

Making the strategic goals as hypotheses in software startups: The role of hypothesis driven development and Agile methodologies

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Abstract

A problem faced by many managers today in software-dominated startups is reconciling a strategic vision, which delivers value to customers quickly, and adapt to changing circumstances.

Understanding which customers are critical and their needs, are significant for any business. But getting to know these particulars can be a real challenge. Unfortunately, some managers still find engaging with the following questions and struggle to make sense out it: How to prioritize which customer segments to target? Which customer opinions to listen? What features might please today's customers and what might displease them?

This 'uncertainty is considered as failure' and should be scaled down in order to be consistent in delivering the products that customers love. Startups should look at a strategic goal as a hypothesis to be tested instead of something to be planned and executed. Startups need to learn by sophisticated experimentation, adapt and continue with the next experiment faster than their competition.

The startups should apply certain product development methodologies that re-conceive its efforts as experiments that test its strategy to see which parts are brilliant and which are crazy. A true experiment follows with a clear hypothesis that makes prophecies about what is supposed to happen. The goal of an experiment is to discover how to build a business that sustains around that vision.

This paper provides information about Agile and Lean methodologies, and how these methodologies can be tailor-made and applied to formalize the strategies as the hypothesis concepts, which contribute to the endeavors of successful startups.

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Keywords:

Startup process
Entrepreneurship
Innovation
Leadership
Agile methodologies
Lean methodologies

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1. Introduction

Creation of a new business venture is a fundamental achievement of an entrepreneur. An impressive number of startups are launching everyday worldwide. In India alone, according to the Nasscom-Zinnov startup report titled "Indian Startup Ecosystem Maturing - 2018.", there are around more than 4000 startups and 100 incubators took off in the year 2016; an average of more than 13 startups are launching daily. Even though, large number of entrepreneur who are committed for their startups, did not succeed in creating lasting business venture.

There is no simple answer to why startups fail or succeed for that matter. Previous research has investigated startups for decades to understand what drives performance, however, there is no simple recipe for managing successful growth (e.g. Miettinen et al., 2010, Ries, 2011). Market and business related knowledge is highlighted as necessary in order for the startups to be able to commercialize their innovative idea into an actual efficient, attractive business (e.g. McKelvey & Heidemann Lassen, 2013; Sullivan & Marvel, 2011). Entrepreneurs many times assume that it is easy to acquire customers. They assume that they will build an interesting product or service, that will bring huge customer traction. This may happen with initial few customer, but over a period, attracting and winning customers is an expensive task (David Skok, 2012).

Therefore, the questions in need of answers are: how 'uncertainty is considered as failure' can be scaled down? What software development methods need to apply to make the strategic goals as hypothesis to be experimented: being able to learn by trail-and-error, adapt and move to the next experiment quicker than the competitor.

1.1 A Game of New Discoveries

A central challenge facing by many managers and executives is to create and lead an adaptive business. That is, a startup with an ability to sense and rapidly adjust to the changes on regular basis. However, we often hear that when a business witnessed a slide, the managers of the startup would change from Point X to Point Y in order to be successful. In most cases, this kind of change is a one-time event. This X to Y change will get you stuck in a new route, in the meantime market moves ahead and leave you behind. Change is something that should be never stopped in today's fast-moving economy in order to seize opportunities, improve performance or address issues.

One of the major challenge facing my today's executives is to generate new ideas. This is much difficult task than the change. Even for the best product or service, the sustainable competitive advantage is short-lived in the fast changing market. In today's market place, only the capability to adapt products or services can have the sustainable competitive advantage.

The biggest decisions that managers make in business or in life are identifying what's important. Sometimes, changing just for the sake of changing or applying a new idea when it is against the startup's values and processes can be a dangerous trap. We should not assume that old thinking is wrong and new thinking is good. While some new thinking can provide real break-thoughts, much of it are inspired from old thinking. The managers need to examine both old and new thinking in the light of today's challenges and offer a view on what is important.

In the game of running a business successfully in today's economy, the managers need to have a clear understanding on the following areas:

- The environment in which startup must compete and win.
- Key things to do exceedingly well in order to derive the success of the startup.
- Uplift the startup to implement the key things faster and better than competitors.

