HOW TO DEFINE VALUE THROUGH LEAN AND AGILE PRATICES DEVELOPING A DIGITAL PRODUCT.

Marcos Novais Ribeiro - Universidade Metodista de São Paulo

Alvair Silveira Torres Junior - USP - Universidade de São Paulo

Resumo

Objetivo – Muitas equipes de TI em diferentes organizações (grandes, médias e pequenas) estão adotando práticas ágeis como a principal forma de desenvolver produtos digitais. Embora essas técnicas abordem a definição de valor para o cliente, é comum relatos durante a fase de desenvolvimento de que não está claro qual valor está sendo entregue e como medi-lo após a entrega. O objetivo deste artigo é discutir como essa definição é realizada por meio dessas metodologias, bem como como ela pode ser mensurada. Desenho/metodologia/abordagem – A pesquisa foi realizada por meio de pesquisa qualitativa (utilizando grupos focais) por meio de um estudo de caso em um departamento de TI de uma grande empresa química. Resultados – Descobriu-se que o termo "valor" é focado durante toda a jornada de descoberta, mas não é explicitamente descrito nos documentos, geralmente os termos são descritos como requisitos ou benefícios, o que potencialmente pode ser uma das causas que atrapalham a gestão do produto pendências ou as métricas corretas em torno do valor para o cliente. Implicações sociais – A pesquisa teve como objetivo contribuir com a melhor forma de identificar e especificar valor por meio de práticas ágeis e pensamento enxuto.

Palavras-chave: Agile practices, Dual Track Agile, Lean development, Lean Start Up.

Abstract

Purpose – A lot of IT teams in different organizations (large, medium, and small) is embracing agile practices as the mainstream to develop digital products. Although these techniques address the definition of customer value, is common reports during the development phase that it is not clear what value is being delivered and how to measure it after delivery. The objective of this article is to discuss how this definition is carried out through these methodologies, as well as how it can be measured. Design/methodology/approach – Research was carried out through qualitative research (by using focal groups) by a case study at an IT department of a big chemical company. Findings – Was discovered that the term "value" is focused during the whole discovery journey, but is not explicitly described at documents, usually the terms are described as requirements or benefits, which potentially can be one of the causes that disrupt the management of product backlogs or the right metrics around value to the customer. Social implications – The research aimed to contribute with the better way to identify and specify value through agile practices and lean thinking.

Keywords: Keywords – Agile practices, Dual Track Agile, Lean development, Lean Start Up.

HOW TO DEFINE VALUE THROUGH LEAN AND AGILE PRATICES DEVELOPING A DIGITAL PRODUCT.

APPLIED ARTICLE (*ARTIGO APLICADO)*

EMPRAD (Encontro dos Programas de Pós-Graduação Profissionais em Administração)

CONTENTS

HOW TO DEFINE VALUE THROUGH LEAN AND AGILE PRATICES DEVELOPING A DIGITAL PRODUCT.

ABSTRACT

Purpose – A lot of IT teams in different organizations (large, medium, and small) is embracing agile practices as the mainstream to develop digital products. Although these techniques address the definition of customer value, is common reports during the development phase that it is not clear what value is being delivered and how to measure it after delivery. The objective of this article is to discuss how this definition is carried out through these methodologies, as well as how it can be measured.

Design/methodology/approach – Research was carried out through qualitative research (by using focal groups) by a case study at an IT department of a big chemical company.

Findings – Was discovered that the term "value" is focused during the whole discovery journey, but is not explicitly described at documents, usually the terms are described as requirements or benefits, which potentially can be one of the causes that disrupt the management of product backlogs or the right metrics around value to the customer.

Social implications – The research aimed to contribute with the better way to identify and specify value through agile practices and lean thinking.

Keywords – Agile practices, Dual Track Agile, Lean development, Lean Start Up.

1 INTRODUCTION

In the context of digital transformation, nowadays many larges, medium and small companies mainly within their IT departments, are embracing agile practices and lean as the methodology to create new digital products as well foster innovation and experimentation.
Practices and tools such Design Sprint, Design Thinking and Prototype are being used to test and validate ideas, as well, Scrum, UX, Kanban and XP are used to manage backlog, increment digital products, or launch minimum viable products (MVP).

