Market Opportunity Discovery for Early-Stage Startups

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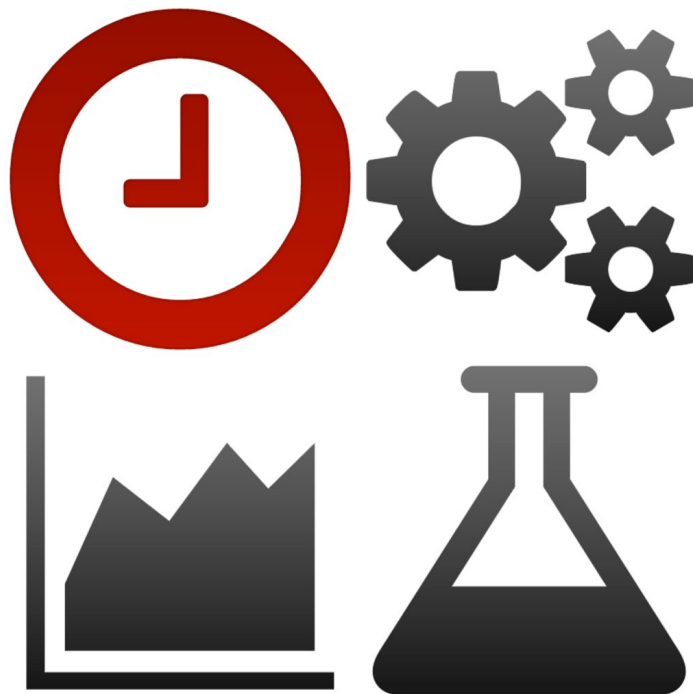Stockholm, Sweden 2015:112

Market Opportunity Discovery for Early-Stage Startups

Practical implications of adopting various popular methodologies for the application of scientific management principles to startups in search of market opportunities

Concluding advice to startups:
Ditch The Lean Startup, adopt Outcome-Driven Innovation

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**Market Opportunity Discovery
for Early-Stage Startups**

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Abstract

Despite the past decade's increased adoption of scientific methodologies by startups, most still fail to scale into large companies. The paralyzing plethora of advice, theory and models recommended to startups is poorly matched by practical advice on the applicability and implications of actually following the recommendations.

In this action-based research I, an IT consultant for twelve years and founder/co-founder of several startups, try out and evaluate the applicability of methodologies for applying scientific management principles to innovation in early-stage startups.

In the first part of my research, I use an naive explorative hands-on approach which results in insights into the limited applicability of popular methodologies such as Growth Hacking and The Lean Startup. These limitations are especially pronounced for early-stage startups who are yet to launch a minimum viable product (MVP), as well as those that have trouble to decide which hypotheses are the riskiest. Most actionable insights during this part stemmed from the engagement in various thought-experiments and reflections, and not from external customer feedback.

To remedy this, and to thoroughly evaluate the applicability of a pre-launch market assessment method, I engage in market opportunity discovery following the recommendations set forth by Outcome-Driven Innovation (ODI). This hands-on in-depth approach yielded seemingly high-quality actionable insights with direct implications for the product and marketing strategy of the studied early-stage startup.

In the discussion part, I reflect over the applicability of the evaluated methodologies and argue that the main difference between applicable and non-applicable methodologies is whether they are manufacturing-based or needs-based.

Finally, I reflect over possible implications and suggest that a startup community wide change of mindset from manufacturing-based methodologies such as The Lean Startup to needs-based methodologies such as Outcome-Driven Innovation will minimize the startup innovation-process variability and increase startup efficiency dramatically on a global scale.

Keywords

Table of Contents

List of tables

List of images

List of abbreviations

CPC	Cost Per Customer
EFA	Exploratory Factor Analysis
GDP	Gross Domestic Product
JTBD	Jobs-to-be-done
MVH	Minimum Viable Habit
MVHE	Minimum Viable Habit Engine
MVP	Minimum Viable Product
ODI	Outcome-Driven Innovation
PCA	Principal Component Analysis
SPC	Statistical Process Control
TARI	Trigger, Action, Reward and Investment
WSS	Within groups Sum of Squares

1 Background

In this section I include some underlying concepts and background history necessary to understand what I want to achieve by conducting this research.

1.1 What is a startup?

Marmer et al. (2011b) merged and modified definitions of a startup from Steve Blank (2003) and Eric Ries (2011c) and published the following definition:

"Startups are temporary organizations designed to scale into large companies. Early stage startups are designed to search for product/market fit under conditions of extreme uncertainty. Late stage startups are designed to search for a repeatable and scalable business model and then scale into large companies designed to execute under conditions of high certainty."

Importantly, startups are not smaller versions of large companies, and new ventures are different than existing ones. Startups search for business models while existing companies execute them. (Blank 2013)

1.2 Most startups fail to scale into large companies

The sheer abundance and continued popularity of news articles about high startup failure rates that remain being produced indicate that the general consensus amongst thought leaders, investors and startup founders seems to be that most startups still fail to scale into large companies.

From a bird's eye view, it seems fair to assume that this constitutes major quality issues in the global delivery of successful large companies through the startup process, causing large societal costs.

1.3 The successful startup's lifecycle

The startup lifecycle as defined by Marmer et al. is (2011a) is made of 6 stages of development:

1. Discovery
2. Validation
3. Efficiency
4. Scale
5. Profit Maximization
6. Renewal

Marmer et al. (2011b) found that while far from all startups progress linearly through these stages, 74% of analyzed high growth internet startups that did not progress linearly through the startup lifecycle failed, ie suffered stagnant growth or went out of business.

1.4 A paralyzing plethora of startup advice, theory and models

From the field of quality management and doctrines such as Six Sigma, we know that continuous efforts to achieve stable and predictable process results are of vital importance to business success. (Schroeder et al. 2008)

Throughout the past decade, numerous theories and models to increase startup success rates have become popular, claiming to increase learning and reduce costs and variability in the search for product/market fit. The models with the most widespread adoption are effectively applying scientific management principles to startups. (Marmer et al. 2011)

However, Marmer et al. (2011) also state: "Yet despite this huge knowledge base emerging about how startups work, startups have been able to absorb little more than the basic patterns of how to build a startup. Most founders don't know what they should be focusing on and consequently dilute their focus or run in the wrong direction. They are regularly bombarded with advice that seems contradictory, which is often paralyzing. And while startups are now gathering way more qualitative and quantitative feedback than they were just a few years ago, their ability to interpret this data and use it to make better business decisions is sorely lacking."

2 Contribution and purpose

In this section I link the background information to what I want to achieve and state the research purpose.

2.1 Currently minimal public coverage of applicability and practical implications

In contrast to the abundance of methodologies for startups to choose amongst in order to apply scientific management principles to innovation, I found few publications covering the applicability or practical implications of choosing one or the other, especially when considering the limited financial resources and limited workforce found in many early-stage startups. Bridging this gap is likely to benefit the early-stage startup community.

I also noticed an almost complete lack of detailed instructions on how to actually perform some of the theorized methodologies in practice. Since most early-stage startups do not have access to marketing research departments nor the funds to contract researchers, detailed instructions that are part of the common body of knowledge become increasingly important.

2.2 Contribution

Through hands-on action research within this area, I hope to uncover relevant aspects of a number of methodologies in order to help early-stage startups minimize the amount of wasted resources during the development, release and marketing of new digital services.

Additionally, the detailed descriptions of the steps taken in each performed action should serve as a practical reference for future researchers and bootstrapped practitioners alike to perform their own innovation research.

2.3 Purpose

The purpose of this research is to bring forth new insights regarding the practical implications of implementing one or the other methodology for applying scientific management principles to innovation under specific conditions apparent in many early-stage startups.

2.4 Emergent research question

Why are some methodologies more applicable to early-stage startups than others?

(Note that as a result of the explorative action-based research methodology, I did not actually have this research question formulated at the beginning of the study. Instead, it emerged during the reflective sense-making phase and is included here in order to more easily be able to tie the purpose and concluding findings together.)

3 Methodology

In this section I state how I set out to do what I did. Since the purpose of the research in itself is to explore and apply new methodologies, this section focuses on the higher level research methodology and not the specific methodologies evaluated as part of the research (which are covered in section "6 Theory, insights, execution details and decisions").

I used a naive explorative action-based approach to perform the research, in which I myself act as both as a methodological researcher and pragmatic practitioner, applying methodologies in the execution environment of my company's startup-efforts.

The practical research was performed during an exploratory action phase in which several methodologies were tried out in practice. I did not have a list of methodologies to try out beforehand. Instead I chose the methodologies and actions using the following iterative process:

1. Search for and study methodologies that are recommended by thought leaders in the startup community
2. If a methodology promises minimization of wasted efforts through scientific rigor for early-stage startups, then read more about the methodology and plan an in-depth execution of the actions recommended by the methodology
3. Evaluate the applicability of the methodology based on insights from the planning efforts, and only if it seems strategically worthwhile, intend an actual in-depth execution of the actions
4. Intend an in-depth adoption of the methodology
5. Reflect over the actions' results and execution
6. Return to the search-and-explore mode of point 1 above unless the research period is coming to an end

During steps 1-3 in the above process, I acted less as a researcher and instead let my actions be mandated mainly by my past/previous experiences as a long-term practitioner of developing digital services/products and steering early-stage startups. During steps 4-5 I applied more scientific rigor to the process as mandated by the methodology.

At the end of the action phase, I had evaluated Growth Hacking, The Lean Startup, The Hook Model and Outcome-Driven Innovation. During that time, I kept a work diary in which I wrote down encountered problems, ambiguities, thoughts and ideas as they were encountered.

After the action phase, I processed the work diary by using Neamtime (see Table 1) and performed a time spending analysis (see section "5 Actions"). Lastly, I entered a reflective sense-making phase in which I used the extensive notes in my work diary to summarize context, insights, testimony and reflections during my work done in the action phase.

The desired outcomes of this approach were to generate insights and practical advice which are closely related to the mindset of early-stage startup entrepreneurs, while at the same time assuring that the more promising methodologies are applied with enough scientific rigor and detailed documentation to enable other startups and researchers to utilize methodologies on their own.

4 The action research environment

This section profiles my company's startup-efforts whose characteristics limit the strategically viable courses of action to a specific scope, namely those that would be strategically worthwhile within this environment.

4.1 Company startup efforts overview

During the past twelve years, I have worked on startup efforts when I have not studied or worked on client-specific work as an IT consultant. Sometimes full time, sometimes not at all. Sometimes in teams of 3-7 people, sometimes alone. Currently, my company's startup-efforts consist of myself on a part-time basis.

The consultancy business currently acts as seed funding for these startup-efforts and allows for third-party services and a smaller workforce to be hired as part of the startup-efforts.

4.2 Current startup efforts

From past experiences, I have adopted some core insights that affect my choice of current startup efforts:

- A good enough initial team for the purpose of a startup is very hard to summon
- Most startup co-founders have little or no clue what they are actually doing (including myself)
- Failed startup efforts can easily result in several thousands of wasted development hours. Albeit leading to a ton of useful insights, experiences, infrastructure and connections that are vital to decrease the risk of future failures, it seems obvious that lots of those benefits can be achieved with much less effort
- Seed and angel investments (at least in the range of $40-300k) in a startup is rather easy (albeit time-consuming) to land but can be destructive to all involved parties by limiting changes in strategy and prolonging development efforts invested into products without a known market
- While blindly trusting your instincts is wrong, it is important to understand why your instincts are telling you something, even if it initially may seem impractical and irrational
- Building something for a target market that you yourself is not a part of is tremendously much harder to get right than building things that you intend to use actively yourself

As a result, I have currently decided to only focus on building products that I intend to use actively myself. Maintaining the IT consultancy business part-time for seed funding saves time-consuming investment procurement efforts and completely removes external restrictions on applicable strategies. Only after successful validation of a particular business model will I consider summon a startup team and seek appropriate investments. If all fails and I get not a single external customer, the personal and/or monetary value that I get from using the product myself should itself exceed the cost of core product development efforts.

This naturally rules out a lot of startup ideas that require a larger critical user mass to deliver value.

Adhering to these principles, I had initiated a couple of startup seeds (Table 1). These are ideas which I historically have acted upon and started building prototypes for, but have since mostly remained dormant due to conflicting life priorities. The year within the square brackets is the year that I first initiated substantial efforts to transform the idea into an actual startup.

Table 1: My company's startup seeds, in order of historical effort level

Brand name [Year]	Description	Marmer Stage	Milestones achieved
Neamtime [2010]	Time reporting productivity suite	Discovery	● Private prototype in active daily use
Markerchase [2013]	Location-based Games	Discovery	● First game released in App Store
Selfminer [2012]	Gain important insights in problems of daily life by analyzing your habits, desires and priorities	Discovery	● Private prototype planned ● Landing page published
Codegeneration.io* [2014]	Rapid production of web applications through data model based code generation as a service	Discovery	● Core tech in active daily use ● Private prototype planned
Clerk.ai* [2014]	Helps small business owners gather, structure and refine the information about business events required for accounting	Discovery	● Private prototype planned

Brand name was unknown at the start of the action phase

I am also currently engaged in a rather far-progressed startup (recurring, happy customers and a strong case portfolio of previous clients. Marmer Stage: Validation) focusing on incentivized online video marketing campaigns together with three other co-founders. I have however chosen to exclude it from this context, since the startup did not originate from my company's startup-efforts, I merely joined a couple of years after its initiation and have historically been working mostly as an IT consultant in the startup.

4.3 The purpose with my company's startup-efforts

Convert startup seeds / ideas into successful startups, meaning ones that:
- Customers are willing to pay for
- Long term habits of using the services are likely to be formed
- Makes the world a better place

… while retaining:
- a sane work/life balance
- the flexibility of working primarily from a virtual office without geographic limitations

… by leveraging:
- the company's past experiences, technological strengths and limited financial resources

… and, most importantly, in order to minimize the amount of wasted resources during the development, release and marketing of new digital services:
- strive to only pursue development tasks of which are highly probable to add value

4.4 Company strengths

- Software engineering expertise from twelve years of experience building internet-based software systems
- Efficient workflows due to a high degree of automation and strategic code-reuse allows development, testing, releasing and managing of several digital services in parallel
- Startup execution experience from five earlier startups with varying success during the past fourteen years
- Various innovations and technologies developed in-house over the years
- Seed funding

4.5 Company limitations

- Limited human resources
- Limited funds
- Limited business leadership experience

4.6 The challenge

By building products that I intend to use myself, I am ensured that I am part of targeted market segments. However, the size the market segments and how to reach it remains unclear. The biggest challenge is thus not to build a product that I know that will be useful to people/organizations like mine, but to discover, reach and maximize the value-creation for the market segments of which I am part of.

5 Actions

This section includes an overview of what I did as part of my company's startup-efforts during the research period, including how much time was invested in each action.

Table 2: Time investments for my company's startup-efforts during and directly after the research phase, in Chronological order

Type	Comment	Hours
Methodology Try-out	Growth Hacking	11,19 h
Build Phase	Attempted to build a Neamtime product as quickly as possible	85,30 h
Tech Infrastructure R&D	Prototype Development Automation	27,87 h
Methodology Try-out	Lean Startup - Part 1	13,28 h
Methodology Try-out	Lean Startup - Part 2	26,55 h
Tech Infrastructure R&D	Strategically Aligned Code Architecture	16,42 h
Build Phase	General improvements to Neamtime product core	33,13 h
Methodology Try-out	The Hook Model	4,1 h
Build Phase	Landing Page + User Registration	25,95 h
Methodology Try-out	Lean Startup - Part 3 - Adv. Campaign	28,73 h
Build Phase	Time Report Visualizations with Filters	17,69 h
Tech Infrastructure R&D	Deployment Automation	89,79 h
Methodology Try-out	Outcome-Driven Innovation	137,10 h
Build Phase	First Real Invoice Timesheets Built Using Neamtime product → Sent to clients	52,46 h
Build Phase	Improve Time Reports Prototype	26,53 h
Action Phase Summarization	Reflective Sense-making and writing	117 h
Upcoming Build Phase	Update landing page and product according to new insights + First Public MVHE Release	n/a

6 Execution details, theory, insights and decisions

This section covers execution details, theory, insights and decisions during the course of the action research. The intention is to explain why I chose to do what I did and share insights as they were reached throughout the process. The methodology theory is presented as close to the source material as possible in order to provide the reader not only with my interpretation of the theory but also the actual advice that was communicated.

6.1 Methodology 1 - Growth Hacking

I had followed the Growth Hacking movement from a distance for years and was eager to try it out systematically. It promised minimization of wasted efforts through scientific rigor for early-stage startups, seemed especially catered for digital service startups and quite frankly, sounded fun. Thus, the first methodology that I ran across that met the requirements defined in the methodology section above was Growth Hacking.

6.1.1 Initial promise

In 2010, Sean Ellis coined the term "Growth Hacker". (Ellis 2010) Core to the concept of growth hacking is the gathering and analysis of visitor/user data combined with creative unorthodox marketing methods, many of which relied on experimentation with and changes to the product (the "hacking").

Andrew Chen, one of the core spokesmen for the methodology, describes it as follows: "Growth hackers are a hybrid of marketer and coder, one who looks at the traditional question of "How do I get customers for my product?" and answers with A/B tests, landing pages, viral factor, email deliverability, and Open Graph. On top of this, they layer the discipline of direct marketing, with its emphasis on quantitative measurement, scenario modeling via spreadsheets, and a lot of database queries. If a startup is pre-product/market fit, growth hackers can make sure virality is embedded at the core of a product. After product/market fit, they can help run up the score on what's already working." (Chen 2012)

In a popular presentation about Growth Hacking, it is stated that most companies only track three things (traffic, users and revenue), however those metrics are not very useful. "The magic is what happens in between." (Griffel 2012)

Since I assumed that traffic was easy to acquire ("just buy it"), but was unsure of how best to ensure conversion rates from said traffic, growth hacking was chosen for further investigation. I read up on the basic theories and started planning an in-depth application of the methodology in the context of my company's startup-efforts.

6.1.2 Theory

A cornerstone reference for growth hackers is Dave McClure's "Startup Metrics for Pirates: AARRR!" (McCLure 2007), which introduced the following five components that constitutes the central conversion funnel for startups:

- **A**cquisition: users come to the site from various channels
- **A**ctivation: users enjoy 1st visit: "happy" user experience
- **R**etention: users come back, visit site multiple times
- **R**eferral: users like product enough to refer others
- **R**evenue: users conduct some monetization behavior

The idea is to use qualitative, quantitative, comparative and competitive metrics and measurements in order to improve product marketing and management. Examples of such metrics are shown in Image 1.

Example Conversion Metrics
(note: *not* actuals; your mileage may vary...)

Category	User Status	Conv %	Est. Value
Acquisition	**Visit Site** (or landing page, or external widget)	100%	$.01
Acquisition	**Doesn't Abandon** (views 2+ pages, stays 10+ sec, 2+ clicks)	70%	$.05
Activation	**Happy 1st Visit** (views X pages, stays Y sec, Z clicks)	30%	$.25
Activation	**Email/Blog/RSS/Widget Signup** (anything that could lead to repeat visit)	5%	$1
Activation	**Acct Signup** (includes profile data)	2%	$3
Retention	**Email Open / RSS view -> Clickthru**	3%	$2
Retention	**Repeat Visitor** (3+ visits in first 30 days)	2%	$5
Referral	**Refer 1+ users who visit site**	2%	$3
Referral	**Refer 1+ users who activate**	1%	$10
Revenue	**User generates minimum revenue**	2%	$5
Revenue	**User generates break-even revenue**	1%	$25

Image 1: Example Conversion Metrics for Growth Hackers (McCLure 2007)

Regarding product development strategy, McClure (2007) writes:

Q: How do you choose what to build?

- Choose features for conversion improvement
  - 80% on existing feature optimization
  - 20% on new feature development
- Just guess, then A/B test… A LOT
- Measure conversion improvement
- Rinse & Repeat

Furthermore, on the subject of practical advice:

Q: What metrics do you choose to watch?

- Hypothesize Customer Lifecycle & Refine
  - Choose 5-10 conversion steps
  - Less, not More is better
- BUT measure & iterate
- Focus on conversion improvement

  Delegate each Metric to someone to OWN

6.1.3 Application of growth hacking in my company's startup-efforts

As per the practical advice, I began by hypothesizing one customer lifecycle and 5-10 possible AARRR conversion metrics for each of my various startup seeds.

During this process, I encountered too many problems to successfully continue with any sort of measurement or iteration phase.

6.1.4 Problems encountered when attempting to apply growth hacking

I soon found myself having discarded all other startup seeds except for Markerchase (see Table 1), due to the fact that it had the furthest developed product (an iPhone app in App Store). I was deep into the definition of conversion metrics and detailed planning of event log based process mining strategies when I stopped, took a step back and decided I was on the wrong track.

I felt queasy about having to exclude the other startup seeds just because they had no existing product, and I estimated the development efforts required to build products for all startup seeds, A/B test and iterate "A LOT" in order to arrive at informed business decisions were too high.

Even within the context of Markerchase where a product existed, I felt that the amount of guess work was too high. Example of problems I encountered:

1. Seemingly arbitrarily chosen metrics - How to evaluate if the metric itself is a good indicator?
2. High uncertainty of monetary value - How to set a meaningful estimated value for each step?

3. With 80% focus on existing product features, it seemed to be aimed at finding local maximums, not assessing the global market opportunities that the product addresses
4. High uncertainty of actual conversion steps - Depending on product/service design choices, marketing and execution, an explosion of possible conversion steps are possible once the products/services are released
5. Funnels vs paths - How to deal with conversion scenarios that "short-circuit" the conversion funnel? I.e. take other paths towards revenue generation than going through every step?

Even after finding advice and partial answers to these particular questions, more questions quickly manifested. I soon concluded that growth hacking had very limited applicability during the earliest stages of a startup, where a product was yet to be released, and even where a product existed, the uncertainty of how to choose, evaluate and follow up on metrics indicated that other methodologies would be better suited at this stage.

6.1.5 Insights and decisions affecting the research context

These initial attempts at growth hacking planning yielded an instinctual insight that out of the five startup seeds (see Table 1), Selfminer most likely had the least potential of the five to achieve growth at this time, while Neamtime likely had a higher potential than Markerchase. I chose to omit Selfminer from the future evaluation efforts, and to prevent further risk of down-prioritization of Neamtime due to the lack of a released product, I switched over to product development with the goal of building a releasable product/service for Neamtime as quickly as possible.

6.2 Product development phase 1 and the switch back to methodology testing

After having spent 85 hours on improving the core parts of the Neamtime product, I had a prototype that I was able to use to prepare high quality invoice timesheets to my clients. The product was however usable only by skilled developers, without any documentation nor hints and the actual timesheets had to be extracted through rather complex database queries manually. There was also no possibility to mark already invoiced time as such, meaning that not even myself could use it to send another round of invoices. It would be of no use to invite external users to try out the prototype at this stage.

Having acquired much greater insights into the tremendous development efforts that remained, I realized the importance of being able to quickly prototype the parts of the system that I believed were vital for a minimal value creating experience.

To remedy this, I switched focus to tech infrastructure development efforts in the realm of feature prototyping through code generation. After 81 hours (of which 27 hours were invested by my company) of optimization, the remaining development efforts seemed substantially less than before, but still too large to warrant further uninformed development. I wanted to have a better framework of evaluating the underlying value creation strategy and business models before continuing.

6.3 Methodology 2 - The Lean Startup - Part 1

Growth hacking had been shown to be more a domain of practice than a specific methodology. Determined to adopt a more practically oriented, scientific methodology next, I scoured scientific and nonscientific publications alike using the mindset of an early-stage startup founder in search for suitable methodologies.

I found very few scientific publications that treated startup methodologies, but chose to investigate the most cited book that I ran across and met the requirements defined in the methodology section: "The Lean Startup" (Ries 2011).

6.3.1 Initial promise

In 2011, Eric Ries combined Customer Development with Agile Development and Lean Manufacturing principles to create the Lean Startup methodology. Interest in the Lean Startup quickly morphed into a global movement. (Marmer et al. 2011b)

Ries claims that The Lean Startup help entrepreneurs "make better, faster business decisions. Vastly better, faster business decisions." (Ries 2011b)

The official introduction to the methodology is: "The Lean Startup provides a scientific approach to creating and managing startups and get a desired product to customers' hands faster. The Lean Startup method teaches you how to drive a startup-how to steer, when to turn, and when to persevere-and grow a business with maximum acceleration. It is a principled approach to new product development." (Ries 2011a)

Being a fan of Lean principles for several years, an active practitioner of Agile Development for more than a decade, and currently in search of methodologies to help evaluate startup efforts, the decision to attempt adoption of lean startup methodology was an easy one.

I read "The Lean Startup" and planned a thorough adoption of the methodology. The theory section that follows contains a summary the most vital parts necessary for this study.

