

# From Ambiguity to Problem/Solution Fit

A hybrid approach to innovation: applying principles from Lean Startup, Design Thinking and the Jobs-To-Be-Done framework.

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## ABSTRACT

The Lean Startup approach to innovation is argued to suit well if an initial problem or product idea is defined from the outset. Still, many startups fail either because of a lack of understanding the problems of which their target customers are suffering or they run out of resources before finding the right problem to solve for. Design Thinking is argued to be well suited in discovering and understanding problems, but the strategy's lack of methods validating assumptions early on could cause the innovator to waste resources solving for problems lacking in business viability. In some instances, an innovator sets out with the need of discovering a problem, validating its business potential before creating a viable solution. Considering their strengths and shortcomings, it is not then obvious which innovation strategy to apply.

This article sets out to study and apply an innovation strategy aiming at reaching problem/solution fit, where the innovator might only have a starting point of an ambiguous nature. Firstly, proposals are reviewed of applying an innovation strategy combining principles from two different communities and approaches to innovation, namely the Lean Startup and Design Thinking. Next, a review is conducted of actionable process frameworks from each innovation community and principles are discussed on how they can be applied in a hybrid process. Following this, a third concept, the Jobs-To-Be-Done framework is studied and discussed as a means to bridge the gap between the two. Lastly, a case study is provided in which principles from the aforementioned frameworks are applied and combined. The results of this research suggest that principles from the different frameworks can work in unison, and that problem/solution fit might be reached sooner with a continuous effort of discovery, precise problem definitions and the validation of assumptions.

**KEYWORDS:** Lean startup, Design Thinking, Lean Design thinking, Jobs-To-Be-Done

## 1. INTRODUCTION

There is no lack of literature proposing methodologies and processes to drive innovation. Still, many software startups fail for developing products without understanding that

there is a sufficient need among their customers and therefore solving for non-existent problems [1]. Research suggests that a reason for this is that companies tend to focus too early on validating a product instead of discovering and testing a problem space [1] and validating problem/solution fit [2].

Design thinking is an example of an innovation strategy that aims at uncovering opportunities for value creation through gaining empathy with end users through exploration [3]. The strategy is increasingly gaining support and traction, in particular within the established business realm [4], but as a framework for innovation for validating market potential and business viability, it leaves certain aspects to be desired, such as early stage testing for validation [5].

On the other hand, the Lean startup movement is evolving continuously, providing solid arguments and case study proof of the potential of this scientific approach to business success [6]. This approach, however, requires a concrete business idea to be in place from the outset, and some criticise the strategy of "fail fast and iterate" for being much like shooting in the dark and in itself might be wasteful [7].

Studies comparing the two approaches suggest that a hybrid strategy might be the answer [5], but this has not yet been substantially explored and exposed in literature. This article explores this topic further by studying literature on processes and methods from both innovation communities and provides a case study attempting to apply such a hybrid framework. The goal of the article is to show how a hybrid approach can be helpful towards reaching problem/solution fit when the starting point consists of merely ambiguous assumptions on possible business opportunities within a market domain.

This article will briefly present The Lean Startup and Design Thinking approaches to innovation and a study suggesting a merge of the two into a so-called Lean Design Thinking approach. In addition, three actionable frameworks are presented in succession: The Lean Canvas approach, Jon Kolko's design process [8] and Jobs-to-Be-Done [9].

The article is aimed at practitioners of the Lean Startup approach to innovation who has experience and knowledge of the design thinking

methodology, that being industrial designers, product managers or early stage startup founders. Instead of analysing these two distinct innovation strategies directly, this article will focus on the perspectives of concrete and actionable frameworks developed from key influencers on principles within each strategy. In addition, the article will highlight aspects from a third framework, jobs-to-be-done and how it might be used in defining and refining an actionable innovation strategy.

The word actionable in this paper is used when speaking of concrete, step-by-step process definitions, including methods of conduct.

## 2. METHOD

This article is partly based on literature review, intersecting the topics of Lean Startup Methodology, Design Thinking and the Jobs-to-be-done framework. Sources are articles, textbooks, blog posts and podcast transcripts, in addition to supplementing with experiences gathered through an actual early stage startup process.

Section three reviews briefly the main aspects of different stages of a startup process. The definitions studied are taken from Steve Blank's concept of Customer Development [2] and Ash Maurya's revisions of the same approach [10]. Special emphasis is here put on the early stages of a startup lifecycle, the phase before reaching problem/solution fit.

