# The Strategy Blueprint
## *A Strategy Process Computer-Aided Design Tool*

Adina Aldea, Tania Rizky Febriani, Maya Daneva and Maria-Eugenia Iacob

*University of Twenre, Drienerlolaan 5, 7522 AE Enschede, The Netherlands*

*a.i.aldea@bizzdesign.com, taniarizkyfebriani@student.utwente.nl,m.daneva@utwente.nl, m.e.iacob@utwente.nl*

Abstract:       Strategy has always been a main concern of organizations because it dictates their direction, and therefore determines their success. Thus, organizations need to have adequate support to guide them through their strategy formulation process. The goal of this research is to develop a computer-based tool, known as 'the Strategy Blueprint', consisting of a combination of nine strategy techniques, which can help organizations define the most suitable strategy, based on the internal and external factors that influence their business. The research methodology we adopted is design science. To visualize the Strategy Blueprint tool, we use a spreadsheet-based implementation. Our first evaluation of the tool in real-life settings indicates that the tool is both useful and easy to use.

## 1 INTRODUCTION

Nowadays, organizations are faced with continuous and fast-paced changes in their environments, which in turn requires them to provide quick responses. To adapt to these changes, organizations need to design and implement planned change at a faster rate (Burke, 2013). However, this can prove to be quite a challenging task. A recent study on the pitfalls of strategic alignment that organizations were experiencing, indicated that about 50% of the participating organizations witnessed problems during strategy formulation, and between 50% and 90% of the organizations considered they experienced problems with implementing their strategies (Roelfsema et al., 2016). More often than not, organizations experiencing problems with strategy formulation and implementation face issues, such as conflicting priorities regarding reaching strategic goals. Moreover, strategy formulation and strategy implementation are seen as separate processes. Also, the strategy is often unsupported by existing information systems (Roelfsema et al., 2016). Ultimately, these problems can lead to poor strategic alignment within an organization, which can have a negative impact on organizational performance. Therefore, it is important for organisations to have a clear, unambiguous strategy backed up by sufficiently detailed plans (Economist

Intelligence Unit, 2004; Kaplan and Norton, 2005; Acur and Englyst, 2006; Sull, 2007; Franken, Edwards and Lambert, 2009;).

Acknowledging the importance of organisations' ability to formulate, align, and implement their strategies in order to remain competitive, many tools and techniques to support this process have already been introduced. At an operational level, many standards have been developed, which have been implemented in a multitude of software solutions, such as Business Process Management (BPM) and Enterprise Resource Planning (ERP). Similarly, at a tactical level, domains such as Business Intelligence (BI) and Enterprise Architecture (EA), have been supported by software tools.

However, when looking at a strategic level, very few software solutions are currently available, most of which do not support the well-known and used strategy techniques such as, the Business Model Canvas (BMC), the SWOT analysis, and the Balanced Scorecard (BSC). Strategy techniques are recognized as helpful and even necessary in streamlining strategy development and execution (Nohria, Joyce and Roberson, 2003). Therefore, a software tool implementation of such techniques could possibly prove valuable to organizations.

Teece (2010) argues, when looking at business modelling, that there is little support for designing and analysing business models, which can lead to

poor understanding of an organisation and ultimately, to commercial failure. The lack of support for designing and analysing aspects pertaining to the strategic level is also recognised by Osterwalder and Pigneur (2013). The authors argue that Information Systems (IS) research could provide beneficial guidance on this topic by offering a common language, conceptual frameworks, and visual schemas that can help with understanding and designing strategy techniques, by transforming the strategy process into a design activity, and by offering guidance for Computer-Aided Design (CAD), similar to the one that EA has developed over the years.

Drawing on the observations of Teece (2010), Osterwalder and Pigneur (2013), in this paper we argue that for a software tool to be able to help organizations with designing their strategies, it should include well-known strategy techniques (e.g. BMC, SWOT, BSC). As Aldea et al (2013) indicated, these strategy techniques can also be combined and linked to each other in order to provide comprehensive support for the different phases of strategy design. In this paper, we design such a software tool, named the Strategy Blueprint. It is a decision-making tool which includes nine well-known strategy techniques. These are integrated within the phases of the strategy process and are also linked to each other.

