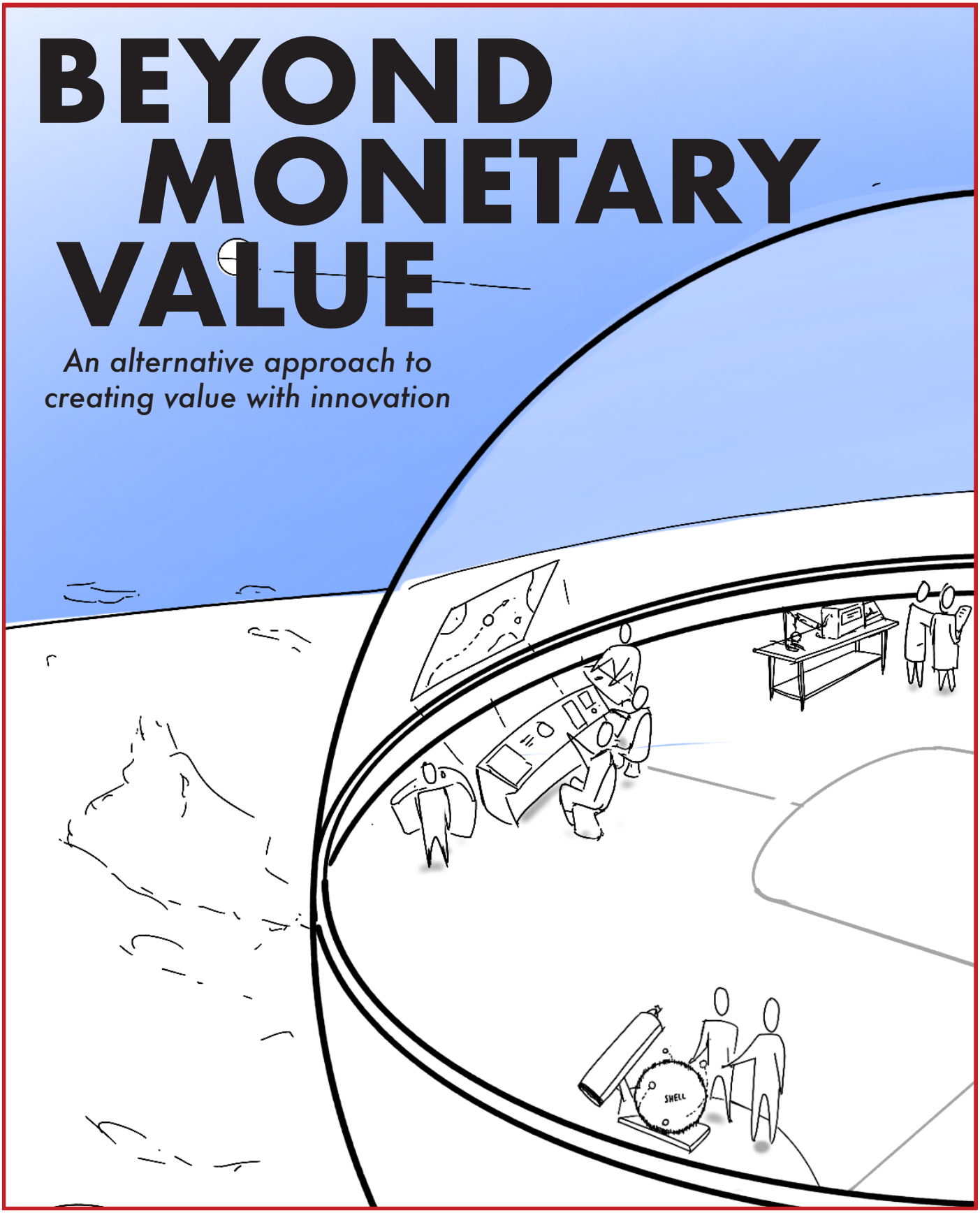
BEYOND MONETARY VALUE

An alternative approach to creating value with innovation



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EXECUTIVE SUMMARY

THE TECHNOLOGY CASE

The Shell technology is a product in development used to treat wastewater streams. The technology has the capacity to remove the pollutant to a level below the current measurable limit. I worked on developing the chemical principle.

Technology
Shell has decided to license the technology. This means that development and commercialization of this technology will not follow the regular innovation journey. The Shell licensing team sponsors the final stages of the product namely the development and deployment phases after which its fate is transferred to the buyer. My role was to research other new markets for the product, help to develop a partnering strategy, identify compositions of wastewaters from a variety of sources and assist in the experimental design performed at the Shell Technology Centre in Bangalore, India.

Market
Research shows that there is a relationship between regulation and the value of the technology for the end-user(25). The stricter environmental regulation, the higher quality solution is needed, hence, the greater the value of the technology to the licensing partner. The most straight forward partnering option is to aim for a partnership with a market leader in the water treatment sector. Existing relationships have proven favourable for partnering (33). A partner with a similar size and finance capacity for projects as Shell is also favorable for a successful partnership (27).

Alternatively, smaller technology partners offer interesting benefits. Smaller partners are more likely to take a hands on approach within the partnership (27) and by co-marketing the product Shell can improve chances of successful market introduction (56). Smaller (technology) companies generally are less integrated, thus will likely not install the final products themselves. A smaller licensing partner will probably have to cooperate in order to provide products which has to be taken into account when devising a payment sceme.

Strategy
In the Shell Invester's handbook, Sky scenario and other recent publications (2,46,62), Shell is clear about its future in sustainable energy sources. The challenge is that the technology could incentivise wealthy countries using coal as an energy source to continue business as usual despite the environmental regulations. This would contradict with Shell's strategic ambitions for cleaner energy solutions.

Shell divides technology development between two types of development vehi-

cles, open innovation and close-to-business. The open innovation vehicles are there to support projects that sit at a distance from Shell's core business scope. There are several strategies that apply to projects ranging from development of technologies that Shell is interested in the investment in companies that pave the way for Shell's journey into the energy transition. It becomes clear that there is no obvious path for the project, or other projects in this position. Nonetheless, such a high tech product such as the technology should be capable of providing Shell with value, even outside of a predefined development vehicle.

NEW STRATEGY CONCEPT

Design goal

A different commercialisation strategy could increase the overall longer-term value from the product. The design goal is: "How can we generate and maximize value from technologies that sit in the periphery of Shell's technology development ecosystem?".

Design for Value

The values the technology should be identified with Shell in mind rather than focussing on the immediate monetary return of selling to a user or licensing partner. Alternative values could include strategic, educational and brand values and bringing design/entrepreneurial skills into Shell. Other large multinational corporations and leading consultancy firms already apply such strategies to gain such values.

Executive summary: New Strategy Concept

With these values in mind I designed the Launchpad strategy, a new innovation vehicle suitable for technologies that are further or too far away from Shell's core business to reach full maturity within Shell. The new strategy launches the technologies into an ecosystem that exist between spin-outs and corporate start-ups. These 'spin-always' remain in an 'orbit' around Shell providing a means to still gain the values identified in the concept ideation phase. The launched spin-away's allow for reflection, observation in markets where Shell has no presence, can serve as a stepping stone for talented individuals into Shell and can create an engaging and exciting environment for individuals from within Shell to develop a broader set of commercialisation skills.

Implementation plan

The strategy will be implemented in similar steps to the classical design stages used by Shell. This thesis covers discover stage, the development stage will be taken on by Shell. The gamechanger open innovation vehicle provides a suitable stage to develop the strategy and test its capacity in the "demonstrate" phase. Assuming the strategy will meet the goals set between stages the deployment is the

official start of the program. The circumstances the strategy operates in will likely change over time for which a 5th stage is defined. Stage 5 revolves around the iteration of the strategy or an "end of lifecycle" scenario that aims at reassigning remaining assets and minimising loss through termination of the program.

To test the validity of the strategy I compared the elements of the Launchpad strategy against successful internal Shell alternatives as well as external alternatives as used by other large corporations. The new strategy comprises elements that can be implemented individually in different situations and combinations. This offers a flexible strategy and hence it is very likely that the strategy will work.

In conclusion, the Launchpad strategy can provide Shell with a more controlled approach to licensing. It aims at creating long term benefits from the non-monetary values that will help Shell venture into a "new-energy" future, whilst keeping full control over the assets.

PREFACE

This graduation project started in June 2018, after a visit to Wetsus at the water campus in Leeuwarden, one of the world's leading water technology development and incubator centres. It was here I was introduced to Albert Janssen (company supervisor) and to the topic of water technology. He offered me the opportunity to do the assignment for Shell, at the Shell offices in The Hague, allowing me to pursue my rowing career alongside graduation. At the time I was training in the lightweight quadruple skulls to participate in the rowing World Cup in Lucerne.
The choice for this "off-topic" assignment was very deliberate. It could serve as proof that an industrial designer can add value to any sector or company and that a capable designer is able to dive into and thrive within any subject that he or she is thrown into.

For this project I took a Deep Dive into the subject. It granted me a look into the world of Shell, water treatment and water as a resource. Looking back I realised this was a topic I had been building up towards over the course of my studies, be it unknowingly to start.

Water is a key resource in processes ranging from agriculture to use in nearly all stages of product manufacturing. Freshwater might as well be the world's most valuable resource, therefore making it an incredibly interesting topic for designers to predict and improve the use of water as its abundance is becoming more uncertain in future years. Being a rower further strengthens that connection. It brings you face to face with your subject day after day, and once you open your eyes to the subject a world of new things opens up to you.

The course of the project deviated from what a strategic product designer is capable of. The design question was adapted in the second part of the thesis allowing for a projects that better reflects the skill of a strategic product designer. We changed the direction within the thesis and shifted the focus to a bigger, conceptual solution to the underlying issue that was discovered during the deepdive. I used the case, initially the main focus of the project, into a step that allowed me to gather better insights into Shell's ways of working. The report's structure had to be revised several times upon landing on the current structure.

An acknowledgement goes out to my support team: Albert Jansen (company supervisor), Frido Smulders (thesis chair) and Bart Bluemink (mentor). Not only did they provide me with excellent guidance, they also allowed and motivated me to pursue my Olympic dream alongside the project, the main cause of it taking much longer than planned. In the year and a bit of time that I have taken to research and write my story, I have also seen by far the most successful period of my 10-year international rowing career. With 2 World-cup titles, 2 European-championship titles and a World-championship medal as the cherry on top, I look forward to taking a last deep deep dive into qualifying and rowing the lightweight men's double scull for the Netherlands in Tokyo 2020.

