

Czech University of Life Sciences Prague  
Faculty of Economics and Management  
Department of Management



Diploma Thesis

Challenges of lean organizations working with third party tech agencies. Discovery Backlog VS Development Backlog

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# CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

## DIPLOMA THESIS ASSIGNMENT

Ketevani Bukhnikashvili, BBA

Systems Engineering and Informatics  
Informatics

Thesis title

**Challenges of lean organizations working with third party tech agencies. Discovery Backlog VS Development Backlog**

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### Objectives of thesis

This Thesis aims to study and define cooperation models of lean organizations and third party software agencies. As literature review reveals, the difference between process flows of lean organization and third party tech agency, might cause problems while working together on a product.

The main goal of this thesis is to analyse the roots of these problems and suggest effective solutions for problem solving.

The objective is to provide a model which will help both parties to work together more effectively.

### Methodology

The thesis will be composed in two parts. The first part will be literature review and deep investigation of problems connected to business relations between tech agency and lean organization. This part will provide definitions of terminology and description of both parties. Relevant materials will be found mainly in books, scientific articles and interviews.

Second part will be practical, based on deep interviews with predetermined questionnaires for lean organizations and third party tech agencies, following will reveal the pain points from both sides. Finally after analysis of gathered information through the way, solutions will be suggested for filling the gap between lean organization and third party tech agency.

**The proposed extent of the thesis**

Approx 60 – 80 pages

**Keywords**

Lean, agency, scrum, startups, product frameworks, software

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**Recommended information sources**

Gothelf J., Seiden J., (2016), Lean UX, 2e: Designing Great Products with Agile Teams, "O'Reilly Media, Inc.", ISBN-13 : 978-1491953600

Pranam A., (2018), Product Management Essentials, New York, Apress (Springer Nature), ISBN-13: 978-1-4842-3302-3

PROJECT MANAGEMENT INSTITUTE. *A guide to the project management body of knowledge (PMBOK® guide)*. Newtown Square, Pennsylvania: Project Management Institute, 2013. ISBN 978-1-935589-67-9.

Sutherland J.,(2015) Scrum : the art of doing twice the work in half the time, London (UK): Random House Business, 256pp, ISBN-13 : 978-1847941107

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Prague on 30. 03. 2021

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## Declaration

I declare that I have worked on my diploma thesis titled "Challenges of lean organizations working with third party tech agencies. Discovery Backlog VS Development Backlog" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 30.03.2021

Ketevani Bukhnikashvili

## Acknowledgement

I would like to thank my supervisor Ph.D. Richard Selby for his support during the whole process of working on this thesis and his priceless advices, which helped to make the process more effective. I would like to thank participants of the interview, who found time to participate in interviews.

## Abstract

As far as the demand for IT services is growing, cooperation with third party tech agencies appears as a subject for discussion. This Thesis aims to study and define cooperation models of lean organization and a third party development agency. The main goal of this thesis is to analyze the roots of the problems in cooperation and provide a model which will help both parties work together more effectively, avoiding challenges. In order to reach the research goal, literature review and in-depth interview analysis were performed. The research found three main problems in collaboration. First, lean organisations being focused on the outcome, while the agencies being focused on the output of the development. Second, parties not sharing the information efficiently, and third, agencies struggling with challenges caused by fast changing scope. Depending on the in-depth interview results and literature review following suggestions were created for overcoming cooperation challenges: Agency can outstaff its employees. As a result a lean organization on the very early stage of the product development cycle gets a dedicated team, which is involved into processes fully. Following gives transparency and the team has a good understanding of reasonings why things are done. Team is empowered, meaning it is self managed and outcome oriented, the whole team's interest is product to be successful.

## Abstrakt

Pokud poptávka po IT službách bude nadále růst, bude předmětem diskuse spolupráce s externími technologickými agenturami. Cílem této práce je zanalyzovat a definovat modely spolupráce štíhlé organizace a externí developerské agentury. Hlavním cílem této práce je analyzovat kořeny těchto problémů a poskytnout model, který pomůže oběma stranám efektivněji spolupracovat a vyhnout se stávajícím výzvám. K dosažení cíle průzkumu byla provedena hloubková analýza rozhovorů a informace použité z dostupné literatury. Průzkum odhalil tři hlavní problémy. Zaprvé, štíhlé organizace se zaměřují na výsledek, zatímco agentury se zaměřují na výsledek daného vývoje. Zadruhé, strany nesdílejí informace efektivně a zatřetí, agentury, se potýkají s problémy způsobenými rychle se měnícími možnostmi. V závislosti na výsledcích analýzy rozhovorů a prozkoumání literatury byl vytvořen následující návrh pro překonání výzev spolupráce: agentura může zaměstnávat pomocí tzv. outstaffingu. Výsledkem je, že štíhlá organizace ve velmi rané fázi vývojového

cyklu produktu dostane specializovaný tým, který je plně zapojen do procesů. Poskytuje transparentnost a tým dobře rozumí důvodům, proč se věci dělají. Tým je zmocněn, což znamená, že je řízen sám sebou a je zaměřen na výsledky. V zájmu celého týmu je úspěšný produkt.

### **Keywords**

Lean, Agile, Outsource, Software development, Agency, Scrum, Kanban, Waterfall, Extreme programming, Agency theory, Outstaffing

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# 1. Introduction

Role of technologies in customer problem solving is getting more and more important. Many public and private organisations invest in development of technical solutions, that can efficiently solve specific tasks and bring profit by commercialisation. Companies pay attention to staying agile to fast changing environment and market trends and also following technological development (Perkin, 2017). Rising demand on software development has put the topic of outsourcing, the process of developing software via 3rd party software development agencies under spotlight (Deloitte, 2019). The amount of organizations that outsource services grow with 5% annual growth rate and the rate is expected to increase (Deloitte, 2019).

This research was conducted with the aim to analyse the cooperation models between the lean organisation as principal and the third party software development agency as the agent. Lean organisation is trying to be agile, reply quickly to market changes and adapt to what the customer needs (Ries, 2011), On the other hand, the outsourcing agency is providing technical assistance to the lean organisation to create technical solutions for customer needs. The main goal of this thesis was to analyze the roots of these problems and suggest effective solutions for problem solving. The objective was to investigate and provide a model which will help both parties work together more effectively, avoiding existing problems.

To address the research goal, literature review and in-depth interview analysis were performed. After performing the literature review, it was revealed that the difference between operational flows, organisation, culture and aspirations of lean organizations and third party outsourcing agencies might cause problems while working together on a product. The research revealed three important challenges of collaboration. First, the difference in focus. Lean organisations focus on the outcome, while the agencies focus on the output of the development. Second, an inefficient share of information. Parties do not always share the information when needed and with the amount needed. Third, the challenges of fast changing development scope. Software agencies struggle to understand and adapt with fast changing requirements of principal. Depending on the in-depth interview results and literature review following suggestions were created for overcoming cooperation challenges: Agency can outstaff its employees. As a result a lean organization gets a dedicated team on the very early

stage of the product development cycle and the team is fully involved in the process. Following gives transparency and the team has a good understanding of reasonings why things are done. Team is empowered, meaning it is self managed and outcome oriented, the whole team's interest is product to be successful.

## 2. Goals and Methodology

### 2.1. Goals & Objectives

The role of technology is growing in everyday life, companies are choosing new creative ways to solve problems. “Huge investments are made by organizations and governments for introducing new technologies that have the potential of bringing a paradigm shift in the lifestyle of the users.” (Sharma, 2014, p.17) Neil Perkin in his book “Building the agile business through digital transformation”(2017) says that the organizations try to become flexible and adaptive to rapidly fast changing market requirements and trends, on the other hand they need to try to follow technological development. As far as the demand for IT services is growing, cooperation with third party tech agencies appears as a subject for discussion.

This Thesis aims to study and define cooperation models of lean organizations and third party software agencies. On the one hand, lean organization, which is trying to be very agile, provide quick answers to the market change and adapt the digital product to what the customer wants. As far as lean wants the customer to be involved in development and feedback of the customer implemented, the scope of the initial product is barely stable and sometimes it has to grow or change. (Ries, 2011) On the other hand, a third party development agency, which is getting the task from the client, evaluating scope of the project, timeline, required resources and only after clarifying details gets involved in the development process. As literature review revealed, the difference between process flows of lean organization and third party tech agency, might cause problems while working together on a digital product.

The main goal of this thesis is to analyze the roots of these problems and suggest effective solutions for problem solving.

The objective is to investigate and provide a model which will help both parties work together more effectively, avoiding existing problems.

### 2.2. Research Questions

To be able to achieve the objectives of the thesis, following research questions were defined:

- What are the main differences between operations management of lean organization and third party tech agencies?

This question will reveal what makes lean organizations and third party tech agencies different from each other, in terms of process flow and values. Answers on this question will provide a clearer picture and will make problem identification easier.

- What are the problems that lean organizations and third party tech agencies face while working together?

After seeing the main difference between two parties, problems will be formulated and described

- What are the most effective ways of these parties working together?

Answers to the last question will help to deliver the main objective of the thesis, make suggestions of how lean organizations and third party tech agencies can work together more effectively.

## 2.3. Methodology

Methodology of the research describes the data collection process, using and presenting most suitable data collection techniques. It also presents design of the research, data collection strategy, participant groups and companies, also highlights the limitations of collections and makes sure ethical aspects are presented during the whole way of research.

To cover all relevant sources and provide the answers to the research questions, this thesis is composed in two parts.

The first part is literature review and deep investigation of problems connected to business relations between tech agency and lean organization. This part provides definitions of terminology and description of both parties. Describes different frameworks of software development, highlights contrasting attitudes and needs that lean organizations and third party tech agencies have. Relevant materials were found mainly in books, scientific articles and interviews.

Second part of the thesis is practical, based on my own research. Six companies were chosen for this study, from where three companies were lean organizations and three third party tech agencies. Literature review part revealed different approaches toward the process flow and

product, between lean organizations and third party tech agencies, which were complicating the cooperation and making it less effective. To validate the problems as a first thing and see how companies address these challenges in-depth interviews were conducted with company representatives, participants of the interview were Senior Product and Project managers, with years of experience working on product development. The meeting was conducted online, using a zoom platform, open questions from predetermined topics were asked to participants and answers were recorded. After analyzing both parties of this thesis, literature review and deep interview, the solutions were suggested for lean organizations and third party tech agencies for working together more effectively.

## 3. Literature Review

### 3.1. Lean and Agile Methodologies

Wang in his work “Leagile, software development: an experience report analysis of the application of lean approaches in agile software development” gives examples of how many times lean and agile were considered as two different names for exactly the same thing. Wang says that “lean” and “agile” are poorly defined, that causes the fact that often they are misunderstood. (Wang 2010) This part of the thesis aims to demonstrate definitions of these two, to eliminate misinterpretation.

#### 3.1.1. Lean Definition

The root of the lean goes to creating Toyota manufacturing line, when Taiichi Ohno and Shigeo Shingo developed the lean manufacturing revolution, from here The lean startup takes the name. Lean thinking rapidly changes how supply chains and production systems run. The Lean approach assessed the components of the production process, emphasized the parts that did not create value and eliminated them. (Rother, 2010)

Toyota Production System had identified and categorized wastes in 7 categories, that include production defects, as well as inventory and overproduction. These wastes were eliminated step by step until only value adding process parts were left. These practices come from the Japanese practice of “kaizen”, the improvement, which in practice means iterating and developing the processes. Among the principals we can see that individual talent and knowledge of each worker is appreciated, batch sizes are shrunked, production is just-in-

time, inventory is controlled and production time is highly accelerated. The lean made clear the line between the waste of resources and creation of value, changing the way how things were done before. (Perkman, 2017)

The idea of Lean blossomed globally as Eric Ries mentions in his book “The lean startup”. Entrepreneurs all over the world started to discuss the application of lean startup ideas. Whole new communities of practices were organized in hundreds of cities and the popularity of lean is continuing to grow rapidly. Eric Ries analyzed the lean manufacturing approaches and developed a new approach for product development based on his personal experiences. Ries maintained focus on eliminating the waste, by practicing iterative development which includes multiple product deployments for gathering market feedback. Ries follows the flow of setting and validating specific hypotheses regarding the pains and gains of the designated end user and the decision making process. These hypotheses are validated via experiments that minimize the cost of building a full scale product and also minimize the risk of failure on market(Ries, 2011, p28).

Ries bases his methodology on the following pillars:

- Build-measure-learn cycle - that covers setting the hypothesis, designing and conducting the experiment to validate the hypothesis, analyzing the results and using the results for the next build-measure-learn loop (Ries, 2011, p18)
- The minimum viable product (MVP) - As Ries defines, MVP is a version of a new product which allows a team to collect the maximum amount of validated learning about customers with the least effort. (Ries, 2011, p82)
- Innovation accounting - Metrics that give possibility to assess the product success per cohort. These metrics do not focus on cumulative results of multiple cohorts, but compare the individual cohorts over time to reveal how the customers react to the product over time. (For example product usage or customer retention rates) (Ries, 2011, p18)
- The pivot - a ‘structured course correction designed to test a new fundamental hypothesis about the product, strategy, and engine of growth’. Pivoting gives opportunity to shift focuses during iterations, while focusing on the product vision. (Ries, 2011, p33)



The lean is used in entrepreneurship too. If in manufacturing the outcome is calculated according to the quantity of high quality products produced, in startups a different unit of progress measurement is used, “validated learning”. With a deep knowledge of lean, entrepreneurs can find and eliminate the sources of waste that are plaguing entrepreneurship. (Ries, 2011)

To summarize, a lean attitude is to minimize the waste and maximize the value that product has to provide. After some time, the idea behind lean production found its place in logistics, from there was spread to the military, after was construction, and the service industry. Time by time principles of lean thinking was recognized as universal and adopted successfully by many more industries. (Poppendieck, 2002)

### 3.1.2. Agile Definition

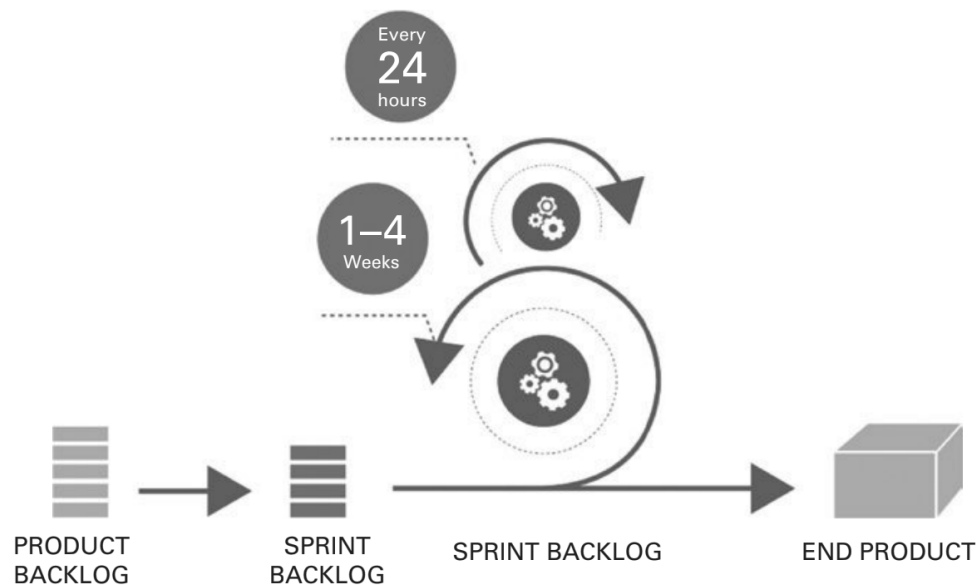
Agile is a practice in software development, focusing on iterative development, with the goal to eliminate waste and deliver the value as soon as possible to the end users. “Agile Manifesto” was published in 2001. Agile Manifesto was created after a meeting of several software engineers in Utah resort. The goal of the meeting was to discuss the existing lightweight frameworks and methodologies for product development (Schwaber 2001). These lightweight frameworks were a newer approach in industry, different from waterfall philosophy, which had very strict guidelines and required each part of the development process to be defined in detail beforehand. Agile Manifesto was a result of analysis of existing lightweight methodologies, which had already existed for many years. Although the manifesto puts emphasis on specific values and principles. (Perkin, 2017, p79)

These principles are:

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan (Schwaber 2001)

Since the publication of the agile manifesto, multiple iterative software development methodologies have developed and adopted. According to Scrum Alliance, a leading organization in agile certification, as for today agile as a term is an umbrella name that covers

multiple frameworks and methodologies used for software development. (Scrum Alliance, 2021)



(Figure 1 - Neil perkin, “Building the Agile Business through Digital Transformation”, 2017, p80)

What is common for all the frameworks under the term Agile is the aspiration towards delivering value to end-users faster by using iterative approaches. Teams following agile philosophy, refuse the “big bang” delivery of product at the end of development, and instead deliver multiple small increments. Iterative delivery helps the team evaluate the assumptions faster, gather the feedback, correct mistakes and deliver the updated product quicker (Highsmith, 2009).

The figure 1 Shows the process flow example of one of the agile frameworks. Here The product feature requirements are defined according to product goal, and are stored in product backlog, which is a list of requirements. The team that works on development of the product, works in time containers called sprints. Sprints are suggested to be optimal from 2 to 4 weeks. For each sprint team defines the sprint development goal and sprint scope. Team members meet every day to share progress and roadblocks. The team iterates and creates a working increment every sprint, meaning they deliver a product that works and is potentially releasable. (Perkin, 2017)

Characteristics of agile based development frameworks cover the following approaches:

- Autonomous and cross-functional teams that can deal with changing product development requirements
- Work in iterative time containers with the aim to fulfil the given requirements for the time container and develop a working product in order to get the feedback from the customers and main stakeholders
- Openness and open communication between the development teams, with the predefined list of inspection meetings per time container

The main value provided by agile frameworks is the possibility to stay flexible for change and adapt to ever changing demands. The mindset of releasing working software as soon as possible and as often as possible means that the whole process of waterfall methodology is minimized and put to time containers. This iteration includes a statement of goals for the development time containers, development and testing of individual pieces of functionality. The iterative approach mitigates the risks of developing the product that will miss the product market fit. Sooner the product is released, lesser the risk and faster the feedback (Perkin, 2017).

## 3.2. Lean Organisations

### 3.2.1. Product Development Flow in Lean Organisations

As described in the definition part, lean thinking was adopted outside of manufacturing too and got implemented in entrepreneurship. The active usage of lean was found in startups and product development. Lean startup is a set of practices, which helps entrepreneurs increase the chance of creating a successful startup. As Ries mentions in his work, startup can be defined in the following way: “A startup is a human institution designed to create a new product or service under conditions of extreme uncertainty”. (Ries, 2011, p17)

New product development holds hope to improve positioning on the market, or open new markets, create new value and raise standards of the market, and improve financial conditions of the company (Wheelwright, 1992). Providing value on the market in the extreme uncertain environment can be challenging, to eliminate the waste of time and money Eric

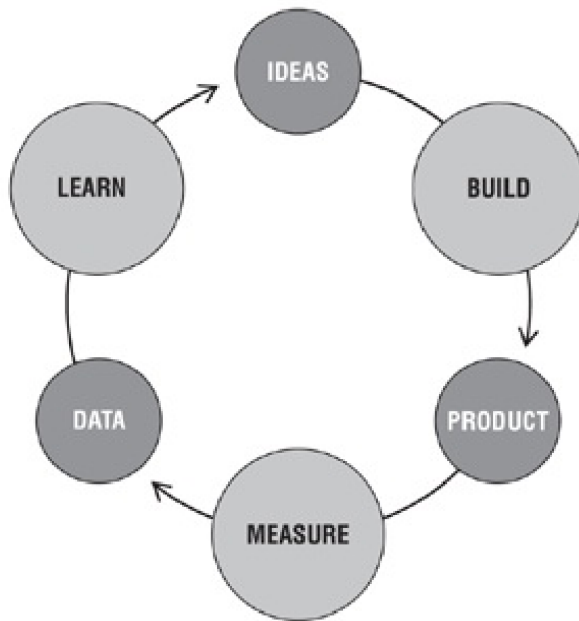
Ries in his work “The Lean startup”, introduces lean process flow, calling it “Build-Measure-Learn feedback loop” (Figure 2).

Reis, after defining the first step of startup as testing leap-of-faith assumptions (most important hypothesis), advises to move to the build phase as quickly as possible with a minimum viable product (MVP). MVP is a first version of a product which has enough features to be launched for early customers, the main idea of MVP is to get the feedback from early customers as quickly as possible for future development of the product (Ries, 2011). The MVP enables to run the Build-Measure-Learn loop, spending on it not a lot of time and effort. The minimum viable product is not the final version and lacks a lot of features that might be found as essential for customers.