2. Objectives of the Study

The following are the objective of the study:

- To bring in how to change the business model of the software startups to view the strategies as hypothesis, especially in new product or service development—customer discovery, what markets to target, what software development methods to use, and how to design products or services from the end customer's point of view.
- To evaluate what value can be deliver to the customer? Which of the customer problems can be to solve? Which customer needs are we satisfying? What products and services can be offered to each customer segments?

- To understand how Agile and Lean methodologies can be tailor-made and applied to formalize the strategies as the hypothesis, which contribute to the endeavors of successful software startups.

3. Literature Review and Research Gap

Methodology to prioritize Business and Technology Strategies to provide Enterprise Competitiveness, Oswaldo Luiz Agostinho, (2014). The Technology Management attends the majority of product and manufacturing needs and updates technology directions of the enterprises. One can say that the approach is essentially technological driven, with proper parameters and drivers. Looking for the business side, the current and future drivers are outlined from the determination of the business strategies, driven by market trends, product needs, competitiveness, among other factors. The correlation matrix is presented in this paper facilitating tools to select focus, objectives and target assigning relationships between strategies and competitiveness attributes, to select the more appropriate strategies. Consequently, these selections will orient the application of resources and organizational efforts to achieve necessary competitiveness.

Understanding the Business Strategy Factors that Drive the Business Impacts of Cloud Computing, Fagmie Davids (2017). Organizations are faced with business environments that rapidly change and are fiercely competitive. Information Technology (IT) can assist the organization to achieve business value, provided it is an enabler. The purpose of this paper is to investigate various business strategy categories and align those to the various cloud computing options available to organizations may undertake. The strategic role of IT then gave clarity in terms of understanding the role that IT may play within an organization. Some clarity was provided regarding the type of strategic contribution provided by IT. The paper then also touched on the strategic alignment model, and how it could be used to understand how IT fits within the overall business strategy of an organization.

Driving business value through an effective IT strategy development. Khulood Salem Albeladi, Usman A. Khan, P. M. Khan. (2014). Information system managers, senior executive and strategic planners are increasingly turning their attention for opportunities for achieving for competitive advantage and effective business value through implementing reliable information Technology (IT) strategy. IT strategy is a comprehensive plan that information technology management professionals use to guide their organizations. The most important factor is the alignment between IT and business strategy, organization structure, and processes. Strategic alignment simply relates organizational strategy and information strategy as driven by the overall business strategy. The relationship is described by scholars as the 'Information Systems Strategy Triangle' with emphasis on firms' success criteria, such as: 1) Balancing business, Information System and organizational strategies, 2) Incorporating business strategy that drives both Information System and organizational strategies, 3) Treating Information System strategy at close inclusion to checkmate (preclude) its consequences on business and organizational strategies if isolated.

E-business strategies to cut back cost of business enterprise. Ahmad Tasnim Siddiqui, Amjath Fareeth Basha. (2013). As the time is passing and the world is becoming more virtual and online than physical. This is the time to re-establish the business and to reach more and more people throughout the world. The idea is that it should reach to maximum people living around the world i.e. the business needs to be global and online. Aim of this research paper was to find out the various ways and resources from where we can save the money in traditional business while converting it into e-business. Now each and every one should look at their business and find out the various ways to reduce the operational costs and unwanted resources to reduce the costs and utilize those resources to improve the performance, effectiveness by using internet technologies, other technologies like mobile technologies, application software's for automation etc. And all these things can be into operation amazingly without difficulty. Organizations having good amount of capital can rely on something like oracle's e-business suites. To conclude, there are many areas where business entities can look for reducing cost.

4. Defining Focus

Trying to do all things to all customers is a hallmark for failure. Instead, pick a position and play where you have a best shot, where you can know your customers and their needs. Then focus on that segment intensely and make it easy for customers to do business with you. The endurance you show at it, the harder it will be for others to emulate your strategy. Nevertheless, the chances of surviving the business is depends on the capability of continuous change in response to the ever-changing environment.

