AGILE METHODS IN A NEW AREA OF INNOVATION MANAGEMENT

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Abstract

In our fast changing world the traditional approaches of long term strategic planning and distinct Research and Development (R&D) teams might not fit the promptness of change currently taking place. As a result, more and more companies focus on capabilities of their employees and organizations to launch agile new products or re-design the core processes and business models of the company. Especially large mature companies face the challenge of transforming into this new area of management. New structures and frameworks help these companies to transform into an innovation driven enterprise. This paper aims to provide guidance in applying different frameworks in practical use. For example, a Three Canvas Model is presented that allows to operationalize the business model canvas, including the innovation success factors viability, feasibility and desirability. The model supports the definition of the customers and their needs and the joint definition of the product vision as a basis for developing the product with agile processes or for managing a project. Furthermore, the model supports the linkage between early phases (front-end innovation and upstream innovation) and the actual development phase (downstream innovation). To get a good linkage a clear vision is essential and is seen a key success factor. Applying the model in real business environment has proved that it helps to foster agile product management and agile product innovation. Still more research is necessary to determine how established organizations can better act in an agile way. The agile tools are still "piecemeal" and rarely integrated across all processes. But this must be seen as an optimization potential for organizations in the future. However, the development of continuous agile practices that are vertically and horizontally coherent, takes agile leadership as well.

Introduction:

The usage of agile methods is becoming increasingly important for companies. However the SwissQ Trend and Benchmark Report 2014 has revealed that agile approaches are mainly used in software development. For other parts of the organizations, like IT management or product management, agile approaches are much less used (SwissQ Software Development 2014, 2014:14). To fully benefit from agile approaches in developments, the whole processes and culture of the organization should at least be aware of agile development methods. Especially product management should use agile approaches to a reach a higher maturity level.
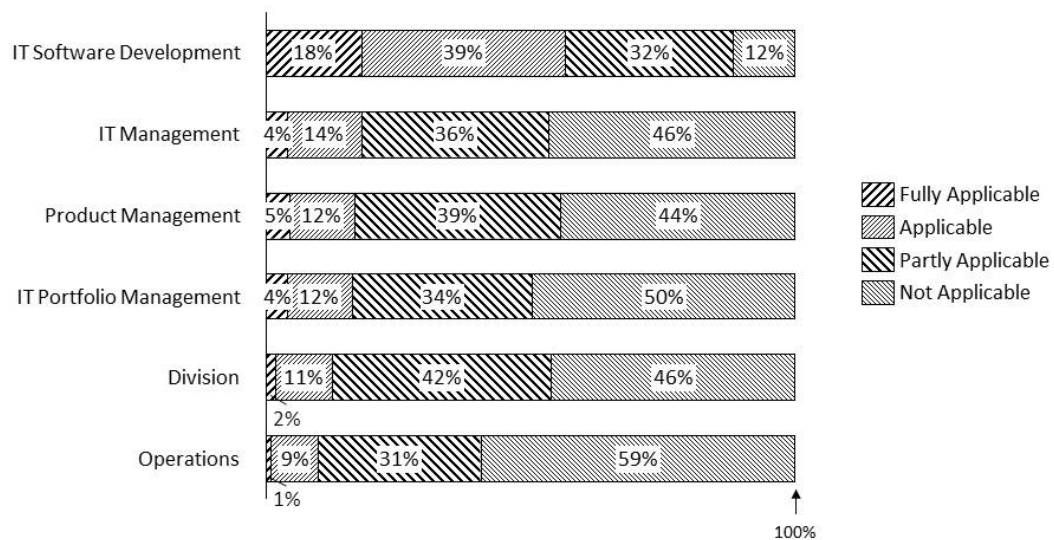

Figure 1: Agility in Organizations, (SwissQ Software Development 2014, 2014:14)

However, agile methods are applied mainly in software development projects. The most popular agile method in software development is Scrum (SwissQ Software Development 2014). In most cases Scrum is applied in single teams, developing a specific peace of software or product. In some cases the projects run on a larger scale and multiple teams are involved.

Nevertheless, there are some approaches for the agile development of physical goods. Sobek et al (1999) and Liker (2006) recognized for example that Toyota is using the lean principle beyond manufacturing for any technical or service processes. They described the development process as a "set-based concurrent engineering" approach, whereby prototypes are used in an excessive manner and a broader range of possible designs are followed in parallel, while certain decisions are delayed. According to Liker, this approach may be the fastest and most efficient way to develop vehicles. (Liker, 2006)

A global study by IBM (2010) observed businesses that have increased their agility and improved business outcomes. The results were significant.

1. Growth in new business improved more than 100% year-to-year
2. Cost reductions of more than 100 times were achieved
3. Innovative solutions directly improved brand image
4. Process life cycles were reduced from months to days
5. Call center volumes were expanded with no increase in staff

In summary the complexity is increasing in our fast changing world and operational agility becomes more and more important. However, the change from a traditional to an agile organization is challenging. Nerur et al. (2005) discuss the challenges of migrating to agile methodologies. He distinguished management and organizational, people, process and technology issues. Figure 2 categorizes and outlines the critical success factors.