The Measure phase measures if the effort spent on the product was worthy or not, it measures feedback of early customers on the first prototype of the product. Measuring phase is very challenging, but helps to create learning milestones, which are alternatives for traditional business / product milestones. Learning milestones play an important role for entrepreneurs in assessing the progress of their product in an accurate and objective way. (Ries, 2011)

After the Build-measure-learn process comes the most difficult part, the entrepreneur has to answer the question whether to pivot the original idea and strategy or persevere. If during the process it was discovered that some initial ideas were false and customers does not need / like the provided solution, it is time to make an important change in strategy. The idea behind the lean loop is to minimize the waste of time, effort and money, via giving advice to move fast from stage to stage and deliver product on market with high interaction with customers from a very early stage. Figure 2, from the book “The Lean startup”, visualizes the Build-measure-learn feedback loop. Visualization shows how entrepreneurs need to switch from idea to building the product, after measuring the data and learning, after finishing the loop go through it over and over again. (Ries, 2011)

## BUILD-MEASURE-LEARN FEEDBACK LOOP



Minimize *TOTAL* time through the loop

Figure 2 - Eric Ries, “The Lean Startup”, 2011, P.81

Lean approach also guides the process of developing multiple product lines. After crafting the mission statements for multiple products, organizations should create separate teams according to the products, which by themselves align with the core company missions. Steven Blank suggests to organize departments by market types (Blank, 2003)

### 3.2.2. Lean in Software Development

Mary Poppendieck in her work “Principles of lean thinking” discusses lean thinking results in technical product development. Lean thinking as a methodology to think how to organize human activities to deliver the most benefits to society and value to individuals via eliminating waste, is used in software development from mid 90-th. First company adopting this methodology was eBay. Company started to develop software capabilities according to customer requests. Pierre Omidyar was getting emails from customers describing what they were expecting from the platform, after that change was rapidly implemented. The admissible fact is that most interesting features, giving to eBay competitive advantages were created in this way. The same attitude, quick response on identified needs of customers was adopted by many companies time by time, Microsoft, Digital River and many more (Poppendieck 2002). Mary Poppendieck describes four main principles of lean thinking, which the author found the most relevant to software development (Figure 3).

<b>The Basic Principles of Lean Development</b>
<b>Add Nothing But Value (Eliminate Waste)</b>
<b>Center On The People Who Add Value</b>
<b>Flow Value From Demand (Delay Commitment)</b>
<b>Optimize Across Organizations</b>

Figure 3 - Mary Poppendieck, "Principles of Lean Thinking", 2002, P.3

Add nothing but Value - The first step of lean thinking is to realize what is waste. Anything that does not create value for the product, or is possible to do without it, it is considered as waste. There are described seven common wastes for software development and ways to solve the problem and eliminate the names wastes:

- Extra Features - No extra features are developed, just the ones which are extremely important
- Requirements - Detailed explanation of current iterations, focusing on what team is working right now
- Extra Steps - Only required steps are included and for each step there is a verbals clarification
- Finding Information - Information is reachable, everyone from team is in same room, also the customer, so exchange between each other is extremely easy
- Defects Not Caught by Tests - Test has to be done first, including developers and customers
- Waiting, Including Customers - Delivery of product in small increments, so noone has to wait
- Handoffs - Developers work with the customers directly, talking and understanding the tasks

(Poppendieck 2002)

Center on the people who add value - In lean development, center and focus are people adding the value to the product. Unlike mass-production, in lean development, low skilled programmers are not told by superior what exactly to do, but helps them to grow. Focusing

on people means raising the competency of people via training. This attitude gives team members more appreciation and support, each team member exists to support each other. Traditional organizational structure is not used in a lean environment, organization structure is getting to be team-oriented, which means centered is value flow and not functional expertise. (Poppendieck, 2002)

Flow Value From Demand (Delay Commitment) - The principle of lean software development is that nothing has to be done unless it is required, which means that lean does not do forecast, but is sure that something that is done is actually needed and the customer wants it. So the idea of lean is to maximize the flow of value and information. Lean software development, as well as lean production, delivers the value to customers just-in-time. Lean divides existing problems into small batches, problems are discovered from customer tests and customer feedback. This gives the possibility to react just in time and address each case quickly. (Poppendieck, 2002)

In lean software development it is advised to get rid of as many handoffs and documents as possible. Lean way of doing business is to create a skilled customer team, which will work with a skilled developing team, team will have authority and responsibility to divide and develop the system in little batches and deliver them fast, but most importantly is that all of named steps has to be driven by customer feedback and customer priority. The effective way to implement lean development is to deliver batches of real business value in short time boxes. (Poppendieck, 2002)

Optimize across Organizations - Poppendieck describes how departments and divisions under the same organization might have their own measuring system of success and effectiveness, which leads to bias and losing the common goal. As mentioned above lean organizations are usually structured around teams, which share and support the same business value, success has a united measurement unit and lays close to the overall goal of the product. (Poppendieck, 2002)

Delivering an IT included project is a challenging task. The research conducted by Standish group, an organization that researches the project successes for 25 year, revealed that 75% of smaller projects end successfully, while only 10% of large projects end successfully. Success is defined by delivering the project on time, on target, on budget. (The Standish

Group, 2015) Gaikema suggests that the rate of success of large projects can be increased by breaking them into smaller projects(Gaikema, 2019). This approach aligns with the lean approach of being focused on multiple small iterations.

### 3.3. Software Agencies

#### 3.3.1. Software Outsourcing definitions

Outsourcing can be defined as cooperation between organization and third party agency, when an organization hires another specialized company or individual person to do the specific tasks of functions on its behalf. It is possible to outsource IT (ITO), management of information technology processes, assets and everyday tasks (e.g. IT support, IT networks), also outsourcing can involve BPO, standing for Business process outsourcing, which means outsourcing of selected business processes, third party agency manages and administers the tasks connected to selected service (e.g. accounting, HR, sales, customer support and etc). The number of companies outsourcing their services is growing year by year, during the last four years the growth rate of IT outsourcing was around 5% and it is expected to grow more. (Deloitte, 2019)

In 2016 Deloitte held a study about global outsourcing, in the work are described incentives of outsourcing the services. Respondents were companies with annual revenue over 1 billion USD. Operating in America, Europe, Asia, South America, Middle East and Africa. Study showed that the answer to the question “how does your organization perceive the benefits of outsourcing?” were following: mainly ability to cut the cost and keep focus on core business, solve the problem of capability, greater global scalability and others (Figure 4).



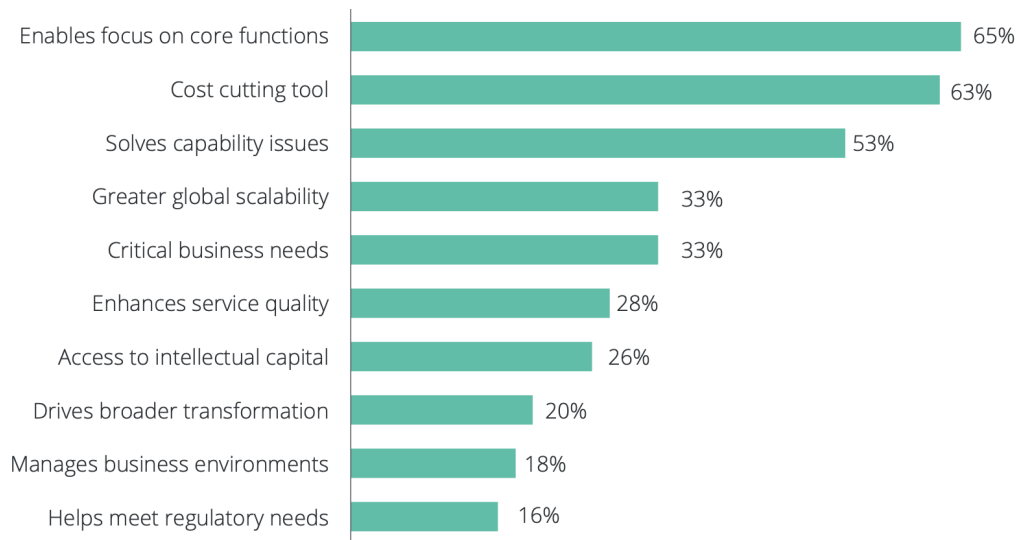


Figure 4 - Deloitte, “Outsourcing and Shared Services 2019-2023”, 2019, P.7

Outsourcing IT services became one of the uprising businesses around the world. Companies started to realize that the IT field is not their main concentration and they can allocate resources spent on this on their main business value. Companies started to consider having IT in house as a headache. From early 90-th lots of big companies started to experiment with outsourcing some information technology services or fully switch to outsourcing model. Outsourcing might seem to be a great decision but it is not easy and quick to take. This issue is one of the main concerns of managers, after answering the question if outsourcing is a good decision or not, comes another more complex question “how to do that?” and “how to manage relationships between vendor and client?” (Aubert, 2003) The main goal of gaining advantages over the competitors, can be reached by the inhouse tech team. Although including outsource means enriching the tech knowledge as well as giving the the business possibility to spend more time and attention on the core functions of business (Saitta, 2005)

John Cross in his work “IT Outsourcing: British Petroleum’s Competitive Approach” describes how big company like British Petroleum outsourced IT and what steps the company took. British Petroleum became one of the creative pioneers on the market who managed to find their own, innovative way of working with outsourcing agencies. To address the questions listed above, the company decided not to rush with outsourcing and started to experiment. In 1989 the company signed a contract with several small and several large companies. As a result the cost was cut, but BP noticed a problem with the common picture that all parties of process had to see. Each contractor was dealing just with their part of the

job, but the picture was not full and the job in the end did not have a sense of whole. BP realised that the problem was not in contractor agencies but in their own systems too, which were too diverse. Company started to standardize the systems and before handing the work to outsourcing agencies put all services under one head, making it more organized and easier to control. After having some experience with outsourcing companies, BP already knew that they would benefit from fully outsourcing IT services. Main concerns they had was a dependence they would gather from contracting just with one outsourcing agency. Company decided to have several outsourcing agencies in partnership. (Cross 1995)

BP defined the requirements toward the partners, screened them according to their requirements, partner company had to be:

- Entrepreneurial
- Service oriented
- aggressive about keeping overhead costs down

Last but not least requirement was that agencies had to work together, like an alliance, so BP organized the workshop attended by all candidates. In the end of the workshop they got proposals from agencies and were able to choose three companies being able to work together perfectly and create a value for BP. (Cross 1995)

### 3.3.2. Software Agency Business Model & Process Flow

As described above software development outsourcing is rising, so companies offering this service are appearing on the market more often and this business became one of the very successful. Lots of literature exists on outsourcing subjects, but there are not many describing how this business works, what business models do agencies have and how their team is composed.

This part of the paper is depending on the author's personal experience and three respondent's answers describing three different software agencies.

The software development agency cooperates with companies with multiple necessities, offers technical solutions and provides resources for execution of the request of clients. Agency has employees organized into functional silo teams. As the agency is responsible for providing a needed amount of technical resources to clients' supply product team with necessary competencies, the agency has a variety of professionals in-house. Our respondents named several professional directions such as: backend developers, frontend developers,

full-stack developers, mobile developers (iOS, Android), architects, QA (quality assurance) specialists, designers, project managers, testers, AI specialists, analysts, scrum masters. The list is not full as technologies change and new professionals are coming in the team. Agency is has divided the employees in silo teams and assigns needed professionals to the projects. Process usually goes in the following way: Potential client company reaches out to the software development agency for a technical solution. The agency evaluates the request, calculates timing of the project, necessary resources for execution and cost of development. After reaching the deal, the agency starts working on the project and involves needed professionals in the project. For example assigns responsible project manager, scrum master, testers and developers. After successfully finishing the project professionals go back to silo teams until they get assigned to a new project.

Due to the business model and process flow, the software development agency tries to plan the usage of their resources for different projects ahead, so that all individual resources have a plan for the upcoming period of time.

### 3.4. Cooperation Problems of Lean Organisation and Outsourcing Agency

Previous chapters defined lean organisation, software development outsource agency, their goals and operational models. In the 21st century, partnership of the lean organisation and the software development agency is a common practice and is not surprising. As seen from the definitions in previous chapters, these two entities, although being grown in tech environments, may differ from each other in terms of operational approaches. This chapter focuses on research of the problems that arise between agency and lean principal, when they cooperate. Earlier approaches suggested that the refined written contracts and clear responsibilities on the paper were the keys to solve the problems, but the approach has not provided sufficient guidelines for every occasion(Vilvovsky, 2009).

#### 3.4.1. Agency Theory

Agency theory is a well known principle in various business industries. The principle is used for explaining and settling the issues, rising from the ongoing relationship between the two parties, in which one party, that (often called principal) delegates entire or partial work to

another party (often called agent) who makes sure the work gets done, either directly performing the work, or managing the 3rd party resource that performs the work. (Ghimire, 2013) Agency theory suggests that goal conflict and the differences in the information perception might lead to inefficient cooperation (Subasinghage, 2012).

Sometimes the problem that arises during the principal and agent relationship, is that the work of the agent is not entirely aligned with the principal. The agent works on its own behalf and not in the best interest of the principal, the work delegator, meaning that the increase in the amount of input in agency work, does not affect the principal respectfully. This leads to less effectiveness of resources, that might end with the principal not being able to reach intended goals.

It is a common practise to acknowledge software development projects as successful when the projects are delivered in predetermined budget, within time, with all the functional details agreed to include and with agreed standard of quality. (DeLone and McLean, 1992). Projects not meeting some of the above mentioned criteria could be counted as less successful, while the projects failing majority of the the criteria being considered as failed (Pinto and Mantel, 1990)

#### 3.4.2. Factors Affecting Agency Theory

According to the model of the agency problem, suggested by Mahaney and Lederer, finishing the project with all predefined agreements is counted as the desired outcome for both parties, principal and agent. According to the model, success of the overall project is highly influenced by the type of the agreement between the parties. Mahaney and Lederer define that increasing the reward for the agent for fulfilling the tasks positively affects two things. First of all the overall success of the project, and second, the amount of monitoring from the principal, which on its half, also affects the project success positively. (Mahaney, 2002)

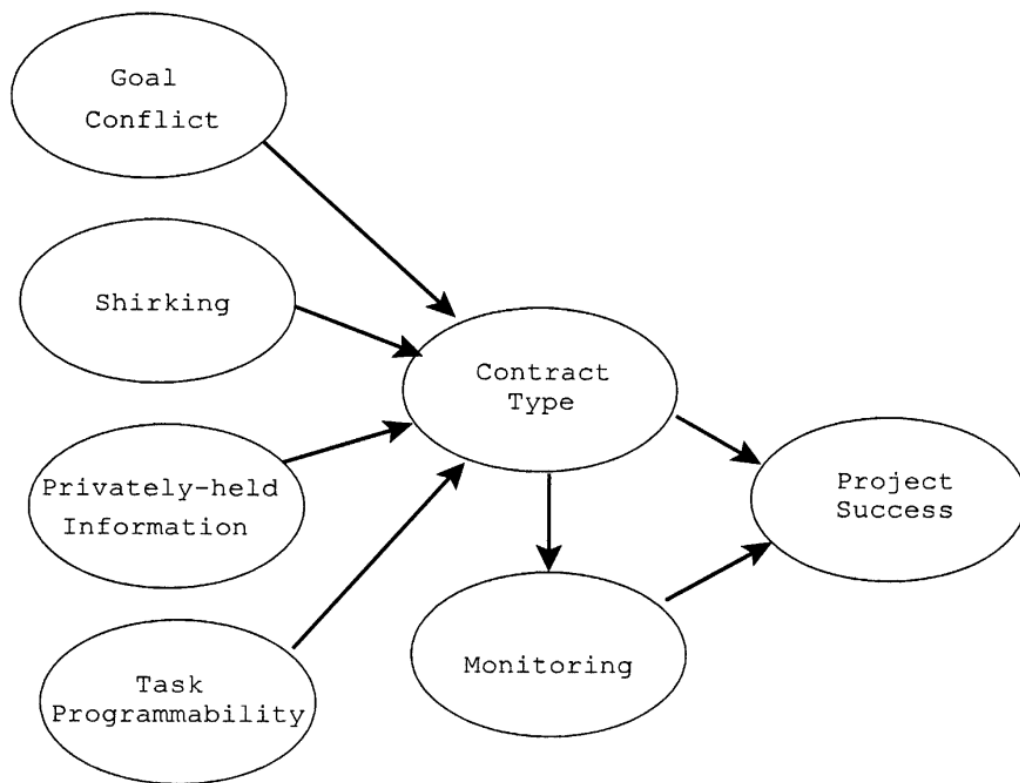


Figure 5 - Mahaney, Information systems project management: an agency theory interpretation, 2002

Agency theory is usable for addressing two issues that appear during the principal - agent cooperation. On the one hand it is addressing the issue of aligning the aspirations of different parties, that is caused by different motivational factors. On the other hand agency theory also addressed the difficulties for the principal to monitor and direct the agents work. As a result of the mentioned issues conflict arises regarding time-frame, budgeting and quality control during the development.

During the development process problems may emerge due to the legal, tech and management approaches. Due to the limited view of the issues, the principal might not provide enough information that the agent requires for fully understanding the task. At this point both sides might tend to make decisions that benefit only their side and do not align with the partner. This might lead to the risk of the agent abandoning the project increases. (Ghimire, 2013)

Mahaney and Lederer further define that goal conflict between the two parties, Responsibility shirking from the performer, and keeping specific important information

unshared with the principal gives the principal more incentives to tie the relationships with the actual outcomes of cooperation. Therefore “goal conflict, shirking, privately held information, and task programmability all affect project success” (Mahaney, 2002)

Patrick Keil suggests the assumption that in this type of dependency, the rational approach from the principal and agent might lead them to interest divergence. In this scenario the approach of the agent and the consequences of these approaches might have a direct effect on the success of the principal. Due to the unshared perspectives and rapidly changing information, the agent might receive freedom of action.

This freedom might lead the principal to greater lack of information and uncertainty, that will result in disadvantages in terms of agility of process management, thus endangering the principal interests. Keil also suggests that when the fundamental interest of the two parties are different, the agent might reveal the opportunistic inclination towards maximising their benefit, instead of aligning with the client's goals. (Keil 2005)

In order to better understand the implications of agency theory Mahaney and Lederer also conducted structured interviews with IT professionals. The structured interviews had well-defined questions, with open endings. The interviewees were asked about their perception of developers motivation and motivational methodologies already exercised. The interviews revealed intrinsic motivations that were hidden beyond the flat salaries.

Rewards for outcomes

Description	Number of subjects
Technical training	7
Flexible work schedule	6
Sense of contribution to organization	6
Public praise	5
Favorable annual performance appraisals	4
Private office space	3
Time off	3
Pride	3
Financial bonus	2
Newer technology (i.e., PC or laptop)	2
Opportunity to work at home	2
Project completion celebration	2
Choice of future assignments	1
Job promotion	1
Job security	1

Figure 6 - Robert C. Mahaney, Albert L. Lederer, Information systems project management: an agency theory interpretation, 2002 , p4

As the table suggests, IT professionals have various incentives driving their actions. According to the participants of interviews these incentives are realized in real life in different ways. For example one of the interviewed project managers mentioned that sometimes the developers tended not to use the easy solutions that would solve the client task, but would rather dive into the new technology that would enrich their knowledge of technologies. The research unhides the sources of conflicts. Those actually creating the software are oriented to keep their market value high and deliver a functioning software, while the people responsible for plans focus on delivering the software in time and on budget. Sometimes, like in the example above, people responsible for creating the software invest too much time in refining the code quality and gaining new knowledge, which results in exceeding the project budget and deadlines. (Mahaney, 2002)

In his research regarding Agent theory, Keil also addresses the implications of lack of monitoring and information share. As mentioned above agents, while having the freedom to manage their actions, might tend to act in their benefit. According to Keil the problem root is that the agent has the informational advantage about the actual process flow, including the amount and quality of inputs needed for reaching specific output. This situation creates the possibility for the agent to monetize her freedom by increasing the profit unfairly. This might be based on decreased amount of input, or overpricing the input. This results in lesser effectiveness for the principal. (Keil, 2005)

Keil suggests that increased monitoring and information sharing could be seen as a way out. Monitoring might include various sources of control which the principal will use to increase their access to information and process details. The intent is to measure the amount and quality of input and received output. These actions require extra costs from the principal:

- First of all, monitoring is directly connected with additional human or technical resources.
- Second, this requires the knowledge of the methodologies, technologies and process flows of each specific aspect of the agent workflow and the specific project in question. (Keil, 2005)

As a response to this problem, multiple researchers suggest introducing the incentive tied contracts, concentrating on the ways that help align principal goals with agent incentives. (Keil, 2005, p3) The ultimate way suggested tying the financial benefits with the performance of the outputs. Agent parties will receive the additional payoff when the performance of the output exceeds the expectations. Although Keil also suggests the pitfall of this kind of attitude.

