circular and dynamic approach (see Lages, 2000; Lages, Lancaster, & Lages, 2008; Lages, Mata, & Griffith, 2013 as exceptions). To achieve its full potential, the VCW needs to measure different types of value creation (e.g. Lages & Fernandes, 2005; Lages & Lages, 2004; Lages, Silva, Styles, & Pereira, 2009) and have a resilient stakeholder orientation (Berman, Wicks, Kotha, & Jones, 1999), involving different kinds of internal and external stakeholders with a Win–Win vision. This justifies the interest in understanding relationships among different stakeholders, namely by assessing and measuring them through different scales and scorecards (Crespo, Griffith, & Lages, 2014; Lages, Lages, & Lages, 2005; Lancaster & Lages, 2006; Lages, Jap, & Griffith, 2008). A dynamic stakeholder orientation wheel provides continuous inputs to the problem-solving process. Creativity benefits from partners and a work

environment that enhances intrinsic motivation. Managers should therefore endeavor to match partners and people's skills, interests, and personality types to the right project (Coelho, Augusto, & Lages, 2011). VCW creativity is important to generate adaptive innovation within each phase and among the five VCW phases.

### 3. DIANA theoretical framework: practice converted into theory

Nothing is as theoretical as a good practice, and practice is very useful to feed theory and vice-versa (Charmaz, 2014; Eisenhardt, 1989; Van de Ven, 1989). This article results from an observation of numerous unsuccessful and successful cases over the last two decades and an in-depth analysis of the literature (Charmaz, 2014). Various theoretical rationales provide the foundations for DIANA (Fig. 1). This article presents the VCW steps sequentially below, but implementation need not be sequential, because like animal and plant species, companies and society need to constantly adapt to unexpected changes and numerous (un)-identified opportunities.

First, the VCW can help to select from among a variety of complex options, dealing with the paradox of choice. Teams and people require tools with systematized paths. Empirical evidence demonstrates that the variety of choice can be daunting and demotivating, and might create tensions at the personal level (Iyengar & Lepper, 2000). Similarly, the lack of tools to deal with the variety of choice can create divisions, a wide range of tensions (Schwartz, 2004), and may ultimately prove harmful to organizations, individuals, and society.

Second, the VCW can help rethink the traditional approach to decision-making and problem-solving, namely by helping to overcome several limitations of the traditional use of brainstorming, such as frequent judgment, fear of judgment, and that talkative participants tend to dominate the sessions (McCaffrey & Pearson, 2015). Additionally, this “flexible stage-gate” framework allows managing the rigidity-flexibility paradox, isolating and at the same time integrating each of the several steps. The VCW helps to mold innovation into internal and external constraints (Christensen, 2013). VCW presents a dynamic approach that helps to generate and select ideas, move from an abstract challenge to a focused value proposition with a clear unique selling point (USP), and generate customized business models. In the presence of numerous possibilities to operationalize ideas, the VCW can help decision makers to involve everybody, from people playing the angel's to the devil's advocate, from techies to laggards; thereby deciding among a variety of complex options to increase value. Teams can align in terms of cognitive conflict, can avoid affective conflict, and consequently select the solution(s) with the greatest potential for success.

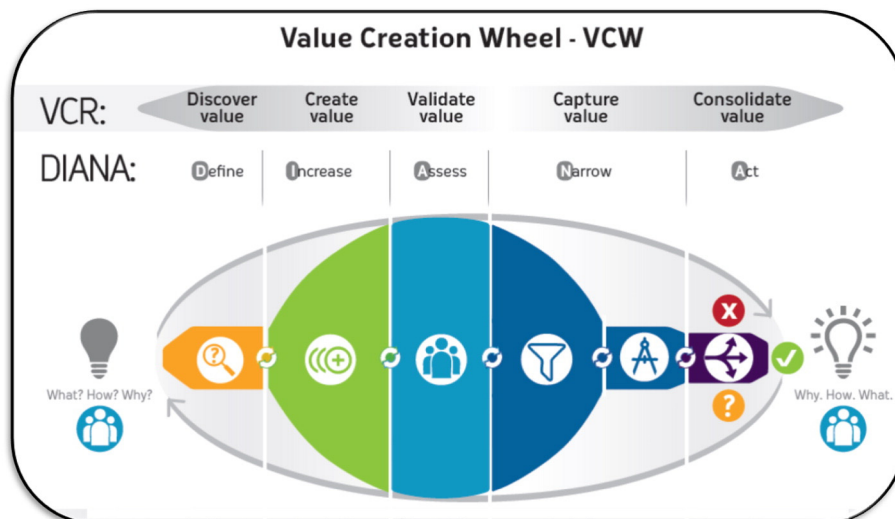


Fig. 1. DIANA: VCW's theoretical framework.

