

The present work was submitted to the Faculty of Mathematics, Computer, and Natural Sciences

**Bachelor thesis**

**The product optimizations for inadequate digital product management processes of digital startups in the Mongolian market.**

**Written by:** Khongorzul Davaajav

**Student ID:** 15011421312857

**First supervisor:** Prof. Gerhard Wackenhut

**Second supervisor:** Prof. Bernhard Kueppers

Ulaanbaatar, Mongolia  
05<sup>th</sup> of May, 2022

## Statutory Declaration

Davaajav, Khongorzul

\_\_\_\_\_  
Last Name, First Name

15011421312857

\_\_\_\_\_  
Student ID Number

I hereby affirm in lieu of an oath that I provided the submitted bachelor thesis

**The product optimizations for inadequate digital product management processes  
Of digital startups in the Mongolian market.**

I did not use any sources other than those stated. In case that the work is additionally submitted on a data medium, I declare that the written and the electronic form are completely identical. The work was not submitted in the same or similar form to any examination authority.

Ulaanbaatar, 05<sup>th</sup> of May

\_\_\_\_\_  
Place, Date



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Signature

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## Abstract

Keeping pace with the promptly changing technological evaluation with the sub concept of its digitalization has been developing rapidly in Mongolian startup market for the last few years. The country is in 5th in east Asia regional ranking and in 67th worldwide on IT startups with only 3.4 million population [1].

Managing digital products is more non-identical than having traditional product management. Its core difference from non-digital products is their data availability and data evaluation. Hence, they need separate product management processes and stages on their digital product and most early-stage startups in Mongolian market are lacking to properly install it on their digital PM activities.

The paper consists of 5 sections including introduction, literature review, methodology, result and conclusion. In the literature review chapter, there will be the related definition and explanation of the key terms (digital product management, startup, technology driven product, agile, product lifecycle/steps etc.) and their characteristics in nature of the concept itself. The purpose of this literature review is to the significance of the product management of startups overall. It mostly consisted of looking at fundamentals in the topic area and existing PM related articles, researches and reports in order to start growing expertise. The materials gathered from associated books, websites, blogs, reports, and investigative journals. Moreover, the problems and the consequences that are explained in the introduction part, will be considered more deeply in view of its optimization of development in the methodology chapter. Open qualitative interview questions were sent out to product management specialists of Mongolian digital-startups in order to conduct the research and get familiar with the methodologies. This was done with the goal of acquiring real evidence from startups' product managers and linked managers' experiences as well as putting the research's theories and concepts. Afterwards, the viewpoints of the interviews and experiences, as well as the comprehensive theories and approaches of different product management dealing with problems and consequences discussed in the introduction, were analyzed in the result part. This was then used to successfully lead the conclusion part.

## 1. Introduction

### 1.1 The background and the problem statement

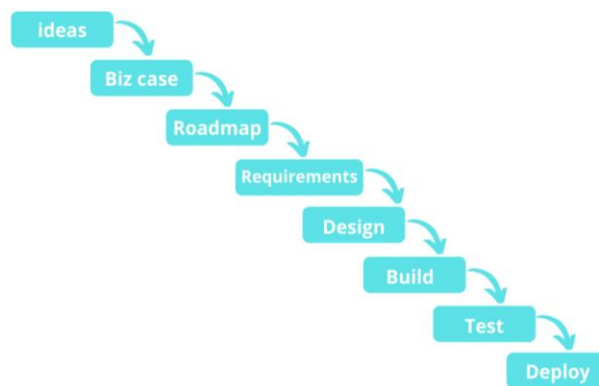
“Almost all products are being digitally driven nowadays, and organizations who don't recognize this are quickly being disrupted,” emphasizes Marty Cagan, author of the Inspired book, which best expresses the need to modify the digital product management paradigm. Despite the fact that product management is the biggest subject in business, technology and design, those startups mostly lack the concept. In the digital business sector, the term "digital product management" became a buzzword and their product management can decide whether the organization can go through healthy product life cycle procedures. With a lack of adequate management of the entire product system, product life cycle will be damaged, and major makeovers and breakthrough strategic innovation concerns will appear which will eventually lead to having disappointed stakeholders and unsatisfied customers.

The concept and role of product management are dissimilar from the design, engineering, marketing, or project management, having obligations that are more detailed and onerous. The product team is guided by product management /also known as PM/ methodologies to integrate technology and design to decode end users' obstacles while satisfying the business goals that are set in the beginning. This thesis focuses on digital products that are generated by startups which is the first stage of a company in the technological realm.[2]

A start-up, defined as a new product firm that has yet to attain a market fit, strives to come up with a product that can fuel a profitable business [3]. Fitting into the market within the financial constraints and associated limited time are the unwritten truth that every start-up needs to handle which is where product management becomes critical.

Let me simply describe how most organizations execute their digital PM phases, which begins with an idea development process that must be prioritized and is known as a roadmap. Based on the book 'Inspired' [3] explanation, the goal of the roadmap is to see which task is the essential to be accomplished and when the task is launched or handed over to the end user. Before it is built, we need business cases that analyze every idea, nailing down to the questions considering its value making, money, and time costing. Then requirement documents are expected to prepare with stakeholders' opinions from the roadmap. The requirements become the bridge that connects the designer with engineers regarding the user story or survey or map that needs to be built, then user experience (UX) design is expected to be built. QA (quality assurance) testing is done after the work to see if the concept the team is trying to launch is working properly or causing a regression. The idea is deployed to the end user after QA testing gave the team a positive result.

Above explained steps in modern digital-lead product startups, are not a preferable approach to fit the product into the market since it seems to take a very long time and at the same time lacks flexibility which makes it hard to implement within the frame of time and financial constraints as we discussed earlier. Why does this PM perspective result in many issues and complications to the product development? If we take a closer look at the steps, we can see the following problems related to digital product management processes which can cause a startup to fail. [3]



*Figure 1: Root causes of Failed Digital Product Efforts*

- Business cases:** As previously stated, the business case is utilized to determine its value creation, financial, and time costs. However, it is impossible to find them without knowing the actual product that will be built. During my internship days, this problem occurred, and the engineers couldn't tell how much time the product would take, which is obvious. Most senior engineers hesitate to even provide an estimate. However, in order to go to the next roadmap, companies need to have information to prioritize, so at this stage product managers probably make some assumptions.
- Product roadmaps:** Half of the ideas or lists of work are not going to work since the startups are ambitious. One of the reasons is that the consumer is not as enthusiastic about the product as the startup does. Also, not all task lists will follow the roadmap if the business case estimates the time and limitations incorrectly, since they have their own challenges when it comes to prioritizing.
- Product management term:** Sometimes it is difficult to distinguish between project and product managers in the workplace.
- Role of design:** UX design needs to be considered in the earlier steps but it is mostly not the case, going after requirements. In order to do so, first product managers or product

teams need to understand why UX design is so important in the product management process.

- **Late engineering:** Engineering opinion, their suggestions need to be at least in front of the business case.
- **PM methodology:** If a product team uses Agile, they should properly install it in their product management steps. Using agile in this model gives not higher than half of the value of the method. What has been described is most likely a standard waterfall technique, whose main flaw is that it always considers risks at the end. [3]
- **Opportunity cost:** Creating all those issues in the processes of product management then eventually causes the loss and waste, the opportunity cost of the company will increase according to what they sacrificed and spent in their frame of time and money.

From this brief explanation of how early staged companies operate their product management, it is clearly seen why those consequences appear during the product cycle and cause the startup not to successfully deliver the product to the customer. Those **research questions** appear according to a given problem:

*“So how can digital startups properly optimize the right digital product management processes for their operation?”*

## 1.2 The consequences and the aim of the study

The term startup is defined differently. The most common and accurate definition is a company in its early stages of operation.[4] The Socrates-funded Model Business Startup Ecosystem Model study defines startups as "a set of activities designed to create an accessible, valuable solution for consumers through innovation and a sustainable system." [5] Both ways, the term originated in the early 2000s when Silicon Valley's Dot com bubble began to emerge.[6]

Startup stages are derived from getting ideas, making a business plan, forming a team, attracting funding, choosing a location and office, making a marketing plan, and building a customer base. Most startups go through the common stages of making a long-term plan.[7]

However, not all startups are successful after going through these steps. According to the survey, 21.5% of start-ups fail in the first year, 30% in the second year, 50% in the fifth year, and 70% in the 10th year. Another study found that 11 out of 12 businesses fail.[8]

In identifying 146 common issues facing 12 start-ups, 52.6% of the total issues facing start-ups in Mongolia were related to the internal environment, including products, services, knowledge and skills of entrepreneurs, business plans, human resources, and financing. and so

on. These consequences are leading to the digital startup's failure due to improper cycle of product management:

→ **issues related to the knowledge and skills of entrepreneurs:**

- Insufficient understanding of innovation by start-up entrepreneurs,
- unsuccessful start-ups do not find solutions to every problem they face and do not have time to study the product life cycle.

→ **Issues related to business plan:**

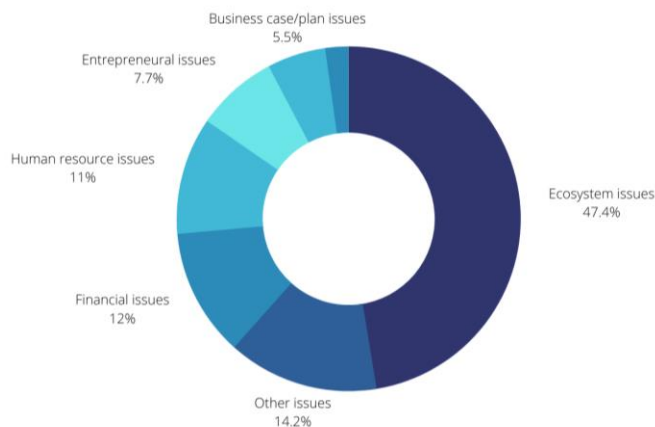
- Can't take advantage of the strategic gain due to insufficiency of business plan,
- not being able to make a good business plan.

→ **Issues related to customers:**

- customer dissatisfaction,
- Consumer stereotypes and old mindsets make it difficult to accept and use new types of products and services,
- have multiple competitors with similar products in the same market.

→ **Issues related to product and service:**

- the product is not up to date or the product is delivered to the wrong time or place
- The products offered to the market by start-ups do not meet the required standards and are difficult for consumers to use due to international intellectual design differences,
- The product is not needed in the market,
- poor quality of products and services produced by start-up businesses and lack of customer satisfaction.<sup>[5]</sup>



*Figure 2: Reasons of why startups in Mongolia fail*

These consequences are leading to the startups failure due to inadequate digital product management.

The aim of this thesis paper is to define the digital product optimization to the problems, consequences related to inadequate digital product management of the digital startups in Mongolian market. There are additional objectives specified and fulfilled in addition to this core goal:

- To introduce the principles, processes and practices of digital product management, and the main benefits of its utilization.
- To analyze the progress being made to systematize the product management process, as well as how those principles might be influenced to optimize the problems and its consequences.
- To raise these issues with leading industry professionals by means of formal validation interviews and subsequently analyze their opinions.

*Eventually, the ultimate objective of product optimization for poor digital product management in digital startups, is to make a product as credible and attractive as possible while minimizing the challenges and ramifications.*

## **2. Literature Review**

### **2.1 Digital vs non-digital product management**

Managing digital products, on the other hand, is basically the same as managing non-digital items. However, the core distinction is the availability of data between digital and non-digital product management. Simply put, digital product managers have access to and examine more data. For example, digital product managers have access to a variety of metrics derived from consumer interactions with the product that non-digital product managers do not.

Moreover, a product manager is in charge of pushing product development to market success. This is the role of a digital product manager for digital products. Software tools, applications, and any other electronic product fall under this category.

Because developers may make changes to digital goods more quickly, digital product managers are always learning new facts. This continuous learning allows them to identify pain areas and translate fresh insights into product and user-experience enhancements for consumers, transforming excellent goods into exceptional ones.

For example, TomYo edtech is a popular startup in Mongolia, their content on their application tracks their data on its users, including how many times the user opens the app and how many contents the user watches, and also their success rates. Because TomYo is a digital product, it records and encapsulates this information in real-time.

Without further user research, a non-digital product will not have this sort of data. Even if non-digital product managers collect this information manually, it will not be timely or reliable.

## 2.2 Digital Product Management

### 2.2.1 Product team

Ideally, a product team that includes a product manager, a product designer, and anything from two to ten to twelve engineers.

#### Product manager:

The product manager job has a negative image in many organizations, especially older, large companies. Companies remove employees from other organizational roles frequently which is typically project management or business analysts and emphasizes them as if they're transitioning to Agile, and don't need project managers or business analysts any longer, only product managers they need. The fact is that the product manager must be one of the company's most talented employees. It's a guaranteed prescription for failure if the product manager lacks technological acumen, financial knowledge, integrity with senior executives, deep client understanding, enthusiasm for the product, or respect from his or her product team. [3]

A product manager is in charge of determining what needs to be created and provided to consumers, as well as analyzing prospects. They normally specify what needs to be added and implemented to related backlogs. CEO's and VCs are more likely to value the product managers because the customer is at the heart of any organization and product managers are eager for all customer achievement and in charge of future product development. When a product succeeds, it is because each member of the team performed their part at best. It is, nevertheless, the product manager's fault if a product collapses.

There are four key responsibilities of a strong product manager: [3]

1. **Customer-centric knowledge:** Acquiring knowledge about customers problems, sufferings, wishes, and how they feel and purchase the product. This information will subsequently be used by product managers or teams to determine why and how their consumers act, as well as their future product direction.
2. **Data knowledge:** Product managers are continuously researching data from their A/B testing and other analytical tools regarding product problems and assessing it for their next moves during the research on product

manager's responsibilities. So, it is essential that understanding the data and their proper management is one of the strong responsibilities of product managers.

3. **Grasp of the business:** Including how it functions and what role your product plays inside it. This necessitates an understanding of your numerous stakeholders. Management, sales, marketing, finance, legal, company growth, and customer service are frequently represented by key stakeholders. In most cases, the CEO is also a key stakeholder.
4. **Become a close friend with the market and industry:** It is about significant technological developments, consumer habits and expectations, industry analyst follow-up, and an awareness in the market and customers. Also get familiar with the ecosystem of other products.