Although, this toolkit of agile practices aims to experiment and generate value faster to the customer, is still quite common situations where teams are dealing with unclear requirements or not well-defined value proposition, mainly during the initial phase setting goals or the right

approach to initiate the discovery and product development. As consequence, development teams deal with product backlog poorly defined and not well understood, ending in waste.
CAGAN (2017) says one of the most common situations, is where the teams have long and frustrating Sprint planning meetings because backlog items are poorly defined and not well understood.
The definition of value also is an important aspect around of this. GOTHELF states:

> "Value" is the most ambiguous word in business. It means something different to every person that says it, primarily based on where they're positioned in an organization. Executives talk mostly about *business value*. Customer-facing product teams use the phrase *customer value* though there are still many teams I come across who speak in terms of business value. Finally, internally-facing teams — this includes teams like HR, DevOps, security, performance, infrastructure et al — will speak of *organizational value* as their measure of success.

On the other hand, Womack (2003) states that value is ultimately defined by the customer, considering the perception of price, deliver time, product attributes and quality, being created by the producer.
Usually, all product teams do a set of activities to decide what to build and then do a different set of activities to build and deliver it. While you'll learn that these activities can and should overlap and interweave with each other, the work that is required to do each is fundamentally different (TORRES, 2010).

Even teams embrace a scope, a set of activities over the agile practices to build and increment digital products, the right definition of value and how to accomplish it can be turned depending on the context and interactions along of the time, becoming a challenge, and in some case a frustration to the team.

Based on this situation, the authors addressed the following research question: how is defined value to the customer during the discovery phase of a digital product? As well, how the practices such lean and agile are contributors at discovery phase till the start of development? The main idea of this research is investigating the steps and procedures around the phases of disco very and gathering of requirements, as well see how the definition of value during the phases. is. To a deep understand over the topic, will be evaluated the current methodologies in place and its applicability, as well qualitative research through a case study at an IT department, with different product teams whose develop and increment digital products.

Identify the path forward to define value for specific use cases and how to set it during the development of a digital product, can contribute for less effort or waste still during the discovery phase.

2 THEORETICAL REFERENCE

To address the evaluation of the current agile practice and methodology in place that are embedded at the process of the development over digital products, mainly during the discovery process.

2.1 Lean Thinking

The first book about lean thinking was published in 1996 by Womack and Jones, targeted to expand the principles of lean practices to enterprises and financial context, once the concept was succeeded in manufacturing, mainly with lean manufacturing or lean production (HINES, 2004).

It aims to be a philosophy that the critical starting point for lean thinking is specify the value (WOMACK, 2003), and increase customer satisfaction through the better utilization of available resources.

Lean is a way of thinking about creating needed value with fewer resources and less waste. And lean is a practice consisting of continuous experimentation to achieve perfect value with zero waste.

According to the statement at LEAN Enterprise Institute:

> "Lean is a way of thinking about creating needed value with fewer resources and less waste. And lean is a practice consisting of continuous experimentation to achieve perfect value with zero waste".

In lean thinking specify the value by specific product, identify the value stream for each product, make value flow without interruptions, let the customer pull value from the producer and pursue perfection, are clear principles related design thinking (WOMACK, 2013).

There are five principles in lean thinking:

1. Specify value to the customer.
2. Value stream mapping
3. Continuous flow

4. Pull
5. Perfection

2.2 Lean Start Up

Lean Startup method provides a scientific approach to creating and managing startups and get a desired product to customers' hands faster. (Ries, 2011). The name was inspired from lean thinking. Lean is considered as a philosophy of eliminating waste and creating value (Womack and Jones 1996; Hines et al., 2004; Shah and Ward, 2007).
According Blank (2013) ,

> "In contrast to traditional product development, in which each stage occurs in linear order and lasts for months, agile development builds products in short, repeated cycles. A start-up produces a "minimum viable product"—containing only critical features—gathers feedback on it from customers, and then starts over with a revised minimum viable product.".