Keil gives an example of Nixdorf, German hardware and software producer. Nixdorf experienced the consequences of the lack of monitoring. During the IT projects, they were paying external contractors 3.5USD per code line written. Nixdorf found that the developers were artificially boosting the amount of code written, by including lines with 'nop' command. The command stands for no operation performed on the line. Therefore the system skipped the line and did not get any benefit from it, moreover might have become heavier at time, although the agents increased their benefit in terms of revenue. Keil names this kind of behaviour "gaming the system" when the increased gain of the individual agents does not correlate positively with the results of the principal. (2005)

It is also important to look at the hidden costs of outsourcing. Sutherland, in his paper "Distributed Scrum: Agile Project Management with Outsourced Development Teams" (2007) provides several statistics of how outsourcing can be carrying hidden costs. Sutherland analyses the results of the Barthelemy Survey, according to which 14% of operations outsourced from the 50 companies interviewed were failure. Sutherland suggests the cost of transition as one of the reasons. (Sutherland, 2007)

Another Study performed by the German Institute for Economic Research, including 43,000 firms from Germany that were manufacturing during 1992-2002 suggests that outsourcing did only lead these companies to low performance. (Gorzig, 2002)

### 3.4.3. Agency Perspective About Cooperation Problems

Problems between third party software agencies and organizations exist, research held by Goodfirm in 2019 revealed major problems that third party software agencies face while



working with clients. As we discussed, lean organizations are concerned on rapid reaction on customer requests and feedback. So changes in product requirements is considered as a normal workflow. According to Goodfirms' research, 53,8% of agencies find it hard to adapt with changing requirements of the client. Trends and market demands change very fast, agencies often have to face the fact that product description, agreed with client is not valid anymore and parts of the product have to be changed. This leads to the change of product scope, requires redevelopment of existing functionality or development of a new one, agency finds it difficult to allocate resources in this uncertain situation. (Govindaraju, 2015) Change of the scope accordingly affects the timeline of the project and leads to the need of budget change. (Goodfirms, 2019) According to Krancher, although continuous updates bring benefits for the overall product, it also brings the negative effect on the individual engineer efficiency. (Krancher, 2020)

Second biggest challenge from an agency perspective is continuous performance and load testing management. 17,7% of respondents highlighted this as a major problem for the development team. Performance management is critically important to create flawless products but adapt with clients' operations and strategies used for management, are hard to cope with for the development team. (Goodfirms, 2019)

Third challenge revealed by the study, with a rate of 13,1% is employing the right people. Projects that the agency is getting are usually unique and very different from each other. Speed of technology change affects agency workflow, to stay on the track and be able to provide right resources for each project, the agency needs to compact the project team from right professionals answering product needs. (Goodfirms, 2019)

For 8,9% of the agencies find it difficult to fully understand client requirements. Agencies face cases when clients are not sure what exactly they want, or it is hard for them to explain in details. Agency needs full understanding of the product to estimate cost, scope and timeline. Uncertainty from the client side makes their work harder and might cause some misunderstandings. (Goodfirms, 2019)

Fifth challenge named by 6,5% of the respondents was integrating different systems and technologies. To go in details, integration of a wide range of systems in one custom software

might be challenging for an agency, CRM (customer relationship management), human resource management, accounting, workflow management and many more. (Goodfirms, 2019)

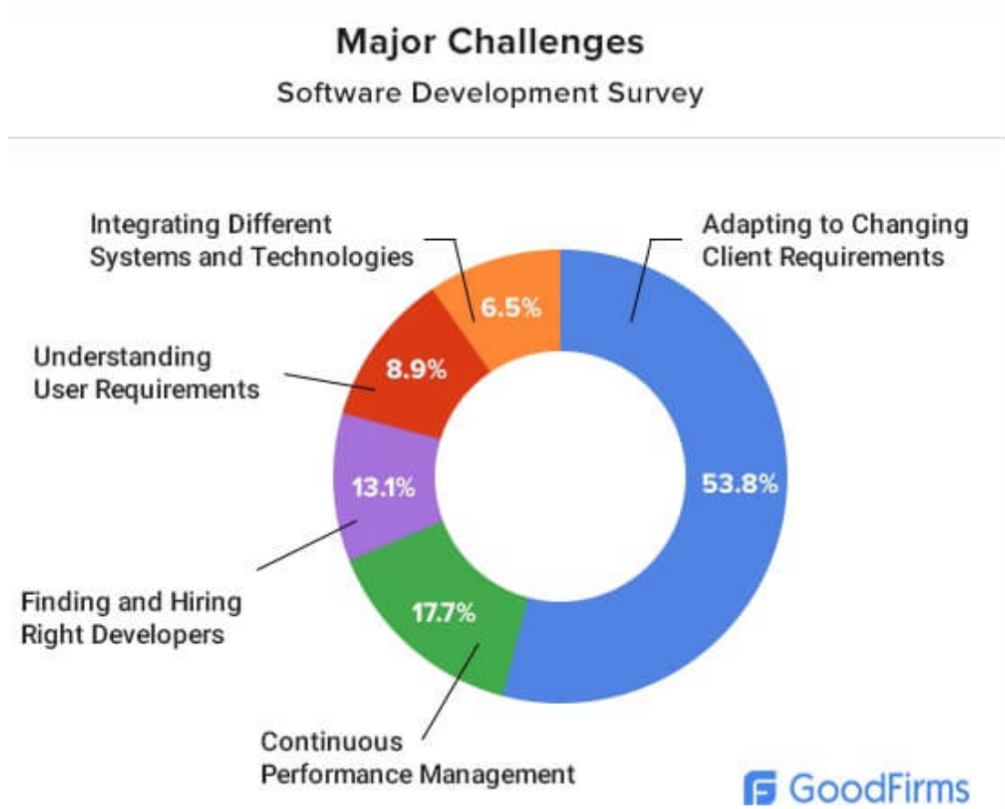


Figure 7 - GoodFirms, “Remarkably Useful Stats and Trends on Software Development | GoodFirms Research”, 2019

#### 3.4.4. Output vs Outcome Mindset

The successfulness of a company depends on its ability to satisfy customer needs. As Melisa Perri suggests in her book “Escaping the build trap” (2020), companies should associate their value with the outcomes they provide to their clients, not with the amount of specific products or features they develop or launch. It is vital for the organisations to check and verify their understanding of the value exchange system with the clients. According to Melisa Perri, Focusing on outcomes as values for customers, and checking the results after each iteration means shifting the mindset from project oriented to product oriented. As Ash Maurya defines, a person building a new product or service should use experimentations for validating the assumptions. Maurya suggests that keeping the experiments and feedback loop quick positively correlates with breakthrough rates. (Maurya, 2016)

Project mindset means operating with project based cycles, where each component is predefined, with its own delivery date, deadline and only after the mentioned characteristics are defined, the team can start work. The process is oriented on reaching a specific goal, which in most cases is a specific feature or product, which therefore defines the metrics for operation assessment. project is a specified scope of the product features to deliver. As soon as the project feature is delivered, the project is deemed finished and the team moves to another scope, another project. Although there are many metrics for project success, they fall under checking whether the project was done according to predefined characteristics of time and resources. These metrics measure the output, the direct result of the development process, without measuring the further processes on market that the product has to go through in order to specify the end user. (Perri 2018)

On the contrary, the product mindset, concept of which is also close to the Lean startup mindset pushed many organisations to focus on whether the customer was satisfied with the product or not. According to Melissa Perri, a product is nothing but a mere vehicle that delivers the value to the customer. Having the end user and their necessities in mind means assessing the product not according to project metrics, for example how well the scope of product was defined during the development, or how high was the quality of the code or components of product, but assessing them by how many customers they made happy. (Perri 2018)

As the market changes constantly, product needs to be assessed against market needs and modified when needed. As Steven Blank suggests in his book “4 steps to epiphany”, the process of creating a successful business consists of multiple phases, including finding the problem-solution and product-market fits. This process often requires multiple iterations with the constant focus on the end user and their pains. This is where a project comes in combination with a product. Each iteration can be counted as a small individual project. Development team can track the project management metrics, which will be helpful in analyzing and eliminating waste in the process, but the product management team has to track the customer satisfaction metrics to define what product the development team should build in order to satisfy the customers. (Perri 2018)

### 3.4.5. Agencies and Lean Culture

As the last decades has seen the uprise of Lean/agile philosophy in numerous business industries, software development outsourcing agencies have also started applying it to their workflow. Applying the lean philosophy and frameworks has turned out to be demanding for the agencies. Jeff Gothelf and Josh Seiden, in their book “Lean UX” define the possible reasons behind it. (2016)

As Seiden suggests, the core problem for a large number of agencies is that their business model is in conflict with the lean principles. Most of the agencies follow the traditional operating model, meaning they earn revenue by delivering the output, which might be software ,source codes, design or wording materials, presentations or etc. These materials are the direct outputs of the agency work, in other words only a product. As defined above, the products are the mere carriers of the value for the end users, not having a specific worth for the principal lean organisation by itself. The principal organisation is focused on the outcome of the product delivery, while the agent is often focused on the output delivery. Having differences in the intrinsic motivations might lead to conflict between the two sides. (Seiden, 2016)

Second problem for outsourcing agencies raised by Gothelf and Seiden is the natural inclination towards individualism and as the authors define “the culture of hero design” (Seiden, 2016, p149) one of the examples brought is the position of executive creative director. Due to the market demands, agencies have to structure their teams in a form of silos, not the product teams. This type of organisation helps keeping the utilisation rate high, although makes it hard for the cross disciplinary team to collaborate. Being used to working in a functional silo might affect multiple fundamental attributes of the lean team, for example transparency and ownership. Which by itself leads to poor focus on outcome. The functional gap might be further increased by the lack of communication and informational exchange between agency and the client. It requires product and development experience to maintain close communication. Giving the requirements to the agency at the beginning of the period and expecting the results that fit the client goals, might leave the client with the useless product and no funding at the end of the period. (Seiden, 2016)

After conducting a series of deep interviews with the outsourcing and vendor company employees, Xi, Xu and Todo revealed several issues connected with outsourcing (Figure 14). Main issues revealed as seen in the figure are lags in operational management and staff attrition and skilled staff shortage. (Xi, 2013)

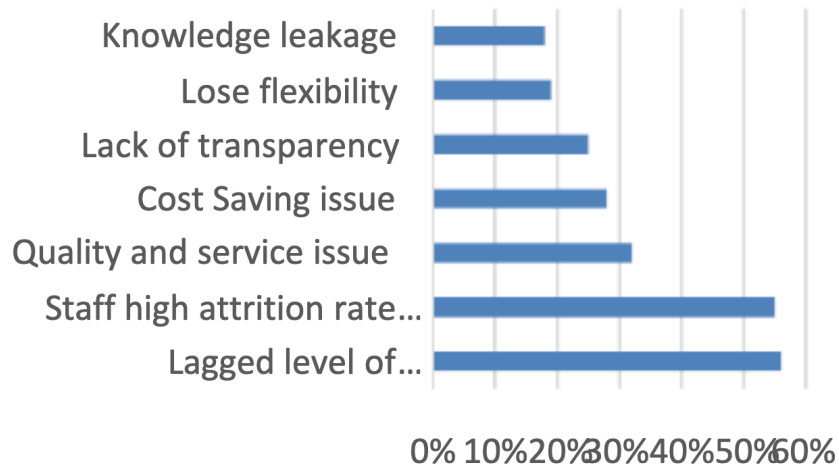


Figure 8 - Xinyuan Xi, Yingyu Xu, Hiroyushi Todo, The Present Situation of IT Outsourcing and Countermeasure, 2013, p429

Analysing the fact that the problem lies in the lack of communication shared focus, the possibility of successful cooperation might be increased if both parties focus on these problems. The client and the agent should maintain high collaboration quality which includes sharing vital information regarding the requirements and the processes, as well as take necessary measures to keep the focus on the final output, which could be the necessities of the end user, or the specific strategic or tactical goal for the client.

It is also a common practice for the software agencies that try to focus on the client desired outcomes to leave the fixed scope and fixed budget contracts and switch to a different cooperation model. The participation of agencies in the development might be based on handing the development resources to the client for a particular time. Another model, which is even more focused on client success is the agreement based on reaching the client goals. This might lead to more opportunity for the agency to exercise the lean principles, and shift the workflow from functional silo approaches to a functional team based approach. This also gives more flexibility to manage the iterative cycle of the product development and management. (Seiden, 2016)

For the client, on the one hand, giving more freedom of action to the agents might feel like giving up the control. Although on the other hand, during the deliverable based contract, the client was performing the part of the development process, that meant splitting the process into two parts without proper communication and information sharing. Therefore by following the outcome based contract and giving up the unsuccessful surface level control, the client can receive the commitment of the agency towards the client outcomes.(Seiden, 2016)

Another strategy for increasing collaboration and remaining the shared focus, suggested by Gothelf and Seiden is eliminating the boundaries between the client and the agency. Agencies can work on having the client involved in every decision making process, shifting the formal delivery or demo days to more informal milestone set up and check events, as well as organizing the coworking and brainstorming meetings, where the two sides will work for the same goal, increasing the team coherence and the sense of the team. From the client perspective one of the common methods to have the focus shared and increase the feeling of coherence in the members of the development team, is to include the agency in the early stages of product, including concept creation, design and research. As the lean principle is based on running frequent build-measure-learn cycles, the team members will have the possibility to follow the logical sequence of the changes, which they would miss if the product or project was only introduced to them after the conceptualizing or design phase. Enriching the team with the agency representatives can positively affect the early phase and increase the speed of the early build-measure-learn cycle, as the cross functional team might cover more competencies and suggest more different understandings of ways to reach the desired goals. (Seiden, 2016)

### 3.5. Commonly Used Product Development frameworks

This part of the thesis describes software development methodologies, commonly used by companies. Literature review revealed importance of software development methodologies used by parties while cooperating. Output versus outcome mindset and description of the culture of these two companies shows that sometimes cooperation problems might be caused by the difference in how companies manage development processes. Methodologies matter, lots of studies were conducted measuring success rates of different software development methodologies. It is critically important that the development team fully understands the

method they work with and agrees with it. Choice of which methodology to follow often is defined by “certain organizational, project, and team characteristics”. (Vijayasathy, 2016) The software development methodology can have an effect on the success of the project. The most favorable methodologies nowadays are ones, which is suitable for high volatility of project requirements. (Rajagopalan, 2016). According to Owen and Linger, the agency and the principal might agree on a tailored methodology, which is a combination of the approaches used previously by the two different parties. This kind of approach is based on the project specific circumstances, and the experiences of the parties. (Owen and Linger, 2011) This part of the work shows description and differences between the most commonly used practices.

### 3.5.1. Definitions and Main Groups

Software development combines conceptualising, designing, engineering, documenting, Quality assuring and maintaining of the software programs and applications. Software development is a rapidly increasing field, characterized by a high rate of update of methodologies, approaches, standards and frameworks as well as specific process flow and dynamics due to differences in affecting factors:

- Software languages and development frameworks used in development update often. The speed of introducing, accepting and outdating the languages and frameworks are incredibly high. Hardware used for running the code gets updated year over year, as more sophisticated and complex programmatic assignments require more computing power
- Developing a software requires a combination of work from different fields, therefore development process often includes a cross functional team comprising from highly skilled individuals with different backgrounds
- Software development teams often include members from multiple geographic locations, often operating in different time zones. (Livi 2014)

Considering the specific project requirements, fulfilling the given assignment and delivering a working software, often requires setting case specific software development methodology. Methodology is a combination of agreements, directives and guidelines, that are used by the team members in each part of the process, from initiation to maintaining the software. Methodology could also reflect the values and beliefs that support the team to keep the

process under control. This chapter reviews the methodologies that are commonly used in modern day software development and explains their main requirements, benefits and pitfalls.

Methodologies for development are mainly characterized in the following main groups:

- Heavyweight methodologies
- Lightweight methodologies
- Combined

Heavyweight methodologies and frameworks are based on waterfall approach, dividing the development process into clear phases, including research, design, development, testing deployment and maintenance. These methodologies are simple in terms of following and implementing, due to the nature of having detailed documentation and explanation and division between phases. Heavyweight methodologies also create a possibility to assess and manage the workflow speed of each individual type of work. (Liviú 2014)

On the other hand, lightweight methodologies are based on agile approaches, which promote acceptance of rapid changes in environments, technologies and requirements. These methodologies are more commonly used in the cases when the requirements or the inputs are changing fast and it is hard to forecast the future. To minimize the risk from an unclear environment, lightweight methodologies propose general guidelines, not the specific rules. Lightweight methodology goes against the stage gate styled, plan focused approach (Milanov, 2012). Guideline is based on an iterative and empirical approach, when a product is delivered in multiple iterations, every time checking and validating specific unknown factors. Iterative approach gives the possibility to stay flexible to changing environments and adapt easily to new situations. (Liviú 2014).

Combined methodologies combine the approaches from both directions. As mentioned above, the development team makes a decision of which methodology to use after assessing the environment and compatibility of methodologies with it. Different factors that could be considered might include product type, team experience and expertise, complexity of assignments, rate of changes in environment, knowledge of development languages, as well as the time and budget constraints. (Liviú 2014)



Some of the product development methodologies share the values and approaches, in the book “A guide to the project management body of knowledge”, published by Project Management Institute we see interesting grouping of the methodologies. Figure 5 shows Lean as a main group, Agile and Kanban methodologies as a subset of lean. All methodologies grouped under lean share the idea of lean thinking, they focus on the value, all of them try to eliminate waste and have small batch sizes. Agile itself groups several subsets under its name, as grouped methodologies fulfill the principles of Agile Manifesto.