Management and organizational

- Organizational Culture
- Management Style
- Organizational Form
- Management of Software Development Knowledge
- Reward Systems

People

- Working effectively in a team
- High level of competence
- Customer relationships—commitment, knowledge, proximity, trust, respect

Process

- Change from process-centric to a feature-driven, people-centric approach
- Short, iterative, test-driven development that emphasizes adaptability
- Managing large, scalable projects
- Selecting an appropriate agile method

Technology (Tools and Techniques)

- Appropriateness of existing technology and tools
- New skill sets—refactoring, configuration management, JUnits

Figure 2: Innovation Capabilities for agility, Nerur (2005: 76)

Very often a wide gap exists between different departments and organizational entities within a company. Coster (2013) terms this phenomenon the "agile business gap".

Stanford University started research programs to understand why organizations fail in bringing new ideas into the organization. Leifer (2012) describes it as the challenge of "how to bring it home". The research is based on various Design Thinking projects with major industry partners around the globe. While the ideation and prototyping phase runs mostly smoothly, the implementation phase is a disaster in most large organizations. A study by Lewrick et al. (2012) analyzing the impact of Design Thinking projects of large companies with university partners, also identified that the implementation of the developed ideas became the biggest challenge in innovation success. The implementation for most ideas was started, but received multiple changes in the

development process. The final products or services did not include the critical functions needed to be successful. In other instances, the solution focused finally merely on the design rather than on the functionality. Interviews with various stakeholders revealed that many decision-makers relevant for the implementation have not participated in the early definition of the problem, the innovation journey, experiencing the customer and the design and prototype interaction. Figure 3 depicts a typical agile process. Knowing the journey seems to be essential to accept and appreciate the final solution. Not knowing the journey might be confusing for stakeholders not involved in the process, because in most cases the "planned solution" comes to the "expert mind" first.
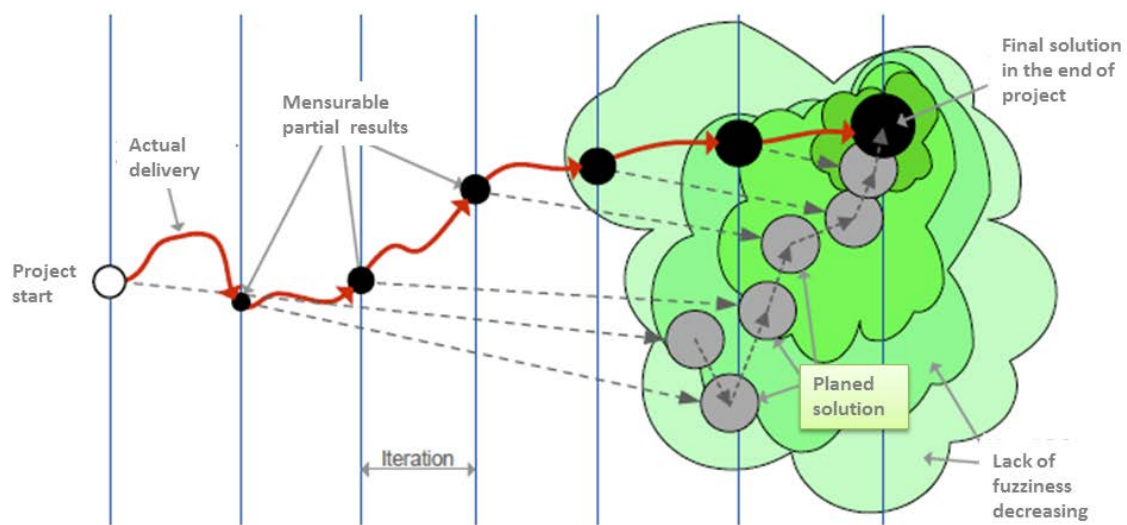

Figure 3: Agile Product Management, (Oesterreich and Weiss, 2008)

Consequently, transforming customer needs into product requirements asks for a joint understanding of the complete situation (problem- and solution space) in the team. This can be supported by visualization of the ideas and moderated processes. The visualization of a product vision is beneficial.

Appling the philosophy of the business model canvas to create a product vision might be one way to engage stakeholders during an early stage and to bring them to develop a common vision. Existing methods and tools like the empathy map or the product vision canvas are useful to succeed. Osterwalder (2011:131) states that the *Empathy Map*, a tool developed by visual thinking company *XPLANE*, is a good way to start and to create really simple customer profiles and to go beyond a customer's demographic characteristics.

Pichler (2012) defines a product vision board or product vision canvas in order to describe and visualise the vision and the product strategy. It helps to capture and validate the ideas and assumptions about the target group, the user needs, the key product features, and the value created for the company developing the product.

Definition of Terms

The definition of innovation varies across sub-fields of innovation research. Schumpeter (1934) defines innovations as *"The commercial or industrial application of something new, a new product, process, or method of production; a new market or sources of supply; a new form of commercial business or financial organization"*. A broader definition is stated by Drucker (1985). He considers innovation as the process of providing new improved capabilities or increased utility with a strong emphasis for market orientation.