Furthermore, we adopt the argument of Osterwalder and Pigneur (2013) that a software tool for strategy formulation should use guidance from IS research. Specifically, for the Strategy Blueprint, we use knowledge from the EA discipline, in the form of the ArchiMate modelling language (The Open Group, 2016). ArchiMate serves as a common language between the different strategy techniques. This facilitates a better understanding of the role of each technique and of how the core concepts of each technique can be related to each other. Moreover, we applied a qualitative concept mapping approach (Carnot; 2006; Kinchin, 2008) in order to create a mapping between the concepts that are used in the selected nine strategy techniques included in our tool (i.e. the Strategy Blueprint), and the ArchiMate modelling language. We did this to ensure that the results generated with the help of the Strategy Blueprint can be reused by those practitioners in the organization that manage the implementation of the formulated strategy, such as Business Architects or Enterprise Architects. Such an approach could also provide valuable insights into how the new ArchiMate 3.0 can relate to strategy techniques. We make the note however that our mapping is qualitative in nature as in the works of Carnot (2006)

and Kinchin (2008), and does not mean to provide a (possibly automatic) translation of a strategy described in terms of one technique into a strategy described in terms of another technique. In the same vein, our mapping exercise was not aiming at establishing any transformation rules between the descriptive concepts of each technique and Archimate. In contrast to this, we wanted to compare how the nine strategy techniques organize the strategy-relevant information that they handle and how the concepts that these techniques are using, could possibly share meanings with the meanings of the conceptual constructs of the ArchiMate modelling language.

Finally, in this paper we address the need for an appropriate visualization supporting the combinations of strategy techniques. We do this by designing a spread-sheet-based tool. Our main design goal for this tool is to provide organizations a strategy formulation instrument that can be used without prior knowledge about the specific strategy techniques included in the tool. From a practical standpoint, this implies that the tool would guide managers and other strategy-oriented practitioners while using multiple strategy techniques for strategy formulation, without prior knowledge.

For the purpose of this research, we follow the design science research methodology according to Peffers et al. (2007). This had an impact on the organization of our paper. In what follows, Section 2 presents background and related work. Section 3 describes the development of the Strategy Blueprint and its visualization. Sections 4 and 5 contain a demonstration and evaluation of our proposed approach and visualization by using a real-life case study. We conclude with discussion, limitations, future works, and recommendations in Section 6.

## 2 BACKGROUND AND RELATED WORKS

This section provides background on three topics: (1) strategic alignment and strategy techniques, (2) reasoning approaches and specifically the approach of reasoning trees that we will employ to help define the logic behind designing our tool, the Strategy Blueprint, and (3) Design Science as a method for industry-relevant research.

### 2.1 Strategy Techniques

Strategic alignment means that all elements of a business - the way the company is organized, the

resources it employs, its assets — are arranged in such a way as to best support the fulfillment of its long-term purpose (Santana Tapia, Daneva and van Eck, 2007). While a company's purpose is enduring, strategy includes choices about e.g. what products and services to offer, which markets to serve, and how the company should best set itself apart from rivals for competitive advantage. While a company's purpose does not change, strategies and organizational structures do, which can make chasing "alignment" between strategy and the organization feel like chasing an elusive target. Careful formulation, planning and re-planning of strategy is therefore of paramount importance. According to Aldea et al. (2013), the strategy formulation process involves the following phases: visioning process, environmental analysis, strategic options, strategic choices, strategic objectives and metrics. In the following paragraphs, we present those strategy techniques that can be used within these phases. Based on Aldea's systematic literature review (2017), we identified nine strategy techniques that we consider as 'good candidates' for inclusion and adaptation in our computer-aided tool, the Strategy Blueprint. These techniques are: Brainstorming, BMC, Porter's Five Forces, PESTEL, SWOT, Resource Base View, Confrontation Matrix, BSC, Blue Ocean Strategy. We chose these strategy techniques for inclusion, because of their ability to capture the type of information that is needed for formulating strategies. While most of these strategy techniques are well-known (SWOT, BMC, BSC), a few of them are relatively less popular (Resource Based View, Six Paths Framework), however they were selected due to their potential to connect to the other techniques.

In order to provide support for analyzing the potential impact of certain decisions, we also include risk analysis concepts. According to literature, there are four methods that are commonly used in performing risk analysis in relation to strategy: real option analysis (Mikaelian et al., 2011; Rowley, 1989), sensitivity analysis (Lindič et al., 2012), scenario analysis (Ide et al., 2014), probability and impact matrix (Project Management Institute, 2008), and the Monte Carlo simulation (Luko, 2014).

As part of preparing this paper, we considered the advantages and disadvantages of each type of risk analysis put forward in these techniques. We ended up choosing the following two for inclusion in the Strategy Blueprint: scenario analysis, and the risk probability and impact analysis. Last, we make the note that in our tool, we also use the tornado diagram (Borgonovoa and Plischke, 2016) as a graphical visualization for opportunity and threat analysis, instead of using it for risk analysis.

## 2.2 The Concept of Reasoning Tree

Scholars in psychology, cognitive science and education define 'reasoning' as the process of drawing conclusions or inferences from information (e.g. see Lohman and Lakin, 2011). In Strategic Management literature, however, the concept of reasoning has so far been mostly combined with decision-making and problem-solving. E.g., in a recent publication (Xu, 2011), evidential reasoning is one of the reasoning concepts addressed in combination with decision making.