The concepts presented in section four highlights aspects of two different approaches to innovation, namely Lean Startup [6] and Design Thinking [3] before reviewing a proposed framework describing a hybrid approach, Lean Design Thinking, merging the two. Findings are discussed with regards to the shortcomings of the two individual approaches and how one might use the proposed merging of the two as an actionable framework.

Subject of section five is a review of literature on how to apply the Lean Startup approach, focusing on the work of Ash Maurya and the Lean Canvas

for modelling initial assumptions of a possible business model and subsequently systematically testing those assumptions to reduce risk [10]. The focus is on the phases of documenting a plan A, understanding the problem and defining the solution. A discussion follows on the findings with regards to the framework's lack of initial problem discovery methods.

Following this section, Kolko's actionable Design Thinking framework [8] is reviewed in section six, focusing on the process steps leading up to the definition of product constraints. Findings are discussed with special emphasis on the framework's lack of methods to validate assumptions

Section seven reviews the framework of Jobs-to-be-done and its applications, followed by a discussion on how it can be applied to both the problem discovery phase of a project, validation and as a means of defining focus areas of value creation and translating them towards a roadmap for further development.

### **3. PROBLEM/SOLUTION FIT**

Steve Blank suggests a process to place aside to product development, which aims to discover and validate the right market for an idea [2]. The first part of the discovery consists of finding problem/solution fit. The aim is to test the riskiest hypotheses of the problem taken in consideration by implementing a first solution. The second step is to build the right product features that solve real customers' needs, also known as the product/market fit. If the product/market-fit is not achieved, then a problem/solution-fit must be reiterated, an operation known as pivoting. Ash Maurya provides a simpler perspective of which to understand problem/solution-fit versus product/market-fit [10]. He suggests one has reached problem/solution-fit when the answer is yes to the following: "Do I have a problem worth solving?". This implies answering three underlying questions: "Is it something customers want?" or is it a must-have solution, "Will they

pay for it?" or is it viable, and lastly, "can it be solved?" or is it feasible.

Besides getting confirmation on these three question, Maurya suggests that the goal of the Problem/solution fit stage is to derive a minimum feature set in which to launch a minimum viable product, an MVP, which is to be the subject of learning and iterated upon toward solving the customer's confirmed problem [6].

#### **3.1 Discussion**

The terms of problem/solution fit are slightly fuzzy and originally not well defined. In this article, the simpler definition made by Maurya will be used as a reference.

## **4. COMBINING LEAN STARTUP AND DESIGN THINKING**

### **3.1 Lean Startup**

Building on Lean manufacturing principles, to optimize production processes, developed by Toyota, Eric Ries translated the principles, evolving the "customer development" method [2] into an innovation method for startups [6]. Ries defines a startup as "a human institution designed to create new products and services under conditions of extreme uncertainty" [6] The basis of the methodology lies in a scientific approach of testing hypothesis through experimentation, modelled as a build-measure-learn-loop [6], "creating a continuous feedback loop with customers during product development cycles" [10]. The aim is to test and validate business assumptions early, so that valuable resources such as time and money will not be wasted creating a product no one needs. This continuous feedback loop is modelled as build- measure-learn cycle.

### **3.2 Design thinking**

"Design thinking" is another user-driven innovation strategy, developed by the design consultancy IDEO [11] as a way of identifying and solving complex problems in a multi-disciplinary fashion. Many of the principles are rooted within

the realm of industrial design, but the approach borrows many methods, especially with regards to user research, from disciplines such as anthropology and sociology. The main focus of the design thinking approach lies in developing empathy with the end-user of a product or service, through understanding their experiences in the current state of things.

**3.3 Lean Design Thinking**

Mueller and Thoning have conducted a thorough review and comparison of both innovation strategies [5], outlining a proposal for how to adapt each process with regards to the other and lastly a proposed merging of the two. In the comparison, they argue that Design thinking is more holistic, meaning it can only be applied to the entire problem, whereas the Lean startup’s build measure learn loop can be applied to specific sub processes, on a micro level of an innovation project. A notable difference is also the initial starting point of which the processes begin. Design Thinking does not start with a business idea, but rather a challenge. The ideas are then developed within the process, following a thorough understanding of the end users and

identification and theorising of user needs or problems through synthesising insights. The Lean

startup approach requires an initial business idea and a product vision to be present from the beginning, and rather goes through a process of pivoting on this initial idea. Thus it suggests that it might not be suitable as an innovation approach if the initial starting point is of an ambiguous nature, where the problem is not yet explicitly defined.

