

# **Understanding business model innovation in start-ups**

## **– A dynamic managerial capabilities perspective**

Iroro Emmanuel Eradajaye, PMP, PMI-ACP, PMI-PBA

Submitted for the degree of Doctor of Business Administration

Edinburgh Business School  
Heriot-Watt University

September 2022

The copyright in this thesis is owned by the author. Any quotation from the thesis or use of any of the information contained in it must acknowledge this thesis as the source of the quotation or information.

# Table of Contents

<b>Abstract .....</b>	<b>iv</b>
<b>Acknowledgements.....</b>	<b>v</b>
<b>Declaration .....</b>	<b>vi</b>
<b>Glossary of Terms .....</b>	<b>vii</b>
<b>List of Abbreviations .....</b>	<b>ix</b>
<b>List of Figures .....</b>	<b>x</b>
<b>List of Tables .....</b>	<b>xi</b>
<b>1. Introduction.....</b>	<b>1</b>
<b>1.1 Research background and significance .....</b>	<b>1</b>
<b>1.2 Research question, aim and objectives.....</b>	<b>3</b>
<b>1.3 Research approach .....</b>	<b>3</b>
<b>1.4 Thesis structure.....</b>	<b>4</b>
<b>2. Literature review and theoretical framework .....</b>	<b>6</b>
<b>2.1 Introduction .....</b>	<b>6</b>
<b>2.2 Business model .....</b>	<b>6</b>
2.2.1 <i>Defining a business model.....</i>	<i>6</i>
2.2.2 <i>Components of a business model.....</i>	<i>11</i>
<b>2.3 Developing a business model .....</b>	<b>13</b>
2.3.1 <i>Tools for business model development .....</i>	<i>14</i>
2.3.1.1 <i>Business model canvas .....</i>	<i>15</i>
2.3.1.2 <i>Lean canvas .....</i>	<i>18</i>
2.3.1.3 <i>Summary.....</i>	<i>19</i>
<b>2.4 Business models and strategy .....</b>	<b>21</b>
<b>2.5 The context of start-ups .....</b>	<b>24</b>
2.5.1 <i>The imperfection of start-ups .....</i>	<i>25</i>
2.5.2 <i>Technology and complementary assets .....</i>	<i>25</i>
<b>2.6 Business model innovation.....</b>	<b>26</b>
2.6.1 <i>Motivations for business model innovation .....</i>	<i>29</i>
2.6.2 <i>The process of business model innovation .....</i>	<i>30</i>
2.6.3 <i>Business model innovation and competition .....</i>	<i>36</i>
2.6.4 <i>Challenges of business model innovation.....</i>	<i>38</i>
<b>2.7 Dynamic capabilities.....</b>	<b>40</b>
<b>2.8 Dynamic managerial capabilities .....</b>	<b>42</b>
2.8.1 <i>Managerial human capital.....</i>	<i>46</i>
2.8.2 <i>Managerial social capital .....</i>	<i>47</i>
2.8.3 <i>Managerial cognition .....</i>	<i>48</i>
2.8.3.1 <i>Emotion regulation .....</i>	<i>49</i>
2.8.3.2 <i>Path dependence.....</i>	<i>50</i>
<b>2.9 Literature synthesis .....</b>	<b>51</b>
<b>3. Methodology .....</b>	<b>55</b>
<b>3.1 Philosophical paradigm .....</b>	<b>55</b>
3.1.1 <i>Comparing alternative paradigms.....</i>	<i>56</i>
3.1.2 <i>Arguments for the chosen philosophical approach .....</i>	<i>59</i>
<b>3.2 Research strategy and methods .....</b>	<b>60</b>
3.2.1 <i>The case study method.....</i>	<i>60</i>
3.2.2 <i>Sampling strategy.....</i>	<i>62</i>
3.2.3 <i>The case companies.....</i>	<i>63</i>
3.2.4 <i>The multiple cross-sectional case study approach .....</i>	<i>63</i>

3.2.5	<i>Data collection</i> .....	66
3.2.5.1	<i>Interview transcription</i> .....	67
3.2.6	<i>Data analysis</i> .....	68
3.3	<b>Ethical considerations</b> .....	70
4.	<b>Pilot Study</b> .....	72
4.1	<b>Case and participant selection</b> .....	73
4.2	<b>Interview mode</b> .....	74
4.3	<b>Interview guide</b> .....	76
4.4	<b>Interview language and Time management</b> .....	77
4.5	<b>Pilot study outcome</b> .....	77
4.5.1	<i>The interview questions</i> .....	78
4.6	<b>Summary</b> .....	79
5.	<b>Data Collection and Analysis</b> .....	80
5.1	<b>Research sample</b> .....	80
5.2	<b>Individual Interviews</b> .....	81
5.3	<b>Document review</b> .....	82
5.4	<b>Analysis</b> .....	83
5.4.1	<i>Familiarizing with the data</i> .....	83
5.4.2	<i>Generating initial codes</i> .....	84
5.4.3	<i>Searching for themes</i> .....	86
5.4.4	<i>Reviewing themes</i> .....	88
5.4.5	<i>Defining and naming themes</i> .....	89
5.4.6	<i>Producing the report</i> .....	90
6.	<b>Profile of the case study start-ups</b> .....	91
6.1	<b>A framework for classifying BMI</b> .....	91
6.2	<b>Describing the case study start-ups</b> .....	92
6.2.1	<i>Firm A</i> .....	92
6.2.2	<i>Firm B</i> .....	94
6.2.3	<i>Firm C</i> .....	96
6.2.4	<i>Firm D</i> .....	98
6.2.5	<i>Firm E</i> .....	99
6.2.6	<i>Firm F</i> .....	100
6.2.7	<i>Firm G</i> .....	101
6.2.8	<i>Firm H</i> .....	102
6.2.9	<i>Firm I</i> .....	103
6.2.10	<i>Firm J</i> .....	105
7.	<b>Findings</b> .....	109
7.1	<b>Results from the individual cases</b> .....	109
7.1.1	<i>Case1 - Firm A</i> .....	109
7.1.2	<i>Case2 - Firm B</i> .....	112
7.1.3	<i>Case3 - Firm C</i> .....	114
7.1.4	<i>Case4 - Firm D</i> .....	117
7.1.5	<i>Case5 - Firm E</i> .....	119
7.1.6	<i>Case6 - Firm F</i> .....	120
7.1.7	<i>Case7 - Firm G</i> .....	122
7.1.8	<i>Case8 - Firm H</i> .....	123
7.1.9	<i>Case9 - Firm I</i> .....	126
7.1.10	<i>Case10 - Firm J</i> .....	128
7.2	<b>Cross case analysis</b> .....	132
7.2.1	<i>Collaboration Capabilities</i> .....	135
7.2.1.1	<i>Networking</i> .....	135
7.2.1.2	<i>Commitment</i> .....	136
7.2.1.3	<i>Internal cooperation</i> .....	137

7.2.2	<i>Capitalization capabilities</i> .....	137
7.2.2.1	Experience .....	137
7.2.2.2	Searching .....	139
7.2.2.3	Maximizing Resources .....	140
7.3	<b>Summary</b> .....	141
8.	<b>Discussion</b> .....	143
8.1	<b>Collaboration Capabilities</b> .....	144
8.1.1	<i>Networking and Managerial Social Capital</i> .....	145
8.1.2	<i>Commitment and Managerial Cognition</i> .....	146
8.1.3	<i>Internal Cooperation and Managerial Human Capital</i> .....	148
8.2	<b>Capitalization Capabilities</b> .....	149
8.2.1	<i>Experience and Managerial Human Capital / Cognition</i> .....	150
8.2.2	<i>Searching and Managerial Human Capital / Cognition</i> .....	151
8.2.3	<i>Maximising resources and Managerial Human Capital</i> .....	153
8.3	<b>Summary</b> .....	154
9.	<b>Conclusion</b> .....	156
9.1	<b>Implications for practice</b> .....	157
9.2	<b>Implications for research</b> .....	159
9.3	<b>Limitations of the study</b> .....	161
9.4	<b>Recommendation for further research</b> .....	161
9.5	<b>Concluding remarks</b> .....	162
10.	<b>References</b> .....	164
	<b>Appendix A – Information Sheet</b> .....	178
	<b>Appendix B – Consent Form</b> .....	182
	<b>Appendix C – Invitation Letter</b> .....	183
	<b>Appendix D – Initial Interview Guide</b> .....	184
	<b>Appendix E – Updated Interview Guide</b> .....	185
	<b>Appendix F – Pilot study Invitation Letter</b> .....	187
	<b>Appendix G – Results from the individual case analysis</b> .....	188

## Abstract

Although start-ups and incumbent firms both engage in business model innovation, the research literature on business model innovation has largely focused on incumbent firms. Start-ups play an important role in the growth of an economy, and with their failure rate being high, the need for an adequate business model and continuously innovating it, is crucial for financial performance and competitive advantage. Underpinning this study is the understanding that a business model represents how a firm creates, delivers, and captures value. Moreover, business model innovation involves reconfiguring components or the architecture of a business model for the benefit of the firm, which requires capabilities.

The importance of the dynamic capabilities of a firm, and the need to quickly identify and respond to opportunities, and consequently innovate business models has previously been noted. However, gaps still exist in how business model innovation is understood with respect to dynamic managerial capabilities in start-ups. This study contributes to the body of knowledge by exploring the influence of capabilities on business model innovation in start-ups. Based on the theory of dynamic managerial capabilities, the following research question was examined: What capabilities allow managers (e.g. founders, decision makers) in start-ups to innovate their business models?

This study was situated within the critical realism paradigm and used multiple explorative cross-sectional case studies on start-ups. The primary source of data was the subjective experience of managers, who were recruited through purposive sampling. Semi-structured interviews were used to elicit the data, which was recorded and transcribed verbatim. The transcripts were analysed using thematic analysis, and documentary evidence was used for triangulation. The findings highlight two main dimensions of capabilities that enable start-up managers to innovate their business models. These are *collaboration capabilities* (comprising of *networking*, *commitment*, and *internal cooperation*) and *capitalization capabilities* (comprising of *experience*, *searching*, and *maximizing resources*). This study draws attention to the need for managers to foster these capabilities, and the implications for professional managerial practises and the research literature are delineated.

## **Acknowledgements**

This journey has been challenging and thrilling, and I want to express my sincere gratitude to those that contributed in one way or another to make it happen.

I would like to thank my supervisor Dr Swapnesh Masrani for his unwavering support and guidance throughout the development of this thesis. The nice discussions we had, and the many feedbacks provided helped set me in the right direction. I also want to thank Dr Yen Tran for her support and insight.

I would like to thank Dr Stephen McLaughlin for his mentorship and help in putting together the research proposal.

I also want to thank the support staff at Edinburgh Business School. Especially, DBA Operations Manager, Adrian Carberry, and Research Secretary, Holly Sinclair, for their timely response to all my queries.

Many thanks to the participating companies of this study for taking the time to provide their invaluable contributions. A big thanks goes to Tormod Moldestad, the Managing Director of Kobben, a technology business incubator, for his encouragement and help in facilitating data collection.

Last but certainly not least, a special thanks goes to my wife, Esther, without whom this would not have been possible, and my daughters, Ochuko and Mine, for their encouragement, support and understanding, especially when I had to spend a bit more time at my desk instead of spending it with them.

## Declaration



## Research Thesis Submission

Name:	Iroro Emmanuel Eradajaye		
School:	Edinburgh Business School		
Version: <i>(i.e. First, Resubmission, Final)</i>	Final	Degree Sought:	Doctor of Business Administration (DBA)


### Declaration

In accordance with the appropriate regulations I hereby submit my thesis and I declare that:

1. The thesis embodies the results of my own work and has been composed by myself
2. Where appropriate, I have made acknowledgement of the work of others
3. The thesis is the correct version for submission and is the same version as any electronic versions submitted\*.
4. My thesis for the award referred to, deposited in the Heriot-Watt University Library, should be made available for loan or photocopying and be available via the Institutional Repository, subject to such conditions as the Librarian may require
5. I understand that as a student of the University I am required to abide by the Regulations of the University and to conform to its discipline.
6. I confirm that the thesis has been verified against plagiarism via an approved plagiarism detection application e.g. Turnitin.

Signature of Candidate:		Date:	27 September 2022
-------------------------	---	-------	-------------------

### Submission

Submitted By <i>(name in capitals)</i> :	IRORO EMMANUEL ERADAJAYE
Signature of Individual Submitting:	
Date Submitted:	27 September 2022

### For Completion in the Student Service Centre (SSC)

Limited Access	Requested	Yes	No	Approved	Yes	No
<i>E-thesis Submitted (mandatory for final theses)</i>						
Received in the SSC by <i>(name in capitals)</i> :				Date:		

## **Glossary of Terms**

**Bootstrapping** – Starting a company without substantial capital or support from investors.

**Complementary assets** – the capabilities required to exploit a technology (besides those that underpin the technology) (Afuah and Tucci, 2003).

**Cost structure** – various costs incurred by a firm.

**Decision variable** – variables whose attributes, values or properties may be chosen by the decision maker.

**Incubator** – a firm with a program and mission to facilitate the development and growth of start-ups.

**Incumbent firms** – a firm whose products and services are well established within a given industry or market.

**Open innovation** – a mindset to innovation that promotes sharing and receiving information, contrary to conventional method of doing innovation where information stays within pre-set confines.

**Operating model** – relates to the know-how, competencies, tangible assets, intangible assets, and value chain of a firm, by which it creates and delivers value for the customer (Torabi, 2020).

**Margin** – the degree by which a firm's revenue generated from products and/or services exceeds the associated costs.

**Mechanism** – a process or system by which a desired outcome is achieved.

**Revenue model** – a structured description of how a firm generates or plans to generate revenue.

**Service orientation** – designing and delivering the best possible service for customers.



**Start-up** – a firm that was recently founded and has started showing signs of future potential.

**Technology Business Incubator** – a firm that support and facilitate the growth and success of entrepreneurs, start-ups, scale-ups, and established firms.