One example might help illustrating the need for defining focus. Two gentleman had their eyes on the top job at General Electric. One named Smith. The other named Jones. Smith was your typical 'can do' corporate executive. So when he was given the computer operation to run, he accepted the assignment with relish. John on the other hand was realistic. He knew that GE hadn't gotten into the computer business early enough to dominate it. At this late stage of the game, it was going to cost the company too much to catch up to IBM. If it ever could. After Smith failed to turn the computer business around, Jones got a change to participate. He recommended that GE get out of the computer business, which it eventually did by selling the operation to Honeywell. That's one reason why Rginald H Jones would up as chief executive of the General Electric Company and J Stanford Smith would up at International paper. In a nutshell, if one can understand the role of positioning in the example of the computer business in GE, then one can transfer this knowledge to almost any other situation. [1]

As we have seen, the major challenge for the executives is to make the intelligent choices and define winning strategies for the company. Executives often look for the fruitful processes to help defining focus. In this paper, the following approach is proposed:

- Summarize the strategic alternatives, from which you make final choices.
- Customer centric development, to define which customer to serve and what is most important to customers.
- Create Innovative products and services from the in-depth analysis of the users and their world.

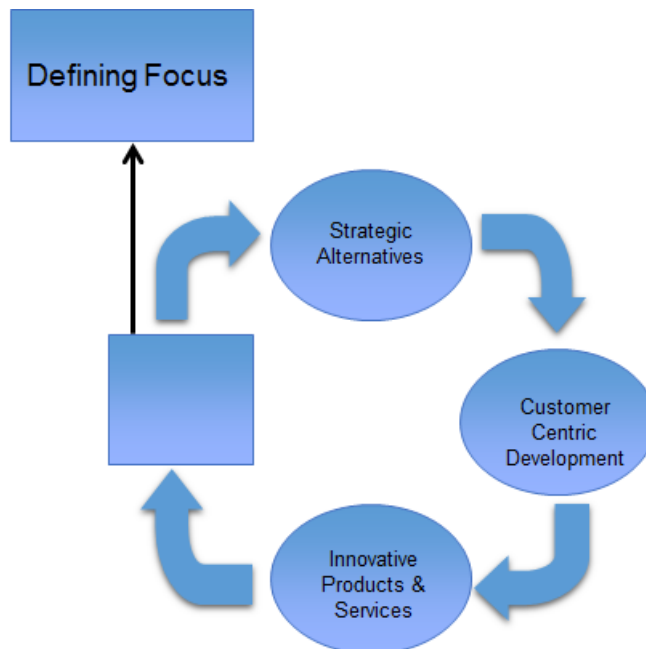


Figure 1: Defining Focus

4.1 Beginning with strategy

A company's success or failure is defined in terms of its strategy. In other words, strategy makes the difference between the successful company and the failure. The strategy of a company determines how the resources can be used in a better possible way to achieve maximum benefits in the competitive arena.

If strategy is about creating a successful business, we need to be clear about the meaning of success in business. The following two key principles underlie success in business:

- Create great value for your customers.
- Make great profits for your company and stakeholders.

These two principles are looking mutually exclusive and often overlap. Only when you create value to your customers, you retain their business for long. On the other hand, if you create value for customers and does not generate great profits for your company, the investors would flee and sooner than later you run out

of resources. Thus, the effective strategy of the company is to create value to your customers and at the same time make profits for your business.

Strategy as Making Alternatives

As the strategy is about intelligent deployment of available resources to achieve company goals, the formation of winning strategies required that we make a series of difficult alternatives. That is, to be successful the executives need to focus on the right things, such as, for example:

- Which customer segments to focus on?
- Which all businesses to do?
- Which customer opinions to listen?
- What features might please today's customers and what might displease them?

Strategy is about making the most intelligent alternatives. This, among the executives is the most crucial element in any successful business.

Therefore, how the executives to focus on deploying the available resources to get maximum returns:

- How to make it easy for customers to do business with you?
- How to foster company loyalty?
- How to streamline your business processes that impact the customers?
- How to maintain better customer relationships?

4.2 Customer-Centric Development

The starting point of any business is customers. Without customers, you have no business in business. For a business, the end customer is the one who consumes the product or service, the one who pays for it; and the end user is the one who uses the product or service. Sometimes, users who are also the customers. If the customers don't value your product and services, sooner or later you will be out of the business. Determining what is important to your customers is vital for developing winning strategies to serve the customers. [3].

Citing facts drawn from the recent research proves that early and continuous integration of end-users in product development activities add significant and sustainable value to the product innovation. The product development with the end-user integration is logically necessary because end-users are expert regarding the product usage and developers are experts in product development and functioning. For developing of high-end products, integration of both end-users and developers is prerequisite all the times.