Third, practitioners, public policy makers, professors, and researchers generally agree that the traditional theoretical frameworks do not provide all the answers and tend to build on trade-offs rather than on paradoxes. During some interviews to validate the VCW, a MIT Sloan Professor observes, “the traditional frameworks are about benchmarking, substitutions, and cannot think outside existing markets.” Others argue that some frameworks such as Design Thinking (Brown, 2008), Stage-Gate (Cooper, 1990), and Technology Roadmapping (Phaal, Farrukh, & Probert, 2004), either lack a structure or are too rigid, or have a bias toward either a market-pull or a technology-push perspective. A MIT Engineering Professor mentions that the advantage of the VCW is that “[it] is adaptive, not ticking boxes, is structured but allows creativity, and applies well to tech-based innovation.” Finally, another MIT Sloan Professor mentions that what he likes about the VCW is that “it presents a solution for the tech-push and market-pull paradox. Normally people and frameworks come from one side...”

#### 4. TIAGO practical tool: theory converted into practice

DIANA theory inspires TIAGO, a customizable tool that adjusts to the problem and context of implementation. TIAGO is not final, but highly flexible and dynamic, allowing problem-solving partnerships, incorporating the relevant information from internal and external stakeholders and theory, and building on many different quantitative and qualitative sources. Many companies struggle to find the right solutions and a clear and focused value proposition to support a business model. A CEO from the Healthcare sector mentions that some “recent business models are really interesting for start-ups but when we move to biotechnology, they do not apply anymore.” Another CEO of a well-known European retail company that applies a popular brainstorming methodology mentions: “at the end of the day, it was a bit frustrating because the ideas were not focused.” TIAGO aims to address these challenges and present concrete solutions rather than abstract ideas.

##### 4.1. TIAGO and the five phases

The TIAGO practical tool consists of five phases: 1) tap, 2) induce, 3) analyze, 4) ground, and 5) operate (Fig. 2). For simplicity purposes, Fig. 2 presents the five phases sequentially. They are dynamic, flexible, circular, and not necessarily sequential. The higher the number of

stakeholders and 15 Is' tools, the richer TIAGO will be and the longer will take to implement.

In the first phase (Tap) is necessary to define the space and clarifying the problem/challenge in the specific context to analyze. To start is essential to gain market, technical and/or practical knowledge about the value chain and topic at hand. One also needs a clear vision, goals, understand the trends, and have a precisely defined research question. This process might take from minutes (e.g., when a CEO is very acquainted with the theme and has a very clear problem to be solved) to several years (e.g., during any discovery process such as a Doctoral thesis).

In the second phase (Induce), the aim is to achieve as many ideas for solutions and filters as possible using various stakeholders. People cannot kill ideas and it is important involve all the critical internal and external stakeholders. Idea generation should be supported by multiple approaches (e.g. bank of ideas, brainstorming, crowdsourcing, networking, open-innovation, and workshops), instead of exclusively traditional approaches, in which hierarchy and bureaucracy kill individual creativity (Hirst et al., 2011). All incremental and breakthrough ideas and those resulting from benchmarking need support. At this stage, there are no good or bad ideas. The VCW brainstorming is different from other techniques (e.g., Design Thinking) in several aspects. The brainstorming stage, concerns two areas that after an in-depth analysis must remain separate: a) solutions and b) filters. If possible, the people generating the solutions should be different from the ones generating filters. The solutions to solve a problem might emerge from primary and secondary research, idea streaming, market-pull, and tech-push exercises. The filters are the acceptance/rejection criteria, the reasons (e.g., problems, challenges, threats, opportunities, and strategies) why a solution might or might not be suitable for future implementation. Filters often reflect the characteristics of product/service/technology/person (e.g., technology readiness level, price, positioning, attributes), market/competition (e.g., market size, market growth, red- or blue-ocean), team/company (e.g., vision, capabilities, resources, size), and environment (e.g., political-economic, socio-cultural, technological, ecological, and legal forces- PESTEL).