6.3.2 Theory

6.3.2.1 The Build-Measure-Learn feedback loop

"The fundamental activity of a startup is to turn ideas into products, measure how customers respond, and then learn whether to pivot or persevere. All successful startup processes should be geared to accelerate that feedback loop." (Ries 2011)

6.3.2.2 Validated Learning - The basic unit of progress in startups

"Progress in manufacturing is measured by the production of high quality goods. The unit of progress for Lean Startups is validated learning - a rigorous method for demonstrating progress when one is embedded in the soil of extreme uncertainty. Once entrepreneurs embrace validated learning, the development process can shrink substantially." (Ries 2011)

The faster a team can go through the loop, the faster they can learn, and theoretically, the faster they can create a sustainable business. (Ries, Simms 2013)

"The only way to win is to learn faster than anyone else." (Ries 2011)

6.3.2.3 Applying scientific method to a startup

"To apply the scientific method to a startup, we need to identify which hypotheses to test. I call the riskiest elements of a startup's plan, the parts of which everything depends, leap-of-faith assumptions. The two most important assumptions are the value hypothesis and the growth hypothesis. These give rise to tuning variables that control a startup's engine of growth. Each iteration of a startup is an attempt to rev this engine to see if it will turn. Once it is running, the process repeats, shifting into higher and higher gears." (Ries 2011)

Exemplifying what Ries classifies as leap-of-faith-assumptions, the initial concept of Votizen involved four big leaps of faith:

1. Customers would be interested enough in the product to sign up. (Registration)
2. Votizen would be able to verify them as registered voters. (Activation)
3. Customers who were verified voters would engage with the site's activism tools over time. (Retention)
4. Engaged customers would tell their friends about the service and recruit them into civic causes. (Referral)

(Ries 2011)

6.3.2.4 Pivot

A pivot is a structured change to fundamental hypotheses that change the direction of the business. If (and most likely when) these initial hypotheses are proven wrong or partially wrong, a pivot needs to be considered. (Ries, Simms 2013)

6.3.2.5 The Minimum Viable Product (MVP)

"Once clear on these leap-of-faith assumptions, the first step is to enter the Build phase as quickly as possibly as possible with a minimum viable product (MVP). The MVP is that version of the product that enables a full turn of the Build-Measure-Learn loop with a minimum amount of effort and the least amount of development time. The minimum viable product lacks many features that may prove essential later on. However, in some ways, creating a MVP requires extra work: we must be able to measure its impact. For example, it is inadequate to build a prototype that is evaluated solely for internal quality by engineers and designers. We also need to get it in front of potential customers to gauge their reactions. We may even need to try selling them the prototype." (Ries 2011)

6.3.2.6 An experiment is a product

"An experiment is more than just a theoretical inquiry, it is also a first product. If this or any other experiment is successful, it allows the manager to get started with his or her campaign:

enlisting early adopters, adding employees to each further experiment or iteration, and eventually starting to build a product. By the time that product is ready to be distributed widely, it will already have established customers. It will have solved real problems and offer detailed specifications for what needs to be built. Unlike a traditional strategic planning or market research process, this specification will be rooted in feedback on what is working today rather than in anticipation of what might work tomorrow." (Ries 2011)

6.3.2.7 Engines of Growth

There are three main engines of sustainable growth, summarized in Table 3 below. Small businesses are advised to focus on one engine at a time. (Ries 2011)

Table 3: Engines of sustainable growth as per "The Lean Startup" (Ries 2011)

Engine of Growth	Characterized by	The gist
Sticky	Exceptional levels of the same customers recurring month after month	"Before focusing on finding new customers, focus on your current ones."
Viral	Exceptional levels of referral	"For you to rely on viral marketing, your product needs to be absolutely incredible and fit your target market perfectly"
Paid	Revenue for each customer exceeds cost of acquiring each customer	"As long as you're making a profit on each customer, you can invest those profits into more advertising to accelerate growth"

6.3.2.8 Innovation Accounting

Each engine of growth can be defined quantitatively, and each has a unique set of metrics, as shown in Table 4 below. (Ries 2011)

Table 4: Growth metrics for the different growth engines. (Ries 2011)

Engine of Growth	Metrics	Positive growth looks like
Sticky	- New Customer Acquisition (NCA) - Customer Churn Rate (CCR)	NCA > CCR
Viral	Viral coefficient	Viral coefficient > 1
Paid	- Lifetime Value (LTV) - Cost per Acquisition (CPA)	LTV > CPA

Ries (2011) suggest that the differences before and after each change is documented in a table with different columns for before and after. The actual metrics are chosen based on growth engine and the specifics of the concept/hypothesis being tested, but an example is provided in Table 5 below.

Table 5: Example table structure for innovation accounting according to "The Lean Startup" (Ries 2011)

	Before	**After**
Engine of growth	Paid	Paid
Registration rate	%	%
Activation	%	%
Retention	%	%
Referral	%	%
Revenue	%	%
Cost per customer (CPC)	$	$
Lifetime value (LTV)	$	$

6.3.3 Planning phase

Since all feedback loops begin with writing a falsifiable hypothesis that tests a pressing assumption, I started by writing down value and growth hypotheses for the different startup seeds. This resulted in a large number of hypotheses for each startup seed, on average about 7-10 fundamental hypothesis per seed, as well as a larger volume of more abstract and unlikely hypotheses that I excluded from the evaluation context. The large number of hypotheses stemmed mainly from the combination of multiple hypothetical target customers who had multiple different hypothetical problems.

Since it would not be justified to develop actual product prototypes as MVP:s for each startup seed before initiating the first Build-Measure-Learn feedback loop (the estimated development efforts were still too high), I searched lean startup advice if there were viable alternatives.

One model within Lean Startup that addresses this is The Experiment Board. Instead of building an actual product prototype, they recommend the following three methods:

1. Interview - Where you get out getting in front of customers and get answers
2. Pre-sell - Where you sell something before actually having anything to sell
3. Concierge - Where you manually deliver the service for customer

(Javelin.com / Lean Startup Machine 2014)

Due to the amount of hypothesis to test, many with diverging hypothetical target customers, I discarded "Interview" and "Concierge" as viable methods going forward. I did not have the resources to search for, contact and interview over 30 different hypothetical target customers. Even less did I fathom attempting to deliver multiple different hypothetical services manually to corresponding hypothetical target customers. Even if I did find these target customers, I felt that would not be able to trust that their opinions represented a broader target segment. Lastly, the main reason to interview and manually deliver the service would be to get a better understanding of the problem space of the hypothetical target customer. Since I was already developing services that were targeting by me well known problem spaces, I did not feel that I would get much more insights than what I already knew. After reflecting about this, I realized that I had already interviewed and applied the concierge method many times during the last few years and would need to try something new in order to receive new insights.

Inspired by the "Pre-sell" method, I planned a lean startup experiment that would allow A/B testing of multiple hypothesis in parallel in a scalable way. I would launch simple ad campaigns marketing the various hypothetical solutions in the hypothetical problem spaces and see which ones attracted most clicks and user registrations.

Key to A/B testing is to vary a single or a few sets of variables at a time, so I decided that each startup seed would need to offer the same set of basic components:

- A landing page
- A set of subscription-based payments plans
- A fully automated sign-up and payment processes
- A simple but previously unknown brand
- No parallel sales efforts - 100% user acquisition through digital marketing channels (AdWords, Facebook, LinkedIn etc)
- All communication restricted to the english language

I would use the same underlying technologies for all startup seeds and simply vary the service offerings and marketing messages. Based on the testimony of Lean Startup practitioners, new products introduced to the market have little chance of actually converting new users. Thus, I theorized that I would be able to learn a lot from the first basic conversion steps in the conversion funnel: ad click-through rates, user registration and choice of subscription plan. By acquiring the same amount of traffic for each startup seed, it would become apparent which one was converting more valuable customers based on the different marketing messages alone. If the user was or was not able to access a working product available after the registration process was not a concern at this point since I would only be comparing the conversion rates of the first funnel steps.

The advertising costs would be low thanks to the use of fully automated digital marketing channels. Creating the landing pages would not be a concern thanks to the increased availability of services catered for A/B testing marketing campaigns. I planned to perform cohort analysis based on the information that the demographic advertising platforms would provide in order to profile the target customer, and after the experiment I planned to reach out

to a relevant set of registered users for each respective startup seed and interview them for further learning through direct customer feedback.

The only concern at the planning stage was the fact that this approach likely would not result in reliable indicators for business models based on the Sticky or Viral engines of growth. Sticky engine requires existing customers and the Viral engine requires a great product. Luckily, it was rather easy to adapt the business models within each startup seed to be based on the Paid engine of growth.

As a bonus, a falsifiable growth hypothesis was being tested for each business model: that paid ads would allow new users to discover the service. I would also get insight into whether or not the same ads performed differently across the various advertising platforms.

The plan seemed to conform to The Lean Startup methodology and I entered the execution phase.

6.3.4 Encountered problems during the execution phase

I had only briefly started to execute on the plan when I realized how unrealistic it was. In the midst of crafting marketing communication strategies for four different startups and their various hypothetical target customers and problem spaces, I realized two main things:

1. Crafting marketing communication strategies is a great way to evaluate the value creation hypothesis and business model attractiveness without even leaving the building. I learned surprisingly much about each startup seed in a very short period of time of writing down suggestions in a spreadsheet and imagining how a customer might react when confronted with the suggestion. This was different than simply thinking about how to sell the future services - actually having to decide explicitly on a messaging strategy generated exceptional reflective learning.
2. Crafting and executing good enough advertising campaigns for the four different startups and their various hypothetical target customers and problem spaces was going to take too much time and effort. The plan needed to be revised.

6.3.5 Decision - Focus on a single startup seed

Despite the imposed restrictions on each startup seed in order to minimize variability of the business model during the experiment, the major differences in target customers and value propositions left me feeling like I could not give each startup the proper attention required to execute. Furthermore, I did not have brand names for Clerk.ai and Codegeneration.io at the time. Executing advertising campaigns requires brand names, associated graphical elements and, if wanting to use Facebook ads, a Facebook page. I found it bizarre to spend time on creating brand names, graphical elements and Facebook pages for brands that soon could be shown to have little or no market potential.

At this point, I decided to limit further methodology evaluation efforts to a single startup seed.

To decide on which one, and inspired by the strong positive learning experiences stemming from crafting marketing communication strategies, I decided to register each startup seed on AngelList, a popular website where angel investors are able to invest in the startups that are registered. This required me to evaluate official entries for "Company Name", "High-Concept Pitch", "Product description", "Screenshots", "Company website" and "Technology" as would be seen by potential investors in the future.

Sure enough, this exercise soon offered me instinctual insight that if I had to choose a single startup seed as the basis for future evaluation efforts, it would be most strategic to choose Neamtime.

Neamtime's technology requirements could be strategically aligned with Clerk.ai's, as well as the ones used in IT consultancy assignments, allowing for a high level of code reuse between my many ongoing parallel projects. Also, by improving the code generation processes, I would end up with a better prototype for Codegeneration.io.

Developing Neamtime further would thus further all startup seeds except for Markerchase, which was a reasonable trade-off since I did not estimate it by itself have higher potential than the three others together.

6.4 Methodology 2 - The Lean Startup - Part 2

I rebooted the application of The Lean Startup methodology, this time with a single startup seed and with a better insight in how the MVP could be strategically implemented technically (aligning technology requirements with other parallel projects).

6.4.1 Planning

To be able to write proper marketing messages for the advertising campaign, I felt that I needed to have a better understanding of what the first actual release of Neamtime would offer. Thus, I started out by identifying the components to include in the minimum viable product. However, I soon discovered that it was a surprisingly unforgiving process, ridden with guess work. Would features A+B+C be the smartest to include in the MVP? Or maybe B+E+F? Or A+E+F? It seemed completely backwards and wasteful to implement all features in the MVP just to be able to experimentally confirm what combinations actually generated value, and to choose only a single set of possible feature sets seemed to induce variability into the process and thus increase the overall risk of wasting development efforts.

Instead, I decided that before implementing the first MVP I would implement the same set of basic components that I had planned previously. Regardless of features to include in the MVP, I would anyway require these components:

- A landing page that supported A/B testing
- A set of subscription-based payments plans
- A fully automated sign-up and payment processes
- A simple but previously unknown brand

- Ability to acquire users through digital marketing channels (AdWords, Facebook, LinkedIn etc)
- Tracking features that supported analysis of conversion ratios

When this was implemented, I would initiate the advertising campaign in order to establish a baseline and feedback loop with customers, as per The Lean Startup advice.

The advertising campaign would generate at least a handful of registered users whom I could qualitatively interview in order to get a more informed decision regarding what to include in the MVP.

6.4.2 Execution phase

I started out by drafting the contents of the landing page including the subscription plans it would showcase. The latter turned out to be the biggest challenge so far - it required me to thoroughly evaluate and document probable target customers, marketable features, support levels, maintenance costs, value creation levels, purchasing power levels and various tactical aspects of pricing plans. A surprising insight was that a freemium-based business model required - in order to be profitable - either an extremely low customer and maintenance cost or a very high conversion rate from freemium users to paid users or other significant benefit.

After this, I spent a significant amount of time on preparing implementations of, service providers for and configuration of:

- The landing page
- The ability to acquire users through digital marketing channels (AdWords, Facebook, LinkedIn)
- Tracking features that supports analysis of conversion ratios

All in all, I had spent 26 hours on the planning and execution phases of The Lean Startup so far.

6.5 Product development phase 2 and the switch back to methodology testing

Armed with development tasks of which I was certain would add value to the later release MVP, I switched over to product development and spent 16 hours on strategically aligning the code architecture, interweaved with 24 hours of general improvements to Neamtime product core components. Due to the insights regarding customer and maintenance costs, 9 hours were devoted to careful research and detailed planning of deployment and customer support systems which would result in low enough hosting, support and maintenance costs for customers.

At this point, I had a better understanding of valuable features that could be implemented as part of the MVP but I was not sure of which ones to prioritize over another. In order to minimize process variability and thus the risk of engaging in wasted development efforts, I sought to utilize a methodology for prioritizing the order of which the features were implemented. "The Lean Startup" book did not offer an actionable recommendation in this

area that did not involve testing out prototypes of the features against real users. Caught in a catch 22, I returned to search for a suitable methodology.

6.6 Entering the lean startup jungle of theoretic models for business model definition

The search for a promising models for MVP feature prioritization was unsuccessful. The general advice in this situation was not to think in terms of feature prioritization, but instead business model definition. A large volume of advice, recommendations and theoretical models surfaced, some of them being: Lean Canvas, Business Model Canvas, SEMPORCES, Story Mapping, Service Blueprints, Business Model Yacht, Running Lean, One-Page Lean Startup and Lean Startup Project Management.

Even figuring out the subtle differences between some of them was time-consuming enough and I was not going to try them all out. Furthermore, I was not convinced that business model definition tools would help prioritize the features for the MVP.

6.6.1 New requirement on methodology - Should enable evaluation of potential ideas without requiring a released product

An observed trend at this point was that the models that had up until this point seemed to assume that the startup already had one or many of the following: a minimum viable product, a team, an office, seed money, a plan, a landing page, a pricing model, a clear product roadmap, a sales team.

I decided for a new requirement on methodology - it should enable evaluation of potential ideas without requiring a released product. This way, it is more likely to be applicable for very early-stage startups and other types of innovators.

In order to evaluate which models were applicable in the very earliest stages of a startup lifecycle, I started looking for publications that compared, contrasted and reviewed said models. Eventually I found Rod King's presentation "Business Model Canvas vs lean Canvas vs One-Page Lean Startup" (King 2012) after which I realized that Lean Startup theories may not even apply at the very earliest stages of a startup. To illustrate this, Image 2 below shows a purple lifecycle line extension with an orange indicator added to Rod King's summary and visual model of Eric Ries's Book, "The Lean Startup", indicating where the earliest stage startups are found. The fact that the lean startup's "Birth" phase is found later in the startup lifecycle supports the notion that it might be to early to attempt lean startup methods to my company's startup seeds.
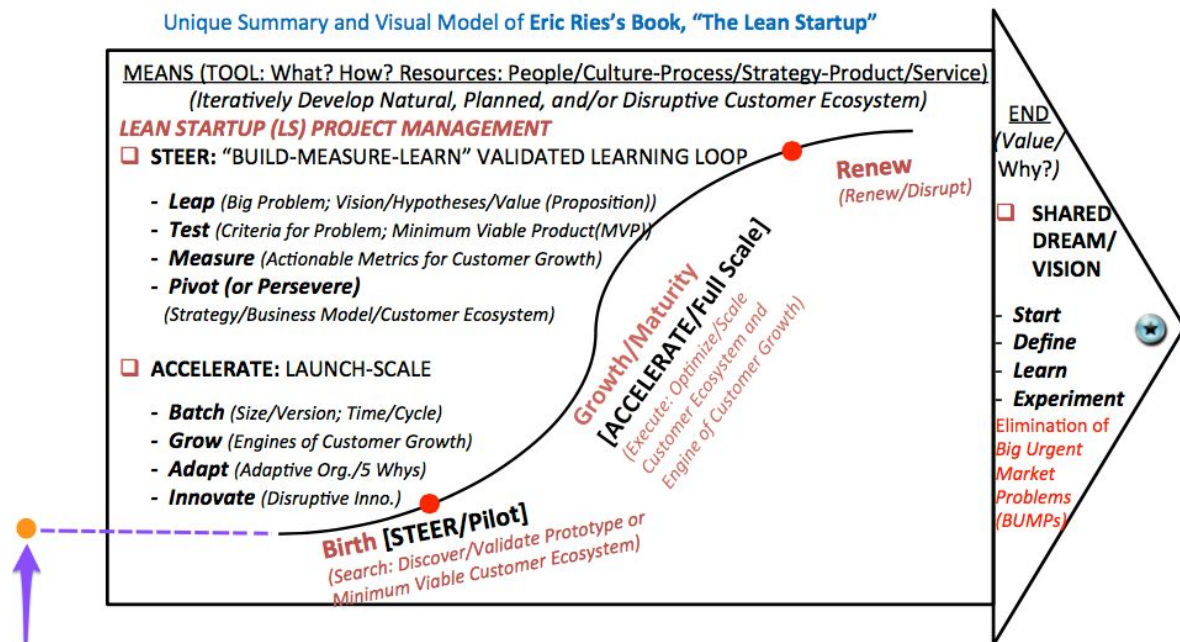
Image 2: A purple lifecycle line extension with an orange indicator added to Rod King's (King 2012) summary and visual model of Eric Ries's Book, "The Lean Startup" (Ries 2011), indicating where the earliest stage startups are found

By mere chance, Slideshare's "Next presentation" feature displayed Rod Kings presentation "3 Visual Tools for Lean Startup Habit Designers: Rapidly Understand and Design Addictive Customer Experiences (ACEs)", which included the advice "Always Start with Design and Testing of Minimum Viable Habit (MVH) As Well As Minimum Viable Habit Engine (MVHE)." (King 2012)

This made so much sense, focusing on the higher-level value creation and long term habit forming mechanisms for the individual user rather than optimization or validation of startup concept details. I decided to omit Lean Startup methodology until further notice and instead focus on "Habit Engines", switching focus from producing a Minimum Viable Product (MVP) to a Minimum Viable Habit Engine (MVHE).

Slideshare's "Next presentation" feature displayed Nir Eyal's presentation "The Hooked Model" (again, by chance) and I immediately decided to investigate it further.

6.7 Methodology 3 - The Hook Model

Thus, the third methodology I ran across that met all the current methodology requirements section was The Hook Model.

6.7.1 Initial promise

The title itself includes a promise worth investigating on it's own. The author's slideshare presentation on The Hook Model (Eyal 2013) also mentions:

- Creating consumer habits drives Higher Customer Lifetime Values (CLTV)

- Creating consumer habits gives companies greater flexibility to increase prices
- Creating consumer habits supercharges growth

My understanding is that the methodology is focused on the build-phase and thus does not require an existing released product while at the same time promises to improve customer metrics that both lean startup and growth hacking are designed to optimize. This sounded great, thus I read about a third of the book and started planning the adoption of the methodology.

6.7.2 Theory

The Hook Model shown in Image 3 below was introduced in the book "Hooked: How to build Habit-Forming Products" (Eyal, Hoover 2013).

As summarized by the author himself:

- The degree to which a company can utilize habit-forming technologies will increasingly decide which products and services succeed or fail.
- Habit-forming technology creates associations with "internal triggers" which cue users without the need for marketing, messaging or other external stimuli.
- Creating associations with internal triggers comes from building the four components of a "Hook" — a trigger, action, variable reward, and investment.
- Consumers must understand how habit-forming technology works to prevent unwanted manipulation while still enjoying the benefits of these innovations.
- Companies must understand the mechanics of habit-formation to increase engagement with their products and services and ultimately help users create beneficial routines.

(Eyal 2012)

Image 3: The Hook Model (Eyal, Hoover 2013)

In other words, the basic idea of The Hook Model is that should move your product's users through a loop that – over time – will foster a habit of returning and contributing. It looks like this: A trigger, internal or external, drives a user to the platform where they get some sort of variable reward, contribute something of their own, and return to the platform later for the same loop. (Adhiya 2015)

6.7.3 Planning

I started out by going back to my notes on what components to include in the MVP and started organizing them according to the Hook Model, meaning that I took every feature and split it up into Trigger, Action, Reward and Investment (TARI) phases.

Something interesting happened in this process - a complete customer life cycle started materializing in the spreadsheet, all the way from never having heard of Neamtime all the way to recurrent usage for continuous time reporting and invoice timesheet production needs.

Having this complete lifecycle really helped estimate the total efforts necessary to build a successful product in the future. Also, in the light of the TARI phases, the potential habit and/or value-creation effects were easier to estimate, and it felt rather obvious how some features were more important than others. Furthermore, the feature-hooks revealed new development requirements for many hooks, including interdependencies between hooks which affected their estimated implementation costs and often required them to be implemented after other hooks were implemented.

I extracted identified the minimum viable habit engine be identifying the fundamental hooks required to make a it possible to move users through the high-level value creation loop, summarized in Table 6 below.

Table 6: The Minimum Viable Habit Engine (MVHE) for Neamtime enables users to move through the central value creation loop

Investment/action	Leads to reward
Start tracking time using Neamtime-proposed methods	Confidence that worked hours are tracked properly and thus can efficiently be invoiced later on
Add time report and visit "Reported time"-section	Ability to understand how many hours are reported
Supply information about clients, cost pools etc necessary for drill-down and bulk assign time spent to clients and cost pools	Drilldown tracked hours on clients, projects etc -> a first invoice estimate can be communicated to client
Assign individual chunks of spent time to high-level activities and cost pools	A better summarized time report -> a first real invoice can be communicated to client
Finalize first invoice timesheet, marking the spent time as invoiced	Future invoices/estimates can be communicated to clients

After some tweaking, status-based color coding and ranking of hooks, I soon had an actionable MVP development plan which described which the first three product releases could be and how the closest development milestones most strategically should be prioritized (see Table 7).

Table 7: How I found that the first five development milestones should be prioritized after having identified the TARI phases

Priority	Component	Goal
1	Landing Page	Be able to talk about Neamtime.com
2	Core Features	Be able to do send additional invoices to my clients and get closer to the Minimum Viable Habit Engine

3	User Registration	Be able to collect sign-ups "pre-launch"
4	Tracking features that supports analysis of conversion ratios	Be able to track currently possible steps in funnel
5	Basic UI and Getting Started guides	Be able to login and see basic interface and docs

6.8 Product development phase 3 and the temporary return back to Lean Startup methodology

Armed with development tasks of which I felt certain would add value to the later release MVP, I switched over to product development and spent 26 hours on implementing user registration features and the marketing website.

At this point, most of what was required for the advertising campaign was in place, and I thus returned to the Lean Startup methodology efforts to evaluate the strategic relevance of its execution.

6.9 Methodology 2 - Lean Startup - Part 3

6.9.1 Evaluation of the strategic relevance of the planned advertising campaign

With enough development tasks of which I felt certain would add value to the later release MVP, the previously planned advertising campaign was not mandatory to execute directly. The time put into preparing for the advertising campaign could be used on product development instead.

On the other hand, the second recommended action in lean startup methodology right after building an MVP is establishing a baseline and feedback loop with customers. Thus, if I did not prepare for the advertising campaign now, I'd still need to do it directly after releasing the MVP, effectively meaning that it could just as well be executed directly.

Also, Ash Maurya, author of the book Running Lean, sold named book to customers even before it was written. He had a blog and informed his users that he would summarize his advice on The Lean Startup in a book. He set up a "smokescreen" - a web site page with a preview of the book's contents and ability to pre-order the book. When he got enough orders, he concluded that it was worth actually writing and publishing it. (Maurya 2012)

Analogically, I saw a similar set-up where I could let advertising campaigns run and attract new users while I was building the MVP. The new users would be greeted with a message that their accounts were yet to be activated, and when the MVP was released, there would be an initial user base from day one.

I decided to create a smokescreen for Neamtime and market it through Google, Facebook and LinkedIn targeting only the segments I believed would be interested in the service.

