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ESTABLISHING A DIALOGUE BETWEEN EU AND TURKEY TO STRENGTHEN
THE FOUNDATIONAL STRUCTURE,ORGANISATION AND MANAGEMENT OF EARLY START-UPS
THROUGH UTILISATION OF PROJECT MANAGEMENT BEST-PRACTICES

OUTSPEED START-UP

PROJECT MANAGEMENT PRACTICE GUIDE FOR STARTUPS

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REPUBLIC OF TURKEY MINISTRY OF FOREIGN AFFAIRS DIRECTORATE FOR EU AFFAIRS

PROJECT MANAGEMENT PRACTICE GUIDE FOR STARTUPS

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Acknowledgments

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In the scope of the project, to prepare a comprehensive but concise Practice Guide, as the authors, we:

- Studied the various project management and startup lifecycles, methods and tools in the literature,
- Conducted surveys and interviews with the players of the startup ecosystem; startups, mentors, incubation centers, technology transfer offices and investors
- Organised workshops among the key experts in all four partner countries to exchange ideas and best practices

Throughout the project, we participated in many webinars, summits and workshops in order to explain our approach to startup project management and to get feedback from the experts. When we completed the Practice Guide, we conducted training camps for startups and webinars for startup mentors to introduce the Practice Guide and again to get feedback from them.

There are quite a few people we, as the authors, would like to thank for their support and contributions throughout the project.

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We believe this Project Management Guide for Startups will act as a light house for startups to take their idea and transform into a successful business in their challenging journey with many uncertainties.

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1 Introduction

1.1 Purpose

In today's world, anybody and everybody can innovate and be a startup due to the advancement of the Internet, cloud computing, telecommunication, open source software, 3D printing, etc. The cost of building physical and digital products is decreasing and it is getting easier to reach out to millions of users all over the globe. Although there are a lot of factors helping people to innovate and to be an entrepreneur, most of the startups still fail in reaching their dreams. Most startups cannot live longer than few years and even the ones that are still alive are in a big struggle to make profit. Not just startups but also significant number of the new product projects of companies, even the global ones, fail as well. New product/service design projects, in general, and startup projects in particular, have tremendous amount of uncertainties and risks regarding the problem to be solved, the target customer segments and the business model as well as the solution to be developed. On top of tremendous uncertainties, there are various reasons for startup failures such as running out of cash, lack of customer demand, high cost of customer acquisition, poor management, poor timing, disagreement between founders, founder burnouts and failure to pivot on time.

All startups need to develop a business plan early in their endeavour, both for their own use and to apply for funding or investment. A business plan or a business model canvas is like a blueprint for the business - it details the goals and how it is planned to achieve them over a specific time period. Creating a business plan is a key part of starting any business venture. Even if it will never be used for attracting investors and raising capital, it is very useful for helping all entrepreneurs to ask and think through essential questions regarding establishing and running a good business. Nowadays, business model canvas is preferred over a long business plan for agility and speed.

Startup founders are generally very knowledgeable and experienced in the technical fields related to the new product or service that they are working on. However, they need to know enough about other disciplines such as marketing, business development, accounting and of course about project management in order to better manage the whole startup effort and increase the chances of success.

Project management body of knowledge, including but not limited to stakeholder management, scope management, risk management, effort and duration estimation, can help founders develop a more accurate business plan and can play an important role in startup success.

The purpose of this document is to provide a concise, easy to use practice guide to help startup founders in planning and managing their startup projects by utilising the project management tools, techniques and templates as well as some of the common startup methods such as Design Thinking, Lean Startup and Lean Business Canvas.

1.2 Background

Startup is defined as "a human institution designed to create new products and services under conditions of extreme uncertainty" in Eric Ries's popular book ***"Lean Startup"*** (Ries, The Lean Startup: How Constant Innovation Creates Radically Successful Businesses, 2011). Potential of high growth is another attribute that distinguishes startups from a regular small

business or an entrepreneur. This means that the startup founders not only develop a new product or service but also needs to also focus on scaling up the product as well as the company.

Project Management Institute's (PMI) A Guide to The Project Management Body of Knowledge (PMBOK® Guide) defines project as "a temporary endeavor undertaken to create a unique product or service" (PMI, 2017). This definition is very similar to the definition of the startup except startups operate under the conditions of extreme uncertainty and they also need to consider how to turn the product/service into a profitable business as part of their project.

A startup effort can be considered as a very risky project because a very unique output such as a new product, a service or a business model is being developed in a limited time, with very limited resources and on top of that under conditions of extreme uncertainty. Therefore, planning and managing startup projects are much more challenging than contract-based projects where you have a contract and a customer who is paying you for the work and the scope of the project is well documented before starting the project.

The main reason for the conditions of extreme uncertainty for startup projects is that the project scope is not known, is not given by the contracting authority and cannot be defined precisely without experimentation. Startup projects are based on many assumptions with regards to the potential customers, the problem to be solved, the solution to be developed as well as the business model and the market conditions. It is quite difficult to define an accurate and complete project scope under all these assumptions and unknowns. When the scope is not well defined or when it is almost certain that the scope will change frequently, the early estimates for the project budget, resources and schedule cannot be accurate enough.

What makes the situation even worse is the optimism of the startup founders. Optimism is one of the traits of entrepreneurs and this leads founders to assume that their hypothesis about the target customers, problem, solution and business model are correct and they jump to action without enough analysis or plan.

1.2.1 Project Management

PMBOK® Guide defines Project Management as the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. Project management discipline and methodologies have been around for hundreds of years, helping different companies in various industries to achieve their goals in a systematic manner (PMI, 2017).

Effective project management helps individuals, groups as well as public and private organisations to:

- Meet business objectives
- Satisfy stakeholder expectations
- Increase chances of success
- Deliver the right products at the right time
- Resolve problems and issues
- Respond to risks in a timely manner
- Optimise the use of resources
- Manage change in a better manner

PMBOK® Guide has been utilised extensively by corporations in many sectors from defense to construction. Corporations are organisations with significant number of employees with

clear roles and definitions. Unlike startups, profitability of one project and short-term survival are usually not a major concern for corporations.

In such large organisations, the business case for a project usually generated by the Marketing, Business Development or Research & Development Departments. After valid justifications for the project, if the relevant stakeholders approve, the project is assigned a sponsor. Then the sponsor appoints a project manager who would be responsible to form a team and manage the project from that point till the delivery of the product/service. Usually, after the product or the service is developed, it is handed over to the product manager or marketing to coordinate the sales and marketing efforts and the project manager and the project team do not have to be involved in the life of the product/service after this point.

Section 7.2 Project Management Foundation provides details on project management, project lifecycles and project management knowledge areas.

1.2.2 Startups

For startups, the journey starts with the Business Idea. Unlike corporations, startup founders need to validate the business idea, their proposed solution as well as the business model on their own. This validation is important as the startup founders need to know the desirability (human perspective), the feasibility (technical perspective) and the viability (business perspective) of their potential product/service at an early stage with minimal effort and cost.

As a startup, although the focus is generally on developing a new product or service, startup is not just a product; the activities of a startup also include marketing, sales, finance, planning and management of activities and resources, etc. In other words, the role of the founder is the combination of at least four distinct roles/functions in the corporate world:

- Business Analyst (for Marketing, Business Development, R&D activities) who is responsible to analyse and interpret the data from marketing campaigns, sales campaigns or R&D efforts in order to justify the Business Case for a potential product
- Project Manager who recruits team members, assigns roles, controls and monitors the activities of the team members
- Product Manager who coordinates the efforts to launch the product, initiate & oversee the marketing/sales campaigns
- Company owner who is responsible for financial management, administration, legal, etc.

Thus, startup founders should educate themselves in these areas including project management.

1.3 Can startup effort be planned and managed?

Traditional project management studies used to over-emphasise planning and control over flexibility and adaptability, leading to approaches that are insufficiently compatible with high-uncertainty endeavours such as new product development and startup projects. In response, the concepts of targeted flexibility and adaptive project management have been proposed. A key driver of the need for adaptive project management for startups is the extreme uncertainty, which can exist for different project aspects such as customer, market response, technology, financials, schedule and with different intensity and at different times in the project flow.

Extreme uncertainty, or unknowns are not easily manageable with traditional, predictive project management approaches. Instead, these projects should focus on "validated learning" through experimentation (Lean Startup's build-measure-learn cycle) or selectionism, allowing many aspects of the project plans to emerge through these learnings, rather than being determined in the beginning of the project.

Within the traditional project management framework, a project is typically considered complete when the product is handed off to manufacturing or to the contracting customer whereas a startup project cannot be considered complete before the product is completed, certain level of sales is achieved and operations to sustain the market share are established.

The early, "fuzzy" stages for new product development are focused on gaining a fundamental understanding of what will determine the success of the future product and result in key project definitions, including early adaptors, markets, product concept, key features, technologies and business model.

Gartner's 2016 report proposes a combination of iterative and experimental approaches in the following form for startup projects (Brand, Blosch, & Osmond, 2019):

1. Use Design Thinking to empathise with the customer and discover the real need
2. Evolve the innovative idea using Lean Startup's Build-Measure-Learn cycle
3. Use Agile to build out and evolve the technology elements of the product

Combine Design Thinking, Lean Startup and Agile

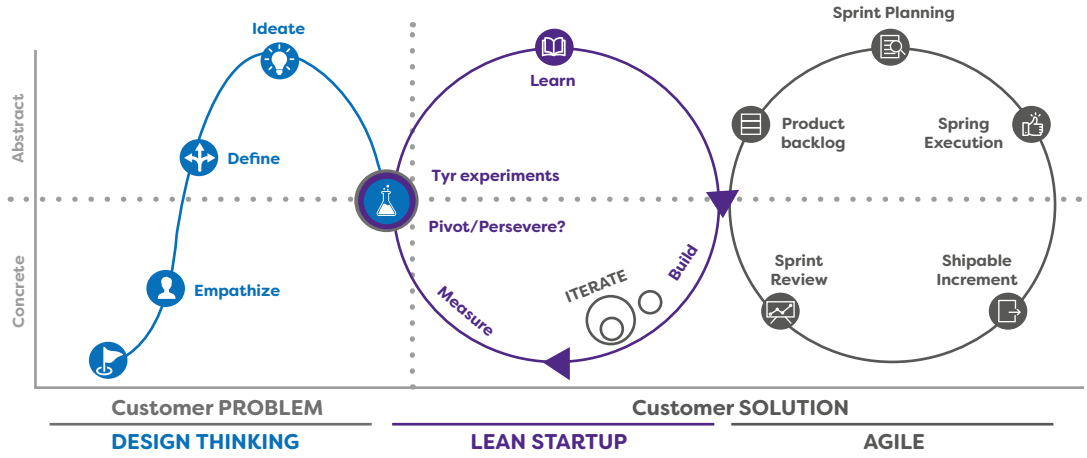


Figure 1: Gartner's startup management approach (Brand, Blosch, & Osmond, 2019)

Startups, due to the conditions of extreme uncertainties, cannot have a perfect project plan or business plan to start with. Ash Maurya, in his book ***Running Lean***, states that successful startups find a plan that works before running out of resources rather than having the perfect plan to begin with (Maurya, 2010). Many experts in the field, including Steve Blank and Eric Ries, recommend a continuous feedback loop to better understand customer needs and to validate critical assumptions throughout the project (Ries, The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses, 2011).

This approach of continuous experimentation and feedback helps startups change their game plan whenever needed based on the feedback from customers and market.

Project management tools and techniques, such as stakeholder analysis, time management, risk management, estimation techniques, can help startups develop a sound game plan to start with as well as a great baseline for tracking and updating the critical project information throughout the project after each iteration/ experimentation.

1.4 Project Management Practice Guide for Startups

This guide introduces a customised project management approach for startups. This new approach proposes a lifecycle for a project at a startup setting with a strong emphasis on the Project Management tools and techniques as well as inspiration from Lean Startup, Agile, Design Thinking and other relevant methodologies while supporting the agility and flexibility that they need.

Often times, project planning and management seem boring and not so useful for the founders but to increase the likelihood of success and to better manage the team, budget and other resources, we need to focus on the boring stuff: how to measure progress, how to setup milestones, how to prioritise work. The purpose of or the expectation from the project planning activities is not to create the ultimate perfect plan, but to have a good starting game plan and then to update the plan after each iteration / experimentation.

Outspeed Startup Survey

During the course of the Outspeed Start-up Project, the authors conducted a survey among 300 technology startups and the results clearly show the need for better project management for start-ups. The profile of the startups who answered the survey can be summarised as follows:

- More than 75% of the startups were founded in the last 2 years and more than 85% were in idea/seed or early commercial phase.
- More than 65% pivoted at least once.
- More than 90% of the founders have at least a BSc degree of which 21% holds a PhD degree, yet more than 65% did not have any Project Management-related certificate

The results of the survey included the following findings and the full results are available in the Appendix for the curious reader.

- 60% of founders do not have any PM certification

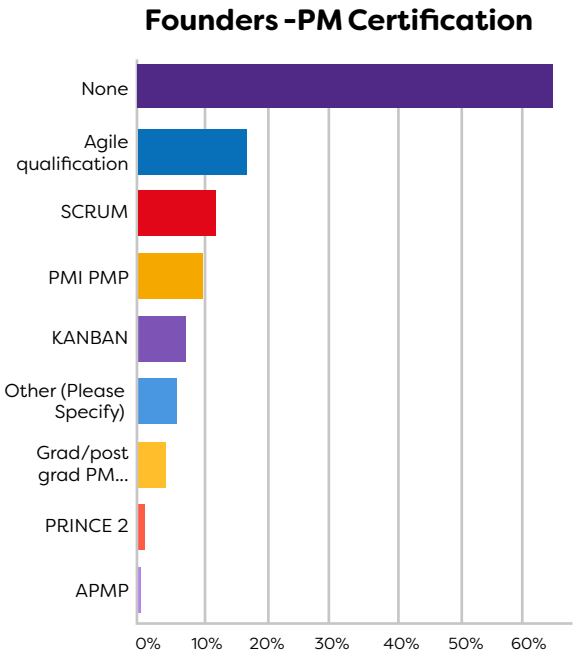


Figure 2: Outspeed Startup Survey – Founders Project Management Certification

- When asked which activities are forgotten/not included in the project action plan, more than 45% of the startups mentioned Risk Management, 30% wrote Quality Management and Communication Management, around 27% mentioned Marketing and Stakeholder Management.

Figure 3: Outspeed Startup Survey – the activities forgotten/not included in the project action plan

- Similarly, when asked the most difficult issues faced, more than 55% of the startups selected estimating effort and cost, around 30% mentioned tracking progress of the project as well as tracking risks.

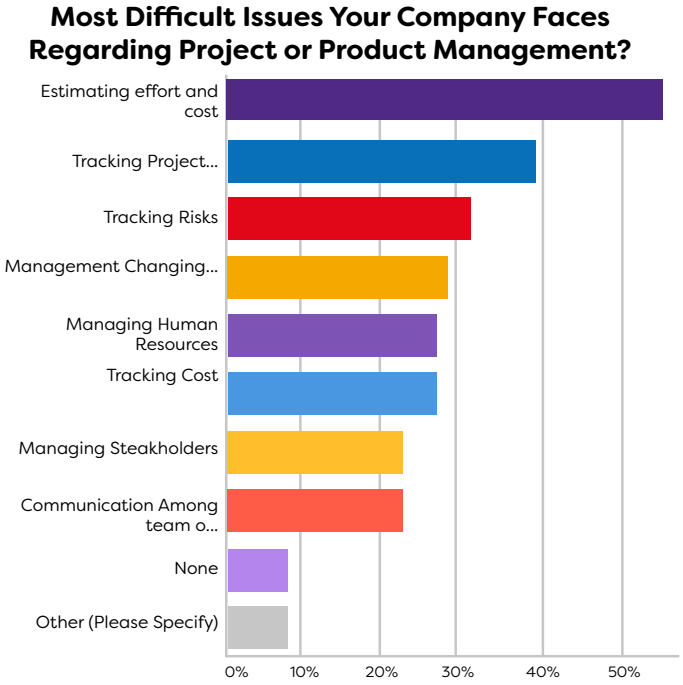


Figure 4: Outspeed Startup Survey – the most difficult issues faced by founders

- When asked how well project scope, budget and schedule changes are monitored and controlled based on documented processes, startups gave themselves a score of 2.4 over 5 on average.
- When asked if sufficient time/effort is invested in estimating the project schedule and budget, the average score given is a mere 2.9 over 5.

Startups are aware that they do not spend enough time and energy in planning the scope, budget and effort as well managing & controlling the other knowledge areas such as Risk, Communication, etc. The current start-up methodologies focus mainly on problem validation, product-market fit validation and growth techniques, yet managing, monitoring and controlling the Risk, Scope, Budget, Stakeholders throughout the whole project should also be a concern for startups and this needs project management skills.

This Practice Guide assumes that the reader is familiar with startup and project management terminologies and approaches. Readers who need more in-depth information about startup and project management approaches can refer to **Appendix** section where the key concepts and methods in both startup and project management realms are discussed in detail to obtain basic understanding of both worlds. **Appendix** explains in detail the current startup terminologies and methods proposed in the literature as well as project management methodologies especially by taking PMI's Project Management Body of Knowledge (PMI, 2017) as a reference.

In the remainder of this guide, we propose a startup lifecycle integrating the current startup lifecycle methodologies with project management tools and techniques and a chapter is dedicated for each phase of the lifecycle including Initiation, Planning, Execution & Control and Closing. A quick summary of each chapter is provided below.

Chapter 2. **Proposed Startup Project Lifecycle** explains the new startup project lifecycle proposed by the authors of this guide, as part of the EU funded **Outspeed Startup Project**, inspired by both startup methodologies and Project Management methodologies. The scope of the start-up project may change frequently, especially in the first few iterations during validation or development of the product, therefore an iterative project lifecycle is favoured

rather than a predictive project lifecycle. However, since resources of start-ups are scarce and investors/other startup ecosystem actors would like to know the scope, budget and duration of the project, a hybrid lifecycle model is proposed so that the project can be planned with all the essential information available in the beginning of the project.

Chapter 3. **Initiation** Chapter explains the **Initiation phase** of the project where the startup idea is transformed into a structured product/service proposal. In this stage, startup founders are advised to define and validate the target ***customer,*** the ***problem*** they tackle, the ***solution*** they propose as well as the ***business model*** they plan to follow to attract customers and earn money as much as and as soon as possible. In terms of elaborating the initial idea and understanding the link between the problem and the solution, this chapter gives references to Design Thinking and Lean Startup. The initiation phase of a startup project is the most critical phase and it is radically different from the regular projects in the corporate world, since in corporations, the initial project documents such as the business case, statement of work, technical specifications, etc. are prepared by the customer and/or related departments such as the marketing or business development of the corporation before the project starts. The main outcome of the initiation phase is the decision to start or cancel the project with few deliverables such as the project charter and lean business canvas.

Chapter 4. **Planning** elaborates how startups should plan their project. The planning activities carried out as part of the Project Management knowledge areas such as Scope Management, Risk Management, Stakeholder Management are explained in Planning chapter with examples. Corporations can dedicate time and resources to cover each knowledge area in detail, but startups do not have this luxury. Thus, in Planning Chapter, why each knowledge area matters and how they can be integrated into the way of thinking and the habit of planning are explained and specific templates are provided.

Chapter 5. **Execution** discusses how startup founders should execute the plan and monitor and control the project. For every iteration executed during the development of the product/service and for any intentional change, certain plans, such as scope, cost, schedule, risks, quality and procurement, need to be monitored, necessary adjustments need to be made and communicated to the related stakeholders by using the right channels.

Finally, Chapter 6. **Closing** phase emphasises that there can be several closing scenarios for a startup project, i.e., the project does not have to be / would not be labelled as ***complete*** after the development of the product. Founders would define the completion criteria for their project. Nonetheless, there are a set of activities and checks that every startup may need to carry out during closing, as further explained in the Closing Chapter.

2 Proposed Startup Project Management Lifecycle

This section briefly explains the startup project management lifecycle developed by the authors of this Guide, as part of the EU funded Outspeed Startup Project. The rest of the Practice Guide explains the details of the proposed lifecycle and provides startups with guidance and templates for systematic and easy implementation.

The authors are inspired by the methodologies described in PMBOK (PMI, 2017), Design Thinking, Lean Startup (Ries, The Lean Startup: How Constant Innovation Creates Radically Successful Businesses, 2011), Agile and Lean Business Canvas (Maurya, 2010). Having reviewed the literature and practices regarding project management in startups and new product development projects, the authors conducted online surveys, face-to-face interviews and workshops with startup founders and startup mentors to understand the needs and challenges that can be addressed with improvements in project management as well as best practices regarding project management in startups.

Startup journey starts when the founders come up with a business idea for a new product or service. The end point of startup projects, on the other hand, are difficult to determine in the beginning of the project and may differ from one founder to another. Most founders tend to believe that their startup project will be over when the product or the alpha prototype is developed. However, the first version of the product is rarely the final version that has the product-market fit and even the product with a verified product-market fit rarely brings the necessary financial income for sustainable operations as soon as it is released for customer use. Another possible ending point for a startup project is the break-even point at which the total income is equal to the total cost. Whilst laying out a project plan for their startup project, founders should come up with an end point that they deem desirable at the time of the planning.

A simplified startup lifecycle may look like the below scenario:

1. Find a problem worth solving, then define a solution.
2. Engage your customers/end users throughout the development cycle to verify the problem-solution fit and product-market fit and avoid wasting time and resources for a solution not desired by the customer.
    a. Continually test your product with smaller and faster iterations.
    b. Build a feature, measure customer response, and verify/refute the idea.
3. Based on the tests, “pivot” (change your customer, problem or solution hypothesis) if necessary
4. Stay focused on speed and learning.
5. Capture the ideal time to find investors to grow (scale-up).

A significant milestone in a startup journey is the point when a commitment is made by the founders to quit their daily jobs and establish a company, or by investors to invest in the company or by a state institution to fund the startup project. Investors and state institutions requires founders to prepare a business plan to make the investment decision. Creating a business plan is a key part of starting any business venture. Even if it will never be used for attracting investors and raising capital, it is very useful for helping all entrepreneurs to ask and think through essential questions regarding establishing and running a good business.

Founders should validate the desirability, feasibility and viability of the idea to a certain extent before committing to it full-time or spending too much money or resources. Planning of this period of idea validation can certainly help founders to easily navigate the fuzzy front end of innovation and to validate the most critical assumptions as soon as possible. This initial phase of startup can be called “initiation”.

Whether the end point of the project is product-market fit, break-even point or a possible exit, the business plan covers all activities, resources, cost and income till this end point. Clearly, this end point can be changed, and the project can be prolonged at a revised plan later during the implementation of the project.

The detailed project planning generally covers the time after the founders make a commitment by either quitting their daily jobs to fully devote themselves for their business idea or when they secure a funding or an investment for their business idea. The planning for the whole startup journey starts when the founders come up with the business idea, and it should be carried out in parallel to the initiation phase and throughout the rest of the project.

Startup projects are significantly different from the contract-based projects where the scope, project duration and the budget are very well-defined and are part of the contract with the customer. Startup projects do also differ from the new product projects in large organizations where most of the preparation work such as market research, financial and feasibility analysis are performed by dedicated groups or departments before top management’s approval of the project.

2.1 Outspeed Startup Glasses

We developed the Outspeed Startup Glasses as a startup project management lifecycle based on the PMBOK® and the common startup tools and methods such as Design Thinking and Lean Startup. In this model, the life of a start-up is divided into two main periods: the Pre-commitment period and the Post-commitment period. The pre-commitment period includes the activities that needs to be accomplished prior to the commitment decision, i.e., before spending any significant time & money. The post-commitment period is where funding is secured and all available resources are put into use to realise the business idea as a product/service and as a running business.

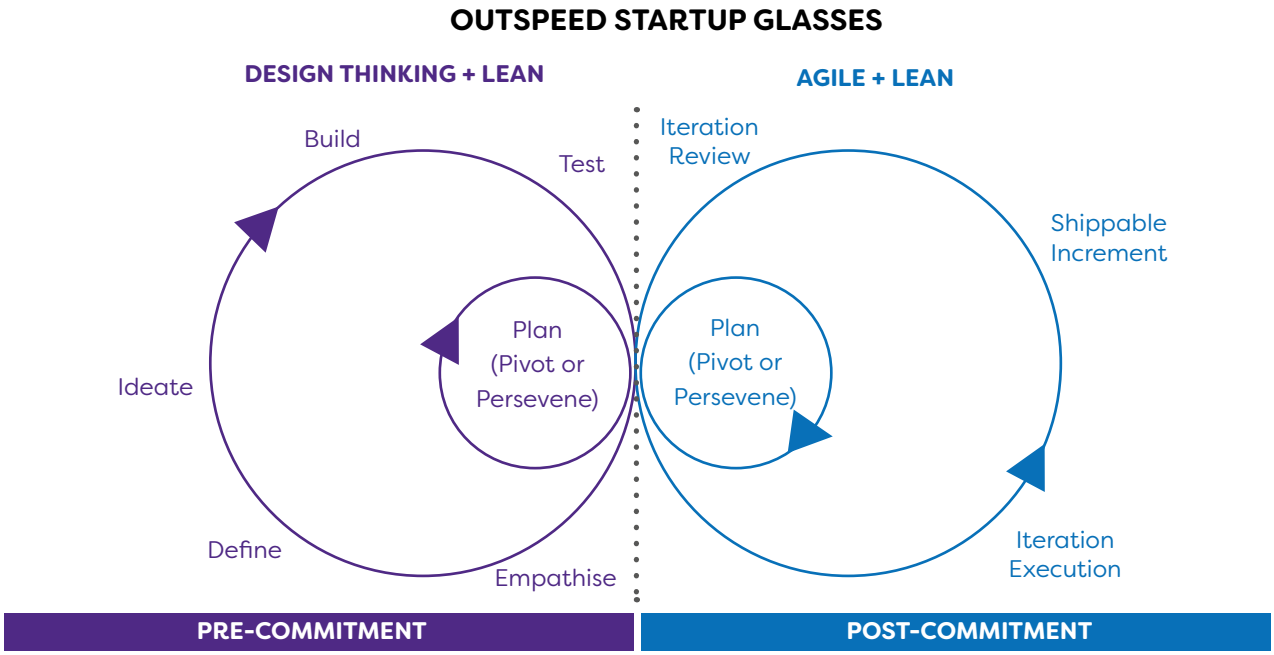


Figure 5: Outspeed Startup Glasses - Startup Project Management Lifecycle

The **pre-commitment period** includes:

a. **Initiation** activities (shown as the big circle) where problem, solution and business model are defined, value and growth hypotheses are tested and validated in small scale.

b. **Planning** activities (shown as the small circle) where the idea is formulated as a project and defined in terms of scope, budget, timeline, risks and other factors.

It is important to note that if founders realise during the initiation phase that their idea does not solve the problem they address, the solution they propose is not technologically possible or that the potential customers are not ready to pay for the solution, then they can halt the process and there is no need to carry on to planning phase.

The Initiation phase mainly tests the feasibility and desirability of the solution, whereas the planning phase focuses on understanding the viability of the solution – whether it is possible to implement the solution within the budget and the logical timeframe, how many resources would be required, and that it would make enough money to survive and flourish.

The planning phase (however short it may be) is crucial to understand the size of the project, the timeframe till startup becomes self-sufficient and other potential requirements to turn the idea into a working and profitable solution. After the planning phase, founders may wish to re-visit their decision for commitment and whether they are indeed ready to spend time & their own money towards what is planned.

Additionally, for any entrepreneurial endeavour, it is important to have access to funding as soon as possible and this only happens when the product/service is considered to be feasible, viable and desirable by investors and other funding bodies in the startup ecosystem. In order to prove this, founders need to show these actors the scope, timeline, budget of the project as well as action plan, risk mitigation plan, etc. In other words, startup founders would not only plan the project for their own sake but also to receive funding from investors and alike.

As described in detail in Section 3 and 4, the Pre-commitment period makes use of startup methodologies such as Design Thinking and Lean start-up. Design Thinking method encourages team to work in close collaboration with the user to understand their pain points, problems, and potential solutions. Early activities of Design Thinking, namely Empathise, Define and Ideate, are used in the beginning to identify and fully understand the users/ customers. Lean Startup approach emphasises the need to test hypotheses via frequent experiments that reveal customer preferences and behaviour through objective metrics. Lean Startup's Build-Measure-Learn cycle is used to validate the solution hypothesis and the critical assumptions in the Initiation phase and throughout the project.

