

# Initiate Great Software Applications by Using Design Thinking, Lean Startup, and Agile

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The Agile way of working has become the norm in the software development industry to overcome the limitations of the Traditional Waterfall Model. It promotes an empirical and iterative approach that facilitates customer collaboration, feedback loops, and fast delivery. Still, the ability to be flexible and to develop faster might not be enough to create innovative products that the customers love. For that, Design Thinking matches technology with the way people think, by imagining their interaction with the product and generating ideas about their actual problems and needs. Lean Startup validates these ideas after a short period of time by promoting the creation of a simple product that is provided to the customers to check if the initial business hypotheses are still standing. There is not a clearly defined handover point between Design Thinking, Lean Startup, and Agile during the product creation process; they are complementary and overlapping at some points. However, combining their key aspects is essential for the success of the product. This paper describes how to match these three powerful concepts into a five-day workshop to set the stage for a new product development process.

*Keywords:* Agile way of working, Design Thinking, Lean Startup, software development

## Introduction

The traditional approach used in the software development process is named Waterfall. As the name of the model implies, the work is built in a sequential way, following a set of chronological steps.

The product creation starts by generating the whole design upfront, continues with actual implementation, and ends with the testing part. Only after the first stage of the process is 100% completed, the work can move to the next stage and so on. It is a one-way road.

Since there is no room for changing requirements during the process, it becomes very clear that everything should be carefully planned from the beginning. Basically, the success of the product is highly correlated with the ability to understand and define the initial requirements, since the customer is no longer involved in the process once the designing phase is finished. This means that the product is validated with the client only at the end of the process. This way, the potential misunderstanding and wrong assumptions that we are tempted to make in the designing phase may lead to products that are never used, because they do not really address the customers' needs.

If the initial plan is updated due to the customers' changing and evolving desires, at least one of the following elements will be negatively impacted: the costs, the time, or the quality.

However, with the technology evolving so fast, do we still have the luxury of spending years creating products that may become obsolete by the time they are delivered?

In the past decades, the software applications have been growing in complexity. So have their users' needs. The moment we understand that we have to deliver complex solutions for complex situations, we realize that creating the whole design upfront is impossible. We do not know everything from the beginning. In our development process, we need to have time to explore.

The Agile way of working came up as a response to all these challenges and limitations. Instead of working in sequences all the time, Agile promotes an iterative and empirical approach. This means that the work is delivered to the customers in iterations: We start with the basic functionalities and let them evolve over time, considering the feedback and the lessons learned from the previous iterations.

Since the scope may vary in time, the analysis and planning are done just in time and just enough, in order to minimize the waste. The Agile teams are willing to adapt all the time, according to the customers' changing desires.

Having as a starting point the Manifesto for Agile Software Development (2001), the Agile approach came up as a set of values and principles that emphasize the importance of collaboration, flexibility, and customer centricity, considering the working software the most valuable indicator of the progress. In time, a lot of methodologies have emerged to facilitate the agile values and principles adoption in the software development process.

According to the 11th State of Agile Survey (VersionOne, 2017), the top three reasons for adopting Agile methodologies are to accelerate product delivery, manage changing priorities and become more productive. Considering this, one serious question comes in my mind.

Is our ability to develop faster the essential element that helps us generating innovative products that the customers love?

In an era of constant change and high uncertainty, what keeps big software development companies fit for purpose is their ability to innovate.

Innovation helps organizations design solutions that respond to customers' needs. To provide it, they need to get to know their customers better: identify their problems, their desires, their profile, and behaviors. All these activities are part of the Design Thinking process, which can be described as being the human side of the technology. Matching technology to the way people think and imagining how they interact with the application will make everyone's job easier, no matter what the job is.

Even if this concept sounds great in theory, the hard part comes when we try to implement it. The reason is that Design Thinking may sound too chaotic and ambiguous to be embedded in the organizational processes. However, if companies want to generate better ideas and turn them into viable products that cover customers' needs, they should start to merge the artistic designing process with the scientific act of product development and delivery.