Choosing product development methodology depends which methodology suits not just product, but also the team. Project teams sometimes even blend different methodologies to adapt them to their needs. The objective is to reach the best outcome, no matter which approach is used. (PMI, 2017)

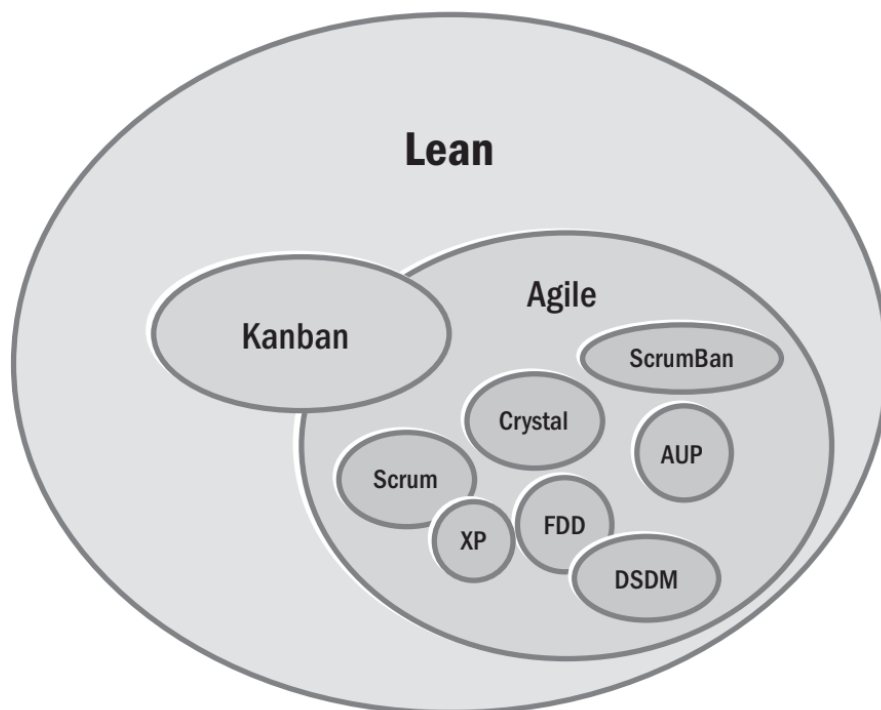


Figure 9 - Project Management Institute, “A guide to the project management body of knowledge”, 2017, P11

Below this section are discussed several of the most common product development methodologies: Waterfall, Scrum, Kanban and Extreme Programming

### 3.5.2. Waterfall

Waterfall is a heavyweight methodology that divides the development process in the sequence of steps top to bottom. Waterfall methodology is useful for the situations when the result of the process is predictable. Waterfall represented one of the first methodologies to be adopted in various industries, including software development. The benefits of following a logical sequence was harvested by the adopters. The figure represents the top to bottom sequence of waterfall steps. (Liviú 2014)

The Waterfall development is a linear process, where starting each stage of the process requires finishing the previous stage(Kisielnicki, 2017). After each stage deliverables are handed over from the team to team. Project manager, who is in charge of controlling the process, has clear guidelines, deadlines and requirements that define the success of each stage of development. It is important to note that dividing into different stages might as well include dividing the development process into developing the user interface, a part that is visible for the end users and engineering the core logic of the system, which could be invisible for the end user. This type of division naturally leads to receiving overall and combined feedback from the customer only after each stage is completely finished and the software is tested. Waterfall fits development projects with clear requirements and no unclear horizons. (Liviú 2014)

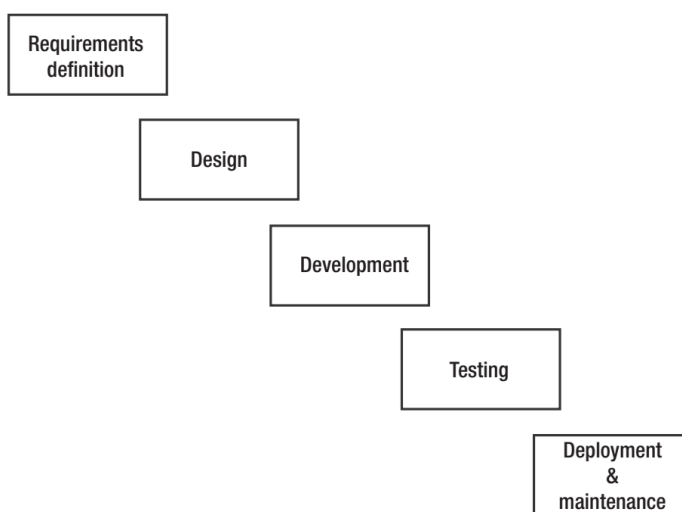


Figure 10 - Pranam A., (2018), Product Management Essentials, p66

Benefits of waterfall include:

- Strictly defined scopes of requirements, time and budget for whole project, as well as for each stage
- Detailed documentation, that is often created before the stages start. As the requirements and environments are expected to stay the same, long documentations are often used to cover explanations of processes and features in detail
- Design phase creates strict guidelines for development. Design is approved and used for the control of the requirements from the early stage

Pitfalls of waterfall include:

- Non consideration of changing requirements
- Not being flexible to changes in inputs and required outcomes.
- Focused on output, not outcome
- Limited connection with feedback

(Pranam,2018)

### 3.5.3. Scrum

According to the scrum guide, written by the founders of scrum Ken Schwaber & Jeff Sutherland, scrum represents a lightweight framework, for teams who need to create value in complex environments and using adaptive solutions. Scrum focuses on creating the environment where the product representative delivers vision of the complex product, development team transforms the requirements into a working increment, and the stakeholders provide feedback frequently and early as possible (Sutherland, 2020). The authors of scrum scrum guide define that the framework is not a complete detailed, but more of an incomplete guideline. It purposefully excluded detailed instructions and focused on guidance of interactions and overall team working principles. (Sutherland, 2020)

Scrum is based on lean mindset, empirical and iterative learning, defining that the only reliable source of knowledge and foundation for decision making is observation and experience. Three main pillars of scrum include Transparency, inspection and adaptation as the scrum guide suggests (Sutherland, 2020). Scrum inherited focus on waste minimization from Lean. Scrum is commonly used in situations when facing complex issues with multiple unknown factors that could define the end result. In response to fast changing and mainly unknown environments, scrum proposes using an iterative approach to minimize the risk of

failure. Scrum guides the development in cycles. Instead of having work components strictly divided into stages, scrum suggests creating working increments that change or increase in time, shaping the final form in time. Main purpose is to run the technology development cycles as fast as possible and ensure receiving feedback quicker and more often. (Smith, 2018)

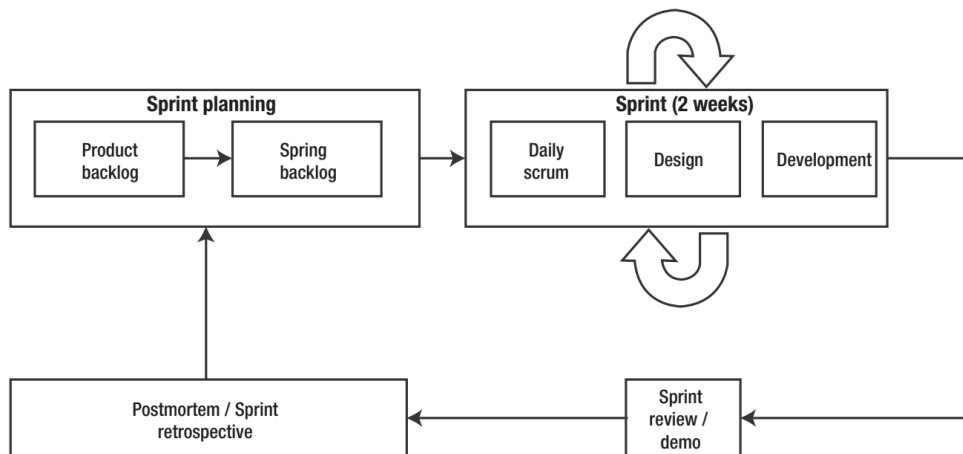


Figure 11 - Pranam A., (2018), Product Management Essentials, p69

As it is visible on the figure 11, scrum is based on a repeating model of delivering working software. Initially the product backlog is created, holding all the values and visions for the product. Backlog includes the goal and the specific requirements. The scrum team operates in time containers called sprints, usually from 2 to 4 weeks length. At the beginning of the sprint, the scrum team analyzes and plans the functionalities that maximize the customer value and that can be delivered during the sprint. During the sprint period a potentially releasable working product is created, that can be tested and feedbacked by the end user or key stakeholders. Scrum includes 4 formal meetings during the sprint to inspect the process and adapt to the challenges. These events help the team remain transparent and flexible. Scrum might also use the artefacts for transparency, like boards(Pranam, 2018)

Benefits of scrum include:

- Short feedback loop and high level of informacy
- Coworking design and development
- Actual product to use and test at the end of each sprint
- Increased team coherence
- Possibility to detect and eliminate waste and threats in early stages

(Pranam, 2018)

Pitfalls of scrum include:

- Necessary commitment to procedures and values
- Threat of inclination towards constantly increasing scope

(Harleen, 2014)

#### 3.5.4. Kanban

As it was mentioned in “Definitions and main groups”, kanban can be considered as a subset of the lean methodology group, as it shares values and principles with lean thinking. The shared values are:

- Focusing on delivering value
- Waste minimizing
- Respecting people
- Transparency
- Adapting to changing environment
- Continuously improving (PMI, 2017)

“Staring tomorrow, stop starting, start finishing” says Hammarberg and Sunden in their book “Kanban in Action” (2014). Authors highlight that Kanban methodology was picked by many organizations around the globe, as it is very easy to start working with Kanbat, a company can just start right at the moment where it is now. Most important principle that company can even transfer to their motto is to stop starting, which means before taking any other task, tasks which are ongoing have to be finished. “Getting up and running with this isn’t hard—the effects can have a dramatic impact on your productivity.” (Hammarberg & Sunden, 2014)

Word Kanaba is Japanese term and means “signboard”. Kanban is a visualizing methodology, which manages the product creation process, concentrating on constant delivery of product. Unlike scrum methodology, kanban does not stop development every 2-4 weeks, because of sprinting. Kanban uses signboard and provides workflow statuses (e.g. to be done, work in process, done), which gives a good sight of the project and sense of where the team is right now. (Hammarberg & Sunden, 2014)

Beside sharing principals with lean, Kanban definitely has its own important principles, Hammarberg and Sunden highlight three most important principles: Visualization, limiting work in process, and managing flow. Visualization can be done through very primitive board and sticky notes. Limiting work in process means to have as little number of tasks running at the same time as possible, this approach helps to do the tasks quicker. Managing the flow is a constant improvement of how things are done. (Hammarberg & Sunden, 2014) Three more principales are usually added to this list and considered as important additions: making processes explicit, implementing feedback loops and improving collaboratively. (Flora 2014)

Visualized example board of the Kanban method is displayed on figure 8, where tasks have the statuses: to do, analyze, dev, test and done. Beside tasks are classified in bugs, features and tasks, bugs are marked with red color, features with green and tasks with yellow. Board also has an urgent line where highest priority tasks are placed. Tasks are assigned to responsible persons. Done status is given to tasks which are finished, tested and closed. (Hammarberg & Sunden, 2014)

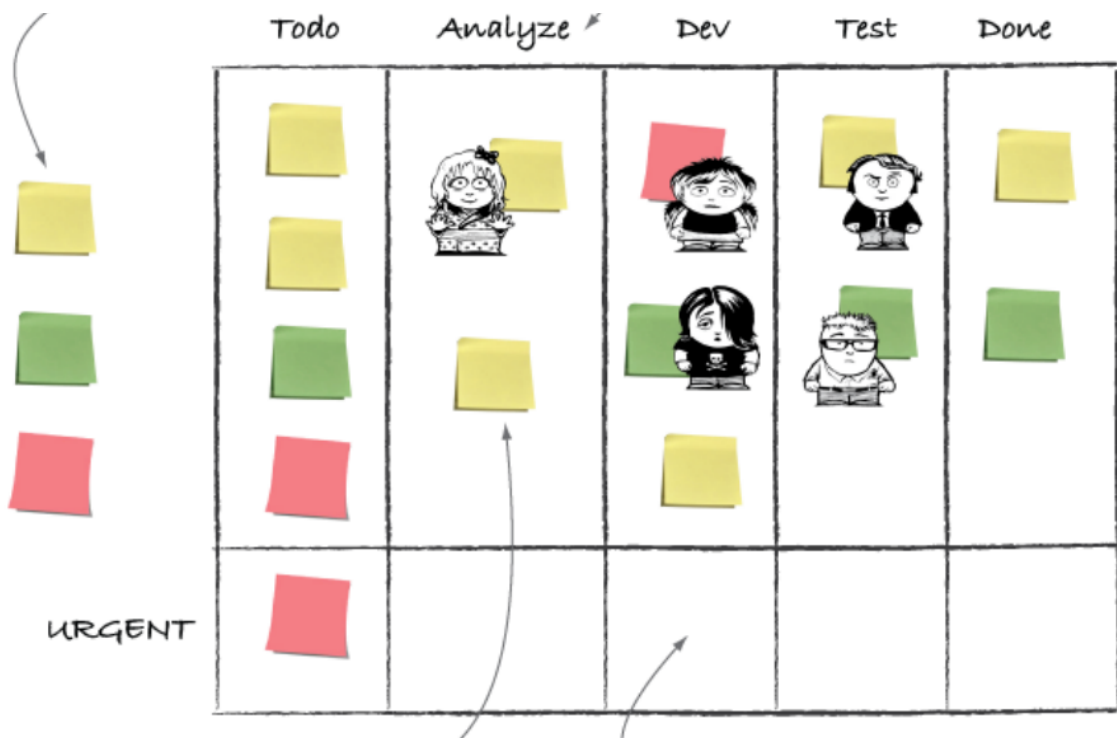


Figure 12 - Hammarberg & Sunden, "Kanban in Action" 2014, P.63

### 3.5.5. Extreme Programming - XP

Extreme programming is a lightweight methodology of software development. To maximize delivered value, XP uses rapid feedback approach and high-band-width communication. It supports tight communication with customers, has a particular planning approach and provides constant testing of deliverables. “Extreme Programming (XP) defines a process for developing software: it addresses the problem from early exploration to delivery.” (Wake, 2002)

We already discussed that in many cases software development might be unclear and constantly changeable according to the market needs. The goal of extreme programming is to develop software successfully despite occurring changes. This methodology intends to have higher software quality and adapt very quickly to the customer feedback, make quick changes in the product to meet the business needs. (Flora 2014)

Extreme programming breaks the whole software development process into smaller, manageable pieces. XP does not support the idea of plan, analyze and design at once for the whole project. To make the process more manageable and adaptable to changing environment XP does planning, analyzing and designing process for smaller pieces of software development. Process is repeated for each piece of development (Figure 9). What makes XP very different from other methodologies is pair programming and testing. Pair programming means that in the coding process two programmers are involved, one is actually doing the job and the second is supervising, but the roles are swapped from time to time. Programmers are required to write the tests before writing the code, as huge attention is paid to the unit testing process to deliver high quality software product. (Despa, 2014)

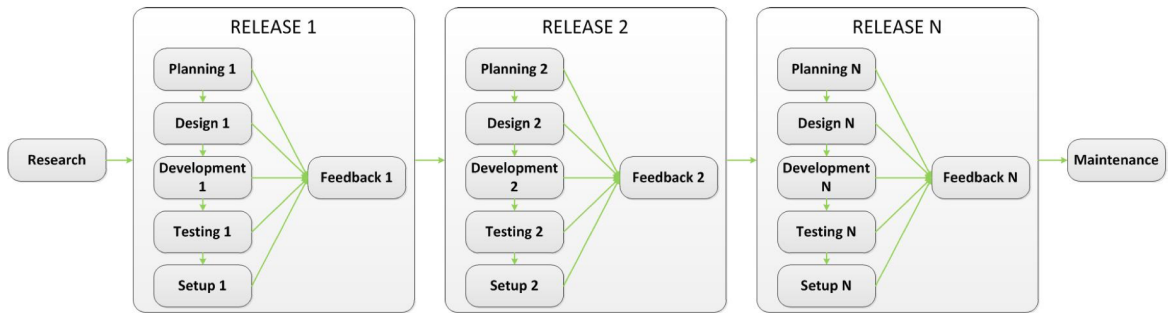


Figure 13 - Mihai Liviu Despa, “Comparative study on software development methodologies”, 2014, P.44

### 3.5.6. Frameworks Used by Agencies

During the last 60 years, numerous work management and product development approaches have developed and adapted. Each of them have given birth to specific frameworks, which have been adapted by the users to the specific demands and situations.

According to the research performed by a research platform “Goodfirms”, multiple frameworks are still actively used in modern technological projects. During the research, more than 150 outsourcing agencies and experts were surveyed. The goal of the research was to reveal how often the specific development frameworks and methodologies were used by outsourcing agencies and freelancers. Research covered agencies from multiple regions, including Northern America, Western and Eastern Europe and Asia. (2019)



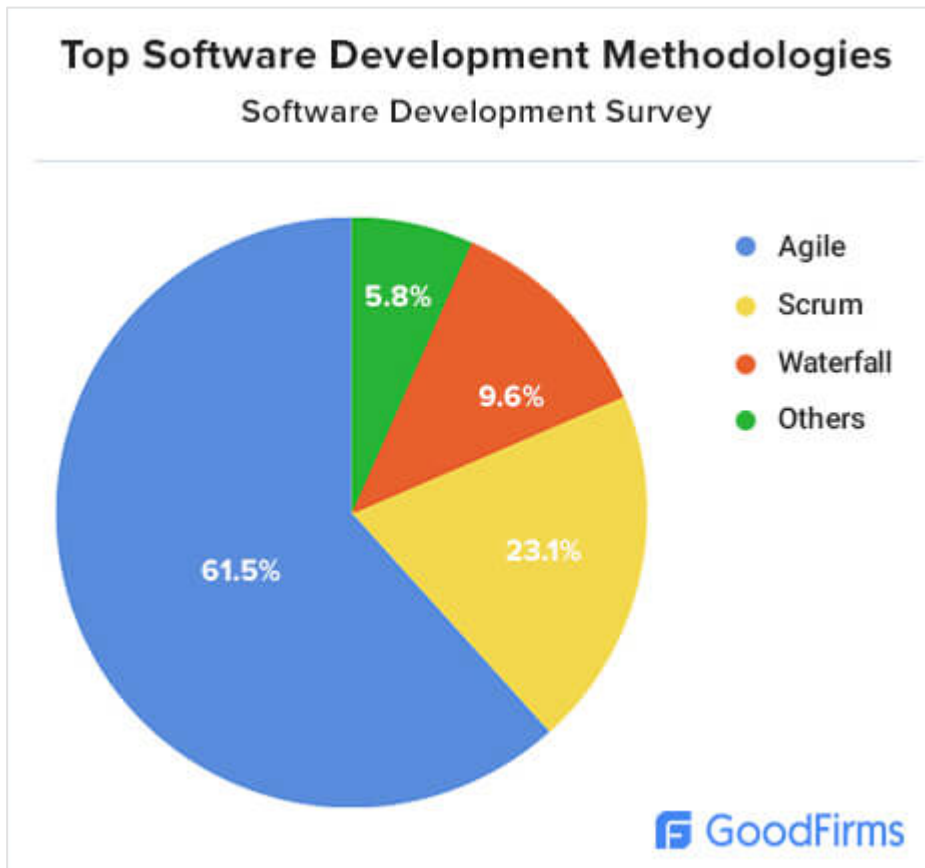


Figure 14 - GoodFirms, “Remarkably Useful Stats and Trends on Software Development | GoodFirms Research”, 2019

Research found that As the agile and lean methodologies got widely accepted in the number of industries, it has been actively introduced in the software development outsource field. As the statistics show, Agile based frameworks are widely exercised in 61.50% of the companies surveyed during the research. Analyzing the reasons of agile/lean frameworks been widely applied, the researchers came up with several conclusions:

- Lean / Agile is based on flexibility in changing environment, supporting collaboration and teamwork
- Lean / Agile frameworks encourage transparency with regular inspection and adaptation, which creates a possibility for the client to stay involved in the development process, therefore stay committed to decisions
- The above mentioned methodologies create possibility to stay flexible to client necessities and requirements, which was mentioned as one of the biggest roadblocks in development from the agency perspective (GoodFirms 2019)

Research also revealed that 23.10% of the participants surveyed used Scrum, or other agile based and adapted framework as the main development framework. The main reasons agencies used Scrum and other agile based adapted frameworks were the following:

- Increased possibilities for collaboration as a team, provided by scrum ceremonies like daily scrum meetings, weekly sprint plannings reviews and analysis
- Possibility to include the product (client) side inthe development process when needed
- High client satisfactions from using the methodology (GoodFirms 2019)

The research found that, although sometimes called outdated and primitive, standard waterfall methodology based frameworks are still used by 9.6% of the agencies and contractors. The research revealed that waterfall styled standard stage base approaches still have usage in the specific areas of design or development, which do not characterize high volatility. Linear approach results in faster development when the environment is not changing fast. (GoodFirms 2019)

And finally, according to the research the minority of software development agencies, counting up to 5.8% exercise multiple methodologies, while choosing specific methodology according to the individual cases. (GoodFirms 20)

## 4. Practical Part

### 4.1. Thesis and Research Aims, Objectives and Questions

To highlight one more time the aim of this thesis is to study and define cooperation models of lean organizations and third party tech agencies. As described in the literature review part, the difference between these two parties is obvious, lean organization is trying to be very agile, provide quick answers to the market change and adapt the digital product to customer's needs. This strategy usually leads to product scope change and uncertainty, which third party tech agency might find problematic. Third party tech agencies find it harder to adapt to changing product scope as allocation of resources, timeline and budget of the project depends on what is product scope.

The main goal of this thesis is to analyze the roots of these problems and suggest effective solutions for problem solving.

The objective is to investigate and provide a model which will help both parties work together more effectively, avoiding existing challenges.

To be able to achieve the objectives of the thesis, following research questions were defined and partially answered via literature review:

- What are the main differences between operations management of lean organization and third party tech agencies?
- What are the problems that lean organizations and third party tech agencies face while working together?
- What are the most effective ways of these parties working together?

Following problems were highlighted via literature review:

- Changing client requirements
- Output oriented approach of the agency
- Product team coherence problem
- Lack of control from principal prospective
- Different product development methodology used by parties

Above mentioned five problems were found in cooperation between lean organization and third party tech agency. Named problems were decided to be tested further during in-depth interviews with both, lean organization and third party tech agency. In order to reveal the problems and suggest possible solutions, a semi-structured deep interview with 6 questions was designed. For the research purposes representatives of 6 companies were chosen for participation. 3 of the participant companies represent lean organisations and have experience of working with software development outsource agencies, another 3 companies participating in deep interviews represent the development agency side. All the companies participating in the research operate on Georgian and on international markets. For the research purposes, one representative of each participating company was chosen to be interviewed. Each participant was senior product or project manager, with multiple years background from the industry. The interviews were conducted online via online meeting platform.

## 4.2. Interview Questions Design

The questions used in the research were created and designed specifically for this specific research and by the research conductors. The aim of the questions are to suggest answers to above mentioned research questions and help draw conclusions regarding the research topic. The interview includes 6 open ended questions with the purpose to let the interviewees give their suggestions and not follow the predefined direction. The questions ask the participants to describe the situations and cases, to collect data regarding their approaches and understand the causes and results. Average time for the interview was pre designed to be 15-20 minutes.

As the literature review suggested, the problems in cooperation between lean organisation as principal and software development outsourcing agency as an agent develop during different stages of cooperation. Therefore The interview was designed to describe the views of the participant on the whole process of cooperation, reveal factors from both principal and agent side and compare their reflections.