In the third phase (Analyze), the key decision makers identify the potential of each solution and filter coming from the previous phase. The output in this phase greatly depends on the hierarchy and control systems within the organization, and the number of internal and/or external stakeholders involved in the process. To make this phase extremely effective, we recommend using the POKER method, developed by Lages and Hartmann (Lages, 2015). The POKER method

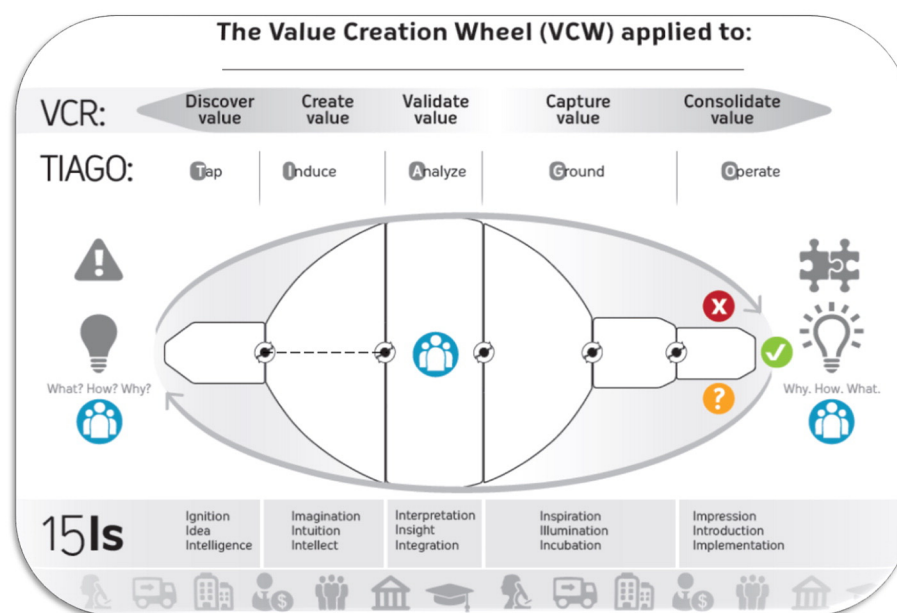


Fig. 2. TIAGO and 15Is: VCW's practical tools.



consists in informing, validating, refining, multiplying, and/or eliminating existing solutions and filters. Key decision makers should then select and rank the filters from the most to the least important. Although we strongly recommend the POKER method for this phase, all of the other TIAGO phases can also utilize this method.

In the fourth phase (Ground), the team builds the Value Creation Funnel (VCF). The VCF results from applying the ranked filters (e.g. behavior- and outcome-based control systems) to the solutions coming from the previous phase. This allows to identify the solutions with the highest potential in a particular context and leads to one or more solutions for operationalizing the issue (e.g., through a concept or prototype). Although the VCF is an efficient and effective tool to narrow a wide range of solutions, the team should be open and flexible, and the VCF tool should not be rigid. For example, in a recent project, after the VCF stage a board member says, “in addition to the ideas that passed the VCF, I wish to include X solution”. The VCF team should give the space to consider the human factor, emotions, ideas, solutions, and strategic filters that sometimes are intangible and hidden codes, that top management are not willing to share in public. At the end of this phase, the team must present concept(s) and/or prototype(s) for the final idea(s). Keep all the excluded solutions from the VCF in a database for a new VCW cycle or for future projects.

The fifth phase (Operate) is the development and implementation of the solution(s) through a business model, where applicable. The board needs to decide on Go, NoGo, or Check (i.e., go back to any of the previous stages of TIAGO). Board members might outsource, or delegate to a subsidiary or a department inside the company the decision to define a roadmap and/or implement.