**Value capture** – the means through which a firm create profit from its transactions.

**Value creation** – executing actions that result in increased firm worth.

**Value delivery** – everything necessary to ensure maximum value to customers.

## List of Abbreviations

Abbreviation	Meaning
API	Application programming interface
B2B	Business-to-business
BM	Business model
BMI	Business model innovation
BMC	Business model canvas
CEO	Chief executive officer
COO	Chief operating officer
CPO	Chief product officer
CTO	Chief technology officer
CV	Curriculum vitae
CVP	Customer value proposition
DC	Dynamic capabilities
DMC	Dynamic managerial capabilities
ER	Emotion regulation
GDPR	General data protection regulation
IP	Intellectual property
IT	Information technology
MVP	Minimum viable product
OEM	Original equipment manufacturer
PC	Personal computer
ROI	Return on investment
TBI	Technology business incubator
TTM	Time to market
UDI	User driven innovation
US	United states
VPC	Value proposition canvas
VMC	Value model canvas

## List of Figures

Figure 2-1: Relationship between strategy, business models, and performance .....	22
Figure 2-2: BMI through new content / activity.....	33
Figure 2-3: Simplified schema of dynamic capabilities, business models, and strategy .....	41
Figure 2-4: Dynamic managerial capabilities and strategic decisions .....	45
Figure 3-1: Comparing the research paradigms .....	58
Figure 3-2: The methodological approach of this study.....	65
Figure 6-1: Classifying business model innovation.....	92
Figure 7-1: Summary of findings .....	142
Figure 8-1: Capabilities that influence BMI in start-ups.....	155
Figure 9-1: Collaboration Capabilities Triangle .....	158
Figure 9-2: Capitalization Capabilities Triangle .....	159

## List of Tables

Table 2-1: Examples of business model definitions in the literature .....	7
Table 2-2: Components of a business model canvas .....	17
Table 2-3: Components of a Lean Canvas .....	19
Table 2-4: Example of probing questions to evaluate a business model .....	20
Table 2-5: Examples of ways by which a business model may be innovated .....	30
Table 2-6: A framework for BMI.....	32
Table 2-7: Example of elements needed for BMI through new content.....	33
Table 2-8: Self-evaluating questions for managers considering BMI .....	36
Table 2-9: Example variables used to measure human capital.....	46
Table 2-10: Example variables used to measure social capital .....	48
Table 2-11: Example variables used to measure managerial cognition .....	48
Table 3-1: Phases of thematic analysis.....	69
Table 4-2: Researcher & participant interaction during face-to-face & telephone interviews.....	75
Table 4-3: Pilot study interview details .....	75
Table 5-1: Characteristics of participating start-up companies .....	80
Table 5-2: Overview of individual interviews .....	82
Table 5-3: Example of codes generated for a data extract .....	85
Table 5-4: The number of initial themes identified for each case .....	87
Table 5-5: Example of an identified theme .....	87
Table 5-6: Defining and naming a theme .....	89
Table 6-1: profile of the case study start-ups .....	107
Table 7-1: Themes found for <i>Case1- Firm A</i> .....	109
Table 7-2: <i>Case1 – Firm A</i> : The capacity to join and utilize innovation and business networks or environments .....	110
Table 7-3: <i>Case1 – Firm A</i> : The capacity for education, learning and the pursuit of personal interest ...	110
Table 7-4: <i>Case1 – Firm A</i> : The capacity to focus on the customer and want the best for them .....	111
Table 7-5: <i>Case1 – Firm A</i> : The capacity to maximize individuality, complementary skills, and internal collaboration. ....	111
Table 7-6: <i>Case1 – Firm A</i> : The capacity to maximize own resources.....	111
Table 7-7: <i>Case1 – Firm A</i> : The capacity to research, test and validate.....	112
Table 7-8: <i>Case1 – Firm A</i> : The capacity to apply proven tools and concepts .....	112
Table 7-9: Themes found for <i>Case2- Firm B</i> .....	112
Table 7-10: <i>Case2 – Firm B</i> : The capacity to apply learned business concepts.....	113
Table 7-11: <i>Case2 – Firm B</i> : The capacity to collaborate with other organizations .....	113
Table 7-12: <i>Case2 – Firm B</i> : The capacity to learn, identify gaps, and work hard in pursuit of interest..	114
Table 7-13: <i>Case2 – Firm B</i> : The capacity to be in an innovative environment and network .....	114
Table 7-14: Themes found for <i>Case3- Firm C</i> .....	114
Table 7-15: <i>Case3 – Firm C</i> : The capacity to be flexible and adapt.....	115
Table 7-16: <i>Case3 – Firm C</i> : The capacity to capitalize on background, experience, and expert competence.....	115
Table 7-17: <i>Case3 – Firm C</i> : The capacity to research, learn and test.....	115
Table 7-18: <i>Case3 – Firm C</i> : The capacity to engage stakeholders using the right channels .....	116
Table 7-19: <i>Case3 – Firm C</i> : The capacity to network .....	116
Table 7-20: <i>Case3 – Firm C</i> : The capacity to collaborate and be visible in partnerships .....	116
Table 7-21: Themes found for <i>Case4 - Firm D</i> .....	117
Table 7-22: <i>Case4 – Firm D</i> : The capacity to focus on own strengths.....	117
Table 7-23: <i>Case4 – Firm D</i> : The capacity to network and be in a network.....	117
Table 7-24: <i>Case4 – Firm D</i> : The capacity to build a solid foundation through planning and research ...	118
Table 7-25: <i>Case4 – Firm D</i> : The capacity to capitalize on unique and complementary skills .....	118
Table 7-26: <i>Case4 – Firm D</i> : The capacity to adapt .....	118
Table 7-27: Themes found for <i>Case5 - Firm E</i> .....	119
Table 7-28: <i>Case5 – Firm E</i> : The capacity to utilize own network.....	119
Table 7-29: <i>Case5 – Firm E</i> : The capacity to care and focus on the customer .....	119
Table 7-30: <i>Case5 – Firm E</i> : The capacity to manage resources and exploit own strength.....	120

Table 7-31: <i>Case5 – Firm E</i> : The capacity to learn and adapt .....	120
Table 7-32: Themes found for <i>Case6 - Firm F</i> .....	120
Table 7-33: <i>Case6 – Firm F</i> : The capacity to capitalize on unique technical competencies and resources .....	121
Table 7-34: <i>Case6 – Firm F</i> : The capacity for commitment, flexibility, and agility .....	121
Table 7-35: <i>Case6 – Firm F</i> : The capacity for a personal network and presence in an innovative environment .....	121
Table 7-36: Themes found for <i>Case7 - Firm G</i> .....	122
Table 7-37: <i>Case7 – Firm G</i> : The capacity to utilize accrued experiences and education .....	122
Table 7-38: <i>Case7 – Firm G</i> : The capacity to learn, experiment, and adapt .....	122
Table 7-39: <i>Case7 – Firm G</i> : The capacity to be present in a personal, professional and innovation network .....	123
Table 7-40: <i>Case7 – Firm G</i> : The capacity to exploit own strength .....	123
Table 7-41: Themes found for <i>Case8 - Firm H</i> .....	123
Table 7-42: <i>Case8 – Firm H</i> : The capacity to capitalize on professional background and experience .....	124
Table 7-43: <i>Case8 – Firm H</i> : The capacity for commitment and focus on the customer .....	124
Table 7-44: <i>Case8 – Firm H</i> : The capacity to collaborate with partner organizations .....	124
Table 7-45: <i>Case8 – Firm H</i> : The capacity to learn, research and plan .....	125
Table 7-46: <i>Case8 – Firm H</i> : The capacity to pay attention in a personal, professional or innovation network .....	125
Table 7-47: Themes found for <i>Case9 - Firm I</i> .....	126
Table 7-48: <i>Case9 – Firm I</i> : The capacity to build on extensive industry experience .....	126
Table 7-49: <i>Case9 – Firm I</i> : The capacity to plan and research .....	127
Table 7-50: <i>Case9 – Firm I</i> : The capacity to device a clear and workable competitive strategy .....	127
Table 7-51: <i>Case9 – Firm I</i> : The capacity to put together a strong team that works towards a common goal .....	128
Table 7-52: <i>Case9 – Firm I</i> : The capacity for networking and partnership .....	128
Table 7-53: Themes found for <i>Case10 - Firm J</i> .....	128
Table 7-54: <i>Case10 – Firm J</i> : The capacity for learning and dedication .....	129
Table 7-55: <i>Case10 – Firm J</i> : The capacity to exploit own strength, background, and experience .....	129
Table 7-56: <i>Case10 – Firm J</i> : The capacity to involve and engage the customer .....	130
Table 7-57: <i>Case10 – Firm J</i> : The capacity to identify a problem or opportunity and address it uniquely .....	130
Table 7-58: <i>Case10 – Firm J</i> : The capacity to restructure and adapt .....	131
Table 7-59: <i>Case10 – Firm J</i> : The capacity to utilize own network or community .....	131
Table 7-60: Emergent themes from the cross-case analysis .....	133
Table 8-1: Collaboration capabilities and dynamic managerial capabilities .....	144
Table 8-2: Capitalization capabilities and dynamic managerial capabilities .....	149

## **1. Introduction**

### **1.1 Research background and significance**

Discussions about business model innovation (BMI) is gaining increasing attention among researchers and practitioners because of its growing importance to the financial performance and competitive advantage of firms (Andries and Debackere, 2013; Spieth *et al.*, 2014; Foss and Saebi, 2017; Hossain, 2017). A business model (BM) serves to commercialize innovation by providing a framework that allows firms to create, deliver and capture value from service or product innovation (Chesbrough and Rosenbloom, 2002; Chesbrough, 2010; Teece, 2010). BMI on the other hand, involves responding to new sources of value creation through the discovery and implementation of novel BMs (Teece, 2010; Bjorkdahl and Holmen, 2013; Schneider and Spieth, 2013). BMI increases the competitive advantage of a firm, which is vital for long-term performance (Mitchell and Coles, 2003; Mitchell and Coles, 2004; Zott *et al.*, 2011; Hossain, 2017).

Firms usually pursue new ideas and technologies while lagging on BMI even though it is more important (Chesbrough, 2010). A firm combining a simple idea with a solid BM may experience better performance than one combining sophisticated technology with a weak BM (Chesbrough and Rosenbloom, 2002; Chesbrough, 2010). Furthermore, firms offering similar value propositions to the same customer segment may utilize different BMs and get markedly different results (Chesbrough, 2010; Bjorkdahl and Holmen, 2013). This shows that the value derived from customer offerings is reduced if a firm fails to find an appropriate BM. Hence the importance of BMs for performance cannot be overemphasized, and the ability of a firm to proactively and continuously innovate its BM is a crucial source of competitive advantage (Chesbrough and Rosenbloom, 2002; Chesbrough, 2010; Schneider and Spieth, 2013).

BMI entails reframing existing offerings and foreseeing new opportunities and challenges that are necessary to outdo competitors (Francis and Bessant, 2005). It is therefore worthwhile for firms to engage in BMI by constantly reconfiguring key elements, or the architecture of their BM in response to relevant changes in their business environment (Zott and Amit, 2009; Bucherer *et al.*, 2012). Engaging in successful BMI requires know-how and capabilities. Firms therefore need to know when it is necessary to change their BM, and how to do so, considering the various activities and stakeholders involved (Hossain, 2017). However, the influence of capabilities in promoting and shaping BMI and vice-versa, has received insufficient attention in the literature (Brink and Holmen, 2009; Bjorkdahl and Holmen, 2013).

New ventures (start-ups) and incumbent firms may engage in BMI. However, the driving circumstances for the BMI and the corresponding impact may vary (Comberg *et al.*, 2014; Foss and Saebi, 2017). For instance, while an incumbent firm may be responding to a change in the market, a start-up may simply have started out with the wrong BM due to insufficient market experience (Comberg *et al.*, 2014). Start-ups have the flexibility to more frequently engage in BMI than incumbent firms because of their usually high environmental uncertainty. It is not always certain that the BM they begin with is the one that will ultimately succeed. “For start-ups, any act of entrepreneurship means the choice of a BM” (Foss and Saebi, 2017:220). Hence, there is a close linkage between entrepreneurship and BMI. Despite this linkage, most of the research on BMI focus on Incumbent firms (e.g., Chesbrough, 2010; McGrath, 2010; Koen *et al.*, 2011), while BMI in start-ups is under-researched (Comberg *et al.*, 2014; Klewitz and Hansen, 2014; Foss and Saebi, 2016; Foss and Saebi, 2017).

Start-ups usually explore new markets and introduce new products and services that contribute to the growth of an economy. On a global scale, the start-up economy is getting increasingly large. In 2021, start-ups received over six hundred billion dollars in funding and created a value of more than three and a half trillion dollars (Startup Genome, 2021; Jurgens, 2022). However, not all start-ups that set out to do something new eventually succeed. The failure rate of start-ups is known to be high; over seventy percent (Audretsch, 2007; Carree and Thurik, 2010; Riani, 2019; Eisenmann 2021). Good BMs may likely increase the rate of start-up success by providing a practical guide for the business, enabling it to be built in a deliberate way (Johnson, 2010; Bouncken and Fredrich, 2016). So, more research-based knowledge of BMs and BMI is warranted.

The domain of BMI is still developing and offers considerable opportunities for research (Spieth *et al.*, 2014). In the context of start-ups, researchers have suggested several specific avenues for further research. For instance, Foss and Saebi (2017) asserted the importance of studying the drivers, facilitators, hinderances and performance implications of BMI. There has been a resounding call for a better understanding of BMI as it relates to capabilities, and how tools and practical approaches may be developed to aid the process of BMI (e.g., Trimi and Berbegal-Mirabent, 2012; Schneider and Spieth, 2013; Spieth *et al.*, 2014; Ghezzi and Cavallo, 2020). Teece (2018) argued for a better understanding of BMI, as it will throw more light on key aspects of dynamic capabilities (DC).

There is a clear link between BMI and DC in the literature, and the need to understand how DC develop and evolve over time has been highlighted (Andersson and Evers, 2015; Teixeira *et al.*, 2021). DC allows firms to anticipate and respond quickly to opportunities in their business environment. Nonetheless, the role of managers is key, as they make the decisions and take the necessary actions that result in BMI. Hence, the dynamic managerial capabilities (DMC) perspective is vital in exploring the role of capabilities in the BMI of start-ups. This study contributes to more understanding of how BMI unfolds in start-ups, and it brings to light specific capabilities that may enable start-ups to successfully innovate their BMs. This has implications for planning, team formation and competency building in start-ups.

## **1.2 Research question, aim and objectives**

This study aims to explore how capabilities influence business model innovation in start-ups. It draws from the theory of dynamic managerial capabilities, and addresses the following research question: *What capabilities allow managers (e.g. founders, decision makers) in start-ups to innovate their business models?*

To attain the aim of this study, the following objectives have been defined:

1. Explore the factors that prompt managers in start-ups to innovate their business models
2. Examine how business model innovation unfolds in start-ups
3. Investigate how the capabilities of managers in start-ups influence business model innovation

## **1.3 Research approach**

This study addressed the research aim, question, and objectives through multiple explorative cross-sectional case studies under a critical realism epistemological position. Given the exploratory nature of this study, a qualitative approach was adopted. Ten start-ups were selected from a technology business incubator to participate in the study. Each start-up constituted one case, and the selection was done using purposive sampling; with emphasis on relevance and representativeness. The perception and subjective experience of individual start-up managers regarding BMI in their start-ups was gathered. This made up the primary data for each of the cases which was elicited using semi-structured interviews. Individual and



cross case analysis was done using thematic analysis (Braun and Clarke, 2006), and triangulation was ensured through document review.

#### **1.4 Thesis structure**

This thesis is made up of eight main sections.

Section 1 introduces the aim and objectives of the study, as well as the background, significance, and research approach.

Section 2 presents a review of relevant literature on BM, BMI, DC, and DMC. It highlights the context of start-ups and concludes with a literature synthesis that brings the various fields together to identify gaps and formulate the research question.

Section 3 presents the methodological considerations for this study. It discusses the philosophical paradigm, strategy, and method. Furthermore, it provides justification for using a multiple cross-sectional case study approach.

Section 4 presents the procedures and outcome of the pilot study done in preparation for data collection and analysis.

Section 5 begins by presenting the profile of ten start-ups that made up the ten cases explored in this study; including the sampling approach. It then discusses the techniques for data collection and analysis.

Section 6 describes the participating start-ups of this study in more detail with emphasis on their BMI.

Section 7 presents the findings of this study. It begins by presenting the results from the individual cases, before concluding with the cross-case analysis.

Section 8 discusses the findings of this study.

Section 9 presents the conclusion of this study. Including the implications to practise and research. The limitations of the study and recommendations for further research are highlighted.

## **2. Literature review and theoretical framework**

### **2.1 Introduction**

A BM is fundamental to every firm (Chesbrough, 2007), as it informs and delineates how a firm runs its business (Zott *et al.*, 2011; Kesting and Gunzel-Jensen, 2015; Berends *et al.*, 2016). Even more so in today's competitive and constantly changing business climate, where firms sometimes need to respond to new technological developments or find new ways of doing business (Schneider and Spieth, 2013; Spieth *et al.*, 2014). BMI has emerged as valuable and important for both incumbent firms and start-ups in achieving business objectives (Hossain, 2017). It is therefore no surprise that practitioners and researchers alike, are increasingly interested in discussions about BMs and BMI (Schneider and Spieth, 2013; Spieth *et al.*, 2014; Kesting and Gunzel-Jensen, 2015; Foss and Saebi, 2017).