The method is also based on five principles, being: Entrepreneurs are everywhere,

1. Entrepreneurship management
2. Validated learning
3. Build-Measure-Learn
4. Innovation accounting

Although the methodology was initially focused on startups, today it is used in different segments of companies, to quickly test and validate scenarios and products. (Blank, 2013)

2.3 Design Thinking

Nowadays, design thinking one of the best practices used at innovation and problem-solving approaches. As defined by Brown (2009).

> "Design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people (users and stakeholders), the possibilities of technology, and the requirements for business success, it's a non-linear, iterative process that can have anywhere from three to seven phases, depending on whom you talk to."

The cognitive process of designing is not limited to "problem solving"; rather, the mind oscillates between a tentative problem frame and fledgling solution concepts, simultaneously refining both (Sedano, 2020).

Image 1: Design thinking phases, adpated from interaction design foundation.

2.4 Empathy Map

This tool helps teams develop deep, shared understanding and empathy for other people. It's used to help them improve customer experience, to navigate organizational politics, to design better work environments, and a host of other things. (Gray, 2017). According to the design team who held the sessions, the main idea is to get context around the user, before jumping directly at the flow.

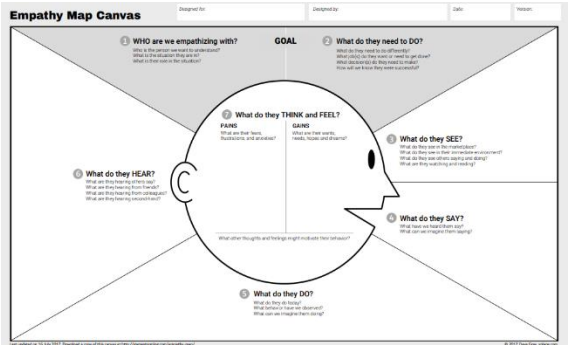

Image 2: Empathy Map Canvas, caputred from gamestorming

2.5 Dual-Track Agile

Dual-track agile is a methodology that embraces the process Discovery work happens concurrently and continuously with development work. (Patton, 2017), is a conceptual framework for reconciling human-centered design (HCD) and agile development (SEDANO, 2020). The name was coined by Martin Cagan and Jeff Patton. The Discovery track is all about

quickly generating validated product backlog items, and the Delivery track is all about generating releasable software. (Cagan, 2017).

Through the methodology there are two mainstreams: discover and development. The stream related discover is focused on fast learning and validation, ideas opportunities or problems to solve. It starts by describing what is the problem to be solved and for whom, the solution to be build and solve it, as well how to measure success. Meanwhile development work focuses on predictability and quality.
Cagan (2017) says one of the advantages of the methodology is to align the rhythm of traditional UX teams and the pace of Agile. Basically it's align and sync both activities putting the right cadence.

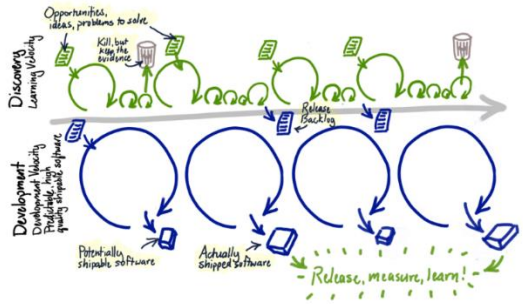

Image 3: Dual track-agile, caputred from jeffpatton&associates

Although there is a growth in the use of the Dual-Track methodology in the industry, there are few studies that evaluate its empirical application in product design.
digital technologies, not being known, in practice, the real contribution of such an approach (Cataldi et al., 2022; Péraire, et al., 2019).

3 RESEARCH APPROACH

The objective of the research was to identify how is defined value to the customer during the discovery phase of a digital product as well, get context of how the agile can contribute during the discovery phase until the start of development of a digital product. Aiming for gathering evidence that fulfill the research question, was chosen a qualitative research method through a case study. A case study is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context. (CROWE et al., 2011).