Before conducting the interviews, the above mentioned questions were used in a test interview with multiple interviewees to make sure the questions of the interview were clear for non native but fluent english speaker interviewee. Several corrections were made in the

structure and sequence of the questions to make sure the questions were not driving the interviewees towards a specific conclusion. Based on the test interviews, two final interview questionnaires were developed, one for the lean organisation representatives, and another for the representatives for the development agency.

Each interview conducted by the researchers started with the opening form the researcher, describing the scope and goals of the research and the agreement of keeping the name of individual interviewee anonymous due to GDPR (General Data Protection Regulation). It was also agreed that the information provided by the research participants would not be used by authors for any purpose other than using in this specific research. Next step was for the interviewer to establish rapport with the participant by exchanging general information and collecting details of participant background.

### 4.3. Company and Respondent Profiles

Six companies participated in the research, representing two groups: lean organisations and outsourcing agencies. This research covers semi-structured interviews with one representative from each company.

Outsourcing agencies participating in the research are:

- Wandio
- Monoke.Studio
- Webiz International

Lean organisations participating in the research are:

- OPPA J.S.C.
- Crystalbet
- Space

Wandio is one of the partners of EPAM systems, and of one of the fast growing custom software outsourcing companies from eastern europe, with headquarters in Tbilisi, Georgia. Their services include web development, mobile, development, database development, Analysis, design, devops and quality assurance of products. Wandio has built multiple middle and large systems for international markets since 2015. The industries and fields

served include fin-tech, human resource management, e-commerce, banking, loyalty programs and etc. The interviewee from Wandio, which participated in the research works in the software development direction. Interviewee has a background of work management methodologies, architecture, coding, including working with software engineers and designers.

Webiz is a software development outsource company, Headquartered in Tel-Aviv Israel, with an operating centre in Tbilisi, Georgia. Webiz Supplies Web and mobile product development services to clients, including Software architecture, Coding, UI/UX, business strategy, marketing strategy, QA. Clients are from different geographic areas, including USA, Israel, EU. The representative of Webiz participating in the research works in the product management direction. Participant has experience of being responsible for researching, building and launching products, including working with software engineers and principal client company business owners.

Monoke.Studio is a Software development outsource company. Monoke is based in Tbilisi, Georgia. Monoke.studio serves customers from different geographical areas, including Europe, Americas, and Australia. Monoke provides 3rd party outsource contractors to customers when needed. The participant of this research from Monoke.Studio is a software project management expert, with the background of working on both, principal and agent side.

OPPA is a payment service provider based in Tbilisi, Georgia. Main products of OPPA are self-serving payment kiosks for cash payments, electronic wallet mobile & web applications, Saving platform. OPPA serves multiple payment markets including Georgia, Turkey, Azerbaijan. From 2015 to 2021 OPPA tested up to 20 product initiatives and deployed upto 11 of the products for customers. For product development purposes OPPA uses different resources, including internal teams, as well as outsourcing contractors. Research participant from OPPA is responsible for the product development process and has direct day to day communication with the software development outsource agencies.

Space is a digital bank, providing core banking and fit-tech services for the customers. Space helps customers deal with daily financial activities by heavily focusing on technologies and

automating multiple services. Since launch in 2018, Space has delivered upto 15 different products for customers. Main product is the Space mobile app, which fully replaces the standard bank, eliminates the necessity of bank branch visits for customers and communication with clerks of the bank. In the mobile app, users have loan offers, transfers of money, different payments, credit and debit cards and management of other bank cards. Space product development is based on reengineering banking transactions and actions, by constant market analysis. Space invests in researching user experience, and simplifying the processes. Representative of Space is from the software development direction, with more than 10 years of experience in working with outsource companies and delivering different product versions.

Crystalbet is an online betting and casino company. Crystalbet operates in Georgia. Main products of the company include betting for sports, poker, slot and casino style games. Crystalbet was launched in 2011, Since 2011 Crystalbet launched up to 40 different products and became second biggest on the market. Crystal is represented by one of the product development managers, which is directly responsible for product results. Responsibilities include building, launching and nurturing the product.

## 4.4. Depth Interview Description and Reasons of Use

### 4.4.1. Definition and Types of Interview

Interview is a type of qualitative research. Main three sources for qualitative findings are in depth interviews which have non closed ends, observations of researchers, and documents, that includes studying existing documents. (Patton, 2002)

Using the interview, the interviewer interacts with the interviewee, gathering information for further analysis. Conducting an interview gives the interviewer the possibility to uncover the insights that would not be revealed by the survey. Interviews are designed for face to face communication, which can be replaced by conducting over phone or online meeting tools without physically being at the same location.

Objectives, goals and specific requirements define the structure and sequence of the interview. Different interview types that are commonly acknowledged are:

- Structured interview - An interview type, when the questions and the sequence are fixed for each participant, and no change is made during the interview process
- Semi structured - An interview type, when the interviewer has pre determined the topics and specific scope of the interview, but does not follow a fixed sequence of questions
- Unstructured - An interview type, when the interviewer does not follow any pre written set of questions

In depth interview is a type of interview, when the interview process lasts for a longer duration, it is focused on gaining more detailed insights and getting info regarding objectives. During in depth interview, interviewer gives the interviewee the possibility to discuss the topic in question in depth.

As Patton defines in a research “How to use qualitative methods in evaluation” In depth interviews can be conducted in three different ways. First is informal conversation, second is general interview approach and third is standard interview with open ended questions. In any of the formats of the interview mentioned above, the interviewee answers questions which are recorded by the authors of the interview. (Patton, 2002)

In depth interviews provide specific benefits to the researcher:

- Large amount of details and depth of information, that could not be retrieved from a survey
- Possibility for the research conductor to analyze and evaluate the behavior of the interviewee
- Being one on one gives possibility to conduct more open interview, as the interviewee might open more towards the questions and not feel peer pressure (Showkat, 2017)

Although In depth interview comes with specific limitations, including:

- Limitation in terms of size of sample
- Selection process non randomness
- Amount of time necessary to conduct, analyze and evaluate results for the interviewer



#### 4.4.2. Reasons for Choosing Depth, Semi-Structured Interview

In depth semi structured interview was chosen as the primary research methodology by the researcher for this paperwork. While making a decision, different methodologies and tools were assessed in terms of time needed to perform research and analyze results, as well as the depth of the details needed from the participants. The literature review part suggested that problems and issues are lean organisation and agency relationships evolve due to the decisions made by the participants in order to handle specific issues and reach their goals. The analysis also revealed that participants of cooperation might or might not be aware of the threats and pitfalls of using the specific methodologies and frameworks.

This analysis led the researcher to conclude that the research participant might not be aware of all the factors affecting the escalation or deescalation of the processes. Also as the problem is complex and the decisions and actions are based on analysis of multiple and sometimes changing variables, Surveys might not have managed to reveal the connection of cause and result. Also the possibility of revealing new deep insights or a new variable for the scope was considered while choosing the methodology. Therefore it was decided to use a semi-structured deep interview.

#### 4.4.3. Description of The Questions Asked

The participants of the research were asked to reply to five predefined questions. Two sets of questions were used in research, one set of five questions were designed for agency representatives, another set of five questions were designed for the lean organisation representatives. Both sets of questions were designed to describe the process of cooperation of the lean organisation and development agency. Different wordings were used in the two different sets to fit the position of principal or agent. Online meeting platforms were used to conduct interviews. Individual names or any specific data, that makes identification possible is not included in the research, due to request of participants. Other interviewee backgrounds and company information have not been disclosed to participants. The questions and answers below represent the actual wording of the interview.

Questions asked to the representative of the development agency are the following with the exact sequence:

1. When working with the client, what are the common scopes and goals of cooperation?
2. Tell me about the process of the cooperation. How does it get organized from the beginning to the end?
3. Tell me about the product and software development methodologies and frameworks you use when working with your clients and why?
4. Describe your biggest challenges of working with clients, with the reasons causing the challenge.
5. How do you deal with the above mentioned challenges?

Questions asked to the representative of the lean organisation are the following with the exact sequence:

1. When working with the software development outsource agency, what are the common scopes and goals of cooperation?
2. Tell me about the process of the cooperation. How does it get organized from the beginning to the end?
3. Tell me about the product and software development methodologies and frameworks you use when working with outsource and why?
4. Describe your biggest challenges of working with development agencies, with the reasons causing the challenge.
5. How do you deal with the above mentioned challenges?

#### 4.5. Interview Analysis

Conducted interviews revealed problems of cooperation of lean organisation and agency. The respondents who were questioned, represented the same processes from their point of view. Interviews revealed what steps they take to increase the chance of success, how they learn to cooperate and how they approach the problems to solve. The interview also gave the researcher the view of how they feel about the topics mentioned above. The researcher analyzed how the interviewees reacted to specific questions, how hard or easy the specific topic seemed for the interviewee to talk about.

This chapter is focused on analysing individual interviews and assessing the answers of individual participants to understand the motives and reasons of specific information provided by the interviewee.

#### 4.5.1. Analysis of Interview 1

The respondent was representative of the software development agency, with the hands on experience of running software development teams and managing communication with the client. The respondent also has a solid background of product development and management methodologies and frameworks, as well as experience of working as a software engineer.

From the beginning of the interview, the respondent exhibited interest in the topic that was going to be discussed. Interviewee mentioned that he and his team have been discussing these issues frequently. It could be seen that this was not a one time problem that was once set solved and forgotten. He also mentioned that he had been reaching out to different people from various companies who have the same work direction to discuss, so they could share information. This also gave the researcher a hint that this topic might be a pain point for the agency, without current best practice solutions.

On the first question asked, regarding the scopes and the goals of the cooperation, the interviewee mentioned he would start from the easy part which was the scope. It is visible that for him the scope was easier to understand. As the interviewee defined the scope, it is the actual assignment, the end output that they have to build. For him the output was easy to talk about and discuss.

The interview mentioned several scopes. First of all he gave the example of a functional outsource, for example outsourcing a front end development, or back-end development. It needs to be mentioned that after defining the scope at the result that needs to be delivered, or the assignment that needs to be fulfilled by the agency, the respondent gave the example of functional service. It was obvious that talking about the functional assignment and managing functional resources was a very comfortable topic to discuss. As a second example of frequently agreed scope, the responder mentioned the spiral scopes, which as we defined was *“the client wants to hire the team without the specific fixed scope. The initial scope might*

*be identified, but it gets changed and updated during the process”* (Question 1) The participant showed mixed feelings while talking about the non-fixed, changing scope. The goals were the hardest to discuss as he mentioned during the conversation. He mentioned that the goals are never easy to understand. And also gave two reasons that he thought were leading to confusion: The natural habit of the client to not share all things into details, and the speed of change of the product and sprint goals. Without having a question asked about the problems and reasons, responder mentioned that the agency is working on details with heads down to work, and it is hard to follow the client's goals. He highlighted the importance of customers being open to the agency. Overall, as he mentioned, the goals of customers can be divided into two main directions. First is building and launching a fully functioning product, and second is finding what to build and launch.

On question two, regarding the organization of the process, The responder defined that there is no predefined set. As we can assume the reason is still the differences in situations and the requirements of the specific situation of the customer. Although the responder mentioned they always try to put the processes in some kind of defined flow. The responder showed the threat of the uncertainty and how it might affect the processes. Here once again, he started by discussing the fixed scope with set requirements provided by the clients. It is understood that the first step the agency takes is to understand the requirement and assess it in terms of the functional teams (front, back and etc.) The measure of man/days used by the agency also reveals that the main arithmetics is done on the output and then the input is assessed. Interviewee mentioned that they try to work with the customer from the beginning to set some requirement borders, for example the technologies used, development languages and frameworks used. This step also helps the agency assess the amount of resources in terms of functional teams. When the client does not have a perception of where the product can evolve, the agency, as the responder mentioned, prefers to sign a contract tied to a period of time for a specific set of resources.

When talking regarding the methodologies, responder mentioned one more time, that choosing the methodology depends on the specific requirements. As it was shown in the answer, the agency represented in the interview had to introduce different methodologies so they would be able to serve specific requirements. This once again underlines the importance

of being flexible to changing requirements. In this case if your whole team is experienced in each methodology and framework, you won't have a problem keeping the process on rails. In difference, when the team has only one member who has experience in a specific topic, the risk of failure might increase if the experienced member is removed from the team. Here while talking about the methodologies and frameworks the interviewee mentioned two different types of approach, agile and waterfall. These are the two directions, first designed to operate in an environment of many unknowns, and the second is the one suitable for the situation where every variable is known.

As the interviewee gave the definitions and described the situations they used these methodologies, it was obvious he had a scientific understanding of these methodologies. It was also mentioned that in some cases, the cooperation starts with one approach and continues with another, This fact also supports the assessment that the requirements, even ones which are fixed, might change and become undefined along the way. It is also important to mention that while answering the question the interviewee mentioned the general structure of the agency. As described the teams are still divided in functional directions, functional silos, which gives the agency the benefit of having the people and knowledge organized. Although when the client comes with a scope based on iterations, the agency has to assemble a cross functional team from different silos, thus losing the benefit of silo.

As an answer to the fourth question regarding the problems, the responder listed two main problems, mentioning that these problems are on the surface, and it takes experience to actually understand the pattern of problems. It is interesting that here he once again used a word "project" when talking about the client product iterations. As the first problem the changing requirements were mentioned. It was obvious that the participant understood that the customer had to change requirements and this did not come from the inexperience of the client, but from the nature of the business. Although, regardless of the reason for the requirements changes, the problem is still marked as number one. The second problem was regarding the actual development methodologies, technologies and tech frameworks used by the client. As explained during the interview the client is more focused on the client satisfaction side and only makes the changes when they are due. On the other hand, as the responder said, their agency works hard to keep the softwares neat without bugs resulting

from merging of different software modules. This can be explained by the reputational issues. When agencies work on a product that has partially been developed previously it brings some risks. After the different parts are merged, the old part might have less speed, causing errors and program fails. For the client these problems might be associated with the low quality of product delivered by the agency. Therefore in order to keep the reputation high, the agency works to deliver a bug free product, thus splitting the focus from the client and focusing on the output.

As for the solutions, the responder mentioned working with the client to forecast upcoming threats or opportunities. Regarding the possible threats from the outdated software and management methodologies of the clients, the responder answered that their primary goal is to explain the benefits to the client, and if the client decides or has to decide to keep the current solutions, the agency has to define the scopes of responsibility for further cases.

#### 4.5.2. Analysis of Interview 2

The interviewee represented a software development agency. He had a background of product management, and at the time of the interview was directly responsible for managing several ongoing contracts.

When asked the question about the goals and scopes, the responder started by talking about the scopes. As he mentioned, most of the times the specifications and requirements set by the customers, require a cross functional team. As it was mentioned during the answer, the agency has to keep developers from various disciplines and knowledge of various Coding languages and frameworks. The same answer included the explanation that, in some cases the scope is tied to the requirements and therefore are defined along the way. Therefore the agency has to run a team of various experiences to have the customer requirements and queries covered.

When talking about the goals, the responder took some time to think, in difference, when asked about scopes, the response was imminent. The scope was a comfortable topic to discuss, while the goals were something that required extra thinking and reflection. Before giving any examples or types, the responder defined that it was hard for him to answer the question. He concluded that they were more focused on the day to day requirements and

assignments because the contract was focused on the actual output. On the other hand, also mentioned that setting and following the goals and vision was the responsibility of the client, and the representative from the client was participating in the development for the very reason. Participants mentioned that the most common goal of clients while cooperating was to build and test a new product from zero. It needs to be mentioned that the answerer mentioned “I may suggest” when talking about the goals of the client. This indicates that the scope was easier to interpret and focus on, than the goal, which according to the responder often changes. The answer also mentioned that in most cases clients come with just a mere idea or basic concepts. This also indicates the expectation of the client to create the product from zero.

Second question regarding the process management was answered by the respondent quickly. He counted the steps on hand, giving the impression that these steps were a common practice, often used by him. The first step mentioned was assessment of the situation and requirements of the client. On this step the assessment is not done only by the tech team of the agency, but a combination of product managers and engineers. Responder showed that this was the foundation of the cooperation, therefore he did his best to assess the stability of the resource requirement or the possible deviations. As he mentioned, it would be uncomfortable to have an unexpected need of the resource that is not planned to be included in the team. This shows that the responder preferred to have the usage of their human resource well planned. Furthermore, he mentioned that everybody has schedules because the hired resources are paid on monthly bases and they can't keep developers just in case. This shows that the agency is focused on keeping a high level of utilisation of resources, which might not be always aligned with some of the agile framework principles like Kanban, Kanban says that the process might have either idles of people, or idles of work. Always being focused to keep the resource used all the time, might increase clutter and bottleneck. While answering the questions the interviewee mentioned “as I've learned” with the ironic facial expression, giving the researcher feeling that the changing requirements and the unexpected need of specific resources had caused problems in the past.

After discussing the possible requirements and expectations, the answerer mentioned the step of setting up the team. The team was defined as cross functional, while the first answer showed that by default for the goal of human management the human resource is divided into functional silos. When discussing the requirements word “project” was used by the

interviewee. It needs to be mentioned that the researcher did not use the words products or projects not to lead the responder and to keep possibility to observe the vocabulary of the responder. Another word that caught the ear of the researcher due to the emphasis set on, was the word “sophisticated” when talking about the building software. Using “sophisticated” showed his focus of the interviewee was on the quality of the product. The responder mentioned the next phases of the process, covering agreement on technologies and approaches and frameworks. He also mentioned the approach of sprints for product delivery. He put emphasis on having a well organized feedback loop with the customer to find the deviations and correct. Responder mentioned that customers often build perfect products in mind and need to be attached to ground by frequent delivery of reality. The final phase as discussed was the quality assurance done by the agency even after the delivery of the product.

As for the methodologies and frameworks, agile based scrum framework was mentioned as the most common way of operating. When answering, the interviewee added that this was especially due to the fact that the customers did not know the requirements beforehand themselves. It seemed according to the facial expression and comment emphasis, that the responder counted it as a weakness or ironic that even the party who is supposed to explain requirements does not have a clear view of requirements.

When asked about the problems, answers came without hesitation. Interviewee mentioned that although he likes to use scrum, the changing requirements are a threat, as the company earns money by selling the resource, and even if they can;t serve customers,or they do not sell specific resources to customers, they still have to pay the developers for full time. Hiring short term contractors was named as one of the options when the company has shortage of resources, but this option did not spark joy in the interviewee. As mentioned by himself, due to the quality of work. Without asking for the specific solutions for the problem, responder mentioned that the only thing he can do to avoid or at least minimize problems, was to work harder on the initial assessments of the scope.

As a response to the question about the solutions to the challenges mentioned in the previous question, responder listed a couple of ways:

- Giving the customer the prior warning about the possible complications in case of changing the requirements



- Offering the option to hire a team from an agency without ties to a product description, but ties to the period of time. Agency can guarantee the resource quality, and the client can manage the team as a whole
- Third, ensuring that the tech team is involved in the early stages, even research and design.

The responder was enthusiastic participating in the research and further suggested his own ideas how the situation and the services provided by the agencies can develop. As he mentioned the agencies might have to change into a different product provider, either focus on specific SaaS profile, or develop themselves as a product development outsource, not software development outsource, thus focusing on the end user benefits. This comment underlines that the changing requirements in the principal business industries also affect the developer agency business model. If the client needs the service focused on outcome not output, the agency might have to update. The interviewee also asked if it was possible to see the results of this research, which also support the idea that the questions asked in the interview are current concerns of the agencies.

#### 4.5.3. Analysis of Interview 3

The third participant of this research was a software project management expert, with the background of working on both, principal and agent side. The interviewee has experience working on the product on the principal side, while cooperating with the agency. Later she joined the agency and gained experience of managing the resources from the agency side. Before the interview started the interviewee showed big interest in the research topic and suggested participation as this was the topic already concerning her.

When Discussing the first topic, the scopes and the goals, the responder started with smiling and mentioning that it is interesting as she sees this topic from different sides. She mentioned that lean clients from her experience never come with fixed scope, it is mainly a flexible scope or general idea about the final scope. It is interesting to mention that this respondent was the only respondent to speak about the client goals with ease. She mentioned that the client goal most of the time is to research and find the solution that is loved by the customer. Here the responder emphasized that the solution to the problem is important, not the product or the level of sophistication of the product. She underlined the importance of having the representative of the client to control the focus on the mission and vision, as the agency can't

take that as their responsibility due to being expert in the technical side of building only. The interviewee finished the answer by mentioning that *“the best customer for the agency in terms of complexity in handling is the one with predefined product, although on the other hand the best customer in terms of market view understands they can't have a super clear view of the market and they approach step by step. Meaning they have to iterate and can't have a predefined scope for the agency, which makes them a tough client for the agency in terms of resource handling.”* These sentences show that the responder believes the successful business models of the parties are different, one focused on exploring unknowns step by step, while another being oriented in direct input to output conversion.