Research on BMs and BMI is still young and growing (Comberg *et al.*, 2014; Spieth *et al.*, 2014), and this study aims to contribute by exploring BMI in start-ups from the perspective of DMC. DMC are a subset of DC (Adner and Helfat, 2003; Ambrosini and Altintas, 2019) which help firms gain competitive advantage by quickly identifying and responding to opportunities (Teece, 2014). This literature review provides the framework and basis for this study.

### **2.2 Business model**

Transforming a new idea or technology into a value adding and revenue generating BM is a vital part of a firm's innovation process (Lumpkin and Lichtenstein, 2005; Corbett, 2007; Chesbrough, 2010). The transformation may take the form of a service or product configuration that may be offered to a specific market; brought about through interrelating activities that make up the BM of a firm (Chesbrough and Rosenbloom, 2002). Successful firms satisfy real customer needs through the effectiveness of their BM (Johnson *et al.*, 2008). So, what exactly is a BM?

#### **2.2.1 Defining a business model**

Afuah and Tucci (2003) suggested that a BM describes the means through which a firm deploys its resources to offer customer value and make money in the process. In other words, it describes how a firm creates and captures value (Chesbrough, 2007; Zott *et al.*, 2011). Besides value creation and capture, value delivery has also been emphasized as a vital part of a BM (Chesbrough and Rosenbloom, 2002; Osterwalder and Pigneur, 2010; Teece, 2010; Bocken and

Geradts, 2019). Table 2-1 presents some selected definitions of a BM from the literature. Slavik (2019) posited that a firm's BM is effective if: 1) customers find its offerings valuable and are willing to pay for it, and 2) the firm is able to cover all necessary costs and earn a profit. However, one may still wonder how exactly a BM describes the workings of a firm. How is it conceptualized? How can it be better understood? And to what end? According to Johnson *et al.* (2008), all successful firms may not fully understand their BM, but they all have one that is effective through which they satisfy important customer needs. Although a BM is a common term used in the business world, most managers do not really know, or are not able to clearly explain what it is (e.g., Shafer *et al.*, 2005; George and Bock, 2011; Klang *et al.*, 2014). This confusion or lack of understanding may be related in part to the evolution of the BM concept.

Table 2-1: Examples of business model definitions in the literature

Definition	Publication
A business model is "the method by which a firm builds and uses its resources to offer its customers better value than its competitors and to make money doing so"	Afuah and Tucci (2003:4)
"A business model can be conceptualized as a system that is made up of components, linkages between the components, and dynamics"	
A business model "refers to the logic of the firm, the way it operates and how it creates value for its stakeholders"	Casadesus-Masanell and Ricart (2010:196)
A business model "provides a coherent framework that takes technological characteristics and potentials as inputs and converts them through customers and markets into economic outputs"	Chesbrough and Rosenbloom (2002:532)
A business model "is a set of expectations about how the business will be successful in its environment"	Downing (2005:186)
"A business model, from our point of view, consists of four interlocking elements (Customer value proposition (CVP), Profit formula, Key resources, Key processes.) that, taken together, create and deliver value"	Johnson <i>et al.</i> (2008:52)
"A business model is the design of organizational structures to enact a commercial opportunity"	George and Bock (2011:100)
"A business model is a concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture, and economics are addressed to create sustainable competitive advantage in defined markets"	Morris <i>et al.</i> (2005:727)
A business model is a "blueprint of how a company does business"	Osterwalder <i>et al.</i> (2005:2)
"A business model is a representation of a firm's underlying core logic and strategic choices for creating and capturing value within a value network"	Shafer <i>et al.</i> (2005:202)

“A business model describes the design or architecture of the value creation, delivery, and capture mechanisms a firm employs” Teece (2010:191)

“A business model can either be conceptualized as a set of transactions or as an activity system”

Zott and Amit (2010:219)

A business model depicts “the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities”

---

There is a broad range of definitions for a BM in the literature. Given in the context of several firm characteristics and decision variables (Andries and Debackere, 2013; Spieth *et al.*, 2014). The definitions and the boundaries of the BM construct has been characterized as inconsistent and fragmented (George and Bock, 2011). This has been attributed to how the literature has built-up over time. Researchers and practitioners alike, have largely discussed the concept of BMs separately; without building on the work of one another. This has led to the adoption of definitions that are either superficial or skewed towards specific areas of interest (Osterwalder *et al.*, 2005; Shafer *et al.*, 2005; Zott *et al.*, 2011; Coombes and Nicholson, 2013). Examples of such areas of interest are e-commerce, Information technology, strategic issues, and innovation/technology management (Zott *et al.*, 2011). Researchers and practitioners generally appreciate the usefulness of the BM concept in corporate management and entrepreneurship (e.g., Morris *et al.*, 2005; Shafer *et al.*, 2005). However, the lack of a coherent definition has been a major source of confusion, resulting in some criticism of researchers for lack of attention (e.g., Morris *et al.*, 2005; Shafer *et al.*, 2005; Baden-Fuller and Morgan, 2010; Teece, 2010; George and Bock, 2011). Morris *et al.* (2005) noted that despite the importance of BMs, researchers are not engaging in sufficient critical research to further develop the concept. They pointed out the significance of valuable research on BMs with reference to start-ups. Stating that the reason start-ups fail even when talent, resources, ideas, and market opportunities are available may be due to inadequate BMs. Teece (2010:176) asserted that “the study of business models is an interdisciplinary topic which has been neglected – despite their obvious importance”. Consequently, BMs are not well understood. Hence, it is not uncommon to observe the commercial failure of promising technologies due to unsuitable BMs for market entry and value capture.

However, several researchers have attempted to clarify and consolidate the concept of BMs. With the goal of developing a common understanding. So that researchers who view the concept from different angles, or have different perspectives, are still able to effectively build on the work of others. This has resulted in more recent systematic reviews of the literature on BMs.

Morris *et al.* (2005) focused on the entrepreneur's BM in their review of the literature. They posited that most of the definitions can be categorized into three hierarchical levels: The first being the *economic*, followed by the *operational*, and then the *strategic*. At the *economic* level, the definition is about how a firm makes profit, using decision variables such as pricing methodologies and revenue sources. The *operational* level emphasizes architectural configurations; with focus on infrastructures and processes that enables value creation in a firm (e.g., resource flows, production methods). At the *strategic* level, the firm's competitiveness and sustainability is emphasized. With focus on opportunities for growth, market positioning and interactions in its environment.

Similarly, George and Bock (2011) approached their review of the BM literature with an entrepreneurial lens. They augmented their review with analysis of solicited perspectives of practicing managers; and proposed that a BM has three fundamental dimensions: *resource structure*, *transactive structure*, and *value structure*. The *resource structure* encompasses the firm's architectural configuration of its resources, capabilities, and technology through which it satisfies the needs of customers. The *transactive structure* addresses how the firm interacts with its stakeholders (e.g., partners, employees). While the value structure describes the mechanisms through which the firm creates and captures value.

Zott *et al.* (2011) took a multidisciplinary approach in their review of the BM literature and identified four common themes from earlier research. The first theme is that a BM has emerged as a unit of analysis that is different from industry, firm, or product. Though a BM may apply to a particular firm, its boundaries extend beyond those of the firm. An example in this regard is found in work of Osterwalder *et al.* (2005). They examined Apple's iTunes website business for music download and asserted that Apple's objective was not solely to sell music. It was also to strengthen the overall sales of their portable music player, the iPod. The business spanned several industries including hardware, software, music and online. However, what was interesting was that the BM offered several design choices that augmented each other. The second theme is that a BM attempts to describe how a firm does business in a holistic manner. In other words, the BM is a system that is made up of several working parts. This can be further explained using an example in the work of Casadesus-Masanell and Ricart (2010). They asserted that a BM is in simple terms analogous to a machine (e.g., a car made up of different parts like; engines, wheels, tyres, interior, etc). Different machines have different logic of operation which determines the type of value they create for users. Some people

prefer smaller cars, others prefer larger cars. Just like cars, the evaluation of the performance of a BM requires an understanding of its components and how they relate to each other. The third theme is the importance of a firm's activities and those of its partners. While the fourth theme is that a BM attempts to describe how a firm creates and captures value.

Klang *et al.* (2014), in their systematic review of the literature explored the paradoxical nature of the popularity and criticism of BMs amongst researchers and practitioners. They identified recurring themes in the literature and proposed three dimensions that make up the core of the BM concept: *Classification*, *Constitution* and *Configuration*. *Classification* relates the BM concept to other managerial concepts, such as strategy and value. *Constitution* deals with identifying and specifying how the BM relates to its components. Here, three roles and location of the components were identified. First, the firm's internal activities with no direct influence on external stakeholder relationships (e.g., technologies, product features, capabilities). Second, the firm's relational mechanisms with influence on external stakeholder relationships (e.g., link to customer, value proposition, value networks, value chains, value streams). Third, external stakeholders situated beyond the firm's boundaries (e.g., market segment, suppliers, partners, competitors). *Configuration* portrays a complex system made up of interdependent BM components that interact with each other, and as such, may have different manifestations that influence firm performance.

Spieth, *et al.* (2014), based on their systematic review of the literature, recognized three roles and functions assigned to BMs, namely: *explaining the business*, *running the business*, and *developing the business*. *Explaining the business* addresses the need of a firm to be able to articulate how it generates or plan to generate profit. It targets both external stakeholders (e.g., partners, investors, customers, media) and internal stakeholders (e.g., employees). *Running the business* addresses the operational aspects of the firm. Here, the BM enables the creation of processes that support managers and employees in ensuring smooth business operations. *Developing the business* addresses the strategic issues of the firm. With the focus of identifying opportunities and positioning the firm for sustained competitive advantage.

Clearly, a BM is a holistic multi-component system weaved into an architecture that enables a firm to effectively run its business. Running the business involves satisfying the needs of customers, making a profit, and sustaining a competitive advantage. A BM is also multi-dimensional, serving specific purposes internally within the firm, and externally towards

stakeholders in its environment. The BM helps the firm achieve its goals. As incumbent firms utilize their BMs, start-ups have the initial challenge of finding a viable BM that is repeatable and scalable.

This study concurs that a BM comprises of specific choices and their corresponding consequences; with various configurations having various logic of operation through which value is created for stakeholders (Casadesus-Masanell and Ricart, 2010). In addition, this study acknowledges the emphasis that researchers have placed on BMs as a means of value creation, capture and delivery for customers (Afuah and Tucci, 2003; Johnson *et al.*, 2008; Baden-Fuller and Morgan, 2010; Chesbrough, 2010; Teece, 2010). In line with Teece (2010: 191), this study considers a BM to describe “the design or architecture of the value creation, delivery, and capture mechanisms” of a firm. In other words, it defines the approach through which a firm delivers customer value; and ensures that the value is paid for and translated into profit (Teece, 2010; Teece, 2018).

### **2.2.2 Components of a business model**

BM is a system that comprises of interlinked components. Their performance does not depend on the individual components alone, but also on how the components relate with each other (Afuah and Tucci, 2003). A firm’s BM is not completely understood without an understanding of its underlying components and how they fit together. This is important for managers because it influences the business design choices. The business design choices make up the overall business architecture from which a business could expand through innovation. The chances of a firm benefiting from its innovation increases with good managerial understanding of the business design choices, together with technological trends and customer needs (Teece, 2010). Moreover, managers need to be able to clearly and effectively, explain the business logic of their firms to stakeholders. While avoiding the temptation to interchangeably use terms that do not have the same meaning. For instance, practitioners often use business strategy or economic model, in place of BM (Trimi and Berbegal-Mirabent, 2012). Referring to components of a BM as the BM itself is misleading and confusing. For instance, a firm’s online auction or online community is not a BM, but rather a part of its pricing mechanism and customer relationship respectively (Osterwalder *et al.*, 2005). Similarly, “new organizational forms can be a component of a business model; but organizational forms are not business models” (Teece, 2010: 176).

There are several perspectives on the components that constitute a BM in the literature. For



instance, Morris *et al.* (2005) asserted, based on their review of the literature, that among the most mentioned BM components of a firm are its value offerings, customer relationship, economic model, target market, internal infrastructure and partner network. They however suggest that the components that constitute a firm's BM concern: its value proposition, market factors, internal capabilities factors, competitive strategy factors, economic factors, and personal/investor factors. The value proposition addresses how value is created. The market factors address who the value is created for. The internal capabilities factors address the firm's internal source of advantage (competencies). The competitive strategy factors address the firm's positioning in the marketplace for competitive advantage. The economic factors address how the firm makes money (its economic model). While the personal/investor factors address the ambitions of the entrepreneur with respect to time, scope, and size.

In their literature review, Shafer *et al.* (2005:200) categorized components that were more frequently mentioned in the literature based on their similarity. By this, they suggested that BMs have four components: "strategic choices, creating value, capturing value, and the value network". Johnson *et al.* (2008) posits that there are four interlocking components of a BM that helps a firm create, deliver, and capture value, namely: customer value proposition (CVP), profit formula, key resources, and key processes. The CVP relates to the ability of a firm to help the target customer solve an important problem. The profit formula is made up of the cost structure, revenue model, resource velocity and margin model, which together maps out the firm's value creation as it creates value for the customer. The key resources and processes are those required to deliver the CVP, which could be people, information, technology, approach to customers, etc. Gassmann *et al.* (2014) highlights the target customer segment, value proposition, value chain and revenue model as the main components of a BM. Along similar lines, Yunus *et al.* (2010) points out the value proposition, value constellation and profit equation as three components of a BM. The value proposition addresses the identity of the customers and the firm's offering. The value constellation defines how the firm's offering is delivered to the customers, and the profit equation describes value capture from revenue derived through the value proposition.

McGrath (2010) suggests that a BM has two core components. The *unit of business* and *process or operational advantages*. The *unit of business* refers to the value offerings that customers pay for. This could be products, services, etc. It could also be a free *unit of business*, where the revenue is not generated directly from beneficiaries of the value offerings (e.g., software solution users), but from other parties that need the attention of the users. Examples of this

includes the advertising model used by firms such as Facebook, or the freemium model used by LinkedIn. The *process or operational advantages* refers to the activities the firm performs to secure sales of the *unit of business*. This is reflected in the architecture and key metrics of the business through which the firm drives performance. The key metrics of which usually represent vital constraints in the value chain of the firm. Overcoming such constraints can be a differentiating factor for firms with respect to competitive advantage. For instance, Amazon opted for selling products online, thereby overcoming the constraint of limited floor space.

Evidently, there are several terms and opinions about the constituent parts of a BM. What is important however, is that these parts interrelate and work together to form a system by which the firm creates, delivers, and captures value. This study takes the position of Foss and Saebi (2017:202), which suggests, based on a systematic review of the literature, that the components of a BM are “the firms value proposition and market segments, the structure of the value chain required for realizing the value proposition, the mechanism of value capture the firm deploys, and how these elements are linked together in an architecture”. A BM is the linchpin of a firm’s architecture with respect to profitability. It will likely be ineffective and incomprehensive if some components are overlooked. Hence, BM developmental efforts of firms should be deliberate.