INTRODUCTION AND RESEARCH QUESTION

Introduction to the research question

Energy has played a strongly positive role in global change. But fossil fuels, including coal, oil and natural gas, are currently the world's main source of energy. Fossil fuels release carbon dioxide when they burn, which adds to the greenhouse effect and increases global warming. This will have to change.

Shell has recognized that they can take responsible action in this phase of the energy transition. There is also a strong need to adapt the company to sustain its business into the future.

One of Shell's biggest recent actions has been to change the companies' focus from fossil fuel to energy (61). Despite the fact that Shell's main energy products are still based on fossil fuels, this decision will allow Shell to adapt within the confines of what the company states it does.

Shell sees itself as a technology driven company (60). Technology is one of Shell's key focus areas (80) essential to remain competitive. Shell organizes their innovation in so-called "innovation vehicles". Each of the vehicles offers an ecosystem and processes to develop ideas towards their full commercial potential.

Initially, my assignment focused on the development and commercialisation of a Shell technology seated at the periphery of Shell's technology development ecosystem. In 2015, the technology strategy changed to focus more on Shell's core business (80). Because of its limited application value within Shell the technology was put aside unfinished. Albert Janssen (company supervisor and "project owner") showed great ownership of this process and product and remained positive about the value of the product. He decided to push for completion and generating value for Shell through licencing. But which commercialization approach is best? This makes the research question for the technology development case:

Research question: Case

"How can we generate and maximize value from the technology?"

During the deepdive analysis of the technology, I explored market opportunities, defined performance needs and helped in the experimental design for the research team at the Shell Bangalore technology centre. This initial work as part of the technology development team provided lots of insights into the company and the Shell technology development processes and continuous developing ecosystem.

My findings for the technology point towards greater value that can be created

by following a different development strategy. The best way to define this was through the design of a new innovation vehicle/strategy. This resulted in an over-arching strategic design research question answered in the second part of this thesis:

"How can we generate and maximize value from technologies that sit in the periphery of Shell's technology development ecosystem?"

Research question: Design

GLOSSARY

These terms are used in this report repeatedly and have a specific meaning:

Design(ing)
The approach of problem solving in a structured way so to observe and take into account all side factors producing a solution made for the users of the product

Product
The product refers to the complete package of everything that is produced. The main element will be the technology but the product also includes branding, marketing and strategy. These elements combined give the product its unique values.

Technology
The technology is the key component of the product. In this project the technology is developed through research and made into a valuable asset by patenting it.

Project
The project refers to all the work done up until and during this graduation internship and thesis, including the case for Shell before the start of this assignment.

Assignment
the assignment refers to all that I was involved in during the project working towards an end goal of product commercialisation.

Ownership
Ownership, or product ownership, refers to the sense of responsibility over a product or project, not necessarily belonging to the individual(s) working on it (for instance a product owned by an employer)

Market
A market groups products that are sold to similar buyers. this indicates that they compete for profits and that there is a varying but limited amount of money that can be competed for.

Disclaimer
The information and insights for this thesis have been found either through literature provided to me by Shell or available to the TU, and through the experiences and observations gained in the process of developing the technology. Some observations weren't scientifically justifiable coming from casual conversation or general curiosity. They were crucial to the process of the story. In most of those cases the underlying cause or result could be used as source.

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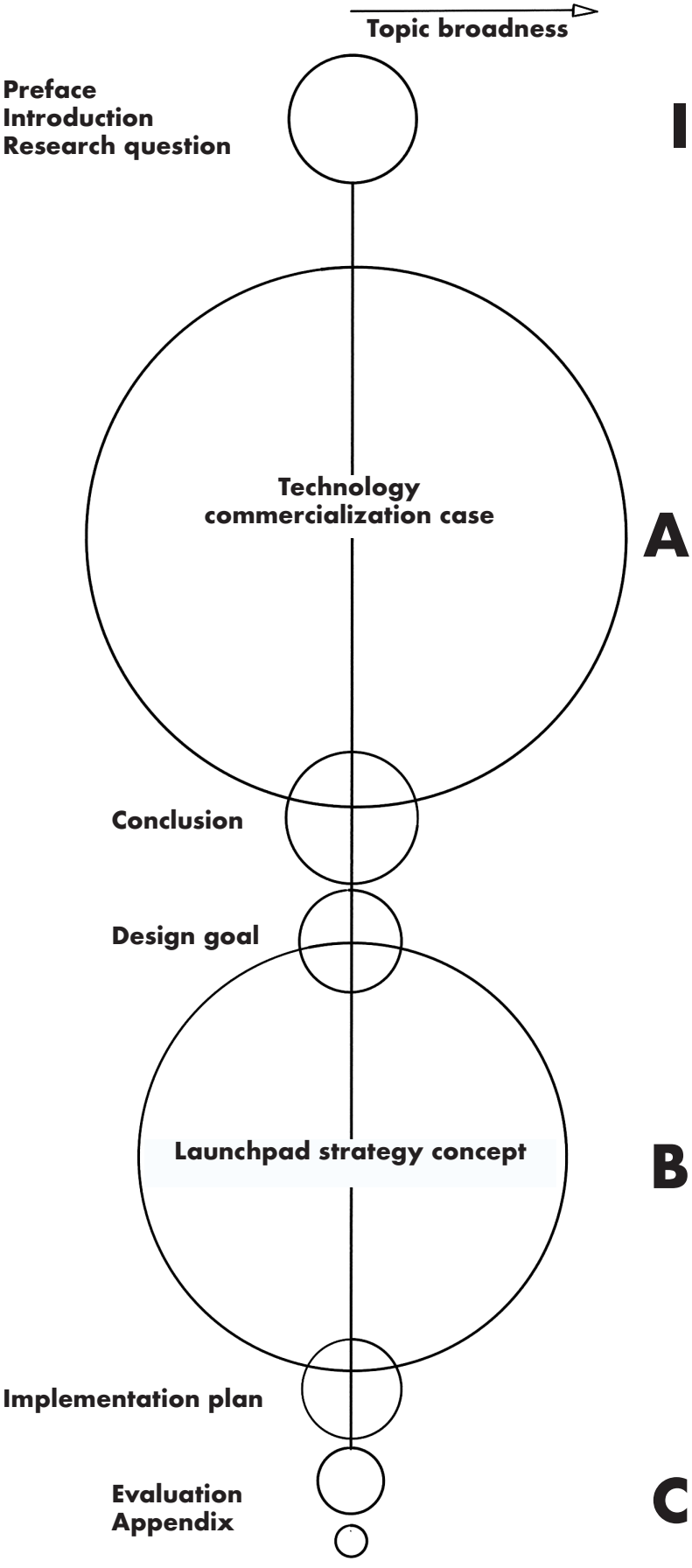
REPORT STRUCTURE



Preface, Introduction and Research question: Leading in the deepdive of the thesis. Initially a plan and a pathway is defined. The assignment

Conlusion: The commercialization provides the first answer to the research question, but posing a new one in the process.

Design goal: From the deepdive a new question arose, could a different approach provide a better outcome?

Launchpad strategy concept: Evaluating the values that where identified in the deepdive provided the pathway towards a different approach to value creation from specific technologies.

The launchpad strategy is designed to create as much of the values as possible. Providing Shell with new approach to value creation from technology.

Implementation plan: The implementation plan describes how the launchpad strategy can be build up within Shell

Evaluation and appendix: The final additions to the report.

A: Technology Commercialisation Case

The technology commercialization case was removed for confidentiality reasons. It functioned as a confidential appendix to Part: B, launchpad strategy concept. The executive summary should provide any nessecary insights.

B: Launchpad strategy concept

DESIGN GOAL

B1: Design goal

B1.1: Introduction

Reflecting on the possible value of licencing made me wonder whether this is the best approach to making the most of the technology. Licencing seems to only create short term value for Shell, especially when anticipating changes in the market and the possibility of competitors designing new or better products. The technology only has value if it's one of the best solutions available. An alternative is to sell the technology outright, which allows Shell to further de-complicate its product portfolio. This would also align with Shell's strategy and would keep the company more agile and focussed. Value can certainly be gained elsewhere.

Using a different, better approach would allow Shell to focus more on creating an increased long-term value from its product, compared to what is currently achieved through licensing. Instead of approaching the value from a customer point of view, and designing to fit the user's requirements, we can take Shell as the final recipient of value, and may end up with a different outlook on what the values are that Shell can gain from the technology product.

It is important to provide a clear definition of 'design' and 'users' in the context of this thesis. For the definition of design within this thesis I was inspired by the book Designing Design by Kenya Hara (29), lead designer at Muji, a renowned design brand. He describes design as "The approach of problem solving in a structured way so to observe and take into account all side factors producing a solution made for the users of the product". Within this thesis the perspective on the "user" I design for, changes. Initially the "user" is the end receiver of the technology value. Later "design" and "user" focuses on Shell themselves as the ultimate value receiver.

I can provide Shell a strategy concept tool to make the most of the technologies that, like the technology, fall outside of the development ecosystem and sit in the periphery of Shell's innovation strategies. Based on the conclusions from the previous chapters I defined a design goal. The design goal describes the primary function of the concept:

B1.2: Design goal

"How can we generate and maximize value from technologies in the periphery of Shell's technology development ecosystem?"

The deepdive shows that there are certain values from technology products that Shell

doesn't take into account when developing its products. In this new approach, I focus on creating those values in addition to those they currently have. By doing so, I will create a novel view on product value and development. I identified the following values that could add to product success.

- *Strategic value*
- *Educational value*
- *Reputational value*
- *Entrepreneurial/design value and replicability*

The next chapter, concept ideation, I look for opportunities to combine as many identified value creators into a single concept. I start by dissecting the values into their sub-parts. Then, building on the knowledge and experience gained from the deepdive, I construct a concept that would provide Shell with the aforementioned values.