And yet, even after we get to know our customers and their needs better, the process may have some limitations. The truth is that the world is too dynamic and unpredictable to assume that we are going in a positive direction without validating it. The Lean Startup approach overcomes this risk by promoting the creation of a simple version of the product that is provided to the customers in order to validate an essential set of business hypothesis. This approach makes it very clear that receiving as much feedback as possible is not enough. The goal is to get the necessary feedback to validate if we are on the right track.

How can we correlate Agile, Design Thinking, and Lean Startup into a great product creation process?  
The answer forms the basis of this article.

### **Research Method**

The main purpose of the research was to design a set of initial steps that describes how to set the stage for the creation of a new product in an agile environment by exploring fundamental concepts, like Agile, Design Thinking, and Lean Startup, and how they can work together to generate impressive solution that the customers love.

What helped me gain a deep understanding on these topics was a multi-method approach.

The foundation of my study is represented by a good theoretical understanding, gained by:

- Reading the books from consecrated authors in these fields (Ries, 2011; Rubin, 2012);
- Consulting case studies, surveys, and scientific articles on Agile, Lean Startup, and Design Thinking topics (Brown, 2008; Gibbons, 2016; Gothelf, 2016; Schneider, 2017; Claes, 2017; Roach, 2015);
- Participating in agile and lean training sessions and gaining certifications, like: Scrum Master, Product Owner, Kanban System Designer, Kanban Management Professional, SAFe Agilist.

The pillars of my research are represented by the experience exchange activities with other Agile practitioners, coaches and leaders that helped me explore this topic from different angles and take into consideration different points of view:

- Participating in events organized by Meetup.com platform for the people sharing common interests;
- Participating in Agile communities of practice.

The roof of my research is represented by my two and a half years working experience as an Agile transformation coach in a software development company, performing activities like:

- Delivering Agile and lean training sessions;
- Facilitating product discovery workshop sessions;
- Facilitating Agile team foundation workshop sessions;
- Coaching Agile teams during their Agile transformation journey.

### **Results**

All the above methods provided valuable insights that were structured into a set of initial steps which may help Agile teams to start building great products for their customers. At its core, the set of steps not only helps companies increase customers' satisfaction, but also increases employees' motivation.

Design Thinking will provide a sense of purpose to the Agile teams. The purpose would be, as Phil Gilbert, head of design at International Business Machine (IBM) stated, to "be a great host for your users, for people, for humans".

Lean Startup reduces the waste from our product creation process by giving us time to explore the uncertainty, to experiment, fail fast, learn from our mistakes and make informed business decisions based on the customers' reactions, feedback, and actions. All of this information, coming as a customer response after a simple version of the product is delivered to them, will provide to the Agile team a sense of completion and accomplishment. We have to keep in mind that that simple version is not about a minimal form of the product; it is about the minimum set of functionalities that will allow us the test the essential business hypothesis.

Using Agile methodologies without Design Thinking and Lean Startup will not guarantee that we place the users on the top of our business. The reason is very clear explained by Caroli (2018). He provides by far the

best summary of these concepts by stating that adopting a design mindset we learn to build and by using the lean mindset we build to learn.

When an Agile team wants to start creating a new product, a solid foundation workshop is required to set the stage for their future way of working. This is a five-day workshop where all the team and the key stakeholders should participate. The success of the workshop is highly correlated with their capacity to work together and get involved in a lot of dynamic activities.

During the workshop, the team should take the first essential steps of each of the three concepts mentioned above, as follows.