Yin (2009) states that with more the research question seek to explain some present circumstance (such: “how” and “why”), more the use case method will be relevant. In this case, the proposed method fits well for software discovery and development, covering many activities and outcomes (KÖNNÖLÄ et al., 2016)

3.1 Research Protocol and Data collection

Was developed a study case protocol according to the template and recommendations from BRERETON et al., [s.d.] The study case was conducted at a multinational company with a Squad team who have fifteen participants with different functions whose is developing of a digital product along of 6 weeks observation, they are using both practices from lean start up and dual track agile. Aiming to identify the criteria to define value during the discovery phase, were selected two different use cases that were already implemented used three different techniques to perform the data collection. Initially a questionnaire considering open-ended questions with eight team members, and secondly a semi-structured interview with two participants related design activities focusing gather more details around the questions used at the questionnaire practices related discovery phase, lastly was held a participant observation. As mentioned by Yin (2014) applying the triangulation of different methods to ensure the assertive and accuracy of the case study.

Table 1 – Use Cases Description

Use Case	Description	Business Area
UC 1: Supply Shortages	Issue: Due a lot of factors, supply planners are not informed correctly about relevant facts that influence the day-to-day activities. Usually lacking information about availability dates of purchase orders, productions orders.	Supply Chain Planning, Procurement
UC 2: Supply Risk Assessment	Supply Analysts receive alerts from regarding potential risks impacts at their product portfolios, consequently potential sales risk. Assessing supplier events quickly is essential to focus on important cases first and to initiate corrective actions without delay.	Supply Chain Planning, Logistics

Table 2 – Roles and quantity of participants at questionnaire

Position	Quantity
Product Owner	1
Product Specialist	1
Data Scientist	1
Data Analyst	1
Developers	6

Table 3 – Roles regarding semi-structured interview

Role	Quantity	Period	Duration
UX Design Specialist A	1	January 2022	1 hour
UX Design Specialist B	1	December 2023	1 hour

3.2 Limitations

There were two limitations of this case study. Firstly, was not possible to interview the users involved on the use cases, which lead to impacts on the evidence and point of view. The second research limitation is the data analysis were conducted by a single researcher, involved on the project. This means that the data analysis was conducted by a single researcher, increasing the individual bias applied to the data set.

4 RESULTS

As described at the methodology, were interviewed fifteen participants with different functions whose was addressed questionnaire considering open-ended questions. Also, there was a semi structured interview with two design team members. In order to better interpretation of the data and set a pattern of the results, was harmonized the results considering the answers, as table 4.

Table 4 - Questions for the interviews and its correspondent

associate practices of Agile, Lean and other procedures.

#	Questions	Related to	Lean or Agile practices
1	What was the technique/methods used during the discovery to identify pains and needs of the customer/user?	Identification of pain and needs	• Design Thinking • Empathy map • Business Discovery map • Fluxogram
2	How is defined the pain to the users during the discovery phase?	Identification of pain and needs	• Empathy map • Other tools, depending of use case
3	How was identified the value attributes during the discovery phase?	Identification of pain and needs	• depending on each use case
4	How was structured the proposition of ideas and solutions?	Identification of ideas and solutions	• Informal documentation,
5	How these ideas are validated, considering the attributes?	Identification of ideas and solutions	• Interviews • Focus group
6	How are these ideas prioritized?	Identification of ideas and solutions	• Prioritization cards
7	Value attributes are defined during the prototyping of the solution?	Prototyping	• depending on each use case
8	Once prototype is validated, value attributes are described to development?	Hand over to development	• User Stories, User journey, epics

Most of the answers replied to the usage of more than one technique to support discover phase. Design thinking method were presented at the two use cases, mastering the overall activities related discovery. To a better understand the results, the sections will be organized according to the related topics of the interview.

Identification of pain and needs

According the observations as well the responses on questionnaire, initially at the two cases during the empathize session were used two tools in order to proceed with a business discovery map and lifecycle value stream chain (as image 4 and 5), both techniques aimed to better understand the process flow along the users

Image 4: Illustrative example of business discovery map tehcnique

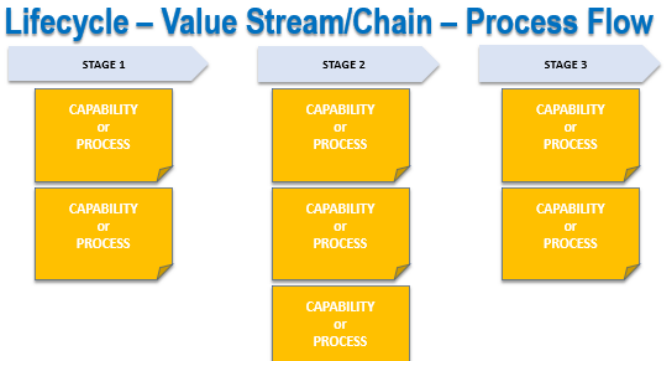

Image 5: Illustrative example of lifecycle-value stream/chain – process flow tehcnique

Secondly, also was used empathy map aiming to better understand the context around the users who is participating on the process.