6.9.2 Planning and execution phases

I spent 28 hours preparing and executing the advertising campaign. This included creating a minimal viable graphical profile for Neamtime, as well as creating a social presence on Facebook. The published ads and landing page marketing messages are shown in Image 4 below.
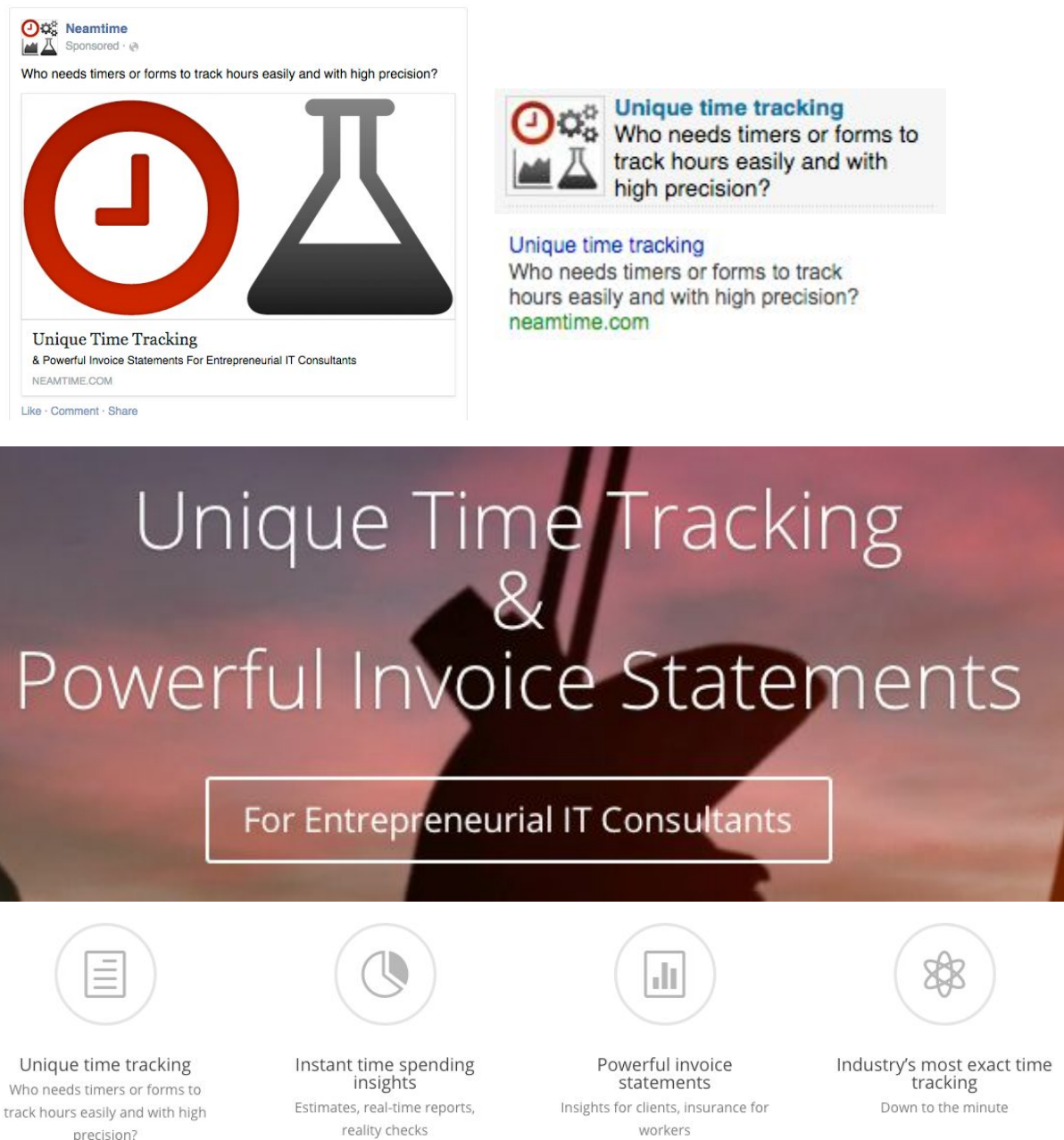
Image 4: Published ads and landing page marketing messages for first advertising tests

6.9.3

Problems encountered during the planning and execution phases

The main problem encountered was that when it came to actually creating the ad campaigns, the amount of possible combinations of target customer types and product features were too overwhelming.

Example of some possible marketable features:

- Effortless time tracking
- Instant time spending insights
- Powerful invoice statements
- Industry's most exact time accounting
- Team features

Example of some possible target customers:

- Personal/professional/freelancer/consultant (wants to focus on doing a great job and get paid without hassle)
- Lean team
- Consultancy manager (wants their professionals to focus on doing a great job and know that all their hours can be billed to the client)
- (Insights-reports / Time study for...) Clients (wants to be confident that their contractors are working on value-adding activities)

To fully test the combinations I would in theory need to set out hundreds of parallel ads with a broad targeting and see which ones outperformed the others. Certainly a possibility, but to ensure large enough sample sizes, the cost for the advertising campaign would be many magnitudes higher than anticipated.

Thus, in lack of a missing a useful methodology for pre-gauging feature interest against various possible target customer segments, I decided to use my instincts and chose what felt like the most attractive feature and target customer segment combination.

I then guessed what targeting filters on each respective advertising platform would be likely to be part of the target customer segment, so that I was targeting only the segments I believed would be interested in the feature.

I felt that I was basically trying out one particular combination of feature, target customer and market segmentation criteria out of hundreds of possible combinations, but nevertheless hoped that the campaign would give some insights. I chose to begin with one week's campaign on a $30 per day budget, distributed evenly across the three advertising platforms (Facebook Ads, LinkedIn Ads and Google AdWords).

6.9.4 Results

After the first week, I noticed that the Facebook Ad Campaign had only used up a fourth of the allotted budget, probably due to the restrictive filters I chose on the audience. The

LinkedIn Ad had been automatically stopped after three days ($30 spent) having displayed the ad 15000 times without yielding a single click. The complete results are presented in Table 8 below.

Table 8: Results of the first Ads campaign, as per the table structure for innovation accounting according to The Lean Startup

	Facebook Ads	LinkedIn Ads	Google AdWords
Engine of growth	Paid	Paid	Paid
Click-Through-Rate	0.32%	0%	0.62%
Cost per click	$0.28*	n/a	$0.33
Registration rate	0%**	n/a	0.94%
Cost per registration	n/a	n/a	$34.8
Activation	not possible	not possible	not possible
Retention	n/a	n/a	n/a
Referral	n/a	n/a	n/a
Revenue	n/a	n/a	n/a
Cost per customer (CPC)	n/a	n/a	n/a
Lifetime value (LTV)	n/a	n/a	n/a

* Additional actions aside from clicks: 2 Post Likes, 1 Page Like, 1 Post Share
** The low reach due to restrictive filters makes this statistically insignificant

6.9.5 Quick interpretation of the results

The results on the whole are subjectively mediocre, and hopefully only serves as the worst possible comparison baseline for new user acquisition attempts. At the same time, the Cost per click results are not terrible for a shot-in-the-dark first attempt at marketing the service, showing that there might be some latent underlying interest in "Unique time tracking" after all. With a broader spectrum of marketing messages evaluated and proper optimization of the conversion flow, the cost per customer (CPC) might end up amongst tolerable levels.

The results also indicate that the choice of advertising platform may have a significant for the outcome despite identical marketing message and thus I will pay close attention on these aspects in order to better distribute the advertising budget in the future.

After this initial analysis, I was left with very little actionable insights. Since there is no product for the attracted users to evaluate, use or refer other users to, learning from real customer usage metrics was not feasible at this stage.

6.10 Product development phase 4 and the switch to market opportunity discovery methodologies

The explorative approach during the first part of the research resulted in insights into the limited applicability of popular methodologies such as Growth Hacking and The Lean Startup for early-stage startups who are yet to launch a minimum viable product (MVP) of their proposed products or services. Most actionable insights during this part stemmed from the engagement in various exercises that requires the entrepreneur to think from new perspectives, and not from actual customer feedback.

At this stage I added yet another requirement for further methodologies to evaluate - they need to be based on actual customer or potential future customer feedback, and should be able to be performed at scale, facilitating assessment of the value-adding potential of multiple feature and target customer combinations.

With no matching previously discovered methodology matching the new requirements, I initiated the search for a new suitable methodology. Meanwhile, I also focused on product development efforts in order to reach the point where I had a Minimum Viable Habit Engine sooner than later, working 17 hours on the Time Report Visualizations component and 267 hours on code generation and deployment automation (89 hours of which was invested by my company).

6.11 Methodology 4 - Outcome-Driven Innovation

While previous methodologies were found by scouring scientific and nonscientific publications alike using the mindset of an early-stage startup founder, this methodology was instead recommended to me by my mentor after I had sent a status update on the current state of the research.

I switched mindset from "the early-stage startup founder" to "the researcher" and assessed which literature I would read up on. The book recommendations I had in front of me at the time was "Experimentation Matters" (Thomke 2003) and "What Customers Want: Using Outcome-Driven Innovation to Create Breakthrough Products and Services" (Ulwick 2005). Being a bit saturated on the subject on the importance of experimentation while finding myself asking myself again and again how it would be possible to get insights into what concepts customers found important, I chose to start by investigating Ulwick's Outcome-Driven Innovation (ODI).

6.11.1 Initial promise

Based on the book's title and the introduction, the book seem to promise:

- Understand what customers want
- Create breakthrough products and services
- Market your product/service based on what customers want
- Prioritizing projects in the development pipeline
- A hands-on systematic approach

(Ulwick 2005)

Since this was basically exactly what I was looking for at this point and in general, I read the book and planned a thorough adoption of the methodology.

6.11.2 Theory - Outcome-Driven Innovation

6.11.2.1 Innovation is a science - not an art form

"Managers must be willing to accept that innovation is indeed a science - a systematic process for creating products or services that delivers new value to customers - and not an art form that is forever destined to produce random and unpredictable results. Innovation is the process of creating a product or service solution that delivers significant new customer value. Six Sigma principles and tools such as statistical process control (SPC) can be applied to the innovation process: by identifying the stages of innovation and eliminating the factors that introduce variability into the innovation process, companies can realize higher innovation success rates and more breakthrough products and services." (Ulwick 2005)

While traditional innovation begins with ideas, innovation should be a needs-first process, as shown in Image 5 and Image 6 below. (Ulwick 2014)
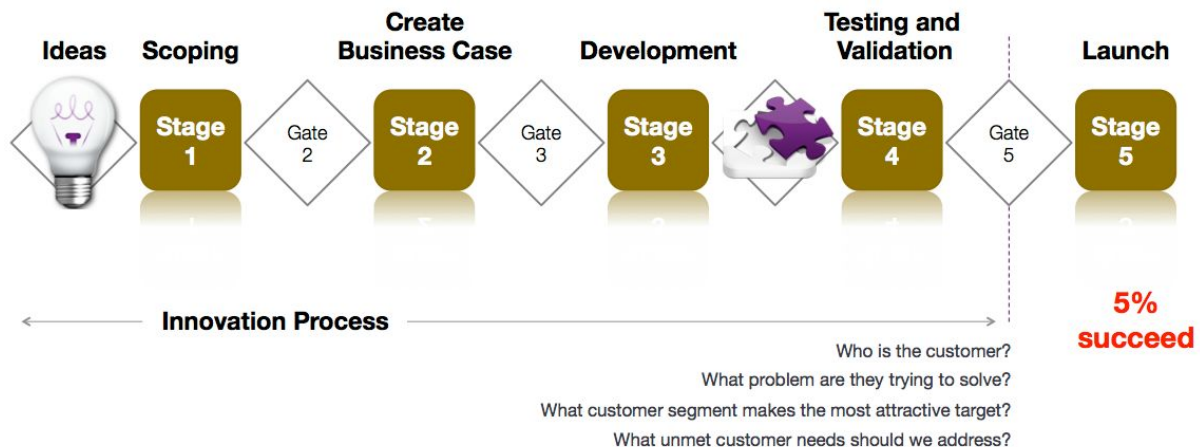
Image 5: Traditional innovation begins with ideas (Ulwick 2014)
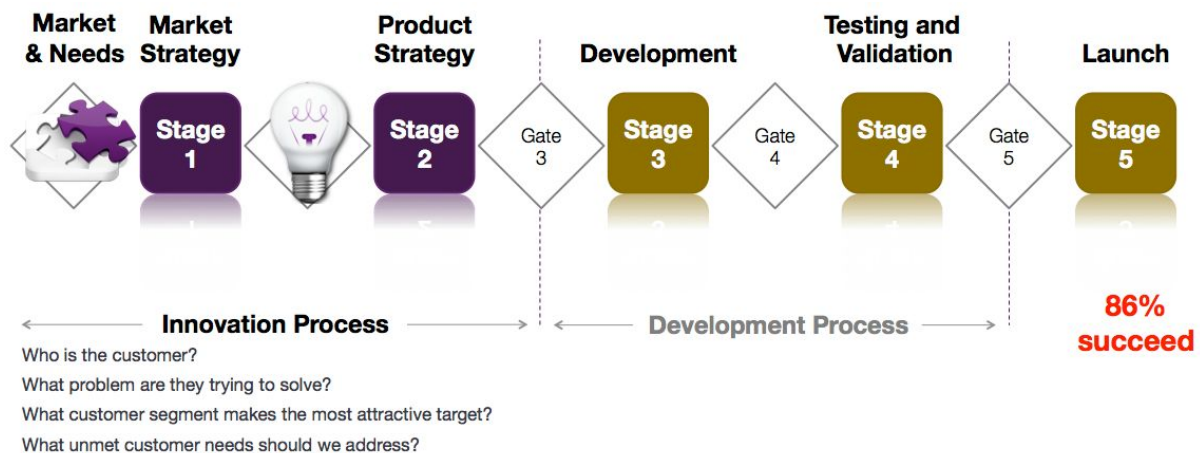
Image 6: Innovation should be a needs-first process (Ulwick 2014)

6.11.2.2 Jobs = A Key Factor to Growth

"In both new and established markets, customers (people and companies) have jobs that arise regularly and need to get done. To get the job done, customers seek out helpful products and services." (Ulwick 2005) Apart from functional jobs, it is equally important to consider emotional jobs, which can be of both personal and social varieties. (Ulwick 2005)

6.11.2.3 Desired outcomes = Metrics That Drive Innovation

"Customers want to get more jobs done, but they also want to be able to do specific tasks faster, better, or cheaper than they can currently. To define just what "faster" or "better" means, companies must be able to capture from customers the set of metrics - measures of value, if you will - that define how they want to get the job done and what it means to get the job done perfectly." (Ulwick 2005)

"These metrics are the customers' desired outcomes. For most jobs, even those that may seem somewhat trivial, there are typically 50 to 150 or more desired outcomes - not just a handful." (Ulwick 2005)

6.11.2.4 Constraints = Roadblocks to Success

"Besides getting more jobs done, or a specific job done better, customers also need help overcoming the constraints that prevent them from getting a job done altogether or under certain circumstances. These constraints are often physical, regulatory, or environmental in nature." (Ulwick 2005)

6.11.2.5 Importance

Customers that respond on the high end (4 or 5) of a 1-to-5 scale when asked to rate the importance of a specific job, outcome or constraint are said to find it important. The importance rating is defined as what percentage of customers find the job/outcome/constraint important, multiplied by ten. The resulting score thus ranges from 0 to 10. (Ulwick 2005)

6.11.2.6 Satisfaction

Customers that respond on the high end (4 or 5) of a 1-to-5 scale to a question like *How satisfied are you with the degree to which the [internal and/or third-party tools/products/services] you use today enables you to [outcome or job/job-step]?* are classified as satisfied. The satisfaction rating is defined as what percentage of customers are satisfied, multiplied by ten. The resulting score thus ranges from 0 to 10. (Ulwick 2005)

6.11.2.7 Market Opportunities

"The opportunity algorithm is a simple mathematical formula that makes it possible to discover the most promising areas for improvement. The importance and satisfaction ratings for each outcome are entered into the equation to determine the level of opportunity. The formula states that opportunity equals importance plus the difference between importance and satisfaction, where that difference is not allowed to go below zero." (Ulwick 2005) The opportunity algorithm is shown in Image 7 below.

$$Opportunity = Importance + Max\,(Importance - Satisfation, 0)$$

Image 7: The Opportunity Algorithm (Ulwick 2005)

The opportunity score ranges from 0 to 20, and when plotted on a two-dimensional area with Importance on the X-axis and satisfaction on the Y-axis, an opportunity landscape canvas, shown below in Image 8, is presented.
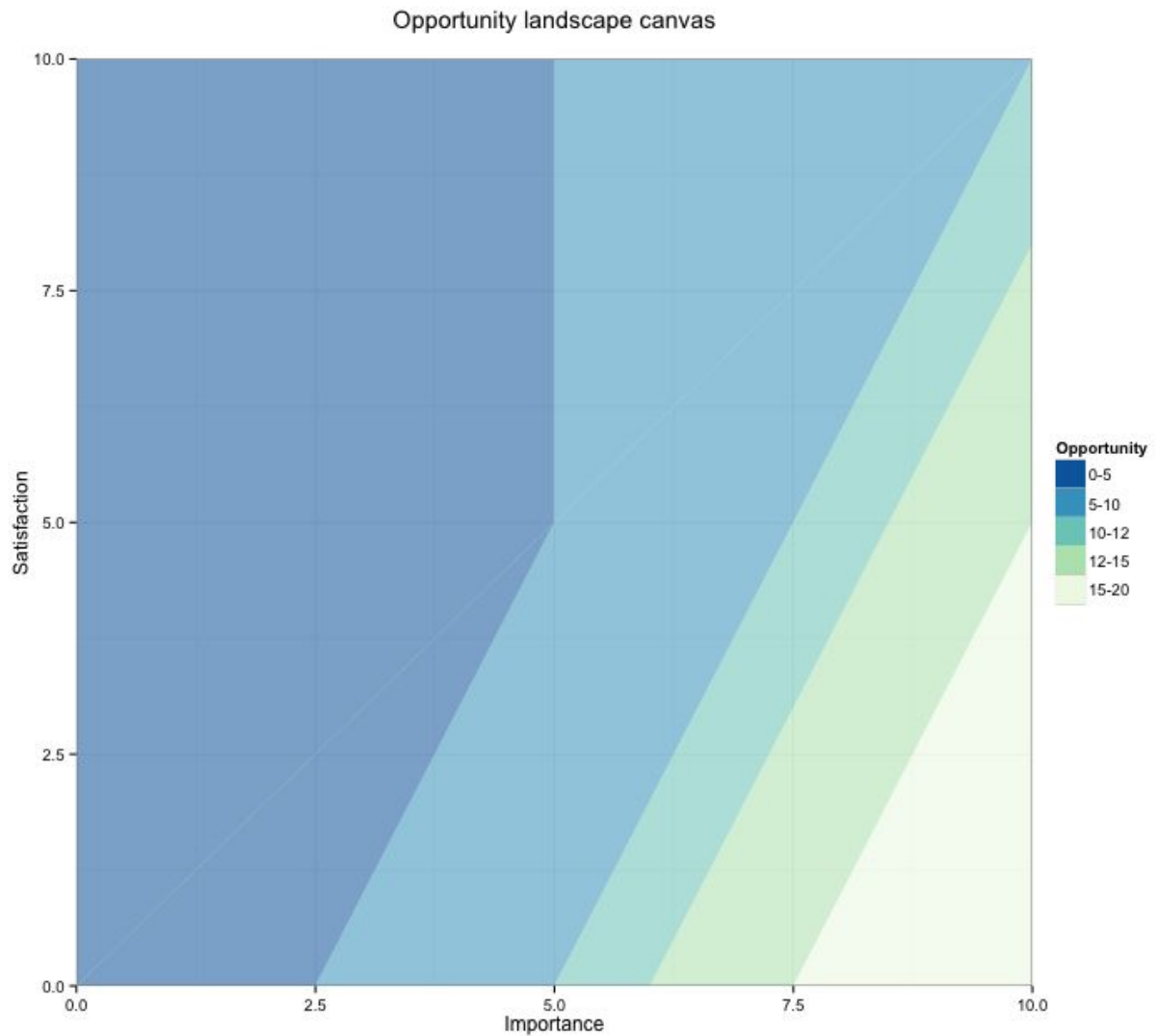
Image 8: An opportunity landscape canvas

"An opportunity for improvement exists when an important outcome is underserved - that is, when it has a high opportunity score. Opportunities with low opportunity scores are either appropriately served or underserved. The opportunities that are most important and least satisfied receive the highest priority." (Ulwick 2005)

A guide to identifying opportunities based on opportunity scores is shown below in Table 9. (Ulwick 2005)

Table 9: A guide to identifying opportunities based on opportunity scores (Ulwick 2005)

Outcomes and jobs with opp. scores...	Significance
greater than 15	represent extreme areas of opportunity that should not be ignored
between 12 and 15	can be defined as "low-hanging fruit," ripe for improvement
between 10 and 12	are worthy of consideration especially when discovered in the broad market
below 10	are viewed as unattractive in most markets and offer diminishing returns. In some less functional markets, such as those for packaging materials, however, opportunity scores in this lower range may be worthy of consideration

6.11.2.8 Summary of the basic concepts

A summary of the basic concepts of outcome-driven innovation are presented in Table 10 below. (Ulwick 2005)

Table 10: The basic concepts of outcome-driven innovation (Ulwick 2005)

Concept	Explanation
Jobs	The tasks or activities customers are trying to carry out
Desired outcomes	The outcomes customers are trying to achieve are the metrics customers use to define the successful execution of a job
Constraints	The constraints that may prevent customers from adopting or using a new product or service
Importance	The importance of all the jobs, outcomes, and constraints according to the customers
Satisfaction	The degree to which the customers are satisfied with how the solutions they are using today address those jobs, outcomes, and constraints
Overserved	Has a low opportunity score
Underserved	Has a high opportunity score
Opportunities	Desired jobs and outcomes that are underserved represent opportunities for improvement
The Opportunity Algorithm	The formula that depicts the relation between importance, satisfaction and opportunities

6.11.2.9 Customer Value Model

"The customer value model defines the outcomes that customers are trying to achieve at each step of a job. In most cases a dozen or so outcomes define success at each step." (Ulwick 2005)

Ulwick (2005) states that for example the job of cutting wood, which is broken down into distinct process steps, has a unique set of outcomes for each step in the process. The process of cutting a piece of wood and some desired outcomes for the first step in the process are shown in Image 9 below. The collective set of outcomes represents the customer's value model - they are all the measures used to judge how well a job is getting done. (Ulwick 2005)
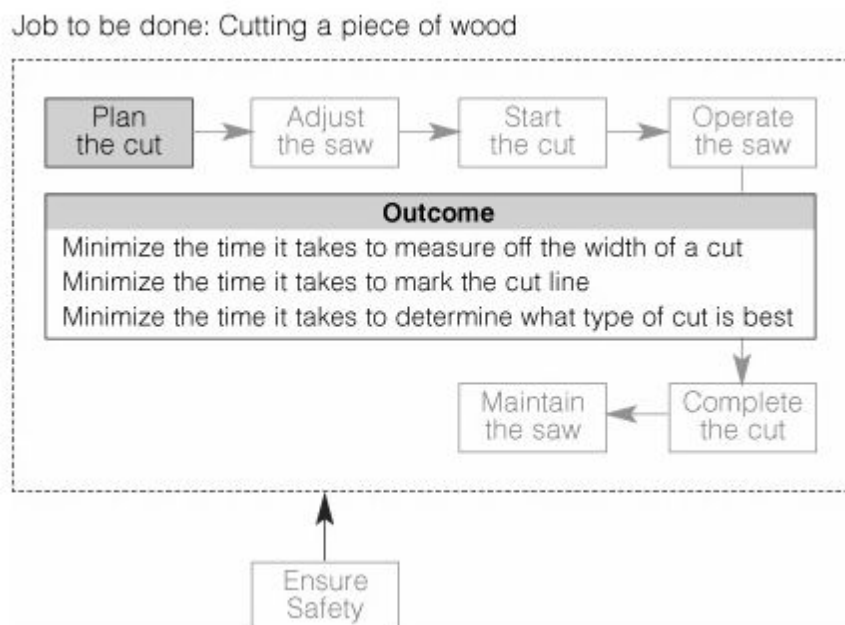
Image 9: The process of cutting a piece of wood and some desired outcomes for the first step in the process (Ulwick 2005)

6.11.2.10 How Does Value Migrate Over Time?

"When captured correctly, desired outcomes tend to remain stable over time, differentiating them from other types of stated customer requirements. People who were cleaning their teeth back in the 1950s, for example, wanted to minimize the time it took to remove food from hard-to-reach places and minimize the likelihood of gum irritation - just as they do today and will in the future. Desired outcomes have this unique quality because they are fundamental measures of performance that are inherent to the execution of a specific job. They will be valid metrics for as long as customers are trying to get that job done." (Ulwick 2005)

"Opportunities for improvement migrate over time in a dynamic fashion; today's big opportunity is not necessarily tomorrow's, and to succeed, companies must be able to determine exactly where opportunities exist in a market at any point in time and be the first to address them." (Slywotzky 1995)

"This, in essence, is the goal of innovation: to define and deliver new solutions that evolve each measure of value along its continuum, better satisfying the collective set of outcomes. Using the opportunity algorithm, it is possible to predict just where value is migrating." (Ulwick 2005)

"The customers' outcomes are stable over time, meaning that most of them will be the same for years to come. What does change, however, is the degree to which these outcomes are satisfied by new technologies and product and service features. Once an outcome is well satisfied by a feature or technology, the opportunity score decreases for that outcome, and opportunities for value creation migrate to the other important, unsatisfied outcomes. When an outcome has been satisfied, a company must either look to other outcomes to create additional value or to other jobs." (Ulwick 2005)