During all five phases, a critical action is to incorporate internal and external stakeholders' feedback regarding solutions, filters, key decisions, business viability, product feasibility, customer desirability, and environmental forces. People contributing to the VCW should range from the lead-users (Von Hippel, 1986) to the laggards (Jahanmir & Lages, 2015; Jahanmir & Lages, 2016). Common sense suggests that skeptics and those resistant to innovation should not participate in idea generation. However, they often play the devil's advocate and present many reasons (i.e., filters for the Value Creation Funnel: VCF) to justify why the proposed solutions would not work. As a Wall Street Journal reporter mentions (Wells, 2016), when commenting on the “Lag-User Method” (Jahanmir & Lages, 2015), late-adopters are relevant because they “tend to want simple, cost-effective products focused on specific uses.” Companies can use late-adopters' input to identify critical filters that explain why products/services might be unsuccessful or slow to perform in the market.

#### 4.2. TIAGO: short-term projects

Over the years practitioners have used the TIAGO practical tool to support short-, medium-, and long-term projects. The Value Creation Radar (VCR), a lighter version of the VCW, is ideal for projects with limited time-frames, human-, and/or financial-resources because the VCR uses a helicopter-view. For example, is used VCR to determine which international market offers the greatest potential for its exports. This is the case of a fast moving consumer goods European manufacturing firm operating in a traditionally non-engaging product category with low product differentiation and easy replacement. The major challenge is to start exporting directly via their website to avoid paying commissions to intermediaries. After the VCR, the final region to target in Europe becomes very clear and market testing goes very well. Several factors support this success, namely the efficiency of the supporting team, the reliability of secondary data, the existence of partners close to the entry point, and the clear positioning for that region. As a consequence of this success, the company decides to move straight to implementation. The Director in charge of this project, who is responsible for serving over 50 markets using the company's online store, mentions: “We have +45% online sales growth (2015/2014) and +60% online sales growth (2014/

2013), with sales 30 times higher than the investment level. (...) We have the basic know-how and the tools to gain more awareness online. What we lack is an investment decision and a methodology to sustain it. Now it is available.” He then concludes that the VCR is “a solid method to take fundamental decisions, namely resource investment decisions.”

In contrast, other complex projects start with a simple VCR but then need several VCW cycles. For example, a technology company that depends greatly on European Space Agency (ESA) funds decides to use the VCW to find the best place in the world to start testing its technology. After validating and ranking a set of filters using the VCF, the company decides to target farmers with irrigated crops in Stevens County, Kansas, US. At the end of the VCR, one of the board members mentions: “And now, to be 100% sure that it will work, shall we take a plane to go there to look for the farmers or shall we put a new filter in the VCF?” The conclusion is to “CHECK.” To do so, the company decides to go into much more detailed primary and secondary data analysis as well as into the 15 Is' tools. Straight after the VCR, the company hires the first two business professionals in the history of the organization and has a board meeting where the members decide to start gradually switching from a tech-driven vision to a tech-market hybrid vision.

#### 4.3. TIAGO: long-term projects

After completing the VCR cycle, if companies believe that the allocation of additional resources (e.g., time, human, financial) will bring them added value, they will start going in-depth into the 15 Is of Innovation (Fig. 2). A 20-year database of problems, solutions, filters, frameworks, concepts, and business models, spread across a large number of industries provides the 15 Is' (not discussed in this article), comprising the five TIAGO phases.

A new campus dedicated to the digital innovations of the cities of tomorrow, uses the 15 Is to develop ideas and address a wide range of challenges. In October 2014, this 75 M€ budget public/private initiative used the VCW to discover how to enhance the interactions between people that will work, live, spend their time, and occupy space in this ecosystem occupying 12,000 m<sup>2</sup> of buildings. In October 2015, the new challenge becomes how to make smart city projects viable in an empowering ecosystem that fully supports innovation, and start-ups before, during, and after the accelerator experience. Several solutions, which partially emerged because of the two VCWs, have been implemented.