### **Product designer: UX/UI**

Designers used to take product requirements from product managers and utilize it to generate their designs. However, nowadays product designers, on the other hand, work closely with product managers and engineers throughout the product development process, from concept to delivery. Similarly, product designers sit side by side with their product manager. [3]

For the design there are concepts including user experience (UX) and user interface (UI). User experience encompasses all of a customer's interactions and touch points with the company and product throughout time. Good product designers consider the customer's journey as they engage with the product and the firm as a whole over time. As far as researching about product designers' responsibility, found few touchpoints product designers need to answer:

- How do customers first get to know the product?
- How do product designers onboard a first-time user and reveal new features?
- How do users interact at different times during their day?
- What other things are competing for the user's attention?
- How might things be different for a new customer versus an old customer?
- How do product designers motivate a user to a high commitment to the product?
- How do users share their experience with others? e.g. relatives, friends
- How do customers receive an offline service?

Prototypes are what product designers use for their communication and test their designs with users to know the viability and achievable level. Product managers come up with interaction design, particularly wireframes, to product designers. After that, a visual or graphic designer is hired to give visual design (UX/UI). [9]

### **The engineers:**

Ideally, product managers should interact directly with engineers or developers. For the issues they're working on in discovery, developers approach product managers for their ideas and comments. Also clarifying questions about the items and inviting them to collaborate on work.

As a general rule, front-end developers focus on the user experience, whereas other engineers focus on administrative specifications such as database, search, integration, and other tech specifications. Depending on the organizational structure, there are also senior engineers, principal engineers, and architect engineers. In general, any senior engineer is beneficial to product management because of the breadth of information they provide about what is achievable. The tech lead, on the other hand, has a specific obligation to assist the product manager and product designer in finding a solid solution when drafting a product requirement document and a business case, for example.[10]

As I discovered throughout my study, not every engineer, even a senior engineer, wants to participate in discovery activities since they are preoccupied with their code and believe it is not their main responsibility. However, in reality, product managers and designers need more help from one tech led to better prepare the product discoveries. Moreover, engineers have a variety of work styles in which the product manager must be aware of the optimum method of interaction.

### **Product marketing manager:**

Customer-centric products or go to market channels are especially likely to be structured as a need for product marketing which is a vital part of the product team in tech-based companies since it plays an important role in discovery, and delivery. For positioning, and a winning go-to-market strategy, modern product marketing managers represent the market to the product team. They are well familiar with the sales channel and are more in its capabilities, constraints, and current competition concerns.

### **Supporting roles: [3]**

- **User researchers:** They can assist in identifying the appropriate customers, creating the right tests to the right target of customers, and extracting the information from each user or customer contact.
- **Data analysts/business analysts:** They help teams acquire the right analytics, manage data privacy restrictions, analyze the data, arrange live-data testing, and grasp and explain the results. They specialize in the sorts of data the company gathers and reports.
- **Test automation engineers:** Engineers that specialize in test automation create automated tests for the product. They have essentially replaced the manual quality

assurance (QA) personnel of the past. The amount of test automation required to release with confidence is substantial and time-consuming.

### **Entrepreneurs and Intrapreneurs: [11]**

Entrepreneurship is defined as a person's or a group's willingness to take risks in order to create, organize, and manage a business endeavor in a competitive global village marketplace that is always changing. The examples followed by pioneers, innovators, leaders, and inventors are all characteristics of entrepreneurs.

Moreover, entrepreneurs act as a founder or product owner in product management and development within a startup framework. Entrepreneurs who are employed full-time but have a company concept they want to explore might utilize crowdsourcing to reduce risk before taking the leap. Because it provides a direct-to-consumer e-commerce sales channel, crowdfunding is a particularly suitable fit for selling consumer items.

An intrapreneur is a corporation employee entrusted with coming up with an innovative concept or project. The intrapreneur may not be exposed to the same risks or benefits as an entrepreneur. The intrapreneur, on the other hand, has access to a company's resources and talents. Intrapreneur. Differences can be seen in the fact that an entrepreneur is the owner of their own business, for better or worse, they have total autonomy and accountability. Moreover, an intrapreneur is a person who works within a company to innovate (usually a big one). For many firms, intrapreneurship has become a key requirement and a survival strategy. Intrapreneurship has resulted in improved financial returns, increased productivity, increased creativity, and enhanced employee engagement in organizations that have adopted it.

### ***2.2.2 PM methodologies /waterfall, agile, lean, scrum/***

Selecting the right methodology for a new product or new product feature will depend on preference and the nature of each project. [12] There are 4 main product management methodologies. Let me briefly introduce each of their features, benefits and drawbacks.

**Waterfall:** Waterfall is a sequential technique in which activities are completed in a more linear manner. It is a simpler process of moving tasks through the phases of defining requirements, designing the implementation, implementing the work item, verification of implementation and quality assurance, and then maintenance of the feature in the end.

First the paper of "Managing the development of large software systems" (W.Royce, 1970) introduced the waterfall product management methodology and modified as modern version which includes ideas, business case, roadmap, product requirements, design, build, test, and

deploy /which is also briefly described in the introduction part [13]. There's a good chance of providing a product that the audience won't find useful or utilize. This is because it's a linear process and once each stage has passed, there isn't room to go back and make changes. The goal in Waterfall is to deliver products on time and to budget, not to focus on outcomes and customer value, which is where the methodology often falls down. Also, it is the most used methodology for failed startups which we identified in introduction part.

Benefits:	Drawbacks:
Price and deadline are both fixed. With a high degree of precision, the cost and delivery date may be determined. Instructions that are clear. With thorough documentation available, the product team knows exactly what to do and when to do it.	One of the drawbacks is that it is tough to adjust a project after its already started to changes in needs of market or insights. This is because the project must go through the requirement specification stages if major changes are required.
	Another drawback can be matching supply and demand from customers. It is challenging to obtain meaningful input and update the product to better line with user demands since consumers only get the program once it's ready. After that this can raise the risk of failure of a project due to a lack of market need or poor customer satisfaction.

*Table 1: Benefits and Drawbacks of Waterfall*

**Agile:** The Agile approach has been developing for 30 years. Basically, the meaning of Agile is based on the process of producing software development more efficiently and flexibly compared to the traditional waterfall method that we described above. [14] The underlying idea is that new goods would be released faster, with changes made in response to consumer input.

Traditional planning, analyzing requirements, design, coding, testing, and deployment are all included in the agile development stages; however, they are organized in a cycle rather than a line /waterfall/. This indicates that the processes are adaptable, reproducible, and may occur in any sequence or in parallel that is what makes agile different from waterfall. This enables for the collection of user input, continuous testing in various situations, and modifying the project's scope on the fly.

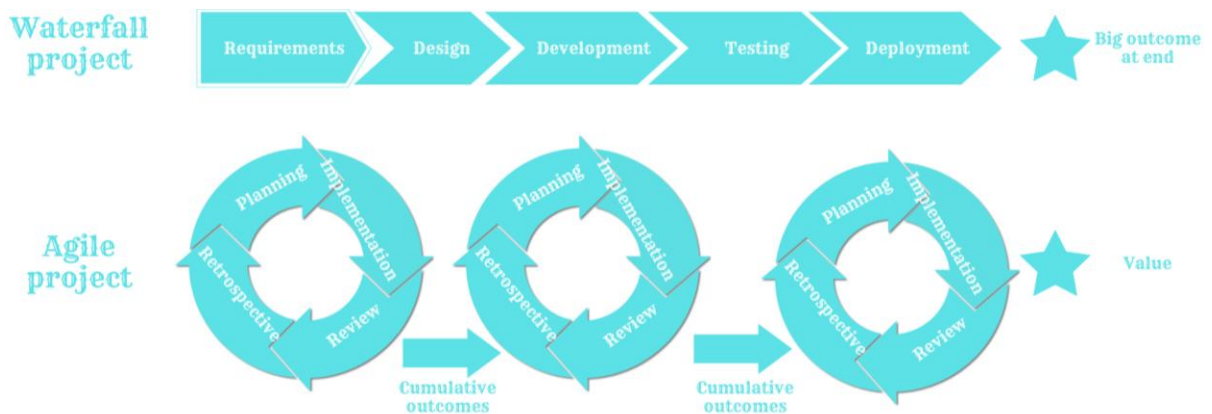
Scrum and Kanban are the frameworks that are parts of agile product management.

**Kanban:** It demands real-time capacity communication and complete work openness. Work items are visibly shown on a Kanban board, letting team members see the status of any piece of work at any time. Kanban works by restricting work in progress, and typically includes three columns: "To-do," "In Progress," and "Done." Unlike Scrum's 2-week sprints, there is less focus on the work being time-bound and more attention on the team's work being efficient. [14]

**Scrum:** Different from Kanban, Scrum teams commit to producing working software in 'sprints,' which are typically two weeks in length. In this framework, team members take on a variety of

responsibilities such as Scrum Master, and ceremonies like retrospectives to guarantee time to reflect on how the team may improve and planning are emphasized to agree on the goals and work to be undertaken in the coming sprint. [14]

**Agile vs waterfall:** The waterfall method's key advantages are its set costs and predictability. Knowing how much it will cost and when it will be delivered. The system's most fundamental weakness is its inflexibility. Whereas, the Agile Method is incredibly adaptable, and it might result in a product that is vastly different from what was initially planned.[14]



*Figure 3: Agile vs Waterfall*

The three limitations of time, cost, and scope form the foundation of the waterfall method. Any change in one of those variables causes at least one of the others to change as well. To produce a good project, the product team must balance these three opposing characteristics. By inverting the three restrictions, the Agile approach adopts a new approach. Rather than considering scope as fixed at the outset, the agile method fixes time (iterations) and cost, and then adjusts scope to focus on the most important issues. Agile is designed to allow scope to shift over time. The objective is to meet the client's most critical needs on schedule and within budget. As the project progresses, Agile allows additional requirements or re-prioritization.

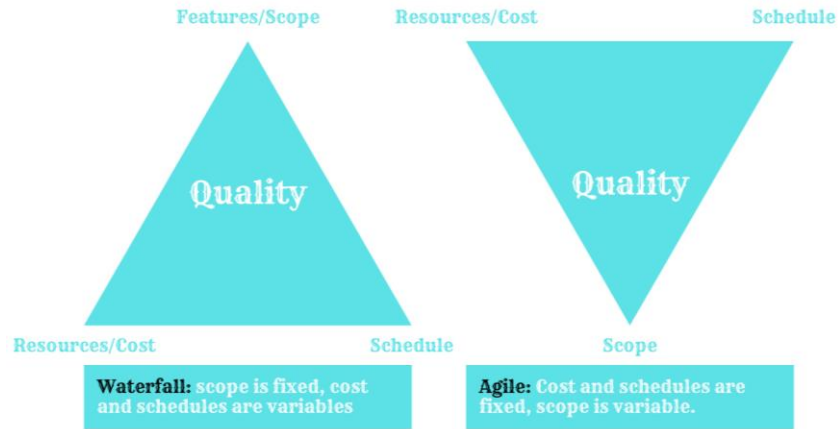


Figure 4: Quality of agile vs waterfall

Benefits:	Drawbacks:
<p>Benefit of agile is definitely detecting and defining problems faster which helps to save time and not to lose the customer due to customer dissatisfaction and queue. Because the problem is that the programs are constructed repeatedly and each iteration is checked, bugs and defects are identified early on. Productivity has increased as a result of a focus on teamwork and communication.</p>	<p>Agile projects might become chaotic if teams and related managers have not been properly introduced by Agile development and its processes. Moreover, agile projects might vary throughout its development, estimating delivery can be tricky.</p>

Table 2: Benefits and Drawbacks of Agile

**Lean:** The Toyota Production System (TPS), which focuses on eliminating waste (thus the term "Lean"), improving processes, and promoting innovation, is where the Lean approach got its start. The Lean methodology emphasizes the significance of product discovery and its ideas, particularly consumer research in the form of direct interviews, developing a minimal viable product, and minimizing waste in the development process through swift testing and revisions.

Its goal is to reduce the risks that come with starting new features and to gather user data and enhance the product repeatedly. According to the Lean method, the greatest way to gain insight about a product is to release it as soon as necessary. Through user feedback loops, the technique aids in the validation of basic assumptions. Its purpose is to mitigate the risks associated with launching new features, collect user data, and continuously improve the product.

[14]

The following are the main concerns of the Lean methodology:

- Identify target customers and their related problems,
- Create number of important product launches,
- Get aware of the metrics,
- Iterate on the product to better meet the demands of the users.

<b>Benefits:</b>	<b>Drawbacks:</b>
Based on real customer data and input, the Lean methodology allows company leaders to understand where to take their product or service.	Lean requires a lot of time to implement and product success is greatly dependent on the team's cohesion and individual dedication.

*Table 3: Benefits and Drawbacks of Lean*

<b>Waterfall</b>	<b>Agile</b>	<b>Lean</b>
<ul style="list-style-type: none"> <li>- Hierarchical approach</li> <li>- Less focus on customer needs</li> <li>- Prioritization is done once before delivery begins.</li> <li>- There isn't much emphasis on teamwork,</li> <li>- Delivering on schedule and on budget is the key to success.</li> </ul>	<ul style="list-style-type: none"> <li>- Cooperative approach,</li> <li>- Prioritization of work is ongoing in certain cases, with an emphasis on customer demands.</li> <li>- Frequently scheduled deliveries,</li> <li>- An strategy that is iterative,</li> <li>- Success is measured by the achievement of objectives and outcomes.</li> </ul>	<ul style="list-style-type: none"> <li>- Cooperative approach,</li> <li>- Customer demands are highly prioritized,</li> <li>- MVP and iterative process,</li> <li>- Success is measured by outcomes and goals in a cyclical process.</li> </ul>

*Table 4: Product management methodology comparison table*

**Design thinking:** Design Thinking is a human-centered approach to product development that focuses on addressing and solving real-world challenges. Using a combined strategy of Design Thinking, Lean Startup, and Agile, Design Thinking can be utilized as a first stage in producing products. Design Thinking enables a better and more in-depth understanding of human wants and issues. Through qualitative research, the technique aids in the discovery of solutions to a number of client problem issues. [14]

Design Thinking's five basic concerns are as follows:

- **Empathize:** Conduct an in-depth investigation of the user's difficulties. It's critical to consider the user's point of view while detecting issues.
- **Define:** Using the knowledge gained in the first stage, define the issues. The end outcome should be a problem statement that is human-centered.
- **Ideate:** Using the information from the two preceding stages, come up with solution ideas. This is when the problems are looked at from different perspectives in order to come up with new solutions.
- **Prototype:** Create low-fidelity prototypes based on all of the previous phases' challenges and solution ideas.
- **Test:** Run a lot of tests on the prototype to fine-tune the solutions.