Mueller and Thoning go on to suggest aspects where the two approaches can benefit from and perhaps integrate each other’s principles and methods. For design thinking, they suggest implementing feedback loops earlier in the process and to validate early problem hypothesis, so that time is not wasted creating solutions to problems that might in fact not exist or be sufficiently important to the end user. Another main point is the development of a business model in addition to the prototype, to validate the viability of the concept solution.

Suggested Improvements to Lean startup are applying more quantitative user research

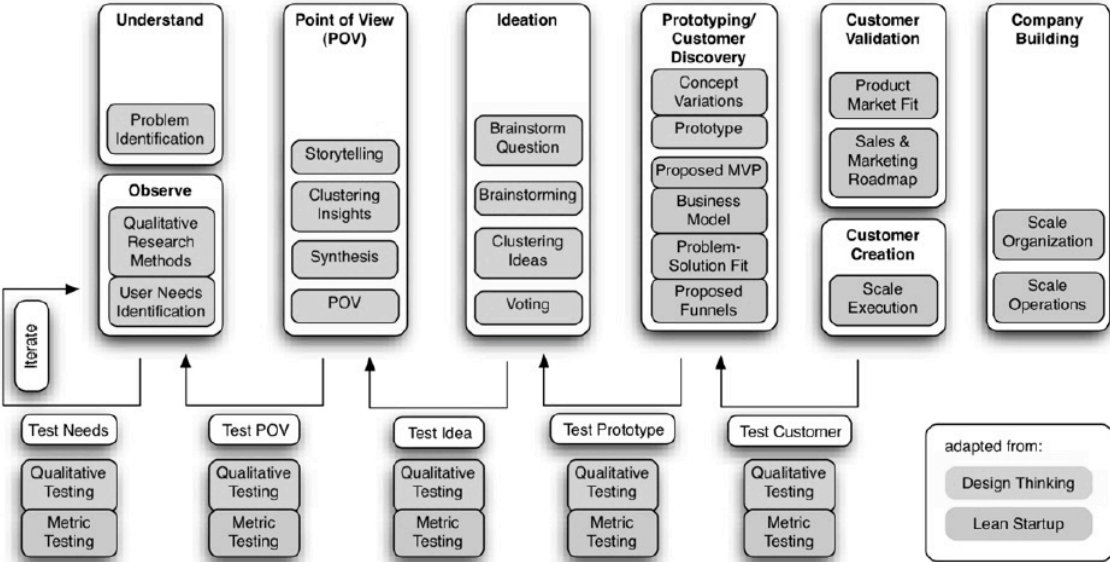


Figure 1: The Lean Design Thinking model as proposed by Müller & Thoring

methods and subsequent synthesis of information to identify customer or user problems. In addition, they highlight a possible value of applying the structured ideation techniques of Design Thinking, specifically before the problem-solution fit is achieved.

Finally, the paper describes a proposed merging of the two approaches into a hybrid "Lean Design Thinking" process, see figure 1. Concentrating on the phases leading towards problem-solution fit, the problem discovery phases of Design Thinking is sat at the beginning of the process, before the prototyping phase is merged with Customer Discovery of Lean Startup. Following each phase, they propose testing and validating, before either moving along to the next phase or iterating.

### 3.4 Discussion

It seems the principles of Design Thinking is not targeted much on the particular innovation needs of startups, so no focus is set on the solutions role in a business model. The proposed merging highlights how a business model canvas can be useful once a problem is defined. One might question however, if modelling the business model hypotheses should not be applicable even earlier, so that it might evolve and be updated with new information as the process develops. This can highlight knowledge gaps and therefore drive the focus of exploration to an extent, but it can also be valuable as documentation and future reference.

As the Lean startup approach suggests, pivoting might be necessary from invalidating a hypothesis. However, instead of guessing blindly at a new hypothesis, applying principles from Design Thinking, one can perhaps extract insights from qualitative methods, thus establishing a better problem hypothesis foundation in a potentially shorter amount of time.