The **post-commitment period** includes:

- Planning (of each iteration) where the work packages defined during Pre-commitment are broken down into small packages and each package is defined & planned in detail when it is their turn to be implemented.
- Execution, Monitor and Control activities where each work package is implemented in chunks that are defined during iteration planning.
- Closing activities where the project reaches the end goal determined by the founders and the final activities are carried out.

The Post-commitment period continues until the end goal defined by founders is reached. It is important to note that the end goal may differ from one startup to another. Some startups may define it as the break-even point, whilst the others may choose the 'Exit point' as the end of their project.

The closing activities may differ depending on the end goal chosen. If the end goal is to reach a certain-level of profit, the closing activities may include handing over the work to operations team who will sustain the product/service, yet if the end goal is the 'exit' of the product, then the closing activities may include lots of other documentation, legal documents, etc.

In terms of the startup methodologies utilised during the Post-commitment period, knowing that the scope of the start-up project may change frequently, especially in the first iterations during product development, **iterative** project lifecycle is favoured rather than a predictive project lifecycle. However, since the resources of the start-ups are scarce and investors/ funding agencies would like to know the scope, budget and duration of the project before investing or funding the project, a **hybrid lifecycle** model is proposed in this guide so that the project can be planned with sufficient information available in the beginning of the project. Agile Development techniques are also embedded in the Implementation, Monitor and Control activities which meant working in smaller batches with a focus on the highest priority tasks leading to shippable work which is in alignment with the Lean Startup approach.

Figure 4 shows the interaction and overlaps among the four phases; initiation, planning, execution and closing.

Figure 6: Proposal of Outspeed Startup - Startup Project Management Lifecyle: Phases

2.2 How Outspeed Startup Glasses Help Startups

The **Lean Canvas©** is taken as one of the main outputs of the Initiation phase since it helps founders summarise the business plan in a single page. A lot of detailed and systematic work must be performed to develop the business case or business plan and then to summarise them in Lean Canvas. The **Outspeed Startup Glasses** blends the Lean Canvas, Lean Startup and Design Thinking approaches with project management tools and techniques so that the Canvas is filled out with as much accurate and comprehensive data as possible.

In a startup project, the three critical objectives are desirability, feasibility and viability. The main difference between a startup project and a traditional contract-based project is the amount of uncertainty stemming from the scope definition in relation to desirability and viability. That is why a hybrid project management approach is proposed in this Practice Guide; in pre-commitment period a comprehensive plan is prepared and in post-commitment period agile approach is used to plan and execute iterations.

As explained in Section 7.2.3, PMBOK defines 10 knowledge areas: Project Integration Management, Project Scope Management, Project Schedule Management, Project Cost Management, Project Quality Management, Project Resource Management, Project Communication Management, Project Risk Management, Project Procurement Management and Project Stakeholder Management.

How **Outspeed Startup Glasses** helps in filling out the **Lean Canvas©**, can be summarised as follow:

1. **Customer segments and early adaptors:** Identifying the customers (who will pay for the product or service) and users (who will use the product or service) plays a critical role in startup success. Most firms solely focus on customers/users and fail to identify the other stakeholders, who can have influence and impact on the customers and on the project. Project **Stakeholder Management** includes the processes required to identify all the relevant parties or organisations that can influence or be impacted by the project. Analysing stakeholders' expectations and impact on the project, developing appropriate management strategies and effectively engaging stakeholders in project decisions and execution will ensure better customer and early adaptors identification and management.
2. **Problem and existing alternatives:** It is important to identify the problem with its root causes and to make sure that the problem is worth solving. The tools and techniques covered in Project **Scope Management** and Project **Stakeholder Management** help

founders to properly identify and analyse the customers and other stakeholders including competitors. This results in better problem definition and competitor analysis.

3. **Unique value proposition (UVP) and high-level concept:** The Unique Value Proposition is a promise of the value to be delivered. It is the primary reason why a prospect should buy from you. Understanding **stakeholders**, including the target customer segment and defining the scope helps develop a solid UVP.
4. **Solution:** Many project management practices, such as **Scope Management**, **Quality Management**, **Risk Management** and **Stakeholder Management**, help founders develop desirable, feasible and viable solutions.
5. **Key metrics:** Lean Startup approach recommends using the "**innovation accounting**" in measuring the project progress rather than the traditional project management metrics such as work completed, Earned Value Management (EVM), etc. Project **Quality Management** includes the processes and activities of the performing organisation that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs of the target audience within the expected standards. This knowledge area of PMBOK can be used to identify the important metrics for the project.
6. **Channels:** Channels are ways for you to reach your customers. **Stakeholder Management** can contribute significantly to identify stakeholders related to customers and channels.
7. **Unfair advantage:** For a successful project planning and execution, risk management plays a crucial role in identifying and managing threats and opportunities as well as strengths and weaknesses. In this guide, we propose that the unfair advantages listed as part of the Lean Canvas should also be supported by **Risk Management** and SWOT (Strength, Weakness, Opportunities and Threats) Analysis in order to strengthen the claims and cover the advantages over threats and weaknesses.
8. **Cost structure:** Scope-Duration-Cost is known as the triple constraints of project management. Most startups fail because they cannot reach product-market fit and traction within the budget (a.k.a. before running out of the runway). The most significant benefit of utilising Project management tools and techniques for startups is in defining the scope and estimating the time and budget for the project.
9. **Revenue streams:** Startup need to generate one or more Revenue Streams from each Customer Segment. Each Revenue Stream may have different pricing mechanisms, such as fixed list prices, bargaining, auctioning, market dependent, volume dependent, or yield management. Project management, from PMBOK perspective, does not offer too much support for business and marketing decisions. However, understanding stakeholders along with the customer segments may offer insight into revenue stream decisions.

PMBOK Knowledge Areas **Lean Canvas**	Scope	Schedule	Cost	Quality	Resource	Communication	Risk	Procurement	Stakeholder
Customer segments and early adaptors									√
Problem and existing alternatives	√								√
Unique value proposition (UVP) and high-level concept	√								√
Solution	√			√			√		√
Key metrics				√					
Channels									√
Unfair advantage							√		
Cost structure	√	√	√	√	√	√	√	√	√
Revenue streams									√

Table 1: PMBOK® Knowledge Areas vs. Lean Canvas

On top of project management's support during the initiation phase in filling out the Lean Canvas, founders can benefit from project management tools and techniques in Planning, Execution, Monitoring, Control and Closing activities.

In the remaining of this Guide, the Outspeed Glasses, as defined in Figure 3 and 4, are explained in detail and templates are provided.

3 Initiation

Projects are created to solve identified problems or meet specific needs of the organisations or individuals. These needs may be due to an opening in the marketplace, a requirement for operational maintenance or upgrade, or be driven by some external requirements. In all cases, startups need to balance the requirements against capabilities in order to make intelligent decisions regarding priority setting, capital investments and resource allocation.

This process of understanding the problem, generating and evaluating the potential solutions, defining and validating the business model and finally making the decision of invest/not to invest is carried out during the **initiation phase** of the project.

Typically, founders instinctively think about "how can we build the product" at the technical level first. However, unless you are working on a technological breakthrough, startup founders should first focus on "customer desirability", then "business model viability" and then, and only then "technical feasibility". Once it is validated that the customers really want the solution and there is a validated business case, founders can look at how to build a product. There is no point in building a business case or technical feasibility analysis if you do not have sufficient evidence that your customers actually need and demand your solution in the first place.

Challenge is much less of how to build a great product and more about having customers willing to buy it. Initiation should be a customer-centric phase.

For projects in larger organisations, the initiating activities are performed by Sales, Marketing or Business Development departments with the help of other related departments. Then the project officially starts when the Project Charter, which is the main output of the initiating phase in traditional projects, is approved by the management. For startups, it is the founders who need to commit to the project in terms of time, effort and money based on the outputs of the initiation phase. The initiation phase provides several clear benefits to the startup founders:

- To identify, elaborate and prioritise the key needs of the customer
- To ensure that the team chooses the right project for execution and that the chosen project will have a high probability of success
- To help all team members understand the objectives, deliverables and success criteria for the project
- To establish the ground for size, scope and the budget for the project to be able to communicate to all stakeholders

In the Outspeed Startup Glasses lifecycle explained in Section 2, the Initiation Phase is represented as the first large cycle prior to full commitment by the founders. It is only after Initiation Phase and a certain level of Project Understanding, founders should commit money, time and effort to the project, thus this section focuses on the activities that need to be taken prior to this Go/No-Go decision, a.k.a. the commitment decision as used in the Outspeed Startup Glasses (Figure 3: Outspeed Startup Glasses - Startup Project Management Lifecycle).

Tips

Discipline yourself to use Stage Gate Approach (Go/No Go Decisions) to progress from one phase to the next with good foundations to build upon your product.

There are two main outputs of this phase; Lean Canvas© (Maurya, 2010), as seen in Figure 5 and the Project Charter. There are some overlaps between these two major documents and the audience could be different for each one; Lean Canvas (Maurya, 2010) is for both internal and external stakeholders whereas Project Charter is mainly for internal stakeholders.

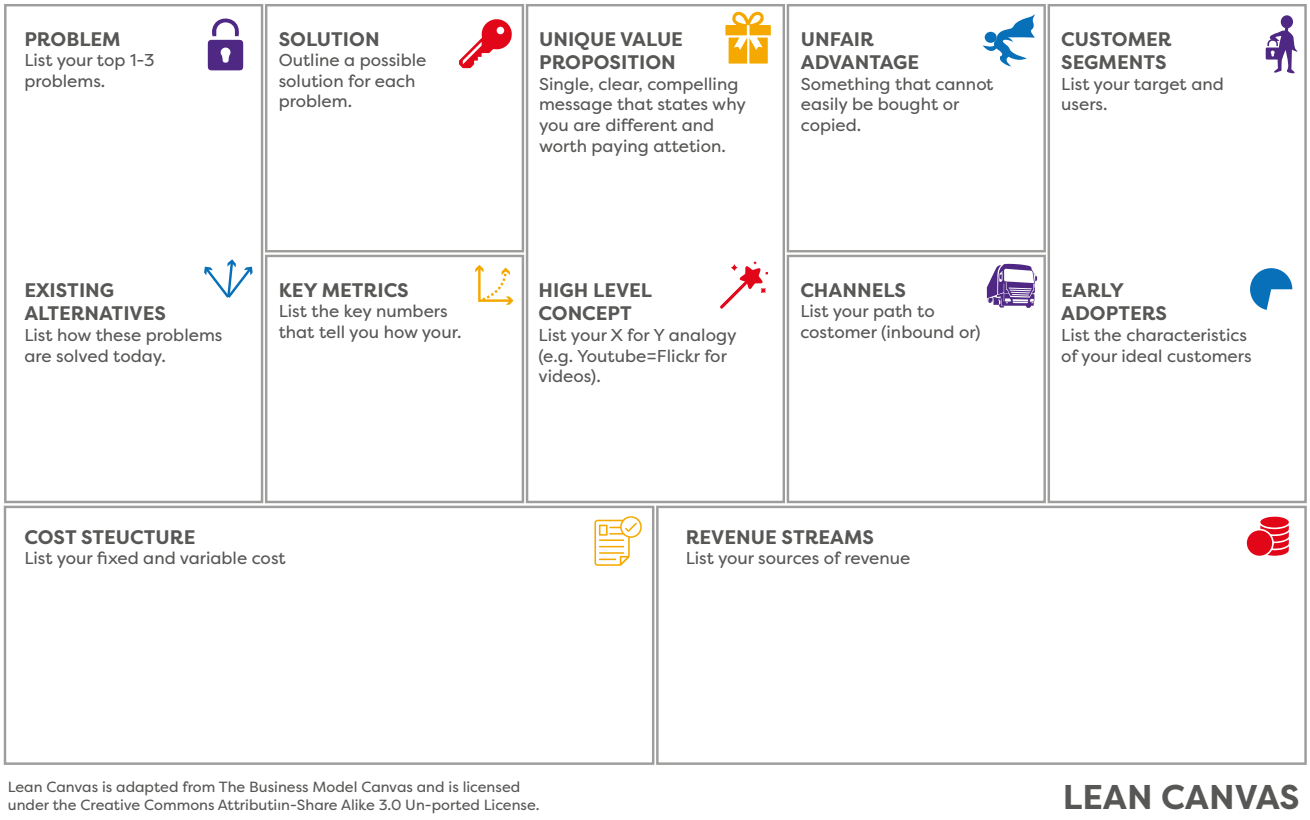


Figure 7: Lean Canvas (Maurya, 2010) – Customer and Problem

Tips

Don't underestimate the power of concise project charter when thinking about project boundaries, planning, and later in execution when stakeholders forget about purpose & objectives.

Lean Canvas© (Maurya, 2010), consists of the following sections and Appendix has more details on the Lean Canvas:

1. Customer segments and early adaptors
2. Problem and existing alternatives
3. Unique value proposition and high-level concept

4. Solution
5. Key metrics
6. Channels
7. Unfair advantage
8. Cost structure
9. Revenue streams

A typical Project Charter may consist of the following sections and a template is provided in the Appendix:

Project title

1. Project start and finish dates
2. Project effort and budget
3. Project description
4. Project purpose or justification
5. Product description
6. Major stakeholders, project manager, team members
7. Major assumptions and constraints
8. High-level risks

In preparing the above outputs, the following intermediary outputs can be prepared at a high level:

a. Customer Classification
b. Benefits Register
c. Preliminary Stakeholder Analysis
d. Benchmark Analysis
e. Assumptions & Constraints
f. Risk Analysis
g. Services and Business Model
h. Preliminary Work Breakdown Structure (WBS)
i. Preliminary Cost
j. Preliminary Schedule

It is worth noting that these outputs are not formal documents – founders should see them as informal, written forms of the project details in a structured manner. The templates covered in this guide intend to help founders to brainstorm and take decisions in an organised manner. The mindset in going through the Initiation stage should be that startup founders gain a good understanding of the size, scope and the budget of the project (including product development, sales, marketing, business development, fund raising activities) as well as the risks and constraints.

In the following sections, techniques, tools and templates are provided to define the business idea (problem, solution and business model), formulate the idea as a project and validate the idea. Just to reiterate, ideally, all these activities ought to be done prior to full-time commitment & spending by founders.

3.1 Define the Business Idea

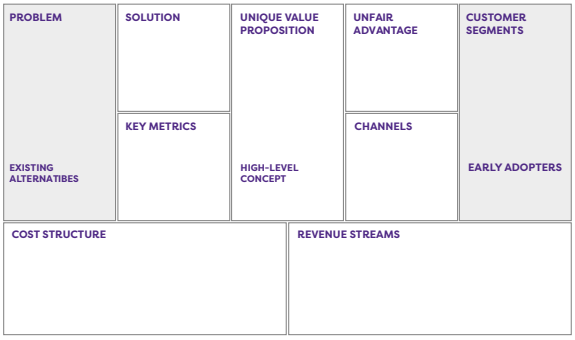
This phase is an opportunity for startup founders to explore the worthiness of the business idea in more detail. The Business Idea inherently consists of the following parts: the problem, the solution and the business model. The problem statement justifies why it is the right time to tackle this issue and who will be positively impacted if the problem (or parts of it) is solved. The solution statement, perhaps impartial at this stage, would clarify how much/what parts of the problem can be addressed and its main purpose. Finally, the business model statement elaborates who will pay for the solution and how the business will grow.

All these steps are necessary in order to comprehend the size of the problem tackled and whether the solution in mind can really be turned into a profitable business to invest in.
Section 3.1.1 explains how to use some of the Design Thinking methodologies in defining the problem or the need as well as how to empathise with the customer to elaborate the problem. Section 3.1.2 discusses the solution definition, the value hypothesis, the key metrics to measure the solution as well as some of the other support tools such as Benchmark Analysis and Stakeholder Analysis. These activities and tools exist to support startups both for effective internal communication and their communication with third parties such as investors, etc.

Finally, Section 3.1.3 focuses on defining the Business model, assumptions and constraints related to the business environment and the unfair advantage the startup team may possess.

3.1.1 Define the Problem

At this stage, it is crucial for startups to fully understand the problem, including the root causes of the problem to be addressed as the success of the solution, i.e., the success of the startup, depends on finding the right problem to be solved.



Problem can be defined as an existing need that the customer is expecting to be addressed/solved partially/completely in some means. In some cases, the problem startups focus may not necessarily be felt by the customers due to lack of information or availability of a solution in the relevant field. These are also called Latent needs, a problem that a user or consumer does not realise they have. These needs tend to go unspoken, as people may think they are not significant enough to be solved, or because nobody has looked at the root cause of the pain areas. Thus, startups can focus both on existing problems demanded by users and on latent needs.

The following sections explain how to define customers and how Design Thinking approach can be utilised in defining the problem with the consideration of the customer. At the end of this phase, the grayed-out sections of Lean Canvas (Maurya, 2010) can be filled out for visual representation and future reference.

3.1.1.1 Define Customers, Early Adopters

Customers are the people who ideally feels the pain or benefit from the solution proposed and pay for the service/product. At the very beginning of the initiation phase, startup founders should have a rough idea as to what type of customers they are targeting (end user or businesses) as well as rough demographics of the customers. Create customer personas and perform role-playing to "get into the minds" of your potential customers.

A second factor is to think when a customer will encounter and adopt the solution proposed. The following Diffusion of Innovations curve (Rogers, 2003) shows how the distribution of target customers will be with respect to their adoption behavior. At the very beginning of the project, it is an absolute must to attract some early adopters in order to integrate their feedback into the idea and shape the product accordingly.

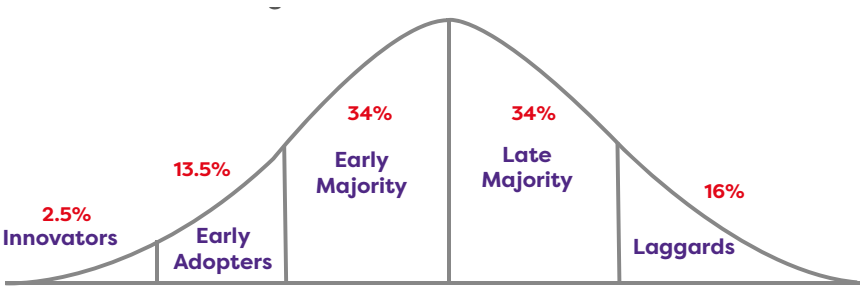


Figure 8: Technology – product adaption curve
(Everett Rogers – Diffusion of Innovation, 1962)

Interestingly, as mentioned in The Lean Startup book (Ries, The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses, 2011), though the early adopters play an important role in shaping/elaborating the product requirements, there is still work to do even when the product is sufficiently developed for early adopters. The reason for this is that the early adopters are more tolerant towards missing features, conceptual errors, design faults, etc. which may not hold for Early & Late Majority. Therefore, startups need to bear in mind that pleasing early adopters may suffice for MVP (Minimum Viable Product), but the final product will require further effort.

The following table shows a Customer Analysis for a Financial Technology product. The proposed solution can have multiple types of customers. In this example, the early adopters are thought to be individual traders and institutional traders. At the early stage of their project, startups will want to receive regular feedback from early adopters, thus it is crucial to know who they are. At the same time, they should keep an eye on how other customers act /which products they utilise) in order to make the product attractive to the other groups of customers as well. This table can be partially filled out at this stage and can be completed later after defining the solution.

Customer Analysis					
Project	Cross-currency Trading Mobile App and API		**Project #**	1	
Prepared by	M Smith		**Updated**	04/08/2018	
ID	**Customers**	**Type**	**Sector**	**Adoption**	**Date Entered**
1	Individual Trader	B2C	Finance	Early Adapter	04/10/2019
2	Institutional Trader	B2B	Finance	Early Majority	05/10/2019
3	Financial Application Provider	B2B	Finance	Early Majority	10/10/2019
4	Market Data Provider	B2B	Finance	Later Majority	14/10/2019

Table 2: Customer Analysis for Cross-currency Trading Mobile App

Customers are just a portion of the project stakeholders. Other stakeholders might include investors, competitors, project team, suppliers, etc. Comprehensive analysis of the stakeholders helps better identify and understand the customers and users. A typical Stakeholder Register table can include the following information and more for each stakeholder:

1. Name, company, contact details (email, phone)
2. Type (Investor, partner, advisor, mentor, resource, etc.)
3. Influence and/or impact description
4. Last touch date, last status
5. Power, Interest, Priority

For founders, it will prove extremely useful to keep a record of everyone they communicate. In that respect, they can setup a stakeholder register at the very beginning and update as they move forward. Founders can also communicate the progress of the project to these set of people as and when there is progress. This not only builds trust between various stakeholders and founders, but also set the right ground for potential investment, partnerships, etc.

3.1.1.2 Design Thinking Approach

The Design Thinking approach divides problem analysis into two phases; empathise and define (Martin, 2009). We suggest that the startups apply the empathise phase as the foundation to understand what the potential customers need, think and feel and then define the problem based on the inputs received during this phase. The following two sections study emphathise and define phases in more detail.

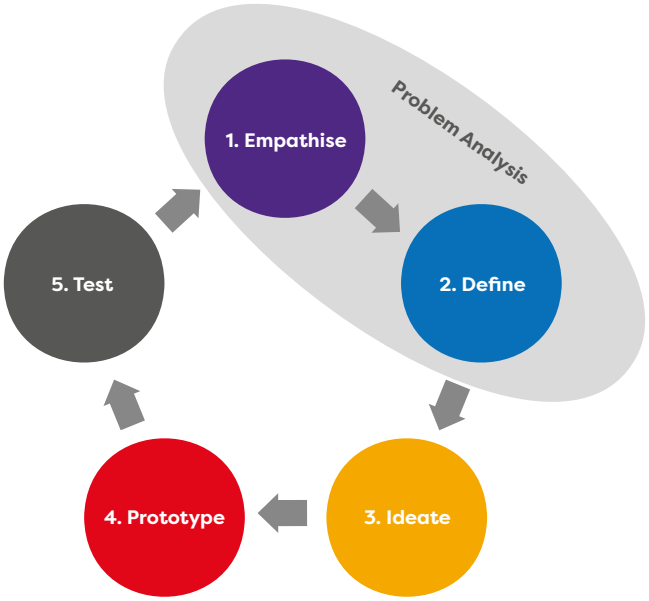


Figure 9: Empathise with the Customer

The problems that startups are trying to solve are rarely their own problems; in order to design for customers, startups must gain empathy for who customers are and what is important to them. **Empathy** is the centerpiece of a human-centered design process. In the Empathise phase, startups try to understand the way their target customers do things and why, their physical and emotional needs, how they think and feel about the problem addressed and the solution as well as what is meaningful to them.

In the Empathise phase, founders can:

- **Observe:** Monitor users and their behaviours in the context of their lives. Capture quotes, behaviours and other notes that reflect their experience. Observing what people do and how they interact with their environment gives us clues about what they think and feel.
- **Engage:** Interact with and interview users through both scheduled and short 'intercept' encounters. Engaging users reveals deeper insights into their beliefs and values, the way they think and the values they hold.

There are many tools which can be used during elaboration of the need. The Moment of Truth (MoT), Voice of Customer (VoC), Brainstorming, Surveys, Focus groups, Customer interviews are some of the tools that can help to determine the scope and severity of the problem as well as the need.

The best solutions come from the best insights into human behavior. Startups need to discover the emotions that drive user behaviour, reveal user needs (which they may or may not be aware of) and identify the right users to design for.

Define the Problem or the Need

The Define phase is when findings from Empathise phase are converted into customer needs and insights. Based on the understanding of users and their environments, an actionable problem statement should be generated.

The problem statement can then be used as a solution-generating springboard. A well-formed problem statement:

- Preserves emotion.
- Includes strong language.
- Uses sensical wording.
- Includes a strong insight.
- Generates lots of possibilities.

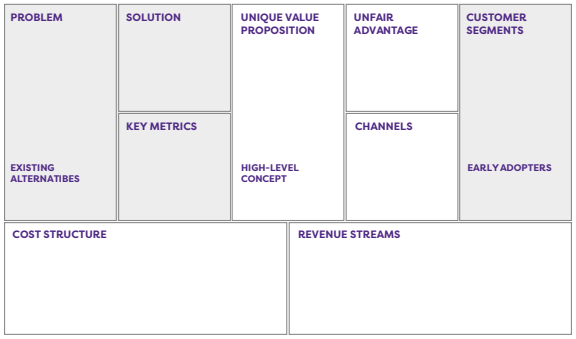
There are several questions that can be asked to elaborate the problem statement:

- What is the problem?
- Who is affected by the problem?
- What impact has the problem got on the people affected?
- Are people affected aware of the problem?
- How important is it to solve the problem?
- How urgent is the problem?
- Why should the problem be solved now?
- Can the problem be solved completely or partially?
- What part of the problem can be solved with the existing technology and resources?

In defining the problem, it would be extremely supportive to have statistical or reliable qualitative data to ensure that the need and the urgency are measured in some means.

3.1.2 Define the Solution

In this phase, founders formulate the solution in simple terms. In this formulation, founders can state what part of the problem is solved (partially or completely), how this solution is different from other existing solutions -if any, the risks, assumptions and constraints surrounding the solution as well as the characteristics of the potential customers.



At the end of this phase, the grayed-out sections of Lean Canvas (Maurya, 2010) can be filled out/updated for visual representation and future reference.

3.1.2.1 Define the Product/Service

The product/service is the proposed solution for the stakeholders/customers who are impacted by the problem or who stated the need. In defining the product or the service, the following details can be included though not all are necessary:

- The specific need/problem addressed
- Main Function/Purpose
- Technology to be used (eg. Artificial Intelligence, Internet of Things, Big Data, Cloud computing, etc.) can be mentioned if it is a distinctive characteristic for the solution

(and perhaps an advantage over competitors), otherwise it is not necessary to make technological decisions at this stage
- Platform on which the solution will be built (eg. Web, mobile, desktop, hardware, etc.)
- Other distinctive solution-related decisions if it is inherent in the solution and exhibits an unfair advantage (eg. 3D printing, metal cutting, etc.)
- Define Unique Value Proposition and Value Hypothesis

The Value Hypothesis, as given in The Lean Startup book (Ries, The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses, 2011), is the hypothesis about the unique relation between the problem and the customer or between the proposed solution and the customer. In the beginning of their journey, startups assume this Value Hypothesis to be valid and bases the groundwork of their solution on this hypothesis.

For example, for a startup building an electric scooter, the underlying assumption can be one or more of the following:

- The current transportation means do not cater for the needs of a specific group of people (defined as target customers)
- The current electric scooter options do not respond to target customers' requirements, because they lack X and Y.
- In small compounds, such as university campuses, electric scooters offer a better and quicker alternative compared to cars.
- People may not know how to ride a bike, therefore in areas where there is a bike lane, electric scooters can also be preferred.
- For people who prefer a greener option in their commute to work, if they do not prefer to bike, electric scooters can be a good alternative.

Based on one or more of the assumptions similar to the ones given above, startups can define their Value Hypothesis which tests whether a product or service really delivers value to customers once they are using it.

The Value Hypothesis, also known as the **Unique Value Proposition (UVP)** is what the product/service offers to customers that already existing solutions cannot. The value introduced can be

- A completely new product/service
- An existing product/service with new and advanced features
- An existing product/service on a new platform
- An existing solution with higher qualitative/quantitative specifications (eg. faster, more secure)
- An existing solution customised for a new customer segment

It is paramount to explicitly state the Value Hypothesis at this stage in order to be able to validate it continuously starting from the Minimum Viable Product (MVP) stage till the end.

3.1.2.2 Define Benefits and Key Metrics for Solution

According to Association for Project Management (Benefits Management, 2020), a benefit is a positive and measurable impact of change. Another notable definition is measurable improvements providing a business advantage (Sopko & Demaria, 2013). In the context of startups, benefits are two folds: those felt by the startup founders and those felt by the target customers through the product/service. From startup founders' point of view, examples to

benefits can include increase of market share in a specific domain, quicker ROI, becoming a well-known authority in a particular product type, etc. From customers perspective, the benefit is the value felt in an already existing or a completely new product/service.