Customer-centered product development describes a set of processes and activities, which are intended to raise product quality from end user's perspective. Here the term quality refers to usability and user experience. The usability of a product is defined as effectiveness and efficient use of product seamlessly. The user experience is a perspective on the quality of interactions between the users and products. Therefore, the objective of customer-centered product development is to develop products that own the customer's total experience through usability and user experience. These objectives can be achieved by early and continuously integrate prospective customers. [5].

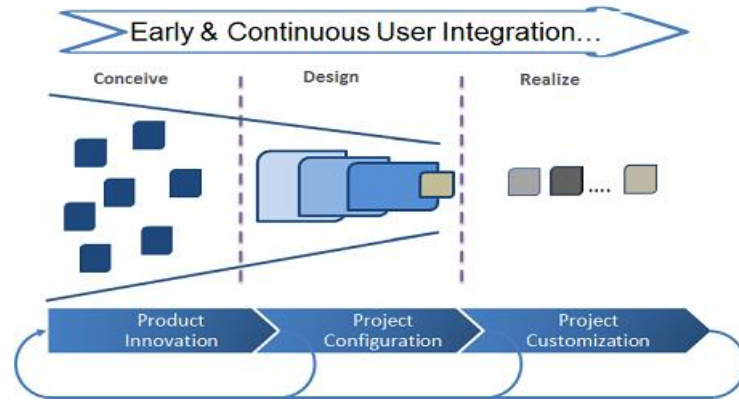


Figure 2: Customer-centric development

From the innovation perspective, customer-centered product development can be in three phases of the product development—conceive, design, and realize.

The Conceive phase represents the Proof of Concepts (POC) process of a product, in which the product innovation foundation are laid. In this phase, framework, processes, outcomes are uncertain. Over a period, when the POC of product is structured and processes are more organized, then merged into New Product Development phase. In this phase, timelines are fixed, processes are well established, and milestones are integrated into the product to be developed. After the product configurations are finalized, the new product development phase is completed. The product is ready for production. Henceforth, during the Realize phase, the continuous feedback from the users of the products is considered for further product customization.

Throughout all these phases, it is proven that user involvement in product development adds significant value.

4.3 Innovative Products and Services

Currently, startups are in extremely competitive situation in the global economy. Only continuous innovation and development of new products and services could guarantee competitive advantage. Product innovation is defined as a driving factor to understand customer needs and to reach customer satisfaction.

ICE Toolbox for innovation

The ICE toolbox for innovation consists a set of tools proposed to promote continuous innovation in the organizations that lead to more affirm solutions. The tools in the ICE toolbox are very useful when are running out of ideas. Applying these tools helps you to probe with divergent thoughts, encourage new ways of thinking, formulate lateral thinking capabilities.

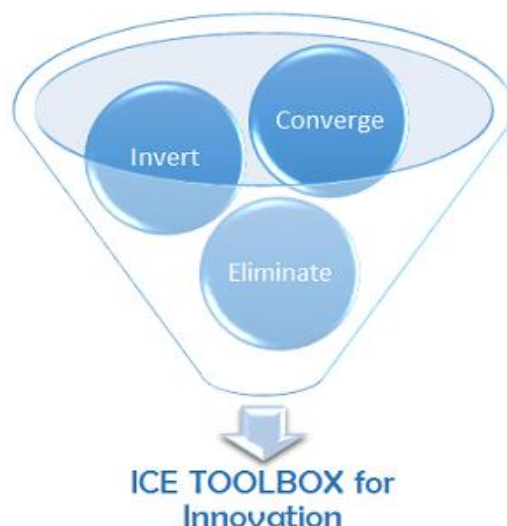


Figure 3: ICE Toolbox for innovation

Applying the Invert Tool

Invert the basic objective of a product or a service and brainstorm for ideas to achieve opposite results. Ask the following typical questions to generate ideas:

- Can a functional be interchanged?
- Can a set of steps in the process be inverted?
- Can a basic assumption about the product be inverted?
- Can a function be inverted for the same result?

Here are the classic examples to illustrate Invert tool.

1. Tom and Jerry series is so popular because the Jerry (mouse) cleverness and cunning abilities never lets Tom (cat) to catch, which is quite unusual in reality.
2. Some restaurants don't charge money for food, instead they charge for time you spent in the restaurant.