### **Use Design Thinking to Understand Personas (Two Days)**

A persona is a character defined to describe a user type that may use a product in a particular manner. In order to understand personas better, participants should take the following steps:

**Emphasize and Define.** For each persona, identify:

- Nickname;
- Behavior and demographics;
- Motivation to take action—the needs to be covered, the problems to be solved, the goals to be reached;
- For each persona-need/problem/goal, imagine the context—when and where;
- For each persona-need/problem/goal, define the user journey—what are the steps that this persona needs to follow in order to fulfill this need/to solve this problem/ to reach this goal? Use color coding to make a difference between the activities that can involve our product and the ones that are impossible to influence;
- For all the activities that involve our product, associate a feeling by answering the question: How this persona may feel while performing this step? Choose one from the following options: mad, sad, glad.

**Explore.** For each journey, come up with ideas of functionalities that may address the needs/problems or help the persona to reach a goal:

- For mad emotions: What functionality should the product provide to eliminate persona's frustration?
- For sad emotions: What functionalities should the product provide to increase persona's satisfaction?
- For glad emotions: What other similar functionalities should the product provide?

**Define the Product Vision—A Clear and Motivating Statement That Describes the Reason for Creating the Product and What Kind of Positive Change May the Product Generate.** Observation: input from specialists—UX, UI designers—that performed an upfront research would be a great plus during this activity.

The template (Moore, 1999) that can be used to define the product vision is:

For [final client],  
 whose [problem that needs to be solved],  
 the [name of the product]  
 is a [product category]  
 that [key-benefits, reason to buy it].  
 Different from [competition or current alternative],  
 our product [key-difference].

### **Use Lean Startup to Define Minimum Viable Product (One Day)**

During this one day session, we need to choose from the functionalities that we brainstormed in the

previous two days, that minimum set that will engage the customers to provide feedback so that the product team should validate a set of essential business hypothesis. By providing a minimum viable product (MVP), the team will have the chance to see, after a short period of time and based on the customers' feedback, if they are going in a positive direction.

In order to define an MVP, participants should take the following steps:

- Define the list of essential hypothesis they want to validate—this means to define what they want to validate and learn from it after the MVP is launched;
- Prioritize personas, considering their contribution in validating the above defined hypothesis; the amount of problems solved by the product, the urgency of the problems and the benefits generated by the product may be good criteria to be considered;
- Select only the relevant personas in validating the essential business hypothesis; no more than three personas should be considered;
- Consider the brainstormed features mapped on the selected personas' journeys; identify potential dependencies between these functionalities and make them visible;
- Prioritize the above functionalities using the Moscow technique;
- Choose the must have features (do not forget to consider the dependencies) to define the MVP.

#### **Set the Stage for the Agile Way of Working (Two Days)**

- Participate to a one-day agile training, in case the team is not familiar with the agile values, principles, and techniques;
- Facilitate an one-day working agreement workshop to:
  - ✓ Define the roles and responsibilities inside the team;
  - ✓ Map and visualize the team's workflow;
  - ✓ Make team's policies and working agreements explicit;
  - ✓ Define the agile framework and the tools to be used;
  - ✓ Define synchronization rituals/cadences needed inside the team;
  - ✓ Define team's objectives and key results.

The five-day workshop described above is a good starting point for any Agile team to begin building a new and successful product, considering users' needs and desires.

### **Conclusions**

Design Thinking presents innovative strategies that can be used to generate ideas according to the customers' need, problems, and goals. Lean Startup helps us make a distinction between truth and assumptions. It is about creating business models based on generated ideas which are validated by real customers after a short period of time. Agile describes an iterative and incremental way of building the product, based on transparency, inspection, and adaptation, integrating the feedback provided by the customers. All of these three concepts and the way they match together during the product creation are a direction, not a place.

The main purpose of this article was to describe just the starting point by designing a set of logical steps that can help any Agile team to start their journey. The steps represent the agenda of a five-day workshop where all the team members and their key stakeholders should participate. During the workshop, the Design Thinking approach helps the team to get to know their users better; Lean Startup is used to identify the essential set of functionalities to start with, while the Agile approach helps the team to define a way of working which

improves team dynamics and effectiveness.

The focus of future research would be towards specific practices and techniques related to these three concepts that can help the Agile teams not only in the initial stage of the product creation, but also to guide them during the whole process.

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