Design Thinking may be thought of as the first phase in software development (whether using the Waterfall methodology or a hybrid approach), where you discover and understand user problems before coming up with solutions. Understanding customer concerns and developing solutions that solve them is key to building sustainable businesses.

### ***2.2.3 Product discovery***

The goal of product development is to address the following important risks: [3]

- Will the client choose to purchase it or utilize it? (Risk of value)
- Is it possible for the user to find out how to utilize it? (Risk of usability)
- Is it possible to construct it? (Risk of feasibility)
- Is this solution appropriate for our company? (Risk of business viability)

Here are a few product discovery techniques: [15]

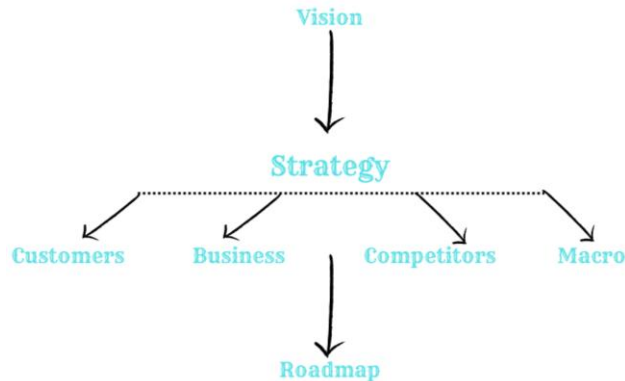
- Discovery framing technique where the product team can do an opportunity assessment to find the objectives, key results, customer problems, and target market. Also, if an entirely new line or new business is about to present, the team can use a business model canvas to assess the market and opportunity and so on.
- Following framing, simple story maps with high and low fidelity can be drafted to serve as a dynamic mirror of prototypes, to receive feedback on future prototypes, and to learn how users interact with concepts. The stories from the map are moved directly into the product backlog as discovery work finishes and moves forward with delivery. Also doing customer discovery programs to find the reference customers which helps the product team to understand where the real product market fit is.

### ***2.2.4 PM strategies and objective***

The product strategy outlines how the product will benefit the business by concentrating on the demands of customers as well as the company's overall goals and vision. The following are the key components of a product management strategy: [16]

- **Customers:** product managers must know who their target customer is, what are their wants or needs, and how to reach them with products.
- **Competitors:** a product needs to be distinct and innovative from similar goods offered by competitors.
- **Profitability:** strategy must also include how new product offers or might create revenue and assist the organization to meet its objectives.

- Macro environment:** it includes economic, technological, political, and cultural factors which have a high impact on the product.



*Figure 5: Product strategy's key components*

Once the team has decided on a strategy, they may utilize it to create a product specification that details what they will produce and when they will generate it. The product strategy then serves as a benchmark against which they will evaluate their progress before, throughout, and after production.

To summarize, every seemingly flawless launch is the result of a well-planned strategy monitored by a product team devoted to bringing ideas to reality. Vision, goals, and initiatives are all part of the product strategy. To develop a solid product strategy, the startup must first grasp the market context in which they operate. Every item of work that the team completes should have a link to product strategy. It directs both the big topics of the work and the tiny details that help to achieve the objectives.

### **2.2.5 PM roadmap, requirement and planning**

A product roadmap is a visual representation of a product's development process and a tool for conveying product vision and implementing it. It might include forthcoming features, technical concerns, and a timeline of how a product will progress. Roadmaps resemble a Gantt chart or a mind map, but different from those, they are used for strategic planning. Managers may use product roadmaps to plan activities by time and milestone, define task dependencies, and track project status as they work on the project.<sup>[17]</sup> Moreover, the roadmap is guided by existing product strategic direction, allowing the rest of the product team to focus on the most important tasks. It should outline high-level goals and initiatives, as well as the activities necessary to attain them and a schedule for completing all of the work <sup>[18]</sup>. Here is the differentiation of roadmap from other project management charts:

- Roadmaps don't go into great detail about how the team intends to integrate features, commit to release dates, or establish hard deadlines.
- Roadmaps don't include a number of features and specifications. It's all about strategy rather than execution. Focus on the vision, product direction, and challenges when creating a product plan.

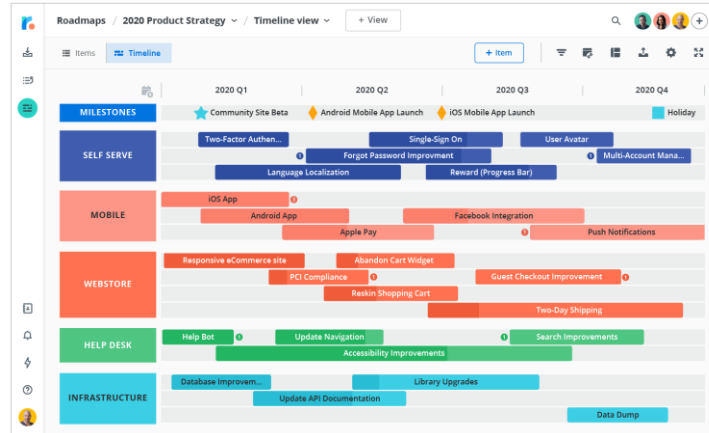


Figure 6: Product roadmap

When priorities shift, roadmaps should be simple to update. It should be straightforward and pleasing to the eye. Companies often build product roadmaps for external e.g., investors, consumers and internal e.g., employees, product team stakeholders. The roadmap lays out what company is going to do and how they're going to do it for their stakeholders. Moreover, employees benefit from the roadmap since it ensures that everyone is on the same page and is generally more thorough.

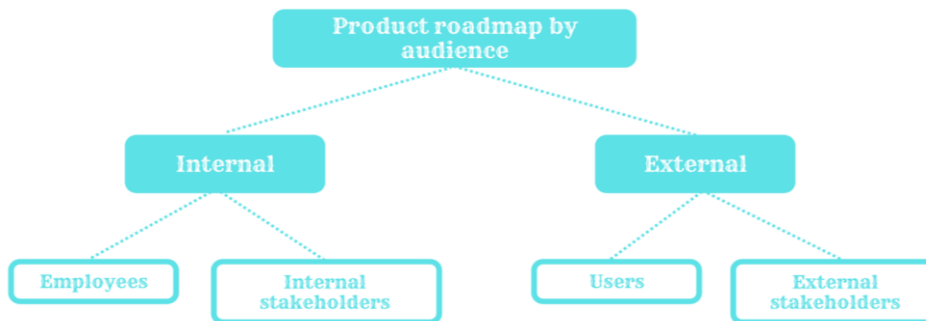


Figure 7: Product roadmap by audience

Most product roadmaps include the following items	Example types of product roadmap	Must-haves to build product roadmap
Time horizons	Timeline based	Vision comes first,
Milestones	Roadmaps with no dates	Tailor the roadmap to the target group,

Themes	Kanban roadmaps	Split themes into epics and user stories if required
Epics		Choose road mapping software,
Stories		Prioritize,
Features		Add a timeline.

*Table 5: Essentials of Product roadmap*

To sum up, product roadmaps are essential for a number of reasons. They allow internal and external stakeholders to understand critical product priorities. On that occasion, there's no need to dive into user stories or elaborate sprint timetables. Besides, roadmaps demonstrate how product goals fit into the company's overall vision and strategy. Following benefits that product roadmap brings to:

- A roadmap makes the terms easy to understand and breaks tasks into a business language that different stakeholders understand.
- A roadmap supplying the stakeholders with up-to-date information and presenting the plan which is effective when companies want consumers to feel that the development team is paying attention to their suggestions. Alternatively, it is a great chance to show how companies intend to provide the updates and related developments to the stakeholders.
- A roadmap is beneficial when it comes to work with several teams in order to coordinate their efforts.

### ***2.2.6 Prototyping***

A lot of prototyping focuses on how to address functional or usable challenges better. Prototyping solutions to unknown problems may result in a product or service that functions well but falls short of sales and revenue targets. [19]. So, it's critical to keep track of consumer feedback during this process. It's pointless to create a customer-favorite product or service that will end up costing the firm too much to be viable. Hence, prototyping is a cooperative effort. All key stakeholders, including sales teams, operations, marketing, customer support, finance, engineering, and senior management, should be included in the prototype process. Furthermore, it is critical to ensure that stakeholders understand the prototype's purpose and to provide clear context and guidelines for examining the prototype.

While prototypes assist in getting a product or service to market, the product or service in the market must modify on a regular basis to stay up with market developments from a product management aspect. Product managers must be aware of client demands and desires, and they must try to update and enhance goods and services on a regular basis. Netflix is an example of

a company that pays close attention to its consumers' demands. It is shifting its strategic focus away from DVDs-by-mail and toward streaming, in order to identify new methods to offer the material its subscribers want in the formats they want. [19]

<b>Prototyping is important for product team:</b>	<b>Advantages of prototype:</b>
To visualize the horizontal feature set (breadth) and vertical feature set (depth) necessary to satisfy each narrative if user stories articulate task-level requirements.	It lessens the possible product risk.
To create faster iterations	It solves real issues.
To get early validation concept	It communicates and demonstrates the solution to the business
To improve quality of technical side from customer's feedback	It can obtain customer feedback
To increase stakeholders, buy-in	It gains insights.

*Table 6: Advantages of prototyping*

### **2.2.7 Product Launch and Delivery**

After testing, start to work with marketing teams and sales teams to come up with a product launch strategy for release. All of the coordinated phases in a company's plan to bring a product to market are referred to as a product launch. It entails much more than simply distributing the goods to clients.

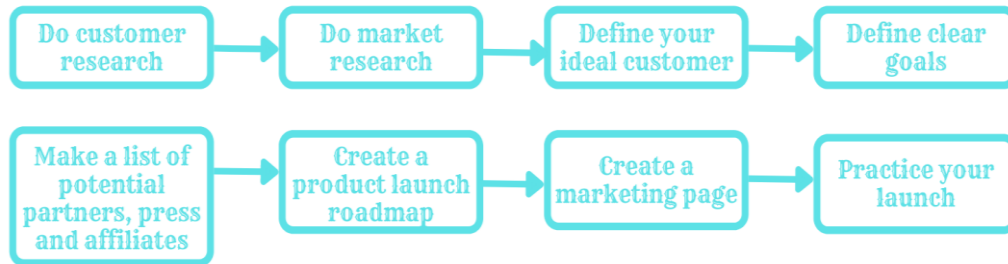
A successful product launch not only attracts greater attention and generates revenue from sales, but it may also boost sales of other things included in launch bundles. Whereas, if product launch results in failure, it can bring in more than lost sales opportunities, it can also harm brand's reputation and deliver little to no return on investment [20].

Product delivery is critical since it is one of the strategies to increase profits in the company. Moreover, product launch is a well-thought-out strategy for bringing a new product to market. The objective is to ensure that everyone in the organization, as well as the partners and potential clients, is aware of the new product [21].

It's just as vital to launch the specific product as it is to produce a wonderful product. Customers will be unaware of the solution if the companies don't do a good job launching it, and they may not meet the revenue and profitability targets. As a result, it's vital to start preparing early. Planning the product launch ought to start 4-6 months ahead of time so that when the product is ready to sell, companies will be ready to execute a successful launch.

Moreover, product launch plans to aid in the sequencing of events leading up to and including a product launch date. The objective is to ensure that everyone in the startup, as well as the partners and potential clients, is aware of the new product.[22]

A product launch is necessary to attract customers and develop traction in the market. Company may attract clients' attention with a product launch. They will learn about the company and potentially other items in addition to discovering the new offering. A product launch is an excellent opportunity to convert potential clients into committed ones. [23]



*Figure 8: Product launch strategy*

The following are critical components to include in the product launch strategy:

- Product development is required for a successful product launch in order to generate a product that people desire or need.
- Consumer and market research. Gathering input from customers and evaluating the competitors which enables the company to develop their product and identify their ideal customer.
- Allow a few clients to try the product initially, and collect feedback from them to track the development. Testing might show changes that need to be made and assist the companies in continuing to develop the product.

When it comes to product launches, timing is crucial. A competitor's launch, for example, has an impact on the launch's time. First-movers aim to get ahead of the game and attract interested purchasers. Other businesses choose to be second-movers. They wait till the public is aware of a product's features. Then, when demand increases, they debut.

*"Startups start presenting concepts, contacting investors, piquing people's attention, developing promotional materials, and then they can go on to the launch... In this respect, development can be thought of as the launch preparation."* notes Vlad Khilchenko, product manager at AltexSoft.

Devin Miller, patent and trademark lawyer and CEO of Miller IP Law, says, *"One thing I learned after my first business nearly failed is that you need to start planning for launch from the beginning of development."* [24]

However, there is no standardized structure for launching a product. The time and details of the launch strategy, according to Andrew Hatfield, director of product marketing at the Portworx startup, are mostly determined by the product type and the degree of work required to bring it to market, as well as the company's planned impact: *"We establish a preliminary launch window after we've chosen to build a new product or deliver a significant version." We shift gears and begin actual launch planning as product development proceeds and the product is declared Beta by product management and engineering. With the exception of when we expect the launch to coincide with a major industry event, such as a conference, I begin planning for the launch early."*

[25]

### **2.2.8 Product Analytics**

The most crucial aspect of a product manager's work is data analytics. On a daily basis, they employ analytics. Product analytics are critical to the success of the product. It may provide all the data companies need to make sure the product is a hit with the consumers, including insights into how they engage with it, what features they enjoy, what hurdles they face, and when they give up.

Product analytics software makes the product analytics easy for companies to better understand how their present and future consumers engage with their goods and services.

Statistics make it easy to observe the impact of changes the team makes. It allows companies to quickly perform experiments and make speedy improvements with a solid A/B testing framework. Product analytics offers important data from which the product manager and their team may derive insights.

The user is at the center of product analytics. It is more focused with how consumers engage with a product than with what the product was supposed to achieve.[26]

Product analytics aids in the abstraction of product design. It's easy to know what clients use and don't use by tracking user events. By deleting features that no one uses while keeping the most important ones, may make the product leaner, lighter, and quicker.

Importantly, product analytics help everyone engaged in the production, marketing, and usage of products.

- Product managers utilize data analytics to examine the user experience and determine what needs to be done to improve it by identifying the product's shortcomings.