In other words, simply a new and more advanced IT system or a newly developed product or service does not ensure success for a start-up on its own. In fact, even for big organisations, studies show that the majority of projects, though they meet time and budget constraints, are still deemed to be unsuccessful if they do not produce the benefits that the organisation expected at the time of the project launch (Ward & Daniel, 2006).

Analogous to Programs in corporates, startups are investments that expect a leveraged Return On Investment (ROI) over a sustained period (Sopko & Demaria, 2013). For this reason, defining benefits at an early stage is crux of intelligent startup management.

Benefits, usually interconnected and stakeholder-specific, can be tangible or intangible. In either form, they need to be defined with some key metrics attached. The key metrics are the parameters that show whether and to what degree

- customers respond to/utilise the value assumed in Value Hypothesis and built in the product,
- co-founders realised the initially set business-related benefits (eg. Increased market share, X amount of profit, etc.)

The benefits and the associated metrics differ greatly from one product/service to another, however, there are certain characteristics of the key metrics which should be kept in mind:

- Key metrics should be SMART (Specific, Measurable, Actionable, Realistic and Time-bound)
- Key metrics should be coherent and independent.
- Please note that you may want some metrics to decrease and some to increase in value. It is important to jot these down together with their current values and assign target values.

An example Benefits register is provided below for reference. In this example, two benefits of the smart meter product to be developed for home use are listed. There can be further business-related benefits foreseen by the founders.

Benefits Register				
Project		Smart meters for home use	Project #	1
Prepared By		F Kalamov	Updated	14/01/2020
ID	Benefit Description	Explanation	Metric Name	Target Variance
1	More efficient use of lighting in residential apartments	The residents would be able to monitor their light use and control unnecessary use	Reduction in electricity bills	Min 20% reduction in electricity bills
2	Prevention of unnecessary electricity use	The residents would be able to see the electricity use per electrical equipment (eg. plugged and unused phone chargers, home assistants, etc.)	Prevention of unnecessary plugging	Min 20% reduction in electricity bills

Table 3: Benefits Register for Smart Meters App for Homes

3.1.2.3 Perform Benchmark Analysis

Prior to deciding whether a product/project is worth the time and money of a startup, it is advised to perform a Benchmark analysis to understand how/to what extent competitors are addressing the need and whether the technology they utilise is superior (and thus preferable) to what the startup plans to offer. An example to a Feature-based Benchmark Analysis is shown below.

Benchmark Analysis - Features						
Project		Baby Monitoring Camera		Project #	1	
Prepared by		S Jackson		Updated	14/10/2019	
ID	Features (Criteria)	Weight	Proposed Product	Competitor-1	Competitor-2	Competitor-3
1	Baby can be monitored even when it is dark	1	✓	✓	✓	✓
2	The video can be recorded for re-watch	2	✓	✓		✓
3	The camera makes additional sound when the baby cries even if the monitor is in quiet mode.	1	✓		✓	
4	The camera can be adjusted remotely if the baby moves out of coverage area.	2	✓	✓		

Table 4: Benchmark Analysis for Baby Monitoring Camera

In this example, the baby monitoring camera that the startup is developing is superior in terms of some of the features compared to other competitors.

More comprehensive Benchmark Analysis including environmental, regulatory, technological aspects of the product or service can also be carried out if these aspects are important for the customers. For the above example, if the technological specifications such as 'hours of recording', 'charge duration', 'battery duration' are important for the owners of Baby Monitoring Cameras, then these must also be included in the Analysis and they also become part of the Value Hypothesis.

One other property of Benchmark Analysis is that it enables founders to evaluate whether any of the features or technological/regulatory/environmental superiorities bring any additional benefits to the end users through the product/service being built. In other words, startups can cross-check with the Benefits Register and see if any of the items in the Benchmark Analysis is associated to any of the benefits originally planned, and if not, they can re-assess if it is really necessary to keep that item even if it does not exist in any of the competitors. This would keep founders more focused on the scope of the product and the value delivered.

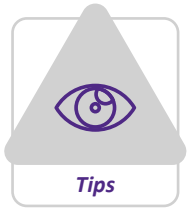
3.1.2.4 Define Risks, Assumptions & Constraints

Assumptions are the statements that we accept to be true and build our project accordingly. Assumptions can be about the target customer, problem, solution or business model. Project assumptions need to be clearly identified and validated before committing significant amount of time and resources so that limited time and resources are not wasted on conceptualising and initiating a project that has no basis for funding, or inadequate personnel to carry it out.

An example Assumptions Template is given below, and a blank version is included at the Toolbox. In the following example, there are assumptions attached to a certain supplier's capability to supply a certain material (ideally on time and within specifications), regulatory body's approach to a certain regulation and technical specification of a product. It is startup's responsibility to manage and check if these assumptions still hold during the project.

Assumptions					
Project		Smart Light Management for Smart Buildings	Project #	1	
Prepared by		G Phillips	Updated	14/10/2019	
ID	Description	Type	Technique	Status	Date Entered
1	Smart buildings require smart light management systems by definition	Problem			02/!0/2019
2	The supplier XYZ will be able to provide us with Raspberry Pi's within 5 days of our order.	Solution			04/10/2019
3	The regulation with regards to Smart Buildings will remain the same or at least the clauses concerning the lightings will not change.	Solution			05/10/2019
4	The lifetime of light sensors is 10 years.	Problem			10/10/2019
5	Enterprise customers will prefer one time payment.	Business Model			14/10/2019

Table 5: Assumptions Register for Smart Lights Management for Smart Buildings



High level brainstorming on assumptions and risks help define boundaries and ideas for better solutions, different technical approaches, and also contingency/backup plans in case if risks materialise.

Constraints are the limits placed on the project. All projects have constraints, and these need to be defined from the outset. Projects have limitations in terms of people, money, time, and equipment. While these may be adjusted, they are considered fixed resources by the Project Manager or the founders.

Assumptions and constraints can be related to hardware/software infrastructure of the solution proposed, suppliers, resources, stakeholders, regulations, technology, economical/ political climate, etc. Startups can choose to alter their assumptions based on some findings, yet they may not have any control on the constraints. It is their responsibility to check their validity and take the necessary actions if there is a change in any of the assumptions or constraints.

Every startup project starts with many assumptions related to the target customers, problems to be solved, solution to be generated and the business model. All the critical assumptions should be validated as soon as possible with prototypes or Minimum Viable Products (MVPs) as proposed in Lean Startup (Ries, The Lean Startup: How Constant Innovation Creates

Radically Successful Businesses, 2011) in order to avoid wasting limited resources based on wrong assumptions.

Lean Startup approach likes to use the term ***validated learning*** as the essential unit of progress for startups and it claims that any effort that is not absolutely necessary for learning what customers want should be eliminated. All effort, especially in the beginning should concentrate on validating the assumptions and product development phase is planned with this idea in mind.

Assumptions may include or imply one or more risks and these risks should be managed as part of the Risk Management practices.

Risk is defined as an uncertain event or condition that, if it occurs, will have a positive or negative effect on project objectives. All projects are risky, but startup projects are even more risky because of all uncertainties related to customer, problem, solution and market. Founders should take calculated risks in order to create value while balancing risk and reward.

The purpose of Risk Management is to identify risks, to exploit or enhance the **positive risks** (**opportunities**) and avoid or mitigate the **negative risks** (**threats**). If not managed, threats may result in issues or problems such as schedule delay, cost overrun, performance shortfall, poor quality, or even loss of reputation, whilst the opportunities captured at an early phase can improve the chance of success.

The project risks should be monitored and managed periodically during the project to ensure that the project stays on track and emergent risks are addressed as well.

An example of Risk Analysis template is provided below. In this example, some of the risks for a Voting Solution based on Blockchain Technology are listed down. This exercise helps founders to realise what may go wrong and how they plan to handle those situations.

Risk Analysis					
Project	Voting Solution using Blockchain Technology		Project #	1	
Prepared by	Neil Smith		Updated	14/10/2019	
ID	Risks	Type	Probability (1-min to 5-max)	Impact (1-min to 5-max)	Mitigation
1	The security of the voter authentication process may not be guaranteed by the third-party solutions.	Outsourcing	3	5	The responsibility of accepting the third-party solution can be shared with/transferred to the authorities.
2	Voting Authority may not be open to adapt a solution that require changes to the voting process	Stakeholder	4	5	Benefits of the product as well as the perceived advantages of existing solutions can be communicated to the authorities.
3	Voters may not have confidence to the new process/solution and turnout may reduce	Stakeholder	2	3	Voters can be informed proactively about the value of the new product to increase the level of trust to the system as well as the turnout

Table 6: Risk Register for Voting Solution using Blockchain Technology

3.1.3 Define Business Model

All startups aim to setup a sustainable business that ideally brings profit to its cofounders and share-holders, if any. In addition to having this overall financial objective, startups can have different business objectives in line with the Business Case. Here are a few examples:

- A social entrepreneur may aim to introduce a self-sustaining product for immigrants to support their local adaptation
- A fintech entrepreneur may aim to be the biggest data provider in a country for certain type of financial instruments
- A health-tech entrepreneur may aim to have his proposed device to be utilised by all the hospitals in the country
- An online-gaming entrepreneur may aim to have his games listed in all famous gaming platforms and reach out to thousands of gamers
- An entrepreneur aiming to build a market-place for electronics may look to sell the platform to a bigger and more established brand.

In addition to having an overall, forward-looking business objective, startups can have specific business objectives which are formulated in defining benefits.

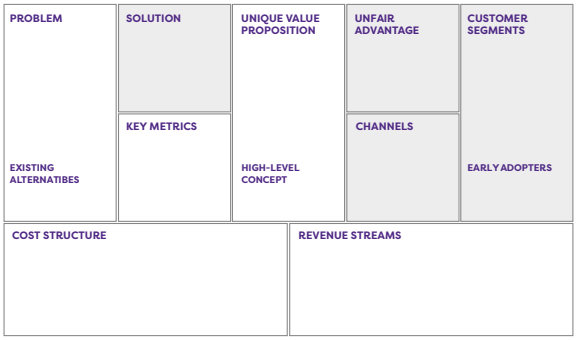
Business Model is a description of how your business runs. It inherently includes both the product(s) and service(s) offered as well as the method of selling (Ovans, 2020). One product can be offered in different forms to different set of customers. Some examples of Business models include, but not limited to Bundling, Pay As You Go, Freemium, Razor/blades, Subscription, Standardisation. A more complete list of business models can be found in Seizing the White Space by Mark W Johnson (Johnson, 2010).

Given the Business Case, the business objectives, the target customers and the proposed solution as inputs, the startups should be able to pick a relevant Business Model. In fact, as the proposed solution can have different forms of the same product/service, there can even be more than one Business Model within the same project.

For instance, a Fintech product can be served as a Freemium Service to end users whereas the data in the product can be delivered via an API to data providers on a Subscription or Pay As You Go model. Thus, in order to select the proper Business Model for their product/service offering, startups need to categorise their target customers and consider the right fit for each category of customers. A simple example is provided below where individual traders are offered a Freemium Service whilst the other customers are offered a subscription service. The expected monthly income field can be filled out once an estimate cost for the project is calculated (Please see Section 6.2.2). Startups would include the business model(s) selected when presenting their project to other stakeholders such as incubation centres, accelerators, investors and alike.

Services and Business Model				
Project	Cross Currency Trading Mobile App and API		Project #	1
Prepared by	M Smith		Updated	04/08/2018
ID	Product/Service	Customer	Model	Expected Monthly income
1	Aggregated Data & Trading Platform	Individual Trader	Freemium Service	
2	Portfolio Management and Analytics	Institutional Trader	Subscription Service	
3	Institutional-grade Market Data Feeds & APIs	Financial Application Provider	Subscription Service	
4	Institutional-grade Market Data Feeds & APIs	Market Data Provider	Subscription Service	

Table 7: Services and Business Model for Cross Currency Trading Mobile App



At the end of this phase, the grayed-out section of Lean Canvas (Maurya, 2010) can be filled out for visual representation and future reference.

3.1.3.1 Define Unfair Advantage (Team, Solution, Network, IP)

Unfair advantage is an inherent characteristic that a startup has which sets it apart from similar start-ups. This characteristic can be in terms of the team, the solution proposed, the business network or any other property that cannot be taken away.

Here are some examples to unfair advantages a startup may have:

- a start-up cofounder may have prior successful experience with a similar product
- Cofounders may be known as effective leaders in the sector
- The cofounders may have a large network at every level ranging from potential customers to investors
- The proposed solution may contain patents owned by cofounders
- The team may consist of people who have vast experience in the relevant sector

Startups first need to acknowledge their unfair advantage in order to make full use of it. Knowing in which area / skill set they are superior would create self-awareness for start-ups and they can then capitalise on this whilst presenting /selling their solution to investors, customers, or other actors in the ecosystem (Gray, 2020).

3.2 Frame the Idea as Project

In this phase, the startups formulate the proposed idea in the form of a project. For this, the co-founders define work packages, resources, risks, stakeholders, schedule, cost and revenue-related matters at a high level. This phase matters for the following reasons:

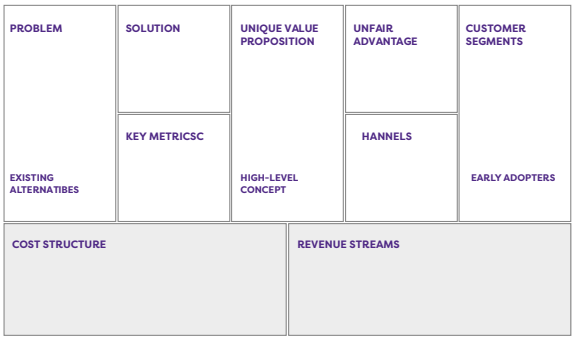
- To have a better overall view as to whether this is a realistic project with the available capital.
- For co-founders to decide whether they are ready to commit time and money to the project.
- To get ready to effectively communicate their project to all the relevant stakeholders such as customers, incubation centers, investors and so on.
- To setup the foundation for the planning of the project.

Startups put their (and potentially their families') standard of living at risk by following their business idea. It is not only their time, but also their money that is at stake, thus the decision of whether to pursue should be made in an informed manner.

The activities during this phase reveal extremely valuable information about the project. For instance, if the project is estimated to cost significantly more than the available capital and the prospect of finding an investor in an acceptable time frame is low, then co-founders need to make the call whether to kill the project or to continue. Similarly, the resources required may be in scarce for the technical development of the product or the main stakeholders may not be supportive of the solution proposed, in which case co-founders can still choose to take the risks, yet this go/no go decision would be an informed decision rather than an accidental one.

Additionally, the information gathered at this phase can also be used in communicating the solution to stakeholders to collect feedback, to seek investment or any other form of support.

It is worth noting that if cofounders decide to go ahead with the implementation of their idea, the outputs of this phase will form the basis for planning and execution of the project. The Planning phase discussed in Section 4 elaborate the risks, schedule, budget and other important elements of the project and the Execution phase in Section 5 will monitor and control these elements.



At the end of this phase, cost structure and revenue stream of Lean Canvas (Maurya, 2010) can be filled out and other fields (already written to a certain level in Section 6.1) can be refined further for visual representation and future reference. Please note that these outputs need updating regularly based on the changes introduced during the lifetime of the project.

3.2.1 Define Preliminary Scope

Scope is a concise, measurable statement of what the project will accomplish (in scope), and, where appropriate, what it will not try to accomplish (out of scope). In other words, it is a statement of the work required to create and implement the product or service as well as the work required to manage the project.

The simplest way to start thinking about the scope is to take a sheet of paper and draw a mind map of work to be done. Start from top level work that your project/product will encompass. Then start drawing the tree roots of each node till you reach all the deliverables and associated work required to meet the project objectives. It is also advised to define specific exclusions from the project where appropriate.

Formally, this process is called producing the **work breakdown structure (WBS).** As defined in the PMBOK® Guide – Third Edition, a WBS is a "deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables. It organises and defines the total scope of the project. Each descending level represents an increasingly detailed definition of the project work. The WBS is decomposed into ***work packages.*** The deliverable orientation of the hierarchy includes both internal and external deliverables" (PMI, 2017).

In the Initiation Phase, a high-level WBS can be prepared to estimate roughly the amount of work required for the project. This estimate can be refined later at the Planning phase without substantially increasing the estimate of work if the founders decide to implement the idea.

An example WBS and relevant work packages are presented in the diagram below. WBS sample presents a Time tracker application. Work is decomposed to 8 larger chunks – work packages, which can be further broken down into smaller work packages or activities if need be. Presentation of WBS can be done vertically or horizontally.

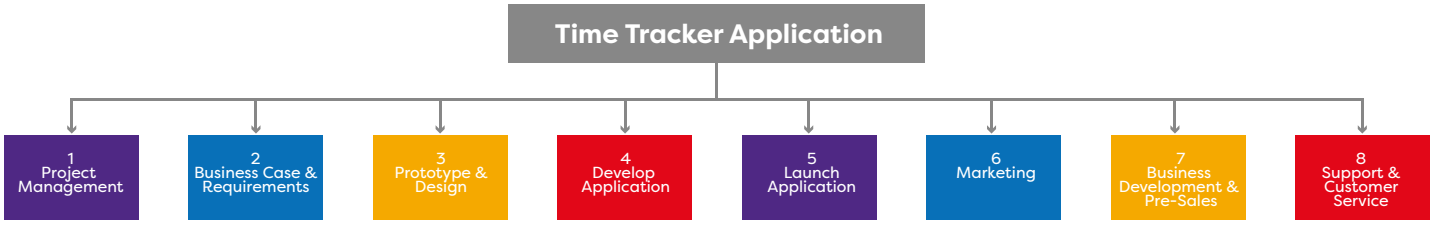


Figure 10: Example of a 1-level Work Breakdown Structure for a Time tracker Application

3.2.2 Establish Preliminary Schedule and Budget

Startup projects may include the development of one or several products that may or may not complement one another. These products may require maintenance and occasional upgrades over its lifetime which may incur operational costs, and at some point in the future the products will be replaced with yet another solution. The end point of the project can be defined in many ways by founders: the project end can be the break-even point, when the return-on-investment (ROI) exceeds X, when the product development is completed, when the product has Y users, etc.

Therefore, depending on the definition of your project's starting and ending points, the true cost of the product may include both implementation and ongoing operational and maintenance costs which determines the product lifecycle costs. When comparing alternative approaches during project initiation, it is useful to compare product lifecycle costs rather than just product development costs. This may help the startup identify the alternative routes to choose that truly provide the greatest value over its lifetime. This total cost is sometimes referred to as TCO - Total Cost of Ownership.

3.2.2.1 Schedule

It is necessary to identify at least the high-level activities of the project based on the WBS and have an estimate of the project duration. The tasks should include all major steps in the project related to product development (such as, requirements gathering, design, implementation, etc.) and project planning and management (such as, quality, procurement, marketing, etc.).

The preliminary schedule can include the major milestones and associated dates. Milestones can be intermediary/final products or major events that may be readily identified as completed or not completed on a specified due date. Since most startup projects have many critical assumptions to validate and want to get customer feedback as soon as possible, iteration planning plays a significant role in project and product success.

An example roadmap is given below for a Financial Application. In this example, there are intermediary products such as Tick Product. The Minimum Viable Product is the website with reduced functionality and data. Overtime, the plan is to grow it and produce a desktop application with more features and trading capability. Please note that the final trading platform is launched almost a year after the MVP.

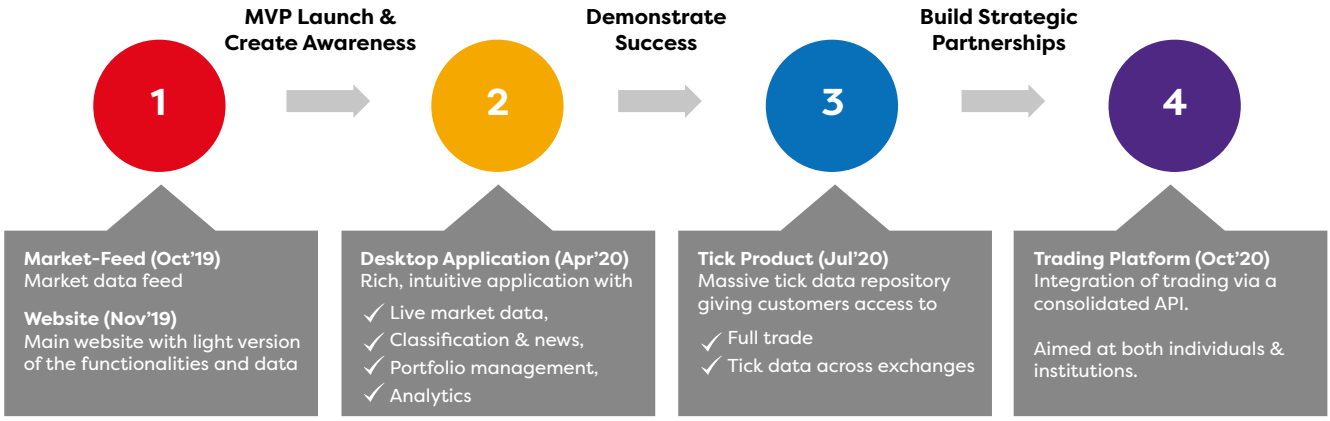


Figure 11: A High-level Schedule of Milestones and Roadmap

3.2.2.2 Cost and Revenue

Work packages detailed under Work Breakdown Structure (WBS) help reveal the skillset and the resources required. Based on this, preliminary resource requirements, such as manpower, material, equipment, software, etc. that are needed to perform the work packages can be identified at a high level and a cost estimate for each item can be attached. Though this may change during the life of the project with scope changes and pivots, it is useful as a baseline in the beginning of the project. Any indirect costs that are not directly tied to the project activities, should also be identified and added to the project budget.

Project budget should include roughly the total cost of the project.

Project Budget			
Project	Smart Light Management for Smart Buildings	Project #	1
Prepared by	M Smith	Updated	04/08/2018

WORK PACKAGE	ACTIVITY	WORK COST	TRAVEL COST	TRAVEL COSTS	EXPERT ROLE	SUBTOTAL
WP01	Project management	€ 500,00	1.000,00 €	200,00 €	Project manager	€ 1.700,00
WP02	Business Case & Requirements	€ 3.000,00			Business analyst	€ 3.000,00
WP03	Prototype & Design	€ 15.000,00			Developer	€ 15.000,00
WP04	Develop application	€ 45.000,00			Team Leader	€ 45.000,00
WP05	Launch application	€ 15.000,00			Marketing	€ 15.000,00
WP06	Marketing	€ 15.000,00	15.000,00 €	20.000,00 €	Marketing	€ 50.000,00
WP07	Business Development & Pre-Sales	€ 30.000,00	10.000,00 €	5.000,00 €	Business analyst	€ 45.000,00
WP08	Support & Customer service	€ 30.000,00			Team Leader	€ 30.000,00
Total		€ 153.500,00	26.000,00 €	25.200,00 €		€ 204.700,00

Table 8: Project Budget for Smart Light Management for Smart Buildings

In defining the business model for the project, the revenue sources are listed. At this stage, startup founders can decide the pricing strategy for each revenue source. For instance, if the subscription is the model selected for a set of customers, the decision of how much they would be charged monthly/annually can be decided at this point with the consideration of the cost of the project. These figures can be inserted into the Table-6 initially filled out at Section 3.1.3.

3.2.3 Final Note: Define the Business Case

Business Case is defined as "a document written for executive decision makers, assessing the present and future business value and risks related to a current ... investment opportunity" (Keen & Digrius, 2003). It also provides the reasoning for initiating a particular task or a project management scheme (Project Management Institute, 2013). Corporates do their due diligence in various functions (R&D, Marketing, Business Development, Innovation Dept, etc.) before commissioning a project and assigning it to a project manager, therefore in corporate project management, the project manager usually would not carry out further analysis to justify the need for the project, yet startups need to dig deep to justify as to whether there really is a pain area and why it makes sense to address it now.

The business case should also reference the driver behind the project, such as: market demand, organisational need, customer request, technological advance, legal requirement, or social need (Goodrich, 2020). Any data points that relates to the need for a solution should be included to lead a data-driven go/no go decision for startup investment.

Ideally, the Lean Canvas (Maurya, 2010), gradually filled out in the previous sections, represents the Business Case for start-ups at Initiation phase. It can be refined at Idea Validation (Section 3.3) and Planning Phase (Section 4) to ensure that with further findings the project still remains to be profitable.

3.3 Validate the Idea

Defining the problem, the solution and the business model, as explained in Section 1.1, help startups justify conceptually that their idea is worth pursuing.

Framing the project, as discussed in Section 1.2, helps co-founders assess whether this is a project they can/would like to carry out within the constraints defined.

Finally, Idea Validation phase, presented in this section, brings a certain level of assurance to the cofounders in terms of whether their potential customers also think that:

- this is a worthwhile problem to address,
- the solution proposed is indeed attractive enough to customers,
- they would be willing to spend money on it.

In order to achieve this without spending too much time and effort, startups should aim to validate the assumptions and hypothesis without carrying out a lot of product/service development work.

The validation process can be in several iterations addressing various hypothesis and assumptions that are critical to the success of the product/service. The following ***Validation Register*** inspired by the **Validation Board** (Lean Startup Machine, 2020) can be utilised to record which hypothesis or assumption is validated in a given validation iteration.

Validation Register			
Project	On-the-go coffee machine	**Project #**	1
Prepared by	J Svenson	**Updated**	04/10/2019

ID	Hypothesis / Assumption	Type (problem/ solution/ business model)	Technique	Observations and Decision (Pivot / change / Other)
1	People like having coffee whilst they are out and about.	Problem	Survey	Survey results show that 65% of coffee-lovers also like outdoors activities or would like to have easy access to coffee when they are out and about. (Persevere)
2	People prefer freshly made coffee rather than one that is made sometime ago and kept warm.	Problem	Focus group meetings	A select group of coffee lovers (2 groups of 20 people) are asked to taste freshly made coffee and coffee that was made 5 minutes prior and kept in a thermos. 85% of people preferred freshly-made coffee. (Persevere)
3	People would not mind carrying a 2kg product to have a freshly made coffee.	Solution	Prototype	20 potential customers are asked to carry a 2-kg prototype around when they are out doing various activities. They are then asked if the effort (to carry the prototype in order to drink fresh coffee) was worth it. 15 people said they would do it again, 3 people said they may do it again, 2 people said they would not do it again. The results support the hypothesis positively. (Persevere)
4	Rather than purchasing an ordinary thermos, people would buy an on-the-to coffee machine even if the price for the machine is 10%-15% is higher.	Business Model	Collect Interest	Both products are offered online. Of 45 visitors in 7 days, 13 showed interest for the coffee machine. (Persevere)

Table 9: Validation Register for On-the-go coffee machine

In the example provided above, the founders test their assumptions about an On-the-go coffee machine. This machine keeps water and coffee in separate containers. It brews the coffee when user presses a button on the container. Some of the assumptions for the product are listed under the Hypothesis column. Some of these assumptions are related to the Problem, some related to the solution and some are related to the business model.

The techniques utilised to test each hypothesis, the description of the actions in that validation iteration as well as the conclusions and decisions are also listed in the Validation Register. One hypothesis can be validated repeatedly at different times, with different set of customers or by using different techniques.

At the end of each iteration **Pivot** or **Persevere** decision is made. Persevere decision is taken when the validation effort supports the hypothesis. Pivot is a change in product/service definition or a shift in business strategy. Pivots may include changes to problem, solution or business model definition which effectively is a change in the final product or service. For instance, for the third hypothesis given in the Validation Register table, if the customers are not happy to carry a 2-kg product around for a freshly-brewed coffee, but they accept to carry a 1.5kg thermos, then the design of the product, the materials planned to be used may need a re-think which may mean a significant change for the cofounders.

The Validation Board (Figure 14) can be used to track the pivots and related hypothesis and assumptions.