### **2.3 Developing a business model**

Developing a BM involves configuring firm offerings to specific markets (Chesbrough and Rosenbloom, 2002). It entails improving an existing BM, or evaluating, refining, and ultimately translating a business idea into a deliberate BM. The ability of a firm to configure its BM by putting together its components and specifying how the various components relate to each other is important. Because it enables understanding, communication, analysis, and management of the BM (Osterwalder *et al.*, 2005). This can be particularly important for start-ups at their early stage of formation, as the managers try to: effectively communicate ideas, facilitate discussions around the ideas, and document learnings (Osterwalder and Pigneur, 2010; Ching and Fauvel, 2013; Borseman *et al.*, 2016). Doll and Eisert (2014) suggested that developing an economically viable BM requires a systematic approach, and that it is best done with the same rigor and diligence as the products and services that the firm offers. They stated that an iterative process that goes through design, analysis, validation, implementation, and scaling is required. While considering the external and internal conditions of the firm. Blank (2006) as cited in Trimi and Berbegal-Mirabent (2012) suggested that for start-ups, a BM

developmental process may be broken down into two stages. The first stage is the actual design stage which allows for trial and error. It involves an iterative process of testing various hypotheses about the firm's offerings. While the second stage involves applying the BM to assess its scalability, flexibility, and reproducibility. Similarly, Teece (2010) posited that developing a good BM is an iterative process. Especially because BMs usually apply to specific situations. In addition, BM components must be developed in relation to each other. Furthermore, the trend of technology progress as well as the business environment in the industry of interest must be considered.

According to Teece (2010:189), "beyond specifying a realistic revenue architecture, developing a BM also involves determining the set of lateral (complementary) and vertical activities that must be performed and assessing whether and how they can be performed sufficiently cheaply to enable a profit to be earned, and who is to perform them". Developing a viable BM requires managers to deeply understand what the customer need and is willing to pay for. Moreover, it requires an understanding of how resources can best be deployed to deliver the customer need in a timely and cost-effective manner (Baker and Nelson, 2005; McGrath, 2010; Teece, 2010; Jones and Li, 2017). Furthermore, it may be beneficial for managers to consider multiple choices and have the ability to listen and learn fast. The BM developmental process should have enough flexibility to allow captured learnings to be documented and tracked (Doll and Eisert, 2014). In addition, experimentation, especially in highly uncertain business environment is vital (McGrath, 2010). Yet, developing a BM is not a trivial task, and it requires the right tools.

### **2.3.1 Tools for business model development**

Several tools that can help firms develop their BMs have been proposed by practitioners and scholars (Teece, 2010; Ching and Fauvel, 2013; Borseman *et al.*, 2016; Slavik, 2019). For instance, Teece (2010) proposed a "profiting from innovation framework" to assist managers in developing appropriate BMs. With this framework, the manager can map innovation types to a choice of BMs. At the same time, the manager can evaluate whether licensing (with intellectual property rights) is a viable option for value capture. Morris *et al.* (2005) proposed a framework that evaluates six BM components on three hierarchical decision-making levels, namely: *foundation*, *proprietary* and *rules*. At the *foundation* level the business is defined with respect to what it is, and what it is not. The *proprietary* level is more customized. Here, decision variables are combined to see how the value required for competitive advantage may

be created. The *rules* level oversees the implementation of decisions taken at the *foundation* and *propriety* levels. This is achieved through rules and guidelines that govern the business operation. As a firm (e.g., a start-up) develops, and its learnings accumulate, the expectation is that its BM would evolve from the *foundation* level to a more articulate and complete *proprietary* level.

However, among the tools that has been proposed in the literature, the business model canvas (BMC) invented by Osterwalder and Pigneur (2010) is widely used in both incumbent firms and start-ups.

#### **2.3.1.1 Business model canvas**

The BMC is a tool that enables a firm to effectively describe and visualize the structure and components of its BM. Its design is simple, flexible, and transparent, rendering it suitable for workshop deliberations and iterations. The BMC has nine building blocks as shown in Table 2-2 below. Namely: *key partners*, *key activities*, *value proposition*, *customer relationships*, *customer segments*, *key resources*, *channels*, *cost structure* and *revenue streams*. The *value proposition* describes the value delivered to customers, as well as the specific needs that are being met through the firm's product and service offerings. The value may be delivered to different groups of customers having different characteristics. This is highlighted by *customer segment*. The *channels* describe the means through which the customers are reached, and potential ways to reach them more efficiently. How customers are acquired, kept and grown is addressed by *customer relationships*. While *revenue streams* describe the mechanism for value capture. Important resources that the firm must possess, as well as the activities that the firm must be proficient in to deliver value to customers are outlined under *key resources* and *key activities* respectively. Their associated costs, and other important costs associated with the BM is addressed by the *cost structure*. Important partnering organisations whose resources or expertise are solicited to augment the BM are described by *key partners*.

The ease with which the BMC can be used to discuss and create new BMs has been widely acclaimed by users in both incumbent firms and start-ups (Ching and Fauvel, 2013; Borseman *et al.*, 2016; Slavik, 2019). However, the BMC has not been without criticisms (Ching and Fauvel, 2013). For instance, Kraaijenbrink (2012) as cited in Ching and Fauvel (2013) noted that among the shortcomings of the BMC are its emphasis on financial success as the sole driver of start-ups, and the exclusion of competition as an important building block. In this regard,

practitioners and academics have proposed several adaptations of the BMC (Ching and Fauvel, 2013; Borseman *et al.*, 2016), an example of which is the lean canvas (LC).

Table 2-2: Components of a business model canvas (Osterwalder and Pigneur, 2010)

1. Key Partners	2. Key Activities	3. Value Proposition	4. Customer Relationships	5. Customer Segments
Who are our key partners? Who are our key suppliers? Which key resources are we acquiring from our partners? Which key activities do partners perform?	What key activities does our value proposition require? Our distribution channels? Customer relationships? Revenue streams?	What value do we deliver to the customer? Which one of our customers' problems are we helping to solve? What bundles of products and services are we offering to each segment? Which customer needs are we satisfying? What is the minimum viable product	How do we get, keep and grow customers? Which customer relationships have we established? How are they integrated with the rest of our business model? How costly are they?	For whom are we creating value? Who are our most important customers? What are the customer archetypes?
	6. Key Resources		7. Channels	
	What key resources does our value proposition require? Our distribution channels? Customer relationships? Revenue streams?		Through which channels does our customer segment want to be reached? How do other companies reach them now? Which ones work best? Which ones are most cost-efficient? How are we integrating them with customer routines?	
8. Cost Structure			9. Revenue Streams	
What are the most important costs inherent to our business model? Which key resources are most expensive? Which key activities are most expensive?			For what value are our customers really willing to pay? For what do they currently pay? What is the revenue model? What are the pricing tactics?	

### 2.3.1.2 *Lean canvas*

The LC was proposed by Maurya (2012) to make up for some of his perceived shortcomings of the BMC. He argued that the BMC does not sufficiently address the risks and uncertainties of BM development in new start-ups. Consequently, four of the building blocks of the BMC were replaced by alternatives in the LC. The *key partners, key activities, key resources, and customer relationships building blocks* were replaced by *problem, solution, key metrics, and unfair advantage* respectively (see Table 2-3 below).

The *problem* block emphasizes the need for new start-ups to first identify a real customer problem before attempting to build a product or provide a service. This helps reduce the risk of start-up failure (Ching and Fauvel, 2013; Borseman *et al.*, 2016). Moreover, valuable time may be wasted if new start-ups with unproven products chase after partnerships without a clear understanding of the customer problem that is to be solved (Borseman *et al.*, 2016). The *solution* block outlines potential solutions to the identified customer problems. This usually drives the key activities of the start-up, and it could result in the creation of a minimum viable product (MVP) (Borseman *et al.*, 2016). As start-ups become more successful, competitors look to encroach into their market segment. Hence, for start-ups to ensure their survival, they must differentiate themselves from their competitors. Not only by creating more value for customers, but also by making their BM difficult to imitate (Chesbrough, 2007). This is addressed by *unfair advantage*, and it may prove challenging in a competitive environment (Holtstrom, *et al.*, 2019). Maurya (2012) argued that the *key resources* in the BMC is more related to *unfair advantage* in the context of start-ups. He emphasized the need for start-ups to identify and focus on the correct metrics in order to keep their activities in check and avoid waste. This is addressed by the *key metrics* block.

Table 2-3: Components of a Lean Canvas (Maurya, 2012)

1. Problem	2. Solution	3. Unique Value Proposition	4. Unfair Advantage	5. Customer Segments
Top 3 problems	Top 3 features	Single, clear compelling message that states why you are different and worth paying attention	Can't be easily copied or bought	Target customers
	6. Key metrics		7. Channels	
	Key activities you measure		Path to customers	
8. Cost Structure		9. Revenue Streams		
Customer acquisition costs Distribution costs Hosting People etc.		Revenue model Life-time value Revenue Gross margin		

Essentially, the LC seems to be better suited to new technology start-ups. It allows start-ups to focus on the problem, solution, and value proposition separately. Unlike the BMC which deals with them together in the same block (Borseman *et al.*, 2016). This may be crucial in avoiding mistakes and ensuring that the correct solutions are found for the correct customer problems (Borseman *et al.*, 2016; Ching and Fauvel, 2013).

### 2.3.1.3 Summary

The canvas approach is dynamic and allows for adaptation based on a firm's need; with respect to its customer base, technological solution, or other specific business context. Therefore, it is not surprising that there are a few other adaptations of the original BMC. For instance, the value proposition canvas (VPC) expands on the relationship between the value proposition and the customer segment in the BMC. The value model canvas (VMC) emphasizes the inclusion of all organizational types, e.g. non-profits (Borseman *et al.*, 2016; Ching and Fauvel, 2013). However, it is worth noting that success does not necessarily depend on filling out the building blocks on the canvas, but on meticulous and decisive actions on the part of managers regarding key aspects of the BM (Borseman *et al.*, 2016).

Shafer *et al.* (2005) identified four problems that could impede the efficacy of a BM. The first one has to do with weak or incorrect assumptions about the basic logic of the business. For instance, will the main offering of the firm depend on compatibilities between two different technologies? Does such compatibility already exist? Is it likely to exist in the next few years? If the BM is just based on hope that there will be compatibility, then it is most likely flawed. The



second problem involves not fully developing all the important components of the BM. For instance, as the firm works hard to acquire customers, is it also developing the systems and processes by which customer orders will be fulfilled? Failure to deliver as promised could lead to a bad reputation which translates to loss of business. The third problem involves inadequate understanding of value creation and capture. For instance, has the firm devised a system for capturing the value it creates (or plans to create)? There have been instances of seemingly successful companies that struggled for a long time to convert value into profit, e.g., Yahoo (Shafer *et al.*, 2005). In this regard, it is also important for the firm's actual and potential value to be carefully distinguished. The fourth problem has to do with incorrect assumptions about the value network. For instance, is the firm's BM based primarily on the assumption that a certain arrangement among partners (or a particular customer behaviour) will continue in the long term? As we have seen all too often, things change. Moreover, when a BM is in place, it is worth considering how it might change by evaluating it against the current business environment (Teece, 2010). Table 2-4 below list some critical questions that may aid such evaluations.

At the same time, competitive advantage is not assured with a successful BM. This is so because competitors might easily be able to imitate the BM (Teece, 2010). Firms must therefore be able to reframe their customer offerings or reconfigure their BMs with time. This involves BMI. It should be iterative and continuous (Shafer *et al.*, 2005). A good starting point however is to develop a BM that is well differentiated such that it is difficult for competitors to imitate.

Table 2-4: Example of probing questions to evaluate a business model (Teece, 2010:189)

Questions	
1.	"How does the product or service bring utility to the consumer? How is it likely to be used? Inasmuch as innovation requires the provision of complements, are the necessary complements already available to the consumer with the convenience and price that is desirable (or possible)?"
2.	"What is the 'deep truth' about what customers really value and how will the firm's service/product offering satisfy those needs? What might the customer 'pay' for receiving this value?"
3.	"How large is the market? Is the product/service honed to support a mass market?"
4.	"Are there alternative offerings already in the market? How is the offering superior to them?"

5. “Where is the industry in its evolution? Has a ‘dominant design’ emerged? Strategic requirements are likely to be different in the pre- and post-paradigmatic periods.”
  6. “What are the (contractual) structures needed to combine the activities that must be performed to deliver value to the consumer? Both lateral and vertical integration and outsourcing issues need to be considered.”
  7. “What will it cost to provide the product/service? How will those costs behave as volume and other factors change?”
  8. “What is the nature of the appropriability regime? How can imitators be held at bay, and how should value be delivered, priced, and appropriated?”
- 

## **2.4 Business models and strategy**

The concepts of BMs and strategy are related. This relationship has been a subject of discourse in the literature (e.g., Afuah and Tucci, 2003; Osterwalder *et al.*, 2005; Shafer *et al.*, 2005; Casadesus-Masanell and Ricart, 2010; Teece, 2010; Afuah, 2019; Holtstrom *et al.*, 2019). Afuah (2019) asserts that managers must understand the relationship between both constructs, and how they drive performance, in order to make informed decisions that result in competitive advantage. The main attribute of a strategy (without getting into all the standard definitions) is that it entails choice making. These choices reflect the means through which the firm plans to achieve its goals while facing uncertainty (Afuah, 2019). The uncertainties may relate to the firm’s capabilities and resources, as well as the opportunities, and threats in the business environment (Trimi and Berbegal-Mirabent, 2012). Furthermore, the choices may be about; courses of action, business conceptualization, and/or market offerings (Shafer *et al.*, 2005). According to Shafer *et al.* (2005:203), “while a business model does facilitate analysis, testing, and validation of a firm’s strategic choices, it is not in itself a strategy”. This suggests that the strategic choices of a firm, and their implications, are manifested in a BM. Morris *et al.* (2005) posits that even though a BM is not the same as a strategy, it does contain some elements of strategy. Osterwalder *et al.* (2005:10) suggests that “a business model can be seen as the conceptual link between strategy, business organization and systems”. They noted that as a BM depicts the connection between various elements of a business concept; strategy accounts for competition, and the implementation that makes the BM a reality. In like manner, George and Bock (2011) characterizes a BM as the way a firm is configured to exploit a particular opportunity. While strategy ensures that the configuration is optimal and effective, considering external environmental factors that may affect the firm. In this regard, optimization may involve adjusting the firm’s configuration towards the opportunity being

pursued, or focusing on a different aspect of the opportunity, or pursuing a different opportunity altogether.

According to Teece (2010:180), “a business model is more generic than a business strategy”. Put differently, a BM is broader than a business strategy in the sense that it establishes the potential value creation of the firm (Morris *et al.*, 2005). This may be interpreted from the perspective that “all firms have business models but not all firms have strategies” (Afuah, 2019:145). However, one could argue that a BM is more specific than a strategy. For instance, Casadesus-Masanell and Ricart (2010:204) portray strategy as “a firm’s contingent plan as to which business model it will use”. They asserted that strategy determines how a BM is configured in response to the contingencies that occurs. Such contingencies usually comprise of environmental variables that are not within the firm’s control. Examples of which could be the chances of recovery from an economic downturn, or the activities of customers, competitors, suppliers, manufacturers or complementors (Casadesus-Masanell and Ricart, 2010). Similarly, Afuah (2019:135) posits that a firm’s BM is “influenced by its goals, strategy and environment”. This relationship is illustrated in Figure 2-1 below. The chosen BM is a manifestation of the realized strategy, and that is what outsiders eventually observe (Casadesus-Masanell and Ricart, 2010). “Strategic choices that characterize a venture are made both intentionally and by default. The business model makes the choices explicit” (Morris *et al.*, 2005: 733). BMs have also been described as a static organizational configuration, compared to strategy which is a set of dynamic processes, activities, and initiatives (George and Bock, 2011:102). The BM, however, does not have to remain static, and must evolve as the business environment evolves.