### 5. TIAGO: business model and impact

Over the last two decades firms have tested TIAGO tools in a wide range of scenarios, from award-winning start-ups to Fortune 500 companies. To grow across the globe the implementation of TIAGO is always in partnership with experts in different fields, various organizations (e.g., consultancy firms, agents/distributors, foundations, firm's suppliers, research labs, and universities), and/or companies that have already established teams willing to implement the VCW in loco. The major principle is that all the partners bring added value to the resolution of the final problem/challenge. One of the major goals of the VCW is to help build a Value Creation Vision (VCV) (Fig. 3) capable of aligning partners with diverse mindsets. The VCW helps to align all the internal and external stakeholders participating in a relationship to solve major paradoxes, such as how to make the bridge between the “what” and the “why”, the technology and the market, and economies of scale and local market needs.

#### 5.1. Companies and consultancy

Organizations that have previously benefited or are benefiting from the implementation of VCW tools include Altran, Air Products, C.A. Papaellinas, Elecnor Deimos, Eurocopter/Airbus Helicopters, Eurolife Insurance, GDF Suez, Gemalto, JMD - Jerónimo Martins Group, MasterCard, Nova SBE & LisbonMBA, Renova, Rio Tinto Alcan, Thomson

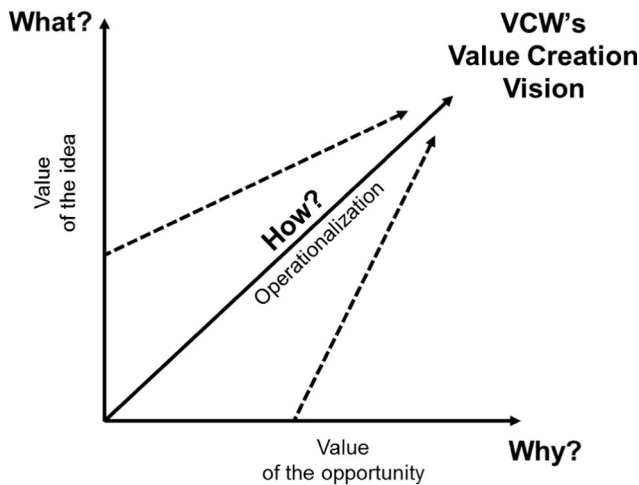


Fig. 3. Value Creation Vision (VCV).

Reuters, and UPS. Many solutions, products, and/or services are already successful in the marketplace. Various countries are implementing several projects across various industries formulating a variety of questions for which organizations currently seek answers using the VCW. Table 1 presents examples of projects initiated between January and February 2016. As with all the projects of the last 20 years, the inputs, tools, and outcomes from this new list of projects are very useful to feed the

Table 1

Examples of challenges that the VCW is currently addressing.

Challenges by field	Industry-specific challenges
<p><i>Growth, strategy and marketing:</i></p> <ul style="list-style-type: none"> <li>Which new market segments to enter?</li> <li>Which new international markets to enter?</li> <li>How to grow via existing customers?</li> <li>How to grow via new products?</li> <li>How to educate and motivate consumers to order the original brand instead of a white label?</li> </ul> <p><i>Mergers and acquisitions:</i></p> <ul style="list-style-type: none"> <li>Which companies shall we acquire in the long-term?</li> <li>How to grow via acquisition of new brands?</li> <li>How to keep the previous clients before the merger and/or changing our brand?</li> <li>How to manage growth in a fast growing organization?</li> </ul> <p><i>Financial services and funding:</i></p> <ul style="list-style-type: none"> <li>How to simplify processes, optimize results, increase revenues, and acquire new customers?</li> <li>How to cut costs while increasing value?</li> <li>How to get funding to finance the expansion of our business?</li> </ul> <p><i>Human Resources Management (HRM):</i></p> <ul style="list-style-type: none"> <li>How to create a marketing and communication department transversal to the whole group of companies?</li> <li>How to improve human resources efficiency while having all stakeholders aligned with the organization's vision?</li> <li>How to build the best team for our department?</li> <li>How to obtain gender balance?</li> </ul>	<p><i>Tech- and innovation-driven firms:</i></p> <ul style="list-style-type: none"> <li>How to integrate the inputs from techies, majority, and late-adopters into the NPD process?</li> <li>How to ensure customer loyalty in the presence of constant tech-innovations?</li> <li>How to overcome barriers to adoption of an innovative service for cancer prevention and diagnosis, in a society with low cancer awareness and screening?</li> </ul> <p><i>Service companies:</i></p> <ul style="list-style-type: none"> <li>How to increase the number of daily downloads and percentage of retention for a mobile app?</li> <li>How to optimize time and costs, and simplify efforts required in processing legal files?</li> <li>How the Air Traffic Control Service of a European country can reduce airplane delays?</li> </ul> <p><i>Retailing &amp; distribution:</i></p> <ul style="list-style-type: none"> <li>How to attract new agents and/or distributors into our business?</li> <li>How to increase the sales of frozen food in a market that values fresh food?</li> </ul> <p><i>Foundations, government institutions, and NGOs:</i></p> <ul style="list-style-type: none"> <li>How to identify the right partners?</li> <li>How to convince authorities to become quicker in providing Visas to highly qualified individuals?</li> </ul>