## 5. LEAN CANVAS

Maurya [10] suggests that the first step in any business venture is writing down one's initial vision and then sharing it with at least one other

person. Traditional business plans has been used for this purpose. They have however, he claims, fallen short of its true purpose because "Most entrepreneurs start with a strong initial vision and a Plan A for realizing that vision. Unfortunately, most Plan A's don't work." Since the initial plan is likely to be proven wrong, one needs something less static than a classic 60-page business plan, which will cost time and effort to constantly revise and change. Maurya therefore suggests using a business-modelling tool, **The Lean Canvas** (Figure 2), an adaptation of The Business Model Canvas, designed by Alex Osterwalder [12].



Figure 2: The Lean Canvas

### 3.1 Document your plan A

Maurya claims that, besides being an effective communication tool, the canvas provides a framework for understanding a key principle – that the *product* of a startup is not the product, but the business model of which the product solution is but a component. The model lets the entrepreneur recognise how the solution must play a complementary part to fit other areas, and then systematically de-risk the assumptions on how those components fit together.

The model is devised into different parts, which as a whole paints a picture of the initial business plan. Maurya proposes that one should attempt to create different versions of a business model, in order to explore the different options available with regards especially to the target market. Following this exploration, one should assess which variation of the different business models

created is potentially more attractive to pursue and define this as the starting point.

### 3.2 Identify the riskiest parts of your plan

The main mantra of the Lean Startup movement is to continuously evolve upon validated learning. [6]. Maurya's process involves a second step following the modelling of the initial business model assumptions and prioritising a model. In order to de-risk the hypotheses made, he suggests a process of identifying which parts of the business model are riskiest, that is, upon which assumptions is the overall startup success most reliant on being true, and then one should attempt to validate these assumptions first. The most important thing with identifying risk is to identify the relative risk associated with the different assumptions in the Lean canvas, and systematically testing each one..

### 3.3 Systematically test your plan

To test towards problem/solution fit, Maurya suggests attempting to answer his three questions using a combination of qualitative observation and interviewing techniques. These techniques are used as part of carefully designed experiments, where one or more falsifiable hypothesis are tested, learning is derived and future actions are determined based on the outcome. If the set of hypotheses are validated, one moves on to testing the next part of the Lean canvas.

Iterating on these experiments and stringing multiple experiments together might reach a specific goal, such as getting to problem/solution fit.

Maurya outlines a precise definition of the design of the experiment itself: "A falsifiable hypothesis is a statement that can be clearly proven wrong". Thus the experiment design consists of converting assumptions from the Lean canvas into falsifiable hypothesis, which implies that underlying metrics are also defined. These metrics are used to give a quantifiable measure

of what serves as validation or invalidation and to make the experiment results actionable.

For the problem/solution stage, Maurya splits the experiment loops into two iterations, 1) understanding the problem and 2) defining the solution. The proposed experiment iterations within the problem/solution stage might iterate within themselves. The aim is to reach validation before going to the next step, meaning if the hypotheses are invalidated, they must be tweaked upon and retested. He suggests revising experiment results every week, preferably having conducted 10-15 interviews, before determining to move on or iterate.

The first experiment iteration, dubbed **the problem interview**, aims at testing and de-risking the hypothesis with regards to a) the validity of the problem, b) who has this problem, and c) how this problem is solved today. Once validated, the next phase consists of defining a proposal for how the problem might be solved and developing a demo to use in the subsequent experiment iteration.

The second iteration, **the solution interview**, aims to validate: a) that a proposed solution solves the problem b) who is the early adopter, and c) a working pricing model. The demonstration of the solution might take the form of a simple prototype, screenshots, video, etc. The purpose of the demo is to measure the reactions of interviewees and furthermore help define the requirements for a future minimal viable product. To effectively communicate and create a realistic narrative for the solution, according to Maurya, the demo needs to: be realizable; look real; be quick to iterate; minimize waste; use real-looking data [10].

When all assumptions in both the problem and solution interview experiments are validated, problem/solution fit is considered reached.

### 3.4 Discussion

Perhaps a weakness with the Lean Canvas approach is that it still demands at least one

initial, preferably concrete hypothesis about the problem, in order to begin testing one's assumptions. This implies that the entrepreneur already sits with some insight or knowledge of the in question, which might not always be the case. At certain instances, one might have only a sense of how one could create value, or at least where there are shortcomings in existing products or services within a given market segment.

The metric driven decision making is in line with the Lean Startup methodology principles of following the scientific method, finding objective, rather than subjective grounds on which to make decisions. Maurya does suggest how to set up an interview to test for the specific hypotheses, but one might argue that there is a lack of exploratory questioning. Discovering only how interviewees solve their problems today is valuable, but how this problem sits in an overarching workflow might open up the solution space to more interesting opportunities.