- Developers and UX designers use the data analytics to be aware of consumers' experiences with the product, to detect and fix design and implementation faults. Designers can also determine which features anger consumers and address them.
- Marketing people use product analytics to market a product to people if they understand what they are doing with it. Furthermore, they may track what consumers do with the marketing information they get.

Here are some of the most important KPIs for a product analyst to consider:

- Consider the engagement to the customer journey. Collecting information on how customers got to know the product, what they did before joining up, which features they used the most (and the least), and what keeps them coming back. This data helps to fine-tune the product so that the customer journey is as smooth as possible for as many new clients as feasible.
- Customer churn is a metric that indicates when a customer has stopped using the product. (see 3.1.6)
- Customer retention is also the indicator to monitor how many customers return, on what days, and how often. Company observes what those customers with a high retention rate do, and then make those goods more accessible to others. (See 3.1.6)
- New customer indicator might reveal how much money a company spends on each visitor before they become a client (royal). Tracking whether this number rises or falls by changing the product.[\[27\]](#)
- Customer lifetime value (CLV) encompasses more than simply the amount of money consumers spend on your goods. By keeping track of this, the company can examine the actions of the most valued clients and try to persuade others to follow suit.

Product analytics is a method for determining how customers interact with digital items. It's a method for putting customers at the center of a business by studying behavioral data, recognizing conversion possibilities, and creating memorable digital experiences that increase customer lifetime value.

Moreover, product analytics allows the team to measure, evaluate, and analyze real-time interaction and behavioral data in order to improve the overall customer experience.

As textbooks say product analytics may be used by any industry with a digital platform to get insights about the consumer experience. Additionally, product analytics has been used to help organizations expand in a variety of industries, including B2B, consumer tech, e-commerce, finance, media, and more. They use product analytics in a variety of ways, including:

- Find out which customers are most engaged with this information to increase customer retention.
- Apply A/B testing to new features in order to make quick product decisions,
- Identify the hook that keeps customer to use the product,
- Offer appropriate products or services to people depending on their habits.
- Use viewer as a criterion for content selection,
- Offer customized products by combining customer insights with data from loyalty programs.

Engagement metrics	Retention metrics	Activation metrics	Acquisition metrics	Monetization metrics
Average daily active users (ADAU)	Retention rate Stickiness	Percentage of activated users Number of activations	Paid subscribers 3-month active users	Monthly recurring revenue (MRR)
Time spent on site or app	N-day retention	Number of activation funnel steps completed by an average user	Page or ad impressions	Average revenue per daily active users (ARPDau)
Pages viewed				Customer lifetime value (CLV)
Session per user				Ad click-through rate (CTR)
				Cost per acquisition (CPA) [28]

*Table 7: Some of the most often used product management metrics [28]*

### **2.2.9 Product opportunity cost**

The loss of potential benefit by choosing one concept or activity over another is known as opportunity cost. There are inherent opportunity losses whenever the company chooses to focus on a certain activity, whether it's a feature build, software update, marketing campaign, or new company endeavor. This might be expressed in terms of time or money.

As you can see, despite its name, the opportunity cost isn't always a terrible thing [28]. Startups have limited resources in both money and time. So, the opportunity cost of anything is what the company gives up to receive it, as measured by opportunity cost. This includes not only monetary worth, but also economic advantages (also known as utility), because once the company spends money and time on one thing, they can no longer spend any of those things on something else. [29]

Startups obviously all want their business to be the best at everything, but in a market, opportunity cost is taken into consideration. Every action they do has an opportunity cost, and company owners must ensure that these resources are utilized effectively. This helps new and



Corporations are also experimenting with methods and programs for working with startups. These investor and corporate trends are offering entrepreneurs more options in terms of who they deal with and how they work with them, making it easier for them to find the proper investment.

One of the key characteristics of a startup is that it seeks out and implements the Scalable Business Model. The startups involved in the startup map are testing their business model in the market, offering the products and services that consumers need, and some of them are operating in each sector with the aim of going international.[30]

### **Healthcare tech**

Due to a lack of quality in Mongolia's healthcare system, many Mongolians seek medical treatment overseas. All of the public hospitals were constructed during the Soviet era, and the medical education system lags considerably behind that of many other nations. Mongolia is similarly largely reliant on imported pharmaceuticals, accounting for 80% of the market. The system and Mongolian physicians are both distrusted. Clinica which is the pioneering healthcare technology startup offers following services: [31]

- No need to wait: The average time it takes for residents of rural areas to receive specialized medical treatment is 9 days. Hence, healthcare tech startups in Mongolia have a huge impact on society in many ways.
- Anywhere, at any moment: With the power of the internet, you may access medical services and schedule a visit with a doctor from the comfort of your own home, the countryside, or anywhere else.

### **Education tech**

EdTech or education technology refers to hardware and software meant to improve human learning outcomes by enhancing teacher-led learning in classrooms. It makes learning easier, practice. When edtech is used as an acronym, it refers to the industry of firms that develop educational technology according to Jake Frankenfield, 2020.

Educational inequality is the root cause of all poverty. For instance, if you live in a rural area, your source of information will likely be television or social media. This means people could end up not knowing that they can study or learn languages online. For example, TomYo EdTech startup in Mongolian market digitizes educational content. [32]

### **Marketing tech**

Marketing technology or MarTech is used by marketing executives to support mission-critical business goals and foster innovation inside their firms. The startup itself has been rapidly expanding and uses technology to deliver effective digital marketing solutions to large

corporations, small companies, and everyone in between. [33] Erxes is one of the leading MarTech startups in Mongolian market and they are expecting to become the first unicorn in Mongolia. [34]

### Media tech

Startups in the media technology field create solutions for media technology issues. Media teams and managers may use software to improve content ideation and scheduling procedures, allowing them to continually simplify their offerings. For example, those startups give content production teams, data science teams, and marketing teams in media organizations the tools and platforms they need to enable automated content generation or mixed reality experiences [35]. Lemon Press is the first email-based media tech startup and has over 30,000 active readers in Mongolian market.

### Supporting organizations:

- **Incubators:** A program designed to nurture new ideas and innovations. It is usually formed near a non-profit university. Startups such as Insur, One Fit and Oculus were born in the NITP incubator in Mongolia.
- **Accelerators:** This includes programs designed to help startups grow and gain a foothold in the market. MCS Ventures is planning to announce the registration of a new accelerator called MStars Hub.
- **Intermediate Office:** It has been a good idea since 2005 to offer a reasonable price because it is financially difficult to rent a direct office to start-ups that are just starting out. There are more than 11 joint offices in Mongolia, such as Work Central Mongolia, Startup Terminal and SMS.

According to the Global Startup Ecosystem 2020 Detailed Report, Mongolia is ranked 93rd or in the top 100 countries, and Ulaanbaatar is ranked 690th out of the top 1,000 cities.

The Israeli startup data portal Startup Blink is a research center for startup ecosystems, with tens of thousands of worldwide startups registered. news organizations. The report states, “Ulaanbaatar is at the heart of Mongolia's information technology sector, and Ulaanbaatar's startup ecosystem has developed rapidly over the past few years, with many talented technology startups emerging and leading the country's economy in a new direction. There is a future for the hub.” [36]

## **2.4 Product Optimization**

### ***2.4.1 PO in digital product management***

In today's world of rapidly changing global technology, digital product optimization must keep up with the evolving digital product management. The term can be explained as the activity of making adjustments to a product in order to make it more attractive is known as production optimization. The purpose of digital product optimization is to improve the digital products through product planning, analytics, measurement, personalization, and experimentation.

Product improvement can have a significant financial impact. There is a statement saying that one correct measurement is worth more than a thousand expert judgments," as Grace Hopper (one of the earliest software developers).

The product optimization practices in the context of pre-release optimization and post-release optimization practices [37]. For example, considering digital product management processes, the examination can take place emphasizing product discovery, planning and testing as a pre-release optimization whereas product delivery and product analytics and development can be discussed in the context of post-release optimization practices.

### ***2.4.2 PO in digital startups***

The process of modifying and upgrading a product to make it more beneficial to current consumers and more appealing to new ones is known as product optimization. Product managers need to optimize the product at the early stages of product management or development to ensure that it is ready for launch.

Eric Ries, author of the Lean startup emphasizes that product optimization is different from product discovery. The product then can be optimized after the product is discovered and found its market fit.

Every developing product and even a finished and ready-to-use one, startups need optimization procedures.

## **3. Methodology part**

### **3.1 Digital product optimization on its process**

As the literature review part explained, there are common 6 steps of digital product management processes including product discovery, strategy, planning and roadmap, testing and prototyping, launch and delivery, and product analytics and development. During the research interview on best practices of digital startups in the Mongolian market, some compelling examples

have occurred emphasizing how they properly optimize their digital product management as a process and as a whole. With that in mind, the following topics and explanations will cover their optimization practices in digital product management accordingly.

### **3.1.1 Digital product discovery optimization**

**Benchmarking:** Early-stage startups as we know have several obstacles, but benchmarking may assist to identify their product-market fit and give directional information.

Benchmarking refers to a continuous process that compares the goods, services, business processes, or working methods to those of other companies that have already successful markets. Companies can enhance their business success by comparing and grading their offer, techniques, and outcomes, and by gaining insight into best practices in the process.

Moreover, benchmarking can help startups to compare their startup performance to that of other firms using key performance indicators KPI, and it necessitates a comprehensive investigation of their rivals' measurements. This can be a time-consuming procedure; however, it is way more beneficial to develop a stronger strategy for the startups [38].

In the product discovery phase, market research and benchmarking take such an important role in better optimizing the product to market in the dedicated industry. Market competitiveness assists startups to push them to discover the high need for customer problem-solving products in the market. With competitiveness, the product teams or entrepreneurs are sharpened and motivated to bring higher quality products than their competitors.

During the qualitative interview research, there is a media technology start-up called Lemon Press that conducted benchmarking in their industry well in terms of internal and external practices. In the Lemon Press example, they are new to the idea, and optimizing the idea to benchmarking helps them to get familiarized and visualized it as an existing market competitor and guides them to go in the correct direction by exemplifying the benchmark. As stated by Ankhbayar who is the CEO of Lemon Press, one of the core optimizations first started with benchmarking other similar product businesses in the field and began to optimize their observed product idea into product discovery.

**Personas:** The persona is a helpful technique for characterizing the ideal customer. Personas are "a detailed characterization of our user and what he/she desires to accomplish," according to Alan Cooper, author of *The Inmates Are Running the Asylum*. "Personas are not real individuals," Cooper adds, but rather "hypothetical archetypes of actual users." Many UX designers and product teams who believe in user-centered design employ personas in their work. He also

recommends utilizing personas earlier in the product development process since they are an excellent method to capture the target group and target customer hypothesis rather than they are most commonly used in the design phase.

So, the insight that determining the target customer is vital in prompt product activities, mainly occurring in the product discovery phase. Developing a persona (see Appendix 2) helps startups to better visualize the ideal end customer and whose problem is then solved by a new product idea.

For example, in the Lemon Press example, they defined their ideal customer persona in terms of buyer and user to optimize their product idea to better discover their product in the sense of the target customer situation. The process includes being questioned by entrepreneurs themselves by considering what problem they are solving and who has that problem and who are going after to interview existing or new customers to create an end-user persona. During the interview, Baasandorj, CEO of Clinica healthcare technology startup referenced that emphasizing user and buyer persona is vital to be determined since personas represent certain behavior patterns, therefore without these patterns and model expectations the team cannot interface our product fit into their current problem.

Therefore, for the startups, entrepreneurs fully investigate their target consumer and hence it empowers them to gain a deeper understanding of their customers and make more customer-centric decisions in product development, marketing, and sales, to name a few areas. It gives them the clarity they need to make the most use of their start-up's limited resources [39].

**Product backlog:** Another dominant product discovery optimization can be a product backlog. When developing the different ideas, the challenging obstacle almost every entrepreneur faces is prioritizing the tasks for the development.

The term itself indicates the features, tasks, tasks in progress, and executed tasks are organized in the product backlog according to their progress toward implementation. A backlog is organized following the most critical features are at the top and the least important ones are at the bottom. Considering the case where bottom-line tasks are kept under previous sprints and are about to be implemented in the following sprint. Here product discovery comes from the product backlog and can be organized as optimized with new product ideas. For example, Erxes which is a marketing technology startup in Mongolia has this product discovery optimization strategy. Their strategy follows if low priority tasks or tasks that require more than one sprint or require a lot of resources including human and budget, those tasks will be kept under product backlog and managed by the product owner him/herself (i.e. entrepreneurs, founders, CPO,

CTO). Then if another task or source that can be interconnected to those tasks appears, it is a perfect opportunity to connect the backlog tasks to the new ones and prepare to be progressed by developing the following next steps. This product discovery optimization has a beneficial effect on a company's partnership and ecosystem aspect if they can bring a high value to their activities.

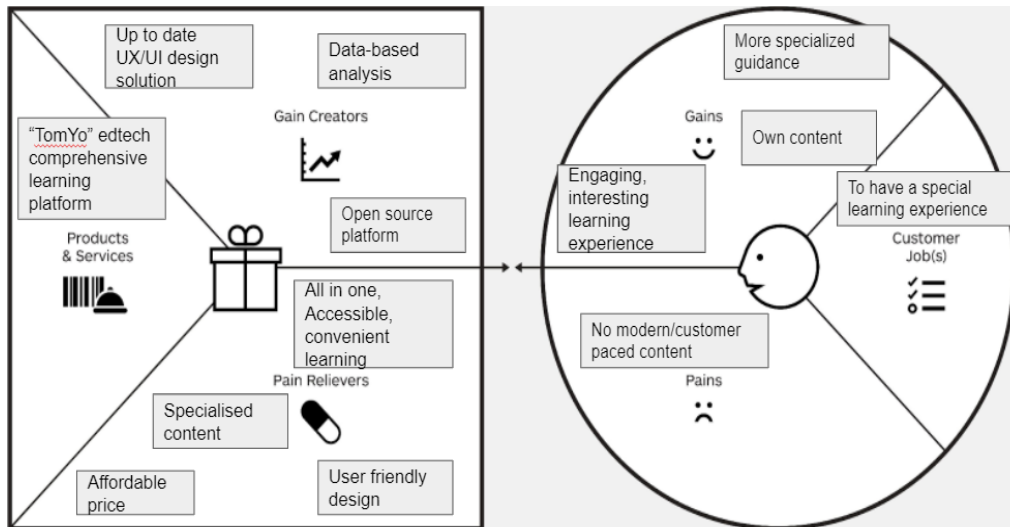
**Customer feedback:** Most of the new features of the product are discovered by customer feedback if it is an already launched product to the market. Product managers optimize customer feedback by conducting various forms of surveys for example long form-based, short in-app, customer satisfaction scores, website feedback widgets, customer interviews, transactional emails, suggestion boards, and so on [40]. Those customer feedbacks then play as a new feature to the existing product or can have a possibility to create another product discovery.