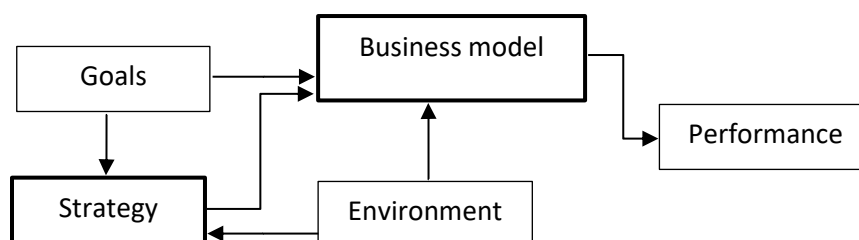


Figure 2-1: Relationship between strategy, business models, and performance (Afuah, 2019)

It has been suggested that BM and strategy analysis are necessary to help a firm with a new BM position itself for sustained competitive advantages (Casadesus-Masanell and Ricart, 2010; Teece, 2010). Such analysis could be done by first segmenting the market, creating a CVP for

every market segment, and then putting in place all that is needed to deliver and capture value (Teece, 2010). Ultimately, the goal is to protect the BM from imitation by competitors.

Casadesus-Masanell and Ricart (2010) proposed a “generic two-stage competitive process framework”. Such that after a firm designs its BM based on its strategy, tactical adjustments may be made when necessary to maximize the value provided to stakeholders. However, opinions differ when it comes to firms in uncertain and fast paced business environments, e.g., start-ups. In such situations, a BM has been perceived as a concept that allows managers to consider their choices differently. McGrath (2010) asserts that learning and experimentation are vital for strategies aimed at discovering and exploiting new BMs; In what she termed a “discovery driven approach”. This is in line with the claim by Shafer *et al.* (2005), that even as a BM enables communication and analysis of strategic choices, it may also cause those choices to be altered. Many start-ups usually have partially framed strategies and BMs at their onset. They work towards a viable BM through experimentation (Morris *et al.*, 2005). This clearly contrast strategies that put more emphasis on analysis and planning. As McGrath (2010:248) put it, engaging in business modelling “is a useful approach to figuring out a strategy, as it suggests experimentation, prototyping and a job that is never quite finished”.

Afuah and Tucci (2003), based on their work on internet BMs and strategies, stated that a firm’s strategic choices are influenced primarily by two factors. The first one is the means of ensuring that the BM is profitable. The second one is timing. Considering for instance; how a particular technology has evolved, or whether competitors intend to, or use similar strategies. However, for strategy to be realized, it must be implemented. A strong BM could fail if it is poorly implemented by managers (Osterwalder *et al.*, 2005). Likewise, a weak BM could succeed if skilfully managed. Moreover, other factors that could affect the outcome of implementation efforts include organizational structure, employee reporting structure, performance measurement and rewards, hiring policy, and collaboration (Afuah and Tucci, 2003). The implementation process may however differ in incumbent firms compared to start-ups due to differences in size, flexibility, creativity, and inertia. In any case, the manager is likely to learn and improve his/her competencies from the implementation process. Which may result in better insights regarding sources of advantage or sustainable profitability. Hence, with time, the manager is likely to become more strategic in how the business is operated (Morris *et al.*, 2005).

Clearly, the BM is fundamental to realizing a firm’s strategy. However, the constructs of BMs and strategy are clearly distinguishable, even though most studies fail to do so (Osterwalder *et*

*al.*, 2005). This study agrees with George and Bock (2011:96) by stating that “the business model does not subsume nor is it subsumed by corporate strategy”. As a BM describe how a firm runs its business, strategy determines the actions taken by a firm, while running its business, to ensure competitive advantage over rival firms (Osterwalder *et al.*, 2005; Afuah, 2019).

## **2.5 The context of start-ups**

This study takes the position that a start-up is a firm that was recently founded and has started showing signs of future potential. The firm must however exhibit certain important attributes to qualify as a start-up. One of these attributes is that start-ups engage in problem solving in the face of uncertainty. Uncertainty meaning that there was no apparent solution to the problem being solved at the time of the start-up formation, and there was no guarantee for success. Another vital attribute of start-ups is that they are designed to quickly scale up (Robehmed, 2013). In other words, they exhibit potential for growth beyond the confines of a particular location. As Robehmed (2013) put it, “A restaurant in one town is not a start-up, nor is a franchise a start-up”.

Start-ups may be seen as experimental enterprises undertaken to develop unusual ideas that satisfy new or existing customer needs. They offer possibilities for new job creation and self-realisation for entrepreneurs (Slavik, 2019). According to Ries (2011:27) a start-up is “a human institution designed to create a new product or service under conditions of extreme uncertainty”. With the high uncertainty usually involved in start-up activities, it is quite challenging to know from the onset whether a start-up is going to be successful or not. Start-ups with great ideas may potentially be successful, but they may also fail, as they so often do (Audretsch, 2007; Carree and Thurik, 2010; Slavik, 2019). Their success or failure may be determined by the strength of their BM, team, and strategy (Slavik, 2019). Therefore, one of the major challenges for start-ups is to build a viable BM. This must be done in the face of uncertainty related to both commercial and technical activities (Andries and Debackere, 2013). Blank and Dorf (2012), as cited by Slavik (2019) noted that the main challenge of technology entrepreneurs is to help their start-ups find a “scalable, repeatable and profitable business model”. Learning and experimentation over time plays a central role in this search and discovery process (McGrath, 2010). Along the line, some failure is bound to happen, without which the viable BM will not emerge.

### **2.5.1 The imperfection of start-ups**

Start-ups exhibit different organizational characteristics compared to incumbent firms. They usually have fewer employees and assets. In addition, their processes are less bureaucratic, and their administrative procedures and hierarchy are usually more flexible. This makes start-ups more agile, creative, and adaptable to change. Which may prove beneficial in product development and innovation (Echambadi *et al.*, 2008; Johnson *et al.*, 2008; Song *et al.*, 2014). While incumbent firms usually have a broad range of capabilities. For instance, market or technical insight, capital, and specialized business development competencies (Echambadi *et al.*, 2008). Start-ups usually lack experience, processes, and resources. Furthermore, start-ups are usually highly ambitious even though they possess little verifiable track record of success (Slavik, 2019). This attests to the imperfections of start-ups as business enterprises. Despite this, start-ups must implement their ideas through viable BMs. Even though the BM is likely to undergo a series of modifications in a competitive, rapidly changing, and uncertain business landscape (Osterwalder *et al.*, 2005).

The ability of a start-up to find a viable BM goes a long way in determining whether commercial success or failure is attained (Chesbrough and Rosenbloom, 2002; Chesbrough, 2010; Teece, 2010). A start-up with an innovative technology may not capture a large portion of the value that can be accrued if its business offerings are not properly packaged. For example, putting together a solution that helps solve an important problem for the customer may be more beneficial than offering discrete technological components or devices (Teece, 2010). However, this is easier said than done. One challenge for instance, is that some managers (e.g., founders) get obsessed with the idea of a unique and perfect technology/product, and miss out on the opportunity to examine the technology/product through the lens of the customer (Slavik, 2019). A start-up is more likely to find a viable BM by developing productive and interrelated activities (which were not obvious at the onset) around a logical business architecture. While ensuring consistency between its architecture, economics, strategy, and growth/exit ambitions (Morris *et al.*, 2005).

### **2.5.2 Technology and complementary assets**

As most start-ups try to solve problems with technology (e.g., developing a new product), they are usually constrained by the required investments. Moreover, there often is a chance that the technology is imitable (Afuah and Tucci, 2003; Trimi and Berbegal-Mirabent, 2012; Robehmed, 2013). This may be disadvantageous to a start-up because competitors or potential

competitors (e.g., incumbent firms) may be able to develop or deploy the same technology for the same purpose. Even if competitors do not currently have the business idea or technology, they may possess complementary assets necessary to exploit that technology. Complementary assets are not easily replicated, and they represent “all other capabilities—apart from those that underpin the technology or invention—that the firm needs to exploit the technology. These include brand name, manufacturing, marketing, distribution channels, service, reputation, installed base of products, relationships with clients or suppliers, and complementary technologies” (Afuah and Tucci, 2003:79). The ability of start-ups to identify and put in place the necessary complementary assets before their competitors is crucial. Hence, to secure a viable BM, a start-up might resort to partnerships or alliances with firms that possess necessary complementary assets (Afuah and Tucci, 2003; Slavik, 2019). This gives the managers room to focus on developing and coordinating other pressing aspects of the BM. If the start-up prefers to build its own complementary assets, then starting early is wise. Especially because of the cost and challenge of obtaining certain complementary assets (e.g., brand name reputation) (Afuah and Tucci, 2003).

Essentially, in today’s competitive business environment, deliberate BM development and innovation is vital. Technological change (or shift) is a major driver for innovating a BM. In addition, factors like; customer behavioural assessments, customer desires, competitor capabilities, regulations, investors, partners (e.g., suppliers), product development, and cost pattern must be considered.

## **2.6 Business model innovation**

An innovation is something new or significantly improved for a firm. It emerges in many forms, ranging from radically new technologies, to complex scientific discoveries or simple incremental additions to existing mode of operation (Paradkar *et al.*, 2015). Firms innovate in order to ensure continued success and profitability; therefore, the innovation must be valuable to customers (Paradkar *et al.*, 2015). BMI is a form of innovation which involves putting in place a BM that uncovers new value for a firm (Mitchell and Coles, 2004; Bjorkdahl and Holmen, 2013). This may be achieved by developing a totally new BM or innovating an existing one (Marsh and Stock, 2006; Chesbrough, 2010; Dopfer, 2018), which ultimately leads to business renewal and transformation (Zott *et al.*, 2011). BMI differs from product or service innovation in that, it may not necessarily invent or improve a new customer deliverable, but it may change the mode of delivery to the customer, and how profit is derived (Chesbrough and

Rosenbloom, 2002; McGrath, 2010; Bjorkdahl and Holmen, 2013). According to McGrath (2010:252), “If an executive can come up with a breakthrough in the way that the business operates, this can represent as important a business model innovation as developing a whole new type of offering”. BMI involves modifying or redesigning the activity system of a firm (Amit and Zott, 2010), which includes innovating its structure for value creation and capture (Bouncken and Fredrich, 2016). Hence, BMI can be construed as the new integrated approach taken by a firm to create, deliver and capture value. This may be achieved by combining processes, technologies and market segments, together with existing and new products or services (Chesbrough, 2010; Teece, 2010; Bjorkdahl and Holmen, 2013; Bocken and Geradts, 2019).

The emphasis of BMI is in reconfiguring the BM, irrespective of whether the entire BM is innovated, or only one or more components are replaced and/or recombined (Mitchell and Coles, 2003; Teece, 2018). The reconfiguration should however be deliberate and nontrivial. Santos *et al.* (2009) mentioned four main forms of BMI reconfiguration activities: *reactivation*, *repartitioning*, *relinking* and *relocation*. *Reactivation* involves modifying customer offered activities. *Repartitioning* involves modifying the physical or institutional boundaries of organizational units that execute activities. *Relinking* involves modifying the connections between organizational units that execute activities. While *Relocation* involves transferring the execution of specific activities to another location. According to Foss and Saebi (2017:201), A BMI is a “designed, novel, nontrivial changes to the key components of a firm’s business model and/or the architecture linking these components”.

Reconfiguring or recombining only certain components of a BM has been termed incremental BMI. It is said to be more common in firms, and may result in more radical change with time, as the incremental changes to BM components and their connections accumulate (Demil and Lecocq, 2010; Bocken and Geradts, 2019; Laasch, 2019). However, Schneider and Spieth (2013) stresses that incremental innovations or adjustments within established BMs is more associated with BM development, and that the focus of BMI for firms is rather to explore and exploit opportunities in their external environments. They stated that the development and innovation of established BMs tend to be grouped together as BMI, but that though they are related, their characteristics are different, requiring firms to act differently. So, it is evident that some researchers have different views regarding the changes in BM components that can constitute a BMI (Foss and Saebi, 2017).



BMI is still a developing concept. Researchers have used significant effort in exploring its definition, application and effects on firms (e.g., Chesbrough and Rosenbloom, 2002; Mitchell and Coles, 2003; Mitchell and Coles, 2004; Brink and Holmen, 2009; Zott and Amit, 2009; Chesbrough, 2010; Teece, 2010; Zott *et al.*, 2011; Bjorkdahl and Holmen, 2013). Foss and Saebi (2017) identified four streams of research in their review of the literature: (1) *Conceptualizing BMI*, (2) *BMI as an organizational change process*, (3) *BMI as an outcome*, and (4) *Consequences of BMI*. The first stream sought to define the concept of BMI. The second stream related BMI to organizational change processes, emphasizing the learning, capabilities and leadership mechanisms required to succeed. The third stream focused on new and innovative BM as an outcome of organizational change processes. While the fourth stream focused on the effect of BMI on firm performance. This study perceives BMI as an organizational change process that may be influenced by firm capabilities (Demil and Lecocq, 2010), particularly, DMC.

In the effort of Foss and Saebi (2017) to distinguish types of BMI, they classified BMI in terms of scope (the amount of modular and architectural change), and novelty (*new to the firm* or, *new to the industry*). They argued that there are four types of BMI; evolutionary, adaptive, focused and complex BMI. Both evolutionary and adaptive BMI are *new to the firm*. Evolutionary BMI involves modular changes in individual components of the BM, which may occur naturally with time. While adaptive BMI involves changes to the architecture of the BM due to changing external environment, e.g., competition. Both focused and complex BMI are *new to the industry*, as the firm deliberately tries to disrupt market conditions. Focused BMI involves modular changes in individual components of the BM, e.g., market segment. While complex BMI involves architectural changes to the BM, as seen for instance, in the sharing economy.

Novelty resulting in value creation and capture is a vital aspect of BMI (Bjorkdahl and Holmen, 2013), which leads to positive firm performance (Amit and Zott, 2010; Chesbrough, 2010; Hossain, 2017). BMI is valuable for both small and large firms (Hossain, 2017). Firms have experienced market failure with promising technologies due to improper BMI (Teece, 2010). Among the benefits of BMI that has been identified in the literature are; its ability to attract new customers, strengthen a firm's strategic position, and increase financial performance (Comberg *et al.*, 2014). In addition, firms may reap benefit from BMI in areas like the use of infrastructure, value chain, and organizational structure (Hossain, 2017). Therefore, BMI can help firms outperform competitors. It does however require the ability to effectively anticipate

challenges and opportunities in changing environments, so as to reframe existing offerings (Francis and Bessant, 2005; Schneider and Spieth, 2013; Hossain, 2017).

### **2.6.1 Motivations for business model innovation**

The point at which firms should or should not innovate their BMs has been discussed in the literature. For instance, Johnson *et al.* (2008) suggests that firms should innovate their BM only when it is game changing for the industry. This suggestion is however counterintuitive to more recent conceptualization of BMI based on more recent research. As it has also been suggested that firms should innovate their BMs irrespective of whether it is game changing for an industry, because it is difficult to foresee which BM experiment would be a game changer (Amit and Zott, 2010; Bjorkdahl and Holmen, 2013). Moreover, BMs are subject to change due to constant external or competitive pressures in business environments (Osterwalder *et al.*, 2005; George and Bock, 2011). For instance, deregulation in a market, technological trends, or new customer needs may cause firms to adapt their BMs (Sosna *et al.*, 2010; George and Bock, 2011). In addition, firms may engage in BMI to optimize processes, reduce cost, introduce new products, access new markets, and ultimately improve financial performance (Foss and Saebi, 2017). The influence of technological changes like the internet and digitization in motivating BMI is well documented in the literature (Mezger, 2014; Hossain, 2017). For example, the BMs of traditional newspapers have been disrupted by internet-based news portals (Karimi and Walter, 2016). Several industries have been disintermediated partly or in whole by online firms (Teece, 2018).