The demo plays an important part in validating not only the solution for potential users, but also the willingness to pay. In contrast to an MVP, or a prototype in Design Thinking terms, this demo is more a showing of a proposed product vision, than how the product might work on first release. Being able to define a minimum feature set from the features in the demo is important when moving into the development phase after problem/solution-fit.

## 6. THE DESIGN PROCESS

### 4.5 An actionable design framework

Kolko's [8] suggested process begins with a discovery phase, aiming to gather behavioural signals. First, one must establish a focus to describe the scope of the research. This scope might be learning about a people's workflow, or how people use and think about a specific product or service. Specifically, he suggests watching people do something and asking questions while they do it, in order to get contextual insights. To prepare for such inquires,

a set of open ended questions should be developed, which in turn are deployed as a way to steer a contextual interview to gather information on specific areas of focus. During the behavioral research itself, Kolko puts emphasis on the importance of recording everything either with photography or preferably video or audio.

After research data is collected, Kolko suggests a number of ways to develop a deeper understanding of the people or area of research through interpretation. The process, he says, will help you identify needs or areas where people are underserved by current products or services. Interpretation will also identify insights, which is defined as "provocative statements of truth about people that speak to their lifestyle choices, their aspirations, and their desires." [8]

The first step involves externalizing the research data, into a "nonlinear, modular form." This process entails writing each quote or factual observation onto a designated post-it note, making every piece of data isolated and independent. Next follows a process of identifying patterns and anomalies. By moving notes around, the aim is to discover common themes by grouping similar or related observations together, a process known as affinity mapping or diagramming [16]. These groups should be named to represent the behavioural intent of the grouping, as observational statements in which one can generalize data from different sources.

Visualizing behaviour across time, Kolko suggests, is also valuable as a way to organise information about activities and experiences concerning a workflow. This method is used to map out the flow of data, emotions and decisions across time, and to show the connections between different stages of a workflow.

The next stage in the process aims to extract insights from the observational statements created during the pattern recognition or grouping process and the time-based visualizations. These insights are trying to answer the reason *why* people behave the way they do,

assigning meaning to the gathered data and pointing towards an underlying need. The insights, Kolko points out, are in fact inferences, based on factual observations. This guesswork introduces risk into the process, because the inferences might be wrong. The insights should be formulated as scenarios, or storytelling narrations. Next, product constraints are simply declared from the insights.

#### 4.5 Discussion

To apply the proposed approach without having experience with the design process beforehand might seem intimidating. Especially during the stage of data analysis and synthesis the processes of searching for meaning could be difficult to grasp for first-timers and perhaps even overly abstract. A suggestion could be to always have someone on the research team that has experience with similar methods.

Still, the methods of synthesising data can prove enlightening when trying to figure out underlying truths to human behaviour. Techniques such as affinity mapping and visualization across time have the potential extracting meaning from data from across different research methods. Another aspect, which seems promising especially in a startup setting, is that only a relatively small data set is required to begin to extract meaning, and further supplementing with more information over time. This makes it possible to define hypotheses early and refine them along the way.

The inferences made during extraction of insights are as Kolko mentions risky, but in no way does he imply how to validate these insights before defining product constraints based on them. This fact is perhaps the approach's most obvious weakness, but validation can easily be integrated if one applies experimentation techniques from the Lean Canvas approach.

Another weakness is with regard to the inferences and construction of insight statements being fairly vague in definition. When working as a small team this might be okay, but these insights still might take different meaning to

different people unless they are properly discussed.

#### 7. JOBS TO BE DONE

The basis of jobs-to-be-done was devised initially as a marketing framework by Clayton Christensen et al [9] as a way to understand customers better:

"... customers just find themselves needing to get things done. When customers find that they need to get a job done, they "hire" products or services to do the job. This means that marketers need to understand the jobs that arise in customers' lives for which their products might be hired."

The framework thus uses the analogy of jobs that customer's needs to get done when defining the needs of customers. "A "job" is the fundamental problem a customer needs to resolve in a given situation. "[9]

Christensen suggests applying different research approaches or tools depending on the familiarity of the domain in question. The emphasis here is put on defining the unit of analysis, namely the job. Herein lies the power of the jobs-to-be-done-framework – one must try to understand the situation, not the customer. The problem with focusing on customer needs, Christensen claims, is that a customer finds herself needing different things at different times. In contrast, the situation, or the job, is a simpler, more stable point of focus because it exists independently of the customer.