For the purpose of our research, we chose to use the technique of reasoning trees. It has been widely used in psychology, artificial intelligence, and knowledge-based systems, and authors in those fields indicated its worth. However, we make the note that its usage in the business domain is under-represented, especially in relation with strategy formulation. While studying the available literature on reasoning trees, we have identified three pairs of reoccurring reasoning types, namely: (1) inductive and deductive reasoning, (2) case-based reasoning and rule-based reasoning, and (3) forward chaining and backward chaining.

We think that, for the purpose of our research, backward-chaining (goal-driven) and forward-chaining (data-driven) are the most suitable reasoning types. The main reason for this is that backward-chaining can be very useful to users that already have a specific goal in mind to achieve. In the case of forward-chaining, users can take into consideration all the available information (without a specific goal in mind) in order to choose the alternative which provides the highest benefit. Both of these reasoning types are in line with our vision for the design of the Strategy Blueprint.

## 2.3 The Design Science Method

Design Science is the design and investigation of artifacts in context (Wieringa and Daneva, 2015). As a research method, it is solution-oriented and is focused on the interaction of a proposed solution and the context in which the solution is used. The design science research process starts with a study of a real-world problem as experienced by those working in the field (Hevner et al., 2004). It includes the following steps (Peffers et al., 2007): problem identification and motivation, definition of the objectives for a solution, design and development, demonstration, evaluation, and communication. Our research followed these steps. Their detailed

description is in (Febriani, 2016). Because of space limitations, in this paper we report mostly on the solution design, its demonstration, and its first evaluation.

# 3 THE STRATEGY BLUEPRINT

This section presents our tool, the Strategy Blueprint, which can support the strategy design process of an organization. First, we summarize the mapping between the concepts of the included nine strategy techniques, and the ArchiMate modelling language. Second, we describe how the reasoning tree helps with designing the logic of the Strategy Blueprint. Finally, we discuss several aspects related to the visualization of the reasoning tree, which are further used in the spread-sheet implementation.

## 3.1 Our ArchiMate Concept Mapping

To better understand and design the relationships between the phases of the Strategy Blueprint, we have mapped the core concepts of the nine chosen strategy techniques to the ArchiMate 3.0 modelling language, based on the guidelines provided by Aldea et al. (2015). Table 1 presents our concept map. Therein, the "x" symbol identifies the concepts included in those techniques that generate an output usable by another model. The "-" symbol identifies the concepts included in those techniques that need input from another model.

Table 1: Mapping of strategy technique concepts to ArchiMate.

| | Goal | Course of Action | Capability | Resource | Actor | Value | Interface | Collaboration | Assessment | Driver | Metric | Product/Service |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Vision* | x | | | | | | | | | | | |
| *Mission* | | x | | | | | | | | | | |
| *BMC* | | | x | x | x | x | x | x | | | | x |
| *SWOT* | | | - | - | | - | | | x | - | | |
| *PESTEL* | | | | | | | | | | x | | |
| *BSC* | x | x | | | | | | | | | x | |
| *TOWS* | | x | | | | | | | | | | |
| *Brainstorming* | | x | | | | | | | | x | | |
| *Porter's 5F* | | | | | - | | | | | x | | |
| *Risk analysis* | | | | | | | | | x | - | | |
| *Blue Ocean* | | x | | | - | - | | | x | - | | - |

Based on this mapping (Table 1), the scope of the strategy techniques, and of the phases of the strategy formulation process, we have designed the logic of the Strategy Blueprint. This logic is presented in the form of a reasoning tree, which illustrates the different routes that users can take to formulate their strategies with the help of the Strategy Blueprint.

## 3.2 Our Design of the Reasoning Tree

The design of the reasoning tree draws on the work of Aldea et al. (2013) about strategic planning and enterprise architecture. According to these authors, there are three main steps in the strategic planning process: Visioning Process, Strategy Formulation, and Strategy Implementation. As mentioned earlier, the strategy implementation is outside the scope of this research, and is not covered by the reasoning tree. However, our research includes two additional phases that are different from the work of Aldea et al. (2013), namely, market analysis and risk analysis. These two phases are not mandatory in strategic planning, yet we consider them helpful for organizations, for optimizing the results of their decisions. Based on the method proposed in Aldea et al. (2013), and the 11 strategy techniques mentioned in Section 2, we develop our reasoning tree for strategy formulation, as shown in Figure 1.

The reasoning tree contains six main phases and five alternate paths. Some phases of the reasoning tree can generate an output which can be used, as an input for a next phase. An example of this is the Strategy Formulation phase which depends on the result of the Environmental Analysis phases.