We can better see how this process builds on the previous by taking a step back. Figure 1 shows what development processes are possible for an Idea. Line 1 illustrates the engineering process, comparable to the development of the roadmap. This is a typical engineering approach to solving the problem. In this next section, we can use more of the decomposition done in the deepdive and design a more innovative solution to Shell's challenge: maximising the value of its products. Even if that means re-defining the challenge in the process, by giving 'value' a new identity.

From here on the technology will no longer be considered. It has served its purpose as the backbone to the deepdive and would likely limit the broadness of the ideation and thus the resulting strategy. The strategy must be applicable to all technologies in the periphery of Shell's technology development ecosystem, of which I assume the technology is only one example.

CONCEPT IDEATION

I identified four key value topics that I can focus on developing. These four topics should fill the gaps that Shell has in the value created in their current development vehicles.The question is: how can those values be created for Shell? The values together form a list of goals for the design to fulfill.

To start I dissect the four values into as many separate elements related to the gaps discovered in the deep dive process. That provides a basis to find alternatives to the licensing strategy allowing me to put them in an overview and compare their capacity to bring us to the design go. From there I look for implementation possibilities in a structure. Those separate implementations can then be formed into a concept direction.

B2: Concept ideation

B2.1: Introduction

The opportunities can be separated into four distinct categories: Strategic, Educational, Reputational and Design implementation values. For each of those categories, the main topic is discussed. The division of the topics gives the possibility to define design goals that can then be used to design the functions of the strategy.

A. Strategic value

B2.2: Strategic value

In the analysis, I discovered a mismatch between the development of the technology case and what the Shell's strategy documents mention. Initially the technology fit Shell's strategy but the re-start of the development pushed it into a position where there was no viable alternative at hand. It should be possible to think of a strategy that prevents this from happening. Strategic values to consider, when designing the solution, are:

- A1. Find a method to create value from the technology products in development that Shell is taking out of its portfolio to match their long term vision.
- A2. Retain the ability to react to changing circumstances. Shell is a huge company that wants to shift its focus to energy, both in the business as well as for their brand. They will need to retain the ability to react to changing circumstances.
- A3. Find a unique position in the energy segment
- A4. Prevent strategic misalignment of their products. The new products they develop will have to be aligned with their corporate strategy. But because of their change in strategy some products being developed became misaligned during their development process. Strategic misalignment of products has to be prevented.
- A5. Support entrance to a new market. Moving to a new segment will require the entrance to new markets. That process will need support.
- A6. Development of a rapid innovation environment for tech outside of Shell's core focus. New markets will increase the need for new products. Shell will have to develop innovation environments that lend themselves to the rapid development of new products at the forefront of their advances.

- A7. Prevent loss of network caused by retreating from a market. Changing segments will in time cut the ties to the network of partners and sources of knowledge in that previous positioning. The loss of that network will decrease the agility needed in the new ventures.
- A8. The ability to build monetary value with the products that fall out of Shell's internal development. More products will fall into the development periphery if Shell keeps moving. A structured way to capitalize on those products provides Shell with more control over that process.

B2.2: Educational value

B. Educational value

Talent development seems central to many of Shell's key operational decisions. International assignments, Tapup, Techworks, a company looking to attract young talents should try and find ways to attract those newcomers *(9)*. Do you need these newcomers or would a different approach to talent acquisition be preferred?

- B1. Create a lower-risk environment that is suited to educate and develop the next generation of employees and management Shell needs.
- B2. Develop experts moving into management roles in a tailored, lower risk, environment.
- B3. Replace experiences gained from expat assignments. From accounts I understand Shell is sending fewer people abroad utilising their global online environment more taking away a big attraction to the company. It's a logical financial decision to limit the number of expats now the alternatives in online work are viable but this creates a need that we possibly could fill with this concept.
- B4. Attract and identify talented individuals that would otherwise not consider Shell as a primary employer *(5)*.
- B5. Create an environment of awareness and reflection capacity by allowing a step outside of the Shell "bubble".

B2.3: Reputational value

C. Reputational value

Reputation is a notoriously hard topic to grip. Reputation strategies need to be implemented in Shell's everyday processes. Integrating the approach on reputation will allow Shell to get to grips with the subject instead of "firefighting" where mistakes are more likely. Integration of this topic should aim to get to a similar level a Shell's approach to safety. A well known strong point. Eventually this approach will be able to grow to company-wide focus.

- C1 Create observation tools.
- C1.1 Create an outside reflection of Shell's action and its impacts on the markets and users from where that reflection is created.
- C1.2 Create a way to monitor Shell's reputation and improve branding and reputation strategies accordingly.

- C2. Create channels for Shell to prove their efforts towards a positive shared vision of the future.

An increased grip on reputation should provide more control over the regulation-technology value loop.

B2.4: Value of design

D. Value of Design *(69,70)*
Design to modernize companies functions as an interface between the users, strategy and products. Design allows for an integrated approach to problem-solving and product development and in recent years has proven invaluable in sectors like finance, governance, healthcare and technology often operating in conjunction with (corporate) startups. In essence, design is a toolkit that can be used to retrieve value from places nobody has looked. Design and entrepreneurship go hand in hand, matching the needs of Shell's corporate strategy to move into the energy sector.

- D1. Introduce design methodology and designers into Shell.
- D2. Develop integrated and holistic design approaches that fit within Shell's development ecosystems.
- D3. Create an increased environment of ownership and responsibility between the product and the developers by linking immediate consequences to the performance.
- D4. Improve replicability of design results.
- D5. Innovate product design to fit within the world of technology.
- D6. Create an adaptable and efficient environment, supporting the venture into the energy sector.

D7. Create a means to challenge, iterate and adapt innovation culture within Shell.

The introduction of design into a company only works with a full management commitment to include the designers in the companies processes and integrate design into the teams that work there *(76)*.

EXISTING STRATEGIES

B3: Existing strategies

B3.1 Introduction

How have other companies tried to innovate their business strategies and technology development? What role can design play in a large corporation and technology development? Large companies generally do not frontrun trends in business and developments due to risks involved with innovating first. Though Shell has a history in jumping the gun on developments (such as solar power development *(62)*), in this case Shell can learn a lot from looking outside, to companies and cases that have made the leap before.

I present cases and examples here of spin-outs, corporate incubators or design methodology being implemented by companies that had to veer away from tradition within their fields of expertise to improve their performance or excel in new markets. I share the lessons and experiences they publish.

B3.2: External examples

External examples

Philips healthworks

An especially relevant example is Philips *(52)*. Philips, similar to Shell, decided to strongly focus on their core business, healthcare technology, and considerably downsized their consumer electronics divisions, that were suffering under the fierce competition in that market *(6,24,30)*. This was a big step away from their traditional past, but a choice that has improved their competitive advantage in their targeted market and has allowed sustainable growth ever since.

B3.2.1 Unilever foundry

Unilever foundry *(76)*

The Unilever foundry is a corporate start-up programme designed to accelerate ideas from inside and outside of Unilever. Their strong documentation on their development of a start-up framing structure says: Through blending the needs of both corporates and startups, their research identified four key elements that make collaboration a success in the long-term:

Unilever foundry lessons (quote):

- *SENIOR BUY-IN "One of the hardest challenges is when you have the owner of the project who is championing it, but they haven't gotten that senior support. Ultimately there will be a breakdown."*
- *TRANSPARENCY AND STREAMLINED PROCESSES "Easy contracting, straightforward procurement, ability for startup to be paid can't be 90 days. A startup doesn't have 90 days!"*
- *CLEAR OBJECTIVES AND PROCESSES FOR SCALING UP - Ability to capture and disseminate insights from the work, and then a process to make sure you can scale a pilot if it works. Time after time, pilots work but then still fall through your hands. You need the structure and linkage to senior executive leaders that can scale something.*
- *EDUCATION AND LEARNINGS - Educating both sides. Education for the startup on how it is to deal with a multinational corporation as much as education for the different people in divisions within the corporation on how it is to deal with a startup. These lessons can be carried through to Shell*

Unilever predicts a short term increase in green corporate startups typified by the focus on tech tourism and innovation theatre. These companies are known to be PR focussed. As the landscape matures it is likely the corporate startups will aim for more impactful results. Once startups and companies work together more closely risks will decrease as experience grows.

Further down the line startups who invest in long term sustaining-business models will be able to profit from the lessons on efficiency and problem solving. The corporates will move to strategic partnerships with startups that fit each others core business.

Though closer to direct users than Shell Unilever is actively exploring new ways to lead in innovation in consumer goods. These guidelines are proven and tested. I will be able to use them to build up structure and business goals for the new strategy.

3.2.2: Philips healthworks

Philips healthworks: A change of course *(52)*
Of all the companies from which I present examples, Philips' definitive step into health care technology relates the closest to the decisions and changes I observed at Shell.

Philips started its company in electronic lighting, growing into consumer electronics and eventually medical technology. At its largest, in 1973, Philips employed over 410,000 people. But growing competition, mostly from Asian companies, the company saw a decrease in profitability and ability to compete *(30,)*. Philips followed a long bumpy road, with decline until 2010 when the company leadership took definitive action. Philips reduced significantly in size, sold its audio and lighting departments, and put all its resources into Philips medical. Though there were initial doubts about this decision, Philips is currently market leader in healthcare technology.

Their decision to step away from the core of Philips work ensured the company could regain its competitive edge. Shell's move into (renewable) energy and a low-carbon emission future is very similar. The day that Philips sold off their lights will reflect the day that Shell stopped pumping oil (although between the two cases there are many more underlying factors that make them substantially different)

Philips healthworks is Philips' corporate start-up programme. It's a technology accelerator that funds and helps technology start-ups develop their ideas through funding, experienced leadership and their expert network provided by Philips. The goal of the accelerator, as stated by Philips is to: "Find common ground for new value creation and accelerate breakthrough innovation." *(53)*. As with the project the creation of value can be seen in its broadest definition, ranging from sim-

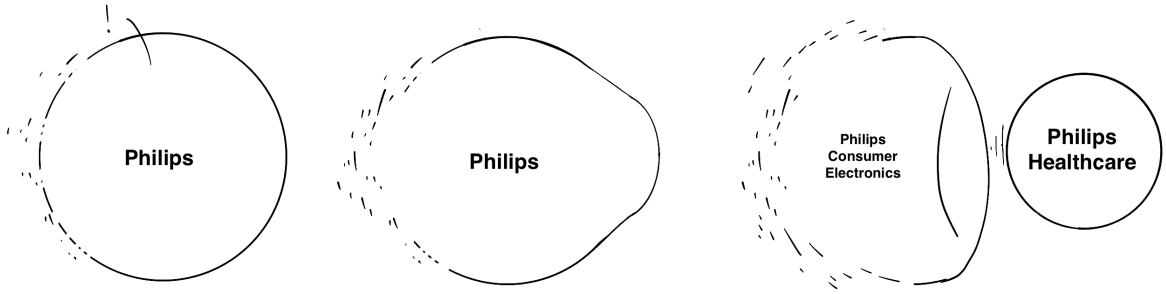


Illustration 16: Phillips changing course in the face of market developments

ple monetary value to strategic or marketing value.