For example, TomYo educational technology startup in Mongolia has different customer feedback channels and platforms and two of their three edtech products (tomyo skills, tomyo drop blok) came from customer feedback during their first product development phase.

Hence, customer feedback matters in the sense of new feature product discovery. All entrepreneurs or product teams need to do is to increase their customer feedback channels and platforms and take every feedback and suggestion as thoughtfully as possible.

**Value proposition:** A value proposition is a brief statement that explains why a customer would select the specific startups' product or service above other competitors in the market. It expresses the most obvious benefit that users obtain by choosing the product. Moreover, a value proposition focuses on the issues entrepreneurs are trying to address for customers and what makes the product or service the best answer to the existing problem. The canvas itself is a visual tool for positioning the product around the demands of consumers and the purpose is to figure out how the company or startup adds value to the market. One can be used to introduce a new offer to the market or to improve an existing one [41].

Erxes has their best example of determining the value proposition canvas. As we know now, a user persona is prepared first hand including their pain points and expectations, after that start to create the value map for their product considering gain creators and pain relievers. The next step is to figure out where the value they offer fits into the user profile. The whole process then allows the startup to utilize a rating system that prioritizes the products according to how well they fit the user profile.



*Figure 10: Value proposition map of TomYo edtech startup*

### 3.1.2 Digital product vision, mission and strategy optimization

**Stakeholder mapping:** While interviewing Gereltuya, product manager of TomYo world, she derived some important terms including vision, mission, and strategy into detailed consideration. For example, a company vision plus having a clearly defined mission and value proposition would be quite beneficial. Even Though the company strategy has a wide concept when it comes to covering all company activities in one document, it needs to be interconnected with its vision and mission statements. To obtain a clear picture of the product vision, she inquired around and found out what the founders and core team have been working on, what kind of relationship they already have with their users/market, and what are their moonshot goals for the product. It's much better if they've set huge overarching measures like the North star.

For its strategy optimization, she has a few main concerns when developing the product strategy while working on every product she is involved with. Firstly, a company's internal and external stakeholder needs to be well defined in the framework of all production activities. In this stage mapping out internal and external stakeholders of the project, she was working after a few weeks of data collecting and observation, such as end-users, content producers, and the engineering team. This stage may be seen as developing market and user personas and can be followed by market research, if necessary, whether or not the product she was working on already has existing users. The next step is followed by defining entities where an entity might be anything from a single stakeholder to a complex system of interconnected product components where she then starts mapping stakeholders and entities inside and across groups to acquire a complete understanding of previous, present, and future product development. Empathy mapping focuses on stakeholders which are to identify any potential pain areas for remedies that can be proposed,

as well as any potential gain points for which the stakeholders' experiences may be amplified. This stage leads to value propositions for stakeholders. Communicating with random and focus-group users, learning about their overall experiences with the product, providing customer service, and reading and analyzing public evaluations were all quite beneficial in this case.

To determine the product's overall priorities, compare the pain and gain areas identified with market research and internal resources. This stage tells us about product positioning from the internal perspective; however, adding external analysis such as competition research will provide us with the real product placement in the market. This stage, when paired with current company-wide business goals, produces unique features for product differentiation. Then the company may collaborate on defining product metrics and can locate it to for example North Star.

**Single/multi product strategy:** As we know, the start-ups in the early stage have limited resources in terms of labor, time, and budget. Likewise, to successfully market their product to the market, they need the right strategy for their right product. Therefore, some startups come up with single and multi-product strategies to optimize their product strategy.

Strategy	Definition	Pros	Cons
Single	What is meant by a single strategy is that a company only sells one product or one version of a product.	Giving full attention to only one product, brings beneficial effects if it succeeds.	Has a high risk of failing a single product
Multi	Having different product development managed by the same company.	Beneficial, if the products are not competitive.	Difficult if a company has limited resources.

*Table 8: Single and multi-product strategy*

For example, Lemon Press media tech startup followed a single product strategy at its early stage. As their CEO stated, this method helped them to optimize their product strategy and successfully market the product. As we know their product is an e-newsletter and they focused only on the newsletter quality and highly content centralized. The company can focus solely on making a one truly fantastic product. Companies may focus on fine-tuning the finer elements of their primary offering, making it considerably superior to the competitors, without the distractions of producing, promoting, and selling several things. It also gives start-ups at their early-stage razor-sharp focus in their marketing efforts, allowing them to select the highest-quality channels and source traffic that converts swiftly into satisfied consumers since they are limited resources at the early age to market the product. The company chooses a single product strategy to have

the opportunity to be niche, and instead of creating a product that caters to everyone. Targeting the market's long tail can be extremely profitable since they will be able to quickly grab the majority of people who feel underserved. The CEO of Lemon Press also addresses that Instead of dividing the efforts over several channels, they can swiftly create their product by focusing on one product and one type of user. They can get to know their consumer better and become more responsive to their shifting demands as a result. Simultaneously, this optimization strategy then becomes flexible enough to revise their product offering to meet those demands by Danny Wong, 2011

**Competitive advantage:** Competitive advantage is some kind of ingredient that enables a company to produce their product and services better or have a more beneficial effect on the company's activity than its competitor in the market. In comparison to its market competitors, these variables enable the production unit to create more sales or higher margins according to research Alexandra Twin, 2021.

When developing a product strategy, a company's competitive advantage plays an essential role and shapes customer behavior towards its product. For example, one of Erxes MarTech startup's competitive advantages is to allow their customers or users to see and get to know the code behind the product on their open-source. Using their open-source, any user can contribute to the product and even have a possibility to engage in fixing or developing the code since it is open and transparent to any participants. Therefore, in that Erxes example, they developed their company product strategy in front of their open source as a front weapon and have already built successful optimization on their product strategy.

### ***3.1.3 Digital product roadmap and planning optimization***

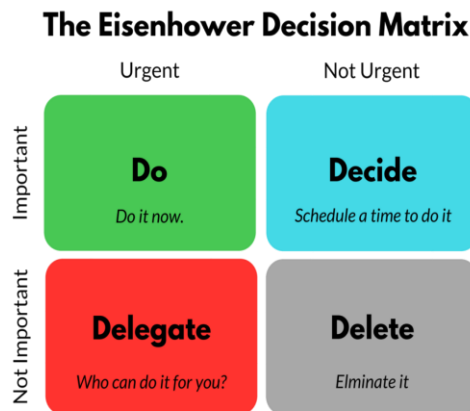
**PRD writing /product requirement document/:** A product requirements document provides a product's specifications, including its purpose, features, functionality, and behavior. It acts as a roadmap and planning for business and technical teams working on the product's development, launch, and marketing. According to Dan Radigan, 2020, PRD defines what a product team or business will produce or design in as much detail as feasible, taking into account all of their qualities and requirements.

In the product planning phase, optimizing what product to build or develop is important for both developers, operations, finances, and marketing. Any digital product startups write their product requirement document and hand it over to the company's foundation three departments (operations, marketing, finance). Product managers or product teams can use the Lean methodology to iterate their PRD writing process because it is not easy and not completed at an

early age as fast as possible. For example, if a product manager is assigned to prepare PRD for a new feature to a website widget, he/she first needs to contact the related responsible people. In this stage, product managers should have a call with a developer from the developer team to better align with what is required to complete and how much time the feature would likely require from a technical side. Then product managers need to develop it as a marketing and financial side. If any of those three has some kind of uncertainty or blockage, PRD can be postponed to after the testing or prototyping stage.

During the research, I found some startups write their PRD at an early stage not having clear information on the coming progress, which results in waste which then has a threatening effect on their limited resource. The best practice for this process is Erxes, and in one marketing platform, they use Lean methodology on their PRD writing and increase its effectiveness and reduce the extra costs to develop the new feature or product. All product managers need to know is that PRD is not completed without any concrete technical, financial, and marketing aspects. Although PRD is at the heart of any product implementation, it cannot be written wrongly and sent to other responsible departments. So, it is okay to write it iteratively after prototyping and getting feedback and suggestions.

**3D Eisenhower matrix:** When creating a roadmap considering the tasks available and likely to be available, the product team or product managers need to allocate the tasks according to any criteria to better plan their work in terms of duration and resources. High to low priority task allocation is the most commonly used optimization method of product managers, one of the examples in the TomYo case. Their product manager uses 3D Eisenhower matrix for their product task allocation on the roadmap.



*Figure 11: The 3D Eisenhower decision matrix*

She included a frequency coordinate to the 3D Eisenhower Matrix urgency and priority coordinates and utilized it with the reasoning below:

<b>Tasks that appeared once visualized as</b>	<ul style="list-style-type: none"> <li>- Urgent and not important =&gt; Do,</li> <li>- Not urgent and important =&gt; Schedule,</li> <li>- Urgent and not important =&gt; Delegate,</li> <li>- Not urgent and not important =&gt; Eliminate.</li> </ul>
<b>Recurring tasks visualized as</b>	<ul style="list-style-type: none"> <li>- Do =&gt; Do once and automate the solution,</li> <li>- Schedule =&gt; Plan as the main focus of the teams,</li> <li>- Assign =&gt; Assign once, deep dive into the cause of the task and automate future assignment,</li> <li>- Eliminate =&gt; Eliminate once, deep dive into the cause of the task and automate future elimination.</li> </ul>

*Table 9: 3D Eisenhower Matrix priority visualization*

**Agile OKR:** Most of Mongolian digital startups use agile OKR on their product roadmap and planning. It is in the framework of agile methodology and refers to product objectives and key results to track and get to pursue the right path by measuring the initial purposes and objectives. Overall, it can be said that goal setting framework. The structure of the agile OKR and user story looks like below:

I will (objective) as measured by (this set of key results).

As a [type of user],

I want to [do something],

so that I can [desired benefit].

Agile OKR is used not only in product strategy but also in employees' everyday tasks. For example, in the Erxes, their employees track and measure their work results as their OKR goal setting. If a product manager is in charge of creating a wireframe for new features requested by a front-end developer. The OKR and the user story will be written as follows:

As a product manager, I will draw an incomplete product feature wireframe, so that the front-end developer will have a clearer picture of developing the feature as drawn in the wireframe.

**Product manifesto:** Simply described, a product manifesto is a set of aspirational principles and standards that guide product managers in the same way that an Agile manifesto supports software developers.

Gereltuya, product manager of TomYo addresses that recent product planning can be optimized by some product manifesto principles.

**Agile timeline:** When planning the product roadmap, it is essential to what methodology to choose to be working with. As stated in the introduction part, many startups believe that they are implementing agile whereas they are half agile and half waterfall or whatever method as a mixture. In pure agile working methodology here, it is explained as its timeline with clear definition which is produced while interviewing with Ms. Gereltuya, TomYo product manager.



*Figure 12: Agile approach by a timeline*

- **Strategy:** The concept or feature is compared to the foundations of the company's goals, and if it corresponds with the strategy, it advances to the next stage.
- **Roadmap:** It is assessed against the roadmap and assigned a priority. The item is then moved to the backlog.
- **Backlog:** If it hasn't been scheduled yet, it will be added to the backlog's outstanding items. The backlog will be refined with the addition of the concept or feature if it is to be planned for the current planning timeframe. After that, it advanced to the proper sprint. A Product Design Doc will be developed, revised, and ideally finished at this point before the sprint that will kick off the first iteration. This document seeks to define the needs of the chosen concept or feature from the user's, businesses, and technical perspectives.
- **Sprint:** One sprint is usually enough for one iteration/execution of a concept or product. The sprint backlog will be made up of tasks completed throughout the iteration, and the team that will submit the task outcomes at the conclusion of the sprint kick-off meeting will estimate and score the tasks. It's worth noting that a sprint team can include people from several overall teams who are cross-functional. We begin work on the tasks after reaching mutual agreement on team deliverables.

- **Daily stand up:** Every morning, team members meet to review what they worked on the day before, any challenges to their tasks, and what they will focus on the next day. The meeting's objectives are a very speedy sync and block-elimination.
- **Retrospective:** Things seldom go as planned, and there are always chances for improvement, optimization, and learning. Team members question what is working, what isn't working, and how they might improve things during retrospective sessions.

**Resource allocation:** Having good resource allocation is at the heart of the product planning process. Erxes provides a good example, with their resource allocation stated in their product plan. Hence, it allows the viewer to see the task with the allocated resource as understandable and comfortable. When it comes to resources at a company, the human resource, budget, and time resources are the most important.

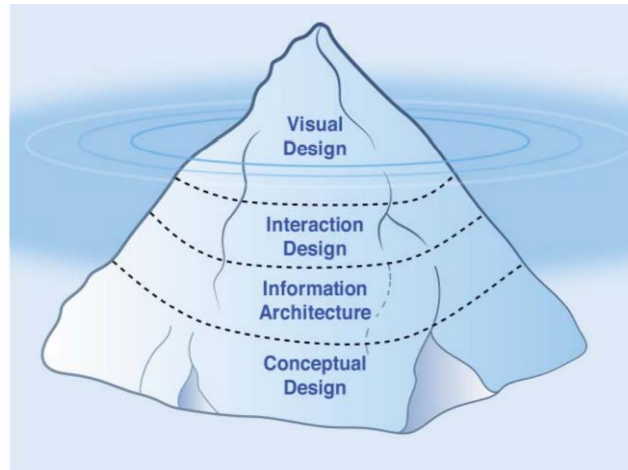
### ***3.1.4 Digital product prototyping and testing optimization***

**Good UX:** Practicality and pleasure are two key characteristics of a successful UX design as indicated in the book *The Lean Product Playbook* by Dan Olson. [42]

Practicality is concerned with the goals of users and the tasks they must do in order to reach those goals. How many users are able to accomplish each task successfully? How many people are able to do so, but have issues along the way? Product manager or product team can get answers to these problems by doing practicality testing.

Pleasure is answered by the question of "Do the consumers like utilizing the product?". The product has aesthetics or not, ensuring that the product seems appealing, is one part of pleasure testing. Customers see the product before they use it, and it's important to make a good first impression. A pleasing design may convey a feeling of high quality, increase the credibility of a product, and put people at rest.