6.11.2.11 Visually identifying the correct strategy to address a market or segment

When the importance and satisfaction ratings for jobs, outcomes and/or constraints in a particular market or segment are known, they can be plotted on top of the opportunity landscape canvas as shown below in Image 10 (for an example of an empty opportunity landscape canvas, see Image 7). By the position of the outcomes, it is easy to see which ones are underserved and which ones are overserved.
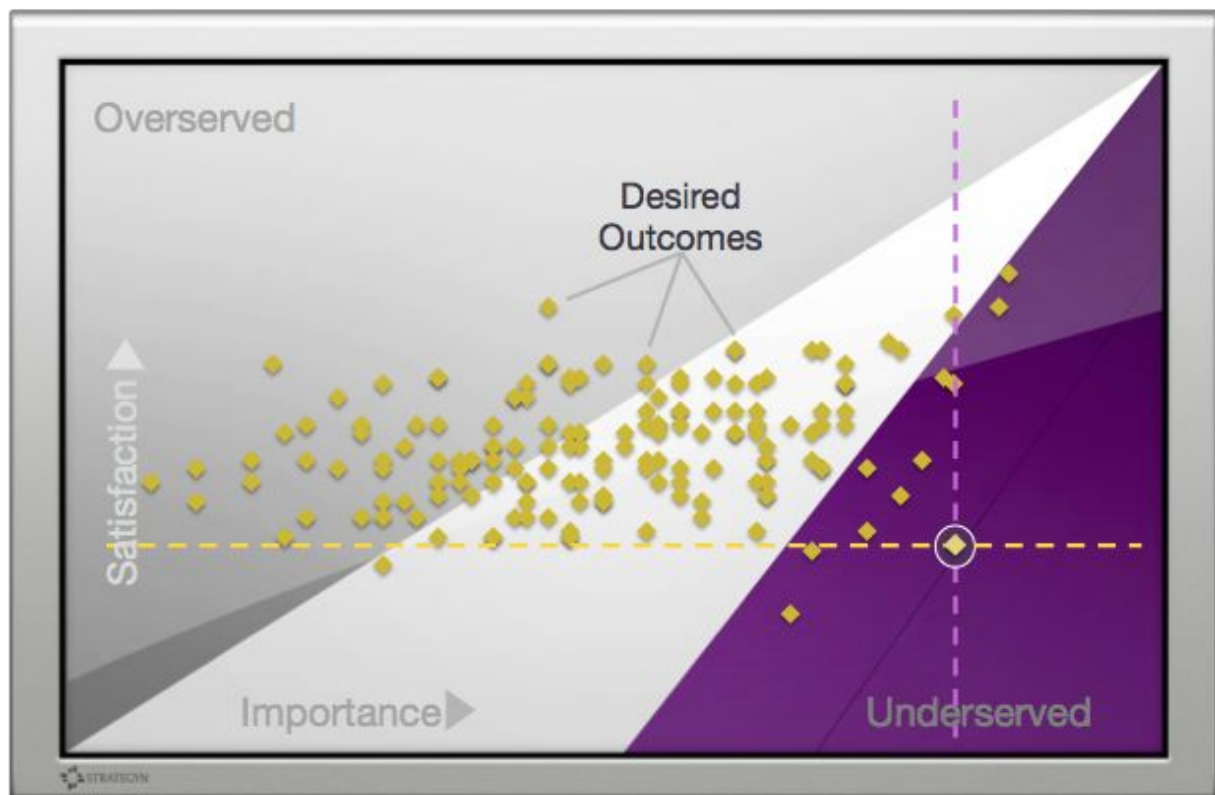
Image 10: Desired outcomes plotted on top of the opportunity landscape canvas (Ulwick 2014)

Since the ratings are based on percentages within a group of customers, the landscapes look differently based on what particular groups of customers are studied. Different customers are trying to achieve different jobs and have different requirements. Consequently, different strategies should be used to target the market or segment. Knowing which strategy to use can be inferred from how the outcomes are pointed across the landscape. A visual guide to picking the correct strategy to address a market or segment is shown below in Table 11. (Ulwick 2014)

Table 11: A visual guide to picking the correct strategy to address a market or segment (Ulwick 2014)

Opportunity landscape	Strategy
	Product improvement strategy Few underserved outcomes – add features to get the job done better
	Disruptive innovation strategy Overserved segment – lower cost solution to get the job done worse
	Sustaining innovation strategy Appropriately-served segment – add features to help get <u>more</u> jobs done
	Breakthrough strategy Highly underserved – new product to get the job done significantly better
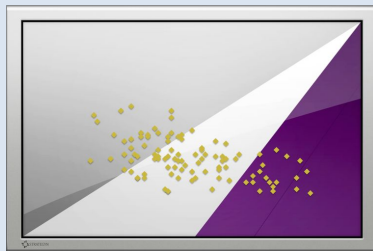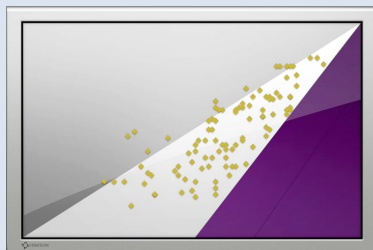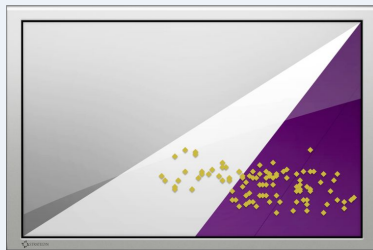
6.11.2.12 Opportunity-based segmentation for the purpose of innovation

An effective segmentation scheme must create a population that:

- Has a unique set of underserved or overserved outcomes
- Represents a sizable portion of the population
- Is homogeneous - meaning that the population agrees on which outcomes are underserved or overserved and responds in the same manner to appropriately targeted products and services
- Makes an attractive strategic target - one that fits with the philosophy and competencies of the firm
- Can be reached through marketing and sales efforts

(Ulwick 2005)

By inspecting the opportunity landscape, we can visually identifying an effective and ineffective segmentation schemes. This is done by categorizing the customers into segments and calculating the group-wise importance and satisfaction ratings. All segments are then plotted in the same opportunity landscape plot, using different colors or shapes for each segment. Depending on we use an ineffective or effective segmentation scheme, the resulting landscape may look like in either Image 11 or Image 12 below.
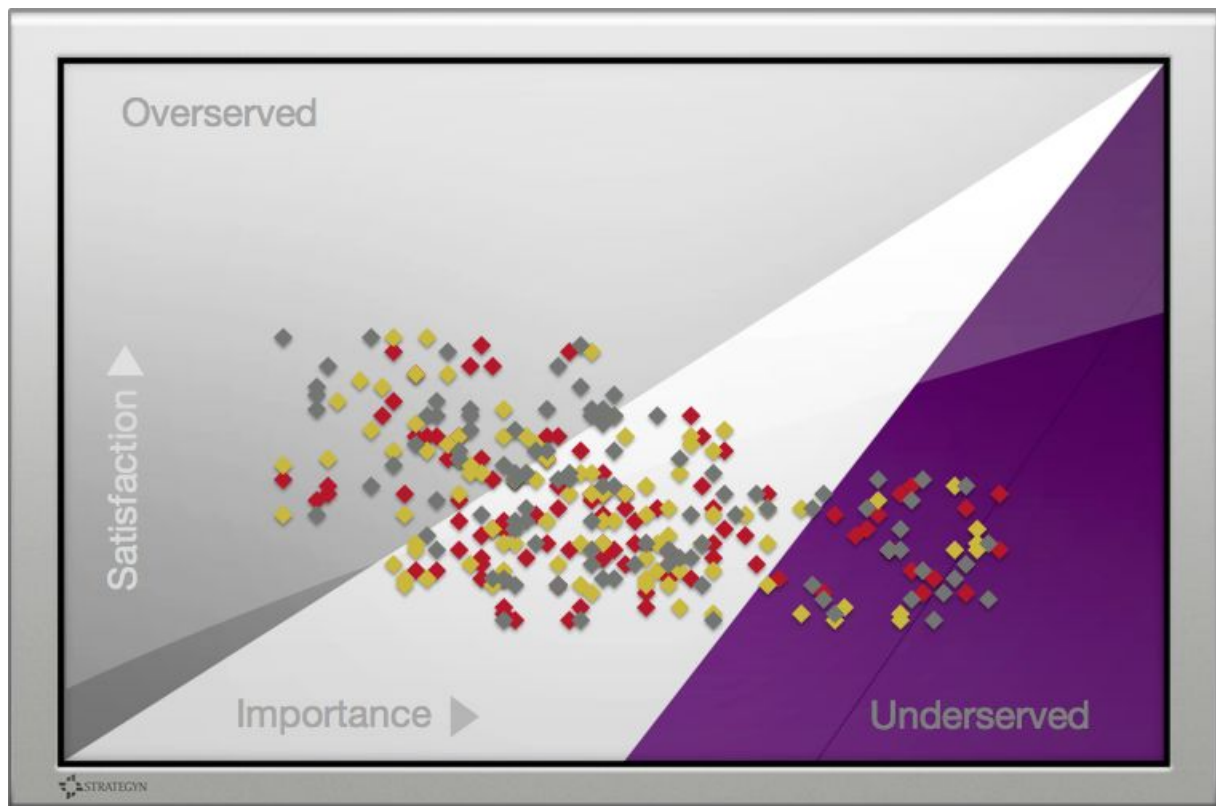
Image 11: A landscape that suggests an ineffective segmentation scheme (Ulwick 2014)
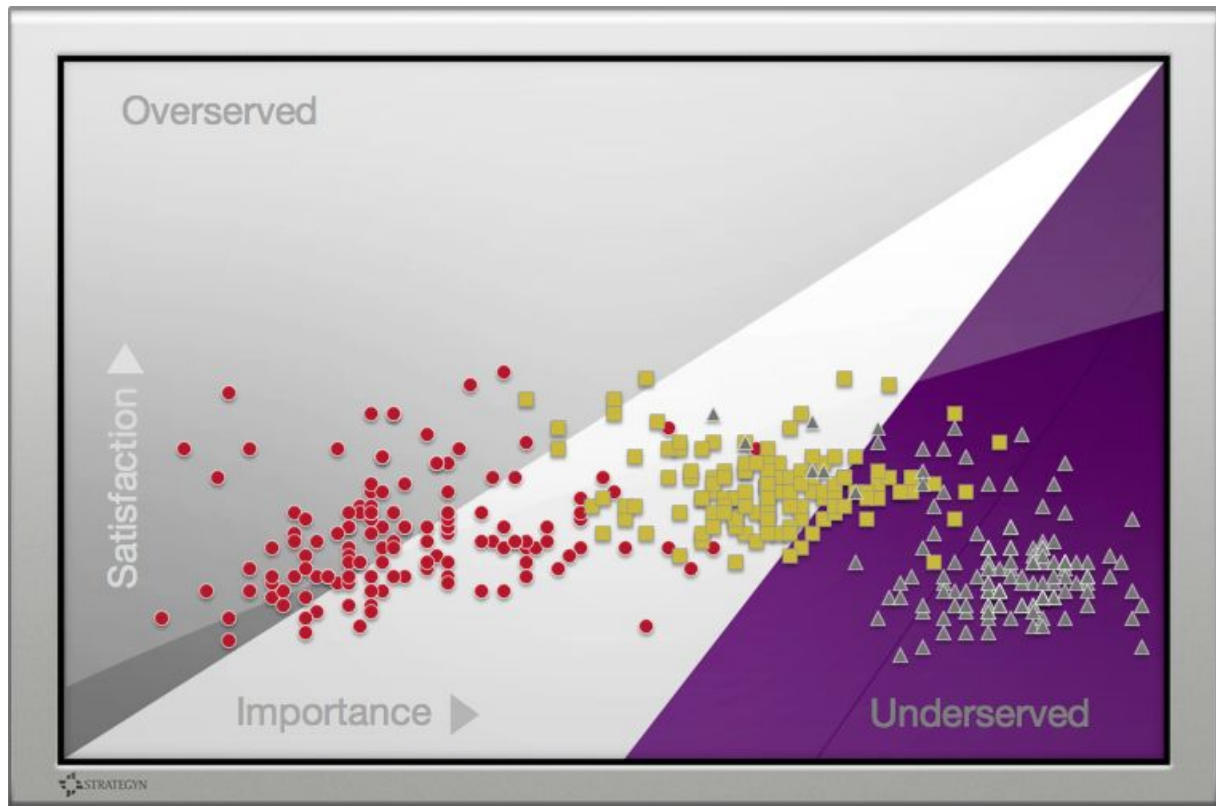
Image 12: A landscape that suggests an effective segmentation scheme (Ulwick 2014)

"Outcome-driven segmentation methodology uses the customers' desired outcomes as the bases for segmenting the market, and, most importantly, the numerical value around which the clustering is executed is not the importance value, but the opportunity score for that outcome. This point is critical. Using the opportunity score as the segmentation variable forces the creation of segments that represent unique opportunities. From a development and marketing perspective this is nirvana, as this market insight is just what is needed to make effective targeting, positioning, messaging, and other product and marketing decisions." (Ulwick 2005)

This allows outcome-driven segmentation methodology address each of these challenges:

- Identifying unique opportunities in mature markets
- Identifying demanding customer segments that may be willing to pay more for more elaborate solutions
- Identifying customer segments that are unattractive and should not be targeted
- Discovering overserved market segments that make attractive entry points for disruptive innovation
- Determining the best way to enter an existing market as a new entrant
- Discovering segments of high potential growth

(Ulwick 2005)

6.11.2.13 Finding segments of opportunity in practice

Effective opportunity-based segmentation schemes can be found by following Ulwick's (2005) step-by-step recommendations:

1. Capture user inputs via customer interviews, screening and profiling questions and document captured jobs, outcomes and constraints in the Customer Value Model.
2. Prepare a survey instrument (questionnaire) that states all the jobs, outcomes, and constraints
3. Administer the survey to a valid representation of the target population (often between 180 and 600 people)
4. Ask the survey participants to rate the importance of all the jobs, outcomes, and constraints using a scale of 1 to 5, where 5 means critically important and 1 means not important at all.
5. Ask the survey participants the degree to which they are satisfied with how the solutions they are using today address those jobs, outcomes, and constraints using a scale of 1 to 5, where 5 means totally satisfied and 1 means not satisfied at all.
6. Include customer profiling questions which you believe are relevant in order to create an effective segmentation scheme.
7. Enter the results into the opportunity algorithm to determine which jobs, outcomes, and constraints are underserved and overserved.
8. To identify those jobs or outcomes that would make the best segmentation segmentation variables, you can use factor analysis (a common statistical technique) to group similar jobs or outcomes together into a number of distinct opportunity-based factors.
9. Segment the survey respondents into opportunity-based segments. Use nonhierarchical clustering algorithms to execute a clustering process. The clustering algorithm should focus on the opportunity scores given to the jobs or outcomes and place the respondents surveyed into a predetermined number of segments based on their responses.
10. Identify and profile the unique opportunity segments in order to arrive at your segmentation scheme.

Note that in step 8, either outcomes or jobs can be used as the basis of segmentation. "Outcome-based segmentation is used to discover segments of opportunity in a specific market of interest. Job-based segmentation is used to discover entirely new markets - a job or a group of jobs that are underserved." (Ulwick 2005)

6.11.2.14 The outcome-driven innovation process

The outcome-driven innovation process is a standard approach designed to help companies overcome factors that can derail innovation efforts. (Ulwick 2005) This step-by-step approach is shown in Image 10 below.
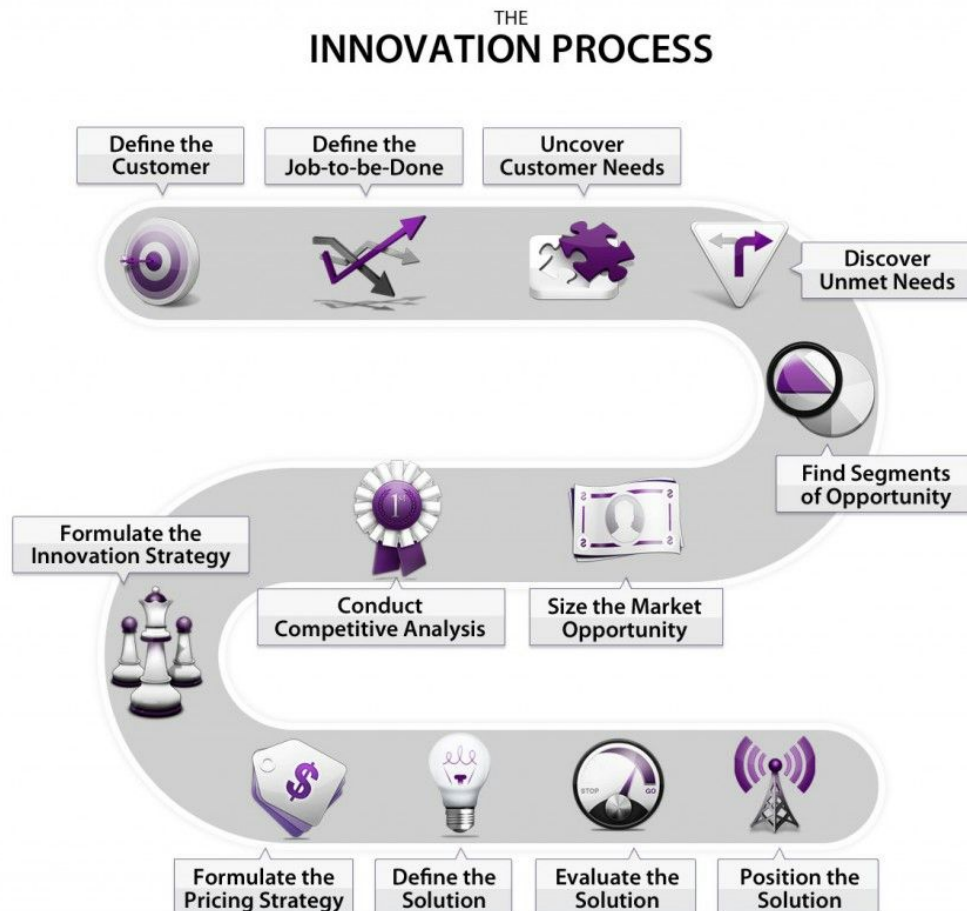

Image 13: The outcome-driven innovation process (Ulwick 2014)

The literature offers recommended best practices for all steps in the outcome-driven innovation process. In this theory section, however, I have only included the parts of the Outcome-Driven Innovation literature relevant to the understanding of the planning, execution and analysis performed during this research's action-phase.

6.11.3 Planning phase

I estimated that attempting the complete outcome-driven innovation process (see Image 13) would take too much time and decided that I needed to concentrate my efforts on a specific subset of the process.

On the basis of Ulwick's (Ulwick 2005) reported findings I hypothesized that starting from the beginning of the process and perform the steps up until "Find Segments of Opportunity" would be the most strategic to try out. Revealing which market segments actually represented the greatest opportunities for Neamtime should help address my company's biggest challenge as of currently (see "4.6 The challenge") and help prioritize product development efforts.

To test this hypothesis I set out to survey a sample of the population according to ODI recommendations.

6.11.4 Execution of opportunity-based market segmentation

6.11.4.1 Customer Value Model

Since I already had deep insights into the jobs, outcomes and constraints in the domain that Neamtime was to be applied, I felt that I it would not be worth the time and effort to schedule interviews and capture external user input by the recommended means (in depth interviews, screening and profiling questions). Instead, I resorted to interview myself and create an initial customer value model based on my own insights.

A time management productivity suite could theoretically be used in a large range of high-level functional and emotional jobs, but I decided to focus on the highly functional "Develop products / services" job to be done. I knew it very well but had not previously been able to pinpoint exactly what parts of this job Neamtime best would focus on.

Since virtually every task can be broken down further into fine grained subtasks, it was not an easy task to decide how much to break down each part of the process into job-steps. To remedy this, I searched for, found and used a rapid UML diagram creation tool (PlantUML) to create what resulted in one high-level and three low-level activity diagrams that describes the product/service development process (see Appendix "14.1 Product/Service Development Process UML Activity Diagrams"). I found this essential for the successful definition of what job-steps to include in the customer value model.

In comparison with the exemplified customer value model from the litterature (Image 9), the resulting process diagrams are much more complex, involving multiple constituents and several continuous parallel processes. Nevertheless, I started documenting desired outcomes and constraints, but quickly found it too overwhelming. There were too many job-steps across different constituents that I had limited insight into. I realized that I did not have the resources to capture the required user feedback necessary to discover the expected dozen or so outcomes and constraints related to each job-step. Instead, I decided to include qualitative

questions in the survey and ask the respondents questions about each job-step that hopefully would reveal some desired outcomes and constraints.

Lastly, I added two continuous processes to the customer value model that I had not managed to fit into the activity diagrams but instinctively believed Neamtime will help optimize:
- Understand what is vital for the completion of or value-adding to the products/services being developed and consciously strive to work only with such activities
- Spend time on value-adding open-source or R&D activities/projects that are not entirely/clearly demanded by client/manager/market in the moment but that most often turn out to be vital for the completion and value-adding for one or several projects later

I now had a customer value model filled with job-steps and realized that the segmentation would not be based on neither outcomes nor jobs, but on job-steps. This scenario was not mentioned in the literature, but since the job-steps in nature seem equivalent to outcomes and jobs, I deemed it sufficiently likely that it would work in the same manner and moved on to survey design.

6.11.4.2 Survey design

I designed the survey through a number of iterations following the ODI recommendations from section "6.11.2.14 Segmenting the market in practice" as best I could, until I deemed it be ready enough to administer.

The basic plan was to have a group of questions that would be repeated for each job step, including the two quantitative questions (importance, satisfaction) as well as the qualitative questions (to get insights into desired outcomes and constraints):
- Quantitative
  - How important is it to [job-step]?
  - When you are [job-step], how satisfied are you with the degree to which the internal and/or third-party tools/products/services you use today enable you to get the job done?
- Qualitative
  - When you are [job-step], how do you want to get the job done and how do you get the job done perfectly?
  - When you are [job-step], what prevents you from getting the job done, altogether or under certain circumstances?

In the first iteration, I realized that the question "How important is it to [job-step]?" could be interpreted from two perspectives, both from an organization-based perspective and a personal line-of-work-based perspective. In order to minimize variability in ratings due to different interpretations of this questions (and curious about what differences in results would be) I chose to include two questions to rate the importance: one from each perspective:
- For your organization, how important is it to [job-step]?
- For you personally, in your line of work, how important is it to [job-step]?

When using the activity diagrams to write the final list of job steps to include in the survey, I felt that I often wanted to include variations of the same job step in order to see differences based on different constituents, possible process variations and the underlying purpose of the job-step in specific instances. For example, I hypothesized that the job step "Report time" might get rated differently if the purpose was to report time internally within the organization or externally to clients. All in all, I ended up with a list of over 40 job steps including various variations on the same underlying job step found in the activity diagrams.

As soon as I started to enter the questions into the survey creation tool (Typeform), I realized that I needed to make the survey shorter and less repetitive. Rating each job-step would probably take at least a minute, and with over 40 job-steps, the survey would take way too long to complete. Even the effort required to produce over 40 question groups in the survey tool seemed daunting.

I need to make a tradeoff: fewer job step variations examined versus a tolerable survey completion time and chose to only include those job steps for which Neamtime was most likely to help get the job done well. I managed to settle on including what I believed to be the 7 most strategic job steps. After all, I was more interested in verifying that the outcome-based segmentation methodology is applicable than I was concerned about mapping the domain in the greatest detail. The differences within these 7 job steps would still provide enough strategical insight into possible market segments and help prioritize features for product development.

After ending up with a short enough survey hopefully to warrant a high completion rate, I continued to want some insights into what surrounding job steps the respondents worked with, and thus created a multiple-choice where they could choose which of the presented job steps were part of their line of work. The maximum choice limit set by the survey tool mandated a minor filtering of the job step variations until I ended up with 26 job steps in the question.

I added some organization profiling questions, tried out the survey on a couple of colleagues and after a couple of iterations of tweaking and personally trying out the finished survey myself, I was ready to administer the survey to the respondents.

6.11.4.3 Administration of the survey

A great matter of concern was how I would be able to get enough survey respondents. New to survey administration, faced with a large global service/product development market to target, and without any existing customer base nor the resources of a larger corporation, I was initially rather clueless of how to construe a cost effective way to get the relevant responses.

I decided on two survey response gathering methods:
1. Invitations across my personal network of professionals
2. Crowdsourced personal recommendations

Only a handful of my network's professionals responded. However, those who did gave me valuable feedback on the survey design, including noticing a few mistakes that I could correct before requesting crowdsourced personal recommendations.

I used a popular crowdsourcing platform to reward $0.5-$2.0 per person that would personally recommend someone they knew that developed products/services to take the survey. I activated 100 $2-rewards, limited to workers in the countries with the highest Gross Domestic Product (GDP) levels, and 100 $0.5-rewards to workers globally.

After one week, I had a total of 183 responses with an average completion time of slightly over 11 minutes per respondent This equates to approximately 35 man hours spent by respondents taking the survey. A quick informal sifting through the qualitative answers gave the impression of a rather high portion of quality results. I moved on to analyze the results.

6.11.4.4 Cleaning of survey responses

Actions taken for cleaning and removal of fraudulent responses:
1. Removed my own test response
2. Removed a couple of responses that looked like early drop-outs
3. Rated the remaining responses based on how nonsensical or fraudulent they seemed to be
    a. Removed straight-liners (those that seem to have responded the same on all questions)
    b. Removed duplicates (same person had already responded more thoroughly earlier)
    c. Removed those that seemed computer-generated (qualitative answers had nonsensical texts)
    d. Removed those that obviously made no sense
    e. Classified those without or with minimal qualitative answers but quantitative answers as "No qualitative but likely OK"
4. Decided to only keep responses that I had rated "OK" or "No qualitative but likely OK"

After basic cleaning and removal of fraudulent responses, the survey yielded 144 responses (6 from personal network, 138 from crowdsourced personal recommendations).