Other phases, though related, are not directly dependent on each other. Visioning Process and Business Modelling are examples of two phases that are not explicitly dependent on other phases, but they do relate to each other. An organization's vision and mission influence its business model, and vice versa. The components of the business model are essential parts for realizing the vision and for ensuring that a mission can be accomplished.

Thus, while going through the different phases of the reasoning tree, analysis and decisions can be made based on the cumulative outputs of the previous phases. As it can be seen in, each phase in the reasoning tree consists of several strategy technique that can be related to the each other.

## 3.3 Visualization

In order to visualize the Strategy Blueprint, we utilize Numbers, the spreadsheet application provided by Apple. Numbers has several benefits: its overall look,
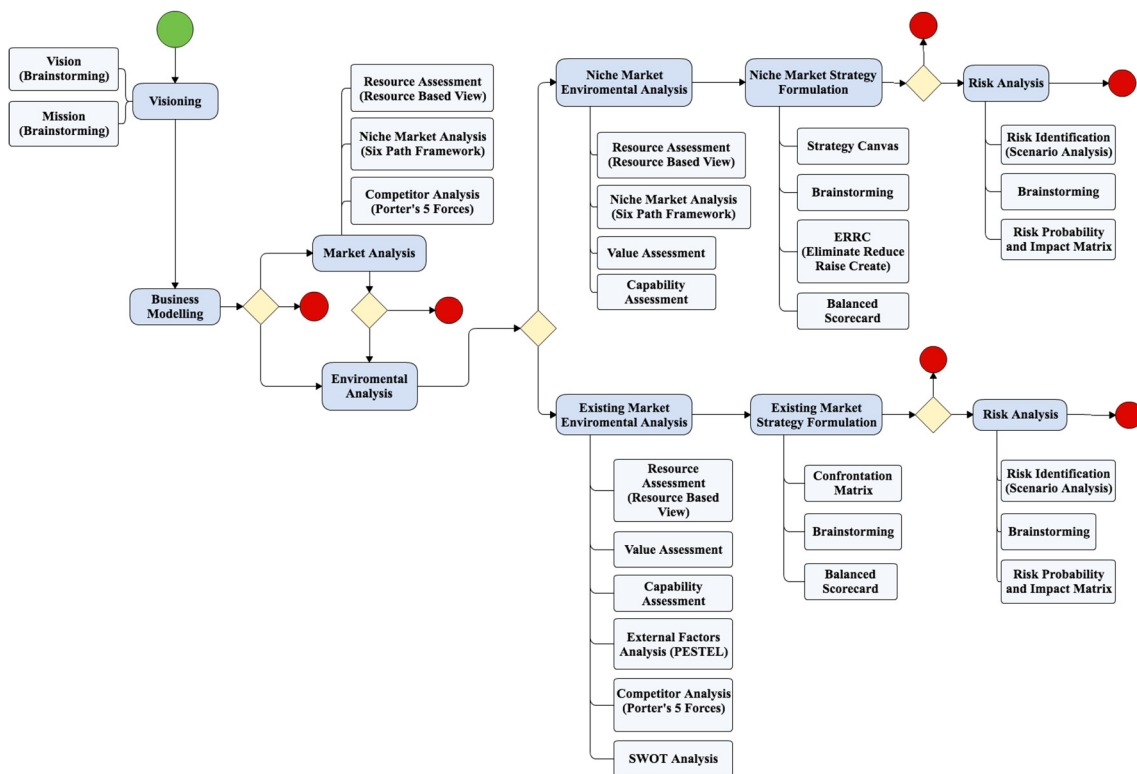
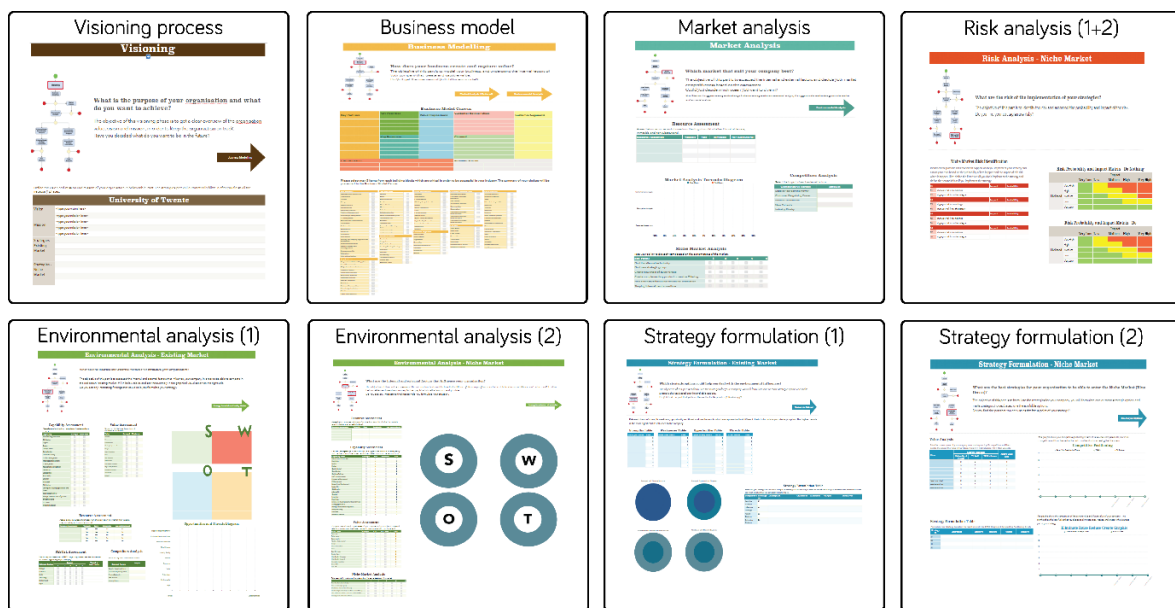Figure 1: The reasoning tree supporting the Strategy Blueprint.