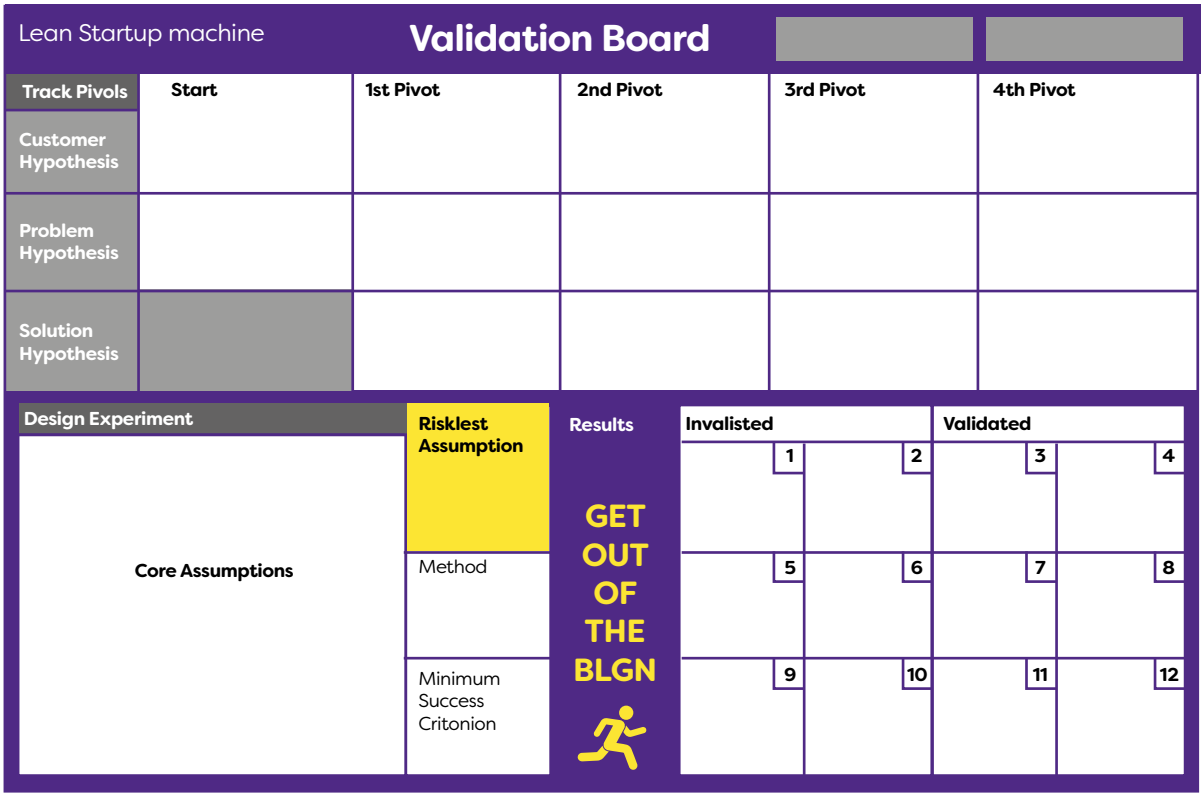


Figure 12: Validation board (Lean Startup Machine, 2020)

The main purpose of the Idea Validation Phase for the cofounders is to be able to persuade themselves that the product/service solves an urgent problem in an effective, innovative and profitable manner. In other words, they need to persuade themselves or the investors that pursuing this project is worth the money, effort and the time they will dedicate through the rest of the project.

The following sub-sections describe various techniques for Problem, Solution and Business Model Validation.

3.3.1 Validate the Problem

Problem validation is about finding out the urgency and importance of the problem for the target customers. The focus during this phase is to receive qualitative feedback supporting startup's initial gut feeling or the quantitative information collected. The main techniques

that can be used include, but not limited to,

- 1-2-1 sessions with potential customers,
- surveys among potential target customers,
- observation of users in their natural environment – also called Ethnographic Research (Lay & Kocsmarszky, 2020),
- Google Trends to find out if the topic is frequently searched for,
- Competitor success to find out if they have enough customers to survive/flourish.

3.3.2 Validate the Solution

Many startups fail to validate the proposed solution before it is too late. The goal of validating the solution (whether remotely or in person) is to ensure that the product/service proposed is solving the right problem in an effective and innovative manner. The trick here is to spend minimum amount of time and money to obtain feedback from customers around the solution.

Examples of early validation techniques include, but not limited to:

- A short **presentation** explaining briefly what the final product/service is and how it will add value to the customers.
- Digital, Drawn or made-up **mock ups** for customers to have a feel of the final experience.
- A simple **prototype** (eg. Non-functional screens) to give customer an idea about the final product/service.
- **Usability testing tools** - eg. UsabilityHub (Usability Hub, 2020) to collect feedback and get insights from the customer for any of the early artefacts.

3.3.3 Validate the Business Model

This process can also be seen as 'willingness-to-pay' validation. In other words, whether the customers are happy to pay some amount of money to receive the product/service. Whilst validating the solution, we test the inherent features of the product whereas in Business Model Validation, startups need to test whether the customer segments determined for different versions of the product (see Section 3.1.3) are indeed happy to put money behind their words.

Here are some of the techniques that can be followed to validate the business model:

- Surveys can be implemented to gather feedback from potential customers about their intent to buy the proposed service/product. This is a passive validation technique and not the most trustworthy one as people can act differently from how they state in a survey.
- Concierge Service technique can be utilised for when the final product/service can be hand delivered or manually achieved. For instance, if a startup promises a daily AI-generated report about financial market status to the end user, rather than actually implementing the whole product, the founders can write manually a report that would look similar to the end product and share with potential customers, see if they are ready to pay for the service and obtain feedback.
- Introduction website should ideally be built very early. This site would give information about the potential features of the product and a potential timeline. The founders can check the traffic on the site by using Google Analytics in a limited period of time.
- Collect interest technique is where founders publicise the product online in advance

and have people register/show interest for the product or the service. This technique helps founders check the level of early demand and the collected e-mail list can be used when the beta version of the product is available.

- Pretend collect orders technique is similar to collecting interest except that the product is shown to be available in the market and a 'Buy Now' or 'Contact to Order' link is also available on the website. Once the customer clicks the button, the site would then inform the customer that the service or the product will be available in X amount of time and that the startup will be in contact with them in due course. This technique requires sensitivity as some customers may perceive it as a scam if the information or the wording on the landing page is not written precise enough. This technique is also called Spoof Landing Page in some sources (Lay & Kocsmarszky, 2020).
- Competitors' customers technique requires startups to investigate if their competitors or similar product owners use similar Business Models. If for that product/service range, the Business Model selected is common, this can also give a certain level of assurance to co-founders.

3.4 Final Notes

Validation is indeed an ongoing process throughout the whole lifecycle of the product. It is up to each startup to decide when to move from Initiation Phase to Planning Phase to take the project one step further.

The main turning point here is the commitment to finance the project. If after N validation iteration, founders are ready to commit X amount of time and Y amount of money to develop the product and turn it into a viable business, then that is the right time to make a more detailed plan of what is next.

The next section elaborates on Framing the idea as a Project (Please see Section 6.2) and discuss Project Management Knowledge Areas: Scope, Schedule, Cost, Quality, Resource, Communication, Risk, Stakeholders and Procurement. Startups, however small they may be, need to plan, manage and control each of these areas in order to successfully turn their ideas into a money-making business.

4 Planning

During the Initiation Phase, the start-up decides whether it is feasible, practical and realistic to pursue their business idea by defining and validating the problem, the solution proposed as well as the business model. The initiation phase is invaluable for the start-up to test whether it is ready to dedicate the time, energy and money to build the solution under investigation or to find required fund from investors.

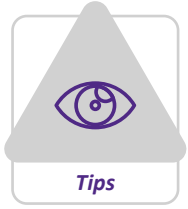
IF YOU FAIL TO PLAN, YOU ARE PLANNING TO FAIL!

The planning phase is where the founders get ready to plan their time, budget and resources to have a better idea about the size and requirements of the project. Clearly, the plans can and will change since startup idea is based on many assumptions regarding the customer, solution and business model and some assumptions will certainly be invalided during the experimentation. Therefor the objective is not to develop the ideal plan but to develop a baseline (initial state) and then to keep track of the changes as they occur.

As briefly discussed as part of Section 2 in defining **Outspeed Startup Glasses,** planning happens both pre- commitment and post-commitment periods.

- During the pre-commitment period, planning not only helps founders visualise the project but also prepares the start-up for accelerator programs, incubation centre/ funding grant applications, angel investor presentations and alike. The content of info decks and investor decks (such as the runway, the budget, the roadmap, what makes this a better solution compared to others, etc.) lie in the nitty gritty details of the planning iterations.
- During post-commitment period, the initial plans are elaborated, the work packages are broken down into manageable pieces, each iteration (that aims to deliver a better version of the prototype/product) is planned in detail. It is common to realise that part/whole of the proposed solution is not feasible or viable, this is also why it makes sense to go through the plan after each iteration even during post-commitment and decide to pivot or persevere.

Planning makes cofounders think hard about how the project will be executed. That is why the process of planning is more important than the plan itself.



After you have finished the first planning iteration grab your Risk Register and think hard how you can adapt your plan to avoid any unnecessary risks.

The purpose of the Planning phase is to:

- Identify or refine the project & product requirements.
- Estimate the scope (tangible and non-tangible elements).
- Define work packages and activities (including a list of deliverables).
- Estimate more precise cost and schedule of the project.
- Verify or update the phases of the project to reflect the requirements for managing the project lifecycle (one cycle, multiple iterations, etc).
- Establish milestones (key time points when big things must happen).
- Refine the risk identification and response planning.
- Estimate Resources and establish the Team (team structure, responsibilities, and communications).
- Think about how you will manage changes when they occur.
- Validate the project success criteria (review Project Charter and Business Case).

Planning is not a one-time effort and should be repeated during this phase when more details are known. In the rest of this section, the following aspects of the project are discussed, and relevant planning tips are provided: Scope, Schedule, Cost, Quality, Resource, Risk, Procurement and Stakeholders.

It is worth noting that projects vary in nature, so does the amount of planning for each aspect. Some products may require more detailed risk/quality assessment than others, some may not require any procurement before the MVP, etc. What matters most for the cofounders is to be aware of these, keep an eye on all these different aspects of the project and take the necessary actions accordingly.

4.1 Define Scope

The project scope defines what startups will do/deliver and how they will deliver. Project scope also includes the product scope (what will be done) and provides the basis for future project decisions.

In the Initiation Phase, whilst framing the Idea as a Project (please see Section 4.2.1), cofounders note down initial requirements, create the first version of work packages in the form of Work Breakdown Structure (WBS). In Planning phase, they need to elaborate this further and break the packages into activities, define milestones and stages if any. The rest of this section explains these activities in detail.

4.1.1 Requirements

The requirements are the set of statements that explain how the proposed solution will address the need from different perspectives. The requirements should not solely address the solution; it should also make the link between the solution, the problem as well as the business model to ensure that in building a solution, the founders do not distance themselves from the original business idea.

The requirements can be formed as **user stories**. The format of user stories can as follows:

< type of user > can do < some goal > so that < some reason >.

The requirement and benefit can be written in the form of the following sentence:

As a (role) I want (something) so that (benefit).

Here are a couple of examples that can be recorded in the Requirements List

“Power users can specify files or folders to backup based on file size, date created and date modified.”

“As a user, I can indicate folders not to backup so that my backup drive is not filled up with files that do not need to be saved.”

Details can be added to user stories/requirements in two ways:

- By splitting a user story into multiple, smaller user stories.
- By adding acceptance criteria.

Anyone can write user stories. It is the founders’ responsibility to make sure a product backlog of user stories exists.

The user stories should be lightweight at the time of the creation. When more detail is required or that a story is selected for an iteration, founders can gather more input about that story from potential customers via focus groups, 1-2-1 interviews, etc. It is also important to attach acceptance criteria to user stories to confirm when that requirement/user story is implemented.

An agile user story template is provided below for example purposes.

Agile User Story Template				
Project		IOT Solution to keep track of recycling levels	Project #	
Prepared by		J Svenson	Updated	
User Story ID	Priority	As a <Type of User>	I want to <perform some task>	So that I can achieve <some goal>
1	High	Admin	View the amount of glass/ plastic/paper thrown away daily for each recycling bin	Report and track the progress
2	Medium	Service men	Monitor the state of the IOT sensors	Arrange replacement or fixing of any sensors if there is any broken sensors

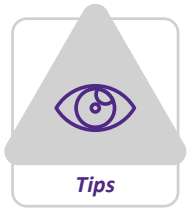
Table 10: Agile User Story Template

When all the requirements are collected in the form of user stories and defined, founders can form a product backlog. This is the basis of scope. The scope can be changed after each iteration with the addition of new user stories or deletion of some of the existing ones.

It is noteworthy to mention that there can be requirements that are not user-defined. For instance, the choice of technology, the infrastructure, the behind-the-scenes works can be determined by the founders and the team. These also need to be recorded to monitor and manage the execution.

4.1.2 Work Breakdown Structure

The Work Breakdown Structure provides the capability to break the entire project scope in a top-down manner into manageable blocks of work, also called work packages, and assign responsibility to deliver the project scope. Work packages are self-contained, measurable pieces of scope with associated cost, start and end point. Work packages are then broken into activities (tasks).



Turn WBS into a team building activity to collect input & get buy-in.

This decomposition process can be based on deliverables such as components of the final product or project phases such as design, development, reporting, etc. (Shenoy, 17 November 2019).

In this activity, it is also possible to purely focus on the features of the solution being developed (also called Features Breakdown Structure). However, in this case other project-related activities (Marketing, Business Development, Sales) can be accidentally excluded, therefore cofounders need to pay attention to these types of work packages as well to manage the project as a whole rather than purely focusing on product development activities.

A good WBS serves as a key input to schedule activities and estimate costs of work package. WBS provides the baseline for scope. Baseline is a time snapshot of scope that was agreed. It is used for comparison to actual results (scope, schedule, cost) during the entire project life cycle.

In Planning Phase, cofounders can elaborate the work packages they created during Initiation Phase. The level of decomposition can be determined by founders.

In the following example, time tracker application is broken down into 8 work packages during the Initiation Phase. These work packages are further elaborated. For instance, for the development of the application, BE Infrastructure, FE Infrastructure, Module 1 and Module 2 work packages are created.

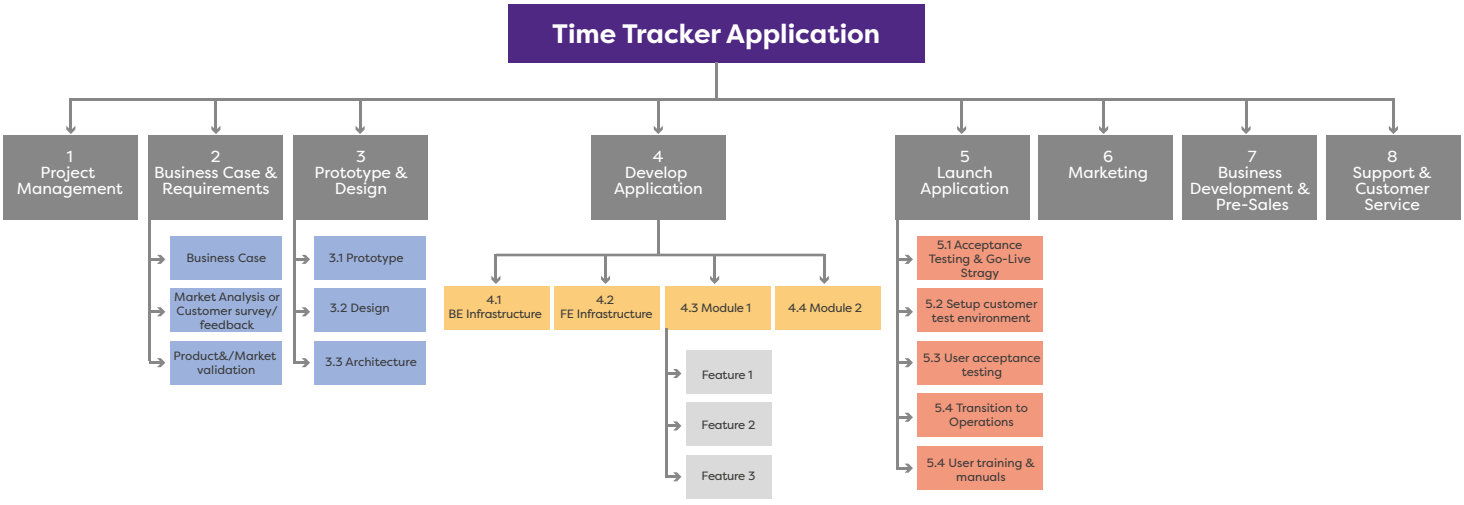


Figure 13: WBS sample further decomposed.

In lieu of Work Breakdown Structure, founders may want to utilise Feature Breakdown Structure (FBS) for the Product Development part of their startup. FBS focuses on the features of the product/service rather than the business as a whole. Therefore, founders should utilise FBS with caution and only for the product design/development related activities. The following figure shows an example of an FBS.

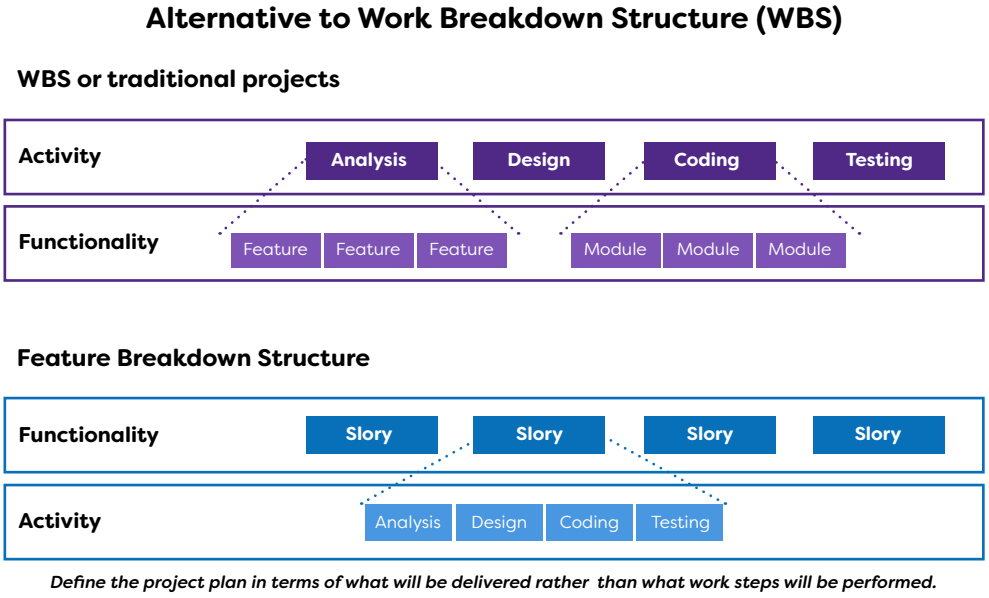


Figure 16: FBS sample further decomposed.

4.1.3 Phases and Milestones

Milestones are important discreet time events with no duration. At the end of each phase, there is usually a milestone indicating the phase is completed and/or a gate that determines if the project may proceed to the next phase. In the example shown below, the Time Tracker Project has a milestone when the Business Case & Requirements are defined, when the Prototype and Design are completed and when the product is launched.

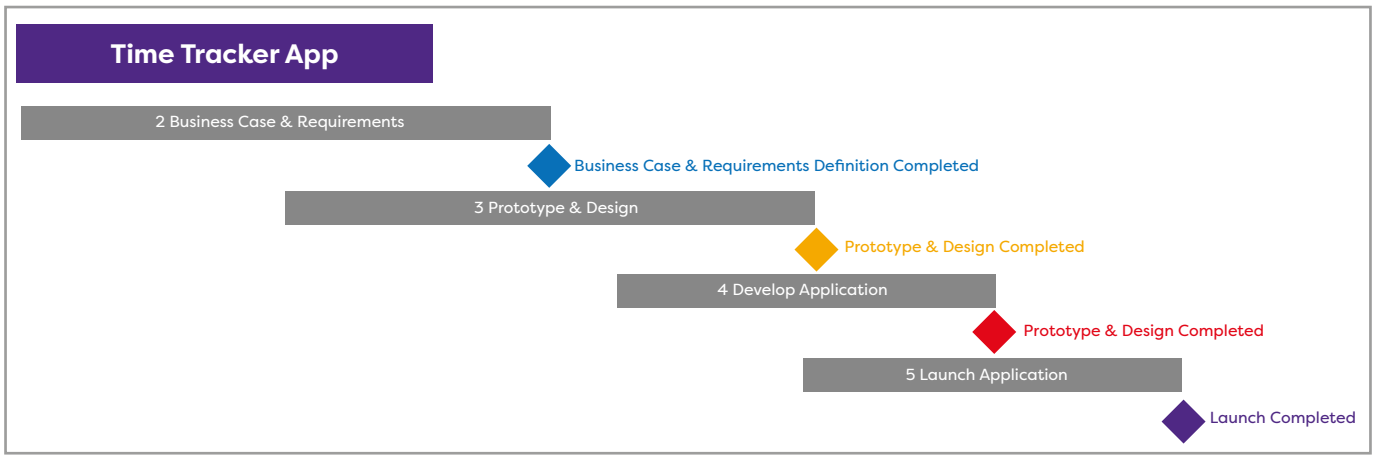


Figure 15: Milestone graph

Startups can also set phases within their projects. After each phase, there can be a go/no go decision based on the project progress. As shown in the Time Tracker Application example below, within each phase, activities that will be delivered in parallel or sequentially during that stage can be listed. The activities are discussed in detail in the following section.

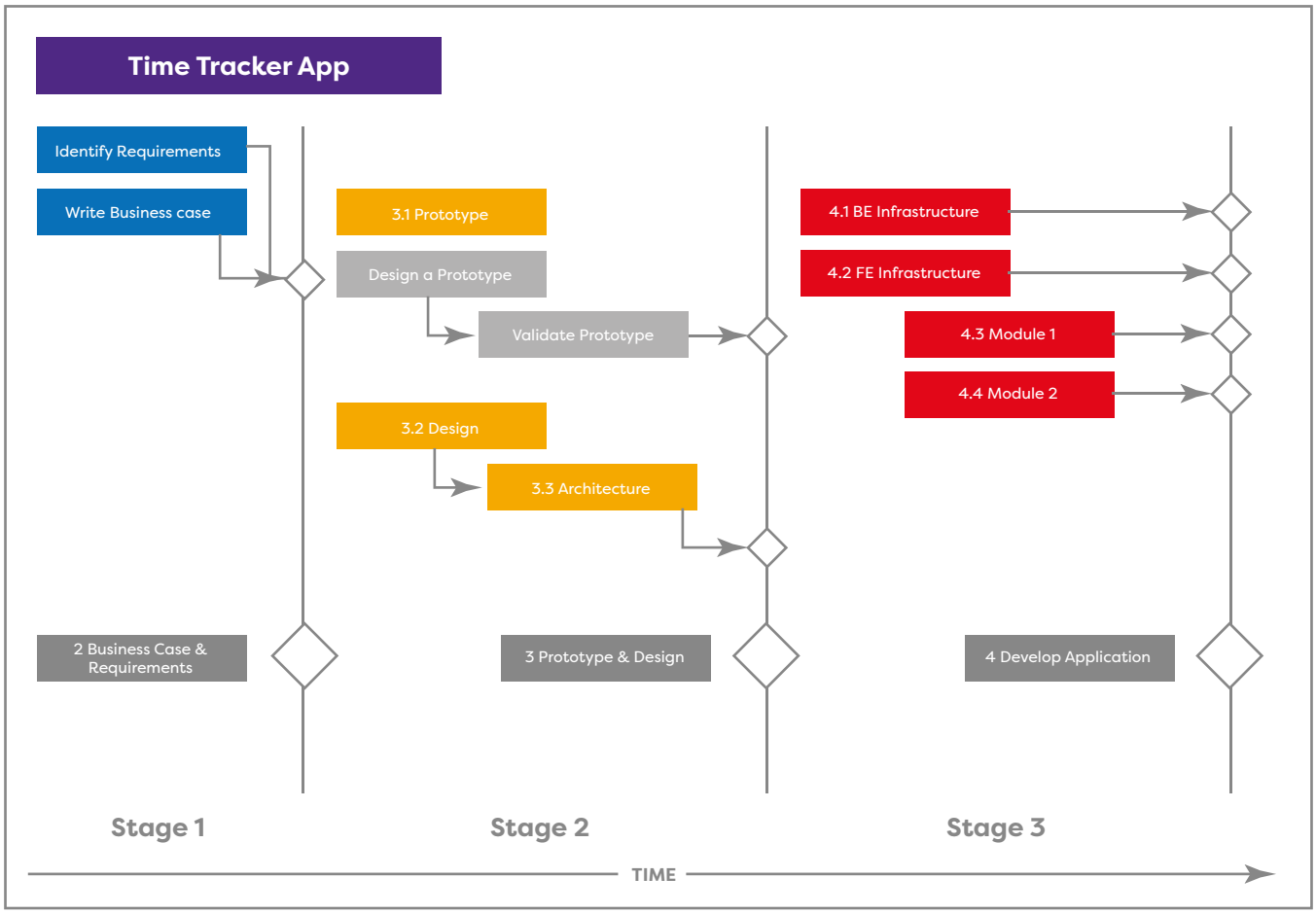


Figure 16: Stage-gate approach

4.1.4 Activities (Tasks)

The Work Breakdown Structure reflects all activities and deliverables associated with overall project management, requirements, design, implementation, transition management, testing, training, installation and maintenance. Activities are defined at the lowest levels of the WBS in order to identify what actions are to be taken for successful completion of each defined deliverable. Activities are created by decomposing work packages to get deliverables. Here are some helpful guidelines for defining activities:

- Decompose the work packages until accurate estimates of cost and resources needed to perform the task can be identified
- Ensure that clearly defined starting and ending events are identified for the tasks. These may be the production of a deliverable or the occurrence of an event.
- Stop before the level of detail begins to look like a “to-do” list (checklist)

One of the most important parts of the Project Planning process is the order of activities that will be undertaken as part of the project. The following example shows roughly how the activities will take place in Time Tracker Application: sequentially, overlapping or in parallel. The following section brings the time & duration component into this order.

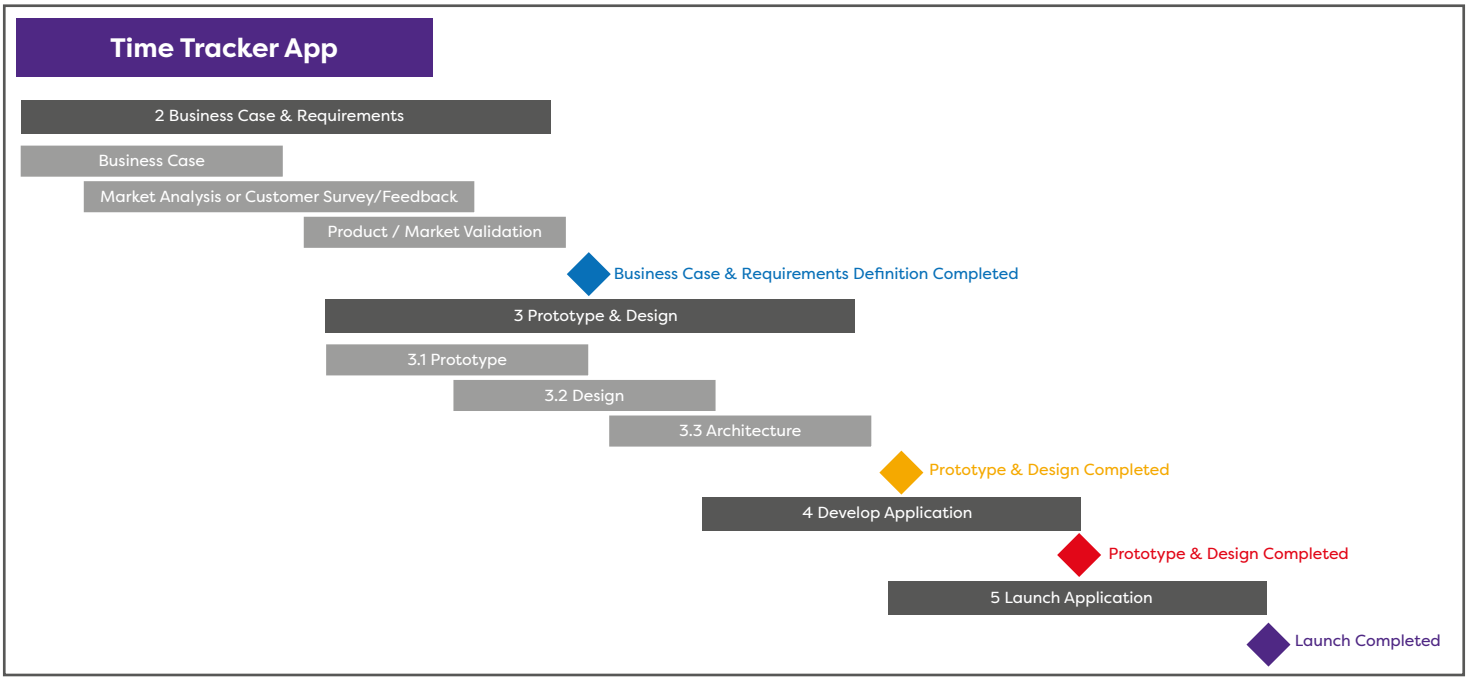


Figure 17: Sequence the activities

Key element of achieving the set milestones is sequencing the activities you need to perform the reach that milestone. Consider any interdependencies and relationships between them for successful execution.