When asked regarding the process organisation, the answerer replied with the sequence of actions. She also mentioned that the core of a successful contract is dealing with the operational management of the team. As a first action, she set receiving the requirements from the client. This is the same as in the previous interviews, only with the difference that this interviewee gave a specific time period as a mandatory period of pipeline, which is 3 months. It was suggested that this amount seems logical from the corporate side, as this was counted as a logical period for the average product manager by the interviewee to know the product planned to launch. Respondent commented about using the flexible scope during the 3 month development period - the “T-shirt” sizing methodology, meaning each task is assessed in sizes like S, M, L, XL and the client can update the scope but stay inside the scope sizing. Interviewee mentioned using retrospectives after each month to make sure they are aligned with customers by discussing what went wrong and what went correct. She also mentioned that they encourage the development teams, that includes developers, product managers to self organize, providing a benefit of shared responsibility.

The interviewee shared information that their agency uses matrix groups for projects, although they are generally organized in functional silos. This follows the trend seen in the previous interviews. The teams are organized in cross functional teams in order to have the power to cover client demands, although the agency has department styled functional structure. The respondent saw this as an opportunity not a threat, further elaborating on the topic, mentioning that this kind of system provided flexibility to learn from each other in the same functional direction, and also they get used to working in teams. She did not mention any specific frameworks, but mentioned being flexible to fit and learn new ones.

When asked about the common problems, Interviewee focused on transparency and openness. She gave examples from her experience and supported the idea of including the agency team in all phases, including research and design. She also concluded that this is the problem all corporate clients have.

As part of the solution, the responder suggested openness as key. She further continued that giving the team freedom of action, can lead to better results, as only they are experts of the specific situation.

#### 4.5.4. Analysis of Interview 4

The fourth participant of this research was from the product management direction, with a track record of upto 15 different developed products, with hands-on experience of leading startups with lean and agile principles. The respondent also has a background of software engineering and doing quality assurance.

In the first question respondent addressed the goals and scopes of cooperating with the development agency. Responder started the answer by defining the goal of the development. He explained that the goal of the development was to find the solution that would serve the customer and solve their problems. Respondent highlighted that the emphasis during the process was on helping customers solve the problem, and they believe the product is just a tool for making customers happy. Interviewee also jokingly mentioned that they could deliver a piece of wood if it helped the customer. He also mentioned the output as a secondary thing to worry about. As for the scope the respondent answered that the scope is changing. As understood the responder prefers to hire an outsource development team tied to a period of time, not to the specific requirements, The reason behind that, as defined in the interview is that the product requirements are going to change very often, so it does not make much sense to tie a contract to changing part. Respondent shared a story of the time when he used a fixed budget and fixed scope agreement. The respondent mentioned that the fixed priced contract was the one and only case for him. He showed disappointment with the experience.

When asked about the process organization, the responder again started with mentioning the focus on the customer. He mentioned that the initial phase is always a research, which might

or might not be done with the engineering team. Outsource team is only introduced to the product development when the minimum requirements are set. Participant also talked about the reason for not including the outsource engineering team to the initial phases. The reason as defined by the participant is that the early phase is about researching the needs of the customer, and there is nothing to develop, therefore hiring an agency would be a cost without benefit. As interviewee defined, during the development process they use the outsource resource to develop the MVP and test the product. Once the product is proven working and selling, they transfer it to the internal team. This description shows that the respondents approach to outsource is like a temporary resource that can be used to test hypotheses, without long term strings attached.

The interviewee named agile as preferred methodology. When talking about the actual methodologies used, he once again showed the importance to deliver a value by iteration. He mentioned that the client requirements were changing, therefore he also had to. He stated that he could only rely on partners who understand the value of flexibility. Respondent named scrum as the preferred framework and defined how important it is to iterate and share knowledge.

The participant listed several problems faced when working with agencies. Keeping the agency aligned to vision ranked as the first problem by priority from the list. As the participant mentioned it was hard for him to keep the team on vision. Second problem mentioned was the tendency of the agency to create sophisticated products, which might lead to losing focus on customer needs. These two problems were easily named by the participant. Thinking about other issues took more time. Which also supports the ranking suggested by the interviewee. Two other problems named after thinking were information sharing about day to day work of the team and consistency in terms of human resources. As respondent mentioned these topics are hidden but often create threats, which are discovered late, and can already have caused a serious problem.

When asked about the solutions used against the listed challenges, Interviewee took a minute to think. After thinking respondent suggested 2 main ways to manage challenges:

- First, screening the partner with the criteria of previous products released using agile practices

- Second, depending on the product manager to keep the team on vision.

As participants mentioned, screening and choosing the correct partner is the key. Once the decision is made and the process has problems due to inexperience of the partner, it takes much effort to keep the team organized.

After a small gap, participants also mentioned the standard retrospectives. As it seemed, the participant already counted the standard agile practices as mandatory and did not mention them in the first case due to that.

#### 4.5.5. Analysis of Interview 5

The representative of the organization was Chief product manager with years of experience in the industry, working on product development from idea to launching. Respondent had experience of working with in house development projects as well as with software agencies.

On the first question, opening the interview, about the scopes and goals of cooperation with the software development agencies, respondent claimed that mainly outsourcing in their case is used during marketing campaigns, when they want to develop landing pages or develop some specific tool used in campaigns. Company operates on a highly competitive market and as interviewee mentioned digital product development is regularly done inhouse, the company has a big development team. While answering on question interviewee seemed to be tensed and tried to justify why they prefer inhouse development over outsourcing. Named one of the reasons for that, firstly mentioned changeable scope of their products, outlined that due to their business, market demands are changing and sometimes the initial product is not similar to delivered one. But it was mentioned that small project development is usually done in cooperation with outsourcing agencies on regular bases, company, as an exception, sometimes work with outsourcing agency on big projects too. As for scope, they usually have a clear backlog, defined product requirements and fixed budget to work with. Scope is changeable but while working with a third party, the company tries to remain the initial agreement and not to make big changes. Agencies are required to deliver products in a timely manner with zero bugs. So when a company addresses the agency they already know what they want to develop and uses agency as a tool to accomplish their goal.

On the second question about how cooperation is organized, respondent says that trust toward agency is a main driver that gives them push to start cooperating, they choose the agency very carefully. During stating this, interviewee seemed clear and confident. They do not tend to search for a new third party each time, but cooperate repetitively with same partners. Cooperation goes in the following way:

- Organization defines project requirements
- Meets agency and discusses the product concept and deliverables that they expect, the project requirements are broken down in backlog
- Agency takes time to evaluate the product development, provides cost, timeline and technical resources that will be needed to meet the project goals. If the organization finds the conditions acceptable for them, the next meeting is scheduled with the whole team, attended by everyone who will be involved in the development process, both from agency side and from organization side, usually the organization involves the product owner to be part of the product team. On the meeting is discussed the product, development methodologies and definition of done.
- Team works with sprints, one or two weeks of intensive work on some part of the development, after finishing the sprint, team meets to assess the results, problems and deliver the part of the product. On the same meeting or on another following meeting, a new sprint and its content is discussed.
- As a respondent says, an organization wants to deliver a product in small parts, test the product on the market, get feedback and continue development accordingly.

On the third question about used methodologies during the development process, interviewee highlighted that the company tries to be agile, but does not follow any specific framework fully. Although mostly used methodology is Kanban. The reasons for that is simplicity and that this methodology does not require initial digitalization of whole product requirements. Gives them flexibility to manipulate, change, replace scope. Respondent highlighted the agency's willingness to see further in development and find out future requirements, which respondent thinks is impossible.

The Fourth question asked to the interviewee was about the biggest challenges that they face while cooperating with software development agencies. Respondent took a time to think and answered carefully the question, it seemed that problems are many and she was trying to name the most important one. Respondent named the concentration of the agency on outputs

and lack of involvement in product value. Agency is interested in delivering high quality technical solution, not the product itself and the value that it needs to create. For this reason changes in product are hardly understandable for them, they lack the vision of the market and are not interested in customer reaction to delivered product. Respondent named this as a “lack of being lean and agile”.

Last question was about solutions, how organizations address named problems. Respondent on this question, provided an example of a project, when requirements were not fully clear and they involved agency to define the technical requirements of the product. Contract regulated just what they need to deliver in the end as a product, not a fixed timeline or resources. Interviewee says this way is very agile, agency knows that changes are expected and they are more concentrated on what they actually deliver as a product. This scope of cooperation is more expensive but as respondent says, totally worthy.

#### 4.5.6. Analysis of Interview 6

The final participant of the research, representative of another lean organisation, was from the software development direction, with experience of more than 10 years, working with outsource companies and delivering multiple products.

From the beginning of the interview, the interviewee mentioned the interest of their company in cooperating with the outsource agency. Interviewee mentioned outsource has been the key resource when developing new products. He made several important notes:

- Outsource is used in environments with many unknowns, when multiple directions can be shaped. The reason as defined by the interviewee is that it is impossible to know the resources needed beforehand, and it might become hard to find a specific resource in house when you already need it.
- They use outsource only in combination with inhouse teams. The reason as defined is to tackle the long work with outsource resources and also keep the knowledge of the product tech side in the inhouse team
- They tie the contract to time period not scope

After giving the details, the interviewee summed up that the goal of the outsource is to find a product market fit, and the scope is managed by the product manager to maximize the value during the contract period.

When asked about the process organization, the Interviewee gave several insights:

- The outsource team is hired after the product manager has a customer pain point found
- They do not have strict guidelines about when to include the agency, but react according to specific situation requirements
- Participant believes that introducing a tech team from the early stage benefits the team coherence and the process
- Product manager represents the goals and vision of the lean organization in the development team. Developers have to follow the vision and develop working software
- The organization is upon the team that composes of outsource and lean organisation representatives

When being asked about the methodologies preferred to use with agency and the reasons behind it, the interviewee definitely responded with agile and scrum. The participant further elaborated that they had cases when the agency worked for some time without proper check ups and the progress had problems. Participant mentioned that the main concern is to deliver a product that works for customers, therefore scrum/agile work best for the reasons as defined by the participant.

Multiple challenges connected to working with the agency, were mentioned by the interviewee when asked.

The challenges included:

- The tendency of the developers to focus on technical side of the product, rather than keeping the end user in mind
- Excess focus from the agency side on the sophistication of the software, leading to wasting time on creating extra functionalities and quality not needed by the end user
- Periodical lack of resources from the agency

Participant defined that the above mentioned problems are also the ones they detected on the



most recent retrospective with the team and as defined by the participant: “pretty much defines the general situation”

As for the solutions for the above mentioned challenges, The participant gave the following suggestions from personal experience:

- Keeping the Product Development Agreements with the agency. These agreements define the general rules of organization, process and problem solving
- Including a multi-functional team in the early phases of product research in order to increase team IQ and perspective on early stages
- Organizing development meetings, when the team meets the actual end users, interact with them and get feedback directly from them.
- Including the development team in planning and assessing further development option
- Strengthening the product manager role and keeping the team dynamics healthy

## 5. Results and Discussion

The aim of this research was to study and define models for cooperation of lean organizations and third party software agencies. On the one hand, lean organization, which is trying to be very agile, provide quick answers to the market change and adapt the digital product to what the customer wants. (Ries, 2011) On the other hand, a third party technical agency, which is getting the task from the client, evaluating scope of the project, timeline, required resources and only after clarifying details gets involved in the development process.

The main goal of this thesis was set to analyze the roots of these problems and suggest effective solutions for problem solving.

The objective was to investigate and provide a model which will help both parties work together more effectively, avoiding existing problems.

The following questions were designed to be able to achieve the objectives of the thesis:

1. What are the main differences between operations management of lean organization and third party tech agencies?

The purpose of this question was to reveal why lean organizations and third party agencies differ from each other in terms of process flow and values and provide a clearer picture to make problem identification easier.

2. What are the problems that lean organizations and third party tech agencies face while working together?

The purpose of this question was to formulate and describe the problems after identifying them

3. What are the most effective ways of these parties working together?

The question was designed to help deliver the main objective of the thesis, make suggestions of how lean organizations and third party tech agencies can work together more effectively.

In this chapter, the results of literature review and interview analysis will be used to discuss the research questions

### 5.1. Question 1: What are the main differences between operations management of lean organization and third party tech agencies?

Analysing the literature review and the interviews conducted, it can be concluded that Lean Organisations are customer - led, meaning they assemble their resources and organize their operations structure according to the need of their customer. On the other hand software development agencies are output focused, who are organized in functional silos, and create project groups when necessary.

Eric Ries suggests that lean product development should be based on an iterative approach based on build-measure-learn loop.(Ries, 2011) The iterative approach gives possibility to build minimum variable products, which give the organisation the possibility to test the hypothesis for maximising value(Ries 2011), adapt and pivot if needed. What is common for all the frameworks following Lean/Agile is to refuse the “big bang” delivery of a product at the end of development, and instead deliver multiple small increments. Iterative delivery helps the team evaluate the assumptions faster, gather the feedback, correct mistakes and deliver the updated product quicker (Highsmith, 2009). The respondents of the in depth interviews, representing the principal, lean organisation party, mentioned in their answers that often the reason for outsource was to support the research of the new product or feature initiative with the necessary resources, especially when operating in an environment with many unknowns. The answers show that the principal organisations are focused on defining and meeting the end user necessities, assuming that these necessities may change over time. Respondents revealed the expectation for the team to be ready to reorganize in terms of resources and competences to provide value to the end user.

On the other hand, the software development agency provides a service based on human resources and operates on a project base. They provide functional support like front-end development, back-end development, QA and others. Project mindset means operating with project based cycles, where each component is predefined, with its own delivery date, deadline and only after the mentioned characteristics are defined, the team can start work. The process is oriented on reaching a specific goal, which in most cases is a specific feature or product, which therefore defines the metrics for operation assessment. project is a specified scope of the product features to deliver. As soon as the project feature is delivered,

the project is deemed finished and the team moves to another scope, another project. Although there are many metrics for project success, they fall under checking whether the project was done according to predefined characteristics of time and resources. These metrics measure the output, the direct result of the development process, without measuring the further processes on market that the product has to go through in order to specify the end user. (Perri 2018) As Seiden suggests, the core problem for a large number of agencies is that their business model is in conflict with the lean principles. Most of the agencies follow the traditional operating model, meaning they earn revenue by delivering the output, which might be software ,source codes, design or wording materials, presentations or etc. These materials are the direct outputs of the agency work, in other words only a product.

This creates several differences in process management comparing to the lean principal organisation:

- Software agency provides labour intensive service, while the principal delivers physical software/hardware to end users
- Software agency keeps the human resources organized in fixed functional silos and assigns them to specific projects, while the lean principal organization runs product teams, composition of which is dependent on the product requirements
- Lean organisations follow the product mindset, meaning they are oriented on continuously delivering value to the end users, while agencies follow the project mindset, meaning each project has to be successfully delivered and closed

## 5.2. Question 2: What are the problems that lean organizations and third party tech agencies face while working together?

The problems that were revealed from the literature review as well as the interview analysis were the following:

- The lean organisation being focused on the outcome of using the developed product, while the agency being focused on the output of the development
- Not having an effective information sharing system between the development process stakeholders, as well as performers
- Challenges caused by changing scopes

The first issue is different focusses. It is a common practise to acknowledge software development projects as successful when the projects are delivered in predetermined budget, within time, with all the functional details agreed to include and with agreed standard of quality. (DeLone and McLean, 1992). Projects not meeting some of the above mentioned criteria could be counted as less successful, while the projects failing majority of the the criteria being considered as failed (Pinto and Mantel, 1990) The problem here is that the end user, who wants to receive the value from the principal lean organisation, does not assess the product according to how much time it took to develop or how effective the production process was. The end user has specific needs that need to be specified. Therefore the lean principle has to come up with the key performance indicators (KPIs) which measure the satisfaction of the end user, which might not be the same as comparing the actual speed or budget of development to the planned.(Gustaffson, 2011)

As the literature review suggested there might be multiple factors, why the agency can be oriented on the output:

- Team members from the agency might be more oriented to increase their market value, therefore might focus on increasing their technical knowledge and use the development tools, frameworks or decisions that might not be necessary for fulfilling the development task, but be beneficial for increasing their expertise in the field (Mahaney, 2002)
- The Agency might be willing to deliver a sophisticated software, to avoid connection of their brand with the low quality product and avoid reputational risks, as found in the interview process
- The agency might not have anything to check the team effectiveness against, for example product vision, or end user necessities, except the pre agreed deliverables per contract

The second problem was connected with the system of information sharing. As the literature review suggested, keeping specific important information unshared with the principal gives the principal more incentives to tie the relationships with the actual outcomes of cooperation. Therefore “goal conflict, shirking, privately held information, and task programmability all affect project success” (Mahaney, 2002) Due to the unshared perspectives and rapidly changing information, the agent might receive freedom of action. This freedom might lead the principal to greater lack of information and uncertainty, that will result in disadvantages

in terms of agility of process management, thus endangering the principal interests. (Keil 2005). Analysing the literature and the interviews, it can be assumed that the inconvenient information sharing system strays the agency away from the vision and end user necessity changes, making the knowledge transfer, the process of sharing knowledge from a team member to another team member harder (Sarker and Sarker, 2004). This can lead to increasing the feedback loop for the principal and making the development process less agile.

Third problem found during the research was the aftermath of changing the scope frequently. As the Goodfirms' research suggested, 53,8% of agencies find it hard to adapt with changing requirements of the client (Goodfirms 2019). One of the interviewees stated that often the clients change the scope might lead to changes in the process. Sometimes changing the scope leads to changing the composition of the team, Which creates even bigger problems for the agency in terms of resource management. As one of the agency representatives mentioned, this situation might push the agency to hire an independent contractor, which is not the best solution due to possible performance quality issues.

### 5.3. Question 3. What are the most effective ways of these parties working together?

Analysing the in depth interviews and the literature reviews, the following suggestions have been drawn:

- Hiring for the goals, not for scope
- Increasing transparency between all stakeholders
- Empowering the product development team to exercise lean approaches and drive the decisions

The first suggestion was formulated after the interview and literature analysis. The interviewee 2, the representative of the agency, suggested tying the contracts to periods of time, rather than the tasks. This approach was also deemed interesting by the representatives of the principal lean organisation. As suggested by the literature review it is a common practice for the software agencies that try to focus on the client desired outcomes to leave the fixed scope and fixed budget contracts and switch to a different cooperation model. The participation of agencies in the development might be based on handing the development

resources to the client for a particular time. Another model, which is even more focused on client success is the agreement based on reaching the client goals. This might lead to more opportunity for the agency to exercise the lean principles, and shift the workflow from functional silo approaches to a functional team based approach. This also gives more flexibility to manage the iterative cycle of the product development and management. (Seiden, 2016) multiple researchers suggest introducing the incentive tied contracts, concentrating on the ways that help align principal goals with agent incentives. The ultimate way suggested tying the financial benefits with the performance of the outputs. Agent parties will receive the additional payoff when the performance of the output exceeds the expectations (Keil, 2005, p3). One of the ways to do this in practice could be introducing the outstaffing model when needed. Outstaffing can be defined as including a third party representative as a team member and having them managed by the team, in order to increase team functionality. (Zlatarov, 2017). Komkova Anna, in her work “Outstaffing as a way to optimize labor costs”, provides the benefits of outstaffing approach:

- Tax cost optimisation
- Access to remote human resources
- Production costs flexibility
- Decreased cost of human resource management (komkova, 2018)

Additional way to keep the team focused on the goal is to include the developer or group of developers in the product research from early stages. From the client perspective one of the common methods to have the focus shared and increase the feeling of coherence in the members of the development team, is to include the agency in the early stages of product, including concept creation, design and research. As the lean principle is based on running frequent build-measure-learn cycles, the team members will have the possibility to follow the logical sequence of the changes, which they would miss if the product or project was only introduced to them after the conceptualizing or design phase. Enriching the team with the agency representatives can positively affect the early phase and increase the speed of the early build-measure-learn cycle, as the cross functional team might cover more competencies and suggest more different understandings of ways to reach the desired goals. (Seiden, 2016)

The second suggestion of increasing the transparency is based on the foundation of the agile/lean approach as well as the interview results. As the literature review suggested,

inefficient information sharing might lead to decrease of team efficiency and inefficient decisions (Keil 2005). The agile methodologies underline the importance of transparency, so that the team members have the information shared (Sutherland, 2020). Scrum and Kanban frameworks use the artefact of Scrum / Kanban boards, which provide the information for all interested stakeholders (Pranam, 2018). Another strategy for increasing collaboration and remaining the shared focus, suggested by Gothelf and Seiden is eliminating the boundaries between the client and the agency. Agencies can work on having the client involved in every decision making process, shifting the formal delivery or demo days to more informal milestone set up and check events, as well as organizing the coworking and brainstorming meetings, where the two sides will work for the same goal, increasing the team coherence and the sense of the team (Seiden, 2017). One of the interviewees mentioned running the development meetings where the development team could interact with the actual customers of the product and the team could listen to customer needs and explain the product to them.