15 Is' database of ideas, challenges, solutions, filters, frameworks, concepts, and business models.

In the words of a Board Member of a large company that is applying the TIAGO tool, this is a way to “industrialize the innovation process, industrialize existing products, enter into new markets, and look for ways to diversify. This tool helps to operationalize these ideas and is a required step to reserve a certain percentage of profits for internal and external R&D.” A Director of the same company states that the TIAGO tool helps to “sieve” the solutions that have the greatest potential to operationalize. In a recent project this company used TIAGO to identify how the organization can create value while cutting costs. After selecting four final solutions the Innovation Committee in charge of applying the customized TIAGO delegated the operationalization to other committees and/or departments inside the organization. After successful implementation of the TIAGO tool, the company has created: a) a governance model, which involves the board and organizational units, and b) a transversal, flexible, and dynamic Innovation Committee (IC) comprising internal and external stakeholders. The customized TIAGO, currently known inside the firm as “Innovation Framework- IF”, supports the IC. The IC works in collaboration with the existing committees and departments, rather than replacing any. Currently the IF aims to identify, analyze, and solve organizational challenges at both strategic and tactical levels. According to a Director, “the IF contributes to building an innovation culture in which external partners can bring added value and all employees feel that they belong and can contribute to the organization.” Expected IF projects include how to enter new and emerging markets, incorporate new breakthrough technology, integrate new partners into the organizational process, and maximize the use of existing resources and capabilities.

5.2. Education, science, and research

Over the years schools of various disciplines (e.g., Business, Biotechnology/Chemistry, Entrepreneurship, Finance/Accounting, Law, Engineering, Medicine, Social Sciences, Sciences, Technology, and Tourism) have applied VCW tools to solve real problems inside the classroom. These schools are from many countries around the globe: Austria, Armenia, Belgium, China, Cyprus, Finland, France, Germany, Portugal, Slovenia, South Korea, Spain, UK, and USA. The VCW tools often appear in technical courses to solve specific challenges or courses of Value Creation, Tech-Transfer, Innovation Management, New Product Development, Marketing, Entrepreneurship, Strategy, International/Global Marketing, International Management, and International Business. The VCW also supports a wide range of applied projects, Masters theses, as well as a Value Creation Field Lab. Additionally, a wide range of doctoral programs in fields of science have learned this tool, and doctoral and post-doctoral researchers have applied VCW to support their work. Experts agree that the VCW provides Executives, MBAs, and Postgraduate students with a valuable opportunity to acquire rich and real experience in an effective way. The high percentage of Executives and MBAs that, after receiving the VCW training, have decided to implement the VCW in their own organizations demonstrates this fact.

After completing the first cycle of the VCW with the support of students learning it, managers often realize the need to allocate more resources, in turn bringing external support and rethinking the whole innovation process within the company.

5.3. Public policy making and society

Despite receiving considerable resources in R&D, companies and universities are not able to use those resources to arrive to market and perform (Lages & Montgomery, 2005; Moedas, 2015). Although excellent in discovering and defending the “what,” companies and universities have great difficulties in discovering the “why” (Sinek, 2009). This problem complicates the engagement of different types of stakeholders, investors, and identifying new targets. As such, vast numbers of

breakthrough patents, technologies, and final products/services languish on companies' and labs' shelves. Very often, companies are “too rarely succeeding in getting research results to market.” (Moedas, 2015), which shows in the proposals for funding that are technology-led and often miss essential aspects such as how to create value, markets' and competitors' analyses, commercialization, and global markets. The VCW can support researchers and the public policy vision to address this challenge. Moreover, society can continue to use the VCW to address critical challenges such as finding a job, building an entrepreneurship culture, and offering concrete solutions for the refugee crisis.