So here is the question: how can the team develop a user experience that is both usable or practical and enjoyable for their customers? Creating a great user experience necessitates expertise in a variety of domains, which is referred to as UX design.



*Figure 13: The UX design iceberg*

Let me explain each iceberg layer in detailed as possible: [42]

- **Conceptual design:** The iceberg's bottom layer, conceptual design, is concerned with the fundamental idea that the product designer uses to construct the product. The conceptual model should, in theory, reflect how company target clients think. A product with a well-thought-out conceptual design is intuitive and simple to operate.
- **Information architecture:** IA for short is the second layer from the bottom of the UX design iceberg. IA is the design discipline in charge of determining how a digital product's information and functionality should be organized. Multiple pages or screens are common in products, and there are a variety of methods to organize them.
- **Interaction design:** It dictates how the product and the consumer interact. User flows are defined by interaction design followed by what actions can the user perform at each phase, and how will the product respond? It also determines how users enter data, for example, via a form. Every user interface control or link with which the user may interact is included in interaction design (click, hover, drag, type, tap, swipe, etc.).
- **Visual design:** Visual design is the top of the iceberg and the aspect of the product that anyone looking at it will notice first. Graphic design, look and feel, and chrome are all terms used to describe it. And, like the chrome on a car, it has no bearing on what the product performs or how they use it, but it does influence how it seems. Aside from generating an appealing product, effective visual design contributes to ease of use by reinforcing the visual hierarchy. It may also communicate a

company's brand's personality, excite users, and set the product apart from the competition. Color, typography, and graphics are the three main elements of visual design.

Therefore, good UX design can optimize product prototyping in a way of customer practicality and pleasure. The next step after creating a good UX design, the team can begin to work on their MVP /minimum viable product/ and test it with customers by beta program, etc.

**MVP (minimum viable product):** The product managers or product team doesn't begin by creating a new product that fulfills the whole value proposition since that would take too long and be too risky. Hence, they want to determine the bare minimum of functionality for the MVP to ensure that they are on the correct track. Both theories and what product managers or entrepreneurs believe are fraught with ambiguity. That is why they should begin by determining the minimal viable product. If they test their MVP and discover that their assumption was incorrect, they will have to reconsider their hypothesis about what is required to address. Here user stories also can appear.

For example, Erxes has skillfully adapted the MVP on their newly designed product or feature. They create the MVP prototype and do qualitative and quantitative tests in terms of product and marketing tests.

	Qualitative Tests	Quantitative Tests
Marketing Tests	Marketing materials	Landing page/Smoke test Explainer video Ad campaign Marketing A/B tests Crowdfunding
Product Tests	Wireframes Mockups Interactive prototype Wizard of Oz & Concierge Live product	Fake door/404 page Product analytics & A/B tests

Figure 14: MVP Tests Categorized by the type

- **Qualitative test:** Anything the team or managers like to put in front of a consumer qualifies as marketing material including a landing page, a video, an advertisement, an email, and so on. This test is an attempt to figure out how and why people find this marketing content interesting. [42]

Indra, CPO at Erxes emphasizes that the five-second test is a useful technique to assess the overall messaging. The goal is to show customers the home page or landing page for five seconds and then ask them what they remember and loved about it. Because people often make snap judgments about products, this might be a good way to see how well the marketing communicates what the product does and why someone would want to use it.

- **Quantitative test:** Quantitative marketing tests can be used to confirm demand for the specific product. The team or managers may also utilize them to improve the acquisition and conversion of prospects into consumers. These tests can give considerable learning with huge sample sizes since they capture user behavior.[42]

The landing page or smoke test is one of the most common tests. The team or managers develop a live web page. The landing page highlights the product the team wants to produce and invites buyers to express interest by clicking a "sign up" button or clicking a link to a cost related page. Because there is no genuine product for customers to use yet, it's also known as a smoke test. Instead, the customer is often presented with a "coming soon" page that thanks them for their attention and asks for their email address or other contact information.

These tests are then measured by conversion rate (see 3.1.6). It is the proportion of guests that clicked on the button to convert from a prospect to a customer. Erxes uses this method well since they are a marketing technology start up and their conversion rate has a high by indication of implementing this smoke test.

Increase engagement and retention	Optimize conversion rate	Improve A/B test
Increase customer value	Personalize experience	Personas

*Table 10: Benefits of testing the MVP with customers*

### Wireframes:

Wireframes, mockups, and interactive prototypes are common product design deliverables. The wireframe, a low to medium resolution depiction of a product that offers a feeling of the product's components and how they are arranged, is the design artifact with the next degree of fidelity.

Drawing wireframes for the new product or feature is one of the main tasks of the product managers in digital product companies. Product managers draw the wireframes of the product and then hand it over to the front-end developers to develop it.

**Live products:** Customers can also be used to test live items. Before constructing the dedicated MVP, the team or managers should have verified its design with clients by testing successively higher quality artifacts. When they've iterated to the point where they are confident that they have confirmed product-market fit, the team goes on to construct a true MVP.

**Marketing A/B testing:** A/B testing, often known as split testing, is a quantitative approach as described above and compares the performance of two different designs on a key measure, such as conversion rate. The team or managers may use A/B testing to compare the performance of different versions of the marketing materials. They may test two alternative versions of the landing page, each with different language, pricing, photographs, colors, and other design aspects, to see which converts better. A/B testing is also possible with most other digital marketing materials, such as advertising, videos, and emails.

Popular A/B testing tools include Optimizely, Unbounce, KISSmetrics, Visual Website Optimizer, and Google Content Experiments (part of Google Analytics). These A/B testing tools allow the team and managers to create multiple variations of products and then distribute traffic among them at random. They keep track of the outcomes for the conversion action they are interested in and show how each variant is performing, as well as the statistical confidence level associated with it.

In Erxes martech, they create a group of people for marketing, and operations and assign them to do A/B testing as a marketing and technical side. Those bunch of people then analyze the testing and report it to the product managers or owners and get the final results by using different A/B testing tools and approaches as indicated above.

**Crowdfunding:** Crowdfunding sites like Kickstarter and Indiegogo may help the team to figure out if people are willing to pay for the goods and how much demand there is. People who wish to produce and sell a product may use these platforms to market it and receive payments from customers who want to buy it when it is released. The team or managers may establish a fundraising goal for the product and only commit to developing it if they meet it. It can assist them in removing the ambiguity of whether or not the goods will be paid for.

**Beta program:** Another product prototyping and testing optimization is organizing the beta program for the new product or feature.

It is a software pre-release that is sent to a broad number of users for testing under real-world settings. Beta versions have gone through internal alpha testing and are typically close to the final product in terms of appearance, feel, and function.

There are open and closed beta tests available. Anyone can use the product in an open test, they are generally informed that the product is in beta and offered a way to provide feedback. Closed beta testing is confined to a small group of testers, which might include current customers, early adopters, or paid beta testers. They are sometimes carried out by sending a particular percentage of people to the beta site rather than the current release. For example, Erxes martech startup uses both open and closed beta tests. Their strategy is to do an open test for the big newly presented product feature and a small product update for a small group of testers as a closed testing way.

Overall, beta testing is the final phase of testing before a product is released to the general public. In this controlled environment, the goal is to find as many flaws or usability concerns as possible.

**System integration testing SIT:** System Integration Testing is a type of software testing that evaluates overall system behavior in an integrated hardware and software environment. It's a type of testing that's done on an entire, integrated system to see if it meets the given standards. It is one kind of quality assurance part.

Clinica, a healthcare tech startup test if all related systems are tightly integrated with all technical specifications. Their main advantage is that SIT is conducting almost every new pull request. It then has a beneficial effect on their system viability and availability in terms of customer satisfaction and employee satisfaction.

To sum up, it is a sort of software testing that is performed in an integrated hardware and software environment to ensure that the entire system functions properly. It's a type of testing that's done on an entire, integrated system to see if it meets a set of requirements (Thomas Hamilton, 2022).

**User acceptance testing UAT:** When the product team runs a test to check if a digital product fits the business objectives, they call it user acceptance testing (UAT). Before going on to production, it is the final step of digital product development. It is done by the end-user to test a software system before deploying it in a live environment.

Healthcare technology startup Clinica has the best example of adapting UAT. Most startups left this UAT considering they have already tested their product's MVP with customers

and left satisfied with their results. However, it is important to refer to every customer feedback and specifications carefully again with their product and again test it one last time as a technical consideration.

Overall, UAT is the final stage of the software testing process. And, actual software users evaluate the program during UAT to ensure that it can execute required tasks in real-world circumstances and meet requirements. UAT is one of the last and most important software project procedures to complete before releasing a new product to the market (Matthew Setter, 2022).

**Rewarding activities:** Any product testing optimization method that we discussed above can have rewarding activities which incentivize the people to participate in the testing. For example, Erxes martech's marketing department encourages the people to take part in their beta testing program as a closed or open and offer their free merch and free months of subscription. Moreover, if a person actively joins their open-source platform they give them stars in return and maintain a friendly relationship with their cooperators.

### ***3.1.5 Digital product launch and delivery optimization***

**Product marketing:** Lemon Press media technology start-up used one-pager for their product in the early stage. It is one kind of product marketing and prepares for the product launch and delivery in the end.

Because companies employ one-pagers for product marketing, it's sometimes referred to as a product one-pager, which refers to a single page that contains a full explanation of a product or service. Moreover, its overview outlines the most important aspects of a company, such as its brief description, product or service offerings, mission vision and value proposition, strategic goals, and significant activities.

**Customer behavior:** Customer behavior requires a lot more time to be defined by the product team and managers, at the same time useful to get the product based.

Consumer purchasing behavior is crucial for marketers because it allows them to understand what customers expect. It assists in determining what drives a client to buy a product.

Habitual purchasing behavior, variety-seeking conduct, dissonance-reducing buying behavior, and complicated buying behavior are the four common categories of consumer behavior. The sort of goods a customer requires, the amount of participation, and the distinctions across brands all influence consumer behavior (Valentin Radu, 2021).

For example, Lemon Press has been using habit-forming product purchasing behavior. Most frequent readers of Lemon Press are influenced by their habitual behavior. Customers have already created their habit every morning at 7 am reading the newly published Lemon Press publication. According to Ankhbayar, CEO of Lemon Press, it is one type of habit-forming customer behavior that is also tough and time-consuming to accomplish.

**SEO search engine optimization:** The process of producing and refining relevant, authoritative content in a way that helps visitors (and search engine crawlers) find solutions to their major problems is known as search engine optimization. It is another optimization method for product delivery.

Crawlers (also known as bots) for search engines scan through all of the material available on the internet. They do it by following internal and external connections inside and across websites. The bots evaluate the material on each of your pages to identify what they are about (including the URL, title tag, headers, links, and more). All of this information is used by the search engine provider to create an index.

High-quality, authoritative content will delight the visitors and entice other websites to connect to. Incoming links come in second to content. Google and other search engines will trust and value the content and website more if more websites are linking to it.

Number of incoming links	Quality of incoming links	Keyword phrase usage	Page loading speed
User experience	HTML and schema markup	Domain authority	Social media signals
Mobile optimization	Key usage metrics		

*Table 11: Important SEO factors along with links and content*

All of these characteristics, in combination with the search engine's comprehension, are utilized to convert an index into rankings for various searches (also known as queries) carried out within search engines.

Erxes MarTech uses SEO on their product launch and delivery to improve the quality of their content, as a consequence, search engines will select to include the information in their results. This will boost the number of daily visitors their website receives from search engines.

**Customer interaction:** Customer interaction is vital for a new product or feature launch and delivery. Existing customers will be a bridge to new customers. They will inform their relatives, friends and work colleagues, etc.

Moreover, setting dates for the launch of products will help the customers to prepare themselves for the product delivery. Also, product managers or product marketing people should inform their new or existing customers about the product launch to set their expectations for the product.

For example, Erxes MarTech start-up informs their customers and stakeholders about their new feature to the product via their monthly email and blog posts.

**Blog posts:** Any article, news story, or guidance that is published in a website's blog area is referred to as a blog post. A blog post often covers a specific topic or inquiry and involves various media types such as photographs, videos, infographics, and interactive charts (Hubspot, 2022).

Blog posts can be used for different objectives.

- To make a statement about a new product all related information including price, availability and so on.
- To tell how this new product or feature is made to the customers or stakeholders.
- To explain how this new product or feature is solving the customer's current problem.
- To inform what updates or new features are added to this product to customers and stakeholders.
- To describe and give a full explanation of how to properly use this new feature or product as a guideline.

Erxes MarTech startup has a variety of blog posts such as community news, employee blog, guest posts, partnership news, press releases, pricing changes, product updates, release notes, and security updates.

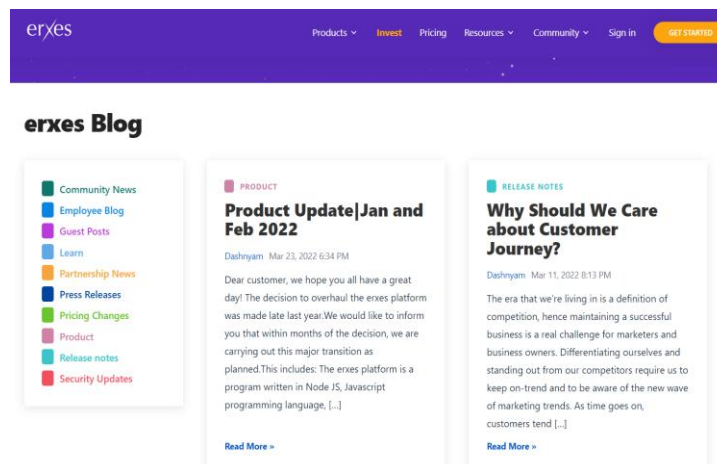


Figure 15: Erxes blog posts in different categories

### **3.1.6 Digital product analytics optimization**

#### **NPS score and customer or stakeholder feedback:**

NPS or net promoter score which is a customers' propensity to suggest a company's products or services to others is measured by a score that ranges from -100 to 100. It's utilized as a proxy for determining a customer's overall happiness with a company's product or service, as well as their brand loyalty.

Any NPS score more than 0 is considered "good." It suggests your audience is more likely to be loyal than not. Anything over 20 is seen as "favorable." According to Bain & Co, who developed the NPS system, a score of 50 or above is outstanding, while a score of 80 or higher is world class.

Receiving feedback and suggestions from customers and stakeholders entails the product team or managers obtaining input and whose opinions are useful and meaningful. Typically, significant or existing viewers or customers, or stakeholders in your job are asked for input.