Lewrick (2007:30) summarizes innovation as a *"creative and complex risk taking endeavour to create and market an invention successfully, utilising all capabilities of a firm, to achieve significant incremental or radical improvement in a product, service, process, technical feature or due to administrative changes"*. This view defines innovation precisely as something successfully implemented and emphasizes the importance of utilizing all innovation capabilities.

Hereby, a stakeholder becomes of paramount importance to the creative process. However, many stakeholders with strong interest are never involved (Nonaka and Takeuchi,1995; Amabile,1996, 1998)

The term "agile" is used to describe a set of values in the development process for products or services. In addition, there are several methods and tools that can also be considered "agile" and are used in support of these values. "Agile" was properly originated in the manufacturing industry as a way to increase productivity, promote innovation, and reduce risks associated with rapidly changing market demands. (Patton, 2009; Kettunen, 2009). However, most of the literature refers and provides examples related to agile software development.

A vision (understanding of business goals and objectives) for the intended innovation or project is important for today`s agile methods. Jeffries et al. (2000) highlights, "your chief weapon is business value". Augustine (2005) adds that "agile methods are popular in the business community because they force concentration on business value above purely technical pursuits."

Problems Addressed

Especially the early phase of the innovation process is crucial to success and characterized by high uncertainty. Agile methods might be one path to engage customer and user needs from the beginning of the development project. This supports the effort to determine the needs and requirements in an iterative approach. It is commonly agreed that successful innovations are characterized by the facts that they consider customer and user needs ("desirability"), the product concept ("feasibility") and the business

perspective ("viability") in a consistent manner. However, the complexity in all the products and processes increases and the need for operative agility is seen as a key factor of success.

The business model and the product need to be developed in parallel. Both are strongly interdependent. However, in existing traditional companies the business model is mostly given and fixed.
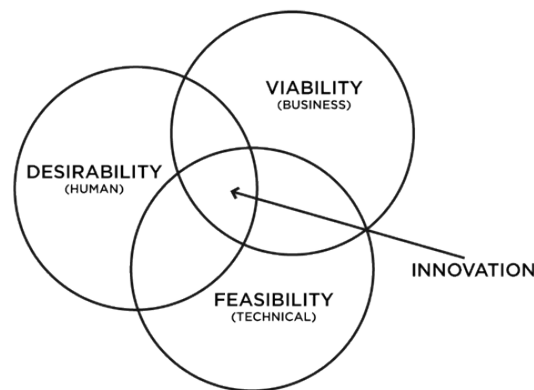

Figure 4: Design Thinking in Management, (Eppler and Hoffmann, 2012:4-7).

The available methods are strong with regard to viability, which can be determined and visualized with the business model canvas. For the other two criteria mentioned above, there are no valuable canvas models described. However, in an iterative approach like Lean or Design Thinking etc., the findings from customer insights must be documented and the learnings integrated. A tool for learning about product and customer/user needs is missing. The developers/designers and the line managers must develop hand-in-hand and in parallel, so that influencing each other becomes of paramount importance. Several canvas models are currently proposed by various scholars and practitioners.

Examples of such models are the "Project Canvas" by openPM (OpenPM, 2014) or the "Consumer Trend Canvas" for analyzing consumer trends proposed by Trendwatching Inc. (Trendwatching, 2014). Gradually more visualization and canvas are applied in organizations. Obeya-rooms are good example for such a visualization.

Objective of the Paper

A literature review and our experiences in implementing ideas and moderating series of design thinking workshops in large organizations provided the foundation for expanding the canvas methods towards "desirability" and "feasibility". The paper conceptualizes a product vision canvas, which is meant to be a derivate of the business model canvas. In addition, we propose a customer/user profile canvas, which helps to emphasize with the potential customer or user. The overall objective is to create a solid tool which fosters the elaboration and communication of the (product) vision and that can be used in different approaches and challenges, by applying for example lean innovation/entrepreneurship, Design Thinking etc.

Introduction of the Three Canvas Model

There are different challenges a team must overcome when starting an agile or lean development process. The team must come to a common understanding and deal with different ideas and options at the same time. Often the team composition changes, especially when the development process starts. In agile development processes, the product is not or cannot be specified in all details. Therefore, the team's common understanding about the future product, the customer needs and the business is essential. The right level between abstract/high-level and concrete/detailed must still be found. An adequate visualization tool supports this process.

Management concepts related to lean entrepreneurship make use of the business model canvas. There are many reasons for increased usage of canvases in the context of user centric design, lean innovation and business design. This reaches from the support of team work to enhanced goal-oriented discussions. However, in many technology driven companies and many innovation processes, the starting point is not the business model, but the customer needs and/or in rare cases the product itself. In fact, the product and the business model needs to be developed in parallel.