When the job is knowable, conventional market-research tools such as customer interviews and surveys are well suited at understanding the situation the customers are subjects to.

In cases where customers know what jobs they need done, but there is no product or service designed specifically to do it yet, customers compensate behaviours to "make do" with what is available. To understand the behaviours of such instances, observing the consumer in context is proposed.



Lastly, If users are not the need to participate in context, and “live the problem’ might be an insightful technique to uncover how people are either living with or working around inadequacies of existing product solutions, and from that identifying hidden jobs needing to be done.

Ash Maurya also suggests framing the problem definitions as jobs in which the customers need done [10]

**7.1 Outcome-driven innovation**

Tony Ulwick claims that the problem with the pivot and fail fast approach to innovation, which defines the Lean startup approach, is that it guesses at what unmet needs might exist without ever defining them [7]. Instead of this potentially time-consuming, wasteful approach, he claims that the goal should rather be to know what the unmet needs are upfront and then spend time trying to come up with solutions that address them.

Ulwick points out that a key to identifying unmet needs and being able to effectively address them, is to have an agreement on what a need is by defining explicit, concretely defined outcome statements (Figure 3). It is described by the set of metrics people judge a product on how well it gets a certain job done. The metrics used to measure value and success, are the customers’ needs.

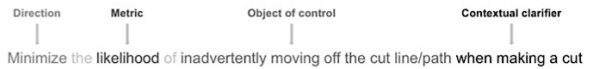


Figure 3: Example of a desired outcome statement.

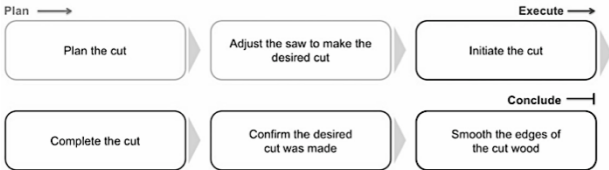


Figure 4: Example of a job map.

In order to come up with unmet needs, one has to come up with needs. Ulwick proposes the creation of a job map (Figure 4). A job map describes a job-to-be-done as a process, with the set of tasks, or job steps, people go through to accomplish a goal. Within each steps, there are metrics people use to measure success in getting that specific step of the job done.

To identify which needs are unmet, that is, which jobs are not being done in a sufficient manner, according to Ulwick, one has to look at which desired outcomes are satisfied, relative to its importance. This can be done qualitatively, but Ulwick also suggests a framework to uncover and prioritize opportunities by conducting a survey and applying an opportunity algorithm [15].

To in turn create a better product, one needs to understand all the metrics people are using to judge the value of your product. The main metric in judging how well a job gets done is from a functional perspective, but one also needs to understand the financial and consumption chain perspectives.

Ulwick describes that a way to get a job done better is to get it done faster, more predictably, with higher output. He claims these principles can be applied across any job.

**7.2 Discussion**

It can be argued that Design Thinking defines insights and needs as the basis of innovation. Though scenarios and storytelling is a common way of communicating their meaning, in themselves these definitions are somewhat ambiguous. Lean Startup often refers to these aspects as problems, also a vague term with room for interpretation.

Focusing on jobs as the focus of innovation seems promising as a way of bridging the gap between Design Thinking and Lean Startup. The framework can provide a simpler, precise definition of what one is trying to uncover and help guide the focus on which jobs one should be solving for.

## 8. CASE STUDY

The author had an initial ambiguous hypothesis of the restaurant business as a domain in which technology has not yet been used to its full potential with regards to optimising processes for maximum profitability and use of resources. Resources were initially a vague term, scoping knowledge, time, produce and potentially other financial aspects. The geographical scope of the initial phases of the project would be within the borders of Trondheim, Norway in which the author is resident. The location was considered a well-suited spot also considering having a well established, but booming restaurant scene.

Having little knowledge within the domain, the author knew from the outset that expansive probing was required in order to gain insights into the moving parts of the industry, and that the initial hypotheses were likely to be subjects of change.

### 8.1 Documenting the plan A

Documenting the initial hypotheses kicked off the process and numerous variations of possible business models were created using the Lean canvas tool, all of which seemed viable on paper. The next step was prioritising which model was to be tested. Using Maurya's method of ranking the business models, one was chosen as a good starting point in which several hypothetical must-have problems could be solved for a large enough market, thus serving as potential blueprint of a sustainable business.