For example, Erxes receives customer feedback and suggestions from the NPS platform and gets the score and sees it as a monthly or quarterly view to review and analyze their customer feedback.

**Data analytics and A/B testing:** A/B tests or split tests in the product are used to compare the performance of two different user experiences (A and B). Assume product managers created a new registration flow for the online application that they believe would have a greater completion rate than the one company now has. Rather than just replacing the old flow with the new flow, they might A/B test the flows by sending 50% of traffic to the old flow (A) and 50% to the new flow (B) at random and comparing the completion rates. Optimizely, KissMetrics, Visual Website Optimizer, and Google Content Experiments are some of the most popular product A/B testing tools (part of Google Analytics).

**Kano model:** The Kano model, designed by quality management specialist Noriaki Kano, is another good framework for evaluating customer wants and satisfaction. The Kano model also depicts a set of two characteristics on horizontal and vertical axes: the extent to which a certain customer requirement is satisfied on the horizontal axis, and the level of customer satisfaction as a consequence (vertical axis). The horizontal axis runs from left to right, with the requirement not being supplied at all on the left and entirely met on the right. The vertical axis runs from full consumer unhappiness at the bottom to complete customer satisfaction at the top, following the bipolar scale. [10]

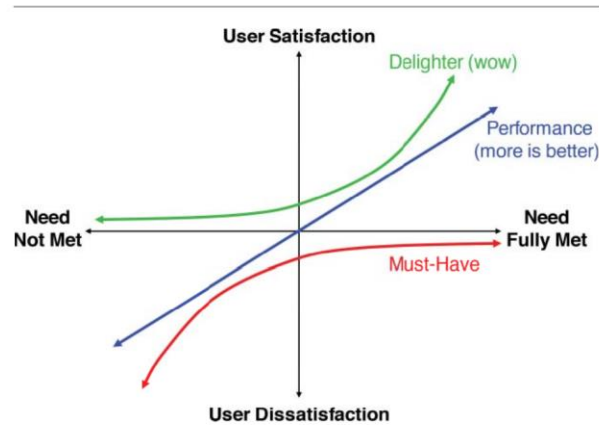


FIGURE 4.8 The Kano Model

*Figure 16: The Kano Model*

The model's value comes from the fact that it divides consumer demands into three categories: performance needs, must-have needs, and delighters. More is better when it comes to performance requirements. Customer satisfaction rises when the requirement is provided to a greater extent.

Hierarchy is also included in the Kano model. Whether the product lacks a must-have, for example, it doesn't matter if it has a delighter. Before the team can gain credit for performance features, they must first achieve fundamental requirements. And before delighters matter, their product must be competitive in terms of performance characteristics. The product team or manager may use the Kano model to have a better understanding of the issue space. Consider the important consumer advantages in the product category and categorize them into the three categories of must-haves, performance benefits, and delighters. Examining similar items and reading product reviews might assist them in developing this framework.

**North star:** A North Star metric is the metric that most accurately predicts a company's long-term success. A metric must perform three things to qualify as a "North Star": generate income, reflect customer value, and track progress. Theoretically, if a measure achieves those three goals and every department contributes to its improvement, the organization will develop sustainably (Mark Simborg, 2018).

After establishing agreed-upon product measurements, TomYo employs North star to set huge overall metrics and locate in it.

**Metrics and tracking:** Product metrics include information on how customers or users engage with the digital app or product, as well as how those interactions affect the business. Product,

marketing, customer success, and analytics teams utilize them to get information about a product's or website's success. Google Analytics, KissMetrics, Mixpanel, and Flurry are some of the most popular product analytics tools.

Product metrics are important because without them, teams would have few reliable ways to assess how their digital product's various aspects are working. Product metrics provide objective and immediate data on how users interact with their product. Business metrics can capture a company's overall success, and customer interviews can provide qualitative information, but only product metrics provide objective and immediate data on how users interact with the product.

Different product metrics are useful in different situations, with some providing a high-level overview of product performance and others focusing on specific aspects.

Common product metrics that companies use to track and optimize their product analytics:

[42]

#### - **Business metrics**

- Monthly recurring revenue (MRR): The entire amount of income generated by the product each month is known as MRR. It can be used to forecast cash flow and financial health as well as uncover revenue trends.

$MRR = \text{Number of customers} * \text{amount each customer pays per month}$

- Customer lifetime value (CLV): The average customer's lifetime value is the amount customers spend on the product over the course of their association with the product. It can help the product managers to figure out how much they should spend on client acquisition and which customers they should target. In fact, it's generally the ones with the highest LTV.

$CLTV = \text{Average Order Value} * \text{purchase frequency} * \text{customer lifespan}$

- Customer acquisition cost (CAC): The average cost of acquiring a new client is referred to as customer acquisition cost. CAC is important for determining the effectiveness of marketing and sales efforts, as well as determining if the money spent on acquiring new customers is worth the income generated.

$CAC = \text{Total cost (marketing + sales)} / \text{Number of new customers}$

- Churn rate: The churn rate is the percentage of users who abandon the product after a certain amount of time has passed. It monitors the business's capacity to keep customers and is frequently used as a proxy for customer happiness.

$\text{Churn rate} = (\text{Number of users beginning} - \text{Number of users end}) / \text{Number of users beginning}$

## - Engagement metrics

- Adoption rate: The percentage of users who go beyond examining the product or feature and begin to utilize it in earnest is known as the adoption rate.

$$\text{Adoption rate} = (\text{Number of new users} / \text{Total number of users}) * 100$$

- Daily/Monthly active user (DAU, MAU): It is a metric that evaluates the frequency with which users interact with the product and is intended to capture the value received from it, with the idea that users who interact with it more frequently acquire more value. DAU/MAU is a common metric for determining retention and growth in SaaS companies.

$$\text{Ratio} = (\text{DAU/MAU}) * 100$$

- Conversion rate: The conversion rate refers to the number of users who execute a certain activity in the product, referred to as a conversion event. Conversion rates assess how well the product directs users to perform the action they want them to take, whether it's making a purchase, downloading an e-book, filling out a form, or any other activity the product managers care about.

$$\text{Conversion rate} = \text{number of conversions} / \text{the total number of visitors}$$

- Sessions per user: The number of times an average user has been engaged on a company site or product is measured in sessions per user. Depending on the sector, the number of sessions expected may differ.

$$\text{Number of sessions per user} = \text{Sessions} / \text{Total users}$$

- NPS: As NPS described above it is a metric that assesses a brand's, product's, or feature's overall perception and/or satisfaction.

Promoters → score 9 to 10 indicates that customers love your product or feature.

Passives → score 7 to 8 indicates that customers are satisfied but not eager.

Detractors → score 0 to 6 indicates that customers are unfortunate with the product or feature.

## - The pirate metrics

- Acquisition rate: The capacity to attract individuals to dedicated products and convert them from visitors to users is referred to as acquisition. Marketing and sales are generally in charge of acquisition efforts, which may be tracked by channel, vertical, and campaign, as well as other sources or activities.

$$\text{Acquisition rate} = \text{Number of users acquired} / \text{specified time period}$$

- Activation rate: Activation is the moment when a user gets value from your product for the first time, usually the first time they perform what the product was created

for them to do. The activation moment is frequently the customer's first experience with the product team's effort, and the team should strive to get the user to this event (the "aha moment") as rapidly as possible.

Activation rate = Number of activated users/ Total number of users

- Retention rate: The capacity of the product to keep users engaged for extended periods of time is referred to as retention. Retention is the pirate measure that best represents product-market fit of all the pirate metrics. Retention rates in SaaS, in particular, are closely correlated with revenue.

Retention rate = Number of continuing users / Number of customers started with

- Referral rate: Referral is a metric that assesses the product's or company's ability to persuade consumers to recommend it to others. Increasing the number of referrals is a fantastic method to reduce CAC. Customer loyalty is also shown in referral rates. While the product team is usually in charge of retention, other teams, such as customer success and/or marketing, are generally in charge of referrals.

Referral rate = Number of referred purchases / Number of total purchases

- Revenue: The end aim of the other pirate metrics is revenue, which is the most important statistic for company performance. Product managers may break down and understand income streams in a variety of ways, including by audience, channel, product, and a variety of other factors.

These measurements provide a variety of information about the product and the customers. Choosing what metrics to choose to implement depends on who the dedicated targeted consumers are, what the product or feature goals are, and how much concentration a certain situation takes. Erxes and TomYo use the pirate metrics on their product team. They examine each stage of the customer journey and make suggestions for how to enhance it. The more user activity they track, the easier it will be as emphasized by Ms. Indra, former CPO at Erxes.

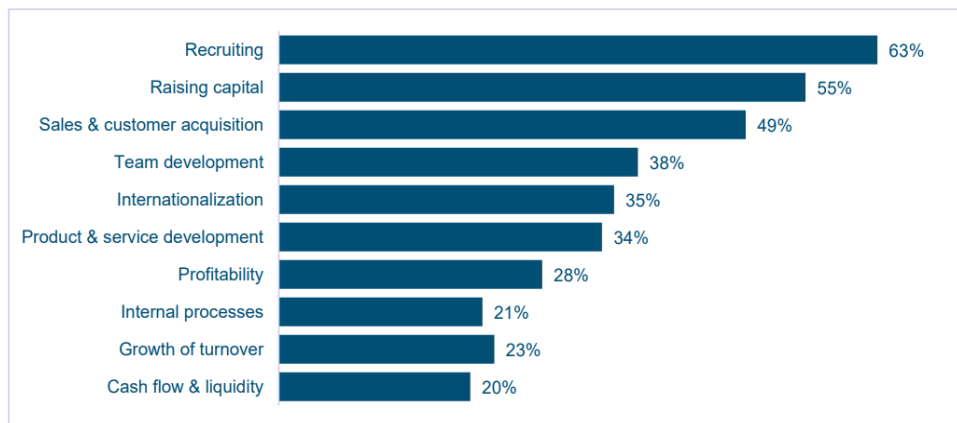
**Chatbot and Customer associate issues:** A chatbot, often known as a bot, is computer software that mimics human speech. Users converse with a chatbot through the chat interface or by voice, just as they would with a human. Chatbots understand and evaluate the words or phrases of users and respond with a pre-programmed response.

Exres MarTech has the advantage to integrate their chatbot and any related customer associate to their core business platform (as part of their business service). So, there will be no risk of losing any customer request or question in the middle of the process. For example, if a

customer associate receives a customer question or request from Facebook messenger or website chatbot, those are channeled through their integration widget and can be answered using one platform. It allows the customer associate to answer the customer’s question as fast as possible and doesn’t cause any delay. Also increases customer satisfaction with employee work efficiency.

#### 4. Result

At the beginning of this thesis paper, there are problems and consequences that cause digital startups to fail in Mongolian market. As we discussed them in detail, more than half of the percent produces an internal environment, including products, services, knowledge and skills of entrepreneurs, business plans, human resources, and so on. Moreover, as the thesis topic suggested, we are more interested in their digital product management process and its data shows that 34% of the internal environment causing product management challenges and the 25% level of entrepreneurial mindset. [43]



*Figure 17: Startup challenges in Mongolian market, 2022*

If we analyze it in deeper investigation, the proportion can be identified in each stage of the product life cycle. From the bar chart below, we can see that product management and development plays a vital role more in the first product idea/concept, prototype, early revenue which all are managed in the early stage of startups.

Figure 25: Startup challenges, by development stages, n=80

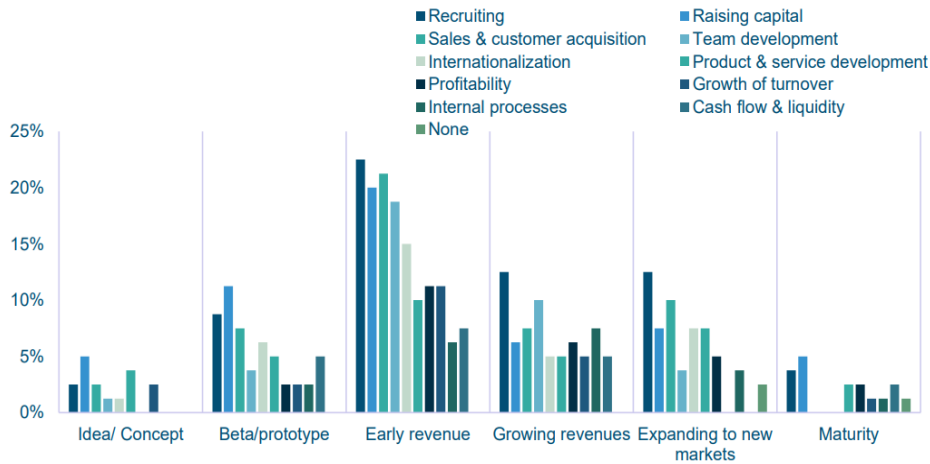


Figure 18: Startup challenges by development stages in Mongolian market, 2022

#### 4.1 Interpretation of quality interview research

The qualitative interview research is conducted in four different fields that are pursuing successfully marketed digital product management in the Mongolian market. The industries are educational technology, marketing technology, healthcare technology, and media technology. The interviews are followed by their related product managers and the CEO of those digital startups. The questions are based on processes of digital product management and its development with the type of open and qualitative. The answers are established on their real experiences while working with new products or feature projects within the early stages of a startup. As for the objectives of this research, finding the product optimization ways for digital product management are vital to early staged startups not to fail to market their product and the best practices of successfully implementing product management for their digital products are needed in properly installing the optimized processes of digital PM.

The following issues have arisen in correctly implementing PM to digital goods, as we initially discussed in the introductory section, and the following optimization was discovered through the qualitative interview study.

№	Problems	Optimizations
1	Business case	<ul style="list-style-type: none"> <li>- Product discovery techniques</li> <li>- Product strategy</li> <li>- Detailed PRD writing</li> <li>- Lean iterative methodology</li> <li>- Team collaborative work</li> </ul>
2	Product roadmap	<ul style="list-style-type: none"> <li>- Resource allocation</li> <li>- External, internal audience,</li> <li>- 3D Eisenhower matrix</li> </ul>
3	Product management role	<ul style="list-style-type: none"> <li>- Product team</li> </ul>

		<ul style="list-style-type: none"> <li>- Entrepreneurs</li> <li>- Product owners</li> </ul>
4	Role of design	<ul style="list-style-type: none"> <li>- Good UX</li> <li>- MVP</li> </ul>
5	Late engineering	<ul style="list-style-type: none"> <li>- Mixture of agile and lean methodology</li> <li>- A/B testing, UAT and SIT testing</li> </ul>
6	PM methodology	<ul style="list-style-type: none"> <li>- Agile OKR</li> <li>- User story</li> <li>- Agile, Lean, Scrum, Kanban, Design thinking</li> </ul>
7	Opportunity cost	<ul style="list-style-type: none"> <li>- Testing, prototyping</li> <li>- Product launch and delivery</li> <li>- SEO</li> <li>- Customer interaction</li> <li>- Data analytic, metrics</li> </ul>

*Table 12: Obtained product optimizations to dedicated problems*

## 4.2 Conceptual framework

1. **Business case:** As described in introduction chapter, the business case is used to identify the product's value-making, money, and time costs. However, it is impossible to find them without knowing the actual product that will be built.