After the ideation and idea selection phase, the customer needs must be substantiated and the business and product concept needs to be developed. For this, the three canvases can be used. After having determined the product and business concept, both needs to be implemented in parallel (see figure 5).
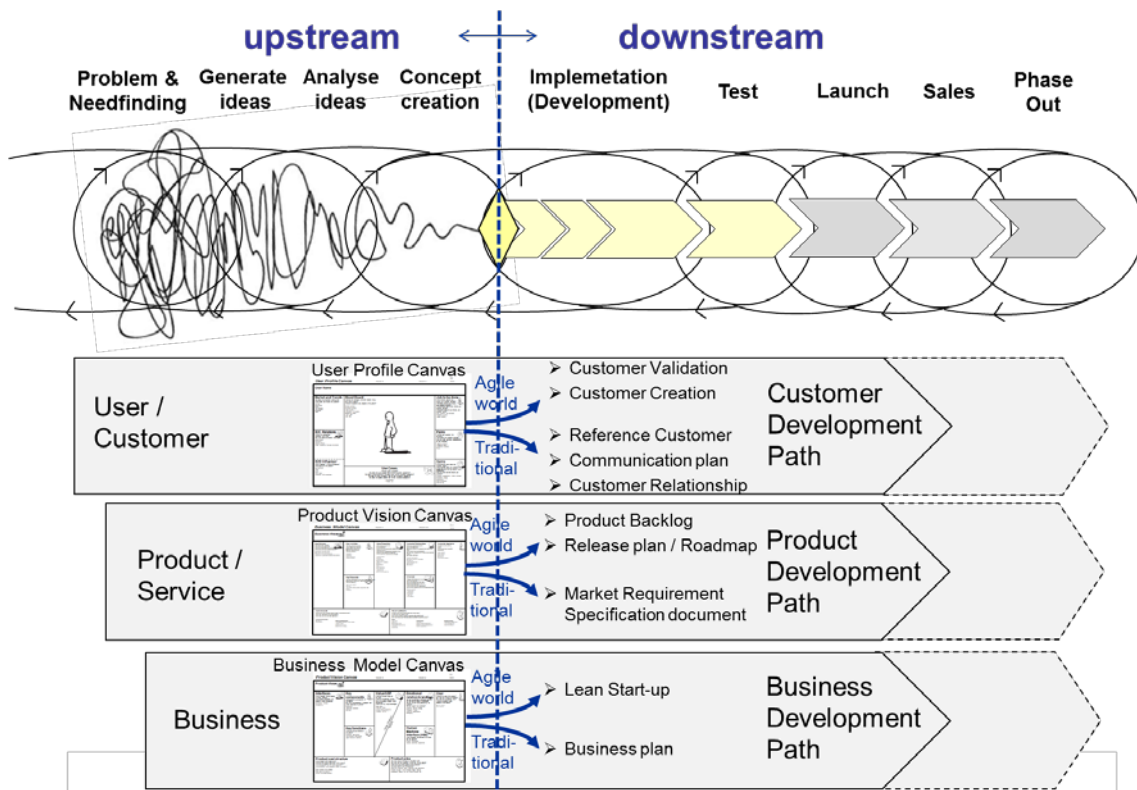

Figure 5: Three model Canvas – Life Cycle

Following an agile innovation process or lean approach, the hypotheses (related to the business model and the product) are iteratively tested with customers and the learnings are integrated in the next iteration cycle. In a waterfall approach, the business plan and the market requirement specification document is derived from the canvases.

The Three Canvas Model presented at a workshop at the Product Management Festival (Link, 2013) allows to operationalize the business model canvas and integrate it with the innovation success factors viability, feasibility and desirability (see figure 5 and 6). The model supports for example the definition of the customers and their needs and the joint definition of the product vision as a basis for developing the product with agile processes or for managing a project.
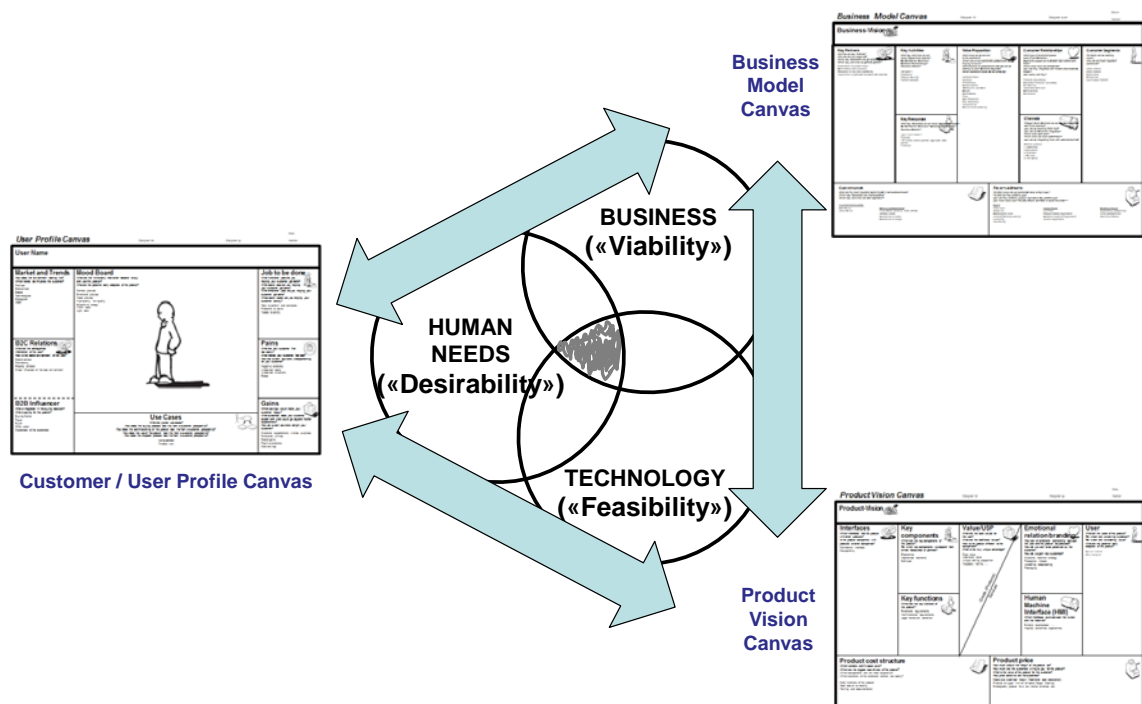