A major difference when compared to Shell lies in the ability of Philips to quickly steer the company in a new direction. Philips' factories and departments have been designed to easily adapt to changes in the electronics market. And compared to Shell Philips' product lines do not rely on massive capital investments (eg. acquisition and drilling of gas and oil fields/ building of refineries).This makes it less costly for Philips to change course. The capital mass of Shell's investments is likely to slow the implementation speed of changes. Compared to Philips Shell will have to follow a longer and more cautious trajectory towards market change, in doing so safeguarding (or repurposing!) investments.

3.2.3: McKinsey Design

McKinsey Design and business innovation trends *(41)*

McKinsey and company is one of the world's leading consultancies, working on design implementation and business innovation. They regularly publish work on the implementation of design into companies, the pro's and con's thereof and what this translates to for you as a manager. Though many conclusions are shared between different sources and consultancies, I think McKinsey has the strongest sources founding their publications. For that reason I include their vision into the concept design.

McKinsey studied the effect of design implementation in modern corporations and concludes that those, with a strong investment into the implementation of design, outperform others upto 211 percent. But that performance comes at a cost. And of the companies assessed (S&P 500) many offer consumer products, products that benefit strongly off design methodologies' capabilities to better take users into account.

However Shell can also benefit from the implementation of design into the company. A recent example is the TU Delft inhouse-design team, a group of IO students, who were tasked with analysing defining and redesigning the communication challenges Shell faces when moving into new markets.

"McKinsey recognises the value of designers as an interface between different company sectors. In modern products the line between physical, digital and service converge, forcing interactions. Design offers a range of tools to combine processes and push development into an engaging mixed-profession development process."

It seems design would grant Shell a tool that allows for customer interaction, the bridging of departments and eventually improve interdisciplinary/department project effectiveness and success.

Pepsico/3M - Mauro Porcini *(70)*

3.2.4: Pepsico

The Current Chief Design Officer at Pepsico, Mauro Porcini, talks about his vision on how companies can embrace design and use it to create value for society and value for the company. He is responsible for the implementation of design into 3M, a company that works from a technology driven development point of view. Similar to Shell though smaller.

At the time of Mauro's introduction 3M was a company that was ready to explore design. Design was not yet 'understood' within the enterprise but they had a large product portfolio with room for improvement. And, more importantly, they owned a wide range of technology patents, a fertile ground to grow the design practice Mauro was asked to create. It offered him the opportunity to take their technologies and use them to create meaningful value.

The introduction of design went through several stages, and those stages can be recognised in other examples of the implementation processes that Mauro was involved in. the stages are:

1. *Denial - "Do we really need this, this seems over-complicated and abstract"*
2. *Hidden rejection - Top management decides they want design, but the actual implementation is hampered by limited traction in the teams that should use it.*
3. *Occasional leap of faith - Someone, a leader in the teams, trusts in the design process and takes a leap of faith with you. As a co-conspiritor, or "champion" they will help provide the traction and the implementation process needed. (From my observations this is the stage Shell is at).*
4. *Quest for confidence - At this stage design is present throughout the company. The goal now is to manage the new challenges that came along with the introduction. Managing things like costs, time and risks will complete the real implementation.*
5. *Holistic design awareness - The real implementation is an impossible goal. Just as in design the implementation of design is never perfect. The more a company embraces design the more efficient it may become. The end goal is an enterprise wide embrace of the design methods and prototyping methods with maximum efficiency of their design process.*

Mauro Porcini on branding goals:
Pepsi used to approach their customers through commercials and television ads. That was the old-school approach. Nowadays Pepsi isn't telling people what to think about them and their products. Pepsi aims to become the topic of the conversations their customers have. They achieve that by acting and through engaging in frequent interactions with the public: in one example they became a victim of their own success *(68)*. "The most powerful form of content is user created. When people create something and start sharing it, that's powerful". The impact is most powerful when made offline. But to do so you need to be able to embrace ideas and create an environment that allows and motivates that development. To do so Mauro uses the 15% rule in his teams. 15% of the time is available for his team to do whatever they like. using company resources. This allows them to prototype ideas and put time into development of ideas without being questioned or pushed back into their everyday role. It puts the focus back on the human beings that have the idea and take the next innovative steps into innovation, similarly to what Albert Janssen did for the technology. The importance of the individual is emphasized. The individual is a the driver behind the development. He or she grasps opportunities and creates innovation. That is what design is all about.

Design isn't reflected by the methodology or 'design thinking'. Rather it is created by the culture, the drive and the prototyping that happens in the process.

B3.3: Conclusion

Conclusion
The best corporate strategies, in our experience, force a multibusiness company to make clear choices about its portfolio and the allocation of its resources. - McKinsey

From reading about solutions designed by other companies we see there is room for Shell to create a space to experiment and implement more modern practises. Shell has a range of solutions fit for their current challenges. I identify from these strategies, that the needs discovered in the deepdive are:

- *Value from those products that contaminate the portfolio*
- *Developing engineers into multi disciplined leaders*
- *The introduction of wide spectrum of talents and thinkers into the companies' core work*
- *A system to attract and develop the next generation of talents in modern working environments attractive to the future talents*
- *The need for a source of design culture and co-conspirators to progress the design implementation in Shell.*
- *Optimised agility to provide maximum of possibilities in their venture into the energy transition*
- *Tools to create a grip on brand reputation*
-

There is an opportunity for Shell to (re)design their open innovation vehicles. The technologies and ideas Shell doesn't take further into the company can create a broad range of values that have a high potential. My analysis shows there is there is an opportunity that I will approach with a new concept.

Now with an idea of what the design should bring to Shell. Looking at other companies and even within Shell I see that these values are being recognised. This supports my design direction. I will now combine my findings into a single vehicle and create a comprehensive overview of what is possible with my design.

From these observations it is clear that a corporate startup like structure will fit the needs of being able to bring the values I identified into Shell. Though the startups will be kept at arm's length, allowing for the interaction and control Shell requires.

SHELL LAUNCHPAD STRATEGY CONCEPT

B4: Shell Launchpad strategy concept

The product ideas connect to very real issues but we need a strategy to develop those ideas to commercial products. During the design process it quickly became clear that Shell could gain many of the values that I identified by creating a distance between the product and the company but without entirely letting go. This segment sits between a corporate startup, close to the company brand and control, and a spin-off, segments of a company that become so autonomous they would function better when separated from the mother company. I design this strategy as an orbital startup. A startup in orbit of a company, but put at large enough distance to disassociate from the corporate brand and allowing a certain level of autonomy in the hands of its team. The company would still be involved but to a much smaller extent that a corporate startup would be controlled.

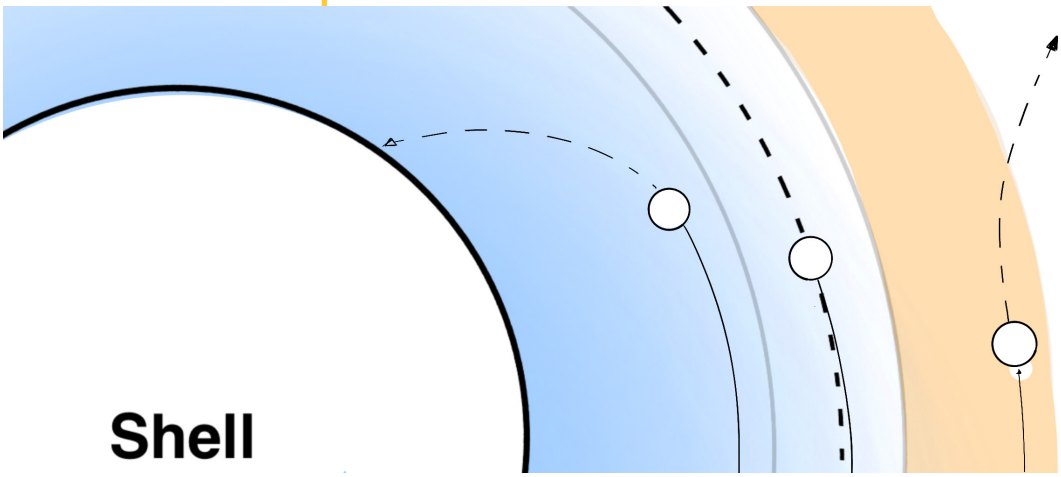
The Launchpad strategy comprises various smaller design goals, as a list of requirements, but provides a clear framework of what the development strategy will look like. I ordered the design goals hierarchically. A single primary goal, with potentially the highest amount of value is chosen from the four key values, strategy, education, reputation and design. In the secondary functions, other possibilities of the strategy are defined, to explore added values that may be overlooked in the standard processes. These are built around structures described in the business model canvas.

B4.1: Primary function

Primary function

- Deliberate talent identification, acquisition and development by offering an at arms-length startup environment, has most long-term potential to Shell and will be the primary focus point of the strategy. This function has the best fit to Shell's current strategies focussing on talent acquisition and development. and will be able to build on those experiences, next to having a foundation to start on.

Figure 17: Visualization of the positioning of the new strategy compared to other examples



Secondary functions

B4.2: Secondary functions

Secondary functions to the strategy offer potential for even bigger value creation. As with a Swiss army knife, the blade is the primary tool, but the other smaller tools add value. The remainder of identified values from the previous chapter will function as the secondary functions.