In this case, for example, Clinica, TomYo, and Erxes startups replace this document with product requirement planning in their digital product management. It is way easier to handle what new features or products will add value in terms of operation, marketing, and financing sides. Product managers also apply Lean methodology to iterate their PRD writing process by solving the issues of not knowing or not testing actual product specifications.

Also, it is beneficial if the document will include information about product discovery and strategy techniques that will be used or are about to use, covered in the document. Some optimizations related to product discovery and strategy are described with real-life examples in the Mongolian market in 3.1.1 and 3.1.2 including benchmarking, creating personas for the ideal customer, product backlog, customer feedback, value proposition, stakeholder mapping, single and multi-product strategy, competitive advantage.

2. **Product roadmaps:** The product roadmap and planning will go smoothly after they well-defined the PRD or business case as what their strategies and optimizations indicate.

If the business case is calculated wrongly with the time and some constraints there will be some contradicts when going into the prioritization process. Therefore, important optimizations in product roadmaps refer to well-allocated resources including humans, time, budget with tasks, and good external, internal audience when preparing the

roadmap. The 3D Eisenhower matrix is another effective approach for frequent or novel jobs.

- 3. Product management role:** When developing or updating the product, the product team or product manager plays a vital role in all product management processes. It is different from project management. For instance, product and project managers collaborated on large projects at TomYo, but their outputs were vastly different, and their resources seldom overlapped. Technology deliverables, for example, were considered products, but content, marketing, and sales deliverables were considered projects. When it comes to product roles, entrepreneurs as product owners and the product team should include product manager, product designer, developers, and product marketing manager with supporting roles of user researcher, data or business analysts are nice to have in early-stage digital startups.
- 4. Role of design:** The startup with good UX design holds one of the powerful optimizations on their product management. They focus on their UX design in the earlier steps and have a good understanding why UX design is so important in the product management process. According to the UX design iceberg, they start with conceptual design, information architecture, interaction design, and visual design (see 3.1.4). Good design then influences the customer's impression and feeling later on with testing and prototyping.
- 5. Late engineering:** Engineering or developers' opinion is utterly essential in every product development stage. Reflecting their point of view, it is not only on PRD but also in testing and prototyping which can include A/B, UAT, and SIT. It is conceivable to adopt an iterative lean strategy if a product has to be produced or tested repeatedly.
- 6. PM methodology:** There are few PM methodologies existing and some startups believe that they are using agile but what they are implementing is mainly a waterfall approach. Hence, optimizing their knowledge with clear information and differentiation from one another is important to implement the chosen PM methodology including agile, lean, design thinking, product manifesto, and so on (see 2.2.2). In the early phases of a project, agile product management spends less time planning and prioritizing. Iterative techniques are used in Agile, and product features are broken into small sprints. As a result, Agile product management is more adapted to digital developing technology sectors. Its adaptability not only allows for improved team collaboration, but it also paves the way for better results. In contrast to traditional product management, where customers are only involved in the early stages, Unlike conventional product management, where consumers

are only involved at the beginning of the development process, agile software development allows customers to participate at every stage.

- 7. Opportunity cost:** Opportunity costs arise at the point where an idea or a feature is compared to the existing product plan. When evaluating possibilities, for example, TomYo's product managers should consider the return on investment, time to make decisions, and opportunity cost. Rather than repeatedly selecting a single option with the highest ROI at a single time point or the lowest opportunity cost for that specific aspect, it entails making a series of decisions over a period of time that will result in the highest return on investment and the lowest overall opportunity cost. Moreover, to not lose and waste any of those developing products, startups apply their opportunity cost optimizations including constantly prototyping, product delivery with SEO, continuous customer interaction, and using various metrics on their data analytics (see 3.1.4, 3.1.5, and 3.1.6).

## 5. Conclusion

Mongolia is fast digitizing, yet the country has only been a market economy for approximately 30 years, having switched from a socialist to a market economy in 1990. The industry in reality has very few role models. However, those startups can be a best practice to early new startups on their successful product management techniques related to industries accordingly.

Startups are founded on innovation, correcting flaws in current products or inventing new categories of goods and services, causing entire sectors to be disrupted as indicated by Forbes. Moreover, a company will be a digital startup if they take a great concept and turn it into a mobile app or website. Many digital startups serve as a bridge between two parties or as a helping hand for certain services.

Considering all those optimization methods described in the methodology part, digital product management is all about coping with innovative optimization approaches to the processes and startup's intrapreneurship activity and last but not least managing all those applications by using an entrepreneurial mindset.

Innovation in digital product management, I would say, specifies the goods that aren't simply about having a good concept, it's about turning that product idea into something useful. Additionally, innovation entails the creation of something new, a product feature, or a concept. Those innovative product ideas and their management is organized by entrepreneurship which is the process of converting a tremendous product idea into a viable commercial venture. With an

entrepreneurial mindset, product owners or founders represent their product team where all roles have their entrepreneurial action towards optimizing their digital product to successfully market it.

Hence, the internal environmental reasons that cause new digital startups to fail are solved by, in general, the team’s entrepreneurial mindset concerning with the optimizing the product management processes and managed by their ambitious entrepreneurs, what we call founders or product owners (managers).

Through this thesis paper, the startups have a better mindset about internal settlement including the product management of their digital products and understanding the linkages between intrapreneurship and product management in regards to a company's product lifecycle. I believe that this research paper can be the roadmap of all those interconnections through one concept to the approach of such successful digital products.

### Table of abbreviation:

<b>PM:</b> product management	<b>MVP:</b> minimum viable product	<b>UAT:</b> user acceptance testing	<b>SIT:</b> system integration testing
<b>VC:</b> venture capital	<b>UX/UI:</b> user experience, user interface	<b>CPO:</b> chief product officer	<b>CEO:</b> chief executive officer
<b>IA:</b> information architecture			

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## References:

- [1] The Global Startup Ecosystem Index Report 2021, Startup Blink, Mongolia
- [2] Grant M. What Is a Startup? [Article]. Investopedia. 2021 [cited 15 September 2021].  
Available from
- [3] Cagan M. INSPIRED: How to Create Tech Products Customers Love. 3rd ed. Wiley; 2008.
- [4] Baldrige R. What Is A Startup? [Internet]. Forbes Advisor. 2022 [cited 4 February 2022].  
Available from
- [5] Залуу судлаачдыг дэмжих сан ТББ: “Гарааны бизнесийг дэмждэг экосистемийн жишиг загварыг боловсруулах нь” судалгааны ажлын тайлан. Сократус студио ХХ; 2021
- [6] Hayes A. What Ever Happened to the Dotcom Bubble? [Internet]. Investopedia. [cited 25 June 2019]. Available from
- [7] Business Planning & Strategy Playbook | Advice & Resources [Internet]. Thehartford.com. [cited 2022]. Available from
- [8] Bryant S. How Many Startups Fail and Why? [Internet]. Investopedia. 2020 [cited 9 November 2020]. Available from

- [9] Wes Bush. Product-Led Growth: How to build a product that sells itself. Published by Waterloo, Canada. 2019
- [10] Dan Olsen. The Lean Product Playbook: How to innovate with minimum viable products and rapid customer feedback. Published by John Wiley & Sons, Inc., Hoboken, New Jersey. 2015
- [11] Eric Ries. The Lean Startup: How today's entrepreneurs use continuous innovation to create radically successful businesses. Published in the United States by Crown Business, an imprint of the Crown Publishing Group, a division of Random House, Inc., New York. 2011
- [12] What is the difference between agile and waterfall? Forecast.app. [cited 12 January 2022]. [Available from](#)
- [13] Viggars M. The Best Product Management Methodology: Agile vs Waterfall vs Lean - Product Collective | Organizers of INDUSTRY: The Product Conference: The Product Conference. 2021 [cited 18 June 2021]. [Available from](#)
- [14] Nowak M. Waterfall vs. Design Thinking, Lean Startup, and Agile. Nomtek. 2022 [cited 22 February 2022]. [Available from](#)
- [15] Marty Cagan, Chris Jones. Empowered: Ordinary peop, Extraordinary products. Published by John Wiley & Sons, Inc., Hoboken, New Jersey. 2021
- [16] What Is Product Management? Definition, Strategy and Steps | Indeed.com. Indeed Career Guide. 2022 [cited 9 February 2022]. [Available from](#)
- [17] D M. How to Build a Product Roadmap For a Digital Product. Cleveroad Inc. - Web and App development company. 2022 [cited 29 March 2022]. [Available from](#)
- [18] Introduction to product roadmaps. [internet]. Aha.io [cited 2021]. [Available from](#)
- [19] Hilary Cinis, Jess Rouse, Andrew Simpson. Prototyping In Product Management - Brainmates - Championing Product Management [Internet]. Brainmates - Championing Product Management. [cited 2022]. [Available from](#)
- [20] How to Plan and Manage a Successful Product Launch | Kissflow Project [Internet]. Kissflow.com. [cited 30 January 2022]. [Available from](#)
- [21] What is a Product Launch Plan? | 280 Group [Internet]. 280 Group. [cited 2022]. [Available from](#)
- [22] Siu E. 6 Elements of a Successful Product Launch - OpenView. OpenView. 2022 [cited 24 January 2017]. [Available from](#)
- [23] Product Launch vs. Feature Launch [Internet]. Productplan.com. [cited 2021]. [Available from](#)

- [24] Campbell P. New Product Launch Strategy + 5 Step Process. Profitwell.com. 2019 [cited 13 March 2019]. [Available from](#)
- [25] How to Launch a Successful Product: Timing, Roles, and Product Launch Checklist. AltexSoft. 2020 [cited 28 February 2020]. [Available from](#)
- [26] Lam V. A Guide to Product Analytics: Benefits, Metrics & Why It Matters. The Product Manager. 2022 [cited 21 March 2022]. [Available from](#)
- [27] What Is Opportunity Cost - Definition, Examples, & FAQs [Internet]. Airfocus.com. [cited 2022]. [Available from](#)
- [28] Patel H. What is product management analytics? - Mixpanel. Mixpanel. 2022 [cited 14 January 2022]. [Available from](#)
- [29] Staff V. Opportunity Costs of eCommerce Marketing - VerticalRail. Vertical Rail. 2022 [cited 4 January 2019]. [Available from](#)
- [30] Монгол СТАРТАПУУДЫН зураглал 2021 | START | startupnews. startupnews | startupnews. 2022 [cited 20 July 2021]. [Available from](#)
- [31] Clinical healthcare technology startup. [Website](#)
- [32] TomYo education technology startup. [Website](#)
- [33] Startupsavant.com [cited 2022]. [Available from](#)
- [34] Монголын анхны ганц эвэрт старт ап болох гэж буй “Erxes”. Lemon Press.[cited 08.20 2021]. [Available from](#)
- [35] Discover 5 Media Startups You Should Watch in 2021 [Internet]. StartUs Insights. [cited 2021]. [Available from](#)
- [36] Ariunbold E. Level Up: Гарааны бизнесийн экосистем бүрдэх нь | Posted by Unread. Posted by Unread. 2020 [cited 24 September 2020]. [Available from](#)
- [37] Product Optimization Practices in Product Management [Internet]. Bvop.org. [cited 2018]. [Available from](#)
- [38] Denier J. 3 Ways to Benchmark for Startup Success - Young Upstarts [Internet]. Young Upstarts. [cited 2 June 2020]. [Available from](#)
- [39] Bodi V. How to Create a Persona and an End User Profile for Your Startup [Internet]. Medium. [cited 27 November 2018]. [Available from](#)
- [40] Vardhan H. Customer Feedback: How to Collect and What to Do with It | Blog | Hiver™ [Internet]. Hiver. [cited 27 April 2022]. [Available from](#)
- [41] Coleman B. How to Write a Great Value Proposition [5 Top Examples + Template] [Internet]. Blog.hubspot.com. [cited 10 March 2022]. [Available from](#)

[42] Todd Olson. The product led-organization: Drive growth by putting product at the center of your customer experience. Published by John Wiley & Sons, Inc., Hoboken, New Jersey. 2021

[43] Baseline survey of the Mongolian start-up ecosystem, Final report, JCI Mongolia, Ulaanbaatar Mongolia, [cited 10 March.2022]

## Appendix

<b>Title</b>	Give this project a distinct name
<b>Change history</b>	Describe each important change to the PRD, including who changed it, when they changed it, and what they changed.
<b>Overview</b>	Briefly, what is this project about, why are you doing it.
<b>Success metrics</b>	What are the success metrics that indicate you're achieving your internal goals for the project?
<b>Messaging</b>	What's the product messaging marketing will use to describe this product to customers, both new and existing.
<b>Timeline/release planning</b>	what's the overall schedule you're working towards?
<b>Personas</b>	Who are the target personas for this product, and which is the key persona?
<b>User scenarios</b>	These are full stories about how various personas will use the product in context.
<b>User stories/features/requirements</b>	These are the distinct, prioritized features along with a short explanation as to why this feature is important.
<b>Features out</b>	What have you explicitly decided not to do and why?
<b>Designs</b>	Include any needed early sketches, and throughout the project, link to the actual designs once they're available.
<b>Open issues</b>	What factors do you still need to figure out.
<b>Q&amp;A</b>	What are common questions about the product along with the answers you've decided, this is a good place to note key decisions.
<b>Other considerations</b>	This is a catch-all for anything else, such as if you make a key decision to remove or add to the project's scope.

### Appendix 1: PRD inclusion

Name	Photo	Quote that conveys what they most care about	Job title	Demographics
Needs/Goals	Motivations/attitudes	Tasks/behaviors	Pain points with current situation	experience/knowledge
Environment	Product usage/context	Family status if needed	hobbies/interest	Additional characteristics

### Appendix 2: Persona specifications