4.2 Develop Schedule

Scheduling is an activity to determine the duration of the activities on a timeline for the product development and more generally for the whole project. Cofounders can use a top-down approach creating the schedule from the WBS in order to maintain a clear view of the relationship between activities (work to be done) and deliverables.

This is generally an iterative process - it can be subject to change due to planning constraints, changes to the project, risk actions, etc.

Schedule should depict highest level of WBS such as work packages. Once the activities have been clearly identified, the duration and required effort can be calculated for each task. There is a clear difference between “Duration” and “Effort”:

- Duration is the time needed for completion (includes non-working time)
- Effort is the number of man-hours required to complete the task.

When planning durations of work packages and activities think how many people/ material you have, what is their daily/weekly/monthly availability for this project and how fast can you execute an individual activity with the available resources. Then think about interdependencies between them. Only then plan schedule.

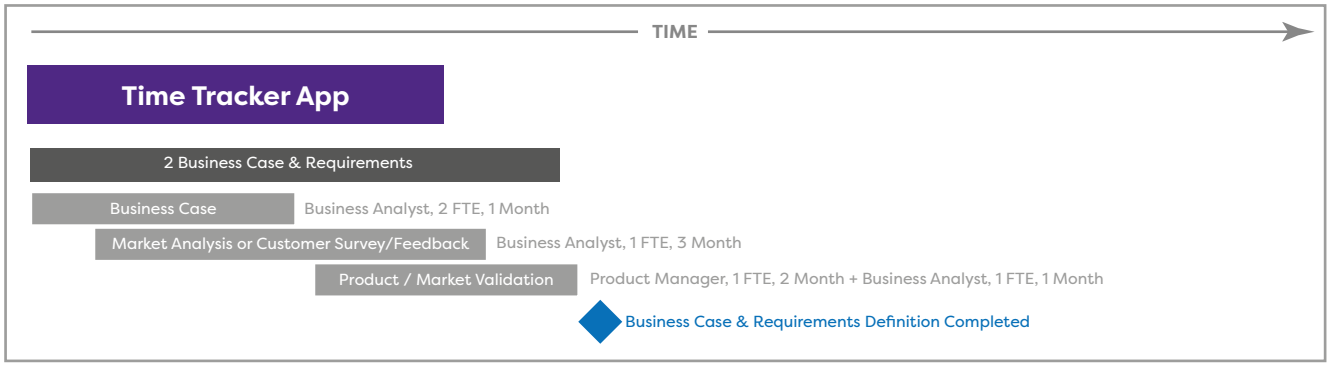


Figure 18: Business Case and Requirements Example

Once again, for the Time Tracker Application, for the activities defined in Section 7.1.3, it is possible to assign duration and effort required.

Detailed activities can be defined within iterations. This kind of schedule can be regularly compared against the baseline in order to detect any deviations from meeting the milestones/ deadlines.

The project schedule provides a graphical representation of predicted work packages, activities, milestones, dependencies, resource requirements and work package durations. The project schedule should show the critical path - shortest possible time from start to complete the project.

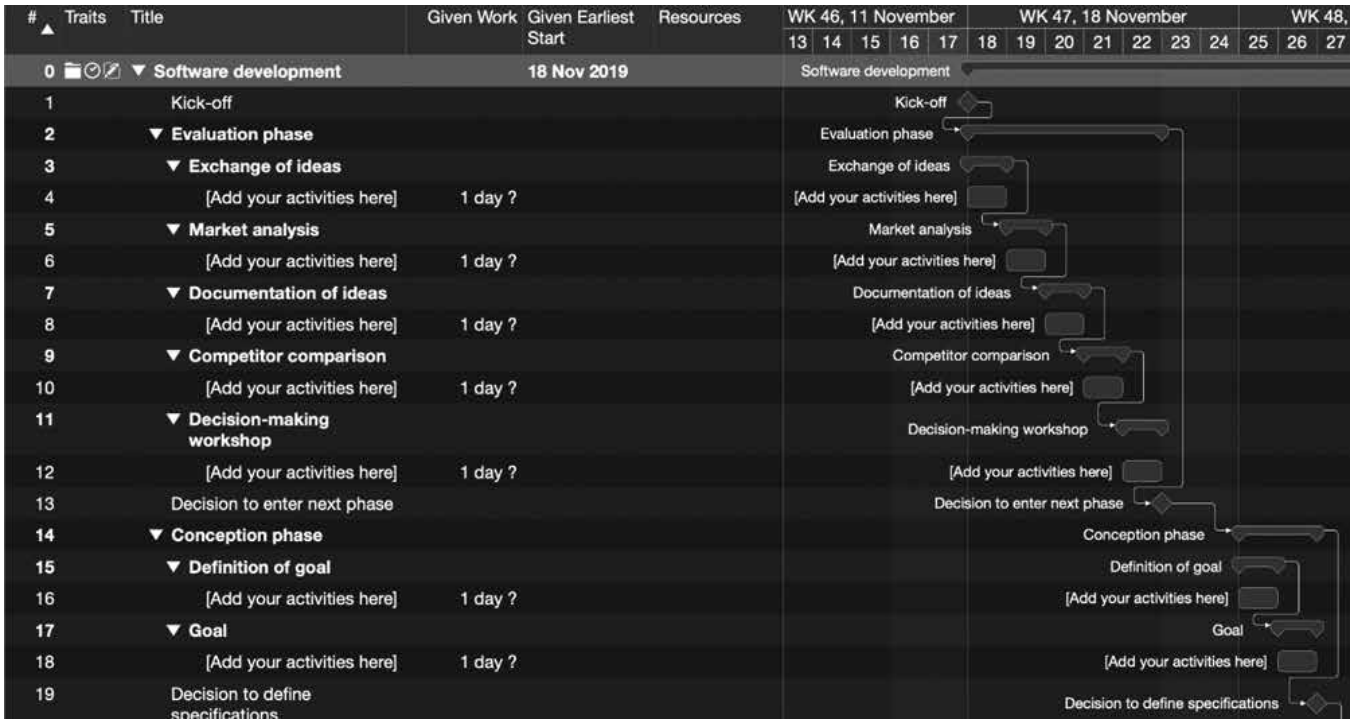


Figure 19: Schedule sample

Schedule might be developed in a dedicated planning tool or simply in MS Excel if there are no skills in the team. The key is to depict/describe interdependencies and provide a time dimension to frame the activities' durations.

Schedule development is an iterative process. Here are the elements to consider in forming the project schedule:

- Duration / effort estimations,
- Prioritisation of activities
- Resource allocation
- Risk analysis outputs (to include in your schedule to prevent any of the risks)

Note: Whenever a significant change on the project (scope, cost, ...) occurs, it is necessary to integrate this change into the planning and revisit the baseline. This is further addressed in the Execution phase.

In addition to the project schedule, the iteration plan would also be useful for the Execution. As explained briefly in Foundation Chapter (Chapter 2), depending on the lifecycle startups chose to follow, iterations develop the product through a series of repeated cycles or act as increments successively adding to the functionality of the product. In defining iterations, startups can list the features that will be integrated, the requirements that will be met or simply the deliverables.

The following example shows the iteration planning for the Time Tracker Application in which each iteration has varying number of module and each module includes several feature implementations.

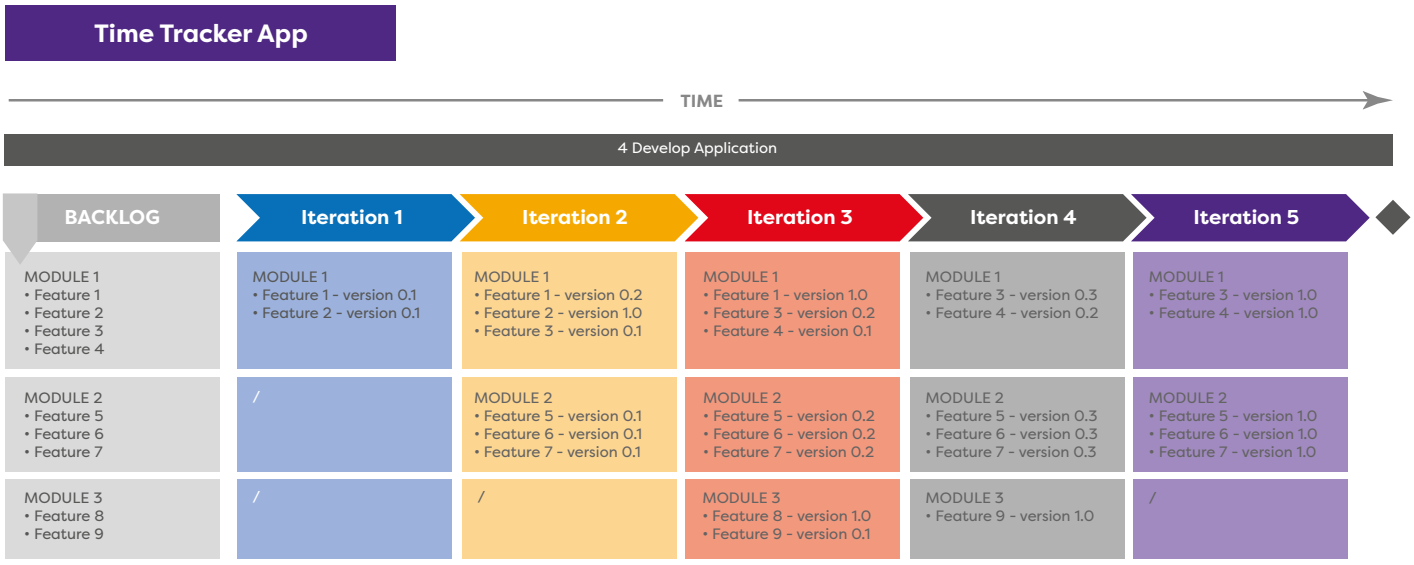


Figure 20: Simple iteration planning. Similar can be done for any work package.

After each iteration, it is a good practice to collect feedback from customers and revise the plan for the next iteration accordingly.

4.3 Develop Cost

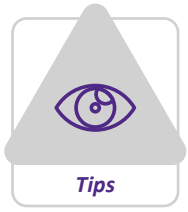
Cost planning is done in parallel with project schedule development. Budgeting, performed at the initial stages of Project Planning, is the determination of costs associated with the defined activities – both materials and labour. The steps associated with budgeting are highly dependent on both the estimated lengths of tasks and the resources assigned to the project.

Initial budgetary estimates are often based on availability of funds or other constraints. These parameters may or may not coincide with the actual funds needed to perform the project. Budgeting serves as a control mechanism where actual costs can be compared with and measured against the budget. The budget is often a firmly set parameter in the execution of the project. When a schedule begins to slip, cost is proportionally affected. When project costs begin to escalate, the cofounders should revisit the Project Plan to determine whether scope, budget or schedule needs adjusting.

WBS can be complemented with a rough estimate of costs at the level of work package and its ownership, which can provide a better oversight. Cost of performing a task is directly related to the personnel assigned to the task, the duration of the task, and the cost of any non-labour items required by the task.

Include risk reserve estimations

The labour costs should factor in vacation time, sick leave, breaks, meetings and other day-to-day activities. Not including these factors jeopardises both scheduling and cost estimates. Project budget also needs to include estimated amounts for risk reserves that should be included in the cost baseline, as well as any management reserve put in place by the sponsor to deal with potentially unidentified risks.



Identify labour & non-labour resources required to perform the work

Non-labour charges include such items as material costs, consumable items, travel, cost of capital (if leasing equipment), computer charges and other equipment costs. Non-labour costs should be considered to prepare and control budget.

The following budget example lists the work packages, the resources assigned, the amount of time required for each resource and the total cost of each work package.

WORK PACKAGE	ID	ACTIVITY	COST TYPE	EXPERT	WORK DAYS	WORK COST	TRAVEL COST	OTHER COST	EXPERT ROLE	FEERATE	COMPANY	SUBTOTAL
WP01	1	Project management	Fees	James Dear	50,00	€ 12.500,00	1.000,00 €	200,00 €	Project manager	€ 250,00	Outspeed	€ 13.700,00
WP02	2	Business Case & Requirements	Fees	Anna Pink	20,00	€ 4.000,00			Product manager	€ 200,00	Outspeed	€ 4,000,00
WP03	3	Phototype & Design	Fees	Anna Pink	50,00	€ 10.000,00		4.000,00 €	Product manager	€ 200,00	Outspeed	€ 14.000,00
WP03	3.1	Phototype	Fees	Anna Pink	10,00	€ 2.000,00		1.000,00 €	Product manager	€ 200,00	Outspeed	€ 3,000,00
WP03	3.2	Design	Fees	James Dear	20,00	€ 5.000,00		3.000,00 €	Project manager	€ 250,00	Outspeed	€ 8,000,00
WP03	3.3	Architecture	Fees	James Bond	20,00	€ 6.000,00			Quality Lead	€ 300,00	Outspeed	€ 6,000,00
WP04	4	Develop Application	Fees	James Bond	95,00	€ 28.500,00			Quality Lead	€ 300,00	Outspeed	€ 28.500,00
WP04	4.1	BE Infrastructure	Fees	James Bond	20,00	€ 6.000,00			Quality Lead	€ 300,00	Outspeed	€ 6,000,00
WP04	4.2	FE Infrastructure	Fees	James Bond	40,00	€ 12.000,00			Quality Lead	€ 300,00	Outspeed	€ 12.000,00
WP04	4.3	Module 1	Fees	James Bond	20,00	€ 6.000,00			Quality Lead	€ 300,00	Outspeed	€ 6,000,00
WP04	4.4	Module 2	Fees	James Bond	15,00	€ 4.500,00			Quality Lead	€ 300,00	Outspeed	€ 4,500,00
WP05	5	Launch Application	Fees	James Bond	110,00	€ 33.000,00	2.000,00 €		Quality Lead	€ 300,00	Outspeed	€ 35.000,00
WP05	5.1	Acceptance Testing & Go-Live Str.	Fees	James Bond	10,00	€ 3.000,00			Quality Lead	€ 300,00	Outspeed	€ 3,000,00
WP05	5.2	Setup Customer Test Enviroment	Fees	Tim Jones	20,00	€ 6.000,00			Team Leader	€ 300,00	Outspeed	€ 6,000,00
WP05	5.3	User acceptance testing	Fees	Tim Jones	10,00	€ 3.000,00	2.000,00 €		Team Leader	€ 300,00	Outspeed	€ 5,000,00
WP05	5.4	Transition to Operations	Fees	Tim Jones	50,00	€ 15.000,00			Team Leader	€ 300,00	Outspeed	€ 15.000,00
WP05	5.5	User trailning & manuals	Fees	Tim Jones	20,00	€ 6.000,00			Team Leader	€ 300,00	Outspeed	€ 6,000,00
TOTAL					**325,0**	**88.000,00 €**	**3.000,00 €**	**4.200,00 €**				**95.200,00 €**

Table 11: Sample of a more detailed budget planning

This breakdown of costs is useful not only for startups' their own budget planning, but also for communicating their project to investors, accelerators, potential partners or to any other actors having an interest in becoming a part of their project.

4.4 Manage Quality

The purpose of quality management is to improve the quality of products and services while achieving cost reductions throughout the project. Startups need to distinguish between Product Quality (how well does the solution meet the requirements) and Project Quality (how well does the project perform). Both are essential to achieve the project objectives.

There are three processes: quality planning, assurance and control interacting with each other:

a. During Quality Planning, the cofounders can:
   - Identify those quality standards relevant to the project
   - Determine how best to meet those standards.

b. Quality Assurance requires that the cofounders evaluate overall project performance on a regular basis to provide confidence that the project will meet the relevant quality standards. (Assurance is done during execution)

c. Quality Control is conducted by:
   - Monitoring specified project results/deliverables to determine relevant quality standards have been met (controlling is done during executing/controlling)
   - Discovering and implementing ways to eliminate the causes of unsatisfactory performance in the solution being developed.

Successful quality processes always strive to see quality through the eyes of the end user (customer). Customers are the ultimate judges of the quality of the product/service they receive. To ensure that, requirements have to be addressed at each phase of the project.

It is important to include a process that validates the expectations of the potential customers. It is counterproductive to develop a system that meets a documented requirement if you and the customer know that the requirement has changed. The change management process helps to control the number of such changes, but quality processes must be in place in order to make changes when they are necessary.

4.5 Plan Resources

Startups usually cannot dedicate a separate resource for each function or a set of activities. The scarcity in resources may require multi-tasking and the resources may be assigned tasks that may utilise a different skill set of that resource, e.g. a full stack developer can do front-end development as well as back-end development or a cofounder can do both research and business development, etc.

The crucial point in planning of resources is for cofounders to become aware of the required resources and make informed decisions as to who can be assigned to what type of tasks. Similarly, if a skillset does not exist in the team, they can also plan to explore opportunities to find a specific resource early enough to meet the deadlines planned.

4.5.1 Identify Required Skillsets

It is helpful in the planning process to develop a list of skills required, first for execution of the project and then for execution of each task. This skills list may then be used to determine the type of personnel required for the task. A resourcing plan (or staffing plan) will identify the total workforce requirements for the project based on current planning and availability.

Again, you can use an adapted WBS where you start assigning skillsets required at the highest levels all the way down to the lowest. This is a great team brainstorming activity to identify who is required at each level of work.

Based on the work packages defined for Time Tracker Application example, the following chart shows the positions required for Work Package 2 and Work Package 3.

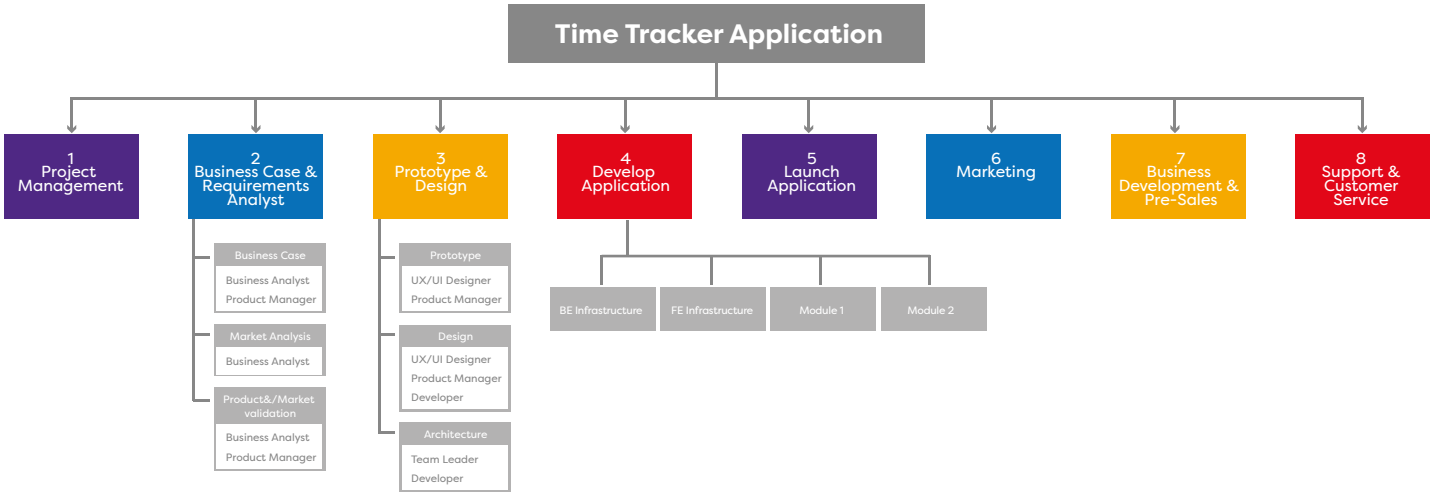


Figure 21: Work breakdown structure

Use WBS as base for the first brainstorming session to draft which skillsets you require. Dig deeper and make a list if necessary.

4.6 Manage Communication

Communications planning involves defining the information needs of all project stakeholders and team members, as well as identifying who needs what information, when they will need it, and how they will get it. Communications planning addresses the way in which we transfer/share information about what needs to be done, how it will be done, when it needs to be done, who will do it, status reporting, issues management, problem resolution, etc. This information is documented in the Communication Plan. This plan can be short or long, depending on the number of stakeholders involved and how structure the communication is required, but it needs to concise and clear to everyone.

Basic plan would include how regularly and in which medium the meetings, communications, reporting will take place. For instance, startups can set stand-up meetings (also called daily huddles) for daily catch-up. They can plan to send out project progress reports to investors or other stakeholders that they would like to keep informed. If they have customers that they involve in the early stages of the project, they can have separate progress reports and further focus group meetings to keep the feedback loop live.

Communication is an art of its own, but transparency, clarity, factualisation, and diligence make it a long way in meeting expectations of any stakeholder. Therefore, investment in building communication skills, technical and soft ones, should be of paramount importance to every start-up.

4.7 Manage Risks

Start-ups are volatile entities by definition. They are fast moving, responding to small ripples, changing directions rapidly – thus prone to bumping to more hazards which can become serious life-death risks. From that perspective, risk analysis and management, besides communication, should be one of the key activities regularly performed by every start-up.

A risk is any factor or future event that may potentially interfere with successful completion of the project. Risks can be negative (**threats**) or positive (**opportunities**) in nature but should be treated collectively to obtain a balanced approach to risk management.

During the Initiation Phase, in Section 4.1.2.5, a simple Risk Analysis is performed. At this level, it can be taken as a reference and elaborated if need be.

It is important to plan ***how*** to manage risks: risk avoidance, risk recognition, risk mitigation activities can be clarified.

Start-ups should identify potential project risks in addition to key risks identified during the initiation phase. For the identified risks, the team should then:

- Assess potential impact and probability of the risk occurring (criticality)
- Assign a risk priority
- Identify the proximity (in time) of the risk
- Determine an appropriate response to the risk (and alternatives if necessary)
- Determine the detectability / symptoms that indicate the risk is occurring (trigger)
- Assign a risk owner for each risk. Risk owner will be responsible for monitoring for triggers and implementing risk response.

The way each start-up will respond to the risks, will also depend on the identified risk "appetite" of the project stakeholders. The team needs to know which stakeholders are risk averse, risk neutral or risk takers; How much risk is "acceptable" and which risks are more critical than others.

A short description of the above in the format of Risk Management Plan will help you manage risks throughout the project.

4.7.1 Risk Identification

Start-ups need to identify all events or actions that may have an impact on the project. In order to do this, they can:

- Refer to past project risk registers,
- Refer to lessons learned from past projects,
- Use a standard risk breakdown structure or common risk list,
- Perform brainstorming or other creative thinking exercises to surface potential risks to the project – Fish bone diagram.

Risk identification is an iterative process that should be revisited throughout the project lifecycle - new risks may appear as the project evolves, risks may become obsolete. Risk meetings should be held repetitively. Each risk is usually associated with a specific activity or deliverable and is thus naturally integrated to the schedule and / or the WBS.

Areas of particular attention:

- All activities on the critical path
- Deliverables with multiple dependencies (or inter-dependencies)
- Critical resources

4.7.2 Risk Analysis[1]

Risk analysis is the process whereby each risk is assessed in terms of its probability (likelihood of occurrence), impact (or impacts) and proximity (what time-frame the risk may occur in). There are several ways in which a risk can be analysed but the basic elements are:

[1]Risk analysis tools in appendix

- Impact = what will be the impact on the project in the case where the risk occurs. Depending on the organisation, various impacts will be "weighted" (e.g. safety is usually treated automatically as highest level). Usually this is considered on a scale from Low to High but can also be considered as a numerical impact on time / cost / etc.
- Probability = what is the uncertainty level of the risk occurring (there is no such thing as a risk with 0% or 100% probability. It should be between 0% and 100%)
- Criticality is the product of impact and probability
- Impact area (which of the project axes are impacted - Schedule, Cost, Scope, ...)

ID	Status	Risk	Impact on	Work package afected	Probabillty	Impact	Mtgation action description	Owner	Date
R1	ACTIVE	The only BE architect not avalable to work due to health issues.	Scope schedule	4,5	Likely	Severe	The only BE architect not avalable to work due to health issues.	Corfounder	12.12.2019
R2	ACTIVE	Prototypes not of adequeate quality for user feedback, due to free UV UX tools used. due	Schedule	3,4	Possible	Moderate	Obtain a trial version of high quality UI/UX tool or puchase subscription for a month or two to develop prototypes of acceptable quality.	Product manager	12.12.2019

Table 12: Example of a simple risk analysis/register.

Qualitative risk analysis is done by categorizing risks as High, Medium, Low. If you can and would make sense you can append also costs of risk. Again, it all depends on the level of detail required.

4.7.3 Risk response planning

Each risk that has been identified requires the selection of an appropriate response based on a structured approach regarding the impact and criticality analysis of the risk.

Negative risks (threats) have 4 possible response types:

- avoid (eliminate the risk by taking a different action)
- mitigate (reduce the probability and / or the impact)
- transfer (move the risk to another organisation)
- accept (do nothing)

Positive risks (opportunities) also have 4 possible response types:

- exploit (make sure it happens)
- enhance (improve probability of occurrence)
- share (improve by implicating 3rd party)
- accept (do nothing)

Each risk should be assigned to a person or team for monitoring and response. If this is not done it is likely that any preventative efforts will go overlooked and the risk will become real (develop into an issue).

4.8 Manage Procurement

It is very unusual for any start-up to be able to create or supply all the resources, materials, etc., necessary to complete a project internally. In those circumstances, the response is to purchase the product or service from an external source. Examples to this include cloud service, web servers, electronic equipment, etc.

Procurement should come up in planning when it is faster to obtain key components or services of required quality on the market, or no skillsets are available on the market to be onboarded on time or if the required components are so highly specialised it would take time and investments start-ups can't afford to build. So, you analyse the above.

Make-or-Buy Analysis is a simplest method to determine the cost-effectiveness of creating a product in-house as compared to the cost of buying the product. Estimate time and money to make and compare that to an equivalent of an off-the-shelf-product.

What and when to procure an external product, service, components depend on several conditions. Ask yourself the following:

- How does this product serve the needs of the project as a whole?
- Is there a service provider available in the marketplace for this specific item?
- Is it financially reasonable to purchase this service/product?
- Do I need this now or at some specific project milestone? When would be optimal to save founds?

Make or Buy is an expert judgment. Use the expertise of people from within and outside the team who have knowledge in the area in question to determine what steps should be taken.

4.9 Identify Stakeholders

Stakeholder identification and management is an essential element in the project planning and further builds on the initial stakeholder analysis performed in the Initiating phase. Stakeholders are any persons or entities that have a direct influence or interest in the project.

Ask yourself the following:

- Who are internal and external stakeholders?
- What is their level of influence and interest?
- When in the project they are most involved?
- What is their level of risk acceptance/aversion (risk appetite)?
- How will we manage the stakeholders?

Key of stakeholder management is communication, therefore plan stakeholder management back-to-back with communication. If one stakeholder is the key success factor, make sure you communicate and groom him well.

A well-developed stakeholder management plan can help the project management team be more effective and consistent when dealing with change as well as communication.