The motivations for BMI in firms comprise of both internal and external factors (Sosna *et al.*, 2010; Comberg *et al.*, 2014). These factors may however differ between incumbent firms and start-ups. For incumbent firms, the motivations could be; the macro-economic climate affecting consumer spending, realization of the failure of conventional ways of doing business, market crisis or change, new technology threatening existing product offerings, or creating new market opportunities (Giesen *et al.*, 2010; Schneider and Spieth, 2013; Comberg *et al.*, 2014; Paradkar *et al.*, 2015). On the other hand, BMI in start-ups may be motivated by; uncertainty or inexperience when building the first BM, finances, adjustment to clearer customer requirements, alignment to a target market, or potential benefit from new technology (Comberg *et al.*, 2014; Balboni and Bortoluzzi, 2015). BMI is fundamentally linked to entrepreneurship and start-up development. As any act in pursuit of improved financial, social, environmental, and organizational performance entails the choice of a BM (Foss and

Saebi, 2017; de Faria *et al.*, 2021). It is therefore often indispensable for start-ups to engage in BMI as they try to attract new customers and position themselves strategically for growth. Furthermore, the need for start-ups to raise capital to run or sustain the business during the early stages serves as a motivation for BMI to help show investors an attractive BM (de Faria *et al.*, 2021). However, as Sako (2012) noted, the most important motivation for BMI is perhaps the ability to fulfil unmet needs of consumers.

### 2.6.2 *The process of business model innovation*

Firms always look to enhance performance by improving their profit margin and revenue growth. To achieve this, BMI is often underutilized. Instead, firms usually pursue product and process innovation (Amit and Zott, 2012). Innovation of products and processes is time consuming and requires significant upfront investment on, for instance, research and development, and re-organization. The future return on investment, however, is usually not certain (Amit and Zott, 2012). BMI on the other hand complements and suitably substitutes such capital-intensive innovation types by dealing with the way the business is run (Amit and Zott, 2012). “At its simplest, it demands neither new technologies nor the creation of brand-new markets: it’s about delivering *existing* products that are produced by *existing* technologies to *existing* markets” (Girotra and Netessine, 2014:1). According to Afuah (2019), the innovation in a BM may stem from: (1) new benefits generated for customers, (2) new ways of delivering benefits to customers, (3) new ways of monetizing benefits, and (4) the development and usage of resources to generate, deliver and monetize benefits to customers. Similarly, Amit and Zott (2012) asserts that BMI may be achieved by introducing new activities, linking existing activities in new ways, or changing who performs activities. They referred to these three distinct ways of achieving BMI as new activity *content*, *system*, and *governance*, respectively. Torabi (2020) asserts that BMI is the process through which a firm reinvents its value proposition and operating model; thereby creating new revenue streams and cost structures (see Table 2-5 below). Girotra and Netessine (2014) posits that BMI is primarily about changes to key decisions that concern: (1) *what* products/services should be offered, (2) *when* decisions are made, (3) *who* makes decisions, and (4) *why* decisions are made. They suggested a framework that managers can use when considering BMI as shown in Table 2-6 below. So, how does this work in practise?

Table 2-5: Examples of ways by which a business model may be innovated (Torabi, 2020)

Change the value proposition	Change the operating model
------------------------------	----------------------------

---

1. Reduce customer transactional cost	8. Utilize technology
2. Offer enhanced solutions to improve customer experience	9. Change or modify the value chain
3. Convert conscious non-customers	10. Eliminate or add steps to the value chain
4. Deliver more emotional or functional value	11. Leverage key competencies and strategic resources
5. Benchmark other industries or other segment of the market	12. Team up with competitors
6. Be aware of market and consumer trends	13. Team up with complementors
7. Modify the revenue stream	14. Expand the firm's resource base

---

Table 2-6: A framework for BMI (adapted from Girotra and Netessine, 2014)

What products/services to offer			When should you make your key decisions		Who are the best decision makers		Why do key decision makers choose as they do				
1.	Focus narrowly	e.g., not applying the same model for multiple segments, but rather subdividing into focused units	1.	Postpone the decision	e.g., through dynamic pricing, where price quotes may be delayed until better and newer information is considered	1.	Appoint a better-informed decision maker	e.g., allowing engineers to choose development projects since they are more conversant with the technologies	1.	Change the revenue stream	e.g., allowing the objectives of the firm and customers to be pursued, by charging for performance (e.g., 95% availability). The better the performance, the better the firm earnings
2.	Search for commonalities across products	e.g., sharing components between a mix of products, or sharing capabilities to serve different market segments	2.	Change the order of your decisions	e.g., delaying investment commitments pending the availability of crucial information	2.	Pass the decision risk to the party that can best manage the consequences	e.g., aligning incentives with suppliers and allowing them to manage some aspects of the business model	2.	Synchronize the time horizons	e.g., being motivated by possible long-term relationships, and therefore the need to create long term value, even in competitive environments
3.	Create a hedged portfolio	e.g., selecting a mix of products or services that hedge the risk of one another	3.	Split up the key decisions	e.g., using the lean start-up approach to gather pertinent information by testing out several small hypotheses	3.	Select the decision maker with the most to gain	e.g., by offering sophisticated and integrated solutions to clients for free, and then sharing profits/savings/benefits that result from such solutions	3.	Integrate the incentives	e.g., contractual arrangements that encourage service providers (e.g., health care providers) to maximize outcome

Amit and Zott (2012) used examples of a technology firm and a retail bank to highlight how BMI was achieved through innovation of the BM content (i.e., by introducing new activities). Based on these examples, the process may be visualized as shown in Figure 2-2 and Table 2-7 below. This depiction shows that something stimulates the need for new content. Based on this, an activity is selected. However, for the innovation to be successful, the necessary enablers must be put in place.

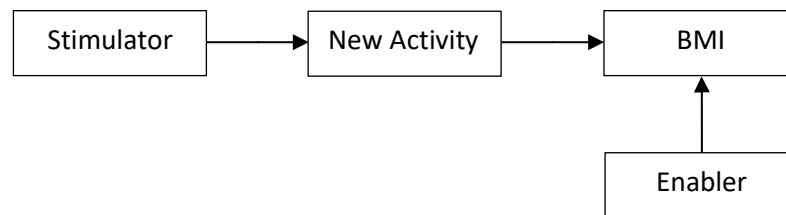


Figure 2-2: BMI through new content / activity (adapted from Amit and Zott, 2012)

Table 2-7: Example of elements needed for BMI through new content

Stimulator	New activity	Enabler
Perceived market needs for a customer segment	New offerings that are not typical in a sector/industry	Recruitment and training of new employees. Linking the new activities to existing systems (e.g., applications, platforms, channels).
Business environmental conditions	Re-focus the firm (e.g., from supplier to service provider)	Build on existing know how and capabilities. Training of top management team.

Selected activities add value to various steps of creating and delivering benefits to customers. The benefits are usually manifested in the delivered products and/or services, which is brought about through the transformation of several inputs (such as materials, information, competencies, etc.) (Chesbrough and Rosenbloom, 2002; Afuah, 2019). As a firm works to generate benefits for customers, BMI may be achieved through new ways of performing the value adding activities, or by linking the activities differently, or changing the sequence of activities (Amit and Zott, 2012; Afuah, 2019). This could be in the form of new modes of operation or methodologies, that may not necessarily alter the delivered product or service (Trimi and Berbegal-Mirabent, 2012). For instance, Priceline (an online travel agency) introduced a reverse market that made customers and sellers interact in new ways. A customer could state a desired price for a flight ticket, with the airline having the option to

accept or not (Amit and Zott, 2012). A firm may also decide to unlock more value by changing who performs the activities. This may be achieved through partnerships, offshoring, outsourcing, etc. for instance, as seen in franchising (Amit and Zott, 2012; Torabi, 2020). Another example is the BM that Apple used for the iPhone (Afuah, 2019). BMI was exhibited in the way Apple crowdsourced the app development. So, instead of trying to develop all the apps inhouse, or through specialized vendors, anyone, irrespective of location in the world, can develop an app for the iPhone. This greatly increased the value and usefulness of the iPhone to customers, at the same time, revolutionized app development in the industry. Similarly, Airbnb crowdsourced apartments and rooms which disrupted the hospitality industry, and Uber crowdsourced cars which disrupted the taxi industry.

It is also worth noting that resources (e.g., personnel, payment systems, funding, reputation, data, culture, etc.) are critical for a firm's generation, delivery, and monetization of customer benefits (Afuah, 2019). As such, BMI may be achieved through the way they are developed and used. This may be exhibited in new ways of; coordinating resources, recruitment, stakeholder relationship management, funding (e.g., crowdfunding), customer data gathering and analysis, and employee motivation (Afuah, 2019).

According to Sosna *et al.* (2010), BMI passes through stages of exploration and exploitation. The exploration stage is based primarily on prior managerial cognitive frames and knowledge, as well as trial and error learning. In the exploitation stage, the new BM emerges, and acquired learnings are developed or integrated into the routines of the firms. Clearly, learning, experimentation, and iteration are vital for BMI in start-ups (e.g., McGrath, 2010; Sosna *et al.*, 2010; Trimi and Berbegal-Mirabent, 2012; Andries and Debackere; 2013). So, practices that incorporate these are worth looking into. Examples of such practices are: (1) open business models, (2) business model canvas, (3) customer development model, and (4) lean philosophy (Trimis and Berbegal-Mirabent, 2012).

Open business model is an approach to innovation that makes a BMs more open and closer to market/customers. It emphasizes the need for start-ups to expand their boundaries by participating in a community of other entrepreneurs. As a result, new ideas may be generated which may lead to improved firm performance (Trimis and Berbegal-Mirabent, 2012). Especially because it may encourage BMI where capabilities or activities are reconfigured in complementary markets (Gambardella and McGahan, 2010; Trimi and Berbegal-Mirabent, 2012). Here, the sharing of knowledge and technology is vital. The idea is to jointly utilize

resources to capitalize on new opportunities. So, as a firm brings in new knowledge/technology from external sources, it also makes its knowledge/technology available to other firms through licensing and IP rights (Chesbrough, 2007; Chesbrough, 2010; Trimi and Berbegal-Mirabent, 2012).

The BMC is important because it allows managers to visualize and assess how their business works (e.g., Trimi and Berbegal-Mirabent, 2012; Ching and Fauvel, 2013; Borseman *et al.*, 2016; Slavik, 2019). The LC is a similar tool that has been adapted to focus on start-ups (Maurya, 2012). The graphical nature of the canvas approach is its main strength, as it aids better understanding of the BM components, how they relate to each other, and the overall BM. This is important for a start-up's learning process. Better understanding results in better communication amongst stakeholders, and it is a starting point for discussing or brainstorming new ideas centred on customer needs, thereby enabling creativity and innovation.

The customer development model emphasizes the need for managers to consider customer feedback while developing products/services for new markets. As opposed to finalizing a product before exposing it to prospective customers. The idea is to focus on learning and discovery instead of execution, while integrating important business functions such as marketing, sales, development, etc. (Trimis and Berbegal-Mirabent, 2012). It is an iterative process that allows start-ups to better validate their assumptions and identify their markets from the very beginning.

With the lean philosophy, fast information processing and decision making (e.g., regarding investments) on the part of managers to meet customer requirements quickly and effectively is emphasized. This is outlined in the lean start-up approach (Ries, 2011), which combines agile, lean, and customer development practices (Trimis and Berbegal-Mirabent, 2012). Here, frequent iterations of tests and improvements are employed with the aim of reducing waste, costs, and time to market (Trimis and Berbegal-Mirabent, 2012). Importantly, the continuous development process is measured using key performance indicators (Maurya, 2012; Trimis and Berbegal-Mirabent, 2012). This is particularly relevant in the start-up scene which is characterized by scarce resources, high risk, and uncertainty.

Amit and Zott (2012) assert that the chances of putting together the right BM for a given situation is influenced by four factors: (1) *Novelty*: how new is the innovation of the BM? (2) *Lock-in*: what are the incentives for customers to stay? Is there a switching cost? (3)



*Complementarities*: do the mutually reliant components of the BM enhance its value? (4)

*Efficiency*: Is the BM cost efficient? Does this translate to competitive advantage?

Nevertheless, to effectively engage in BMI, certain pre-requisites must be noted. For instance, managers need to gather and develop customer insights through proximity, observation, and communication (Teece, 2010; Trimi and Berbegal-Mirabent, 2012; Torabi, 2020). They must understand the standing of their firms within their business environments. Furthermore, they must be willing to challenge established industry norms (Torabi, 2020). Amit and Zott (2012:42) suggested six self-evaluating questions (shown in Table 2-8) that may help in this regard.

Table 2-8: Self-evaluating questions for managers considering BMI (Amit and Zott, 2012:42)

Questions
1. "What perceived needs can be satisfied through the new model design?"
2. "What novel activities are needed to satisfy these perceived needs? (business model content innovation)"
3. "How could the required activities be linked to each other in novel ways? (business model structure innovation)"
4. "Who should perform each of the activities that are part of the business model? Should it be the company? A partner? The customer? What novel governance arrangements could enable this structure? (business model governance innovation)"
5. "How is value created through the novel business model for each of the participants?"
6. "What revenue model fits with the company's business model to appropriate part of the total value it helps create?"

Importantly, firms must capitalize on the experiences they accrue over time. The activities, routines, and structures that make up their BM must enable knowledge transfer. This is vital to their BM dynamics (Mason and Leek, 2008; Kurti and Haftor, 2014), and may result in modifications to routines or activities (or BMI) by which performance may be improved.

### **2.6.3 Business model innovation and competition**

The nature of competition is changing as it is influenced by factors like technological advancement, deregulation, and globalization (Casadesus-Masanell and Ricart, 2010).

Moreover, recent developments such as increasing customer centricity, open innovation, and service orientation has prompted different ways of competition (Schneider and Spieth, 2013)

Consequently, firms are forced to follow suit in order to remain relevant, and the successful ones innovate their BMs (Casadesus-Masanell and Ricart, 2010). BMI is a unique activity required for firms to remain competitive, because it results in new customer offerings, revenue streams and long-term performance (Mitchell and Coles, 2003; Mitchell and Coles, 2004; Francis and Bessant, 2005; Zott *et al.*, 2011; Schneider and Spieth, 2013; Hossain, 2017; Bocken and Geradts, 2019). In several industries, mainstream markets have been upset and Incumbent firms challenged by start-ups through disruptive BMs, causing both incumbents and start-ups to prioritize BMI (Gassmann *et al.*, 2014). It has been noted that most CEOs and senior managers perceive BMI as more important than product, service or process innovation for value creation, profitability, and competitive advantage (Foss and Saebi, 2017; Hossain, 2017).

As start-ups and incumbent firms push for profitability and competitive advantage, strategies and resource investments geared towards the cause of innovating their BMs must be put in place. They must respond to the fast rate of technological change (Trimi and Berbegal-Mirabent, 2012). Teece (2018) argues that inventing an entirely new BM is difficult, though not impossible, in highly competitive developed economies. He stated that technological progress enables truly new BMs, as was observed with the rise of online firms. According to Chesbrough (2010), even though firms are keener on technology innovation than BMI, BMI is more important; so, a good strategy for competitive advantage would be to combine both. He further stated that technology is not valuable unless it is commercialized through a BM. Google, Apple and Amazon are examples of firms whose success can be attributed to active engagement in BMI, in addition to their technologies (McGrath, 2010).