### 8.2 Understanding the problem

Following the Running Lean approach, the focus of the first stage of testing assumptions was understanding the problem, that is, identifying

and validating who had the problem, what was the top problem and how it was currently solved. The planned experiment methods were interviews with people regarded as potentially having the hypothetical problems, namely head chefs at small to medium restaurants, either independent or part of a small chain.

Being well aware of the author's slim knowledge within the domain of interest, questions designed to test hypotheses were supplemented with exploratory questioning and observation methods. The plan was to define a script for every round of experiments, each consisting of five interviews. Staying true to this script would insure a repeatable way of testing the hypotheses in a consistent manner, before a review and potential adjustments to the script was to be made. Firstly, the aim of these interviews was to validate or falsify and potentially iterate on hypotheses. A secondary, but equally important objective was to gather information on workflow in order to determine which jobs the chefs were trying to get done within their daily routine and establish knowledge on the products they currently hired to get these jobs done. When possible, they were also asked to show and explain the use of tools and products they currently hired for these jobs.

The problem interviews were audio recorded and transcribed. After 10 interviews and one session of contextual observation, the author set out to externalize and synthesize the gathered observational data, using the design methods proposed by Kolko. Applying both information clustering as a means of extracting insights and the technique of mapping workflow and the relationships of tools, which the restaurants currently used, the author was able to identify and create several job maps for a number of overarching jobs and processes.

The primary job concerning the head chef might seem obvious from the outset: she wishes to create a profitable menu, which will excite and delight her guests. Within this overarching job there are numerous job steps, consisting of among others: referencing prior menus to see

what had been well received, development of new dishes, checking for availability, pricing and seasonality of produce, writing recipes, calculating menu costs, making orders, registering deliveries and regularly counting stock in storage. For each job, required success metrics where at this stage defined, requiring either a job to be done faster, more predictably and/or with higher output.

Validated thus far was that it was time consuming to get many of these job steps done. Where were the bottlenecks? Interpreting the job maps and referencing which products and tools were currently used to get these jobs done, several things became apparent. Firstly, and perhaps most interestingly was the fact that restaurants, though not explicitly being aware, follow principles analogous to the build, measure, learn cycle, as defined in the Lean Startup approach. Restaurants constantly experiment and learn what works and what doesn't, before iterating. This is done both on a menu level, but also on a dish level, using the 'meal of the day' as a testing ground for new ideas. Secondly, for every job task needed to be done, there was almost without exception some aspect regarding produce involved. On a higher level, one can observe the constant flow of produce going into a restaurant as raw produce and then going out, either served as ingredients to guests or as necessary or unnecessary waste. On a sublevel, all job tasks required either knowledge or information regarding quality, quantity or pricing, whether this information was available within the restaurant, from suppliers or other outside sources. Thirdly, the products the restaurants had hired to get different jobs done where not seemingly optimised for their workflow. Even though information regarding produce was needed across the job map either for input and updating information or as output, the existing solutions did little to connect this information, causing unnecessary manual labour in searching for information or registering similar information across different tools.

After conducting 12 problem interviews upon which the hypotheses were iterated four times, the author felt sure that the uncovered problems and jobs-to-be-done where sufficiently validated to a degree satisfactory enough to move onto the next stage.

### **8.3 Defining the solution**

It became clear that a possible solution could be an integrated digital platform that would connect information in a way that might help restaurants make better use of human resources and knowledge, making calculation and documentation processes more automated and cutting down on the amount of time spent manually registering. Potentially, such a system could also be of great value in order to learn more from their continuous experiments, both as a referencing tool and to help them make better decisions on produce purchases and future menu development. At the time being and as a result of the constant time constraint, there were no formal systems in place for documenting their learnings, causing these insights to get lost over time.

The goal at this stage was to propose a solution to the problems validated in the previous stage and validate if this was a solution that might work. Additionally, the early adopter of the solution must be identified and a pricing model validated. Through experiments demonstrating a solution proposal to the target customers, their reactions would be measured in order to help define the minimum feature set of the MVP, which is to be developed after problem/solution-fit is validated.