Figure 2: Overview of the phases of the Strategy Blueprint.

its user interface and its simplicity. Although, Microsoft Excel is more powerful in terms of features and complex data processing, we opted to use Numbers because of its ease of use, and because we do not need to use complex data processing. This choice is based on the argument that users of a strategy formulation tool do not have to possess advanced programming or modelling skills. Using simple formulas and the available features in Numbers, we can visualized and implement our

reasoning tree, mostly with the help of charts and tables. Drawing upon the work of Eppler, Platts and Kazancioglu (2009), our visualization offers a ready-to-use structure for organizing and synthesizing information (e.g., line chart, tornado diagram, matrix, and pie chart). To generate these visualizations, different types of inputs are used: self-type, checkbox, stepper, and drop down list. Figure 2 illustrates an overview of the Strategy Blueprint phases.

# 4 CASE STUDY AND DEMONSTRATION

This section demonstrates the application of the Strategy Blueprint in a real-world case study in the context of a public organization in Europe. Because of confidentiality agreements, we anonymized the organization and its data. The organization is a Higher Education institution, from here on referred to as 'the University'. We use the visualizations created in Numbers to illustrate how the different phases of the tool can be used in practice.

## 4.1 Our Case Description

The University is a relatively young organization, with only half a decade of history. It has a distinctive entrepreneurial character, and a strong focus on new technology development and its significance for people and society. Despite its entrepreneurial spirit, in the past few years, the University was facing several internal challenges (e.g. unclear profile, low graduation rates of students, relatively undervalued research) and external challenges (e.g. regulation changes, decreasing market share, and reduction of government funding) which have forced a significant change in the overall strategic intent. Since 2008, the University has developed a very detailed strategic plan, which covers solutions for addressing the above mentioned challenges. We used some of the details of this strategic plan in order to illustrate how the Strategy Blueprint tool can be applied.

## 4.2 The Case Demonstration

### 4.2.1 Visioning Phase

The University's vision, which is already defined, sets a strategic direction that needs to be followed for the next 4 years. It describes what kind of university they want to be and outlines what they want to do to

further develop and achieve that vision. It includes the following statements:

- Facilitate spin-offs founded by student entrepreneurs;
- Provide a full range of high-quality education programs at both undergraduate and graduate levels, with differentiation/specialization and profiling in the Master's phase, based on the strengths of University's research;
- Strengthen the University's international, national, and regional networks and alliances;
- Make a difference through the University's research and ensure that its results are used to improve and, if possible, even save lives.

### 4.2.2 Business Modelling

This section defines the University's business model using the BMC (Osterwalder and Pigneur, 2010). The number of items per building block of the BMC is limited to 5 or less, so that we can focus on the most important aspects of the organization. Based on the vision, the available information that has been provided, our own knowledge, and our assumptions about how the University runs its business, the BMC shown in Figure 3 has been created.



Figure 3: Business Model Canvas of the University.

### 4.2.3 Market Analysis

In this phase, we present the results of the market analysis for the University. Three aspects are analyzed: the competitors (Porter's 5 Forces), the resources, and the alternative market (Blue Ocean Strategy). Based on the information filled in the business model phase, for the Key Resources block, five resources are defined: skilled employees, experts and researchers, partnerships, students, and research facilities. The resource assessment is performed based on the four criteria in the Resource-Based View of the firm, which are: rare, valuable, inimitable, and non-substitutable (Barney, 1991).
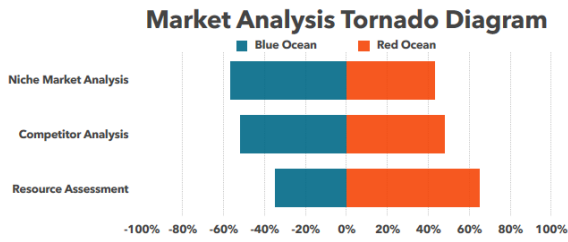
Figure 4: Market Analysis Diagram of the University.