To support the overall context, was created a persona that is is a fictional representation of a type of customer or user. Personas are based on research conducted by the design team; user interviews, stakeholder interviews and secondary research.

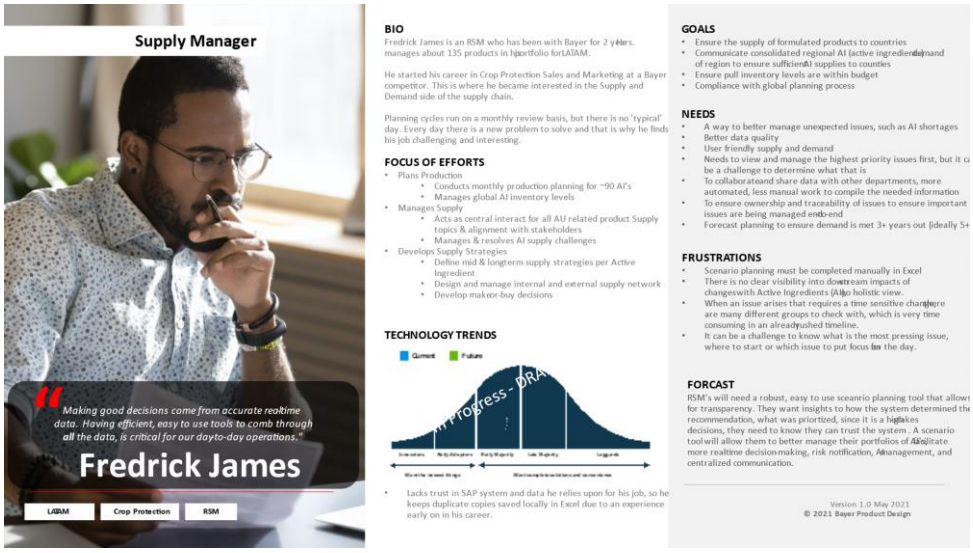

Image 6: Illustrative example of UX persona

In both cases, there was clear findings that were matching with items or impacts due the process. All pain and needs were documented at discovery documentation for both use cases.

Ideas and Proposed solutions

Regarding the ideas, were placed the third stage of design thinking. A brainstorming session over the two cases were conducted, collecting inputs and ideas along each process. These ideas were consolidated and prioritized and voted. The most relevant, were deeply discussed at the session and designed for a prototyping come along over the process that is involved.

Also, during the sessions for the two use cases, were not explicated mentioned or highlighted a topic regarding value related the ideas and proposed solutions. The discussion was an interactive way, which contributes with insights of the development team once acknowledge the problem around.

Prototyping and Tests

Based on the ideas and solutions proposals, were created prototype in both use cases. These prototypes were focused to create high fidelity upon a new user journey including the new digital solution. Faking the data and screens that the user should navigate, design team members were able to set the user journey, adjustments and correction took in place several times based over a looping session with user feedbacks. These phases took in place with cycle of two weeks. Meanwhile interactions with development with users were also developed. In

terms of value definition, at documentation of the use cases it was defined, around user requirements and use case goals, there was not explicated defined or documented as a value proposition.

Hand over to development

Once validated the prototype, design team complete the tasks, preparing a final user journey and breaking down in epics, user stories with acceptance criteria. Inside of this documentation, items such the description, expected outcomes, leading indicators and nonfunctional requirements are transcript. These all items are relevant to development team start their job through sprint cycles aiming to ship a new product or increment the current one. Also on this phase, at all documentation value is described around description or acceptance criteria, but not necessarily explicit as topic.