6.11.4.5 Quick survey response observations

There was, as I had hypothesized, a difference in importance ratings based on the personal and organizational perspective. Curious about the difference in results based on the asked perspective, I decided to maintain two parallel tracks of quantitative analyses by calculating two parallel opportunity scores, one for each perspective.

On a site note, I had been worried that the survey would be considered straight-through time-consuming, boring and/or repetitive, but a surprisingly large number of respondents (around 30 out of 144) commented in the survey feedback section that they had a enjoyed the survey or found it interesting (the more elaborate qualitative feedback is available in the appendix under "14.2 Qualitative survey feedback from respondents").

6.11.4.6 Quantitative statistical treatment of the survey responses

In order to facilitate programmatic treatment of the survey results, I relabeled the job step question groups as shown in Table 12 below.

Table 12: Identification of job step question groups with labels Q1 to Q7

Label	Job step question group
Q1	Improve the product/service development process
Q2	Ensure project/assignment/goals/invoice/deliverables match each other
Q3	Handle situations where you are not satisfied with the work that has been done by employees or contractors
Q4	Report time
Q5	Create time reports/invoice statements to send to clients
Q6	Review time reports
Q7	Improve existing time reports that were too hard to understand

For the purpose of clarity, I have only included the images resulting from importance ratings from the personal perspective importance ratings (see "6.11.4.2 Survey design"). The corresponding resulting images with opportunity scores based on the organizational perspective is available in the appendix ("14.3 Quantitative results - Organizational perspective") and is mentioned in section "11.3.1 Survey design".

Using the opportunity algorithm with the percentage-based definitions on importance and satisfaction ratings from the literature, I set out to calculate the importance rating, satisfaction rating and opportunity scores for each of the seven job steps.

I noticed that some respondents had not rated some of the job steps' importance or satisfaction. How to handle such cases remains unclear after seeking guidance in the literature. Those that did not rate importance or satisfaction for a specific job-step were either unfamiliar with the job-step, or tired of responding to more survey questions. Since I had included a comment in the introduction of each job step that said "If you are unfamiliar with this job/topic, feel free to skip subquestions a to e below and continue with the next job/topic", I chose to interpret missing ratings as unfamiliarity.

I could assume that if the respondent does not experience the job-step in their line of work, they are unlikely to find it important, and are probably satisfied with the situation. However, interpreting missing values in importance rating as "not important" and missing values in the satisfaction rating as "satisfied" would result that the job steps that were unfamiliar to the respondents appears more overserved. I decided it would be best to not let missing values skew the ratings in either direction. Instead, I excluded the responses with missing ratings

and calculated the percentages based on the number of respondents that were familiar with the job step.

Since the aspect of familiarity though clearly has significance, I assigned each job step an "Unfamiliarity" value, which I defined as the negative value of how many respondents had not rated either the importance or satisfaction of the job step. I decided that this approach was the safer strategy since my current goal was to identify the job steps that were both overserved and underserved.

I plotted the job step importance and satisfaction ratings on top of the market opportunity landscape (Image 14) in order to easily identify underserved, overserved and unfamiliar job steps visually (the smaller the dot, the more unfamiliar).
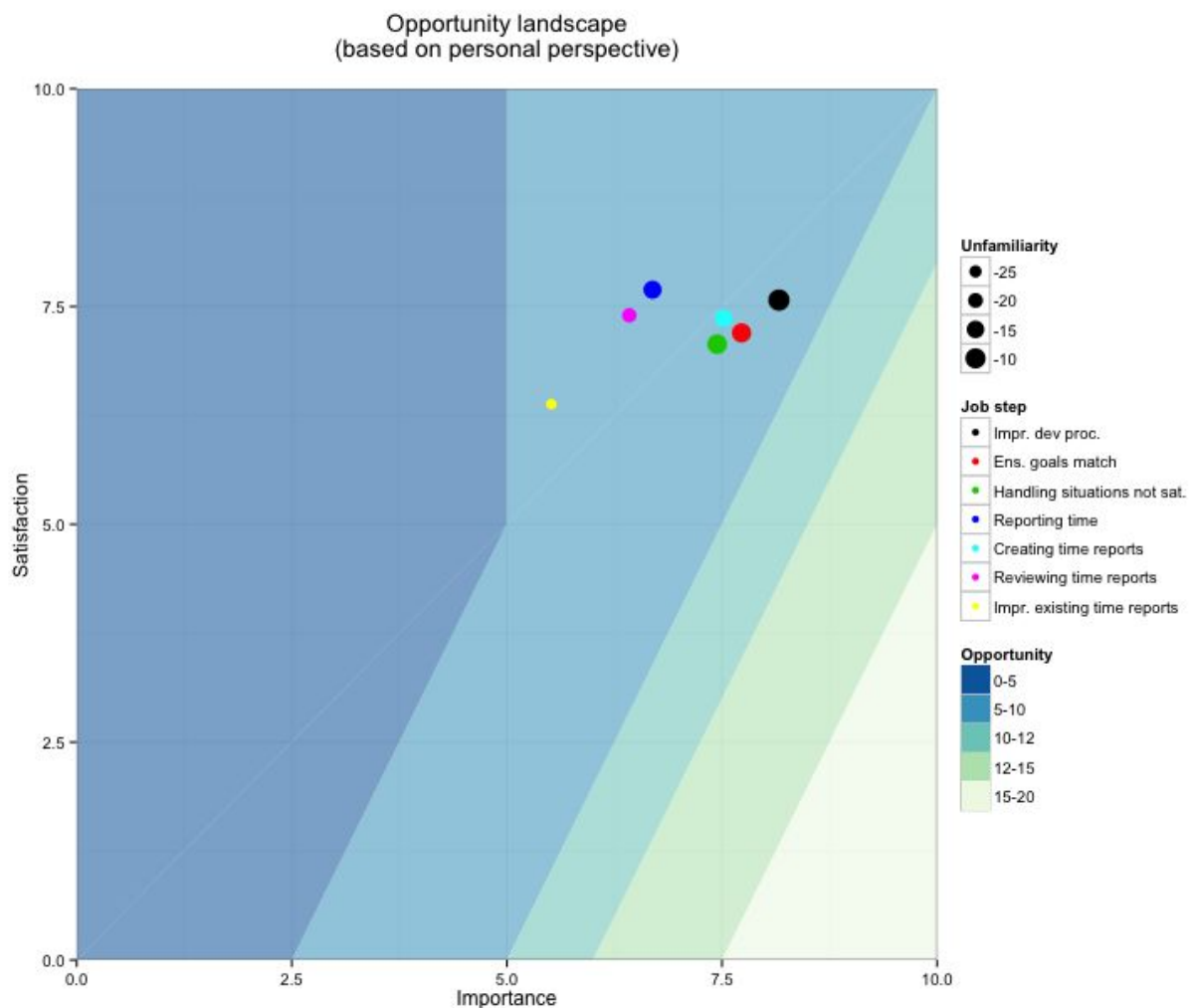

Image 14: Job step opportunity landscape (based on personal perspective)

Next, I attempted to cluster the respondents into segments of opportunity as advised in step 7 in "6.11.2.13 Finding segments of opportunity in practice" in the theory section above.

6.11.4.7 Problems encountered when attempting to cluster the survey responses

I soon found myself not being able to continue with the clustering process until I had been able to answer the following questions:

1. Would principal component analysis (PCA) yield representative results, despite the literature recommending factor analysis? (I was more familiar with PCA and had never attempted factor analysis)
2. How is the respondent-based clustering performed when the opportunity scores includes percentages of the population? (An algorithm that would support this seemed out of reach for my abilities since the most common non-hierarchical clustering methods are incompatible with this definition)

These issues would not represent a problem for a statistician or a market researcher. However, in the perspective of an early-stage startup, a deep knowledge of statistics can not be expected. Without any publicly available examples of how survey respondent segmentation based on market opportunity score is done in practice, I invested too many hours in intense efforts of trying to understand the applicability of various statistical clustering methods and re-reading the instructions, trying to bring clarity to these points. A comparison between PCA and exploratory factor analysis (EFA) by Suhr (2005) seemed to suggest that PCA would yield very similar results, but I remained lost regarding the second problematic aspect.

I eventually consulted with a member of a professional freelancer network who had done loads of this type of statistical analysis during his PhD. A contracting process which itself was cost effective and speedy ($89 in total, 2 days for full delivery including discussions). Together, we concluded that the literature was "rather coy" on the matter. Based on his insights into the applicability of various statistical clustering methods, he brought forth the following clarification: "It seems that in order to identify different subpopulations that have different identifiable needs (i.e. they feel that something is important and are unsatisfied with the current situation), we must treat each respondent individually until the segmentation. I can't see how it's compatible to use the percentages to calculate opportunity and to use opportunity to segment the market. If we were to use the percentages definition of outcome-driven innovation, we would end up with only one value for each question in a single dimension, which isn't really amenable to either EFA or PCA. The literature could be clearer, but given the above it's quite clear that each respondent's individual responses are used." (Signolet 2015)

Together, we produced an open-sourced guide for outcome-driven innovation survey analysis which exclusively uses free tools for data transformation and statistical processing. (Signolet, Wollsén 2015) This guide was then used to perform the clustering of the survey responses below.

6.11.4.8 Clustering of the survey responses

As previously mentioned, not all 144 respondents had rated certain job steps. Since I did not know how to perform clustering when some respondents were unfamiliar with or simply had not rated one or more job steps, I decided to perform the clustering using only those respondents that were familiar with all job steps. This meant that the resulting segmentation scheme would not be able to find any market segments that were distinguished on familiarity. For instance, a market segment such as "those who did not know what [job-step] is" will not be present. After noting down this limitation, I continued with the clustering.

After excluding responses that had missing responses on any of the seven question groups, 96 responses remained. Using each respondent's individual importance and satisfaction ratings, I calculated individual opportunity scores for each question.

To get an idea of the nature of the distribution of the respondents' individual opportunity scores for each job step, Image 15 below shows histograms of their distribution (on the diagonal) as well as the intersection of each combination of the job step histograms.
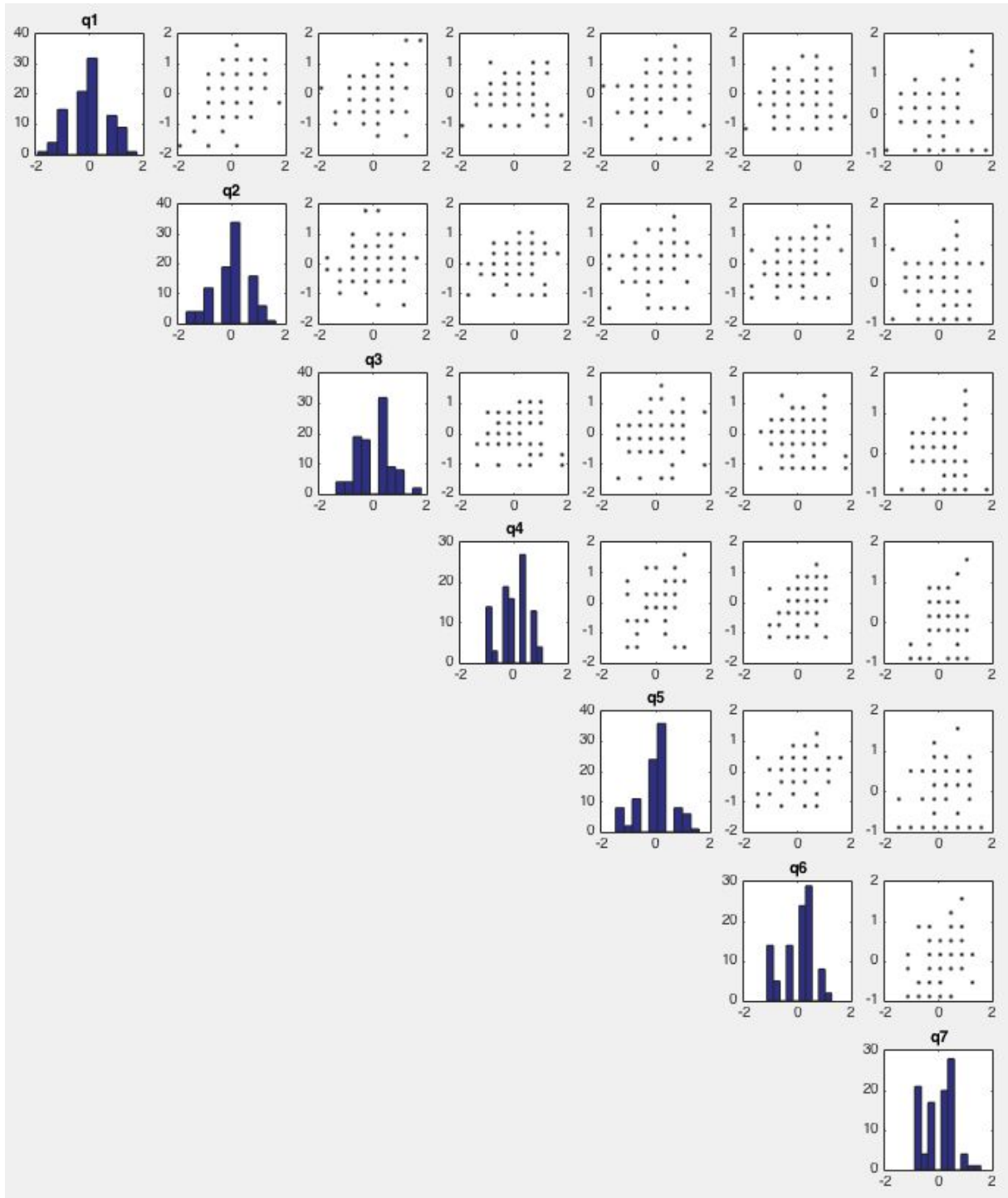
Image 15: The distribution of the respondents' individual opportunity scores for each job step

In essence, if a histogram is thin and tall, the respondents opportunity scores are rather similar. If a histogram is wide, the respondents value the job step opportunity differently. Since many histograms show a difference in such valuation, it is likely that there are underlying segments of opportunity that are waiting to be discovered. In contrast, if all respondents would be valuing all job steps similarly, an opportunity-based segmentation scheme would unlikely be effective.

Dimensionality reduction using PCA was performed based on the respondent opportunity scores vector. The explained variances of the principal components are shown in Image 16 below (for a discussion related to the explained variances, see "11.3.2 Improved statistical treatment of survey responses").
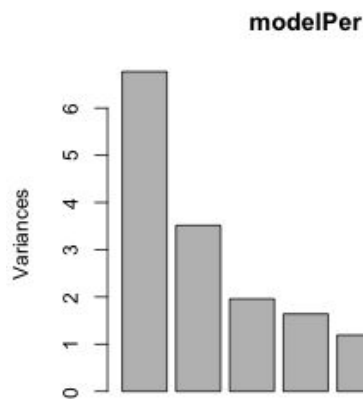
Image 16: Explained variances for each principal component

By plotting the first two components (Image 17), we can see that Q1-3 have similar loadings, and Q4-7 have similar loadings which are roughly orthogonal to Q1-3. This means that there are likely underlying segments that value these job steps differently. More respondents are valuing job step Q5 similar across the population than the other questions.
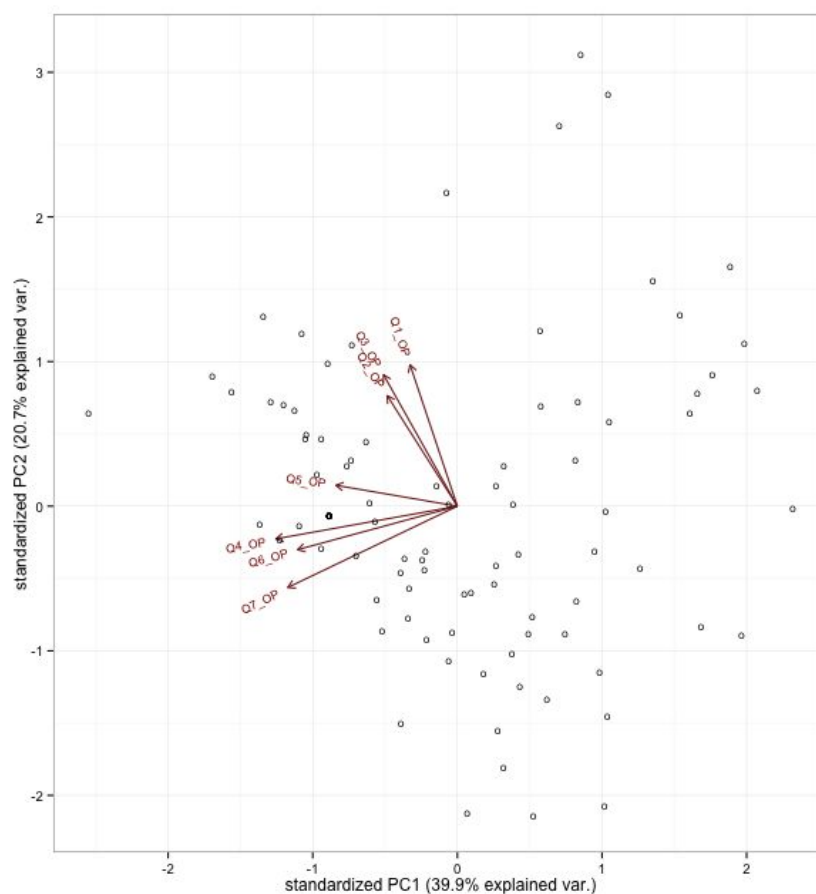
Image 17: A scatterplot of the two first principal components show how similar the job steps are valued by the respondents

I chose to use K-means clustering as it is an easily accessible non-hierarchical clustering method and thus likely that an early-stage startup will be able to learn to use it without having to rely on repeated hiring of statisticians.

To determine the number of clusters, I used the "bend in the elbow" method of plotting the Within groups Sum of Squares (WSS) against a number of clusters from 1 to 15. K-means clustering uses a random seed, so I repeated this calculation 100 times and took the average for each number of clusters. This results in a line graph showing the marginal differences in opportunity scores across all job steps per cluster, depending on how many clusters the respondents would be divided into. The more clusters, the less marginal differences in opportunity scores. A balance can thus be struck by noting where the "elbow" is in the resulting graph. A good amount of clusters is found where the marginal differences start flattening out. The results are shown in Image 18 below.
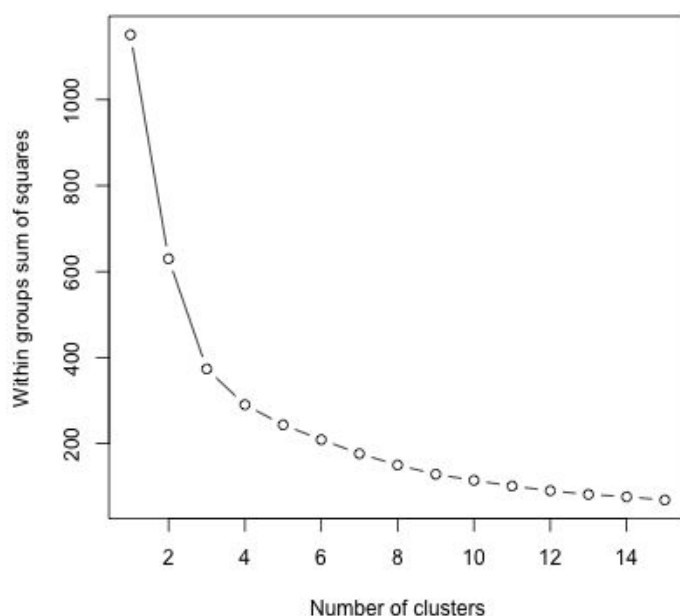
Image 18: Plot from which I determined the number of clusters using the elbow-technique

The bend in the WSS plot suggests 3 or 4 clusters is optimal. I tried out both variants and chose to use 4 clusters since it seemed to identify a valid identifiable market segment. That is, at first I simply chose 3 and went on to perform further analysis. Later I experimented to see if 4 clusters would make more sense intuitively, and that was the case.

The K-means clustering was performed based on the first two principal components so that the resulting clusters can be easily visualized in a two-dimensional scatterplot. The cluster division for 4 clusters are shown in Image 19 below. We see that the clusters are not too uneven in size.
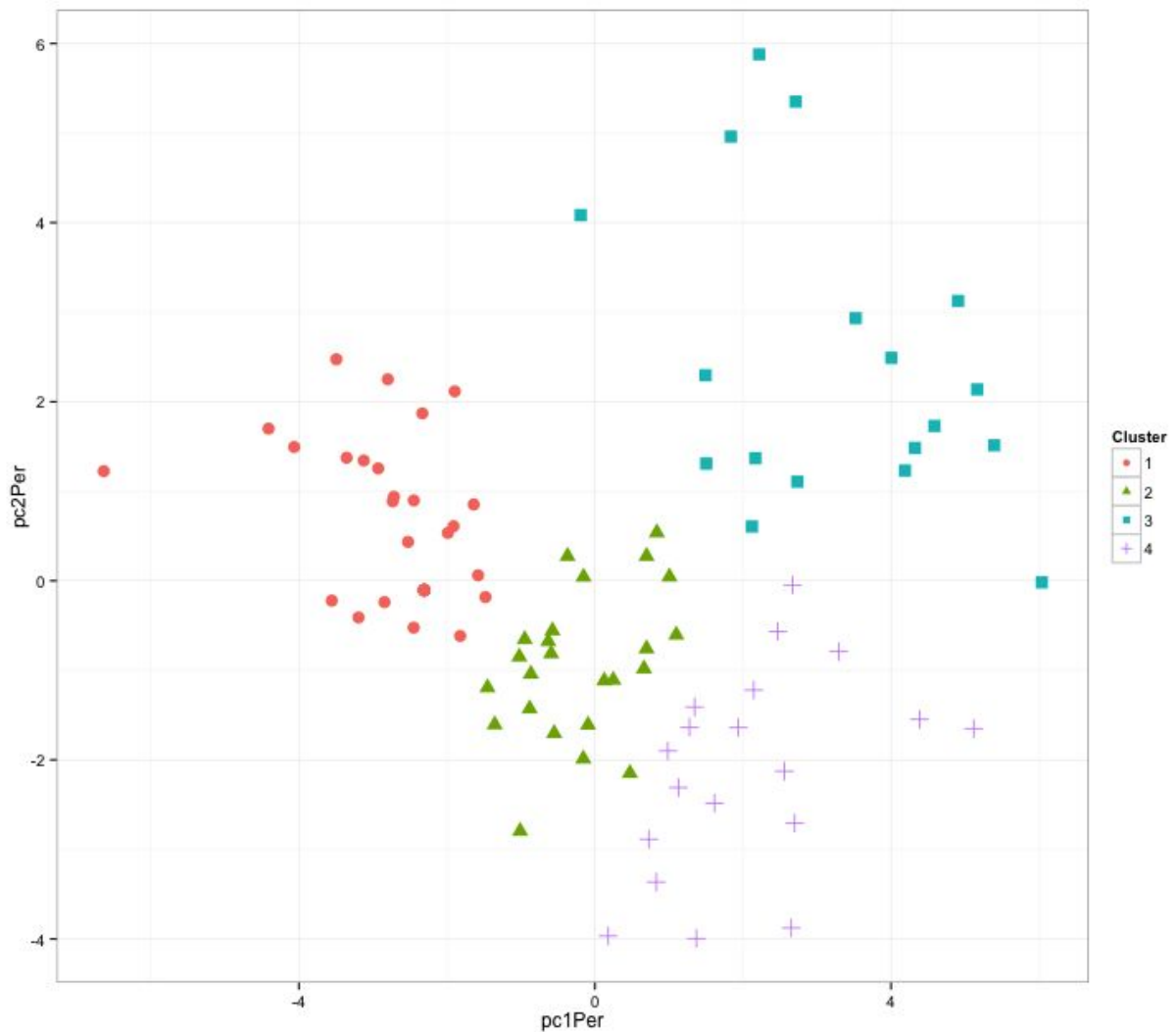
Image 19: The resulting 4-cluster division from a K-means clustering based on the first two principal components

6.11.4.9 Margins of error

In this particular study, a rather low sample size was used. This means that the results may have to be treated as directional instead of statistically significant, especially within the clusters. An overview of error margins when using a large population and a confidence level of 95% is shown in Table 13 below. A large population was chosen since these samples may represent a significant population world-wide. Specifically, a population size of 1000000 used.

Table 13: An overview of error margins when using a large population and a confidence level of 95% (SurveyMonkey)

Sample	Sample Size	Margin of Error
Cluster 1	35	17%
Cluster 2	24	20%
Cluster 3	18	23%

Cluster 4	19	23%
Unclustered	96	10%

I reason that the small sample sizes is not a major issue when it comes to evaluating the applicability of opportunity-based segmentation since it only affects the reliability of the resulting figures but not the core practical implications of performing the segmentation. For the sake of being able to trust the results in a higher degree, for instance in the perspective of my company's information needs, it may however be relevant to complement with additional survey responses to get a more reliable report.