Based on these criteria, the weaknesses of the University are identified as the number of skilled employees and the students. Regarding the other three resources, the University can be considered as quite competitive. As it can be seen in Figure 4, the overall results of the assessment in this phase show that the University leans more towards the existing market rather than a niche market. Thus, the next step is the Environmental Analysis phase, for the existing market.

### 4.2.4 Environmental Analysis

In this phase, five aspects are analyzed: capabilities, value, resources, competitors, and the macro-environment. Capabilities, values, and resources are the internal factors of the organization that are linked to the Key activities, Value proposition, and Key Resources are building blocks of the BMC. The competitors and macro-environment are considered as the external factors of the organization, which are analyzed with the help of Porter's 5 Forces and the PESTEL analysis. The results are presented in a SWOT matrix format (see Figure 5).



Figure 5: Internal/External factors of the University.

### 4.2.5 Strategy Formulation

In this phase, we detail the strategy of the University by using the Confrontation Matrix and the BSC. The results are presented in four pie charts, depicting the elements of the Confrontation Matrix. Based on these results, several alternative strategies are detailed in a BSC, which normally consists of four perspectives (financial, customer, internal, learning and growth). We adjust these perspectives to facilitate a clear connection between the Confrontation Matrix and the BSC, hence renaming them as follows: reactive, offensive, adjusting, and defensive strategy. Each perspective is related to different Confrontation Matrix pie charts. The formulated strategies are further elaborated with the help of the BSC. Figure 6 illustrates an excerpt of the SWOT factors, the Confrontation Matrix pie chart, and the BSC table.
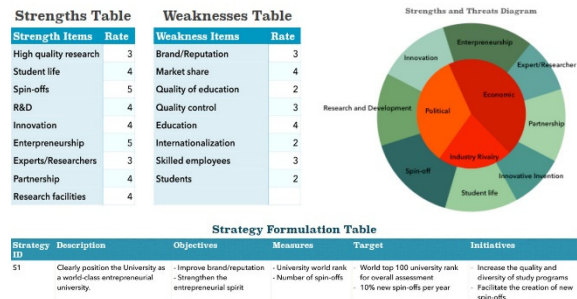


Figure 6: Excerpt results of Strategy formulation.

### 4.2.6 Risk Analysis

In this phase, the risks of the strategies formulated in the previous phase, are identified. To simplify this assessment, two types of risks are identified: the risk of not pursuing the strategy and the risk resulting from the implementation of the strategy. These risks are assessed based on the probability to materialize, and the impact they would have (Figure 7).



Figure 7: Risk analysis of the formulated strategies.

# 5 EVALUATION

A preliminary evaluation of our approach was performed by means of a workshop with five practitioners. During this workshop, we briefly introduced our research and demonstrated its implementation. At the end of the workshop, each participant was asked to fill in a survey to provide their feedback regarding our research. For this purpose, we designed a questionnaire based on the guidelines proposed from the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). UTAUT can be used to understand user acceptance of technology, but can also be adapted to methods, models, and approaches. Since the objective of the evaluation process is to analyze the user acceptance of our approach regarding guiding organizations during strategy formulation, we consider the UTAUT to be highly suitable for this task. From the many constructs proposed by Rowley (1989), we chose the following six to use in our questionnaire: performance expectancy (Q1.1 – Q1.3), effort expectancy (Q2.1 – Q2.2), facilitating conditions (Q3.1 – Q3.4), attitude towards using technology (Q4.1 – Q4.3), self-efficacy (Q5.1 – Q5.4), and behavioral intention to use the technology (Q6.1 – Q6.3). The full list of constructs and statements used in the evaluation workshop is shown in Table 2, where we also report four descriptive statistics for the questionnaire statements such as: minimum (Min) and maximum (Max) values, average (Avg.) values, and the standard deviation (Std. dev.). A 7-point Likert scale was used to rate the statements of the questionnaire, with '1' representing the lowest (don't agree), '7' representing the highest (agree), and '4' representing a neutral response.

As can be seen in Table 2, the majority of the statements from the questionnaire received an average rating from the respondents of 4 or above. From this, we can conclude that overall rating provided by the respondents was at least neutral with most statements receiving a positive average rating. Furthermore, most the standard deviations for the statements in the questionnaire were lower than 1. This suggests a consensus among respondents in a majority of cases. Therefore, we can conclude that the opinions of the respondents were in many cases similar and positive towards the Strategy Blueprint.