Figure 6: Three Canvas Model (Link, 2013)

The Three Canvas Model has been tested with various stakeholders in large organizations and projects. Especially product managers (in their roles as product owners), have been advanced in the early phase of the development projects. The tool supports the linkage between early phases (front-end innovation and upstream innovation) and the actual development phase (downstream innovation). Furthermore, the tool provides evidence that fostering agile product management and agile product innovation is worthwhile indicated. However, the adaption of other capabilities also becomes of paramount importance - particularly capabilities related to culture, management and leadership following agile principles.

Principles of Usage of Canvas

The canvas is printed on large scale (A1 or preferable A0) and attached to the wall (see figure 7). The canvas is completed stepwise by the team, which should be composed interdisciplinary. Avoid writing directly on the canvas; write on a Post-it, put the Post-it on the canvas and fill out the canvas step by step completely. By writing things on Post-it, items can easily be changed or replaced. In addition, hypotheses or ideas can be included in the canvas, even though they are tested only at a later stage.

While following an iterative path (e.g. build – learn – measure or empathize – define – ideate – prototype – test) one will learn more about different items on the canvas. This way, the canvas can be updated after each iteration. Different coloured Post-its can be used to indicate different customer segments or the maturity status of the item (e.g. first hypothesis, tested or verified item).
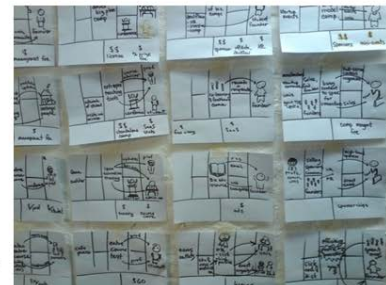
Figure 7: Usage of a canvas

It does not matter with which canvas the completion process is started. One might also work on all three canvases in parallel. However, it is recommended to work early in the process with the user profile canvas in order to better understand the customers/users or stakeholders.

The experience of using the Three Canvas Model has revealed that is beneficial to have clear learning objectives / hypotheses to test in iterations and to document the findings to be shared with the team and the client. After some/many iterations one will have an increasingly clear view about the users/customers as well as maybe on the business model and can then focus on improving the product / product specification. It is also

recommended to develop variants of the idea/concept/approach. Thus, a set of canvases are created and the most promising approach can be selected. It is also possible to use other artefacts (like prototypes, pictures, drawings, etc.) instead of just written Post-its.

In the following, the three canvases are described in more detail.

Business Model Canvas

The business model canvas has been co-developed with many scholars and practitioners (Osterwalder, 2011). Mainly in Europe, the business model canvas has been used in many cases by many different companies and universities. Swisscom IT Services started for example in 2011 to describe all business entities in business model canvas as part of the three year strategic planning process. The pyramid of canvas supports the definition of the overall value proposition and the provision of a better understanding of the entire product/service portfolio.

In general, the business model canvas can be used for established companies or start-ups, for industry or service companies, for B2B or B2C businesses.