## 6. Conclusion

The VCW contributes mostly at two levels. First, the process helps scientists, engineers, managers, entrepreneurs, public policy makers, and society to create value while finding the perfect bridge between the “why” (i.e., value of the problem, opportunity, challenge, market need, and market pain) and the “what” (i.e., value of the idea, solution, technology, patent, science, service, or even a person) (Fig. 3). Additionally, the VCW presents a unique selling point (USP) that alternative options are not able to address (Fig. 4). Helps to address a wide range of questions (e.g., helping to increase the Technology Readiness Level (TRL) and bringing to life dormant patents) and transform potential crises (e.g., lack of funding, absence of strategic focus) into opportunities. The VCW helps to solve a wide range of paradoxes, such as combining technology-push with market-pull to bridge the gap between different mindsets (Hortinha, Lages, & Lages, 2011) and how to manage the tension between an adapted and standardized strategy (Lages, Abrantes, & Lages, 2008). The VCW supports the view that experts need to “adopt a ‘glocal vision’ that explores similar needs and values around the world. This is how manufacturers, service providers, and tech firms can benefit from economies of scale while satisfying regional needs” (Lages, 2012).

Second, contrary to other brainstorming techniques, the initial stages of the process generate a massive number of ideas: solutions as well as filters to select the best solutions. In addition, the VCW disentangles the solutions from the filters and therefore can advance the decision-making process. The final output becomes extremely rich, involving input from a variety of internal and external stakeholders. This result is only possible because the VCW promotes stakeholder/partner orientation and has the capacity to involve key decision makers in

filtering the solutions with the greatest potential at an advanced stage of the process. In addition to people thinking “in the box,” the VCW also involves the input of people who “think differently,” “think outside the box,” and “think with no box.” According to the founder of a Swiss Hedge Fund, the VCW “frames the brainstorming process and by framing it, it insufflates a direction and it gives dynamism.” The VCW can be extremely useful for start-ups because the type of filters that founders use affects the type of approach they follow (Jahanmir, in press).

In conclusion, after applying the VCW a manager comments: “it is about filtering the data until you get good applications for our system. It is a good method, in the middle of so many uncertain things. For our new types of innovations and systems, it is a good way of asking yourself if it will be worth it.” The framework is “a structured circular approach,” allowing one to start with a problem, go back, and to rethink the problem over and over again until reaching satisfaction with the final output.

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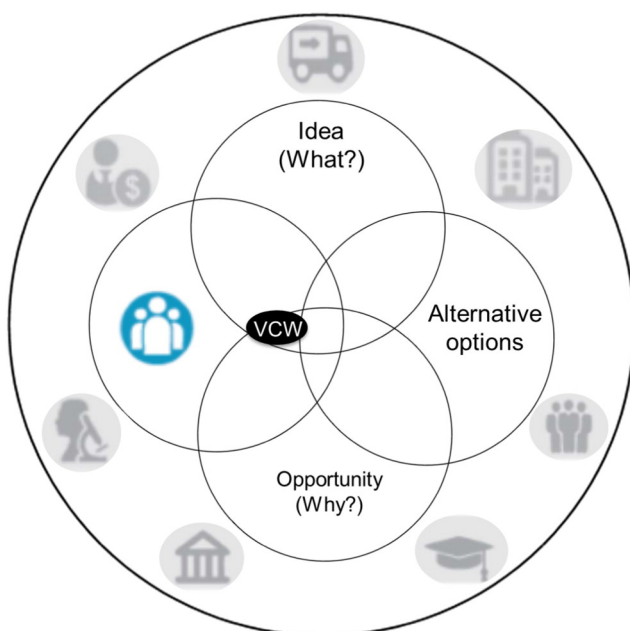


Fig. 4. VCW's looked-for Value Creation Vision.

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