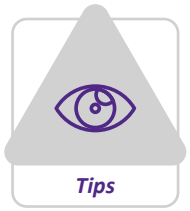
Stakeholder Management			
Project	Cross Currency Trading Mobile App and API	Project #	1
Prepared by	M Smith	Updated	04/08/2018

ID	Name	Company	Email	Role	Expectation	Current Class	Power	Interest
1	John Markus	Angel Investment	angel@inv.co	Sponsor	Expects return of investment, product fully developed by Q3, sales starts Q4	Supportive	9	7
2	Fiona Servet	Max Accelerator	fiona@acc.co	Coordinator	Expects report of progress every 2m	Supportive	6	6
3	Adam Wilsbury	AW Consultancy	aw@consult.uk	Advisor	Need to ask for feedback for the AI module	Supportive	8	5
4	Juan Manuel	NBM	Juan@nbm.es	Marketing Expert	Need to ask support for digital marketing	Neutral	5	7

Table 13: Stakeholder Analysis Example

5 Execution, Monitoring And Control

The **Outspeed Startup Glasses**, as explained in Section 2 of this guide, defines two main periods in a startup life; Pre-commitment and Post-commitment periods. Execution, Monitoring and Control phase starts after the **Commitment** point, at which founders decide to commit money, time and effort into the project and most-likely start acting as full-time employees of the startup.



The best part of planning is that you know when not to follow the plan!

There are two phases in the **Pre-commitment period**:

- ***Initiation*** where the business idea (problem, solution and business model) is defined, framed as a project and validated. At the end of this phase, Lean Canvas and Project Charter are prepared.
- ***Planning*** where comprehensive project planning is carried out to understand the size of the project (scope, budget, time, etc.) as well as the environment that it will be born into (risks, constraints, stakeholders, etc.)

There are three phases in the **Post-commitment period**:

- ***Planning*** of the iterations and the whole project for different parts of the business such as product development, marketing, business development, fund raising and so on.
- ***Execution, control and monitoring*** of the iterations.
- ***Closing*** of the startup project as defined by the founders. As long as the project end point is not an Exit (selling the company), startup life continues to maintain the product and support the customers.

According to the PMBOK, "the Monitoring and Control Process Group consists of those processes performed to observe project execution so that potential problems can be identified in a timely manner and corrective action can be taken, when necessary, to control the execution of the project."

The Minimum Viable Product(s) or a prototype(s) can be produced in order to experiment and validate value and growth hypotheses During the idea validation activities in the Initiation phase, yet the actual execution efforts start after the commitment point.

In the **Execution, Control and Monitoring** phase of the Outspeed Glasses model, the plan and the necessary resources to carry out the project should be in place and ready to perform the project activities. The project plan serves as a guide for project execution, monitoring and control and it covers information regarding the project management knowledge areas; scope, time, cost, quality, resources, communication, risk, procurement, and stakeholders.

Project Monitoring and Control activities take place in parallel with Execution activities so that, while the project work is being executed, the project is being monitored and controlled by implementing the appropriate level of oversight and corrective action. The project should

be observed and measured regularly against the project plan to ensure that the project is within acceptable variances of cost, schedule and scope, and that risks and issues are continually monitored and corrected as needed.

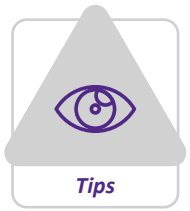
The main purpose of monitoring and controlling activities is to be proactive in finding issues ahead of time and taking corrective action. Corrective action can require revisiting updating the Project Management Plan as needed with the ultimate goal of bringing the project back in line with project objectives and constraints and improving future execution to avoid repeating the same issues.

Critical success factors for a good execution are:

- Pereform continuous validation of the hypothesis and assumptions.
- Involve customers as soon as possible to collect valuable feedback.
- Verify the work and if possible, validate it with customers.
- Communicate a lot with all related stakeholders.
- Periodically compare baselines with actual progress.
- Mitigate changes and risks as soon as possible.

5.1 Scope

The purpose of scope management is to identify and manage both internal and external elements that cause change to the project scope or deviation from the originally envisioned scope. Scope changes may impact the amount of work required, schedule, cost, risk, etc.



Use WBS or FBS to build iteration's backlog

The following steps are important to execute the work:

- Follow plans from planning and check if priorities are still valid.
- Define work packages in the iteration in more details (activities, assignments).
- Execute the iteration.
- Observe and note the required changes to the plan.
- Plan the next iteration.

The following subsections explain briefly what to do to manage scope.

5.1.1 Work the Plan

- Check if high level scope plan still makes sense.
- Check if priorities are still the same. Make sure to start working on scope that will add value and provide input for any future work packages.
- Communicate what is aimed & planned for this iteration.

5.1.2 Elaborate Iterations

- Define iteration objectives and share with entire team – make it visual.

- Define and sequence the activities and key people to deliver on goals.
- Check for any internal/external input/outputs required to achieve the set goals.
- List risks that can jeopardise achieving your iteration goals and assign ownership.

5.1.3 Start Working

As a startup cofounder, you need to:

- Support and empower team.
- Tackle issues and provide solutions.
- Tackle changes.
- Involve stakeholders.

5.1.4 Monitor Work Done

Key part of execution is monitoring, and the following set of items can be helpful:

- Is everyone at their best performance?
- Can you monitor the progress/results of partial deliveries?
- Compare the current progress against the plan – are there any variations? Write them down and find reasons in order to plan better for next iteration.

5.1.5 Deliver the Work

Completed work also needs to be done right, not just fast and within budget. Quality should be priority when building new product.

- Test work done, verify it against specifications and validate against requirements.
- Deliver the product to next user (internal or external) who tests and sends an acknowledgment.
- Test for quality whenever you can, already during the manufacturing process (see more in Quality subchapter).

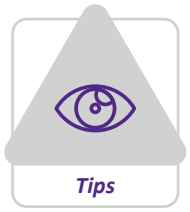
5.1.6 Plan Next Iteration

- Work never ends, so get ready to collect what you learned from this iteration.
- Start planning for next iteration – start from above.

5.1.7 Manage Scope Changes

Scope changes can be because of several reasons:

- Internal triggers include people (founders, business developers etc.) who may not be fully dedicated to support and sponsor the project, key project team members who may not perform their project work on time or within budget or who may leave the start-up. Finally, the budget burn-up rate to execute the entire planned scope can be higher than expected.



Use Change Log to help you handle them as they emerge.

- External triggers include market stability in terms of maturity, emerging trends which may have an impact on the scope or the political or economic macro environment.

A proposed scope change needs to be written down and reviewed by the appropriate stakeholders. The scope change proposal needs to include the estimated impacts on:

- costs,
- resources,
- schedule,
- or other areas of the project.

If the proposal is agreed upon then the changes to the impacted iterations can be applied and communication is passed to relevant parties.

The team needs to be alert to these deviations, welcome them when necessary and prevent them if not essential.

5.2 Schedule

Schedule Managements involves the following main checks:

- Check if the activities/iterations for a given period of time have been executed as planned. If not, adjust the plan based on the deviation.
- Check if there have been any scope changes (scope creep/extension). If so, check how this will affect the schedule and make the necessary adjustments.

Schedule needs to be monitored and controlled on a regular basis during the daily, weekly, bi-weekly meetings. Activities that have not yet been completed need to be included in the next iteration along with those planned.

To manage the schedule effectively, the founders need to:

- Influence the factors that drive change to the schedule
- Prevent uncontrolled changes wherever possible
- Identify, quantify and manage the changes when and where they occur
- Communicate the changes to the appropriate stakeholders

Some of the factors that influence the schedule are

- Resource availability
- Equipment delivery - in particular, equipment that is procured elsewhere and may have a long lead time
- Outsourced service/product
- Uncertain events (risks)
- Interfaces with other activities (interdependent deliverables)

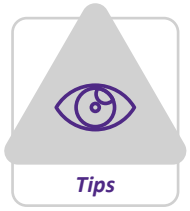
Determining the sensitivity of the schedule to these factors can help the founders put in place early warning indicators to reduce the overall impact on the project schedule.

If a potential schedule impact (positive or negative) is detected it should be investigated for root cause and overall impact as soon as possible, and a response action should be defined.

5.3 Costs

Cost management has the following main attributes:

- Influencing the factors that could cause change to the project cost baseline (budget) and ensuring that any changes are in fact beneficial to the project



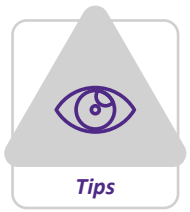
Use Baselined Budget plan to compare planned costs with actual costs.

- Identifying potential changes or deviations, their level of impact and root cause, by monitoring cost performance across the project
- Taking appropriate actions to manage these actual changes when they occur
- Keeping the cost baseline up to date with any authorized changes
- Communicating costs to the appropriate stakeholders regularly

Cost management is not simply a process of reporting what has been spent, it needs to include information about the causes of any deviations, the actions taken to deal with these deviations and the eventual impact on the forecast expenditure for the project.

5.4 Risks

The risk register needs to be reviewed and updated at the same cadence as the project schedule. During execution, it is important to keep an eye on the Risks identified during planning. Here are some of the main checks that founders need to carry out:



Take time to review risks regularly!

- Check if there have been any scope changes/deviations.
- Check if there have been any delays in the schedule.
- Check if there any bottlenecks, blockages that affect the performance of the team.

If any of these checks are positive, founders need to find out how this had an impact on the risks. If not managed and controlled properly, the changes to the scope and schedule, the blockages can cause serious issues which may turn into risks for the startup. Each risk should ideally have an owner who is responsible for its response plan using corrective actions. Corrective actions are measures to take on these blockages and remove them for the team to be able to focus on executing the plan.

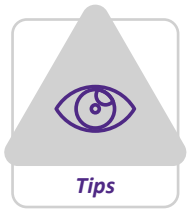
The ***risk register***, the document that keeps a list of the risks for the start-up project and prepared during planning, needs to be reviewed and updated at the same cadence as the project schedule.

The issues, blocking points can be discussed with the project team and other relevant stakeholders at the **daily/weekly/monthly meetings** to see if these issues will create new risks, have an impact on the existing ones or affect the project success.

Any changes to the schedule, cost or scope will have a direct/indirect impact on the risks. Therefore, when such changes are detected, the risks should also be monitored and controlled.

5.5 Quality

Quality assurance is primarily about doing things right the first time - having the right processes and approaches in place in order to produce the required level of quality in the project results.



Cost of poor quality is way higher than quality assurance

Quality Control is focused on measuring specific project results, outputs or deliverables to determine if they comply with the quality standards set based on cofounders' and customers' expectations. These standards, measurable metrics for both the product and the project quality, are set during planning in order to eliminate unsatisfactory results.

Quality control also plays a critical role in preventing errors or defects from being delivered to the customers.

- During execution it is crucial to verify the quality of the deliverables against the baselined functional and technical specifications.
- Feedback of quality audits and verification of the product need to be given to the execution team.
- The quality audits of the deliverables can be carried out during the daily / weekly / monthly meetings as and when needed.

Additionally, any change in scope, cost or schedule can also have an effect on the quality of the product or the project as a whole. Therefore, quality standards may need revision after detected changes.

Failure to meet quality requirements leads to degraded performance or failure of the product/ project which in turn leads loss of business.

5.6 Resources

In the planning phase, the founders determine the skill set for resources. Based on the skills required for any work package, founders may need to plan ahead. If the team does not have the necessary skills for a given work package, the founders may have to look for qualified resources. The solution to this can be integrating a new resource to the team temporarily / permanently, partnering with a third party or utilising a consultant. Any recruitment decision should be made based on the schedule and cost limitations.

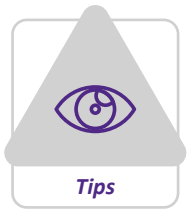
When selecting the team members, founders need to consider:

- Startup culture fit
- Availability - both individual (hrs / week) and group (full time equivalent - FTE), vacations holidays
- Costs - actual hourly rates, training, travel / relocation
- Capabilities - skills, experience, knowledge...
- Location - single-site vs multi-site

Project Team need trust, appreciation, empowerment to be able to carry out their work efficiently. They also need a certain level independence to be able to utilise their skills effectively and challenges to stay interested. Founders need to provide continuous feedback and support to the team, motivate collaboration as well as supervision when there is a need. Teams typically move through the 5 stages of team development (based on Tuckman's model) of Forming, Storming, Norming, Performing & Adjourning (Tuckman, 1965).

Celebrating incremental success is an excellent motivator and team building technique to further boost motivation of the team.

Team Building: Model for Team Engagement is about creating an environment where people will wholeheartedly invest themselves in achieving the vision. To create an environment that is stimulating and engaging, we must look at the driving force behind self-motivation. Leadership experts identify the following eight driving forces: Activity, Ownership, Power, Affiliation, Competence, Achievement, Recognition and Affirmation, Significance.



Building trust and managing conflict are fundamental building blocks of team development.

5.7 Communications

A large part of founders' responsibility during this execution of the project is keeping the various stakeholders informed of project status. Communication plan compiled in the planning phase needs to be updated with project status together with risks/issues using active and passive channels.

Here are several communication channels which start-up founder can utilise during the execution phase:

- Meetings
    - **Daily/weekly meetings** with project team and any other stakeholders to discuss issues, bottlenecks, specific support areas as well as arising risks, and any other stakeholders
    - **Monthly meetings** with stakeholders to report on progress and resolve critical issues that might impede the project success.
- **Portals:** Social Media, Websites, Intranets, Task Management Applications
- **Reports:** Status/Progress reports, Timesheets, Audit reports (if need be)
- **Logs:** Risks, Changes, Issue

Meetings should be kept as short as possible. Founders can use pre-defined templates to communicate the meeting minutes which need to be distributed immediately after the meeting closure, along with any identified actions.

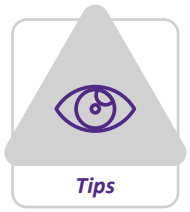
Communication of **iteration plans** within the team increase visibility of plans and support the execution of short and tangible milestones. This will motivate the team and help them envisage what comes next in their work schedule.

5.8 Procurements

The founders are responsible for ensuring that any vendors or suppliers, once contracted to do the work, meet the contractual agreements specified within their contracts. Founders also need to track, review and analyse the performance of contractors on a project. This performance reporting will form the basis of any contractual changes that need to be made during the life of the contract.

5.9 Lessons Learned

The purpose of the Lessons (to be) learned process is to help the team capture knowledge gained during the project and to share so that the entire team may benefit. A successful lessons-learned log will help teams to:



Lessons learned is a simple register/list of what is useful for the future. Check toolbox!

- Repeat desirable outcomes
- Avoid repeating mistakes

The lessons learned process should be initiated at the very beginning of the project and the lessons register / database should be available to the whole start-up and updated with new identified lessons throughout the life of the project.

6 Closing

The Closing activities are performed to conclude all activities across all project to formally complete the project, phase, or contractual obligations.

Project closure for startups can mean one of the following outcomes:

- The product/service is fully developed. The operations will continue to support the customers and potentially to scale-up.
- It is decided to kill the product/service.
- The product/service or even the company is sold to a third party.
- The break-even point is reached.

Closing activities of a startup project most likely differ from contract-based projects where the delivery of the final product is to a specific customer or a department. There will be no official hand-over and customer acceptance report etc. for a startup project. What both contract-based and startup projects still share, is the validation that the right product has been developed for the right purpose and that project objectives have been achieved.

As mentioned before, the end point of a startup project is determined by the founders. Whichever end point founders may choose, there could be certain steps that needs to be taken to close what is defined as the project.

In the rest of this chapter, it is assumed that the product is fully developed, and the project closing is defined as the launch of the product by the founders. However, it is worth noting that the sustainability of a startup start only after gaining financial stability, i.e., having enough customers to make benefit.

Launching the product/service is naturally one of the most important milestones of the project. If this is defined as the closing of the project, some of the closing activities happen before this milestone and some after. The after activities lead then to the official project closure which is the final project milestone. The following two lists focus on pre- and after-launch activities.

During pre-launch, startups should:

- Verify that product was built as required,
- Obtain final beta user acceptance,
- Ramp up marketing efforts to achieve hype among potential customers,
- Ensure that product can be supported & maintained after the launch,
- Address any open issues and risks.

During post-launch, the startups should:

- Organise a launch party to communicate project completion,
- Collect user feedback and carefully analyse it, providing class A support service,
- Plan the post project reviews,
- Review project performance and assessed benefits already realized,
- Prepare a short and concise report for major stakeholders (sponsor, founders, investors, core team),
- Archive project information,
- Declare project closure.

Some of the first activities startups can focus on is to perform after-market surveillance, support, and maintenance. By offering excellent support services and strategic marketing, startups can build a brand, a reputation for their product/service and can get early adopters to be free marketing and distributed sales force.

6.1 Pre-launch

6.1.1 Right Product for the Right Job

The product/service version 1.0 has been created in the Execution phase and is ready for sales. But is it really? Not just yet. The team has been verifying the product features throughout execution phase and now it is time to get their final sign-off, before the product heads to beta users.

6.1.2 Final Beta Testing

The team gives green for beta testing to a selected customer base pre-selected. Once the users start using the initial version of your product/service, the startups need to provide customer support, collect feedback on defects and improvements and quickly categorise all of it either as essential before launching to market or right after. Customers might discover issues that have not been detected, so listening and reacting is crucial.

User research is a crucial component of any product development process. It helps startups identify the needs of users and demonstrate how the product/service can be improved.

Startups can form focus groups, i.e., smaller number of representatives of target customers together with a moderator and have them discuss their feelings, attitudes, and ideas on topics. The intent is to gather many people's thoughts and attitudes on ideas and/or designs.

Beside testing the actual product, testing customers' pricing appetites does matter as well. At the end of the testing phase make them complete a survey on the subject of how much they like the product and what is the price they would be happy to pay.

6.1.3 Ramp marketing

The product/service is almost ripe for launch and so must be the marketing and pre-sales strategies. Startups can take advantage of this internal team motivation and beta users' hype to create market awareness and demand for the product. Make sure marketing and execution team are synched and working hand in hand to converge to that key moment – product launch.

Again, focus on early adopters and their feedback. They are start-ups most valuable sales force.

6.1.4 Support service

Great product, happy customers. Not always! Support services might be a deal breaker if you a have product that requires assistance to customers in times of defects or lack of information on how to use the product. Here come support and maintenance activities in play to save your sales and customer happiness. Along with launching your product, support services must be operational as well. Keep execution and support teams in sync on project closing activities and product launch.

6.1.5 Address any open issues and risks

There is no such thing as a perfect product, and it is expected to have some open items (risks and issues) before launching the product. What matters is startups are aware of these and are able to control them. At the start of closing phase, it is a good idea to revisit risk and issue registers to screen them for most critical ones which may jeopardise product being fully functional and ready for launch.

6.2 After-launch

6.2.1 Organise a launch party to communicate project completion

Launching the product/service to the wild world is probably the most important and long-awaited milestone on any startups journey. Organise a small get-together and do not forget to invite all the stakeholders who contributed to the success of your project as well. Just keep in mind, that the real journey of entrepreneurships starts after this moment. Now it is time to monetise on the launched project and earn back all that investment and more.

6.2.2 Listen and cater 100%

Startups need to scale fast to reach at least a sustainable revenue to survive and for this, reaching out to customers and providing a class A support service is the key.

During this process all customer feedback must be collected in a structured way. There are tools offering rich functionalities to collect such feedback, however, if money is a concern, a spreadsheet with few well thought out columns that can be filtered and sorted can also do the magic (especially with the power of pivot tables).

Date	Customer profile	Channel	Application	Customer feedback description	Category	Requirement description	Implementation Priority
12/01/2020	Young	Support chat	MobileApp	Design is too conservative. More like Apple design would provide better GUI experience and data visualisation.	Improvement	Design should be more clean, simplistic, more 2D elements such as controls etc.	MEDIUM
12/01/2020	Adult	Email Ideas	MobileApp	Would love to Pomodoro timer feature work along with the time tracker feature.	New Feature	Pomodo timer feature.	MEDIUM
12/01/2020	Senior	Email Support	WebApp	I like the web application, but it lacks color contrast. I have bad eyesight and struggle with color differentiation.	Improvement	Accessability for color blindness must be considered.	HIGH
16/01/2020	Adult	Website	MobileApp	The application crashes when it try to sync the manual entry of time spent on a task.	Defect	Verify manual entry and sync protocol	CRITICAL
17/01/2020	Senior	Support	WebApp	The lines between the tasks/project of the same day ocerlap and cause that I can't see very well the individual entries.	Bug	Verify web application GUI rendering in supported browsers.	CRITICAL

Table 14: Customer Feedback Consolidation Template

Having said that, the strategies to reach out to new customers or retain existing ones can all be part of a new project with a defined objective of having x number of customers actively using/registered for the product. This all depends on how startups would like to formulate their project.

6.3 Lessons Learned

All the way to point of launch it has been nothing but learning, a curve so steep that it is perhaps hard to stop and reflect. Now is the time to do just that. Startups can take their core team to an offsite business retreat to reflect on their journey, focus on what has been learnt as well as to strengthen the bond between the team members.

A 2-3 days workshop with structured agenda will help management/founders obtain feedback in general. But do take to examine all business aspects, by listening to pain points of everyone. All the feedback will provide plenty of material to revisit the work processes, project management, product development, marketing, sales and other aspects of business and make huge improvements. These lessons will be valuable also to future projects and must be shared.

Organise structured 2-3 days workshop to collect team feedback. The following 4 quadrant model can be used as guiding tool to guide the workshop sessions.

Figure 22: Lessons learned using 4 quadrant model

6.3.1 Review project performance and assessed benefits already realised

In addition to consolidation of lessons learned where the objective is to collect information on what has worked and what can be improved, reviewing the project performance in terms of cashflow, schedule, scope, benefits & value achieved is equally crucial. This would ideally be performed by cofounders or an internal project manager if any.

All the data collected and information deducted from the analysis can then be readily used to prepare a short and concise report for major stakeholders (sponsor, founders, investors, core team). The report can summarise project objectives, accomplishments, major challenges, end result, project performance in terms of scope, cost, and schedule. Every project's objective is to deliver some benefit to the founders and investors and value to the customers. If data exists, some metrics can be included in the report to expose the achieved benefits and value.

6.3.2 project information

The last activity that any project manager must perform is also archiving project documentation. Start-ups move fast and documentation is not their top priority. But as business and team grow so does the amount of documentation, paper or digital. And therein lies the knowledge and experience of the entire project and people. Especially those hard-learned lessons that can be avoided next time start-up decides to start a new project.

In terms of archiving, startups can focus on organising their documentation, cleaning away the draft versions, consolidating various shared assets, and establish control access with read-only permissions. This will safeguard the project information. As the last step, the archives can be made available to all those involved in the continuation of the product operations and project managers who will tackle new projects.

6.4 Declare project closure

Now the project can be officially declared as completed, finished, closed.

The next project for startups can be to scale up the product/service, to open up an office in another city/country or simply extend the reach of service area. If the current product/service is running sustainably and no further improvements/growth strategies are envisioned, the startup can also decide to work on another idea and formulate it as a new project.

6.5 Final Notes

In this chapter, we have assumed that the project is defined from Idea Stage till the end of the product launch. However, startups are free to choose the project end as they wish. The project may end when the product is bringing enough profit to run the company without needing any additional external funding, or the project may end when investors invest in the product – this is totally up to the founders. What matters is that however the startup project is defined, there should be closing activities, in which startups need to assess and record what has been done to

- Turn the idea into a product,
- Frame the idea as a project with associated cost, schedule, scope, risks, stakeholders, etc.
- Follow the phases: initiation, planning, execution and control
- Make money

This retrospective assessment is important for startups to reflect on what has been done well (and needs to be kept/transformed into an established process) and what needs improvement, so that they have a basis for future projects.

7 Appendix

Section 7.1 provides some basic definitions and fundamental concepts that are well known and practices in startup world. Section 7.2. provides some basics definitions, fundamental concepts and practices in project management world. Section 7.3 summarises the efforts in the literature on project management of startup projects and new product development projects.

7.1 Startup Foundation

A startup company, or simply a startup is defined as "a human institution designed to create new products and services under conditions of extreme uncertainty" by Eric Ries in Lean Startup (Ries, The Lean Startup: How Constant Innovation Creates Radically Successful Businesses, 2011). Startup can also be defined as an entrepreneurial venture in its early stages of operations, aiming at developing an innovative product or service. Having a potential for high growth unconstrained by geography is another factor that distinguishes startups from average small businesses. Therefore, startup founders not only develop a new product or service but also should focus on scaling up the business.

Startups, whether working for themselves as **entrepreneurs** or working in a corporate as **intrapreneurs**, work on designing and developing new innovative products or services. These projects are not paid by a specific customer, therefore, no contract or a detailed technical specification exists for the project.

In corporations, the business case for the product/service is generally prepared by Marketing or Business Development departments or these departments can help the intrapreneur group working on the project. Entrepreneurs, without any help from any corporate departments or resources, are responsible for all aspects of business from problem identification to solution development and from cost estimation to revenue estimation and marketing.

A startup can be defined as a very risky project because a very unique output (a new product, a service or a business model) is being developed in a limited time, with very limited resources and under conditions of extreme uncertainty related to the target customer segments, addressed problem and market potentials. Therefore, planning and managing startup projects is much more challenging than contract-based projects where there is a contract, a customer who is paying for the work and the scope of the project is well defined before starting the project.

The main reason for the conditions of extreme uncertainty for a startup is that the startup projects are based on many critical assumptions regarding the potential customers, the problem to be solved, the solution to be designed and developed and the market conditions. It is quite difficult to define the project scope under all these assumptions. When the scope is not defined very well, then the project schedule and the budget estimates cannot be very accurate.

Due to the extreme uncertainties, startups cannot have a perfect game plan to start with. Ash Maurya, in his book ***Running Lean***, states that successful startups find a plan that works before running out of resources rather than having the perfect plan to begin with (Maurya, 2010). Many experts in the field, including Steve Blank and Eric Ries, recommend a continuous feedback loop to better understand customer needs and to validate critical assumptions throughout the project (Ries, The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses, 2011). This approach of continuous

experimentation and feedback helps startups change their game plan whenever needed based on the feedback from customers and market.

Another significant difference between startups and corporates is survival; project success is a matter of survival for a startup whereas individual project's success is generally not a critical factor in the survival of corporations. This makes it even more important for entrepreneurs to plan and manage their efforts with the help of project management best practices.

A typical startup lifecycle may look similar to the below scenario:

1. Find a problem worth solving, then define a solution.
2. Engage your customers/end users throughout the development cycle to avoid wasting time and resources for a solution not desired by the customer.
    c. Continually test your product with smaller and faster iterations.
    d. Build a feature, measure customer response, and verify/refute the idea.
3. Based on the tests, "pivot" (change your customer, problem or solution hypothesis) if necessary
4. Stay focused on speed and learning.
5. Capture the ideal time to find investors to grow.

7.1.1 Startup Tools and Methods

To successfully manage a startup journey, founders should master many skills related to diverse fields such as new product development, marketing, customer relations, finance and project management. There are many methods and tools that are very popular in the startup world. The methods that have inspired the development of this Project Management Guide for Startups are summarised in the following sections.

7.1.1.1 Design Thinking

Design Thinking is defined as a human-centred approach to innovation that draws from the designer's toolkit to integrate the needs of people (**desirable**), the possibilities of technology (**feasible**), and the requirements for business success (**viable**) by Tim Brown (Brown, 2020). As shown in Figure 27, for each dimension there are different methods to use.

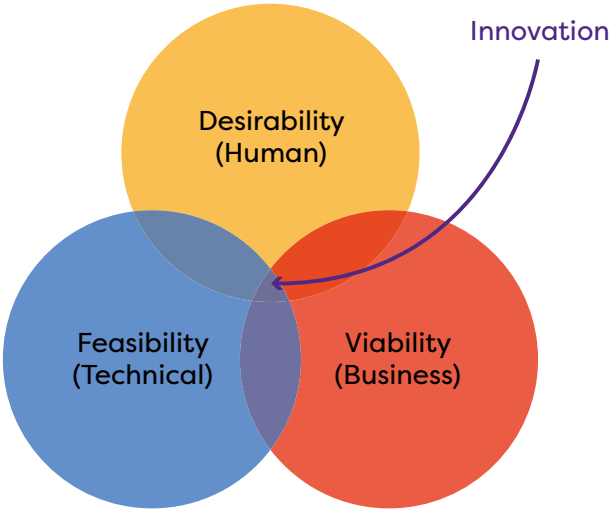


Figure 23: Three principles of successful innovation

Design Thinking encourages design teams to focus on the people they are creating for, which leads to better products, services, and internal processes. Design Thinking is a transdisciplinary approach and can be applied to design of products, services, business model and organisations. Three essential pillars of design thinking are:

- **Empathy** – Understanding the needs of those you're designing for.
- **Ideation** – Generating a lot of ideas.
- **Experimentation** – Testing those ideas with prototyping.