The business model canvas has been amended by the following elements (see figure 8) in order to establish a better connection to the other canvases and to document the importance of a clear problem statement and a vision. The problem statement is stated in a question: Which main problems does the business help to solve? In the building block Business Vision the vision is written in one sentence. Since a business model is often used for a product portfolio, a separate building block has been used.
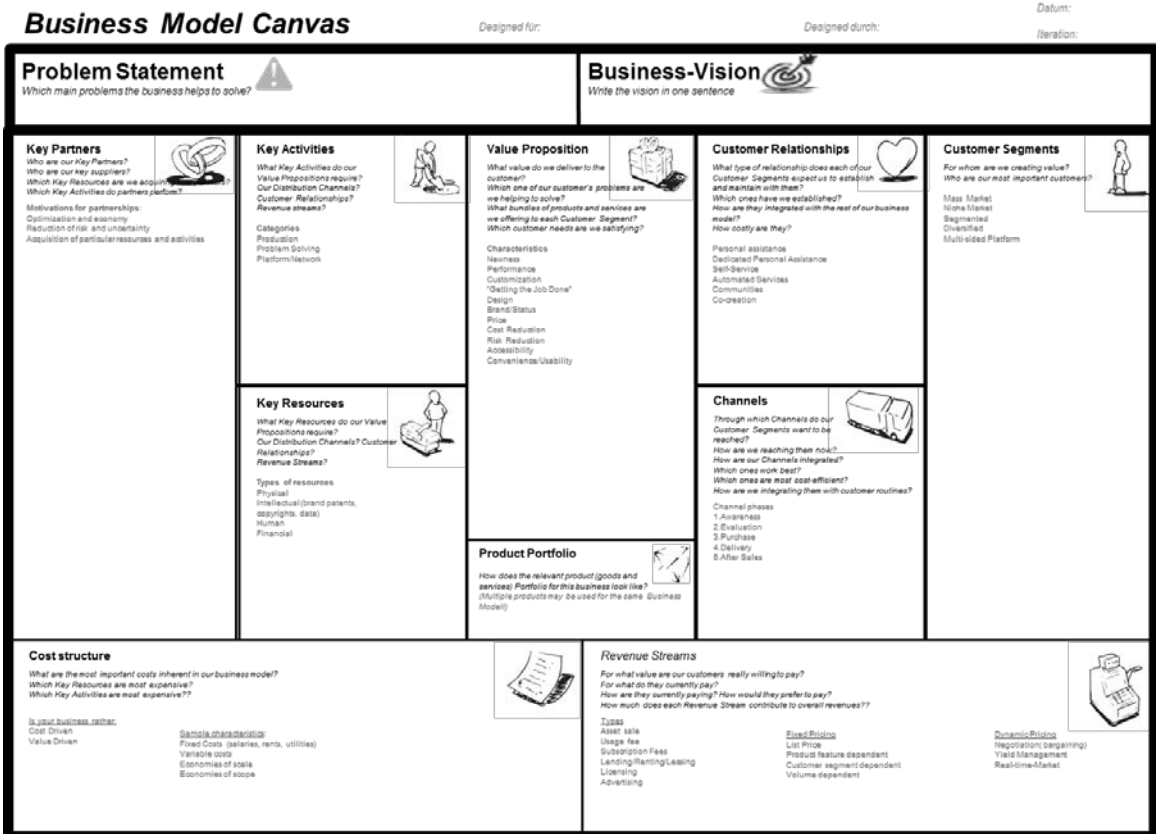
Business Model Canvas Designed für: Designed durch: Datum: Iteration:

Problem Statement ⚠
Which main problems the business helps to solve?

Business-Vision 🎯
Write the vision in one sentence

Key Partners
Who are our Key Partners?
Who are our key suppliers?
Which Key Resources are we acquiring?
Which Key Activities do partners perform?

Motivations for partnerships:
Optimization and economy
Reduction of risk and uncertainty
Acquisition of particular resources and activities

Key Activities
What Key Activities do our Value Propositions require?
Our Distribution Channels?
Customer Relationships?
Revenue streams?

Categories
Production
Problem Solving
Platform/Network

Key Resources
What Key Resources do our Value Propositions require?
Our Distribution Channels? Customer Relationships?
Revenue Streams?

Types of resources
Physical
Intellectual (brand patents, copyrights, data)
Human
Financial

Value Proposition
What value do we deliver to the customer?
Which one of our customer's problems are we helping to solve?
What bundles of products and services are we offering to each Customer Segment?
Which customer needs are we satisfying?

Characteristics
Newness
Performance
Customization
"Getting the Job Done"
Design
Brand/Status
Price
Cost Reduction
Risk Reduction
Accessibility
Convenience/Usability

Product Portfolio
How does the relevant product (goods and services) Portfolio for this business look like?
(Multiple products may be used for the same Business Model)

Customer Relationships
What type of relationship does each of our Customer Segments expect us to establish and maintain with them?
Which ones have we established?
How are they integrated with the rest of our business model?
How costly are they?

Personal assistance
Dedicated Personal Assistance
Self-Service
Automated Services
Communities
Co-creation

Channels
Through which Channels do our Customer Segments want to be reached?
How are we reaching them now?
How are our Channels integrated?
Which ones work best?
Which ones are most cost-efficient?
How are we integrating them with customer routines?

Channel phases
1. Awareness
2. Evaluation
3. Purchase
4. Delivery
5. After Sales

Customer Segments
For whom are we creating value?
Who are our most important customers?

Mass Market
Niche Market
Segmented
Diversified
Multi-sided Platform

Cost structure
What are the most important costs inherent in our business model?
Which Key Resources are most expensive?
Which Key Activities are most expensive?

Is your business rather:
Cost Driven
Value Driven

Sample characteristics
Fixed Costs (salaries, rents, utilities)
Variable costs
Economies of scale
Economies of scope

Revenue Streams
For what value are our customers really willing to pay?
For what do they currently pay?
How are they currently paying? How would they prefer to pay?
How much does each Revenue Stream contribute to overall revenues?