The third suggestion is focused in building and empowering the team. As multiple interviewees suggested, finding and integrating the correct team members is very important. Scrum guide defines the team as a self-organized unit, that is responsible for setting and reaching the goals, thus sharing the responsibility. This means that there might not be a smaller unit than the scrum team (Sutherland, 2020). This helps develop the common goals, as well as the shared performance indicators, as the individual team members won't be assessed according to the individual involvement. As the scrum guide states, the development of the working increment is a collaborative effort, where individuals share the responsibilities and operate under their competencies. As seen from the interview results, it is a common practice for the lean organisations to include the product manager to the development team with the responsibility to work with the development team, share the vision and keep the team focused on maximizing the customer value. As we can, the ever changing requirements is a given environment for the agile teams to operate in, Therefore it can be tackled by preparing the team to be agile. This can be done by eliminating the boundaries between the client and the agency (Seiden, 2016) and empowering the proper lean agile frameworks that define the information flow system as well as the decision making approaches.





## 6. Conclusion

The main goal of this thesis was to study and determine how lean organizations and third party development agencies cooperate, what problems do they have and what could be the best solution for the existing problems. Therefore the literature review and in-depth interviews were conducted. The study revealed that main differences between these two parties are following:

- Software agency provides labour intensive service, while the principal delivers physical software/hardware to end users
- Software agency uses functional silos while lean has dedicated product teams
- Lean organizations have product mindset while agencies are concentrated on successful closure of the project

These differences lead to cooperation challenges and sometimes to problems between them. Parties have different focuses, it is clear that lean organization's interest to deliver meaningful products on the market, which will be well accepted by customers, so lean is concentrated on the outcomes of the project. Agency does not have a vision of the project and main interest is to close the project successfully, deliver output. Information is not well shared between them, agency usually gets involved in development without going deep in understanding product goals. Besides the changing scope is not that easy for an agency as it is for a lean organization. The lean fundamentals ask for rapid change possibilities, when the agency feels more comfortable knowing: what they need to deliver, when and what resources will be needed for closing the project. The changes in product scope is not that easy for agencies.

Depending on the in-depth interview results and literature review following suggestions were created for overcoming cooperation challenges: agency can outstaff its employees. This means when an agency gets to know what product lean organization wants to deliver, allocates resources and gives to the organization for a specific time period. As a result a lean organization on the very early stage of the product development cycle gets a dedicated team, which is involved into processes fully. Following gives transparency and the team has a good understanding of reasonings why things are done. Most importantly team is dedicated to project, their interest from delivering project moves to delivering product. Team is

empowered, meaning it is self managed and outcome oriented, the whole team's interest is product to be successful.

Application of following suggestions might help lean organizations and third party software agencies to cooperate more effectively, while answering best interest of both parties.

Limitations of this thesis can be considered the operating markets of the participant companies in this research. Interviewees mainly were concentrated on Georgian market, so generalizing the results of the in-depth interview is harder as it is hard to suggest if the results on all markets are going to be the same. Another limitation is that just six companies participated in the research, larger scale research of this theme might be very interesting for future research.

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## 8. Appendix

### 8.1. Interview 1

- *When working with the client, what are the common scopes and goals of cooperation?*

First of all, before I start answering the questions. I really think that this is a great time to discuss these topics. Here, at our company, we have been working on solving related issues. This is a very interesting topic nowadays, I believe for every agency. I've recently organized meetings for agencies to discuss the methodologies for work.

Well, that is a tough question. Not an easy one. Generally we have clients with multiple goals and scopes.

Let me start with the easy part of the question here. I can say that scopes can vary. And just to be clear, by the scope I mean the assignment that we, as an agency a development team have to do, all the results that are required from us to build. Most of the time only the development team is asked to be included in an already started project. In this case, the scope is one of these or combined:

- front-end,
- back-end, or
- full stack development.

Front-end is most commonly asked nowadays, Requested to be correct. There are many companies who do a business and only need a front-end website. Oftentimes our front-end developers are working with the client to develop what we call landing pages, that are just a front page web pages, most of the time used by our customers to do A/B testing. Or measure the interest of customers without building a full scale web app. It is also important to mention that there is a difference in what the client wants from our front-end developers. Let me give you examples:

- First, let's imagine you are a product manager that works on developing a product. You do not want to spend much resources without initial testing. SO what you do is you call us and ask us to build a simple landing page, no DB, not huge backend. You just want to gather some basic info, maybe track the clients visiting the page, check which part they are using most and so on. In this case your team consists of front end developers, markupers and web designers. So when you say you want to build a



landing page you still have multiple options to compose a team. We can provide all of them, or you can get just front-end and use your own designer resource.

- On the other hand, there might be a different case. Let's say you are going to develop a new feature or product, but your front end developers resource is limited. You might have few, or they might be working on other projects. In that case you reach out to us and explain the necessity. We give you front-end developers and you integrate them into your team. So basically they are part of your team. You manage them

We often have the similar case with the backend developers. We rent them out to the client and the client decides what to do with the resource.

We have cases when the client gives us the full project and leaves us at liberty to analyze the results needed for the development. We have recently seen an increasing demand of what we call spiral scopes. It means that the client wants to hire the team without the specific fixed scope. The initial scope might be identified, but it gets changed and updated during the process. We also have several situations when customers want us to take care of support of the system.

As for the goals, it never is easy to understand the final goals of a customer. Well of course it is about gaining the market and increasing revenue, but the mindset and the thinking process is really hard to analyze. Especially when considering two facts:

- First, clients have the tendency to accidentally keep the main gist of the product for themselves. And sometimes they can't even understand it
- Second, The goals often change so fast it becomes hard to track them. That is why I have to rely on the client, so they can dictate what to build.

At this point. I'd say the goals could be divided into two:

- Launch a fully functioning product to the market
- Launch multiple versions of the product and adapt to learn from iterations

It might be hard for me to assess more details about their goals I guess. This is something we work a lot here by the way. If we can understand the customer better we can satisfy them better. Nobody wants a product they can't use. On the other hand we have heads down here and work on details, so we need to be in the loop. We need to know what is changing and why.

- *Tell me about the process of the cooperation. How does it get organized from the beginning to the end?*

There is no specific answer. It depends, I'd say. It really depends on the specific situation and the circumstances of the client.

Clients generally have some sort of requirements of service or product. The process depends on the scenario:

- If they have the requirements set for the product, which is fixed and is not going to change, we first of all define all requirements in detail, define the specific requirements in terms of technologies used, deadlines and so on. Then we assess the product scope in different service lines, which are front-end, back-end, design, QA and so on. Mainly we do in man/days. Then we provide all assessments to the client and if agreed we start cooperation. The product is built and tested module by module so the client can check and verify the modules of the product. At the end we deliver the product and do what we call "baby sitting" - a flexible support
  - If the requirements are not fixed and the client wants to build and learn, we work with the client to assess their hypothesis and suggest the best methodologies and team composition for assessment.
  - Then we sign a contract for the resource of the team for a period of time, which could be a six month, or even year and the team is working on behalf of the client. We cooperate with the client representative to plan milestones and releases. The team most frequently operates in cycles.
- *Tell me about the product and software development methodologies and frameworks you use when working with your clients and why?*

The methodologies are pretty much dependent on the situation and requirements of the client. During the last years I think we have tried every methodology existing today. When you have to solve the problem, you need to be able to work with clients. Our teams are organised in functional directions like front, back, design, motion and other services. This is super comfortable for us to manage people and experiences. When a customer needs cooperation including launching multiple iterations of a product we organize in scrum teams. For routine services we use Kanban, where we can work with customers on prioritizing different epics per week. So basically these two fall under agile approaches. We also have projects where we work with standard stage gate styled methodology, which is waterfall to say simply. These are the rare cases when the technology and the task are very well known and simple. We face both of the cases. Often it starts with one and somewhere along the way continues with the another.

- *Describe your biggest challenges of working with clients, with the reasons causing the challenge.*

I can easily list down the problems. These are not on the surface. It takes experience of running multiple projects to see the pattern here.

- The service requirement changes. This is the case when a company reaches out for a specific resource, and somewhere during the development they find out they need to change the resource. They might not need the existing one, or might need more. This is due to the nature of developing businesses. Although it messes up our schedule of resources per projects
- The software frameworks and development languages. I often face the situation when a client wants to develop a new part of software, but the problem is in the old part. It is either too old, or already redesigned many times and has lost its architectural benefits. Sometimes the language or framework are already outdated but it costs too much for the client to change everything. The problem is that we have a dilemma. We have to either create a new part of the software, with the same data structure, same architecture and same language, which of course is not the best option, or we have to teach the tech support of the client how to update their existing software so it will be compatible with the new, modern methodologies. To be sincere, I do not want to deliver a product that will have problems later, even if the problems in the part of the software which was previously delivered by the client. Here is the issue. The client is often represented by the business side, not the tech side. When they have technical issues, they assign the problems to the project of development. They do not have expertise to understand the specific reasons, For them the math is simple, We delivered something that causes them problems and costs, They don't remember that we warned them about the possible problems if not updating their side. This causes reputational risks for us on the market.

- *How do you deal with the above mentioned challenges?*

- Regarding the problem one - changing requirements, we always try to work with the client on assessment so we can make a forecast of possible resources needed along the way.
- As for the outdated coding languages or architecture, we try to help customers understand what is the best choice for them. Our logic is that if the customer is staying in the business, they will require to update the system to modern standards at some

point. Sooner they do better. If that is not an option, we have to specify and document the responsibilities in the contract

## 8.2. Interview 2

➤ *When working with the client, what are the common scopes and goals of cooperation?*

Let me start with the scopes.

- First, Our customers are different in size, industry characteristics.
- Second, products are always different.

Team wise, we often need a set of different developers. Our clients often need full service. Which means covering design, full stack development, markups, motion design, testing. Actually that is why we have to keep expertise high in our team. We keep them in directions and always know what competencies we cover. The frameworks and languages update and increase in numbers, as well as the possibilities to use them, therefore we have to have a team that has a competence in multiple directions. Otherwise we can't cover the requirements of the customers. Sometimes the scopes are really tied to the requirements, and even the requirements are not always clear. Even though the client might have a predefined criteria, let's say preference of the coding language or framework. When we talk about the developer resources, we need to mention that there are many different ways to work with the client. For example, sometimes clients have technical leads who have enough experience, and they just need additional team members who can help with development. Sometimes they hire an outsource with a simple goal to increase knowledge and experience of the team. In this case not all resources are the same. We can give them senior developers and also additional access to our architect / tech leads who possess huge experience these people might not be actually working in the client scrum team, but can be available for retrospectives or sprint plannings, whenever they are deemed necessary by the scrum team. As for the goals, hmm, let me think.. well.. We have cases of many different goals. It is a bit hard to talk cause the contract covers the scope and we do not regulate the cooperation according to the goals. We have the representative of the client who is in charge of the setting and monitoring the goals and visions. Most often we have companies who have money for a new product and want to launch it from zero. Their goal I may suggest is to create a new

product. In most cases they come with an idea and some basic concepts. No design or any specific requirement. That is what I call improvise adapt overcome, hahah (*laughs*)

Do not get me wrong there are agile and lean organizations who still have to develop some specific softwares in waterfall style. It is not like the waterfall is dead, but we mainly use scrum, especially when the product in question is something that has not proven itself.

➤ *Tell me about the process of the cooperation. How does it get organized from the beginning to the end?*

Ok, let me give you a basic structure step by step

- First of all, I need to meet the client with my tech and product team representatives, and make an analysis of what their situation is. And by situation I mean understanding how changing they are. If they are stable in terms of product, I can forecast the resource need, if they are not stable in requirements, I might have to draw some resources at some point for their needs. Which of course is not something I can easily do. Everybody has schedules. We pay them monthly and keep them occupied. Nobody has free developers hah. That part is important, as it defines the expectations later, as I've learned.
- After analysing their environment and mindset, it already depends as I said. Let's say if they are in research and their requirements might change I try to figure out the amplitude of their resource need. For example will they need four different developers from different coding languages or they will only use the same language and only numbers of developers will vary. The main process here is to try and analyze the product requirements or forecast future product requirement types.
- Third step is integrating our cross functional teams, who will be dedicated to the project. Sometimes clients also have a tech team and they want us to work together. As usually at least the product manager is present from the client side. This is very important as we will share the responsibility of building a sophisticated software.
- Then we have to agree on methodology, approach, and discuss the frameworks. Agree on rules.
- After that we deliver product features sprint by sprint. I try to get feedback from client asap, because clients tend to create their products in their mind, and sometimes that product is not even close to what the reality can actually be.
- After delivery, we often have the long qa process, even when the product is live. During this period we work with the client team to give them the knowledge.

- *Tell me about the product and software development methodologies and frameworks you use when working with your clients and why?*

Mostly Agile with Scrum framework. That is because we work mostly with developing products. These kinds of projects are long, requiring a complex mix of resources. Especially considering the fact that often the client does not really have predetermined requirements. And the customer is also already using agile. There is a tendency here. When we started operating and working, the projects were done differently, The clients liked to plan everything ahead and only start developing once every detail was ready. That is what we call a stage gate development, also a waterfall styled approach in the software development industry. But this tendency is long gone. Businesses are developing in terms of their learning culture and they are developing their cultures of product development. This process is becoming smarter and smarter. Also lately we have seen a spark of startups which of course included a lot of people and showed how effective they can be. Nowadays what I see is that even the large corporate clients are following the new agile and lean approaches. No matter how much money you have, you want to use each penny wisely. Therefore the clients we work for, always require bootstrapping. They try to reach maximum efficiency per resource and per dollar. Of course that drive also pushes our industry, I mean software development industry. We also have to change, in order to meet client expectations. All of our developers are used to working in an agile environment, where clients require flexibility.

- *Describe your biggest challenges of working with clients, with the reasons causing the challenge.*

Well, agile is great but it is not always easy for us. For me it is important to pay my developers and staff at the end of month. I have full time contractors who have to be paid no matter what specific resources my clients require. For example I have 15 front-end developers. Sometimes we are not able to use all resources full time, because the projects do not require it in the specific month. But the same project might need 20 developers next month. This is a huge problem for resource management. I often have to hire short term contractors. That is not a great thing for quality. This happens with the developing products and this is the nature of the process. I can do nothing but to try to assess and always have some extra work for my developers not to keep them stopped. This might not help avoid problems all the time, but can help minimize them. It is also hard to find free independent contractors, freelancers who I can trust or have experience of working with. The best way to control resources is to own the resource. But you can't own a developer, promise them a full

time job and then start searching for customers. You might get in trouble due to cash flow. So if I only knew the upcoming project details that would be great of course. But as I mentioned a minute ago, this is not something we can do unfortunately.

➤ *How do you deal with the above mentioned challenge?*

Well, I have to try multiple things:

- I always work with the client at the beginning of the contract and give them heads up about the process. This is not just a service but partnership. Which means this is a cohabitation. We need to help each other, we need to understand each other's weaknesses and strengths. That is why I always meet with the client frequently to be open with them and keep the partnership transparent. Otherwise they will have false expectations
- I advise them to have a short team of my developers and maximize the value by high quality product management. By this I do not mean I do not want to get more money. And by the way the projects do not always pay according to the amount of developers included. But back to the topic, oftentimes the product managers tend to solve the problems by asking for more resources. Not all but it happens. On the one hand it might seem profitable, if they pay more, but I prefer to stay transparent with the client, teach them effectiveness, how to reach efficiency, and also teach my developers to reach efficiency with limited resources. Because there will definitely be a case when I do not have a free developer to add to a team, and I will surely enjoy having agile developers, who know how to work around the lack of specific resources.
- Also I always advise to bring the tech team from the very first steps, including research and design, because the team gets used to each other and they try to solve problems by themselves. Sometimes the clients just come to us with a research done, or with the roadmap more or less shaped. Of course this might be more expensive, but I always suggest they include the developer team in the research process from the initial phase. We had cases when the client would have made a different choice, if we had not given them a dev team right from the beginning. The client might just have a limited tech view, therefore might limit themselves accidentally.

These things do not always work. Probably I've avoided maybe up to 50% of complications, but these things happen. New times, new challenges for agencies. We need to be ready for the changing realities. I've recently started working with my co employees to do

retrospectives in terms of how we manage the client relationships, how we deal with the resource shortage or surplus. I believe we might see the untraditional development of the industry. Some might become SaaS providers, some might develop into a product not software development agencies. The requirements are changing, and our supply has to change as well. I'd be happy to have the findings of this research shared with me by the way.

### 8.3. Interview 3

➤ *When working with the client, what are the common scopes and goals of cooperation?*

I think one of the biggest challenges of the agency is that, hah.. (smiling) that clients are not sure about the scope. And they should not be. I see it from different sides. They want to play with different modules, different offers to find something. For me coming from the corporate client side it is obvious why this happens. When clients come to use they most of the time only have a general idea about the final scope. And that is natural. The corporations always start with the help in research. By the way by scope I mean what makes up the backlog. The list of features or requirements that our team has to develop for the client.

I'd say the common goal is to build a solution that is loved by customers. And here I want to emphasize, a solution is a goal, not a product or even sophisticated working software. Although in this we can only contribute with our technical expertise, and the client needs to direct our power towards the current direction. It often happens that the client builds things from scratch just to find the appropriate product, and during this process we change the scope and sometimes even the service type. I know the cooperation is mainly done to cut costs, but if done incorrectly, the costs actually increase, It takes an organized culture of being open and also being open in terms of scopes, goals, knowns and unknowns with the agency to be successful.

By the way, it is somewhat ironic that the best customer for the agency in terms of complexity in handling is the one with predefined product, although on the other hand the best customer in terms of market view understands they can't have a super clear view of the market and they approach step by step. Meaning they have to iterate and can't have a predefined scope for the agency, which makes them a tough client for the agency in terms of resource handling.



➤ *Tell me about the process of the cooperation. How does it get organized from the beginning to the end?*

That is a great question. This is more like a science for me. A very important part of a contract is actually managing the ongoing operations and learning on the way.

- First of all, I start with requirements from the customer. I ask the client to give me the scope for at least 3 months.
  - Then we analyse and find some holes in it and try to assess the possible requirements that might rise in the future. 3 months is the period which is good enough for me to count the client as reliable partners. Our tech team analyses the scope and we start work. Also from the corporate client perspective, as an average product manager you should always have around 3 months of vision. From my experience 3 month is the period which works for both parties.
  - Then we confirm the scope in terms of t-shirt sizes. This is a method of assessing the work in relative sizes of S, M, L, XL. Our team knows their tech capacity, so in the future if the scope changes, we can tell the customer to change the scope with the same amount. For example if you as a customer cancel L, I have enough space for L, or M and S
  - At the end of each month we organise retrospectives with the clients, we go over every approach details. We retrospect what went wrong, what went well, and we try to plan better
  - Then we plan a new month as a sprint for the next month and I also ask the client to provide enough suggested scope to have a 3 months perspective.
  - When they do not have anything specific, I can suggest that the project is going to finish.
  - During the development, the team self organizes and they hardly ever need our help. We try not to interfere, and by self organizing team I mean each participant of the team, including our developers, client developers, client product manager and anybody included in the team. This way they all share responsibility and it is no longer our or client fault. This is teams fault.
- *Tell me about the product and software development methodologies and frameworks you use when working with your clients and why?*

We use matrix project teams. In our agency we have functional directions of human resources, and we create a matrix team for individual projects. This kind of cross functional

team is the best to deal with the unknown future of the product. On the other hand having people under functional silos, increases the knowledge of the specific direction. Sometimes this is seen as a downside, but I believe this is why the agency is great. On the one hand you increase the expertise, on the other hand you can create the project team. By the way, these people here all have experience of working together, they are all used to working in teams, which means they are flexible in mindset, they are not changed to a stage gate approach. On the other hand they also have the possibility to learn from their seniors in their direction. We do not have a preferred framework, but we are open to learn. There is an increasing culture of agile teams. This is everywhere, the whole world is going crazy about being ready to operate in unknown environments. But the companies do not always understand agility the same way. Let me give you couple of examples:

- First, let me tell you about one of my latest customers. This is an average sized business, doing all things digitally. When they came to me, they had a specific goal in mind, with some scope suggestions. They knew that they were going to build a web application, which would require a number of tech resources. Although they already could forecast that this resource would include front-end, back-end development. But it would not include any Data analysis specialists, or machine learning specialists, because the problem they had to solve did not require high tech solutions. When we started development we had to develop in iterations. We tested some assumptions together. Their product manager was guiding the process. Now this was an agile approach, we learned and adapted according to the end user requirements, therefore the product changed shapes. But the resource and the boundaries of expertise needed did not change, meaning we managed to introduce some boundaries, which of course made it easier to manage the resources needed. We did not have to worry about the possible need of machine learning specialists in this project for example
- The second example is one of our earlier clients. Here the situation was a bit different. The company was operating in the financial technologies industry. When they came to me to discuss the scope and goal, they stated that their customers had a problem that needed to be solved. We set down and discussed the process of research and our involvement in the process. We agreed on a team and started development. Here as well, we worked in iterations like with the previous client. But here is the difference. Several times the client decided to pivot the solution so much, it needed a totally

different team expertise. For example from web based solutions, they went to mobile based solutions. Another time, they suggested including custom face recognition software and optical character recognition software. Now these are a different expertise. Of course the development team can learn it, but when a client needs the product to be done in 2 days, you have to include someone who is well experienced in the topic. So these both cases, going from web to mobile, and introducing new softwares are changing not just scope but also the team composition. We had a hard time doing that for the client. Now it might be seen for the customer as us not being agile, but Personally think these kinds of changes could be planned or avoided.