Applying the Converge Tool

Two or more parts/individuals/groups work together to produce a combine effort greater than the sum of their separate efforts to achieve a different product or service. Ask the following typical questions to generate open innovation:

- Can I build synergy here?
- Can my organization's internal knowledge sufficient to bring value to the customers?
- What processes, tools, individuals, or products can I combine to generate innovation?

Here are the classic examples to illustrate Converge tool.

1. Open source software is developed by many people, which can be used by anyone for any purpose.
2. Ericsson uses Hackathons to generate ideas.

Applying the Eliminate Tool

Eliminate various parts of a product or tasks in a service to see what you would do in that situation. Eliminate tool helps you to think divergently to tackle any situation. Ask the following typical questions to generate ideas:

- Can a non-beneficial component in a product be eliminated?
- Can a useful component in a product be eliminated?
- Can a useful activity be eliminated?

Here are the classic examples to illustrate Eliminate tool.

1. Blade-less windmill.
2. Google self-driver car.

5. Experimenting and Implementing

The final stage of hypothesizing the strategies is experimentation and implementation. In today's global economy, creating and implementing a strategy approach does not work as there are rapid changes in the environment and in organization's own reality. In other words, the organization's strategic direction is created and implemented, and then continuously modified in response to the changes in the environment. Therefore, experimenting the strategies before implementing allows the managers to make these modifications successfully.

An environment that is ready to experiment, learn from the results, and adjust strategies is a hallmark of the adaptive organization. By continuously experimenting, the adaptive organizations maximize the changes of developing new business and capable to handling the changes in the environment.

The software dependent strategic experiments are especially vulnerable for some managers, which impose some kind of pressure on them. This is because, over a period, the managers are subscribed to a belief of certainty of outcome. The certainty of outcome may offer some sense of comfort to the managers, but eventually this approach bites organizations. Practices such as continuous delivery, test driven development in Agile and Lean methodologies can provide remedies to such behaviors. The managers in organizations where Agile and Lean methodologies are followed in product development, are shifted towards the strategies as hypothesis mindset.

5.1 Hypothesis Driven-Development

A hypothesis is a theory to be tested; a good hypothesis is the one that has both predictive and explanatory value. In new product development, proposed solution to a problem needs to be viewed as a hypothesis—what customer segment we target, which features please customers, how the customers use it, and so on. The hypothesis enables you to formulate theory relationship among all the variables.

Startups do not do projects anymore, they do only experiments. Experimentation-driven startups, on the other hand, do multiple smaller experiments. These experiments generate internal and external findings about customer needs and usages. In other words, a product or service development is a process of testing a hypothesis about its behavior in the market for which it is developed.

However, startups require a culture and process shift in order to develop experimentation capabilities. By taking an experiment approach, the startups can more rapidly design, develop, and measure the hypotheses identified in the products and services, with fewer data gaps, thereby increase its chances of success. [9].

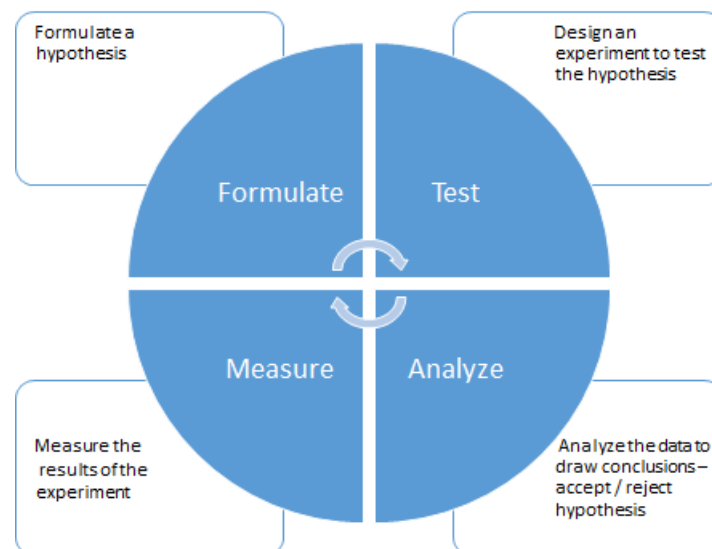


Figure 4: A typical hypothesis life-cycle

The phrase “requirements frozen” is oxymoron in software product development. Requirements tend to change for products and services. There are various reasons for this: 1) changes in the customer needs (market demands), 2) developers increases understanding of the products or services, and 3) change in the organization policy. Sometimes these changes can be complex, uncertain, and exploratory.