Types
Asset sale
Usage fee
Subscription Fees
Lending/Renting/Leasing
Licensing
Advertising

Fixed Pricing
List Price
Product feature dependent
Customer segment dependent
Volume dependent

Dynamic Pricing
Negotiation (bargaining)
Yield Management
Real-time-Market

Adapted from A. Osterwahlder: http://www.businessmodelgeneration.com

Figure 8: Business Model Canvas, adapted from (Osterwalder, 2011)

Product Vision Canvas

The product vision canvas (see figure 9) follows the basic structure of the business model canvas proposed by Osterwalder (2011). Principally, the product and business have to be developed in parallel. In established enterprises, this is often not the case and it is distinguished between product innovation (with a fixed business model) or business model innovation (with a more or less fixed product).

The underlying idea is a kind of translation and concretisation of the business level into the product level in order to better see and understand the interdependencies between the two.

The *Value Proposition* of the business model shall emerge in the real "*Value/Utility*" of the product. A product can be a physical good(s) or service(s). Often a product fulfils various values like other competitor products and in order to highlight the real differentiating aspects, the building block "*key differentiator*" is added. Ideally, the key differentiator is also a key of the "Value Proposition" of the business model. The product must finally be successfully used by the "*End User*" and the value or the product is made available by a good "*Usabilty*". If, e.g. the Human-Machine-Interface (HMI) is not well designed, the user cannot fully benefit from the functionality. If

additional stakeholders have needs that shall be covered with the product, they can be described in the building block "*Stakeholder*".

Similar to the building block *"Customer Relationship"*, the user also has an emotional connection to the product which needs to be created and to be aware of. This is described in the block *"Emotional relation / branding"*.
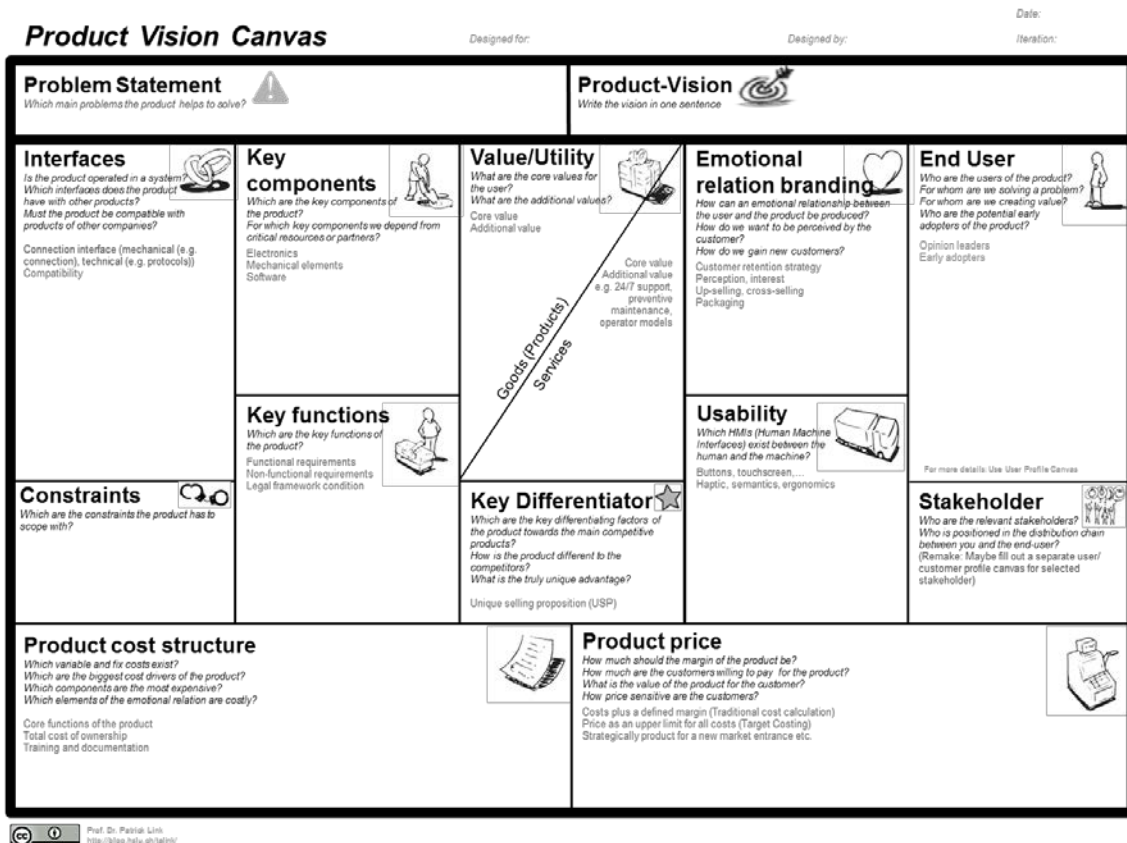

Figure 9: Product Vision Canvas

Like in the business model canvas, the middle part of the canvas explains the "what", the right side explains the "whom" and the left side the "how". The product can be looked at from three different aspects, all having an influence on the product cost structure. The "*key functions*" define the key functions of the product, including functional and non-functional requirements and legal framework conditions. The "*key components*" look at the product from a physical point of view, e.g. which electronic, mechanical and software elements are required. Also on the product level, a "make-or-buy" decision can be made. Some of the key components might be bought. In order to consider this, certain interfaces must be available. The same is true for the possible "*key partnerships*" of the business model: some interfaces are required to benefit and implement the partnership. Therefore, a building block "*interfaces*" is used.