While evaluating the results of the first category of statements relating to performance expectancy (Q1.1 – Q1.3) we can conclude that our respondents considered the Strategy Blueprint as a useful tool for strategy formulation (avg. 5,8), which is easy to use

(avg. 5,6), and can increase their productivity (avg. 5,2). Therefore, we can argue that these results support our claim that the Strategy Blueprint is a suitable tool for strategy formulation.

In case of the effort expectancy statements (Q2.1 – Q2.2), similarly to the previous category, we can conclude that the respondents considered that the Strategy Blueprint is an easy to use (avg. 5,6) and easy to learn tool (avg. 5,2). Similarly, we can observe that the opinions of the respondents are alike, with both statements having a standard deviation of lower than 1. Therefore, we can argue that these results support our claim that the Strategy Blueprint is a tool which can be used and learned by practitioners with ease.

The third category of statements, which focuses on the attitude of the respondents towards the Strategy Blueprint (Q3.1 – Q3.4), also indicates an overall positive opinion of the respondents (avg. 5,4 - 5,8). In the case of these statements, we can also observe a standard deviation lower than 1, which suggests similar opinions of the respondents. Therefore, we can argue that these results support our claim that using the Strategy Blueprint for strategy formulation is a good idea (avg. 5,8; std. dev. 0,44).

In terms of the statements regarding the facilitating conditions (Q4.1 – Q4.3), the average scores provided by the respondent were lower than in other categories of statements (avg. 4 – 4,8). Furthermore, the opinions of the respondents regarding these statements are also very dispersed, with a standard deviation between 1,3 and 2,16. This indicates that some of the respondents consider that the facilitating conditions needed to use the Strategy Blueprint are sufficient, while others disagree. One of the possible explanations for these results could be that the choice of using Numbers as the platform for the Strategy Blueprint is not seen as equally favorable by all respondents (Q4.3). This is also reflected in the statement concerning the resources need to use the tool, where respondents also provide disparate responses (Q4.1). Therefore, in a future iteration of the Strategy Blueprint, an alternative to the Numbers spreadsheet tool should be considered.

Regarding the statements concerning self-efficacy (Q5.1 – Q5.4), we can also observe a difference in the opinions of the respondents, with average scores ranging from 4 to 6,2 and standard deviations ranging from 0,44 to 1,41. Therefore, we can conclude that the respondents consider that they can accomplish a task using the Strategy Blueprint, provided that there is sufficient guidance, in the form of built-in guidance or a person to aid in this task. However, we can argue that given more time to explore the existing built-in guidance and semi- automation included in the Strate-

Table 2: Descriptive statistics for the evaluation workshop.

| Questionnaire statements | Min | Max | Avg | Std. dev. |
|---|---|---|---|---|
| **Q1.1**: I would find the Strategy Blueprint is useful in helping me formulate the strategy. | 5 | 6 | 5,8 | 0,4472 |
| **Q1.2:** Using the Strategy Blueprint enables me to accomplish strategy formulation tasks more quickly. | 4 | 6 | 5,6 | 0,8944 |
| **Q1.3:** Using the Strategy Blueprint increases my productivity. | 4 | 6 | 5,2 | 0,8366 |
| **Q2.1:** I would find the Strategy Blueprint is easy to use. | 5 | 6 | 5,6 | 0,5477 |
| **Q2.2:** Learning to use the Strategy Blueprint is easy for me. | 4 | 6 | 5,2 | 0,8366 |
| **Q3.1:** Using the Strategy Blueprint for strategy formulation is a good idea. | 5 | 6 | 5,8 | 0,4472 |
| **Q3.2:** The Strategy Blueprint makes strategy formulation more interesting. | 4 | 6 | 5,6 | 0,8944 |
| **Q3.3:** Working with the Strategy Blueprint is fun. | 4 | 6 | 5,4 | 0,8944 |
| **Q3.4:** I like working with the Strategy Blueprint. | 5 | 6 | 5,8 | 0,4472 |
| **Q4.1:** I have the resources necessary to use the Strategy Blueprint. | 2 | 6 | 4 | 1,5811 |
| **Q4.2:** I have the knowledge necessary to use the Strategy Blueprint. | 3 | 6 | 4,8 | 1,3038 |
| **Q4.3:** The Strategy Blueprint is compatible with other systems I use. | 2 | 7 | 4,2 | 2,1679 |
| **Q5.1:** I could complete a job or task using the Strategy Blueprint if there was no one around to tell me what to do as I go. | 2 | 5 | 4 | 1,4142 |
| **Q5.2:** I could complete a job or task using the Strategy Blueprint if I could call someone for help if I got stuck. | 6 | 7 | 6,2 | 0,4472 |
| **Q5.3:** I could complete a job or task using the Strategy Blueprint if I had a lot of time to complete the job for which the method was provided. | 4 | 7 | 5,4 | 1,1401 |
| **Q5.4:** I could complete a job or task using the Strategy Blueprint if I had just the built-in guide for assistance. | 4 | 6 | 5,2 | 0,8366 |
| **Q6.1:** I intend to use the tool in the future for helping me formulate the strategy. | 4 | 5 | 4,4 | 0,5477 |
| **Q6.2:** I predict I would use the tool in the future for helping me formulate the strategy. | 3 | 5 | 4,2 | 0,8366 |
| **Q6.3:** I plan to use the tool in the future for helping me formulate the strategy. | 2 | 5 | 4 | 1,2247 |