6.11.4.10 Resulting visualizations

Then, I calculated the cluster-specific job step importance and satisfaction ratings and plotted them as shown in Image 20 below.
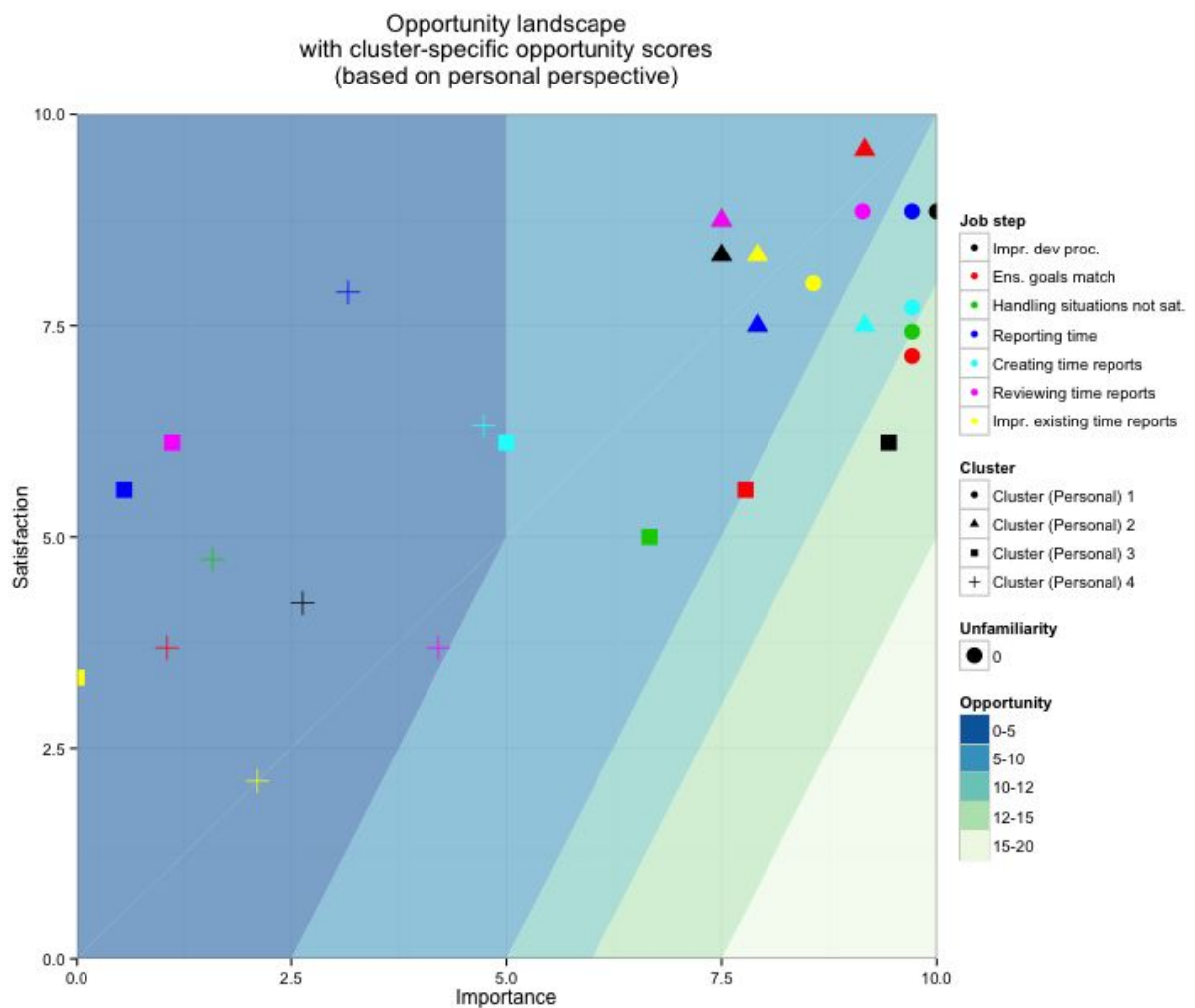
Image 20: Opportunity landscape with cluster-specific opportunity scores (based on personal perspective)

Lastly, I visualized how the respondents answered the profiling questions cluster-wise, shown in images 21 and 22 below. By displaying the response summaries visually next to each other, we are able to draw conclusions about the different characteristics of the respondents in each cluster and as such arrive at our segmentation scheme.
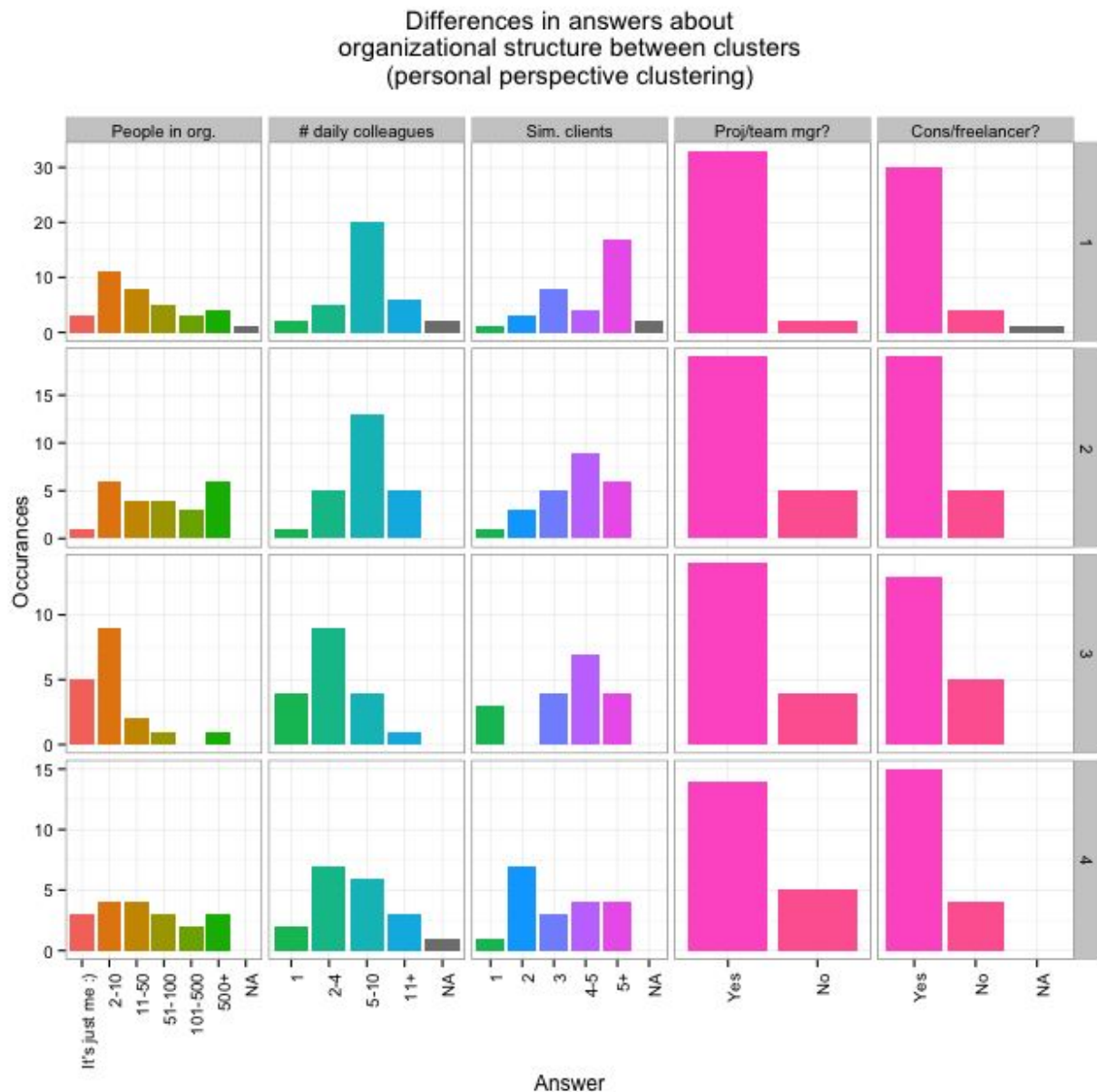
Image 21: Differences in answers about organizational structure between clusters (personal perspective clustering)

Image 22: Differences in answers about what is part of respondent's line of work between clusters (personal perspective clustering)

6.12 End of the action phase

There was no more room for additional actions as part of the research, and instead I began the phase of reflective sensemaking (resulting in the production of this thesis).

Armed with a better market insight, I was more certain that additional development tasks would add value to the later release MVHE, and thus in parallel to the sensemaking efforts I engaged in 52 hours of product development after which I had reached an important milestone: the core features became finished enough to be able to send a new round of invoices to my clients and thus the foundation was laid to be able to use Neamtime continuously for periodical invoicing. After this, I spent 26 hours on implementing a rough version of the "Improve Time Reports" feature in Neamtime, which I used to produce the actions table in section "5 Actions".

7 Analysis of ODI results

7.1 Overserved and underserved market opportunities

The landscape without clustering (Image 14) tells us that the overall market for the analyzed job steps are appropriately served, even slightly overserved. Furthermore, the job-step that respondents were most unfamiliar with was "Improving existing time reports".

The landscape with clustering (Image 20) reveals several opportunities, as shown in Table 14 below.

Table 14: Identified opportunities for Neamtime based on opportunity scores

Outcomes and jobs with opp. scores...	Job steps	Significance
greater than 15	<none>	represent extreme areas of opportunity that should not be ignored
between 12 and 15	Cluster 1: Ensuring goals match and Handling situations not sat Cluster 3: Improving dev processes	can be defined as "low-hanging fruit," ripe for improvement
between 10 and 12	Cluster 1: Creating time reports, Reporting time, Improving dev processes Cluster 2: Creating time reports Cluster 3: Ensuring goals match	are worthy of consideration especially when discovered in the broad market

Furthermore, cluster 4 consider the studied job steps to be unimportant, and is especially overserved for "Handling situations not sat" and "Ensuring goals/deliverables match".

7.2 High-level identification and profiling of the unique opportunity segments

Cluster 1 represents a segment of product/service developers that are mostly consultants and managers in smaller organizations with around 5-10 colleagues, working with a wider range of clients simultaneously.

Cluster 2 in turn represents a segment that is similar to segment 1 above but with a bit fewer clients, have fewer tasks in their line of work, are less likely to receive time reports (will still review time reports) in their line of work.

Cluster 3 represents a segment of those that are juggling many tasks at the same time and working in smaller organizations (smaller teams or by themselves), are less likely to be

managers/consultants and are more likely to spend time on monitoring projects to stay on track, value-adding R&D-activities and strive to only work with value-adding activities.

Cluster 4 represents a segment that have a smaller variety in the tasks of their line of work, work less contractors at all and do not spend time on R&D-activities.

7.3 Strategic implications

7.3.1 Marketing strategy

An abundance of insights seem to be offered, having implications on effective targeting, positioning and messaging, including:

- Smaller organizations are much more likely to be interested in tools that allows them to improve development processes and should therefore be approached with appropriate messaging.
- Those that do not work with contractors nor spend time on R&D-activities should until further notice be excluded from marketing efforts since they are not likely to to be interested anyhow.
- Features that help consultants and managers with job steps related to time reports should be used when messaging consultants and managers with around 5-10 colleagues, working with a large number of clients simultaneously.

7.3.2 Long-term product strategy

The appropriate product strategy (see "6.11.2.11 Visually identifying the correct strategy to address a market or segment") to approach segment 1 is a mixture of breakthrough and sustaining innovation, implying that Neamtime should introduce a new product as well as add features to help get <u>more</u> job steps done better by the members of this segment. For segment 2, it is sustaining innovation, meaning that Neamtime should add features to help get more job steps done by the members of this segment. For segment 3, product improvement strategy, suggesting to add new features to get the job steps done better. For segment 4, disruptive innovation, meaning that it would be wise to devise a lower cost solution to get the job steps done worse by the members of this segment.

7.3.3 Short-term product strategy

Based on the given insights, it seems relevant to initially focus on completing the features related to time reports, finish the previously planned minimum viable habit engine and simultaneously target segment 1, i.e. consultants and managers with around 5-10 colleagues, working with a large number of clients simultaneously.

7.3.4 Overall company strategy

There seems to lite an opportunity regarding ensuring that more value is delivered throughout the customer's development processes. If Neamtime can offer a new product and approach to get the job steps done significantly better, a breakthrough concept through Neamtime may be viable. However, the job step market opportunities were not discovered in the broad

market, suggesting that Neamtime will not be widely adopted on a global scale. In other words, in order to create a breakthrough product/service with global-wide adoption, it is important not to spend time on Neamtime-specific activities that may not bring me closer to that goal. While a natural next step at this point is to continue following the outcome-driven innovation process (sizing the market opportunities, conducting competitive analysis, formulating innovation strategy, formulate pricing strategy, define the solution, evaluate the solution, and finally position the solution), investigating higher and lower level jobs, outcomes and constraints related to Neamtime, as well as investigating other startup seeds and ideas should be considered moving forward.

8 Discussion

In this section, I discuss the impact of my findings in the perspective of my previously stated purpose with the research. Ultimately, this should explain how I reached my final conclusions.

8.1 Observed high level aspects of the investigated methodologies

8.1.1 Growth Hacking

During my attempt to adopt growth hacking, it felt like it was more about monitoring effects of marketing effects than to gauge the chances of success different startup seeds had in comparison to each other.

No growth hacking can make a helpless product successful. Andy Johns, a founding member of Facebook's original growth team, states: "You can't sustainably grow something that sucks. No story (no matter how compelling), no inception (no matter how well-implanted), no on-boarding experience (no matter how brilliant) makes up for a product that doesn't add lasting value to the people who use it." (Kaplan 2014)

It seems that while growth hacking provides the mindset that helps organizations to experimentally evaluate whether or not particular actions had a positive impact, strategic insights will more likely than not shine with its absence.

However, as was shown later, the growth hacking mindset lies at the cornerstone of lean startup innovation accounting. There is also testimony of growth hackers successfully adopting other methodologies, including The Hook Model. (Adhiya 2015)

It may be fair to conclude that while growth hacking on its own is not a methodology that allows an early-stage startup to make core strategic decisions, it may very well be wise to learn the ins and outs of growth hacking in order to leverage the usefulness of other methodologies, especially for later stage startups.

8.1.2 The Lean Startup

In contrast to the initial promise of The Lean Startup being a scientific approach to create startups (see "6.3.1 Initial promise"), I found the methodology strongly biased toward startups with existing products.

In retrospect, I realize that the underlying more important factor is the bias toward having a single hypothesis to test at a time. When there were multiple hypothesis to test, the methodology suggests to try out the riskiest assumption first, validate/invalidate it and then either choose to pivot or persevere before trying out another hypothesis.

During my attempts, I quickly reached an overwhelming amount of falsifiable hypotheses to test. The amount formally exploded when considering hypothetical target markets, possibly marketable features and possible price points. Depending on how detailed the hypotheses could be and still be called a leap-of-faith assumption, I could easily jot down any number

between around 5 and hundreds of relevant hypotheses per startup seed. Attempting a Build-Measure-Learn feedback loop for each hypothesis would not be feasible, but more importantly: The Lean Startup methodology did not offer much insight in how to pick out the riskiest assumption when faced with a large number of assumptions to try out.

In summary, I found that The Lean Startup methodology has limited applicability for startups that have trouble to decide which hypotheses are the riskiest.

However, indirect exercises that required me to evaluate the product from external perspectives (without actually getting in front of the customer) was observed to result in a lot of useful insights. Despite technically being classified as unvalidated learning, the instinctive insights led to the ability to take number of strategic decisions. Thus, attempting The Lean Startup briefly may lead to significant indirect positive consequences and may even be recommended for some early-stage startups.

8.1.3 The Hook Model

I had not expected that the adoption of The Hook Model immediately would result in a greatly improved product development plan. In essence, I had but briefly touched down in for me a new branch of psychology: habit formation.

My conclusion from this limited experience was that while not offering practical advice on how to assess the market per se, habit formation literature offers tools necessary to assess critical aspects of the human mind, which, in plural, the market consists of.

Presumably, innovators and early-stage startups could very well find better innovation, product, sales and marketing strategies simply by educating themselves in the basic fields of psychology. While this is nothing new in general (it is but a version of the proverbial "The more you know…"), the surprisingly immediate positive side-effects of applying The Hook Model during this research warrants a special recognition.

8.1.4 Outcome-Driven Innovation

8.1.4.1 Applicability

Outcome-driven innovation was the only tested methodology that was feasible enough to try out that it actually delivered actionable results based on market feedback.

For this, ODI deserves a recognition as the most suitable methodology for startups in such early stages as those of my startup efforts. That is, out of methodologies that I am aware of after quite significant search and evaluation efforts.

I observe that the resulting advice allows me to formulate seemingly better hypotheses and take seemingly well-informed decisions in a larger number of strategic areas than I was able to do before, without having to resort to alarming amounts of guess work and product development as was the case with Growth Hacking and The Lean Startup. I feel confident that however correct the advice is shown to be later on in my particular case, the variability of repeated outcomes is lower now than if I had only access to the other methodologies. In other

words, if a million startups would take part of a giant A/B methodology testing experiment, where half of them would be introduced to popular startup methodologies in general, and the other half would be introduced to outcome-driven innovation, my hypothesis is that a significantly higher portion of startups would scale into large companies in the latter group.

I also want to place special recognition to another positive aspect of outcome-based segmentation methodology, namely scalability. The quantitative survey-based methodology is highly scalable. Surveys like this can, thanks to its standardized design, be administered and analyzed automatically, allowing early-stage startups to try out hundreds or thousands of hypotheses every week.

8.1.4.2 Origins

Suspecting, again, that I had but briefly touched down in for me a new branch of research, I explored the origin and purpose of ODI.

Ulwick (2005) frequently cites Christensen (Christensen, Raynor 2003) who made the Jobs-to-be-done (JTBD) concept popular. The defining characteristic of the JTBD approach is that "the job, not the customer, is the fundamental unit of analysis for a marketer who hopes to develop products that customers will buy."

Strategyn, the company of which Ulwick is CEO, state that their initial inspiration for their choice of methodology was what Theodore Levitt said in the 1960s, "people don't want a quarter-inch drill, they want a quarter-inch hole." His point was profound: people buy products and services to accomplish a task or achieve a goal. (Ulwick, A. & Strategyn 2013)

They also state that making the "job" the unit of analysis makes it possible to think differently about all aspects of strategy and innovation, and that he has been transforming jobs-to-be-done theory into practice since 1991.

The fact that Christenssen popularized a concept that reportedly Ulwick had been working on for over a decade did not make sense until I noticed that Ulwick's initial publication (Ulwick 2002) focused entirely on outcomes (instead of solutions), but did not include the concept of "job" or general JTBD line of thought.

It is fair to suggest that Ulwick in 2005 officially merged the JTBD approach with his already well-developed outcome-based methodology, called it outcome-driven innovation and defined its purpose as "to transform jobs-to-be-done theory into practice". Since I found great value in the fact that ODI was possible to try it out in practice, I hypothesize that JTBD on its own as popularized by Christensen would not be such a suitable methodology for an early-stage startup to get actionable insight from using customer feedback. Possibly, the concept of the needs-based innovation process presented in ODI explains the majority of experienced utility.

8.2 Deconstructing the schools of thought - Explaining the root cause of inapplicability

A simple explanation for the inapplicability of Growth Hacking and The Lean Startup may be that they stem from a more traditional innovation mindset.

In 2011, Eric Ries combined Customer Development with Agile Development and Lean Manufacturing principles to create the Lean Startup methodology. (Marmer et al. 2011b)
The agile manifesto was published in 2003, while Lean Manufacturing and Customer Development methodology was popularized in the mid 1990s.

In essence, The Lean Startup added the iterative feedback loops on top of a traditional manufacturing process optimization methodology, added customer feedback requirements and called it an innovation process. Supporting this is the fact that the build-measure-learn feedback loop in is practice the same as the traditional innovation process (see 6.11.2 Theory - Outcome-Driven Innovation), except that instead of going through it once during a longer time period, the point is to go through it as fast as possible, rinse and repeat endlessly, faster and faster.

Manufacturing, however, seem inherently differently from innovation, especially in the aspect of that manufacturing requires some sort of factory or production unit to even materialize. This may be the root cause to why the methodologies are hard to apply for early-stage startups: they are lacking a powerful factory enough to falsify their leap-of-faith assumptions at a high enough pace.

JTDB and ODI, on the other hand, seem more in line with the core concept of "true" innovation by stressing the importance of understanding what truly matters to users, with or without a factory. In retrospective, I noticed that the same underlying principle is mentioned by Eval regarding The Hook Model: "Only by understanding what truly matters to users can a company correctly match the right variable reward to their intended behavior." (Eyal, Hoover 2013) Incidentally, I found high utility in the application of both ODI and The Hook Model.

The main difference between methodologies that were applicable and those that were not seem to be whether or not innovation should come from on one hand manufacturing and experimentation, on the other hand needs-mapping and strategic planning. I found that a needs-based methodology offers higher levels of utility when it comes to core innovation efforts.

8.3 Implications

I experienced an example of dangers of adopting a manufacturing-based innovation processes during my Growth Hacking Attempt, where I unconsciously had discarded all other startup seeds except for Markerchase, due to the fact that it had the furthest developed product. However, Markerchase was later dropped in favor of much higher potential startup seeds. Similarly, a startup founder that has hundreds of business ideas and chooses to build

an MVP on the one that he instinctively feel is the one that has potential may "lock-in" on the one with the MVP without considering the other ones well enough.

This goes in line with my past experiences where I was part of a startup team with a great development and management team (the "factory") but without much thought into what jobs we actually were trying to help our users achieve. The startup received $600k in investments during two years based on the premise that we would build beautiful minimum viable products and pivot if traction was found to be low. This plan was executed, and three pivots were accomplished during the course of two years, Eventually, the startup ran out of money without being able to attract enough users to sustain the rather vague business model. The critical aspect here however was how we constantly had this gut feeling that we were not building something that was useful enough, but continued development efforts in order to follow the methodology and milestones set forth by our investors. During the course of two years, we performed not a single market research study and never put any substantial efforts into actually figuring out what our users were trying to achieve. In light of these new perspectives, it seems that the investors had invested in the manufacturing process, and not the innovation process.

Ulwick (2005) states that "Most companies don't know which product and service concepts will be winners and which will be failures. As a result, managers feel compelled to cover all the bases; they initiate hundreds of development efforts, spread resources too thin, and are reluctant to kill projects already under way - all of which creates inefficiencies in innovation."

Analogously, most startups don't know which product and service concepts will be winners and which will be failures. However, if they believe that they can only execute on a single product or service concept at a time, they will probably stick to the one that their instincts feel to be the one with most potential. With the general advice being "Just do it", startups will often start building their minimum viable products without performing an adequate investigation of user needs, target markets and overall innovation strategy. Within a manufacturing-based innovation process, all of those things will eventually become evident based on customer feedback later on. On a larger perspective, where we consider many startups independently working on their own product and service concepts, this leads to an increased variability in the overall innovation process. No wonder that investors feel compelled to cover all the bases; initiate hundreds of development efforts, spread investments too thin, and are reluctant to kill investments already under way - all of which creates inefficiencies in innovation.

On a personal perspective, this means that the startup founders may risk wasting thousands of work hours while working with a deficient amount of resources simply because investors still have a manufacturing-based view of innovation.

Based on this reasoning, I suggest that a startup community wide change of mindset from manufacturing-based methodologies such as The Lean Startup to needs-based methodologies such as Outcome-Driven Innovation will minimize the startup innovation-process variability and increase startup efficiency dramatically on a global scale.

9 Summary of findings

In the section I summarize the applicability of the evaluated methodologies.

Summary of direct findings:

- Many startup methodologies assume that a minimum viable product (MVP) is already in place or can be built with extremely little effort.
- Popular methodologies such as Growth Hacking and The Lean Startup has limited applicability for early-stage startups who are yet to launch an MVP of their proposed products or services, as well as those that have trouble to decide which hypotheses are the riskiest
- Most actionable insights acquired during the application of The Lean Startup at this early stage stemmed from the engagement in various exercises that requires the entrepreneur to evaluate the product from external perspectives, and not from external customer feedback
- seemingly high-quality actionable insights with direct implications for the product and marketing strategy of the studied early-stage startup
- Outcome-driven innovation delivered seemingly high-quality actionable insights insights based on market feedback, and exhibits qualities that makes it suitable for adoption for many early-stage startups attempting to release an innovation-based digital service on the market

Summary of indirect findings:

- Exercises that requires the entrepreneur to evaluate the product from external perspectives (without actually getting in front of the customer) is found to result in a lot of useful insights, despite technically being classified as unvalidated learning
- The Hook Model surprising usefulness for feature prioritizations suggests that early-stage startups could very well find better innovation, product, sales and marketing strategies simply by educating themselves in the basic fields of psychology.

Summary of direct advice to startup founders:

- If you are a startup founder who already knows how to build products and run startups, consider adopting needs-based methodologies in order to become a better innovator. Even a brief study of quality management, human psychology and "jobs to be done"-centric innovation literature may very well lead to dramatic improvements in your startup efforts.

10 Conclusions

In this section I briefly answer the emergent research question and state what I now can teach "the world" that I could not before performing this research.

The main difference between applicable and non-applicable methodologies was whether they were manufacturing-based or needs-based.

On the basis of discussed implications, I suggest that a startup community wide change of mindset from manufacturing-based methodologies such as The Lean Startup to needs-based methodologies such as Outcome-Driven Innovation will minimize the startup innovation-process variability and increase startup efficiency dramatically on a global scale.