- Introducing a broader scope of employees into Shell through the likes of designers, a-typical types, entrepreneurs, that have experience and expertise in:
- Creating strategic anker points in the markets Shell is leaving, thus sustaining agility,
- Creating an environment of product and project ownership,
- Creating tools for Shell to maintain and improve brand reputation.

Auxiliary functions

B4.3: Auxiliary functions

The auxiliary functions are not requirements for the programme. Instead, they are nice-to-have or 'interesting'. They are functions found during the research but lacking in substantiation to be used in the main concept. These auxiliary functions could include:

- Experimentation with external relations.
- Possibility of sales of spin-outs.
- Testing of business tools.

To maximise value without infringing on Shell's core business or portfolio, a technology will need to be developed outside of Shell's development ecosystem. A startup or a spin-out would allow for the creation of such a system without Shell losing its grasp on the technology.

The "opportunity zone" (figure 16) is the area the new vehicle would operate in compared to Shell's current vehicles. The opportunity zone is an area of technologies that needs relatively low investment and lies outside of the scope of Shells regular existing development vehicles. Technologies can drift into this area after strategic changes as was the case with the technology. Technologies can also start as an idea when found too far from the business to be developed in a regular vehicle. These types of technology fall into the periphery of the sphere of influence and can be put through the Launchpad process to be used in the creation of the identified needs.

Illustration 18: Opportunity zone compared to Shell's other open innovation vehicles.

B4.3: Strategy

Strategy

The "opportunity zone" is the area the new vehicle would operate in compared to Shell's current vehicles. The opportunity zone is an area of technologies that needs relatively low investment and lies outside of the scope of Shells regular existing development vehicles. Technologies can drift into this area after strategic changes as was the case with the technology. Technologies can also start as an idea when found too far from the business to be developed in a regular vehicle. These types of technology fall into the periphery of the sphere of influence and can be put through the Launchpad process to be used in the creation of the identified needs.

Startup strategies

Startups use a large variety of strategies to achieve their goals depending on their market and products. For the Launchpad strategy we need to find what fits the use case. The primary value of the strategy aims at talent development and acquisition, but to create the grounds on which that happens a strong business needs to be formed. The technologies that form this base will range from concepts that fall out of development early due to a lack of fit within the portfolio, to products that have been proven to work but have been set-aside due limitations by the companies general technology strategy.

Technology startups can be categorised into three different categories based on their business model. There is no one fits all strategy. There are a variety of strategies to aim to develop the secondary valuesThese strategies are:

Explosive growth

Companies following this strategy generally don't make a profit in the first years of their existence and aim solely to grow and outcompete through volume and speed. The downside of the strategy is that if it fails it fails hard, and a very big amount of investment may be lost. A good example of companies with this strategy are services such as Uber or companies like Amazon.

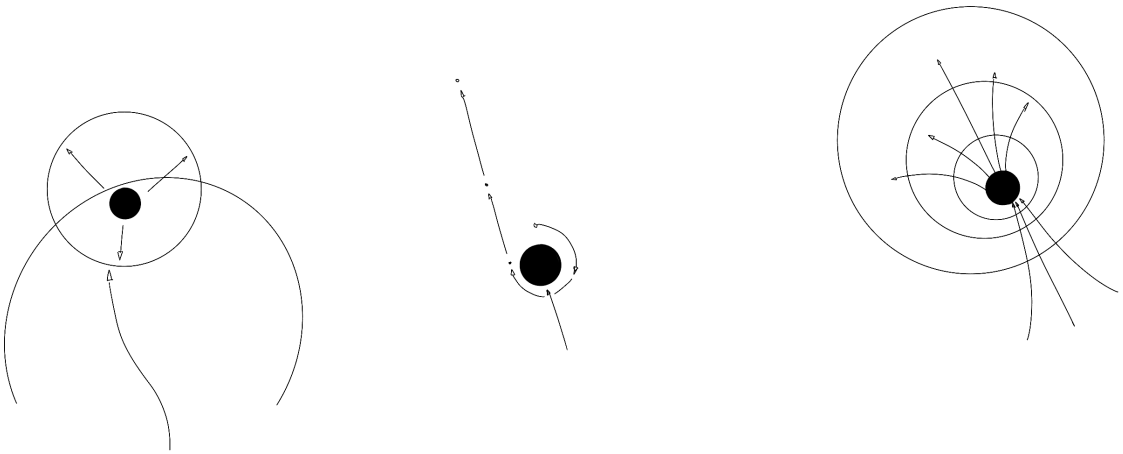


Figure 19: Three different types of start-up growth strategy. L2R: Stealth, Rapid, Explosive

Lean & rapid development
The lean startup relies on the efficiency and effectiveness of their day to day process (19). A small team is able to communicate closely and work effectively to singular goals. Within a lean company sharing everyday knowledge is made easy. This allows for an integrated approach to product development and commercialisation. As mentioned in the market chapter this approach is known to deliver improved performance over its more segregated counterpart. Examples of successful lean technology startups are Dropbox, Pebble and Instagram. Note, these smaller companies, over time, have all ended up being sold to large multinationals.

***Stealthy development** (13)*
A final strategy that stands out is Stealth. This strategy is used for the development of highly disruptive technologies and only works if competitors do not have time to anticipate. Especially as a startup, bigger companies might be able to finish development of a competing product before you are able to launch your own. This strategy is only applicable to a certain type of product. A big example is Siri, a service bought by Apple, and now available on any Apple device, allowing for complicated voice commands.

For Launchpad a lean and rapid development strategy is suits best as a base for spin-outs business model. The goal is not to grow the company explosively and a stealth approach can only be achieved with an invisible process. The lean and rapid development startup allows Shell to show what they are achieving and the skills needed in those startups match the values Shell can gain from this strategy. It should offer the most controlled and relative stable environment for creating the values. Quick product launch and the possibility to change staff without high risks is what this strategy concept needs.

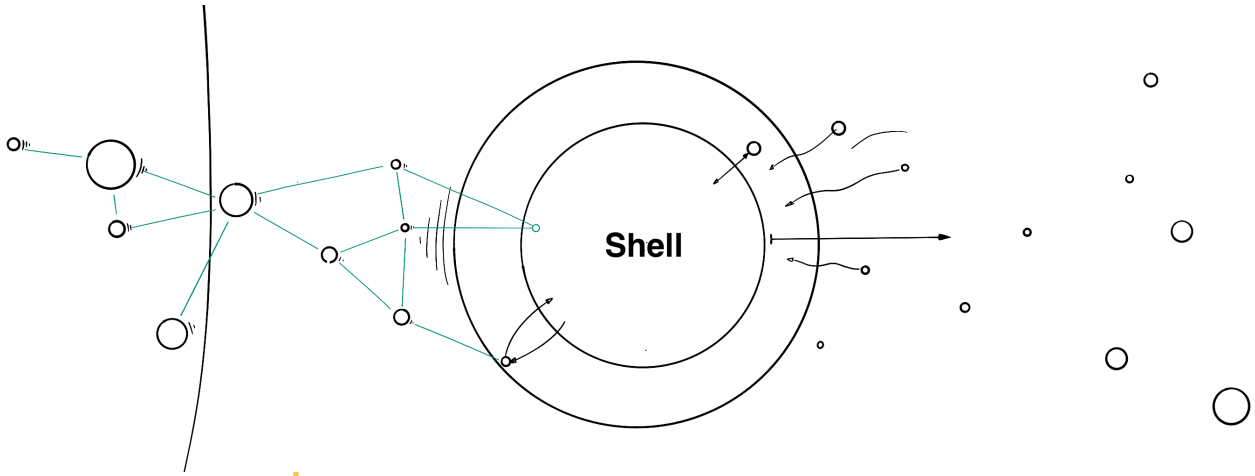


Figure 21: Startups retaining network and connection to markets that Shell has moved away from (left)

B4.4: Network

Network

One of the big secondary functions of the strategy is the retention of the network to the markets that are left by the company. The spin-out will allow Shell to retain their connection to the market, preventing the eventual loss of the network. In turn, keeping a connection to that network allows Shell to remain agile, and step back into those markets in the future. When Shell's strategy moves into a different direction or when it decides to decrease its development broadness, Shell's connections to certain markets may break. I have depicted this as a shrinking sphere of influence By introducing a spin-out, the existing connections that Shell has in these markets can be maintained. The connections may be a valuable strategic resource in the future.

B4.5: Launchpad network

Launchpad network

With this Launchpad strategy fully operating, the multiple launchpad spin-outs created by Shell each will create a web of technology companies making it possible to share learnings on their entrepreneurial efforts within the new Launchpad platform. The Launchpad network can provide knowledge sharing services such as, closed forums to share knowledge on the business,user sides of entrepreneurship within launchpad and the organisation of seminars on topics beyond monetary value creation for Shell. A centralised client pool where the spin-outs can gather information on experiences and collaborations with different customers, helps kick-start the youngest spin-outs. The launchpad network will be able to provide Shell a centralized overview of what the spin-outs are doing, and allows for performance comparisons. The network can be used as a recruitment tool for the platform, allowing Shell to post entry possibilities into the core company when there is a need for broadly skilled- entrepreneurial individuals. There are different options for talent acquisition/employment ranging from part-time contracting or moving from the spin-out to full Shell contact.

B4.6: Leadership and the crew

Leadership & the crew

The primary long-term value creation in the strategy is the acquisition of talents by Shell, as well as allowing talents from inside Shell to step outside of the bubble

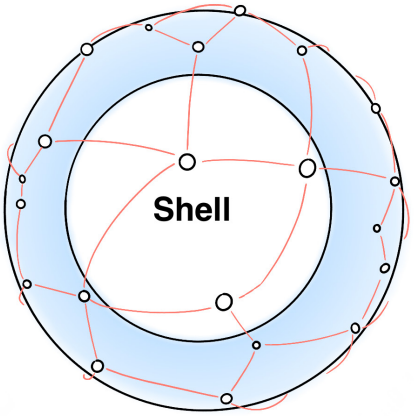


Figure 22: The launch-pad network connecting all launchpad stratups to strengthen learning capabilities and knowledge sharing

and hone their skills in a different “close-to-the-action” ecosystem. The inflow and outflow of information either through learning or individuals moving between the companies, is the largest value contributor of this strategy.

Selecting the right individuals is an essential component of this concept. The individuals needed for success are very situational. As a general strategy, there is little use defining them precisely.