Hypotheses can come into play when requirements are complex, uncertain, and exploratory. The hypotheses about customers, market needs, patterns, and so on should be visible to all the stakeholders in the product development. All these hypotheses need to be tested and results need to be measured. Accepted or rejected hypotheses drives development.

5.2 Choosing Development Methodologies

In today’s global economy, mostly startups follow adaptive process, instead of traditional control change process. An adaptive process that is responsive to the business changes and flexible to easy adaption of the development process. Now the biggest question is, from an operative perspective, which methodology makes startups more responsive and flexible. The methodology enables practitioners to operate with a freedom in order to practice only essential project management activities. Also, the methodology you pick needs to be as light-weight as possible.

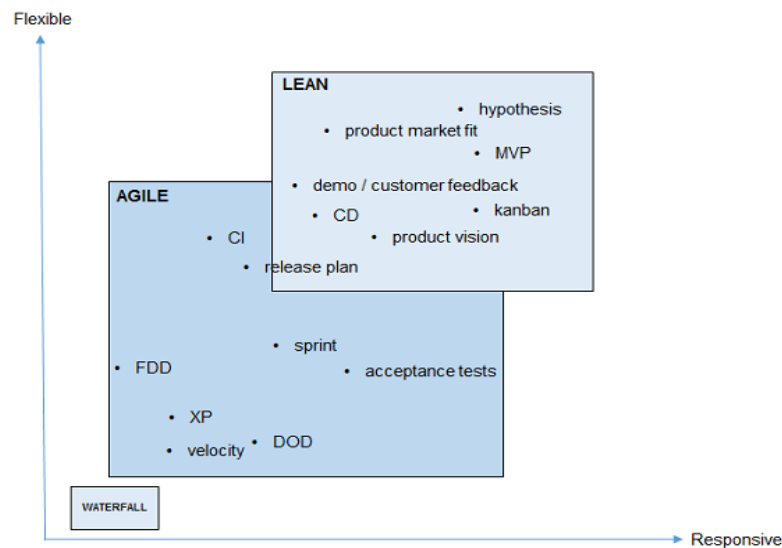


Figure 5: Software Development Methodologies

The figure is not meant to explain the relations among the standard development methodologies. Instead, it provides a means to compare with existing methodologies to motivate the need of in-depth analysis to adapt an operational strategy in startups.

Citing facts drawn from the previous studies states that, almost none of the early-stage software startups practice Agile methodologies. However, some startups practice hybrid version of Agile methodologies when they mature to an extent. When it comes to Flexibility and Responsiveness, the closest area to early-stage startup is the Lean methodologies. When starting, fast release cycles based on minimal functionality is where most early-stage startups put their energies. Also, the early-stage startups emphasis on experimenting and implementing. Nevertheless, try to apply a methodology framework that works for your startup, even it is your own creation by hybrid from different methodologies; after all it should work for you and make sure it is clear for all team members.

6. Conclusion

The main conclusions that can be extracted from this work are:

- Today, startups are facing extreme competitive situations in global economy. Only consistent innovation in product or service development could guarantee competitive advantage.
- Short project life-cycles, technology changes, cost effectiveness, raising competition with changes in the global economy are pushing factors for software startup to go into continuous innovation.

- Customer involvement in product development becoming a key factor for innovation. Combining the practices such as ‘customer involvement in product development’ and ‘hypothesizing the strategies’ hastens experimentation and increases the volume of learning.
- In this paper, the ‘ICE toolbox for innovation’ framework is introduced, to promote continuous innovation in the organizations that lead to more affirm solutions.
- The product development methodology adopted in software startups is characterized by Flexibility and Responsiveness. Apply the software methodology that works for your startup, even it is your own creation by hybrid from different methodologies.
- The main contribution of this research was to develop and assess the value focused thinking by hypothesizing the strategies enables software startups to identify and respond to the business opportunities and threats in which they operate. Moreover, efficient management of, Customer centric development, and choosing development methodologies, may well support successful business strategies.
- Finally, the software managers or decision makers can use this hypothesizing the strategies model to evaluate the performance of the business. Further lines of the research are the continuity of identifying new attributes for each of the objectives, priorities, and value trade-offs. The identification of decision opportunities may be an extra future contribution.

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