11 Suggestions for further research

In this section, I suggest further areas of research which build upon my findings and that I deem likely to contribute to a better understanding of the research domain.

11.1 In general, perform research on startups

After a long period of searching for scientific publications that treat startups, I can conclude that the amount of research performed on startups is less than I expected. Startups are unique subjects for research, since unlike research and development departments within larger companies, startups are much more accessible. They often seek attention and exposure and share more of their insights, progress and goals than possible when acting under strict non-disclosure agreements prevalent in most larger corporations.

Also, to identify and understand failed innovation efforts, startups are unique by often leaving clear public information about past efforts, while failed innovation efforts within larger corporations often are well hidden from public scrutiny.

11.2 How much does the choice and basis of methodology predict startup success or failure

Marmer et al. (2011b) has with their Startup Genome Report offered important insights into what overall startup process works. By analyzing a larger sample of failed and successful startups, it is possible to devise what general processes are more successful than others.

Based on the implications discussed previously, i believe it would be beneficial to also include the use of methodology into such studies.

A possible hypothesis: If a million startups would take part of a giant A/B methodology testing experiment, where half of them would be introduced to popular startup methodologies in general, and the other half would be introduced to outcome-driven innovation, my hypothesis is that a significantly higher portion of startups would scale into large companies in the latter group.

Some methodologies are consciously chosen, some subconscious ("wisdom"). I suggest also including the aspect of conscious or subconscious methodologies, as well as aspects of the startup founders personality traits into such studies. Single-case profiling of startup founder mindsets and the effect on their choices within innovation also seem beneficial to investigate. In case it might be resourceful, I have provided the results of a Myers-Briggs-based personality test in the appendix under "14.4 My personality traits".

11.3 Further improvements and clarifications regarding needs-based innovation methodologies in practice

I recommend that more practical action research is performed regarding needs-based innovation methodologies in practice. Try it out in your company, write about it, share what worked and did not work. This way, we can refine the approach, the mechanics, the workflows of gathering customer data via survey instruments and overall utility.

11.3.1 Survey design

Some suggested areas of improvement regarding survey design:

- Investigate the implications of asking the importance and satisfaction based on different perspective (personally, for your friends, for your organization, etc)
- Evaluate how much insight into the customer value model can be devised based on qualitative customer survey feedback
- The effects of using a tabular format to compact the survey versus using a separate question for each rating
- The effects of including higher and lower level needs including possible survey design best practices to facilitate capturing ratings for similar needs without making the survey more repetitive

Also, I recommend investigating how best to treat missing responses and evaluate the concept of familiarity. When it comes to strategy, it seems obvious that a different strategy should be used in order to target segments that are unfamiliar with certain needs. If a market or segment only contains customers that are unfamiliar with a particular job step then they are not likely to respond to marketing efforts communicating how much better they will be getting that job step done, despite they would in fact be able to get higher-level jobs done better if they were introduced to the job-step or metrics related to the unfamiliar need.

A high level of unfamiliarity may also suggest that the customer value model is not accurate, or that the survey respondents are not part of an intended target market.

To study this, it may be advisable to include the following question in the survey, next to rating the importance and satisfaction of a need: "How familiar are you with [need]" or "Are you familiar with [need]" and then evaluate the utility of that information.

11.3.2 Improved statistical treatment of survey responses

In retrospective, I made some unofficial experiments regarding the statistical treatment of survey responses.

During the clustering, PCA was performed and then the first principal components were used as the basis of the clustering. However, these two components only together accounted for about 60% of the variance.

Skewness and the magnitude of the variables influence the resulting principal components. Thus, I applied skewness transformation, centered and scaled the variables prior to the application of PCA and re-ran the clustering. The result was a minor increase in explained variance, which can be explained by the fact that the responses were all being given on the same scale, 1-to-5.

On a side note, I also performed a PCA on the raw importance and satisfaction responses and saw that the explained variances if the principal components were a lot lower than when using the opportunity scores. This speaks in favor of opportunity-based segmentation in general.

The difference in explained utility when excluding versus including fraudulent responses was larger than that of applying skewness transformation, but not a major one (see below).
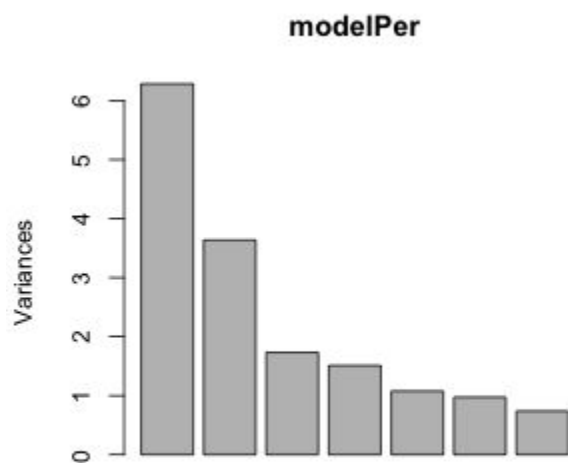

Image Appendix.1: Qualitative survey feedback responses that were longer than 25 characters in length

Minor improvements in explained variance suggests that another clustering approach may lead to a better clustering result, in if that clustering approach could take more variance into consideration.

An alternative clustering method that accounts for 100% variance is self-organizing maps (SOM) (Kohonen 1995)

Using SOM, a four cluster segmentation was also suggested. Out of the 96 respondents, 84 were assigned the same cluster as when clustered based on PCA. The resulting opportunity landscape is shown below.

Opportunity landscape
with cluster-specific opportunity scores
(based on personal perspective)
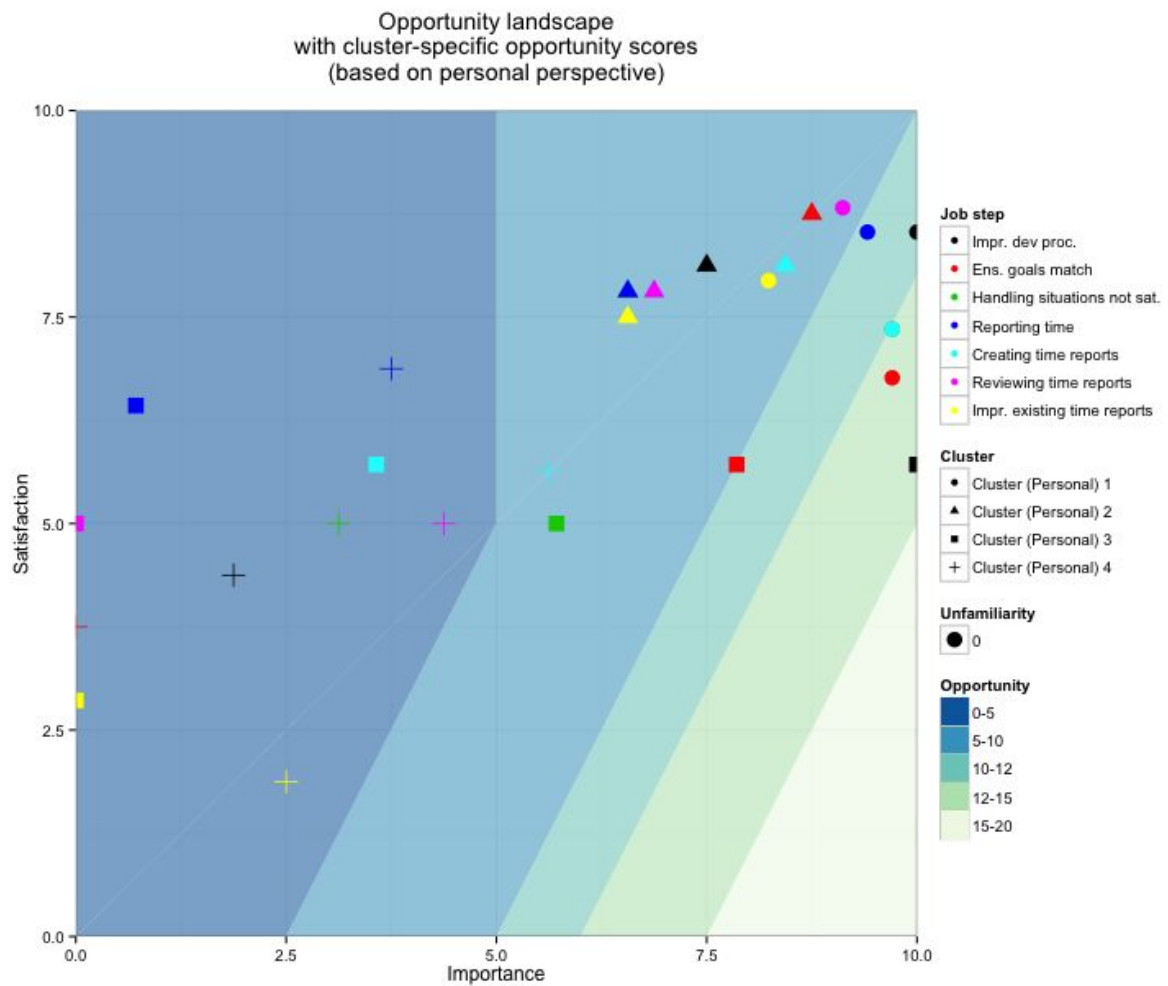
From a quick overview, it seems that while the resulting opportunity landscape is rather similar to the one generated from the PCA approach, the resulting profiles of each segment differs quite much.

Differences in answers about organizational structure between clusters (personal perspective clustering)
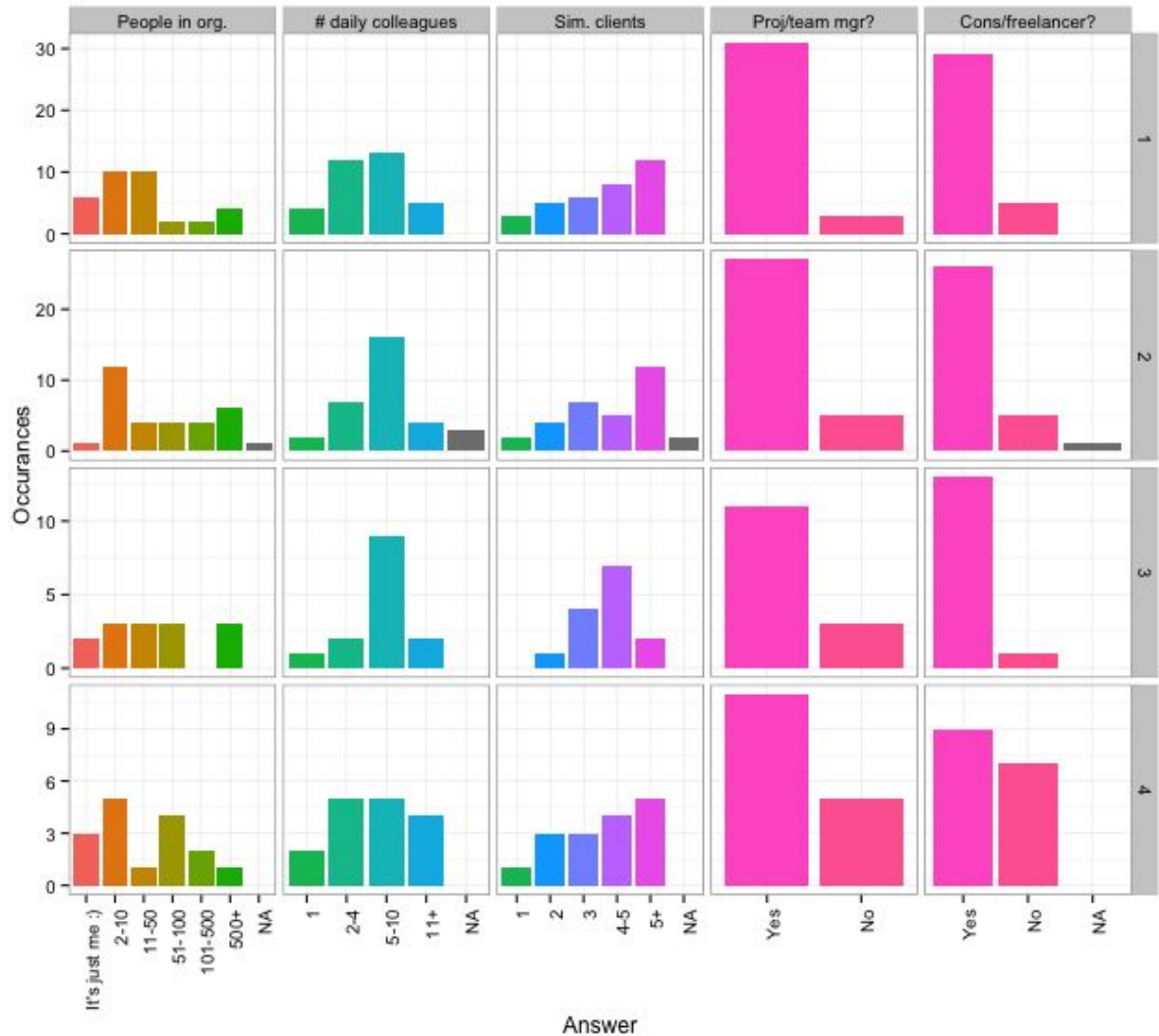
The resulting SOM-based clustering and PC projection is shown below for reference.
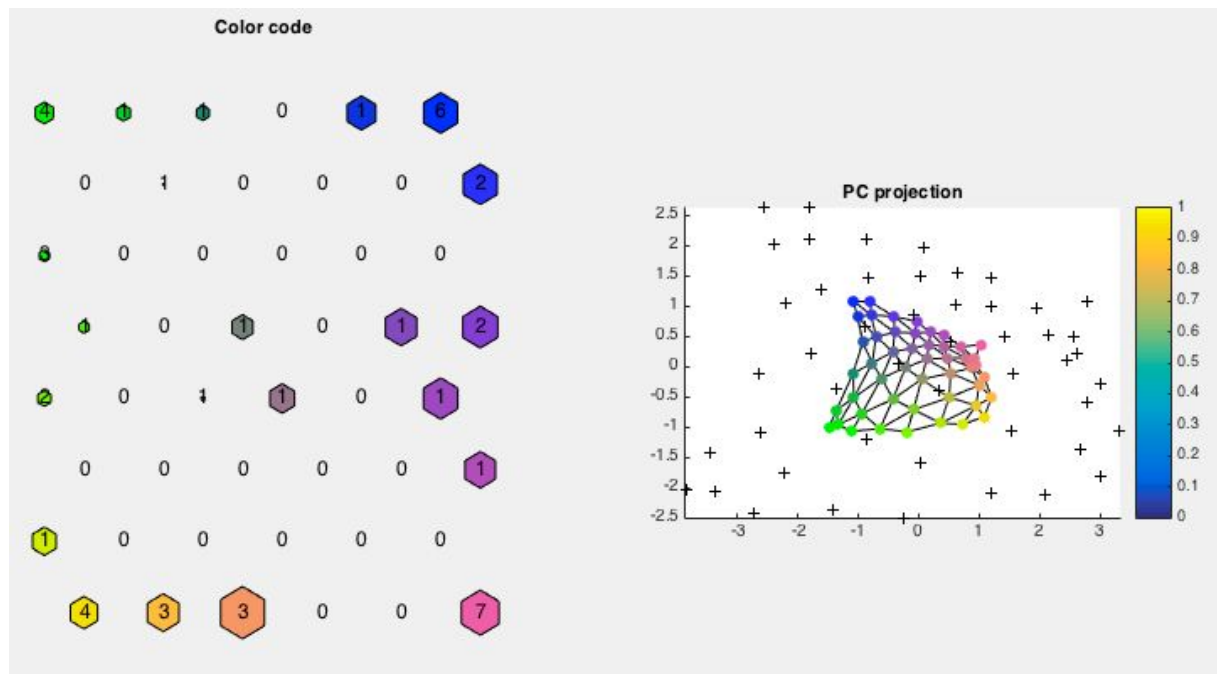
I recommend further investigation using larger sample sizes and a beforehand known market segmentation in order to evaluate the utility of various clustering approaches for opportunity-based market segmentation.

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11.4 Implications of applying JTBD and ODI to other domains

Lastly, I recommend evaluating the implications of applying JTBD and ODI methodologies strategically to other domains, such as User Interface Design / UX, Portfolio Theory and Psychology.

12 Epilogue - A road trip analogy

In hindsight, it appears that I have been deeply entrenched in a school of thought and values that led me to believe that manufacturing-based methodologies were the right methodologies for innovation. As it seems that this case is common throughout the startup community, I predict that a community-wide change of mindset will benefit the community as a whole. Why, then, do we still see startups following manufacturing-based methodologies?

To understand the applicability of the various methodologies, and possibly give insights into why needs-based innovation process is yet not the norm within the startup community, I'll attempt an analogy, inspired by Ries (CITE) analogy: "The Lean Startup method teaches you how to drive a startup - how to steer, when to turn, and when to persevere - and grow a business with maximum acceleration."

In this analogy, you and possibly a couple of friends are going on a road trip from coast to the coast with the sole purpose of paying surprise visits to a couple of friends that live somewhere along the way. The startup is, of course, your vehicle of transportation. Traditionally, horse and carriage was the only option for road trips, but you are living in modern times and choose to use a car instead.

Ries (CITE) talks about going through each of the Build-Measure-Learn feedback loops as a cycle in the startup engine, but the method of getting through the first engine rev and eventually starting that engine is still basically to run out front and crank it up, hoping that it will get up and running. Once it is up and running, The Lean Startup teaches you how to drive your car - how to steer, when to turn, and when to persevere - and achieve maximum acceleration.

Growth Hacking is your trip companion that always seem to be able to make the car go faster and faster.

You were expected to already have a car, and since you assume you know nothing about the road ahead, you have decided to improvise where you are going next instead of planning ahead. In the beginning of the road trip, you do not even know where your friends actually live nowadays, or if they are at home when you will arrive to their homes. You might never have driven a car before and be clueless about what the concept of roads, lanes and even "the correct side of the road" means.

Your education is your driver's license, and your knowledge about basic psychology and habit formation is your understanding of whether or not your friends will be happy to see you once you get to their home, without necessarily knowing where they live.

Jobs-to-be-done is the understanding that it may be wise to check when your friends are home, since the sole purpose of the road trip was to visit them.

Outcome-based segmentation is how to actually check beforehand where your friends live without actually asking them directly and thus spoiling the surprise.

Knowledge of the outcome-driven innovation process leads to the insight that instead of going a hundred miles an hour on back roads for weeks to get to your friends' homes and discover that they are not even home, it might be wiser to book a couple of flights for the dates that you know your friends will be home and arrive by cab directly to their homes. Using this approach, you might even be able to visit plenty more friends than would be possible using a car, at a substantially lower cost.

Airplanes are nothing new, but as it turns out, one of these alternatives are more popular than the other, and as a young entrepreneur, you might want to try out the startup road trip just for fun - after all, lots of famous people have paid great surprise visits to their friends this way. Movies have been produced, legends have been told. Most young entrepreneurs however never get to surprise their friends - their car broke down or ran out of gas long before they got the chance. If they for some reason still want to visit their friends in the future, they better learn that there are more efficient albeit boring ways to do get there than the classic road trip.

Personally, I hope that we are in the midst of a paradigm shift, in which a manufacturing-based innovation school of thought is replaced by a needs-based one. The common adoption of a needs-first innovation process in place of the traditional innovation process may very well be known as the first step in the modern revolution of innovation.

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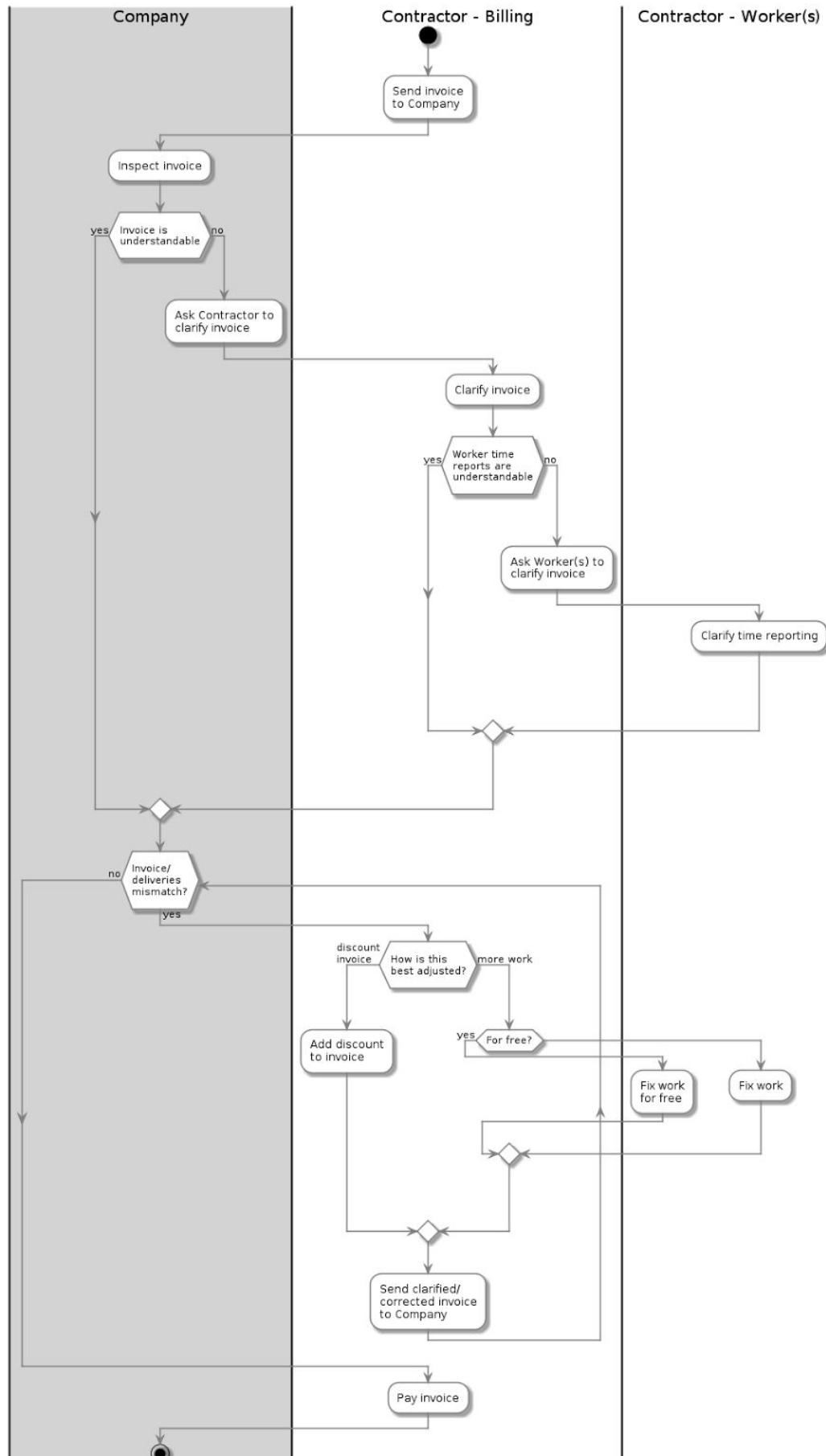
14 Appendix