gy Blueprint, the respondents' opinions might become more positive. Finally, in the case of the statements regarding the intention to use the Strategy Blueprint (Q6.1 – Q6.3), the average opinion of the respondents is neutral to slightly positive (avg. 4 – 4,4), with a standard deviation ranging from 0,54 to 1,22. These results indicate that the respondents are mostly neutral towards using the Strategy Blueprint for strategy formulation. We argue that these results could be motivated by the opinions of the respondents regarding the facilitating conditions and self-efficacy statements. This indicates that, even though the Strategy Blueprint is seen as a useful and easy to use strategy formulation tool, the chosen platform for its implementation (Numbers) and the short amount of time allotted to the built-in guidance and automation of the tool, might have influenced their intention to use the Strategy Blueprint in a negative manner.

## 6 CONCLUSION

In this paper we proposed a computer-based tool for strategy formulation − the Strategy Blueprint. It integrates strategy techniques, a reasoning tree, and is implemented in a spreadsheet-based application. The tool is meant to help the organizations by providing guidance through the strategy formulation process, by giving an overview of factors that influence their organization, and by facilitating decision-making and risk analysis. This has been achieved by combining nine strategy techniques and a risk analysis technique. The relationships between these techniques have been designed with the help of a concept mapping to the ArchiMate constructs, in order to determine those concepts that are shared between the techniques and also those outputs of one technique that could be used as inputs for another technique. Furthermore, the logic of the Strategy Blueprint has been designed with the help of a reasoning tree. This reasoning tree includes all the six main phases and five alternate paths, each of them supported by several interlinked techniques. Moreover, the Strategy Blueprint is implemented in the spreadsheet-based application Numbers, which includes several crucial features that have made semi-automating the process of strategy formulation possible.

The results of our first evaluation − the workshop with the practitioners, indicate that the respondents consider the Strategy Blueprint as a suitable tool for strategy formulation, which is easy to use and learn. However, the choice of the implementation platform might need to be revisited in future research. Similarly, the built-in guidance and the semi-

automation of the Strategy Blueprint might need to be given more attention in a future workshop in order to ensure that the participants are able to better experience its benefits.

## 6.1 Limitations and Future Work

Our research has several limitations. First, we selected nine strategy techniques, while many more exist in both literature and practice. In future work, alternative combinations of strategy techniques should be considered in order to determine those that are the most suitable for formulating a strategy.

Second, further improvements of the Strategy Blueprint should include implementations in platforms compatible to Windows-based systems. We consider that such an approach would address many of the results regarding the facilitating conditions statements included in the questionnaire, and possibly even the ones regarding the intention to use. Furthermore, in future evaluation workshops a stronger emphasis should be made regarding the built-in guidance and semi-automation of the Strategy Blueprint. We argue that such an approach would help address the results regarding the self-efficacy statements in the questionnaire, and possibly even the ones regarding the intention to use.

Third, following Wieringa and Daneva (2015), we acknowledge the need for more evaluation to improve the generalisability of the results. A central question in this respect is evaluating the extent to which our current results could be observable in other similar but different organizations (e.g. other Higher Education organizations, and in other countries). Additionally, the participants in these future evaluation workshops should be selected based on their involvement in the strategy formulation process.

Finally, there are also several recommendations regarding the tool, such as the link between the tool and ArchiMate should be elaborated, to facilitate automatic import/export of information to other tools that support the ArchiMate modelling language. This could prove very helpful for EA practitioners, as they will be able to create strategic models with ArchiMate in an easier and more automated manner. Furthermore, an extension for "positive" risks (opportunities/benefits) in the risk analysis could be included in the tool to give a more complete overview of all types of risk. Moreover, our tool is just a prototype that demonstrates the concept. Nevertheless, the design of the tool (possibly with some adaptation) can be used to create a similar implementation, for example using Microsoft Excel.

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