- *Describe your biggest challenges of working with clients, with the reasons causing the challenge.*

It is a bit hard to understand the goal the client wants to reach. Sometimes they give us the assignment. Although they are not sure about it. Somewhere along the way we have to change things, including team composition. If they let us do the research with them we could diagnose the situation better. From my experience openness and transparency are the keys to successful cooperation. From the product I have delivered on the agency side, those where we managed to share knowledge and information successfully, were finished successfully. Omitting a team member from any part, even let's say omitting a developer from the design or research phase leads to problems. This is a problem all clients have.

- *How do you deal with the above mentioned challenge?*

We ask them to introduce us to the projects as soon as possible and always include us in research. Minimum at least once per month, so we can plan ahead in terms of our resources. In order to develop something successfully you need a team coherence and team understanding of the issue. You don;t design a solution without the product manager or the engineering team. Also I believe, the methodologies and frameworks used today do not reflect the best solutions. I believe that if we give people the opportunity to work together and share their ideas each team will find their way, call it a compromise if you want.

#### 8.4. Interview 4

- *When working with the software development outsource agency, what are the common scopes and goals of cooperation?*

We have a specific approach in cooperation with outsource. We believe in developing the scope step by step. We have our own engineering team, which is working on updating and

supporting our current live products. We use outsource when we have a new product initiative and it is unknown if this product will lead to a feasible service. Therefore we test with different approaches, different product offers, types, designs and when we find the market capture possibility we push the product to the whole market. So I'd say our goal when working with the agency is to develop a feasible product that will serve customers and make them happy. And to highlight here, we do not really care if the product will be software, hardware or piece of wood. The main concern is to keep the customers happy, and provide tools that solve their problems. Everything is already an output, that is engineerable and easier part.

As for the scope, it is development of the product backlog, which is defined by our product team. To be specific scope in terms of service provided by the outsource is the backlog which I am managing. I do not have contracts tied to requirements, but we have contracts tied to time and performance metrics. So it means I have an extra engineering team from outsource for a period of time.

I had a case in the past, when I was more or less sure about the product features I wanted to build. So I did the inquiry of the process, and started the development with the fixed scope and fixed price. Of course as it would have happened, during the development some circumstances changed and I had to update the requirements. That caused a lot of problems, well starting with the reassessment of everything from the agency, so they could be sure they did not work more than initially agreed. Then the technological changes and implications. That was an experience to learn from. Since then I've always used a flexible model, which is having a team for a period with specific Service Level Agreements.

- *Tell me about the process of the cooperation. How does it get organized from the beginning to the end?*
- We start with research. If we see there is a possibility of developing a product, we start experimenting. First no code experiments by showing customers the possibilities.
- Once the first initiative proves successful, we define the scope of the MVP
- Then we do an inquiry of agency services, who can help us build and develop the product. The inquiry is based on service price for scope. We try to have a contract with enough time to develop and test the product on the market, then if we see the potential, we will extend the contract. There is a specific reason why we do not

include the outsource in the research phase. We do not know yet if we will need them or not, there is nothing to develop, so there is no sense in paying money

- During this time we always have a product manager included in the development team. From the agency side, we expect them to have a dedicated project manager or a self organized scrum team
  - Every month we assess the service levels. I check if we received each component on time, what was the difference between estimated and actual times for development. Overall our inhouse engineering team lead also helps in this process.
  - Then we launch the product with the combined support of outsource and inhouse.
  - If everything goes smoothly, we integrate the software to our core and make it part of the main system.
- *Tell me about the product and software development methodologies and frameworks you use when working with outsource and why?*

We are 100% agile. We work in iterative development. We start from the customer, maybe with one customer and search for an ideal development way. With outsource we always have the same requirements. We need to be flexible and ready for the requirements of the market. In some cases even more, we need to understand the problem of the customer and build something really innovative, something no one has thought about. This requires openness towards changes and high level of flexibility. Most of the time we use scrum framework with the sprint size of 2 weeks. We iterate every sprint and work with the agency to reassess the situation. The main reason why we require the outsource to follow agile methodologies is the rate of changes in the environment. The market is constantly. For me a product management representative it is important to listen to the market and adapt. During this process I can only depend on the partner who is flexible and not afraid of changes. Frankly speaking I do not trust the developers who sit in the same room for the whole day and code. You can't really code without checking up the reality from time to time.

- *Describe your biggest challenges of working with development agencies, with the reasons causing the challenge.*

Generally I love working with outsources. It gives you an extra boost in resources, which you'd probably not be able to get from inhouse until the higher priority tasks are done. Although, well it comes with some particular compromises and downsides to be true. It is always like that.

- First, the biggest problem is that it is hard to keep them aligned towards the vision. It sometimes is really tough work for our side
- They need to know that this product might change, it is only based on customer requests. From my experience, if you let the agency take the lead, they will create very sophisticated, bugless products that no one needs on market.

Hmm, what else.. (thinking)

- Another problem is actual work. I never have enough info about their day to day work and the threat is at the end of the week, they will deliver something to my product manager, that will be different from what we actually envisioned
- Then, consistency of the team. I had several cases when a developer was replaced during development, which is not great for actual work and results. New guy, new problems, new period to learn team dynamics. And I've seen this problem in different agencies.

These problems are not often seen as important. But thing is, each uninformed decision might create a threat of missing the vision, and eliminate overlap in responsibilities.

➤ *How do you deal with the above mentioned challenges?*

Well, let me think..(thinking). I don't think we have a golden rule. The best thing to do is to choose a partner which has experience in agile management and has a successful product released. Once you are developing and during the process, it is thought to change the outcome.

- Therefore, first of all, we always look at the previous work of a new agency. The screening face, you can call it. We need to know what the outsource has been working on, how they did it. It actually seems like a process of hiring an employee. We might even reach out to their previous clients. If you think this takes a lot of time, yes I will agree. Thing is we do not love changing partners. We prefer to have stable partners who can develop themselves alongside us. So we have to go over the partner screening once, and then if everything goes ok, we learn about each other and keep the team rules agreed.
- Then we always put our product manager in the development team, so the product manager can bridge our business team with their engineering team and exchange information. Product managers are the key people in our team. They have a lot of trust from our side, and their responsibility is also huge. They need to create and

share vision, vision for the product and for specific sprints. They need to find their common language with the development team. Only then the team will be a real team.

- We set specific KPIs for the product development. If the team developed everything but did not find the customer pain point that is a team problem. If they found the problem but were not able to deliver proper tools, that is still a team problem. We assess the overall performance with the product related KPIs which shares the responsibility on the team.
- We believe in scientific approaches in product development and management. That means we do things by book. And by book I mean the scrum guide most of the case. Now, you might ask how agile is connected to following rules, but it is simple. Scrum guide is a lightweight methodology guide, therefore it gives the general advice and gives space for a human being to analyze the situation and adapt. So we always follow the rules. We do not give the team strict assignments on how to do something. We give them the problem, and they self organize, they find the solution and check it. If they have a necessity, they reach out to us. But we trust in people, and only make sure they practice the methodology correctly.
- We do a lot of retrospectives. We ask the team to learn from the process. If you make the same mistake twice it means you are not developing. At every end of sprint, we have meetings, where also of us, the stakeholders and the actual people who work day to day, meet and discuss the problems, what did not work, or what worked, This is like a Mantra, you need to learn from doing. If you did not draw any conclusions, then you did not do it with mind.

I believe that is it. Well of course this includes the retrospectives with the standard agile practice. We have to meet every end of the month and discuss what we approve and what we do not in terms of methodologies, approaches and decision making standards of the development team.

### 8.5. Interview 5

- *When working with the software development outsource agency, what are the common scopes and goals of cooperation?*

We use outsource mainly for marketing and promotional campaigns. For the product support we use our own team, so every development is basically done inhouse. We have a large

development team. As our product is digital and we serve our customers in the digital world we have to be very fast and try to offer new solutions to customers. So development of new products is part of our everyday work life, we have a lot of projects already developed or waiting to be developed. You know, we prefer to develop products ourselves, but there are some exceptions from time to time. Every small project, like a small lottery or a small end user software for marketing communications are done through outsource. We have specific reasons for that of course (seemed tense). First of all, our products are changing often, but the core is already proven to be working and this is kind of fixed. I mean the main product is discussed and we are not going to deliver something completely different, but still our requirements are getting to be modified as we go deeper in development (Smiles). On the other hand due to our business we need to quickly change communication types, landing pages to smart advertising, registration panels, or new services for customers. These are the services that we might need for a week, a month or every second or third month. Therefore the main scope of corporations is the specific list of backlogged tasks that we want to be executed in a specific short period of time. In general even when we outsource the bigger project, usually we have strict deadlines, strict budget for development, so we try to be very specific and provide as much detailed backlog and product requirements to the agency as possible. We want them to evaluate the product, have tight communication with us during the development period and then deliver the product with zero defects.

➤ *Tell me about the process of the cooperation. How does it get organized from the beginning to the end?*

- I will have to talk a lot, so be ready (smiles). Well, first of all we have specific agencies that we partner with. Trust is a fundamental and first step on deciding whom to partner with, we look at what reputation this agency has. We choose them very very carefully, agency has to be trustworthy, experienced. We need to be flexible and we only work with the agency which is tested. Therefore most of the things are already aligned with the general contract. Usually we have repetitive cooperation with an agency, so they already know who we are and how we work.
- As for the individual project, as I mentioned when we outsource projects, we try to be precise about requirements. As a next step, I meet with the agency representative, usually the CEO of the agency, we discuss the concept of the project, I break down the end result into user stories, so I can give them what the customer needs to achieve. Then I receive the ideas and forecast of the tech team compectation in order to fit it



to the timeline, price of development and other necessary details. After getting written information from their side and provided details is acceptable for us, I schedule the next meeting.

- We have a big meeting attended by the project team, both from the agency side and from our side, usually from our side is involved assigned product owner. We discuss the product concept, methodology that will be used for development, definition of done and so on. Then goes the development phase. Most of our backlogs are not long, and are done in one or two weeks of development. So we always have the results quickly. We follow development in sprint principles, every one or two weeks is a meeting to check what was done during the sprint, what problems occurred and what are plans for the next sprint. If the project is big enough and complicated we have two sprint meetings, one to close the old sprint and make a retrospective, second to plan the next sprint.
  - So the whole our logic is to get something tangible out of each sprint, as I mentioned we do not want to deliver something and then discover “ops the product is unwelcome by the customer”. Once the assignment is fulfilled by the tech team, we launch the marketing & product initiatives, and when we have enough data we go back to the agency for a next phase or next thing to develop.
- *Tell me about the product and software development methodologies and frameworks you use when working with outsource and why?*

We try to be agile.

We do not always follow a specific framework. Although we are used to kanban, where we can always change tasks if needed. Kanban is simple, it does not require much resources from me or any of my team members to learn. Main goal is to break down small tasks and build them step by step. This is a very valuable part of this methodology, back in the past we were trying to assess the project from bottom to toes, plan, evaluate, specify all requirements, know all the resources that could be needed and then start development. You will be shocked but this did not work well (laughing). So when we started to be agile, Kanban fitted us well I think, my employees got used to it easily, still sometimes we lose path and not fully follow it but at least we try. Kanban gives us freedom to make quick changes in product development, adjust to the market. Sometimes the agency tries to understand the future steps beforehand, but that can't be realized in reality. We do not know what we will have to build

next month. In this case using task sizing is most effective for us. We know the capacity of the agency team and I can change the task composition any time.

- *Describe your biggest challenges of working with development agencies, with the reasons causing the challenge.*

Hmm, interesting question (took time to think), outsource is generally great, but they often stick to development only, they are not owners of the product or business, it feels that they are trying to deliver high quality piece of the code and that is it. The picture is bigger, the product or the specific marketing tool does not have any value if it does not follow the customer dynamics. We might be building something tomorrow, but if we see that useless for the market, that is a sunk cost. Just because you spent money on it, you can't continue wasting money. This is a bit hard to understand for agency. I understand it is tough for a developer to have the tasks changed, but that is the reality. Biggest issue is that I think, yes, probably that is the biggest challenge. I remember when we were starting working with an outsource agency, that was a big thing for us, first cooperation was hardest too I guess. We were used to full involvement of our team in the process, suggestions from product team members, adaptations to the quickly changing environment, we could very easily change the trail of the product. When we did the same with the agency for the first time it was a mess, the agency started to calculate what additional resources would be needed, how it would reschedule delivery and affect cost of development. It definitely was a lack of being lean and agile. Still we have the same issues from time to time. Although this problem arises when we have to outsource some big project, which is new for the market. With small regularly outsourced projects which are more like routine this does not affect.

- *How do you deal with the above mentioned challenges?*

How we solve it, okay, let's follow the scenario with bigger projects where the problem actually exists. I often ask for a contract for a period of time without a specific required resource or scope. We have some sketches of what the product should look like, but not any detail, answering the question "how". For example we know that we need to deliver identification service for our customers. That was actually a case (smiles). We meet with an outsourcing agency and tell them what is an end product, what it needs to do, in this case "identify the customer". Agency works on the solution with us, and is involved in the idea too, without fixed sources or time. Once the solution is defined, the agency provides a full team. In this way the team is really flexible and they know they can expect anything. They are not attached to the long functionality scope. They stay agile, and focused on speed. Of

course this is a bit more expensive but I prefer to be ready and have a team that can defy any problem.

## 8.6. Interview 6

- *When working with the software development outsource agency, what are the common scopes and goals of cooperation?*

Great topic. Here, at our company we work a lot to refine outsource practices. We outsource building any new product. Probably most of our products started with outsource. But we do it our way. We always assemble a team of the new products including outsource and inhouse developers. The idea is that the main work is done by the agency, but our team has the competency to take over at some point. We work with the agency to test the early stages of the product. That is the period when the product requires a lot of change, which is directly connected with changing the resources according to what is needed per stage. For me personally, that is a headache, and also not always a feasible way. That is why we cooperate with other agencies who can assemble a team of multifunctional skills. As for the scope I set requirements per version, write down what the end user needs to solve at the end, and it is the team's responsibility to find solutions and designs. Of course it covers design, architecture, coding QA and so on. Of course they have some of our engineers as well, but they basically have to build everything themselves.

So to sum up, the goal is to prove the product is worth keeping and develop the functioning product and find product market fit. And as for the scope the scope is defined later, as we hire the agency by timed contract.

- *Tell me about the process of the cooperation. How does it get organized from the beginning to the end?*

I start with research, first I need to have a list of problems for customers, worth solving. Once I have a pain point caught, I already start working with the team. We do not have a strict guideline when the agency should get involved, but personally I believe having a team earlier is beneficial in terms of team dynamics and work process generally. Of course that is connected with finances and one would try to spend as less extra money as possible. But the thing is having a qualified team involved is very beneficial. So back to the process, I sometimes create some scope suggestions with my inhouse engineering team, and when I have at least a draft of the solution for a customer problem, a software draft, I already start working with an agency.

From the moment they join the process, I as a product manager control the direction of the product. PM - product manager sets the vision and the goals of the product, and the team is responsible for suggesting solutions for it. It is a very open process for us. PM shares every detail, and it is his responsibility to keep on the track, but the team has to follow and understand the needs. That is their responsibility, of course including creating a working increment.

Bottom line is that the team has to be responsible for the process, with the PM responsible for defining the vision, and the developers executing.

➤ *Tell me about the product and software development methodologies and frameworks you use when working with outsource and why?*

We follow agile methodology, most of the time it is Scrum framework to be specific. My concern is to have a working product delivered. The main requirement is that it must be done in the time that is beneficial for business, I give them goals and deadlines, and I expect the agency to have competency of coming up with a solution and the methodology of realizing the solution. If I look at the projects which were successful and which were not, I may assume that the ones where I let the agencies work on projects without giving us a possibility of feedback for more than 2 weeks, have been struggling. I believe information sharing and cooperation must be frequent. Having this in consideration I believe the most successful frameworks that agencies have used with us are agile styled frameworks like scrum. We used to work with waterfall, but now we gave up on it. The situation is changing on the market so fast, we hardly catch up with updated requests. So the days of the waterfall are long gone, at least for us. We tried working with Kanban. Kanban is great although for me it does not support the development of large, full scale products. It is more for the projects where we have the tasks that might not be connected to each other. For example we use it for support teams, when bugs need to be corrected. For big projects we could not really use Kanban. As for the more higher level methodology, we use the 4 step Kata. This comes from the Japanese lean methodologies. It is based on agile. So what it means is that you have a general direction found, then you assess your current state, where you are in terms of market, customers and so on. Next comes the plan for the next goal for you and the actual development process to reach the goal. After reaching the goal, you look around and check what you learned. And it goes again and again.

Back to the part of why we use these methodologies. As I mentioned, the main reasons of us using them is the market change, environment change, compliance change. So basically

every variable can change anytime, so we need to test different things. We need to try multiple approaches and see what works and what does not.

- *Describe your biggest challenges of working with development agencies, with the reasons causing the challenge.*

Challenges are a lot. By the way I can share the latest challenges we defined in the last retrospective. They pretty much defines the general situation:

- First of all, they always try to have requirements ready. But that is not so easy. My main goal for partnership is to find the proper requirements and build on it. Sometimes people only see one side of the process, developers tend to focus on building not learning, especiallyI the agency developers
- Second, they always, always come up with some cool ideas which often actually are great but in terms of technology. And it does not really represent something a product can not leave without. For example, we recently developed a web application, where we integrated a new type of authorisation server. As I understand this was technically a superior decision, but I do not really see much value in it. We could have built other things in that time, something the end user actually cared about but I believe this solution was the most interesting for the developer team. You see, they enjoy building beautiful things, but in reality I prefer it to be ugly but solving problems
- And the third, most of the time we lack somebody in the outsource team. Sometimes we do not have a dedicated AI specialist, sometimes the product only has one backend, sometimes we only have a junior data analyst. I believe this happens due to the scarcity of specific resources in that specific time. But that should not be my problem. I should have all the resources the product needs.

That is really some of the things I am always concerned about, when I work with the 3rd party agency.

- *How do you deal with the above mentioned challenges?*

These are not easy challenges to solve. I can give you couple of things I found that works:

- First of all, I always create contracts where I list down the specific requirements like service level agreements. We call this a product development agreement. This gives all of us the proper expectations, so everybody knows what is required. For example as I mentioned I take responsibility to keep the team bussy, and the team gives me a working product on time, so I can take it to market, test and come back with a new backlog. These agreements work great when a team has a question how to decide a

specific problem or how to make a decision. And by the way, I've received positive feedback from the agencies regarding using this kind of approach. They also need to have some stability I believe.

- Second, is assembling the team as early as possible and keeping them as close to the market as possible. I see great benefit from having a multifunctional team in the early product research phase. The aim is to have the team IQ increased on every phase. This comes with a risk by the way. You have to invest more money, more resources. Of course these resources are not wasted, as long as you validate hypotheses and learn, but it has alternative costs, You could have learnt other things. So this is a decision that needs to be made.
- One great thing we are doing is the development meetings. So we came up with our way of doing it. Instead of the team having a couple of planning meetings and working full time, we have meetings with actual customers. Imagine, during the sprint around 10% of time of the dev team is spent on interacting with actual customers. That gives them more responsibility for what they are building. They have to explain to the actual user in life what they are building. If they can't, that means we did a bad job.
- And of course me and other PMs also try to help the agency by being responsive and working with the team to answer the queries. We really focus on strengthening the product managers and keeping the team dynamics as healthy as possible
- We try to give them a draft of the vision of what is going to be needed in the next few sprints. Of course this might not be super correct, but it helps shape the general expectations.