14.1 Product/Service Development Process UML Activity Diagrams

High-level product/service development process
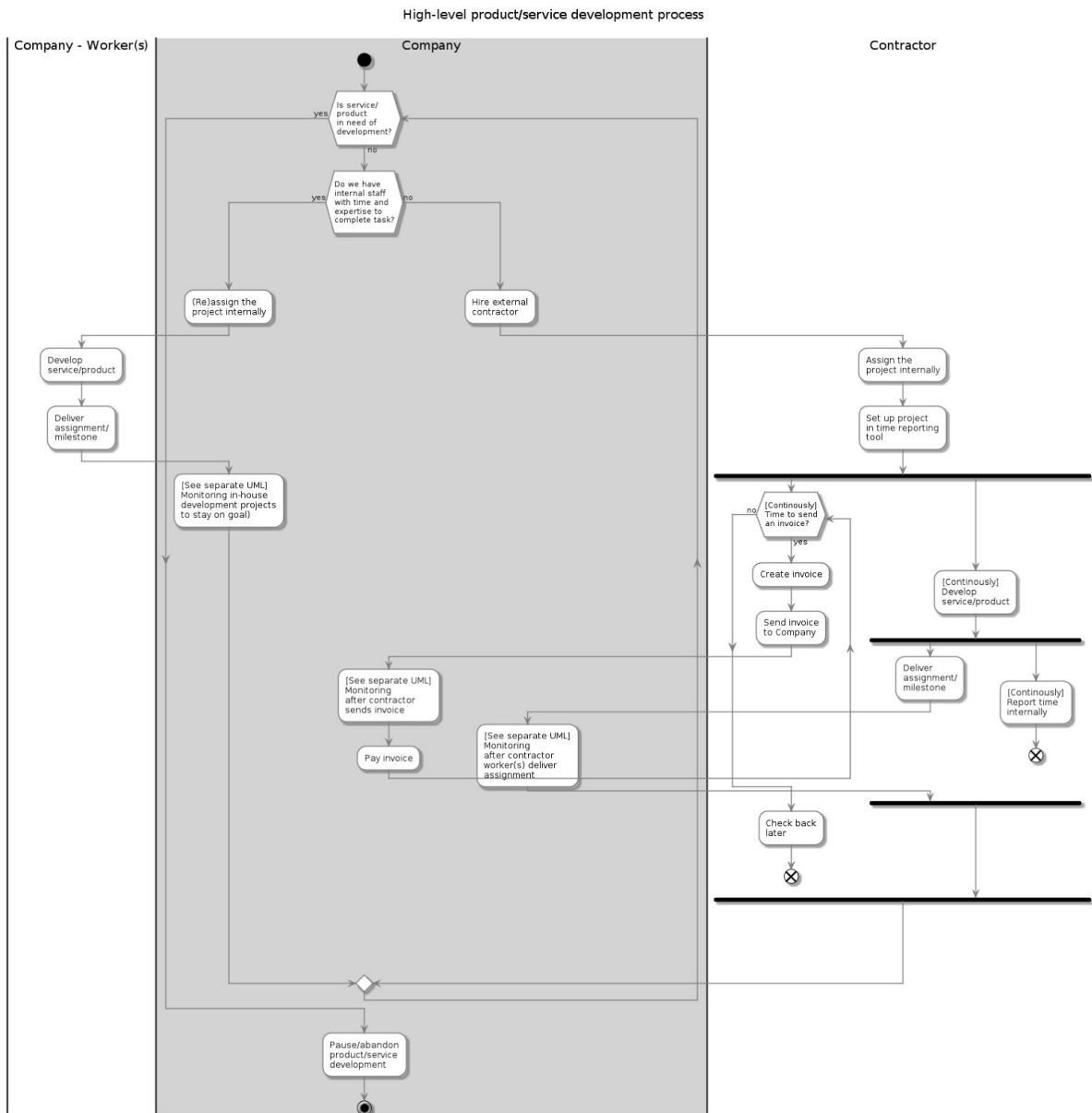
Monitoring in-house development projects to stay on goal
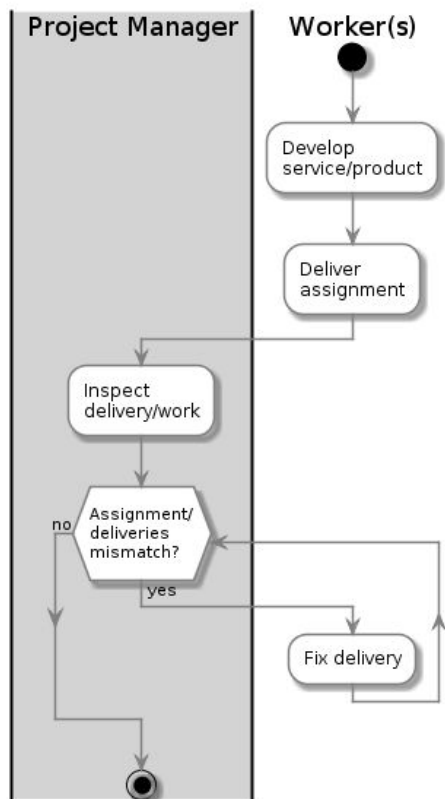
Monitoring after contractor sends invoice

Monitoring after contractor worker(s) delivers assigment

Company	Contractor - Billing	Contractor - Worker(s)

Develop service/ product

Deliver assignment

Inspect delivery/work

Assignment/ deliveries mismatch?

no

yes

How is this best adjusted?

discount invoice

fix work

Add discount to invoice

For free?

yes

Fix work for free

Fix work

Project is on track
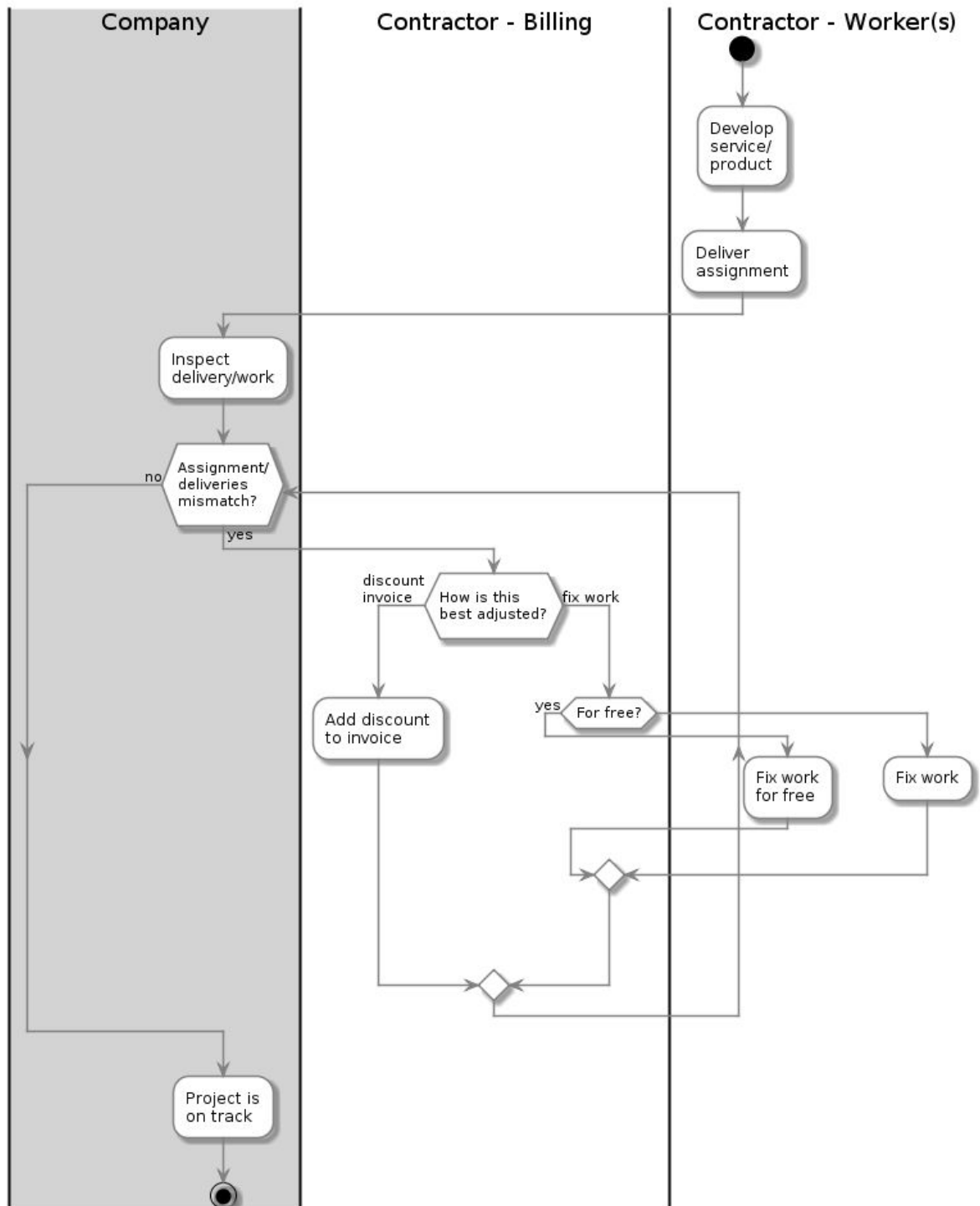
14.2 Qualitative survey feedback from respondents

Table Appendix.1: Qualitative survey feedback responses that were longer than 25 characters in length

Your comments or questions about the survey (if any):

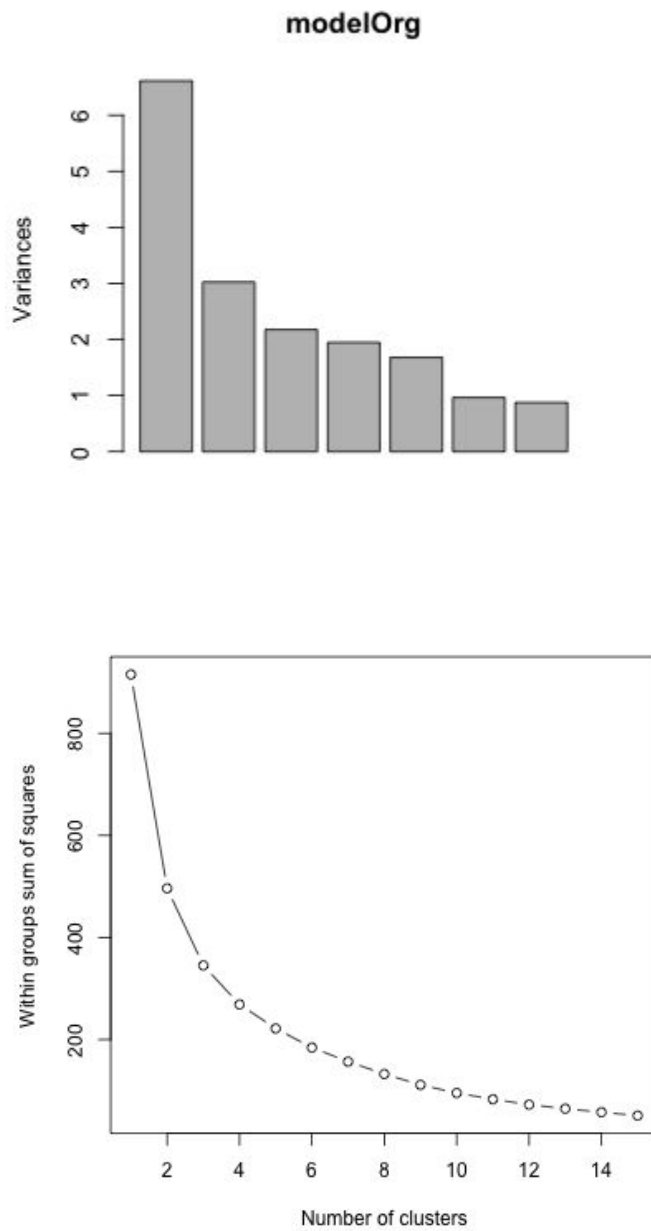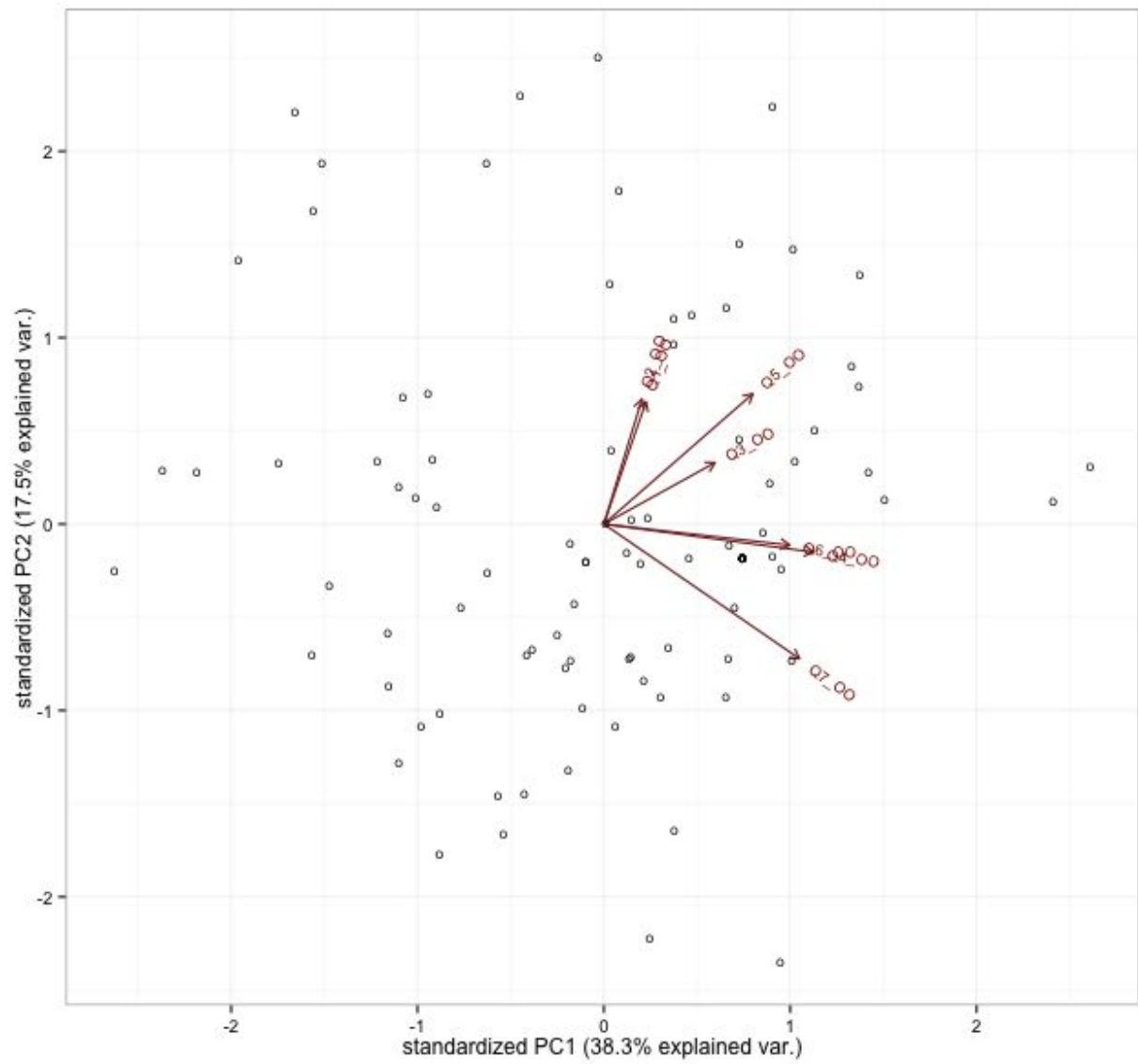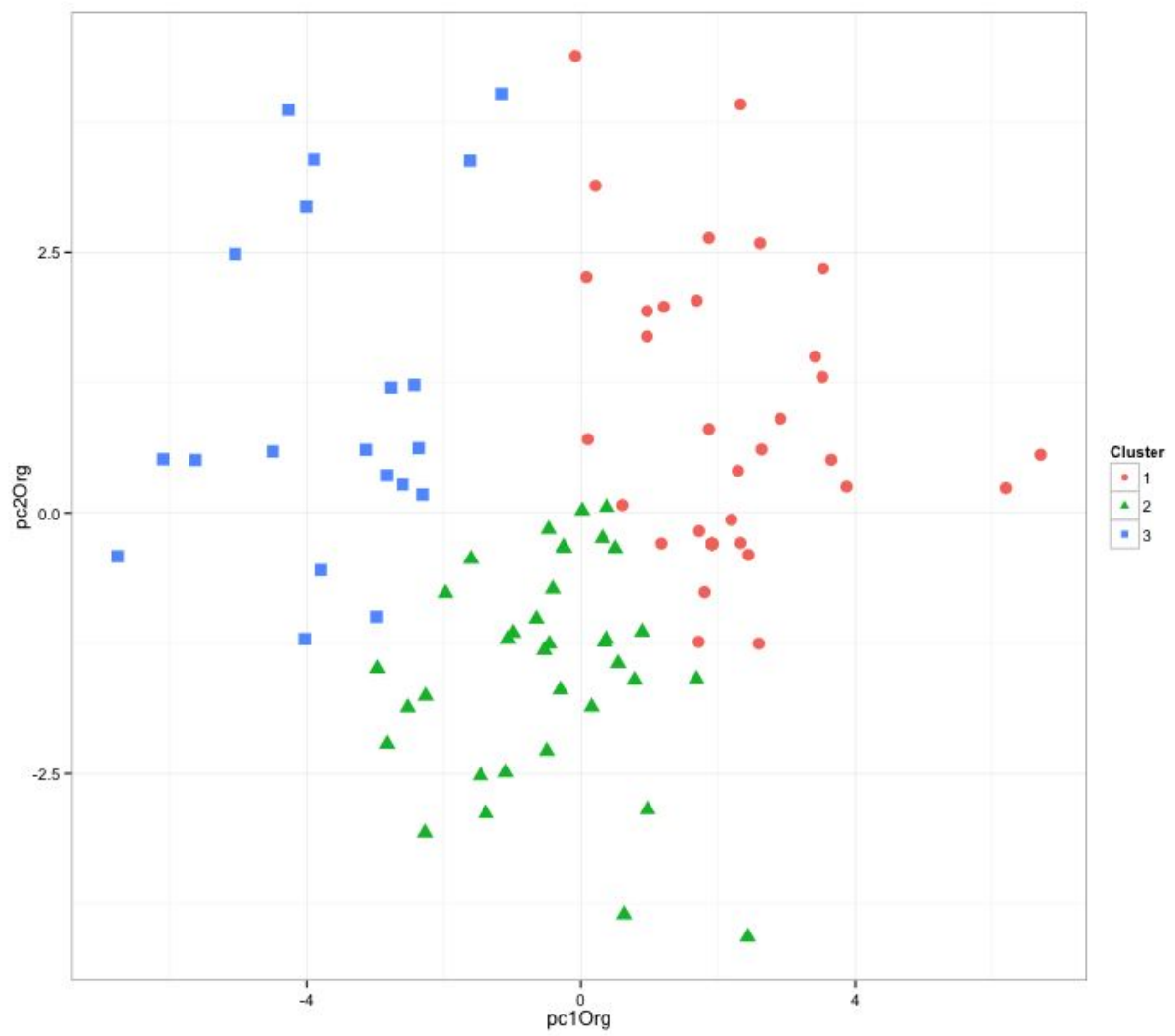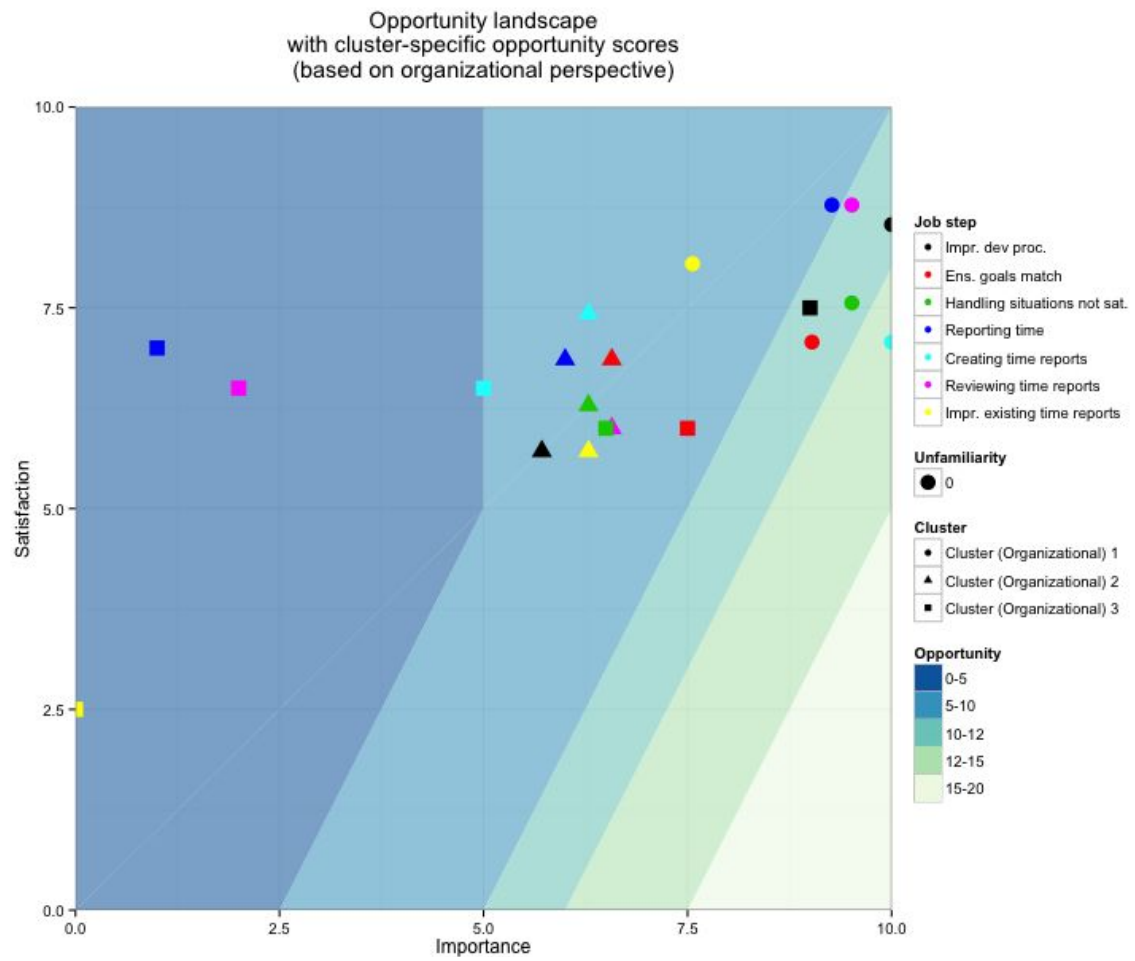| |
|---|
| This was a very pleasant experience, thank you! |
| I love the survey. Please help me to do some more survey like this in future. |
| I did realize that many questions were being repetitive. Also, the questions were a bit complicated to understand. |
| its an interesting survey |
| very interesting and different task |
| its a good survey which every team leader has to view. |
| This survey is very helpfull to identify my working experiance ,and what i know in my job and also the how to behave to the clients,so thanks to the this survey team. thanks thats all. |
| Why are you repeating same questions? Are you expecting a different answer? It was tiring, repeating the same answer. |
| Some questions were quite repetitive. Otherwise everything was fine. Thanks. |
| Very nice survey, it made me think about things that I have been putting off and may have to invest time in as my business grows. |
| I hope this is not a market ploy. |
| I was told this was going to take 10 minutes of my day but it took up quite a bit more. |
| Lot's of the questions don't exactly apply to my business |
| Not sure what the purpose of some questions was? but hope that helps! |
| This was a good survey I allow my brother to do most of the other things. |
| Well executed questions, nice mixture of set answers and free text. However if the order is more unregulated the replies will more likely be less mechanical. |
| Great survey interface. Easy to read, easy to follow. Wish I could have helped more with the final few questions. |
| I was quite comfortable answering the survey. I have been honest and accurate as possible. |

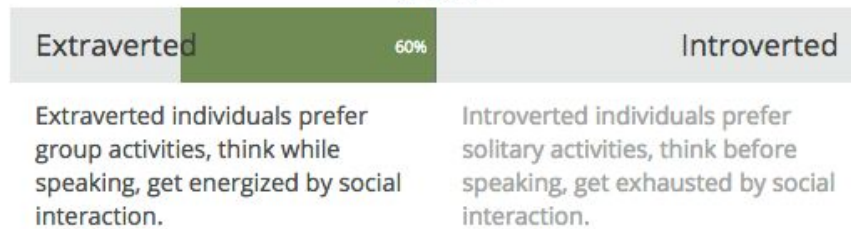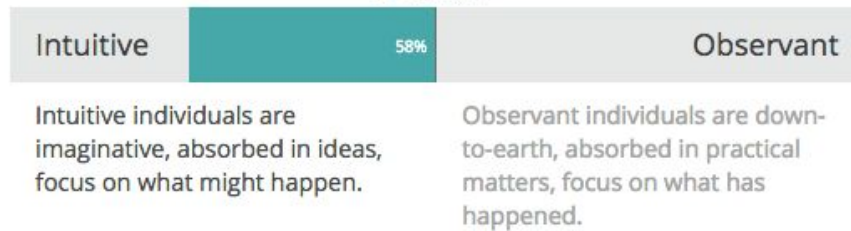## 14.3 Quantitative results - Organizational perspective
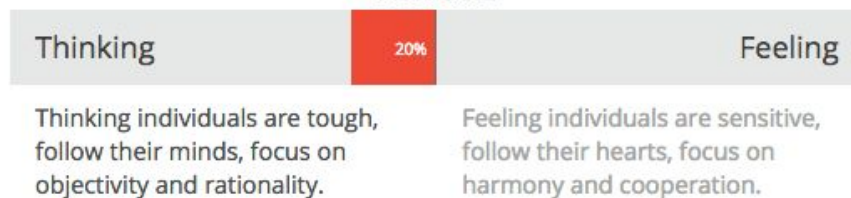

modelOrg

Opportunity landscape
with cluster-specific opportunity scores
(based on organizational perspective)

14.4 My personality traits

- MIND -

Extraverted	60%	Introverted

Extraverted individuals prefer group activities, think while speaking, get energized by social interaction.

Introverted individuals prefer solitary activities, think before speaking, get exhausted by social interaction.

- ENERGY -

Intuitive	58%	Observant

Intuitive individuals are imaginative, absorbed in ideas, focus on what might happen.

Observant individuals are down-to-earth, absorbed in practical matters, focus on what has happened.

- NATURE -

Thinking	20%	Feeling

Thinking individuals are tough, follow their minds, focus on objectivity and rationality.

Feeling individuals are sensitive, follow their hearts, focus on harmony and cooperation.

- TACTICS -

Judging	12%	Prospecting

Judging individuals are decisive, prefer clear rules and guidelines, seek structure and closure.

Prospecting individuals are relaxed about their work, good at improvising, keep their options open.

- IDENTITY -

Assertive	90%	Turbulent

Assertive individuals are emotionally stable, calm, relaxed, refuse to worry too much.

Turbulent individuals are perfectionists, self-conscious, success-driven, care about their image.

(Based on the test available on 16personalities.com)

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