Shell has no shortage of highly educated engineers, the typical Shell team consists mainly of engineers and Shell, being a technology company, mostly faces challenges that require engineers skills to solve. A start-up, or any small company, will require skills like in the field of entrepreneurship, marketing, strategising and budgeting . The diversification of skill sets is one of the values that this strategy will bring.

The size of the spin-out and the opportunities it creates will limit the amount of people involved in the company. For the start of the company advise a leadership duo, one person from Shell, the other one to be determined and assigned with the tasks of Design leader and Culture leader. A team of engineers and support based on the needs of the technology form the first development team. A second team can later be added as the processes within the company grow. A support team can be considered to be added if need be.

Research shows a persevering trend in the consistency of leadership teams. A significant amount of successful startup leadership comprises a duo, combining soft-skills, expertise and man-hours into a shared vision of the company. A combination of Shell experience and external experience will create a leadership team that allows experimentation with new concepts and approaches to challenges. And by keeping a connection to the Shell way of work should make the later adoption of successful approaches into Shell easier and possible. The combination of internal and external experience should result in a hybrid working environment taking elements from what Shell does well but streamlining the processes that come with the size of a large corporation to work in a startup environment.

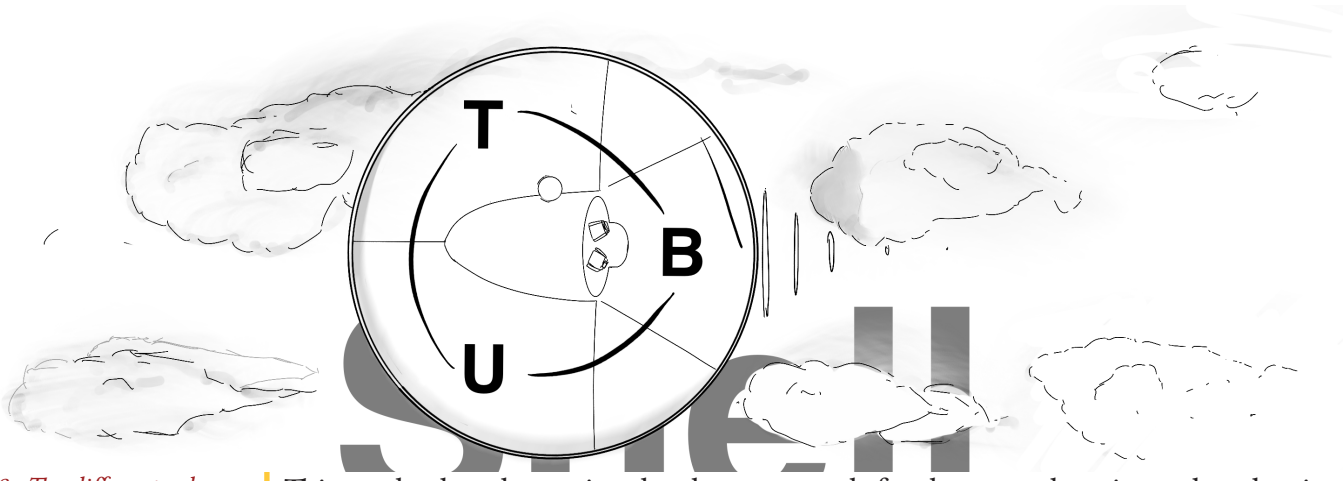


Figure 23: The different roles within the stratup

This can be done by setting development goals for the crew, that aim at the adoption of a rapid development ecosystem. Adaptability to changes in topics and directions is guiding. This is one of the key points noted in the Unilever Foundry example. The development goals should work towards discovering the personal skill and gaining competence in the multi-faceted working environment. The tasks themselves are a means to an end, to learn and be adaptable when facing new challenges.

B4.7: Structure

Structure

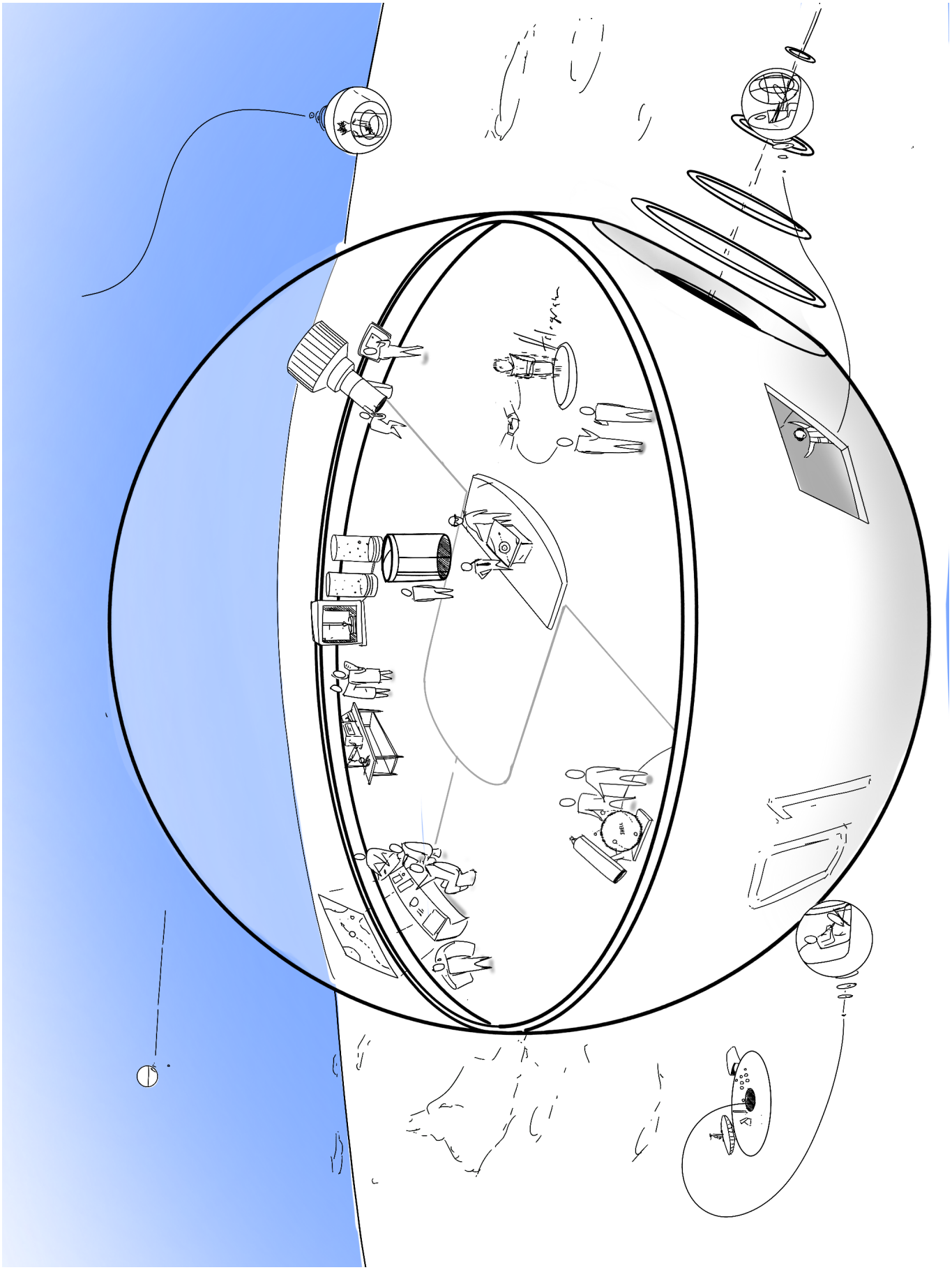
The startup itself will focus on creating a lean development environment with this small team of people. The rapid development of technologies in close-knit teams forms an ideal testing-ground for talented individuals and will allow the people that work on those projects to get to grips with the multi-faceted work styles of a technology startup.

Based on the lean startup strategy the roles in the startup are divided into three categories: business, technology and users *(57)*. Individuals can take on responsibilities in more than one category. The more categories you have responsibilities for, the less expertise oriented the role becomes. The two highest level managers will take on responsibilities for all the categories with the technology expert leaning towards technology and the design expert leaning towards the user end of the spectrum.
In the starting phase of the company, teams will be limited and focus broad. Once the product reaches the market the full spectrum of the lean team structure comes to fruition *(58)*. The team is then supplemented with team members that form a bridge between two of the separate categories. By doing so the growing team, will be able to bridge the gaps between disciplines.

The different roles in the company provide different options to create the values identified in the design goal. For instance, it is interesting for Shell to have an identified “talent” start in the technology role. Once the company grows this person could move to a more mixed focus role, which will help them broaden their skillset. A different approach can be followed when the company is looking to attract new talents from the startup. If these talents prove themselves very capable in leading

a transformational company, they could be asked to work for Shell's original business' and provide these skills notably in rapid development efforts going into the energy transition.

LAUNCHPAD



B4.8: Launchpad concept.

B4.9 Business model and customer value map

Fast business model canvas and customer value map

With the business model canvas *(4)* we can create an overview that describes the spin-outs business model. The strategy of course aims to create an as large as possible value for Shell, but this can be complicated, with Shell in role of partner as well as customer. The business model approaches the spin-outs launched by launchpad as largely autonomous entities. The filled in business model canvas (appendix 1) provides three interesting insights:

The customer segments and revenue streams are simple, but mayt be inflexible.
Values, activities and resources revolve largely around knowledge creation and sharing, that can be used to discover and develop talented individuals.
Costs for Shell are now based around an initial investment, with possible performance related investments related to success. A spin-out may want to look for investors outside of Shell, thought that could depend on the sensitivity of the patent and process.

I use the business model canvas to formulate a customer value proposition, based on the relationship between the company and their customer segments. The overview in Appendix 2 provides an overview of the factors taken into account. The spin-out will be delivering to two different parties. The customer value map is focussed on the main purpose of the spin-out: value-based products for Shell. From this the following value proposition was formulated:

"The Launchpad strategy will provide Shell with a controlled approach to gain long term benefits from non-monetary values that will help the company venture into a "new-energy" future, as an alternative to its current licensing strategy"

This value proposition describes what Launchpad will do, and will be taken into the launches spin-outs as starting-point for their own strategy. The strategy for the spin-outs will strongly dependent on the patent the company will be formed around.