Firms usually perceive well performing BMs as examples to be emulated (Zott and Amit, 2007; Chesbrough, 2010; Doz and Kosonen, 2010; Teece, 2010). This could be the case for firms in the same or different industries. Therefore, vying for competitive advantage may also entail finding a good way of protecting new BMs, or even building protection into the BM through the assets and capabilities of the firm. The extent at which this can be done has been discussed in the literature. Teece (2010) noted that though BMs may look simple and cannot be patented, they may still prove difficult to imitate. Girotra and Netessine (2014) suggested that BMI usually entails changes that are not readily visible to outsiders, hence resulting advantages are difficult to imitate. Bjorkdahl and Holmen (2013) argues that BMI is imitable, but less so than product or service innovation. They call for more knowledge about the type of capabilities that may be required for their protection. Foss and Saebi (2017) suggests that

competitive advantage from a new BM may be sustainable because of the path dependency and social complexity associated with BMI. Although path dependency may also be an hinderance to the exploitation of new opportunities (Chesbrough and Rosenbloom 2002; Chesbrough, 2010; Kurti and Haftor, 2014). Tightly coupled components in BMs exhibit high levels of ambiguity and complexity, which may be a source of competitive advantage. This sort of BM may prove challenging for competitors to emulate at a reasonable cost, because it must also fit with their strategy and capabilities (Bucherer *et al.*, 2012). Complex and tightly coupled BMI may however pose challenges such as; hinderances in the ability to forecast true performance, and inertia in the long run, as competitors implement more successful BMI (Foss and Saebi, 2017). So, tightly coupled BMs, may struggle to gain competitive advantage over loosely coupled BMs, as the latter though vulnerable to imitation, may be more responsive to change (Foss and Saebi, 2017).

#### **2.6.4 Challenges of business model innovation**

BMI is a learning process, and the end is not always known from the beginning. So, choosing the right learning approach and making necessary adjustments continuously is critical for success (Andries and Debackere, 2013; Teece, 2018). The learning must however be fast and combined with quick scaling to ensure sustainable competitive advantage (Teece, 2018). This makes up part of a competitive strategy that must be put in place to augment BMI (Hossain, 2017). As Teece (2018) noted, competitors will eventually imitate successful BMs to some extent, and intellectual property rights is usually insufficient to serve as a robust value capture strategy (Desyllas and Sako, 2013; Teece, 2018). However, protecting the learning experience in some way, and moving fast may help the firm accrue available profits before competitors (Andries and Debackere, 2013; Teece, 2018).

BMI involves dynamic fine tuning in response to internal and/or external changes in a firm's environment (Bucherer *et al.*, 2012). Its challenges are framed by its scope and objectives (Hossain, 2017), and manifested in the reality of the individual firms (Bjorkdahl and Holmen, 2013). Bjorkdahl and Holmen (2013) noted that as firms respond to trends such as outsourcing and external collaboration, their business logic choices becomes more extensive. Hence, the challenge of choosing the right BM as it becomes an open-ended endeavour involving a lot of options (Bjorkdahl and Holmen, 2013).

Besides the challenge of choice, BMI requires experimentation which in turn requires investments (McGrath, 2010), and firms may be reluctant to allocate resources to BMI (Bjorkdahl and Holmen, 2013). Desyllas and Sako (2013:102) notes the complexity of investment decisions required to commit resources to BMI, due to the cost of developing and/or acquiring new assets, and considerations that existing business activities and competencies could be reduced and/or become obsolete. Moreover, firms must reasonably understand the financial tools that apply when engaging in experiments (McGrath, 2010). At the same time, BMI needs active involvement and attention from top management (Foss and Saebi, 2017; Hossain, 2017). This may be influenced by the radicalness and scope of the BMI, as a new BMI with a large scope requires more deliberate search efforts on the part of top management (Foss and Saebi, 2017). Moreover, managers may resist experiments that could potentially disrupt the traditional configuration of a firm that generates value (Chesbrough, 2010). Inertia in support of the current business logic is a major challenge faced during BMI (Doz and Kosonen, 2010). Furthermore, it is difficult to fully anticipate opportunities across an economic sector, and a currently valuable BMI may suddenly be deposed by a new one (Gambardella and McGahan, 2010).

Some of these challenges pose risks to successfully engaging in BMI. Moreover, the interactions between a firm's appetite for risk, together with the nature of its ambition regarding BMI (considering, e.g., complexity and radicality) and general risk awareness and management, may determine whether the effort in BMI becomes successful (Taran *et al.*, 2019). Factors that may increase the risk of a BMI undertaking include; underestimating the complexity of required effort, incorrect assessment of underlying firm capabilities, inappropriate learning from failures, mismatch between the firm's risk appetite and strategy, and non-existent or insufficient risk management routines (Taran *et al.*, 2019).

A firm's lack of awareness about the full potential of its BM may hinder BMI with respect to exploring secondary value capturing opportunities (Kesting and Gunzel-Jensen, 2015). Consequently, such firms may lose business to competing incumbent firms or start-ups that are more transformational. Though Start-ups are usually limited in financial and human resources, they typically find transformation easier because they do not have many assets to reconfigure (Paradkar *et al.*, 2015; Teece, 2018). Furthermore, incumbent firms require strong leadership to secure buy-in from stakeholders, whereas in start-ups, a small group of decision makers could initiate and push the change forward (Chesbrough, 2010).

Given the possibilities and difficulties associated with BMI, the dynamic capability of firms to combine or recombine BM components into profitable BMs is critical (Desyllas and Sako, 2013; Teece, 2018).

## **2.7 Dynamic capabilities**

It is worth understanding what a capability is in general, before attempting to understand the concept of DC. According to Helfat and Winter (2011:1244), a capability is “the capacity to perform a particular activity in a reliable and at least minimally satisfactory manner”. The activity of which must have an objective; conceived for a particular purpose and geared towards an expected outcome (Helfat and Martin, 2015). Similarly, Teece (2014:14) defines a capability as the “capacity to utilize resources to perform a task or an activity against the opposition of circumstance”. DC is a special capability of a firm, which refers to its ability to modify its resource base or change its substantive capabilities over time (Ambrosini and Altintas; 2019).

Researchers have characterized DC in several ways with different emphasis. Some consider DC as an aptitude, a competence, a capacity, or a routine (Ambrosini and Altintas, 2019).

Eisenhardt and Martins (2000:1107) emphasizes the routine position, and defines DC as “organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die”.

Helfat *et al.* (2007:4) emphasizes the importance of managerial skills and defines dynamic capability as “the capacity of a firm to purposefully create, extend, or modify its resource base”. This study takes the position that DC are rooted in organizational routines and managerial skills, and defines it as “the firm's ability to integrate, build, and reconfigure internal competences to address, or bring about changes in the business environment” (Teece *et al.*, 1997; Teece, 2007).

A firm's portfolio of capabilities may be categorized into two levels. The first level are ordinary and operational capabilities such as; effective marketing tactics, efficient manufacturing processes, administration, routine activities, and basic governance which enables the firm to efficiently execute their current BM (Winter, 2003; Harreld *et al.*, 2007; Bocken and Geradts, 2019). The next level is a layer of DC that allow firms to alter, reconfigure and develop ordinary capabilities. They include *sensing* (identifying and assessing opportunities, threats, or future directions), *seizing* (creating BMs to seize new opportunities and capture value), and

*transforming* (firm renewal) (Harreld *et al.*, 2007; Teece, 2007; Teece, 2018; Bocken and Geradts, 2019). DC result in actions that reflect on the decisions managers take under uncertainty. For instance, business expansion into new markets or new product development (Teece, 2018).

DC and BMs are interdependent (Teece, 2018), and BMI has been conceptualized as a distinct dynamic capability (Mezger *et al.*, 2014). The adeptness of a firm at BMI is influenced by the potency of its DC. Concurrently, BMI influences the DC of a firm through its effect on organizational design (Teece, 2018). It has been argued that sensing, seizing and transforming are the DC that are critical for BMI, and should therefore be prioritized by top management (Zahra *et al.*, 2006; Harreld *et al.*, 2007; Helfat and Peteraf, 2015; Teece, 2007; Teece, 2018; Bocken and Geradts, 2019), because they help the firm develop and direct its ordinary capabilities, and those of partners towards profitable endeavours (Teece, 2018). Figure 2-3 shows a simplified framework for DC.

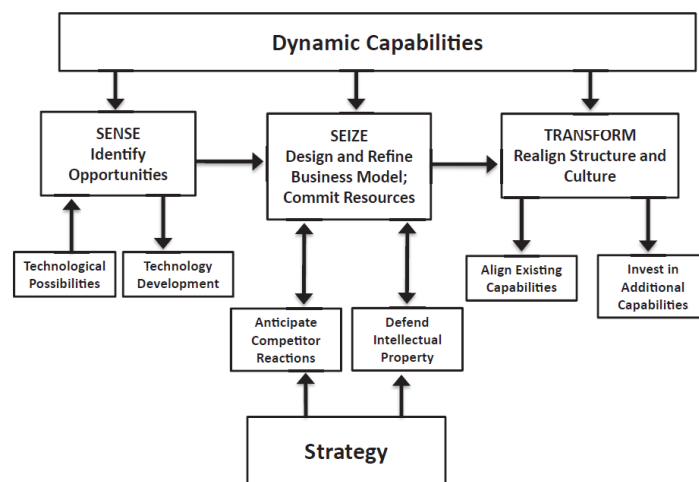


Figure 2-3: Simplified schema of dynamic capabilities, business models, and strategy (Teece, 2018)

Ambrosini and Altintas (2019) noted that there are various kinds of DC. For instance, those that go well with new product or service development, forging alliances, diversification, divestment, or country entry. Teece (2018) posits that firms are not necessarily strong across the various types of DC. For instance, a firm may have the ability to quickly sense new opportunities but may not be so good at exploiting them with new BMs. Another firm may be good at new BM development, but not so good at adjusting or improving the BM. He asserted that a combined strength in sensing, seizing, and transforming is what determines strong DC of a firm. Strong DC enables firms to develop knowledge and skills necessary to move ahead of

competitors in sensing and seizing new opportunities; and to profitably renew and reconfigure their ordinary capabilities in response to market changes (Ayuso *et al.*, 2006; Zahra *et al.*, 2006; Teece, 2007; Wu, 2007; Andersson and Evers, 2015; Teece, 2018).

A firm rely on its managers to create and improve BMs, and this is a vital part of its DC to seize new opportunities. This realization has caused managerial competencies to develop into the field of DMC which is important for BMI (Teece, 2007; Helfat and Martin, 2015; Teece, 2018).

## **2.8 Dynamic managerial capabilities**

Managers are individuals. Like every other individual, they have unique life experiences, and inherent abilities, which together determines what they can do. Essentially, the capabilities (including DMC) of managers are influenced by various outcomes that may result from the interaction between their life experiences and inherent abilities (Beck and Wiersema, 2013). This study focuses on managers that make decisions which may directly or indirectly affect the outcome of their firms. A manager might be a founder, president, C-level executive (e.g., CEO, chief technology officer (CTO), chief operating officer (COO), etc.), director, service delivery manager, product manager, etc. Basically, managers have the responsibility for the performance of their firms. They may lead the entire firm or contribute through their respective functional areas. A manager drives his/her firm towards its goals, so as to achieve or retain competitive advantage (Afuah and Tucci, 2003).

The DMC perspective extends the DC perspective, with particular focus on managers, and their role in renewing and transforming a firm's resource base for competitive advantage and improved performance (Eisenhardt and Martin, 2000; Adner and Helfat, 2003; Helfat and Martin, 2015). Andersson and Evers (2015:262), cited the work by Harris and Helfat (2014) and noted that DMC describes "the capacity of managers to create, extend or modify the way in which a firm makes a living".

Ambrosini and Altintas (2019) pointed out the significance of the DMC of managers for a firm's DC. They suggested that firms could improve performance if their managers develop entrepreneurial activities that help sense and seize opportunities, as well as transform the resource base. Firms having managers with great DC are better able to modify their strategy than firms that do not (Helfat and Martin, 2015; Ambrosini and Altintas, 2019). Such capabilities are ensured by deliberate learning efforts on the part of managers, and will prove

crucial in helping managers sense and seize opportunities when market or technological changes arise (O'Reilly and Tushman, 2008).

According to Teece (2016), the pillars behind DC are managers. He points out three roles of managers: the operational, entrepreneurial and leadership roles. The operational role is about developing current routines, for example, budgeting, organizing, planning, and staffing. The entrepreneurial role is about orchestrating resources, sensing and seizing opportunities, and developing new BMs for the firm. The leadership role is about motivating people, aligning them with strategy, and propagating the vision and values of the firm. Both the entrepreneurial and leadership roles constitute the functions of DC (Teece, 2007; Teece 2016), or more specifically, DMC (Helfat and Martin, 2015). Ambrosini and Altintas (2019) noted that the ability of managers to reflect, interpret and ultimately make decisions is critical for sensing and seizing opportunities, as well as in transforming the resource base. They argue that managerial dependence, manipulation, and creation of routines is vital. Teece (2012) on the other hand argues that DC may not be completely routinized, stating that there is an artistic and intuitive aspect. For instance, in developing a new BM.

In the context of BMI, DMC may be a distinguishing factor for a firm's competitiveness and profitability. Teece (2010) argues that seemingly simple BMs which cannot be patented may be difficult to imitate for reasons that are not so obvious. The reason may well reside in the DMC of managers.

For instance, Andersson and Evers (2015) believes that DMC may help entrepreneurs put together profitable BMs that sense and seize international opportunities. Managerial skills and abilities are difficult to replicate, and together with other capabilities and assets of the firm, can potentially create a set of resources that allows the firm to be more profitable than its competitors (Castanias and Helfat, 2001). Disparity in managerial decisions and actions may be explained from the perspective of DMC; with respect to both the firm's process for capability building, and on an individual manager basis (Andersson and Evers; 2015).

Zahra *et al.* (2006) posits that performance is not assured just because a firm possess DC. They argue that it is the management of the capabilities that enables firms to gain superior performance. DMC involves orchestrating assets and resources, reconfiguring routines, and creating markets, all in consideration of the potential impact on the internal attributes and external environment of the firm (Zahra *et al.*, 2006; Helfat *et al.*, 2007; Teece, 2012; Helfat and Martin, 2015). This requires managers to develop entrepreneurial activities and pursue



good ideas that may emanate from different levels of the firm (Helfat and Martin, 2015; Teece, 2016).

DMC have three main antecedents which are interconnected to each other, namely: managerial human capital, managerial social capital, and managerial cognition (Adner and Helfat, 2003; Martin, 2011; Helfat and Martin, 2015). See an illustration of how these antecedents relate to the life experiences and innate abilities of managers in Figure 2-4 below. These antecedents are unevenly distributed among managers, which leads to different outcomes. Hence, some managers possess effective DMC, and others do not, or are completely devoid of it (Helfat and Martin, 2015; Ambrosini and Altintas, 2019). Furthermore, the possession of one unique capability is not necessarily an advantage, because there are usually several ways to perform an activity. Some of which may be more, or less effective (Eisenhardt and Martin, 2000). However, DMC may be improved when managers interact to share, discuss, and negotiate ideas, because it promotes synergy and continuous learning (Maritan, 2001; Martin, 2011; Beck and Wiersema, 2013).