Design Thinking is a non-linear, iterative process which seeks to understand users, challenge assumptions, redefine problems and create innovative many solutions to prototype and test. The method consists of 5 phases as shown in the following figure: Empathise, Define, Ideate, Prototype and Test (Brown, 2020).

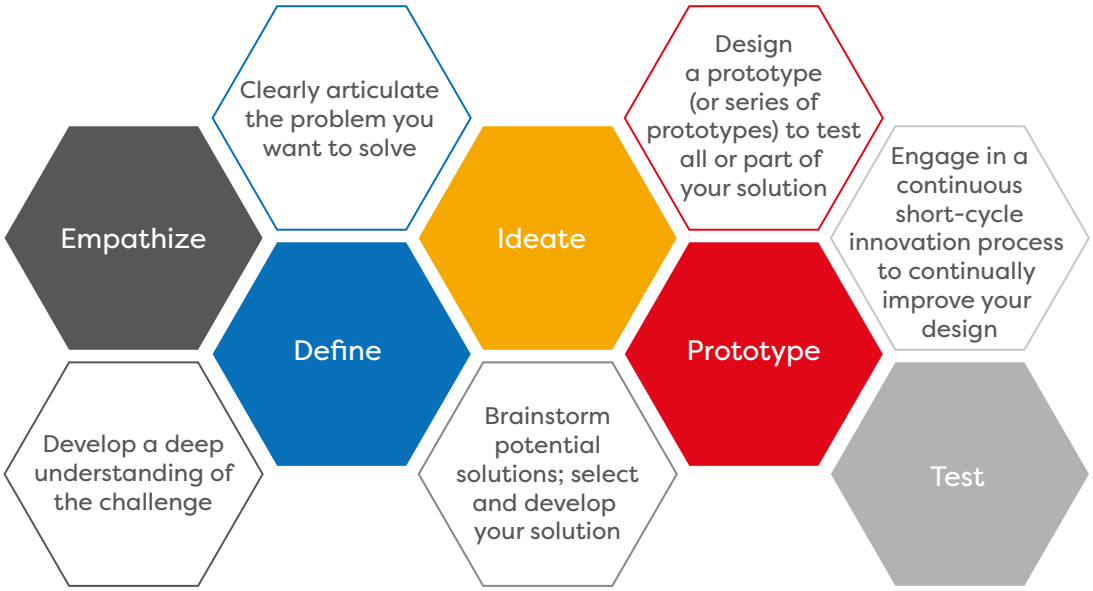


Figure 24: Design Thinking phases

Empathise: Empathy is the centrepiece of a human-centred design process for design thinkers to understand the users/customers, within the context of the design challenge. It is the effort to understand the way they do things and why, their physical and emotional needs, how they think about world, and what is meaningful to them. Some of the methods that can be used to emphatise are:

- **Identify stakeholders:** Identify not just the end-users or the consumer but all related people, groups, institutions that may affect your project or influenced by your project.
- **Observe/Shadow**: View users and their behaviour in the context of their lives and look for latent needs.
- **Interview/Engage**: Interviewing, but it should really feel more like a conversation to really understand the needs and root causes of the problems.
- **5 Whys:** Keep asking **Why** to identify the root causes or underlying needs. As Henry Ford once said, "if I had asked people what they wanted, they would have asked for faster horses." 5 Why technique helps designer in identifying the underlying needs or root causes of the symptoms that the users talk about.
- **Customer journey map:** Capture the story of the customer's experience: from initial contact, through the process of engagement and into a long-term relationship.

a. Define: The Define phase is about bringing clarity and focus to the design space, to define the challenge in hand, based on what the team has learned about the user and the context. The goal of the Define phase is to craft a meaningful and actionable problem statement, also known as a point-of-view (PoV).

b. Ideate: Ideation is about generating widest possible range of ideas to evaluate and select the best possible solution. The determination of the best solution will be discovered later, through user testing and feedback. The tools that can be utilised here to generate and evaluate ideas are brainstorming, prototyping, mindmapping, sketching and 6 thinking hats.

c. Prototype: The Prototype mode is the iterative generation of artefacts intended to answer questions that get you closer to your final solution. In these early stages, you should create low-resolution prototypes that are quick and cheap to make (think minutes and cents) but can elicit useful feedback from users and colleagues. A prototype can be anything that a user can interact with – be it a wall of post-it notes, a gadget you put together, a role-playing activity, or even a storyboard.

Prototypes are created:

- To ideate and problem-solve.
- To communicate.
- To start a conversation.
- To fail quickly and cheaply.
- To test possibilities.
- To manage the solution-building process.

d. Test: The Test phase is when you solicit feedback about the prototypes you have created from your users and have another opportunity to gain empathy for the people you are designing for. Testing of whether the proposed solution is likeable by the potential customers or not remains to be a very important task at every phase of the project. Asking the "Why" questions helps focus on what startups can learn about the customers and the problem as well as potential solutions.

7.1.1.2 Customer Development

Steve Blank, in his book ***The Four Steps to the Epiphany***, argues that more startups fail from a lack of customers than from a failure of product development and he describes a 4-step process for **Customer Development**, in parallel to product development (Blank, 2013). The 4-step process of Customer Development, as depicted in the following figure consists of **customer discovery**, **customer validation**, **customer creation** and **company building**. Blank defines the Customer Development in two phases: **Search Phase** and **Execution Phase**. In the search phase a startup searches for a business model that could work, as well as, products and services that might sell. Once the business model is proven, the second phase starts, in which the startup executes the model and starts building a formal organization.

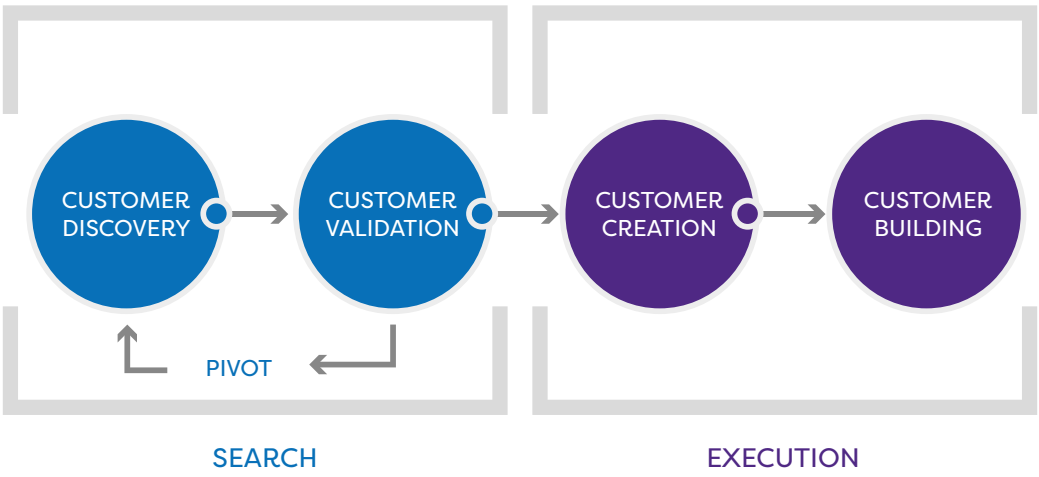


Figure 25: Customer development phases (The four steps to the epiphany, 2013)

This customer development process is executed in parallel to product development process, which is also described shortly in, again, four steps by Steve Blank: Concept/seed, Product development, Alpha/Beta Test, Launch/1st ship (Blank, 2013).

The product development is generally a linear, execution-oriented process, flowing from concept/seed towards right launch in a logical progression with milestones and resources assigned to completing each step. Assuming that startups can learn everything about the customer, market, etc. in the first phase of product development is very realistic. Information and data are gathered about customers and markets in each iteration to learn and validate all the assumptions. The ability to learn from iterations and missteps is what distinguishes a successful startup from the failed ones.

The first step (**Customer Discovery**) aims to identify the customer segments, customer needs and how they value the problem that the product or service proposal tries to solve (so-called **Problem/Solution fit**). The second step (**Customer Validation**) aims to develop a sales model that can be replicated and prove that there is a market for the product or service proposal (so-called **Product/Market fit**). The third step (**Customer Creation**) focuses on scaling the market by creating and driving customer demand. The fourth step (**Company Building**) aims to transform the startup firm from a learning and discovery organization to a business execution machine. Blank believes that product-market fit needs to happen before moving from Customer Validation to Customer Creation.

7.1.1.3 Lean Startup

The author of the Lean Startup methodology, Eric Ries, explains that traditional management practices and ideas are not adequate to tackle the entrepreneurial challenges of startups (Ries, The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses, 2011). Ries found out that adapting Lean Thinking from manufacturing industry to the context of entrepreneurship would allow to distinguish between value-creating activities versus waste and better manage the huge amount of uncertainties faced by the startups. Ries offers "**learning**" as the essential unit of progress for startups rather than tracking completion of activities or components as planned in the beginning of the project or iteration because you may finish all the components and spend a lot of resources but at the end you will realize that the end product is not desirable by the customer.

Ries argues that the Lean Startup represents a new approach to creating **continuous innovation** that builds on many previous management and product development ideas, including lean manufacturing, design thinking, customer development, and agile development. The Lean Startup methodology aims to teach entrepreneurs how to drive a startup through the process of steering (Build-Measure-Learn feedback loop) and enable entrepreneurs to scale and grow the business with maximum acceleration.

Ries suggests that the question the founders should answer is not "Can this product be built?" Unless startup is working on a technological breakthrough, with today's technology, almost any product that can be imagined can be built. The more important questions are "Should this product be built?" and "Can we build a sustainable business around this set of products and services?" To answer those questions, a method is needed for systematically breaking down the business plan into its components and testing each component empirically. In the Lean Startup approach, every product, every feature, every marketing campaign—everything a startup does—is understood to be an experiment designed to achieve **validated learning**.

Eric Ries defines the "**Build-Measure-Learn**" cycle for startups to turn ideas into products, measure how customers respond, and then learn whether to **pivot** or **persevere**. In order to reduce the amount of uncertainty as soon as possible and without wasting too much resources, all startups should accelerate this feedback loop.

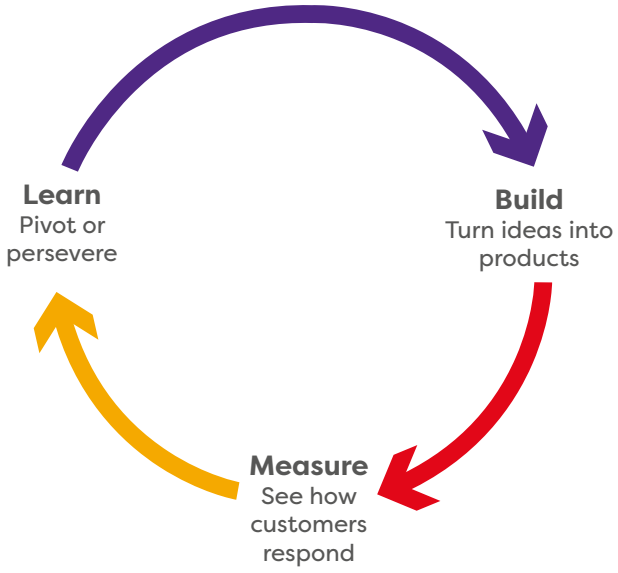


Figure 26: Build – Measure – Learn cycle of Lean Startup (The Lean Startup, 2011)

Loop begins in the **Build** stage with a set of ideas or hypotheses that are used to create some artefacts (a.k.a Minimum Viable Product, MVP, such as mock-ups, code, landing page, etc.) for the purpose of testing a hypothesis. The artefact is then put in front of customers to "**measure**" their response using a combination of qualitative and quantitative data. This data is used to derive specific "**learning**" that serves to validate or refute a hypothesis, which in turn drives the next set of actions.

Lean Startup approach recommends holding innovators accountable to improve entrepreneurial outcomes by focusing on the "boring stuff", like measuring progress and setting up milestones and proposes a method called **Innovation Accounting** to do so.

Innovation Accounting is a way of evaluating progress when all the metrics typically used in an established company such as revenue, customers, ROI and market share are effectively zero.

Customer metrics:

- Customer discussions (How many users do your business talk to each week?)
- Customer feedback (How many users provide feedback on the product each week?)
- Conversion rates (How many users have actually tried the product out?)
- Per Customer Revenue (How much would users be willing to pay for the product?)

Value hypothesis metrics:

- Rate of repeat purchases
- Retention rates
- Willingness to pay a premium price
- Referral rates

Growth hypothesis metrics:

- Word of mouth referrals
- Ability to take revenue from one customer and invest it into a new customer acquisition
- Ability to recruit new customers as a side effect of normal usage

7.1.1.4 Lean Canvas

Ash Maurya states that successful startups find a plan that works before running out of resources rather than having the perfect plan to begin with (Maurya, 2010). He puts forward three main steps for startups to follow along with the Lean Canvas:

1. Document Plan A.
2. Identify the riskiest parts of the plan.
3. Systematically test the plan.

The Lean Canvas is a 1-page business plan template (shown in the following Figure) that helps startups deconstruct their idea into its key elements that are then systematically tested, in order of highest to lowest risk (Maurya, 2010). It is adapted from Alex Osterwalder's Business Model Canvas (Osterwalder, 2010) and optimised for Lean Startups. It replaces elaborate business plans with a single page business model which is fast, concise and portable. The Lean Canvas is also a good format for brainstorming possible business models, prioritising where to start, and tracking ongoing learning.

Like Lean Startup and Design Thinking, Ash Maurya also suggests testing or validating the critical assumptions that the business model is based on. For most startups, unless they are working on a scientific or a technological breakthrough, the solution is not the riskiest part of the business model.

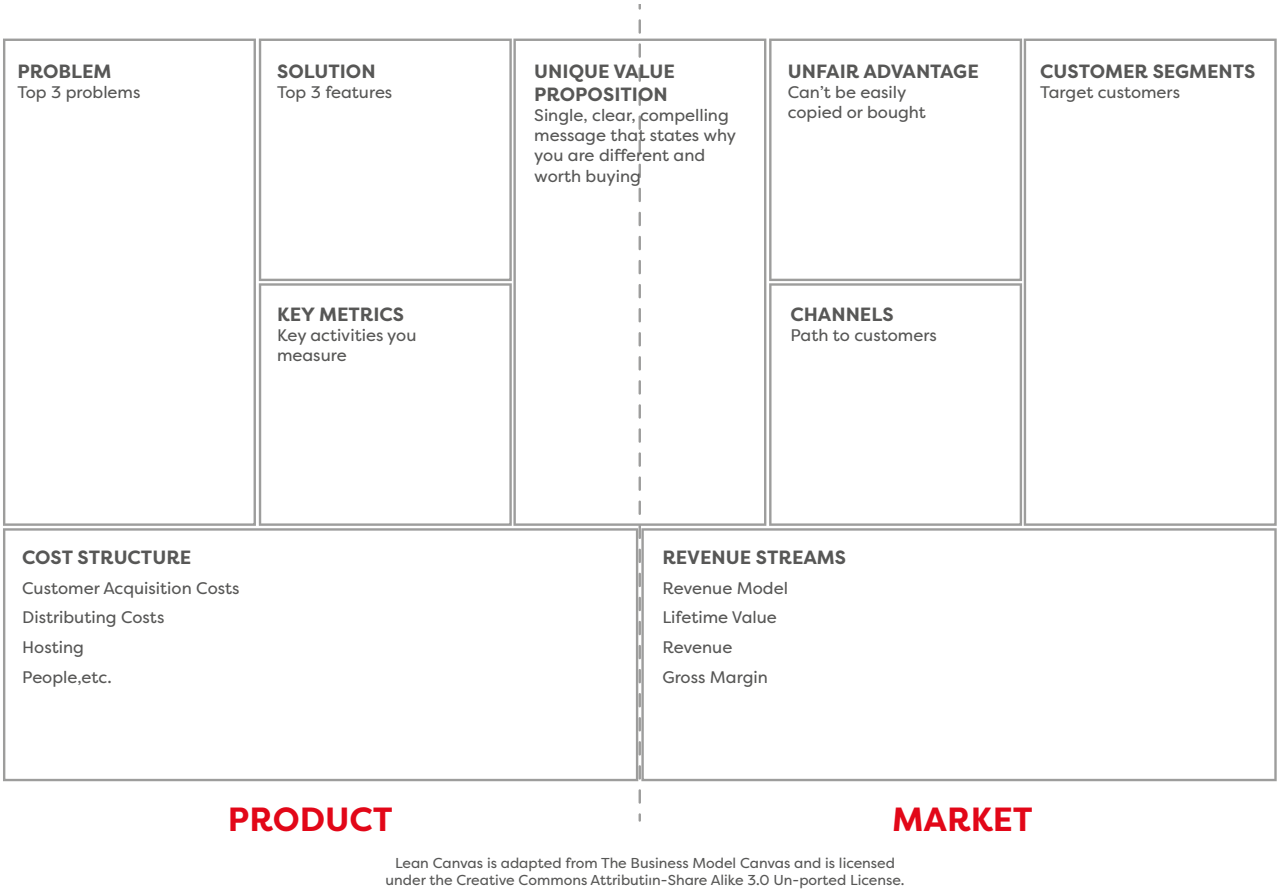


Figure 27: Lean Canvas (Maurya, 2010)

In this canvas, there are mainly 9 focus areas: Problem, Solution, Unique Value Proposition, Unfair Advantage, Customer Segments, Key Metrics, Channel, Cost Structure and Revenue Streams. These focus areas are explained in detail in the rest of this section.

- **Problem:** For the customer segment you are working with, describe the top one to three problems they need solved or jobs need to be done. **Existing alternatives** that the early adopters use to address these problems today should also be documented. Unless there is a brand-new problem, like trip to Mars, is in hand, most problems have existing solutions and these solutions may not be from an obvious competitor. For example, the existing alternative for an idea management software may not be another idea management product, but email and MS Excel.
- **Customer Segments:** Customers (who will pay for the product or service) and users (who will use the product or service) should be identified. For startups, identifying the **early adaptors** is very critical since these will be the users who will use and provide the feedback needed to improve the product.

- **Unique Value Proposition (UVP):** UVP is defined as the statement of "why you are different and worth getting attention" by Ash Maurya. In defining the UVP, the end benefit should be defined, not the problem and the early adaptors should be targeted. The UVP is hard to get right because the essence of the product/service should be distilled in a few words that can fit in the headline of the landing page. The UVP should be different than the competitors' and this difference should be significant.

  The **High-Level Concept** is a sub-box on the Lean Canvas below the Unique Value Proposition (UVP) box. It is an effective tool to quickly get your idea across and make it easy to spread. The High Level Concept is an analogy to a well-known product or concept. For example: YouTube - Flickr for video.

- **Solution:** The top features or capabilities of the solution should be drafted next to each problem. Since the problems are not tested yet, it may not worth the effort to fully define the solution yet. It is enough to define the simplest solution to address each problem. The solution should be finalised through experimentation and validation.

- **Channels:** Channels are ways for you to reach your customers. In addition to defining the right solution to build, it's just as critical to find, build and test significant paths to the customers from day one. If your business model relies on acquiring large numbers of customers, scalable channels should be identified as soon as possible so these channels can be built and tested properly. Some of the channels are email, blogs, search engine optimization (SEO), social media, white papers, webinars, search engine marketing (SEM), print/TV ads, trade shows, and cold calling.

- **Unfair Advantage:** The simplest definition of Unfair Advantage is something that cannot be easily copied or bought by the current or potential competitors. Insider information, the right "expert" endorsements, a dream team, patent, and large network effects are few examples of unfair advantage.

- **Key Metrics:** Key metrics are the key numbers that can be used to measure the performance of the company. Since acquiring customers is very critical in startup success, there should be few metrics about customers.

The bottom two boxes labelled as "Revenue Streams" and "Cost Structure" are used to model the viability of the business. The revenue and cost values are used to calculate a break-even point and to estimate how much time, money, and effort needed to get there.

- **Cost Structure:** The operational costs that will be incurred while taking the product to market should be estimated. It could be difficult to accurately estimate the cost too far into the future, but it would be wise to focus on the runway needed to define, build, and launch the MVP rather than a larger scope. Some other activities that could be included in cost estimation are interviewing enough number of customers and fixed and variable costs of operating the business.

- **Revenue Streams:** Successfully answering the question of "for what value is each Customer Segment truly willing to pay?" allows SA business model can involve transactional revenues resulting from one-time customer payments (e.g. a sales), or recurring revenues (e.g. a subscription).

  How to price the product or service depends on the type of model used, however, it is quite common for startups to lower their cost, even offer it for free to gain traction. However, this can pose a few problems. The key being it actually delays/avoids validation. Getting people to sign up for something for free is a lot different than asking them to pay.

Since ideas can come from different places such as customers, R&D, external changes, competition, etc., there is no specific order to fill in the Lean Canvas(Maurya, 2010). Generally, customer segments and problem boxes are filled in at the beginning, then the boxes about unique value proposition, solution and channels, then cost-revenue and lastly metrics and unfair advantage. Startups can start with any box and follow any sequence, as long as all the information about the startup project is captured and all critical assumptions are identified to start experimenting.

Lean Canvas is part of a bigger Continuous Innovation framework that helps startups systematically uncover what customers want and build products that bring value.

While startups might be aiming to build a mainstream product, they may need to start with a specific customer in mind. Even Facebook, with its now 500 million+ users started with a specific user in mind - Harvard college students. The elements of the business model can and will vary greatly by customer segment. Therefore, it would be beneficial to fill out one canvas for each customer segment.

7.1.1.5 Why bother with early planning and experimenting - Startup Funding

Every startup, irrespective of the nature and size of operations, requires funds to convert its innovative ideas into reality. Running out of cash is one of the major reasons for startup failure. In the beginning, founders fund themselves but in later stages they may need more funding to speed up the progress so that they can seize the opportunity.

Pre-seed funding is the earliest startup funding stage. At this stage, founders are working with a very small team (or even by themselves) and are developing a prototype or proof-of-concept. The money to fund a pre-seed stage typically comes from the founders themselves (also known as bootstrapping), their friends and family, and maybe from an angel investor or an incubator. Seed funding is used to take a startup from idea to the first steps, such as MVP, product development or market research.

The very first money that many enterprises raise, whether they go on to raise a Series A or not, is **seed funding**. Seed funding may be raised from family and friends, crowdfunding, angel investors, incubators, and venture capital firms that focus on early-stage startups. If startups cannot gain traction before the money runs out (also known as running out of runway), then they may fail, and this would be the end point for startup.

Series funding is a series of startup funding stages that follow one after the other and includes Series A, B, C, D, and sometimes E. Once a startup makes it through the seed stage and they have some kind of traction — whether it's number of users, revenue, views, or whatever other key performance indicator (KPI) they've set themselves — they're ready to move on to the next startup funding stage, which is Series A.

In a **Series A round**, startups are expected to have a plan for developing a business model, even if they haven't proven it yet. They're also expected to use the money raised to increase revenue. Series A funding usually comes from venture capital firms, although angel investors may also be involved. Additionally, more companies are using equity crowdfunding for their Series A.

A startup that reaches the point where they're ready to raise a **Series B round** has already found their product/market fit and needs help expanding. The expansion that occurs after a Series B round is raised includes not only gaining more customers, but also growing the team so that the company can serve that growing customer base.

Series B funding usually comes from venture capital firms, often the same investors who led the previous round. Because each round comes with a new valuation for the startup, previous investors often choose to reinvest in order to ensure that their piece of the pie is still significant.

Commonly, **Series C** companies are looking to take their product out of their home country and reach an international market. They may also be looking to increase their valuation before going for an Initial Public Offering (IPO) or an acquisition. Series C funding typically comes from venture capital firms that invest in late-stage startups, private equity firms, banks, and even hedge funds.

Few companies make it to **Series D** and fewer makes it to **Series E**. The possible reasons for startups to go to Series D or E are; they have failed to meet expectations in previous series; they want to stay private longer; or they need a little more help before going public.

Mezzanine financing (also known as **bridge loans**) is for preparing the startup for the final push to an exit – IPO or acquisition. It's a hybrid of loan financing and equity financing. Mezzanine investors do not require any hard collateral, but they do often ask higher interest than a traditional bank loan. They also ask for the right to convert their equity if you default on the loan. Because of the higher interest rate, mezzanine financing can be riskier than other types of startup funding. However, the goal of mezzanine financing is to get the startup to exit more quickly.

IPO is often the last stage of startup funding that companies go through. With an IPO, investment bankers commit to selling a certain amount of shares for a certain amount of money, thereby raising money for the company. The shares are traded on the stock exchange.

Regardless of the funding round a startup aims to try out, there is a need to communicate with investors or other actors of the startup ecosystem to correctly describe the value and the potential realisation steps of the startup project. The methods discussed in Section 4.1 as well as the lifecycle proposed in Chapter 3 in this Practice Guide aims at preparing startups both in managing their project in the most efficient manner possible as well as in getting ready to effectively communicate their project to the relevant stakeholders.

7.2 Project Management Foundation

The purpose of this Practice Guide is to help startup founders manage their startup journey by using some of the Project Management tools and techniques. Therefore, a short summary of project management basics is provided below.

7.2.1 What Is Project, Project Management and Project Manager

Project Management Institute's (PMI) A Guide to The Project Management Body of Knowledge (PMBOK® Guide) is used as the main source for the Project Management subject. PMBOK® Guide defines **project** as "a temporary endeavour undertaken to create a unique product or service" (Project Management Institute, 2013).

Projects and operations have different goals and objectives. The objectives of operations are to **ensure business continuity** (business as usual), to maintain the status quo, while the objective of a project is to implement a certain change, to change the status quo.

Examples of a project include, but not limited to, developing a **new product** for a product line, upgrading an **existing product or a service.** Operations would include managing a **product/service,** maintaining the **product/service.**

PMBOK® Guide defines **Project Management** as the application of knowledge, skills, tools and techniques to meet the project requirements. Generally, the project manager is responsible to ensure that project management techniques are applied and followed. The **Project manager** is a person who achieves the project objectives and ensures the product, service or result is delivered within the defined and agreed variables and constraints.

The person who is assigned as the Project Manager or who assumes the project management responsibility in a startup needs:

- Project management skills
- Technical knowledge
- Knowledge of industry standards and regulations
- Interpersonal skills
- General management knowledge and skills
- Understand the project environment

The ideal skill set as defined in the PMI Talent Triangle® is a combination of **technical project management**, **strategic and business management** and **leadership** expertise (Project Management Institute, 2013).

7.2.2 Project Management Lifecycles

Project life cycle is defined as the series of phases that a project passes through from its start to its completion and provides the basic framework for managing the project. The phases in the life cycle may be sequential, iterative, or overlapping. A project phase is a collection of logically related project activities that culminates in the completion of one or more deliverables.

Project life cycles follow a continuum with **predictive** or **plan-driven** (Fully Plan-Driven aka Waterfall) approaches at one end and **adaptive** or **change-driven** (change-driven, aka Agile) approaches at the other end. In a foreseeable/predictive life cycle, products and deliveries are identified at the start of the project and any change to scope is carefully managed. In an adaptive life cycle, the product is developed over multiple iterations, and the detailed scope is defined for each iteration only when the iteration starts.