A demo in the form of an interactive prototype was created to represent a visual, real-looking web application. Since the author has had some experience developing high-fidelity prototypes prior to the project, this was a natural choice of medium. If needed, the prototype could quickly be iterated and also potentially serve as a template for further development and programming, thus eliminating potential waste.

To test the validity of the solution and collect much needed feedback, the problem interviews demonstrated the solution in a systematic manner. A script was written where the solution was presented through a series of isolated scenarios, testing for one job at the time. The narration of the scenarios first communicated the job, then in turn walked the interview subject through the proposed solution to getting this job done, clicking on the interactive elements of the prototype while telling what was going on. In succession, each job was demonstrated and feedback was gathered.

To test the pricing hypothesis, a question was asked at the end of the demonstration whether they would pay x amount per months to gain access to the solution. By interpreting the implicit reactions to the question and measuring the direct feedback, this pricing model was subject to iterations, but the willingness to pay validated.

#### **8.4 Discussion**

Having little knowledge of the domain in question, the process of formulating the initial falsifiable hypotheses were much like shooting in the dark. It became clear after only a couple of interviews that although they were in fact partly true, they proved too general to be of much value. They did however serve well as a reference for further exploring problem areas and workflow jobs. The exploratory questioning therefore became essential when iterating the hypotheses and interview script for the subsequent experiments.

The target audience proved hard to reach. Given the scope of the project, the author made the decision to increase the rate of iterating the hypotheses, meaning that a hypothesis would be regarded validated or falsified based on a smaller set of input than originally planned. Interestingly, this underlined one of the main problems – the lack of time.

Dealing with a user segment which was hard to reach and difficult to persuade into sacrificing valuable time for an interview, the author

considered each interview sacred, meaning it was crucial to extract as much information as possible. Considering this, the methods of externalizing data became particularly useful, in that one is able to use a relatively small set of data to infer insights and identify workflow patterns and jobs the target users are trying to get done. These inferences are, as Kolko points out, guesses, but they can in turn be validated during the course of subsequent problem interviews in a continuous manner, and one is able to over time fill in existing knowledge gaps and strengthening the overall systemic picture. Consequently, instead of blindly iterating on problem hypothesis, one can argue that these exploratory design methods helps shorten the time in reaching hypotheses that are more likely to be true.

Focusing on jobs throughout the project proved helpful. For instance, the restaurants were trying to get many different jobs done across different restaurant segments and sizes. However, looking at which jobs were common and important across the field where they also were not satisfied with their current hires, helped guide and define the focus of the proposed solution. Formulating the problems and insights as job statements made it easier to test for validation because the format easily translated into falsifiable hypothesis, compared to a narrated scenario. The job maps, analogous to Kolko's suggested visualizations across time, were also valuable. They helped to define which overarching jobs were important in the running of a restaurant, and, once established, figuring out the underlying job steps and products hired today was a simple matter of asking more questions.

## **8. CONCLUSIONS**

This paper has studied the implications of applying a hybrid approach to early-stage innovation, specifically with the aim of reaching problem/solution fit. The approach studied combined methods from actionable frameworks derived from the Lean Startup methodology and

Design Thinking, as well as applying principles from the Jobs-To-Be-Done framework.

The analysis of prior comparisons of the two approaches to innovation concluded that principles from both strategies might be combined to form an improved approach. Principles from Design Thinking to explore and synthesise data on users within the domain of interest and searching for points of possible value creation can be concluded as being valuable to the process. This might be true especially if the initial assumptions about a problem are likely to be wrong, or one is in lack of explicitly defined problems. Likewise, principles from Lean Startup for continuous validation of assumptions have proved to work well in combination. One implication of applying these principles in combination is that the time spent searching for hypotheses that are more likely to be true might be decreased, compared to randomly guessing for every iteration. If this hypothesis holds true for a larger set of cases can be suggested as a topic of interest for future research.

Applying the divergent discovery methods of Design Thinking can make Lean startup practitioners aware of opportunities they might not have considered from the outset. Researching how this can affect and possibly shift the focus of early stage startups should be looked into further.

The Jobs-to-be-done framework proved helpful as a means to translating job maps and insight statements into more defined and falsifiable hypothesis in the format of job statements. The implications of being consistent with creating explicit and structured definitions may be that the time spent between research and validation can be reduced. Furthermore, another promising aspect is that the same job statements might be utilised when defining the development roadmap after problem/solution fit is reached. Looking into how this framework can be formally integrated into a hybrid innovation strategy might be suggested as an interesting domain of future research.

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