B4.10: Company life cycle

Company life cycle

Startups do not have to be designed to exist for long extended periods of time. A startup built around a patent will be able to sustain itself until better products appear on the market. The launchpad spin-outs will experience a similar environment, where it is left to the spin-out to decide if it can afford to innovate or that the companies business model is no longer sustainable in the changing business ecosystem. Shell, as the main stakeholder and/or investor in these spin-outs, will have to make the decision what to do with the company. At this point in time, four options are possible:

- Dismantle the company - prevent the loss of assets as much as possible.
- Assimilate the spin-out - If the company has products related to Shells core business in the future, Shell can opt to assimilate the company and its resources back into core business space.
- Sell or Release the company - If the spin-out strays too far from Shells core business products, the possibility of sale should be considered. An interested 3rd party could acquire the spin-out, providing a monetary gain, or In the case of a financially strong spin-out that could mean a buyout by the smaller company.
- Investment boost - Finally the spin-out can be kept in operation through a new investment from Shell, granted there are innovation opportunities the spin-out could dive onto.

IMPLEMENTATION PLAN

Defining a route to carry out the new design is necessary to let this concept land. An implementation plan will strongly lend in the execution of the strategy. In such a plan I have been looking at how Shell's current strategies come to life. By following similar stages as in Shell's already existing technology development processes, this new strategy remains related to the company and thus, readily applicable for new technology development projects.

Shell's strategies are ever-changing, continually adapting to the companies' needs in a changing market. For example: Gamechanger, an innovation vehicle mentioned in the existing strategies chapter, has been around for decades and in many different shapes. In its current form and position it is open innovation vehicle that is closest related to the proposed Launchpad. Thus, the Gamechanger implementation plan can serve best as a starting point for the Launchpad implementation plan.t.

As mentioned, the implementation plan for the Launchpad strategy will follow a similar process to the development and commercialisation as a Shell technology product. The implementation of the new strategic concept can be divided into 5 distinct phases. My project covers two of these: the discover phase and part of the Develop phase.

However, I advise Shell to review the process steps that I made in this thesis. This would allow for iteration of possible ideas and that would likely fit the development strategy within a Shell context better than that a direct application of my proposals. Also, this strategy was developed from an individual's standpoint and even when it fits to the needs presented in Shells publications (appendix 5&6) it would certainly be strengthened by a second iteration performed by people with more knowledge and experience working in Shell.

1. Discover
2. Develop
3. Demonstrate
4. Deploy
5. A: Iterate

5 B: End of life

The first 4 stages mirror the Shell development strategy, however the 5th step is added and stands for the constant evaluation and iteration of the new strategy to keep itfit for and as close as possible to a changing market. The new stages 5A,iterate and 5B,end of life, are missing in the current development strategy. Adding an iteration step will allow grip on the optimisation of the strategy and makes the process more predictable. This process has already been applied to the current open innovation strategies of Gamechanger and Shell Ventures vehicles. It will help to adjust Launchpad to to the changing needs of the company, and to optimise its value creation capabilities.

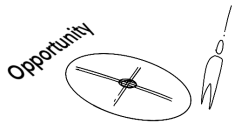


Figure 24: Discover

1.Discover

The case provided to me by Shell gave me further insights for the discover phase of the Launchpad strategy. . The project took place outside of the normal innovation pathways. It became clear that my projects existence might point to an opportunity for Shell. The discover phase can be summarised by the design goal, elaborating what the development stage would consist of.

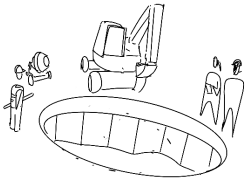


Figure 25: Develop

2. Develop

The development of the strategy focuses on identifying the needs of the user (Shell) and what values a technology product development process can create to fill those needs. In parts, this is covered by the work in this thesis. During this phase, cases need to be identified that are a strong fit in the development area of the launchpad strategy.

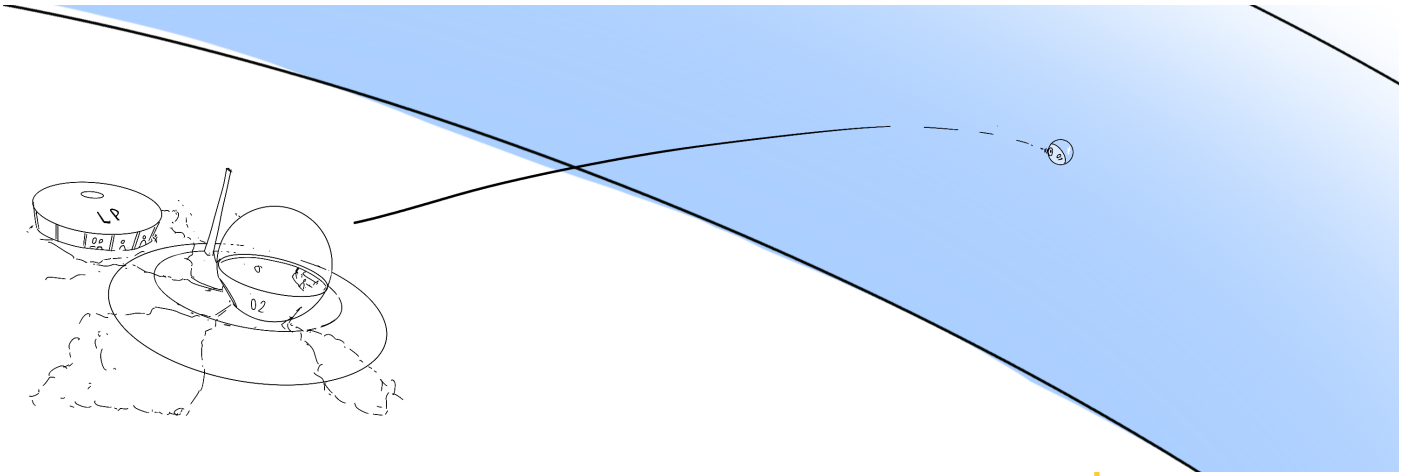


Figure 26: Demonstrate

3. Demonstrate

The functions of new products need to be tested to assess the quality of the concept and the feasibility of its further development. In this phase of the strategy implementation, the strategy will have to be tested using a cherry-picked case that allows for qualitative and quantitative analysis of its performance, comparing it for instance to the learnings Tapup may provide.

I suggest the launchpad strategy starts its life under the wings of the Gamechanger program. The gamechangers' experience with uncommon processes and developing new ideas will prove useful in launching the corporate spin-away.

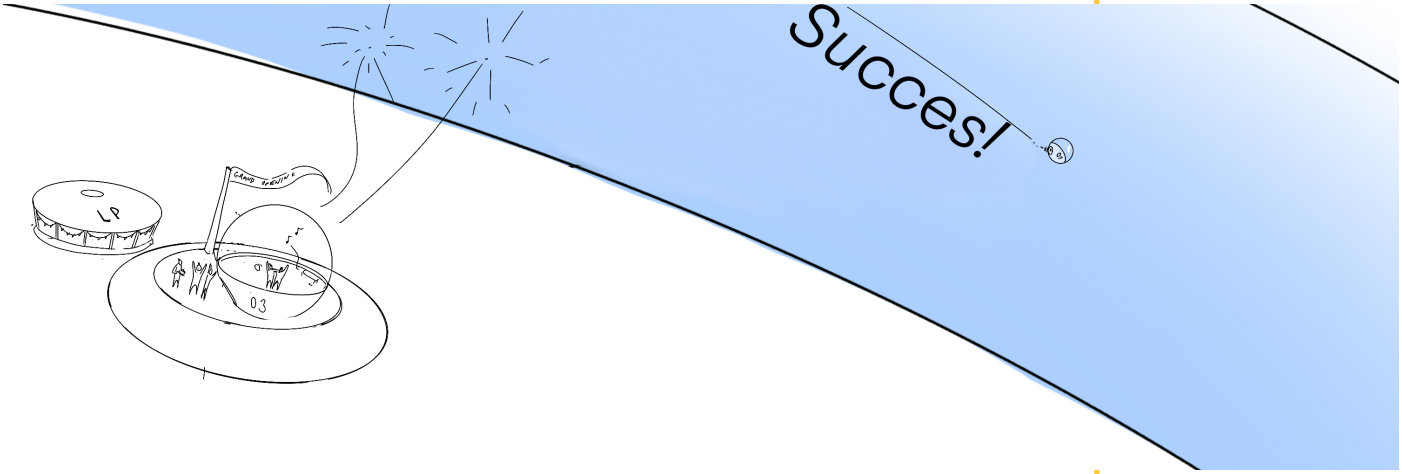


Figure 27: Deploy

4. Deploy

Once the prototype case is found to deliver the values it aims for, more spin-outs can be launched. The designed and deployed strategy is evaluated and performance tested by comparing the results to competing or internal alternatives. There is a stage-gat after deployment. If the strategy performs well and retains its unique characteristics the iteration phase can be started. If the strategy performs poorly or doesn't have a unique position as a new open innovation vehicle the strategy will go into its end-of-life (5B)

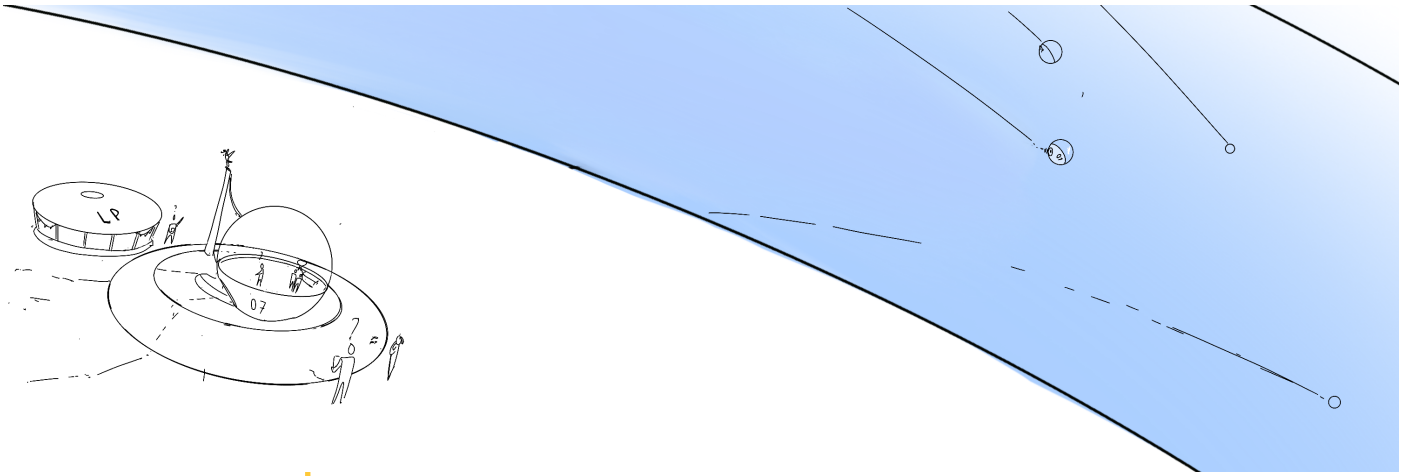


Figure 28: Assess

5A: Assess and iterate

The iteration phase starts in the development phase. At this stage, the effects of design choices will become obvious and considerations for a redesign will arise. The iteration phase builds up through 3 and 4 and becomes stand-alone after the stage-gate at D4.