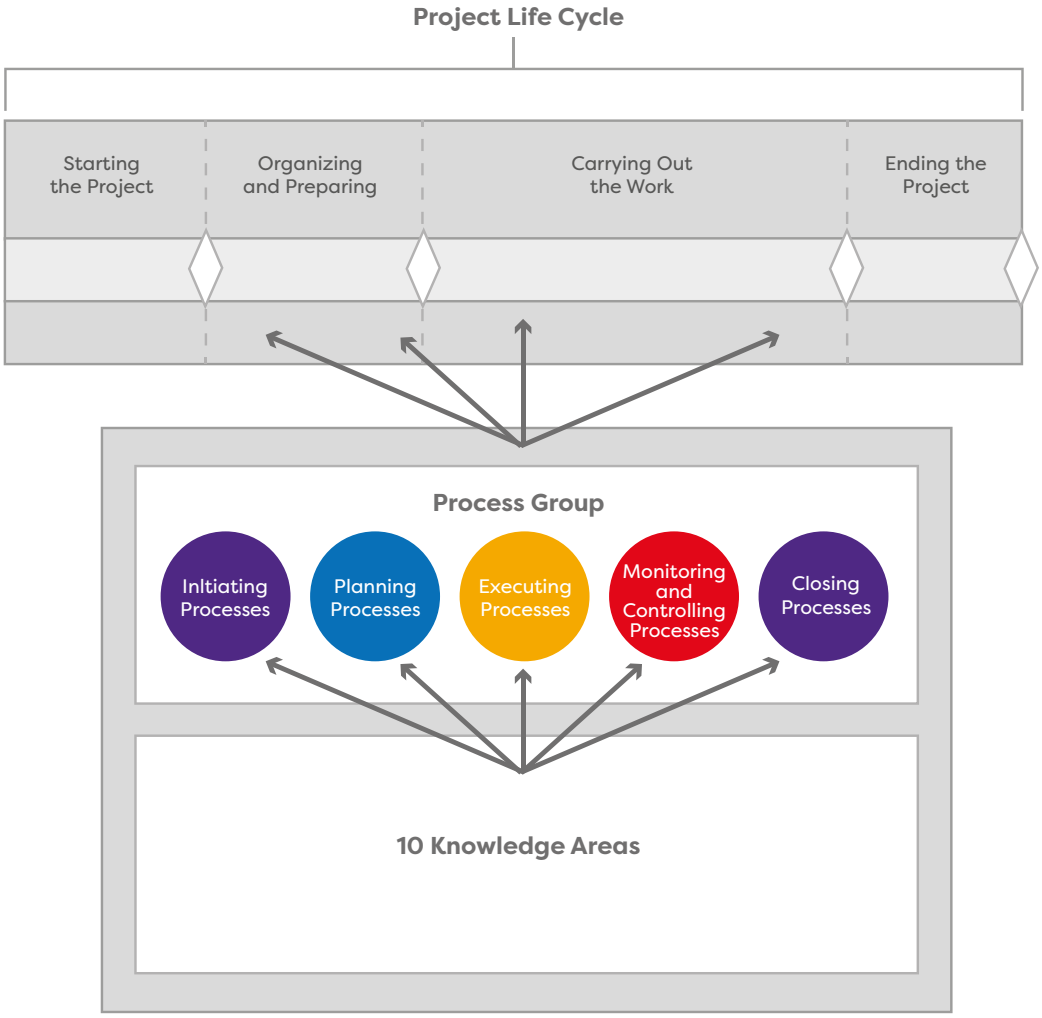


Figure 28: Project Life Cycle (Project Management Institute, 2013)

Within a project life cycle, there generally is a **product development life cycle** with few phases for designing and developing a product or a service. The product development life cycle can be a predictive, iterative, incremental, adaptable, or hybrid model. PMBOK defines these lifecycles as below (Project Management Institute, 2013):

- In a **predictive life cycle**, the project scope, time, and cost are determined in the early phases of the life cycle. Any changes to the scope are carefully managed. Predictive life cycles may also be referred to as waterfall life cycles.
- **Adaptive life cycles** are agile, iterative, or incremental. The detailed scope is defined and approved before the start of an iteration. Adaptive life cycles are also referred to as agile or change-driven life cycles.
- In an **iterative life cycle**, the project scope is generally determined early in the project life cycle, but time and cost estimates are routinely modified as the project team's understanding of the product increases. Iterations develop the product through a series of repeated cycles, while increments successively add to the functionality of the product.
- In an **incremental life cycle**, the deliverable is produced through a series of iterations that successively add functionality within a predetermined time frame. The deliverable

contains the necessary and sufficient capability to be considered complete only after the final iteration.

- A **hybrid life cycle** is a combination of a predictive and an adaptive life cycle. Those elements of the project that are well known or have fixed requirements follow a predictive development life cycle, and those elements that are still evolving follow an adaptive development life cycle.

The **product life cycle** is different from the project lifecycle. Product life cycles cover a product from inception or concept through decommissioning or death. The most common phases of a product life cycle are:

- **Introduction** – there is low sales volume, little competition and customers need to be encouraged to by the product
- **Growth** – sales volume grows, costs decrease and profits rise, awareness of the product increases leading to lower prices and increased competition
- **Maturity** – high volume production drives down costs, the market begins to saturate, more competitors in the market, profits are reduced
- **Decline** – volume decreases, profit is minimal

7.2.2.1 Predictive Lifecycles – Waterfall

The waterfall development cycle is the foundation cycle that all other cycles modified to meet differing needs. Waterfall emphasizes the need to complete one phase in its entirety before moving on. For example, the requirements must be fully known and signed off before advancing to the design phase. The design phase must be complete and approved before moving into the build phase. The build phase must be complete before moving into test. This is commonly seen in large construction projects.

We should envision the whole product in the beginning, plan the whole work and execute/ deliver according to the plan. The product is seen as one, major big delivery at the end (example we are building a house and deliver to the client once finalised and fully ready to use)

Initially, the team is focused on clarifying the overall scope of the project and product, and they develop a plan to bring the product out. Scope changes are managed carefully and planning is made again according to accepted changes. It is used in cases where the product is well understood and where there is a lot of experience in the past.

The Waterfall approach was the gold standard for all projects. It is a fully plan-driven approach where the 3 main project constraints (time, scope, cost) are all determined at a detailed level at the start of the project.

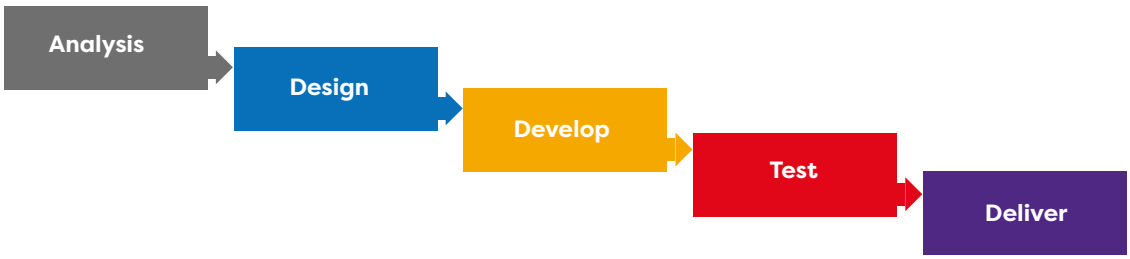


Figure 29: Waterfall approach

7.2.2.2 Agile Lifecycles – Iterative & Incremental

Agile development methodology stresses short build and test cycles with high participation by the end users and customers. It emphasizes small teams, frequent communication and small time boxes for development, usually called iterations. Iterations are generally 1-4 weeks long. This shorter time frame enables project teams to react to changes in the client's needs more effectively.

Objectives are to discuss the following:

- How product strategies are created, and relate to Product Management?
- How it is continually planning for the next iteration.
- Not to forget to include a Technology Roadmap as part of the Product Roadmap.
- Having an Enterprise Architect participate is critical on new development projects.

Product Vision: Established by stakeholders, independent of technology

Release Plan: Stakeholder prioritisation of User Stories. Multiple iterations are called release.

Product Backlog: Created by using User Stories.

User Story: User story is a requirement coming from customer/end-users. User stories are short, simple descriptions of a feature told from the perspective of the person who desires the new capability, usually a user or customer of the system. They typically follow a simple template:

As a < type of user >, I want < some goal > so that < some reason >.

Iteration Plan: Work targeted for completion in one iteration

Delivery: Each iteration could be delivered but would not be delivered to the customer until there is business value

In Agile lifecycles, the product is developed by iterated (repeated) cycles. Additions to the functions of the product are made at each increment. In a repetition, the activities in the Project Management Process groups are applied. At the end of each iteration, a delivery or group of deliveries is completed. Future iterations improve these deliveries or create new deliveries. Feedback is considered and included in each iteration.

Adaptive methods are also iterative and incremental, but repetitions are very quick (2 to 4 weeks); fixed in time and cost (time boxed). The entire scope of the project is divided into a set of requirements (user stories) and tasks that are to be done, called the product backlog.

At the beginning of a repetition, high priority product savings are decided. At the end of each iteration, the product should be ready for customer review.

Adaptive methods are generally used in a rapidly changing environment, when requirements and scope are difficult to define in advance, and where small additions are possible to provide value to stakeholders (customers).

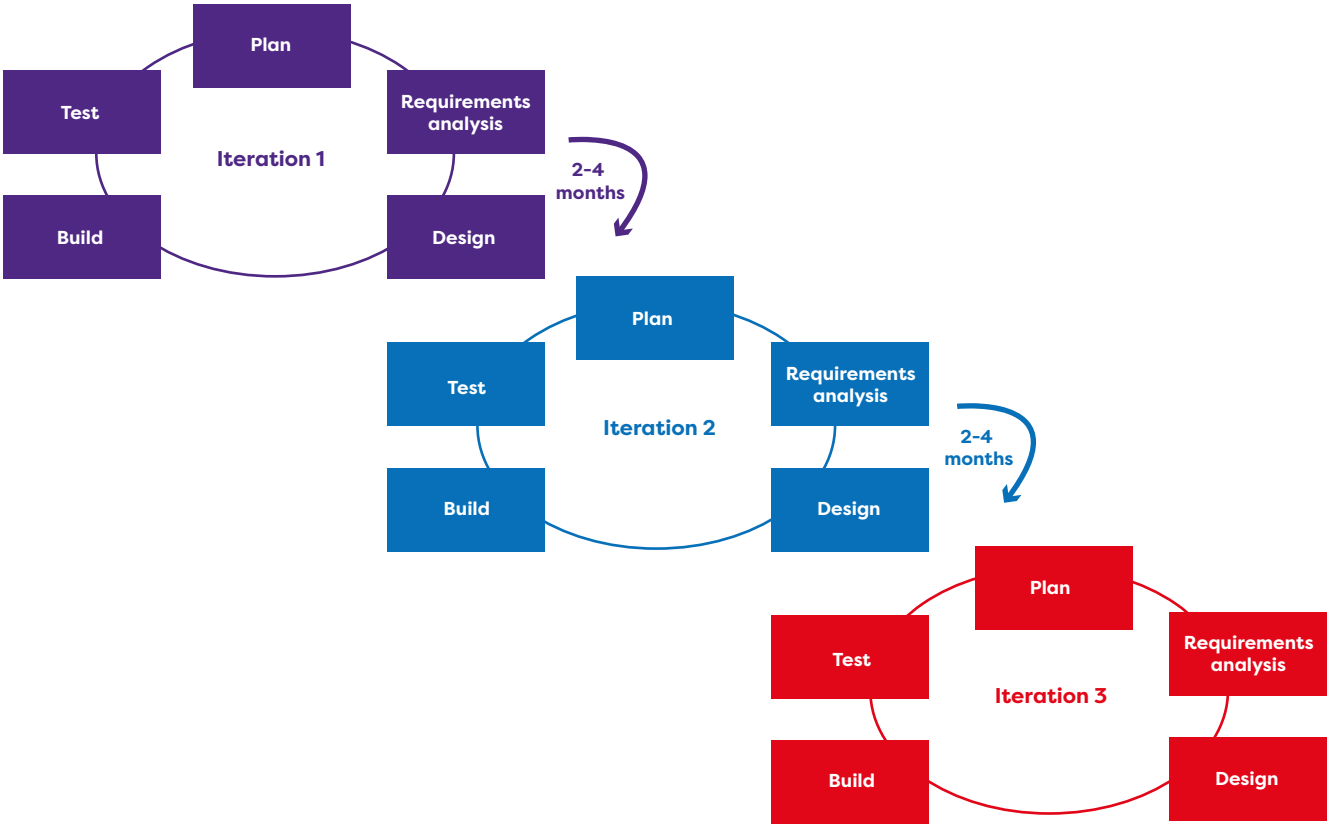


Figure 30: Iterative approach

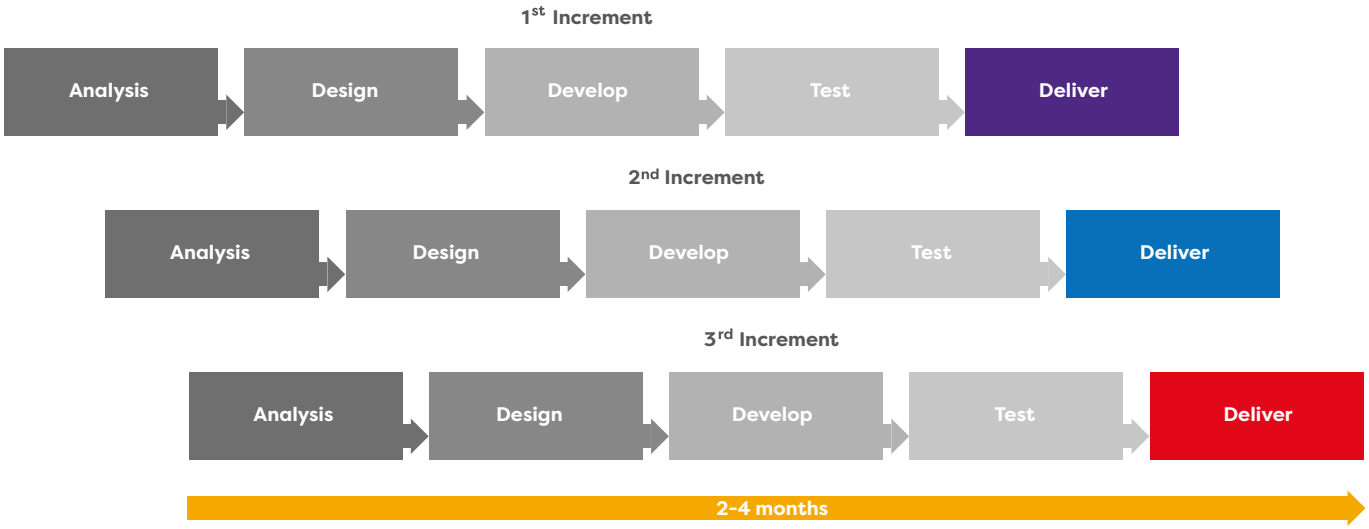


Figure 31: Incremental approach

Adaptive projects are quick and time bound with two critical success factors:

- The customer must be intimately involved in the process
- You must be able to define incremental requirements at the start of each iteration

If requirements are not well known, like when you are developing a first of its kind application, the adaptive approach works nicely.

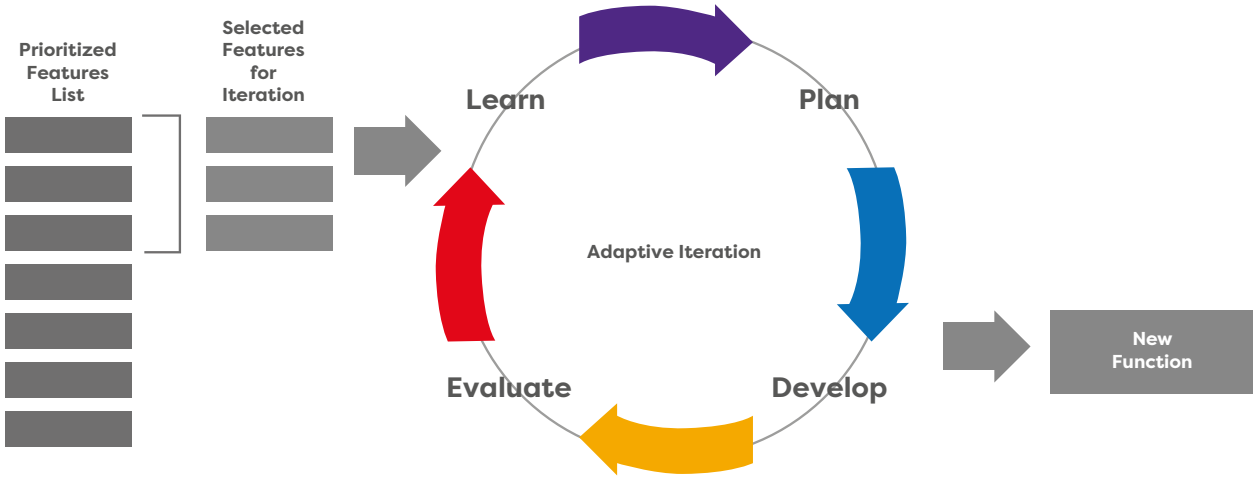


Figure 32: Adaptive approach

7.2.2.3 Hybrid Lifecycles

As it implies, the hybrid takes the best of all approaches. You can use a predictive approach for the elements of the project that are known and an adaptive approach for the elements that will become apparent over time. "Hybrid methodologies accept the fluidity of projects and allow for a more nimble and nuanced approach to work," says Jason Westland.

Hybrid approaches are not new to project management, but they are definitely gaining acceptance as a way to solve life cycle problems in the 21st century. There is software coming on the market that allows you to blend approaches so you can manage different life cycle approaches all in one application. How neat is that?

While many teams will favour either waterfall or agile, the benefits of both approaches can create a case for a hybrid project management methodology solution, one in which the planning and requirements phase is undertaken under a waterfall approach and the design, develop, implement, and evaluate phases follow the agile methodology.

7.2.3 PMBOK and Project Management Knowledge Areas

Each project follows the same approach when it comes to a sequence of master processes or so-called process groups. **PMBOK® Guide**, defines Initiating, Planning, Executing, Monitoring and Controlling and Closing as "process groups" (Project Management Institute, 2013).

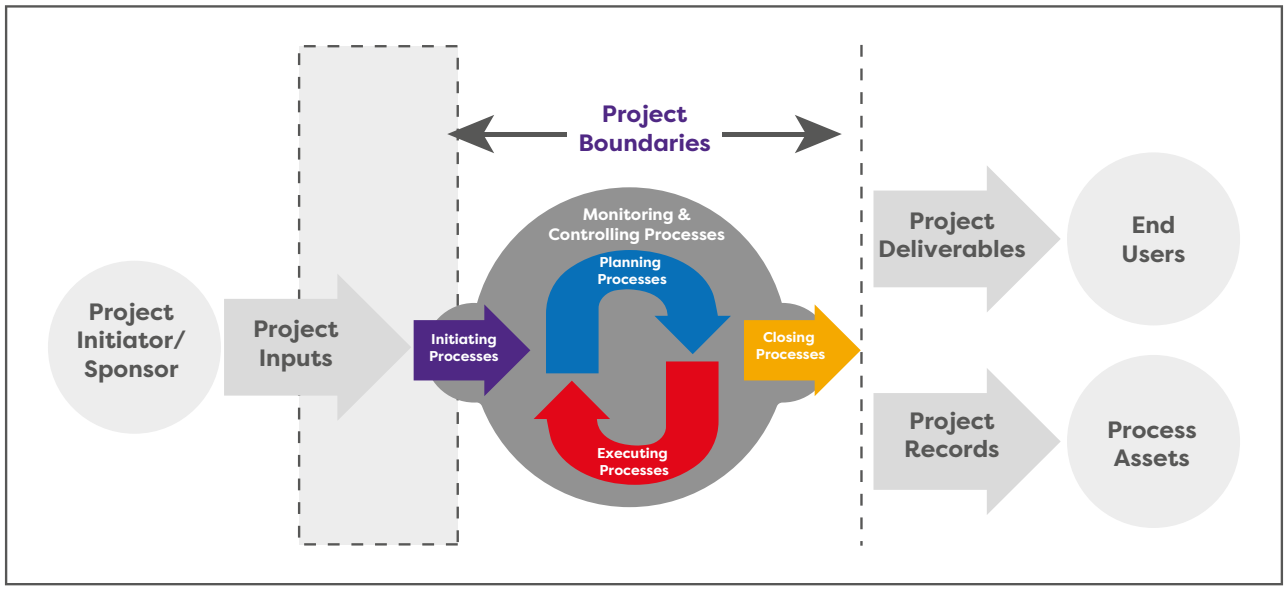


Figure 33: Boundary of a project and process groups (PMBOK)

- **Initiating Process Group**. Those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase.
- **Planning Process Group**. Those processes required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve.

- **Executing Process Group.** Those processes performed to complete the work defined in the project management plan to satisfy the project specifications.
- **Monitoring and Controlling Process Group**. Those processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.
- **Closing Process Group.** Those processes performed to finalise all activities across all process groups to formally close the project or phase.

The graphic shows a very high-level overview of how the process groups interact. In reality, the discrete processes can interact in many different ways. The processes are iterative and it is the project manager's job to identify the appropriate processes and the interactions between them.

There are ten knowledge areas used in managing a project as defined by PMBOK® Guide (Project Management Institute, 2013):

1. **Project Integration Management.** Project Integration Management includes the processes and activities needed to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups.

3. **Project Scope Management.** Project Scope Management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully.

5. **Project Schedule Management.** Project Time Management includes the processes required to manage the timely completion of the project.

7. **Project Cost Management.** Project Cost Management includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget.

9. **Project Quality Management.** Project Quality Management includes the processes and activities of the performing organisation that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken.

11. **Project Resource Management.** Project Resource Management includes the processes needed to identify, create and manage the resources required for the successful completion of the project.

13. **Project Communications Management.** Project Communications Management includes the processes that are required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and the ultimate disposition of project information.

15. **Project Risk Management.** Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project.

16. **Project Procurement Management.** Project Procurement Management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team.

18. **Project Stakeholder Management.** Project Stakeholder Management includes the processes required to identify all people or organisations impacted by the project, analysing stakeholder expectations and impact on the project and developing appropriate management strategies for project, effectively engaging stakeholders in project decisions and execution.

	Knowledge Areas										
Process Groups	Integration	Scope	Schedule	Cost	Quality	Resource	Communication	Risk	Procurement	Stakeholder	
Initiating	1									1	2
Planning	1	4	5	3	1	2	1	5	1	1	24
Executing	2				1	3	1		1	1	10
Monitoring & Controlling	2	2	1	1	1	1	1	1	1	1	12
Closing	1										1
	7	6	6	4	3	6	3	7	3	4	49

Figure 34: Number of processes based on process groups and knowledge areas (PMI, 2017)

In order to deliver a successful project, the project manager must balance multiple project variables and constraints. For example, the customer may want more scope and higher quality than the schedule or budget allow for. It is up to the project manager to identify this situation and work with the customer to balance the scope, quality, schedule and cost with the available resources and at an acceptable risk level.

- Scope – What is the project trying to accomplish?
- Time/Schedule – How long should it take to complete?
- Cost - What should it cost?
- Quality - What are the quality specification to be delivered?
- Resource - What people, material and equipment required?
- Risk – What are the potential risks?

It is the project manager's job to balance these often-competing constraints.

Figure 35: Project variables and constraints

7.3 New Product Development and Project Management

Traditional project management used to overemphasize planning and control over flexibility and adaptability, leading to approaches that are poorly adapted to high-uncertainty endeavors such as new product development and startup projects. In response, the concepts of targeted flexibility and adaptive project management have been proposed. A key driver of the need for adaptive project management for startups is extreme uncertainty, which can exist for different project aspects such as customer, market response, technology, financials, schedule and with different intensity and at different times in the project flow.

Extreme uncertainty, or unknowns are not easily manageable with traditional, predictive project management approaches, such as risk management. Instead, these projects should focus on validated or facilitated learning through trial and error (build-measure-learn) or selectionism, allowing many aspects of the project plans to emerge through these learnings, rather than being determined in the beginning of the project.

Figure below maps the new product Stage-Gate phases (top row) against project life-cycle stages as described in PMI's standards (Project Management Institute, 2013). Each project phase is characterized by its emphasis on particular project management processes (so-called Process Groups). The life-cycle stage "start," for example, encompasses a variety of initiation activities, some of which may carry over into later stages, even after the output of the phase, the project charter, is produced. Within the project management framework, a development project is typically considered complete when the product is handed off to manufacturing.

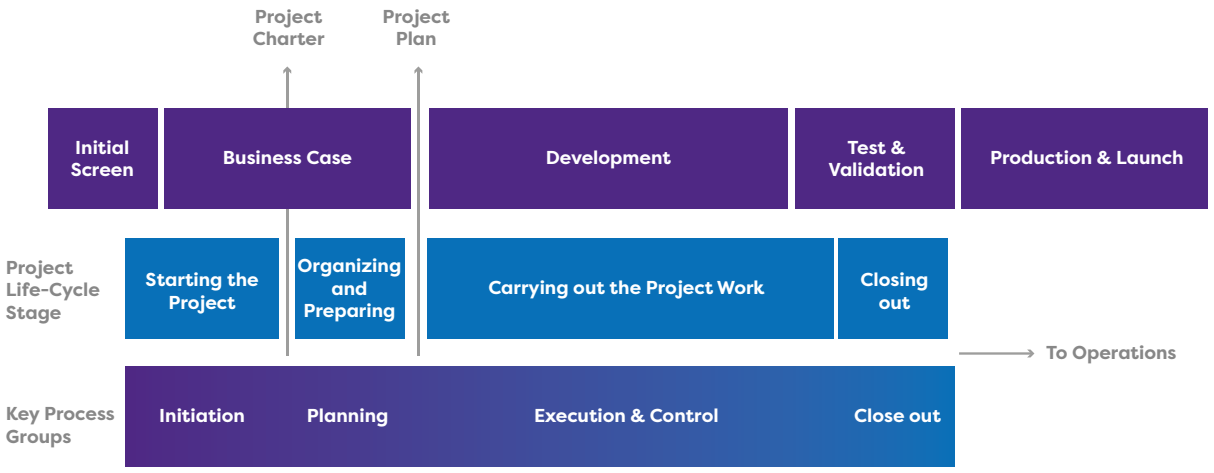


Figure 36: Stage Gate and Project Management Phases (Jetter, Albar, & Sperry, 2016)

The early, "fuzzy" stages for new product development are focused on gaining a fundamental understanding of what will determine the success of the future product and result in key project definitions, including markets, product concept, key features, and technologies.

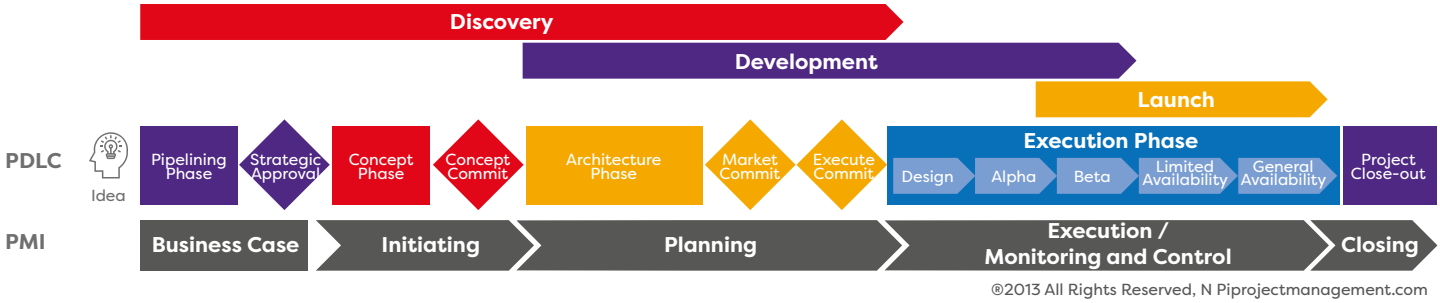


Figure 37: New Product Development Map (NPI Project Management, 2020)

Gartner's 2016 report proposes a combination of iterative and experimental approaches in the following form (Brand, Blosch, & Osmond, 2019):

4. Use Design Thinking to empathise with the customer and discover the real need
5. Evolve the innovative idea using Lean Startup's Build-Measure-Learn cycle
6. Use Agile to build out and evolve the technology elements of the product

The next chapter will introduce the new startup project lifecycle proposed by Outspeed Startup Project Team and inspired by all both startup methodologies and Project Management methodologies explained in this section.

8 Abbreviations and Symbols

AI	Artificial Intelligence
CBS	Cost breakdown structure
FBS	Feature breakdown structure
FTE	Full time equivalent (one person working full time during a specific period)
IOT	Internet-of-Things
IPO	Initial Public Offering
MoT	Moment of Truth
MVP	Minimum Viable Product
PBS	Product breakdown structure
PMBOK® Guide	A Guide to The Project Management Body of Knowledge
PMI	Project Management Institute
PoV	Point-of-view
ROI	Return-on-investment
SEM	Search engine marketing
SEO	Search engine optimization
SMART	Specific, Measurable, Actionable, Realistic and Time-bound
TCO	Total Cost of Ownership
UVP	Unique Value Proposition
VoC	Voice of Customer
WBS	Work breakdown structure

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