Once the left side is clear, the (target) "*product cost structure*" can be determined and verified. The "Revenue Streams" are translated into the "*Product Price*".

The Product Vision Canvas is made to be used in the IT environment, where agile development approaches, like Scrum or Kanban are often used. A key success factor for

these project is a well-defined product vision which can be communicated and shared with the team. This is especially beneficial when the team composition changes - e.g. between upstream innovation (product concept phase) and downstream innovation (development phase).

User/Customer Profile Canvas

In an iterative approach, like Design Thinking or Lean Start-up, the first iteration loops are often used to better understand the user/customer. Tools like the Empathy Map, Personas or the Value Proposition Canvas supports this learning process. There is a big benefit, if the team members have the same understanding about the customer/user and their needs. Therefore, an own canvas is proposed with the following building blocks (see figure 10).

The building block "*Market & Trends*" describes the driving forces and the trends from a rather analytical approach. It marks the influencing factors from a wider level. The "Influencers" are the people influencing the buying decisions more directly. In a B2B context, this comprises the buying centre, while in B2C, the influence of family members or friends can be considered. The "*Persona Description*" refers to the description of the fictional character that represents the user. The "*Use Cases*" describes all possible scenarios that can happen while using the product. The key tasks before, while and after the usage shall be considered, as well as a systemic perspective.

On the right side of the canvas, the elements of the "Value Proposition Canvas" have been used to better understand the user's job. The "*Job to be done*" is described, as well as the "*Pains*" and the "Gains" the user has while doing his or her job.

The center of the canvas is used for a "*Mood board*" which can be used as a collage to better visualize the user.

Figure 10: User Profile Canvas

Benefits and Advantages of the (Three) Canvas Model

In the period from April 2013 to February 2014, we have tested the Three Canvas Model in various workshops at major Swiss companies in the ICT, Energy and Finance and Automotive industry as well as in Universities. From our observations and interviews we have found a set of benefits using the canvas model in general and more specifically the advantages of the extended Three Canvas Model.

The major benefits of using the canvas in general are the following:

- Foster joint understanding and collaborative product definition
- Easy to use and to update
- Visual and intuitive → enhances communication
- Iterative: Very agile and can be constantly adapted
- Focus on key aspects and helps to stay focused
- High information density in the canvas
- Enhances goal-oriented discussions and creativity
- Forces to think in a structured way
- Inconsistencies become visible

- Allows easy creation of additional options (variants)
- Operationalization of the business model
- Supports integration and visualisation of new insights
- Defines assumptions that can be tested

Key advantages of using the extended Three Canvas Model :

- Foster joint understanding and collaborative product definition
- Clear product vision can be derived, communicated and if required be adapted
- Operationalization of the business model
- Inconsistencies (also between product, user and business model) become visible
- Learnings concerning the user and stakeholders can be visualised
- Gives a good overview of the most important aspects

For most of the participants, the customer/user centric approach has been the biggest benefit. Participants already familiar with the business model canvas particularly appreciated the extension of the model. Most of the line managers highlighted the advantages of providing a common understanding to various stakeholders in the company and as well within the team by applying the Three Model Canvas in an early innovation phase. The major constrain was missing time in the day-to-day activities to complete and discuss all the canvas models. The tool is seen as especially beneficial when the team changes and to get a common and clear understanding of the whole concept for the development team. Most participants wish to organize off-site workshops with the diverse team members to meet and discuss.

Conclusions and recommendations

In order to make full use of an agile approach, not only R&D but the whole organization must be adapted. Most of the organizations use agile and traditional approaches in parallel (SwissQ Software Development 2014). The "scaled agile framework" (SAFe) has showed a strong growth in usage in the last year and is seen as a good basis for the future enhancement of agile principles in the downstream innovation process. (Scaledagileframework, 2014)

In the upstream innovation agile principles are used (e.g. Design Thinking), but they are not sufficiently connected to the downstream-innovation processes. A joint framework would be beneficial. In addition, the people within the upstream innovation should remain in the project and people with a key role in the downstream innovation should be part of the upstream innovation team. Special attention shall be paid to the understanding of the three canvases of all new downstream team members. It might be

helpful for the new downstream team to work a few iterations on improving the Three Canvas before really starting the downstream innovation process. This makes the project their "own" project and fosters and deepens the true understanding.

The proposed tools can support this, but should be integrated in an overall framework (including processes, roles, team composition etc.) and an agile leadership culture. The Three Canvas Model is a first approach to set the right product vision and correct level of customer/user empathy. Our observations and interviews with participants in various workshops at large organizations in Swiss companies have shown the benefits of the Three Canvas Model. This model fosters the multidisciplinary discussion by providing a good overview of the important criteria. Furthermore, the end users or stakeholders become more central in the early phase of the ideation process and the model has been perceived as a very agile one, especially for defining the product vision.

Further research is necessary to determine how established organizations can be agile. The agile tools are still "piecemeal" and rarely integrated across all processes. But this is a further optimization potential for the organizations in the future. For the development of continuous agile practices that are vertically and horizontally coherent, it needs agile leadership.

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