The iteration will focus on the feedback from 3 and 4. How is the strategy performing and how can it be improved to meet Shell's upcoming needs?

5B End of life

Changing circumstances for Shell will require different strategies to provide for the needs that come up. The possibility exists that the amount of value the strategy provides will decrease during its lifetime and that the most logical option is to terminate the programme. At this point in time Shell will have to decide what to do with the existing spin-outs, (as discussed in the product end of life segment (reference)). The remains of the strategy can be merged with Shells alternatives and continue to exist under the wing of, for instance, Gamechanger.

The Launchpad approach offers vast potential to bettering Shell's inherent development strategy model. It has been deliberately designed to facilitate implementation by closely following the company's current operations. Yet, it differs with alterations to the final stages whereby more considerations are made: A) To iterations and adapting, in order to closer evolve with the changeable external factors, such choices should be made at distinct stages-gate evaluations with clear benchmarks. B) the programme's ultimate relationship with Shell once it has been terminated. Nevertheless, although all these solutions have been founded on thorough research and personal reflection, it is important to take into account more classified information on internal factors within the company before such a strategy should be implemented.

CONCLUSION

The separate strategy elements that I identified and dissected in the concept ideation are all proven elements. . By combining these elements in my new Launchpad development strategy, I dare to state that the new Launchpad strategy is a viable option for Shell. Essentially my design is a new combination of existing, proven strategy components.

Internal elements
1 - launch internal ideas, that fall out of the mould for development in exisitng development programs, into a space where they can be developed to create a broad set of values for Shell. (Gamechanger)

2 - use big projects as an already moving train to step up, develop and deploy many smaller ideas. (Prelude)

3 - use corporate start-up to develop entrepreneurial skills and offer a challenge to those that are up to it. (Tapup)

4 - pull in talented engineers via an innovation accelerator and alternative working environments. (Techworks)

External elements
5 - Create buy-in internally that the actions the company (Shell) is going to take are necessary. Is there a company that found itself in the same situation as Shell? (Philips)

6 - A structured method to the implementation of design developed in their start-up accelerator. (Unilever foundry)

7 - Visions on implementation of design in company, possible in small startups. (McKinsey design)

The Launchpad strategy is a new combination of existing internal and externally proven strategy elements that I expect to work very well together. This new strategy should offer Shell a unique tool to navigate the energy transition and the company's future in the new-energy market. The case illustrated clearly that Shell is looking for a licencing partner that can help them to finalise the development and deployment of their technology. Rather than looking for existing partners I believe Shell could gain from looking for alternative new partners and from applying the Launchpad strategy.

I believe this final Launchpad strategy design provides Shell with a concept that can contribute to their already existing development vehicles. Please note that the design was based on insights gained during a relatively short period in the company. However recent publications by Shell indicate my concept touches on subjects and solutions of interest and one could argue that it is exactly the smaller unexpected corners of the company that can come forward with out-of-the-box ideas.

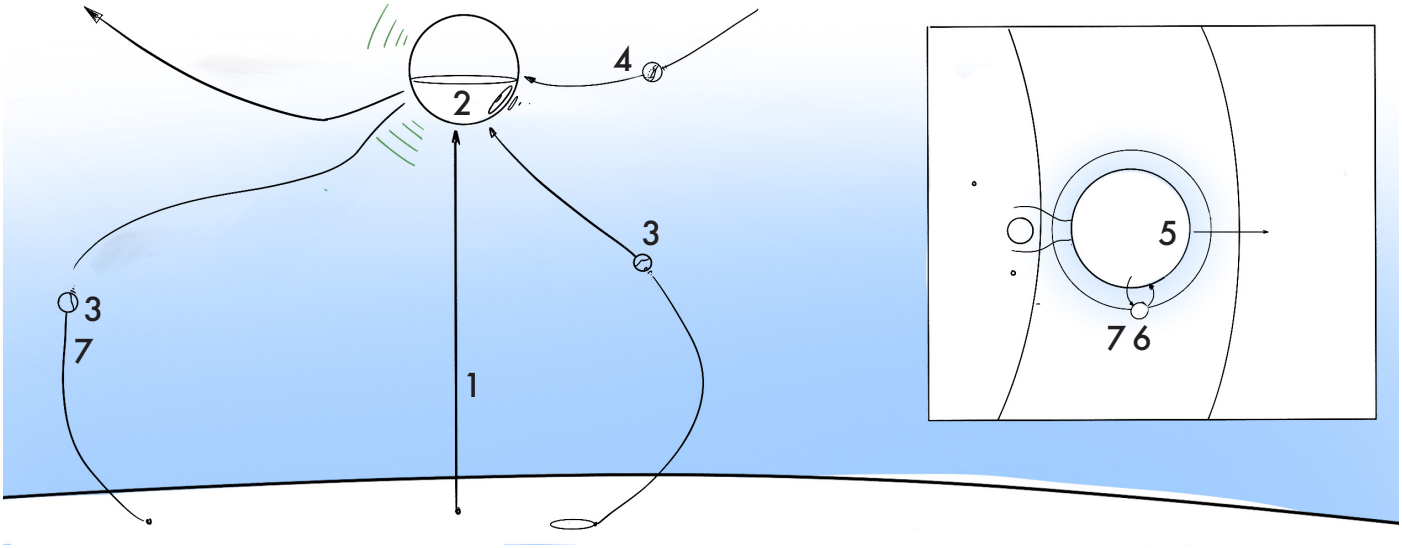


Figure 30: Conclusion overview

EVALUATION

C1: Evaluation

I realise my product choice and development journey were out of the ordinary but I set out to make it so. My personal goal for my thesis was to find a business environment that hadn't been seen through the eyes of a strategic product designer, a design task that differed from the more traditional design projects. I believe that this was the case for the environmental technology development in Shell to which I contributed. I feel my approach was novel but I also think there is plenty of room for improvement.

I had to bridge between the Shell team's goals and challenges and the Delft SPD design expectations. It required some restructuring of the thesis. The writing process became more complex and difficult as a result. Not surprising, when considering the more unusual assignment, but the challenges didn't necessarily come from the directions I expected.

At Shell the project started with a straight line approach for the design challenge. Such an approach doesn't meet the needs of an SPD design assignment and hence it resulted in re-defining the design challenge to develop a solution that solves one of Shell's challenges discovered during the analysis. This was a good decision as it lead me back into designing, instead of just researching. I expect this is a common phenomenon in engineering projects approached by designers.

I was surprised about the ease with which I was able to grasp the specific technical and topical information during the assignment. Especially in the early stages of the assignment I gained a lot of knowledge on the topics related to the subject as well as on other closely related topics. The insights I gained from the deepdive were very valuable. This was possible and supported enormously by the inclusive and warm welcome I received at Shell.

The main challenge was the slight disconnect between the vision of the university supervisory team, which pushed me towards designing a strategy, and Shell, that pulled me towards marketing and commercialisation of the product. In the end this resulted in me working on two reasonably connected topics within the thesis, rather than designing one single 'product' to one defined goal. At one moment in time I was writing a consultancy advice, a thesis and a whitepaper, and the structure of the thesis was thoroughly overhauled at least 3 times before its last iteration. This imbalance between the two parties is one of the reasons why I struggled to connect, structure and balance the final thesis report.

End of November/early December 2018 I finished the deepdive and started planning the remainder of the thesis. It became apparent that I would not be designing the technology further, since the task of developing a technology product manual lay too far from the scope of a SPD masters thesis. Instead I would focus on tackling the oddities and inconsistencies within the development that I had discovered

during the deepdive.

At this stage the meetings comprised a lot of ideation and brainstorming. The ideas from the sessions where very valuable but led me to make a big mistake. I assumed that choosing the prevalent idea that came forward was a good way to progress but instead it severely limited the level of broadness possible in the ideation. This is one of the key elements (and usually one of my strengths) in a structured design process. I should have recognised some steering happening and could have used it to my advantage. Finally, though it pains me to admit, a summer's campaign for rowing glory impeded my ability to adapt to this circumstance a lot.

In the final stages of the thesis, I struggled to pick up where I left and realised that certain topical threads had dropped out of the report. It resulted in some conclusions seeming to be pulled out of thin air. October and November were spent mostly on damage control.

I'm convinced the end product meets the needs that I discovered even though the underlying process may seem to lack some structure. Deciding to go for a challenging, out-of-the-ordinary thesis assignment was a gamble that may not pay off in the form of a high grade. However, it gave me a huge amount of knowledge for the start of my career. Learnings that I wouldn't have gained through an assignment closer to the SPD home.

I tried to leave rowing out of the evaluation, but I realise that my summers athletic campaign impacted my ability to write the thesis a lot. As I stated in my preface, in the year and a bit I took to produce this text I, invested as much, if not more, time into getting closer to my goal of qualifying for the ultimate edition of the lightweight men's double skulls at the Tokyo Olympics in 2020. A journey I continue, in my final season of international rowing.

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