5 CONSIDERATIONS

This research explored the practice of value definition through agile practices at the discovery until the development phase of a digital product. Were identified that practices of lean start up such design thinking, prototype are very well used through teams during the discovery phase until the development of the product, such dual agile track. According to the evidence related the two use cases, despite being discussed and talked about value in generating ideas and proposing solutions, the attributes of value are not explicitly defined or documented. The value generation is embedded in all practices through both practices, being addressed through user requirements or problems to be solved. Although it does not directly impact the development of the product, or the validation of results, considering the lean thinking principles, would be relevant have the explicit use for value identification to support the formatting of development goals, as well as the measurement. May an minor adjustments at the procedures during the discovery phase and discussion around which means value for each use case and not treat as requirements, it would be beneficial of value once it was defined during the discovery and design phase with customers.

It is important to highlight the research was done in a short period and may with more dedicated time and expanding the scope considering other teams and different stakeholders could give more relevant evidence that could contribute with the vision. Even so, is considered accomplished the objective, once identified how is being defined and captured value along over

these methods. Is recommended for future studies extend the research with different companies and methodologies, may this give abroad picture around of the current situation at Brazilian companies.

6 REFERENCES

- YIN, Robert K. Case study research: Design and methods. sage, 2009.
- YIN, R. K. (2014), Case study research: planning and methods, Thousand Oaks, CA: Bookman
- RIES, E. (2011). The Lean Start Up: How constant innovation creates radically successful business. CA: Penguin Business
- WOMACK, J., JONES, D. Lean Thinking: Banish Waste and Create Wealth in Your Corporation. CA: Simon & Schuster ebook, 2003
- TORRES T. (2021) Continuous Discovery Habits: Discover Products that Create Customer Value and Business Value ca: ProductTalk
- CATALDI, G., RODRIGUES, L. (2022). THE CONTRIBUTION OF THE DUAL-TRACK AGILE METHODOLOGY IN DIGITAL PRODUCTS MANAGEMENT. Business and Project management journey.
- https://doi.org/10.5585/gep.vl3il.21521
- SHIM W., & LEE, S. W. (2019). An agile approach for managing requirements change to
- improve learning and adaptability. Journal of Industrial Information Integration, 14,
- 16-23. https://doi.org/10.1109/REW.2017.46
- HINES P., HOLWEG M., RICH N. (2004). A review of contemporary lean thinking, The current issue and full text archive of this journal is available at
- www.emeraldinsight.com/researchregister www.emeraldinsight.com/0144-3577.htm
- SEDANO T., RALPH P., PÉRAIRE C., Dual-Track Development, IEEE SOFTWARE | PUBLISHED BY THE IEEE COMPUTER SOCIETY.
- BROWN, T. (2009). Design Thinking.https://www.interaction-design.org/literature/topics/design-thinking
- CAGAN, M. (2019). Dual-track agile. Silicon Valley Product Group. https://svpg.com/dual-track-agile
- BLANK, S. (2013). Why the Lean Start-up changes everything. Why the Lean Start-Up Changes Everything (hbr.org)
- JEFF, P. (2017). Dual Track Development is not Duel Track. Dual Track Development is not Duel Track – Help your organization focus on successful outcomes (jpattonassociates.com)
- SHOOK (2000) What is lean? - Lean Enterprise Institute - What is Lean? | Lean Thinking - Lean Enterprise Institute
- BRERETON, Pearl; KITCHENHAM, Barbara; BUDGEN, David; LI, Zhi. **Using a Protocol Template for Case Study Planning**. [s.l: s.n.].
- CROWE, Sarah; CRESSWELL, Kathrin; ROBERTSON, Ann; HUBY, Guro; AVERY, Anthony; SHEIKH, Aziz. The case study approach. **BMC Medical Research Methodology**, *[S. l.]*, v. 11, 2011. DOI: 10.1186/1471-2288-11-100.
- KÖNNÖLÄ, Kaisa; SUOMI, Samuli; MÄKILÄ, Tuomas; JOKELA, Tero; RANTALA, Ville; LEHTONEN, Teijo. Agile methods in embedded system development: Multiple-case study of three industrial cases. **Journal of Systems and Software**, *[S. l.]*, v. 118, 2016. DOI: 10.1016/j.jss.2016.05.001.