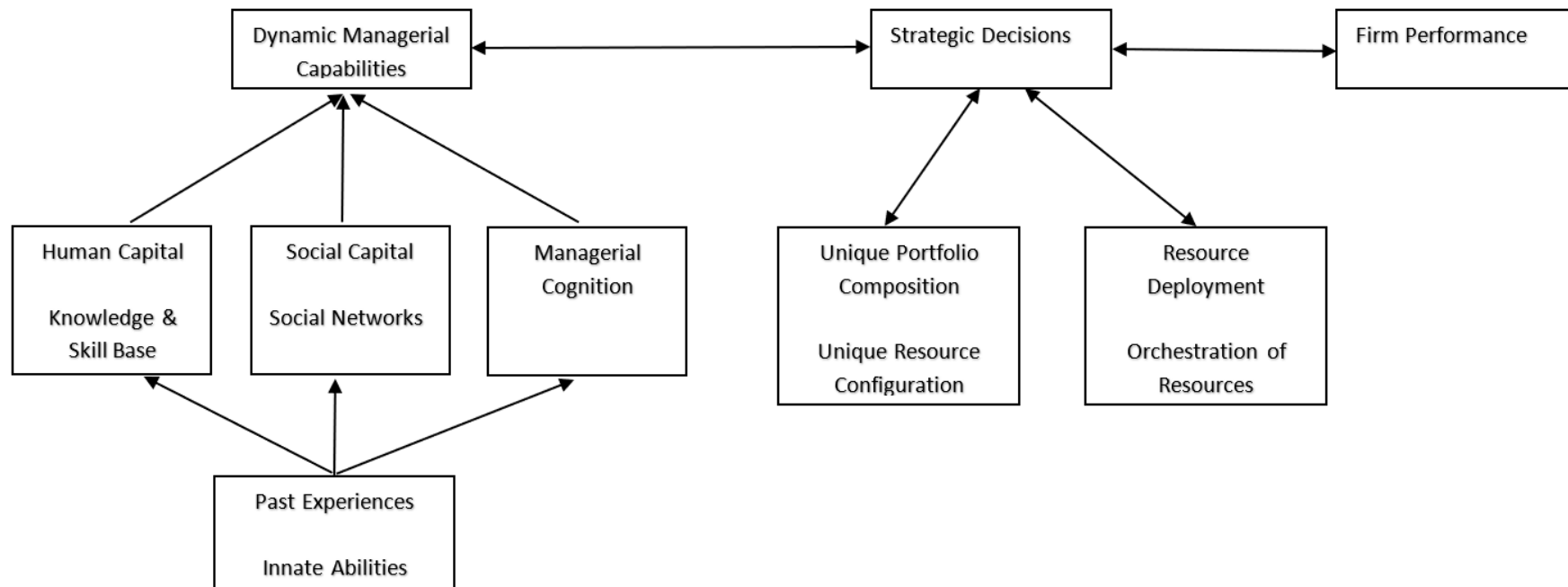


Figure 2-4: Dynamic managerial capabilities and strategic decisions (Beck and Wiersema, 2013)

### 2.8.1 Managerial human capital

The knowledge, abilities, and skills that managers acquire through education, professional experience and personal experience can be referred to as managerial human capital (Adner and Helfat, 2003; Kor and Mesko, 2013; Helfat and Martin, 2015). It is shaped by prior experiences, which serves as a foundation on which new experiences, knowledge, and skills are built (Adner and Helfat, 2003; Kor and Sundaramurthy, 2009; Helfat and Martin, 2015), hence the varying skillsets of managers. Researchers have attempted to categorize human capital with respect to how learned skills and knowledge are applied to specific business environments. For instance, knowledge and skillsets such as a manager's work experience, management experience and education may be considered *generic* if deemed relevant in all firms and industries. Conversely, specific skillset and knowledge, such as detailed knowledge of a particular market segment or the supply chain of an industry may be considered *industry specific* (Beck and Wiersema, 2013). In addition, knowledge and skills may also be *firm specific* or *task specific* (e.g., Castanias and Helfat, 2001; Beck and Wiersema, 2013).

Helfat and Martin (2015) pointed out several variables that researchers have used to measure human capital. See Table 2-9 below. However, clearly distinguishing the exact constituents of the skillsets and knowledge that are more suitable for firm survival (operational capabilities) compared to firm renewal (DC) is still a challenge. Hence firms rely on past experiences for guidance (Beck and Wiersema, 2013). In this regard, Beck and Wiersema (2013) claim that operational capabilities may benefit more from a manager's extensive experience within, e.g., a particular domain, functional area or industry. While DC may benefit more from broader experience, e.g., across a range of functions or industry.

Table 2-9: Example variables used to measure human capital (Helfat and Martin, 2015)

Managerial Human Capital	
Education	Work experience
Level	Position
Type of background	Firm
	Industry
	International
	Functional area
	Management/Leadership
	Entrepreneurial

Developing managerial human capital is a deliberate and practical learning process. With outcomes such as relevant work experience and education, which can be beneficial to firms in several endeavours, such as strategic change or organizational innovation (Beck and

Wiersema, 2013; Andersson and Evers, 2015; Ambrosini and Altintas, 2019). Furthermore, it may influence the ability of managers to sense, seize and transform opportunities (Gavetti, 2012; Helfat and Martin, 2015). Ultimately, the specificity, genericity, complementarity, and level (e.g., individual or team level) of managerial human capital in a firm works together to ensure performance (Martin, 2011; Helfat and Martin, 2015).

### **2.8.2 Managerial social capital**

Social interactions, whether formal or informal, are beneficial to the professional lives of managers. These interactions translate to established connections and relationships which may prove beneficial to a firm; in terms of easier or privileged access to vital information and resources (e.g., partnership, funding, competent personnel) (Adler and Kwon, 2002; De Janasz and Forret, 2008; Steinfield *et al.*, 2009; Kor and Mesko, 2013; Ambrosini and Altintas, 2019). For entrepreneurs, it could result in influence that may be helpful when interacting with stakeholders (Adner and Helfat, 2003; Andersson and Evers, 2015). The accumulated benefits that could result from the relationships of managers is referred to as social capital (Nahapiet and Ghoshal, 1998; Adler and Kwon, 2002; Andersson and Evers, 2015). The benefits can be described as avenues of support which may be manifested in various forms of capital such as human, physical, intellectual, or financial capital. Moreover, the benefits may include the social capital of associates. In other words, the benefits may also be in the form of valuable connections; each with a wealth of connections, knowledge, and resources. Hence, social capital amplifies a manager's resources (Beck and Wiersema, 2013).

"Although the sources of both managerial human and social capital are found in past experiences, the sources of managerial human capital are essentially the past experiences of the individual, whereas the sources of managerial social capital are those past experiences that have been shared (directly or indirectly) with others" (Beck and Wiersema, 2013:412).

Managerial ties and trust are two dimensions of social capital which may be exhibited by managers internally and/or externally (Adler and Kwon, 2002; Andersson and Evers, 2015). Internal social capital enables managers to gain access to relevant information across various levels of the firm, which provides some form of control, power, and influence (Adner and Helfat, 2003; Ambrosini and Altintas, 2019). While external social capital may help managers obtain much needed information from their firm's external environment, for instance, what other firms are doing that could be measured against for competitive advantage (Ambrosini and Altintas, 2019). Essentially, managerial social capital fosters a collaborative environment

where ideas and resources are shared to the benefit of the firm. This is important for innovation. Managers (e.g., entrepreneurs) exhibiting important aspects of social and human capital, such as commitment, conduct, reputation, and capabilities, are usually more attractive to potential working partners (e.g., investors) (Brush *et al.*, 2001; Andersson and Evers, 2015). So, managerial social capital is clearly an important aspect of DMC that could help a firm sense, seize, and transform opportunities (Helfat and Martin, 2015).

Table 2-10: Example variables used to measure social capital (Helfat and Martin, 2015)

<b>Managerial Social Capital</b>		
<b>Social Network Ties</b>	<b>Network Characteristics</b>	<b>Relationships</b>
External	Size	Managers in other firms
Internal	Strength	Business contacts
	Closeness	Directors
	Diversity	Government officials
	Centrality	

### 2.8.3 Managerial cognition

Andersson and Evers (2015:266), cite the work by Gavetti and Levinthal (2000) and defines cognition as “a forward-looking form of intelligence that is based on an actor’s beliefs about the linkage between the choice of actions and the subsequent impact of those actions on outcomes”. It is made up of belief systems, mental models, mental processes, interpretive frames, and emotions through which decisions are made (Adner and Helfat, 2003; Kor and Mesko, 2013; Helfat and Martin, 2015). This is a complicated bundle of components which directly affects how managers perceive information that leads to decisions. For example, mental models take shape based on past experiences of managers, while mental processes are made up of different elements such as, language, communication, problem solving, reasoning, attention, and perception (Helfat and Martin, 2015). Managers have their mental models and must be able to engage in mental processes which makes up their mental cognitive capability (Helfat and Peteraf, 2015). These, together with the other aspects of managerial cognitions creates a personal reality for managers (Beck and Wiersema, 2013), which plays a key role in decision making. This in turn impacts their ability to sense, seize and transform opportunities (Helfat & Martin, 2015).

Table 2-11: Example variables used to measure managerial cognition (Helfat and Martin, 2015)

<b>Managerial Cognition</b>		
<b>Knowledge Structures</b>	<b>Mental Processes/Cognitive Capabilities</b>	<b>Emotions</b>
Mental representations	Attention	Emotion Regulation

Mental models	Perception
Beliefs	Interpretation
Resource Schemas	Reasoning
Strategic Schemas	

---

Managers are the ones with the authority to act regarding BMI. Hence the way they perceive environmental factors and interpret what should be done is particularly decisive (Foss and Saebi, 2017). They confront large amount and variety of information, and their capacity to process new information is limited. They may therefore develop simplified mental models (biases and heuristics) through their idiosyncratic life experiences to guide them in anticipating markets, understanding the ramifications of different choices, and ultimately making a decision (Andersson and Evers, 2015; Helfat and Martin, 2015). This is similar to a *theory driven / top down* approach for information processing (Beck and Wiersema; 2013). Whereby managers quickly assess and respond to events, as they rapidly absorb new information into a pre-existing processing framework. The challenge here is that unstable conditions or circumstances makes such simplified models unsuitable and could result in wrong decisions with grave consequences. Therefore, during new situations, supplementing a *theory driven / top down* approach with a *data driven / bottom up* approach is important (Beck and Wiersema, 2013).

Managerial cognition is clearly a potent antecedent of DMC. Several aspects (e.g., mental processes, knowledge structures and mental models) are quite well understood. Emotion regulation is however one aspect that has received limited attention in the literature (Huy and Zott, 2019). Another interesting concept that is related to managerial cognition is path dependence. Because managerial cognition is critical to how managers perceive viable alternatives or paths in their industry. If done properly, competitive advantage may be attained (Lamberg and Tikkanen, 2006).

### **2.8.3.1 Emotion regulation**

Managers, as individuals, have emotions which may influence their decision making, and their ability to cope with challenging business events. In this context, managers not only deal with their own emotions, but also with those of stakeholders. For instance, to win the support of investors or employees regarding business-critical decisions (Huy and Zott, 2019). The effort managers make to modify or manage their emotions, and/or those of others, for a particular purpose is known as emotion regulation (Gross, 2015; Huy and Zott, 2019).

Huy and Zott (2019), in their empirical analysis which focused on resource mobilization in an entrepreneurial context, showed how managers that pay more attention to emotion regulation were better able to mobilize resources required by their firms. The emotion regulation is of two kinds: 1) *Emotion regulation of the self*, and 2) *Emotion regulation of others*. *Emotion regulation of the self* may occur in managers before the emotion forms completely within them. This involves a conscious effort of altering a reaction to an environment. For instance, a manager may try to feel a desired emotion by re-assessing their perspective on things. Similarly, emotions may be regulated after emergence through deliberate efforts in, for instance, conflict resolution or problem solving. Ultimately, *Emotion regulation of the self* creates psychic benefits as business opportunities are pursued by prompting the continuous application of experience, skills, and knowledge. In this sense, it mobilizes human capital (Adner and Helfat, 2003; Huy and Zott, 2019). On the other hand, *Emotion regulation of others* may help managers gather necessary support and validity from stakeholders. This is achieved by establishing legitimacy through the cognition of stakeholders. Hence, mobilizing social capital (Adner and Helfat, 2003; Huy and Zott, 2019).

### **2.8.3.2 Path dependence**

According to Teece *et al.* (1997), path dependence describes the constraining influence of a firm's past investments, together with routines developed over time, on the way it conducts its business. Examples of such developed routines are domain specific knowledge or capabilities, which increases the likelihood of a firm to continue doing business as usual and reduces the willingness to change strategy (Winter, 2006). Path dependence emphasises the importance of history, and the way past decisions and choices shape the present ones (Kurti and Haftor, 2014).

Sydow *et al.* (2009) characterized path dependence with a three-phase framework: The *preformation*, *formation*, and *lock-in* phase. In the *preformation phase* there is an extensive range of options. In the *formation* phase, self-reinforcing (or positive feedback) mechanisms begin to develop, which reduces the options and leads to gradual path emergence. In the *lock-in* phase, there is a drastic reduction of the options, resulting in a dominant path.

Masrani *et al.* (2018) posits that self-reinforcing mechanism may be consolidated by: (1) coordination effects: where rule guided behaviour result in cost reduction (as in 'economics of scale'), (2) complementary effects: where resources are merged to reduce cost (as in 'economics of scope'), (3) learning effects: which results in operational efficiency, and (4) adaptive expectation effects: where preferences are similar due to the need for social

belonging and the rewards of association. The resulting *lock-in* is characterized by difficulties experienced by the firm (and its managers) in transcending to a different or new state (even if they may want to do so). This is so because the cost of switching is high, therefore they become somewhat stuck (Kurti and Haftor, 2014; Masrani *et al.*, 2018).

Researchers have taken several perspectives in examining path dependence, with some highlighting its importance to firm resource accumulation and survival, and others seeing it as detrimental to firm survival (Lamberg and Tikkanen, 2006; Kurti and Haftor, 2014). This is intertwined with managerial cognition, as the cognition of managers is critical to decisions about keeping the firm on a determined path or the creation of new paths. According to Lamberg and Tikkanen (2006), managerial cognition is modified by the systemic properties, technical properties, ideology, and structure of the firm. The way managers interact in their business environments (both externally and internally), together with their past experiences, shape their cognitive frames (Kor and Mesko, 2013). This may result in a dominant logic, which is important for a firm to sustain its BM. However, it may also hinder adaptability and the pursuit of new business opportunities (Chesbrough and Rosenbloom, 2002; Prahalad, 2004; Chesbrough, 2010; Masrani *et al.*, 2018).

Incumbent firms benefit from resource accumulation over time, with respect to possible sustenance of competitive advantages (Lamberg and Tikkanen, 2006). However, they are usually less flexible and adaptable than start-ups (Johnson *et al.*, 2008). Although, the constraining effect of path dependence may be more visible in incumbent firms, start-ups are not completely absolved from path dependence. Especially because the past mental maps, knowledge, and experiences of start-up managers informs their BM development (Kurti and Haftor, 2014). Therefore, path dependence is also relevant in the context of start-ups.

## **2.9 Literature synthesis**

The criticality of BMs and BMI has been immensely recognized in the literature (e.g., Mitchell and Coles, 2003; Mitchell and Coles, 2004; Chesbrough, 2010; Teece, 2010; Zott *et al.*, 2011). BMI is however still a developing field, of which several researchers have called for more research, specifically as it relates to start-ups (Comberg *et al.*, 2014), managerial decision making (Hossain, 2017), and key aspects of DC (Teece, 2018). For firms to remain competitive in today's business climate, they must not only be aware of their current business environment, but also be able to anticipate challenges or opportunities, and respond quickly



(e.g., Francis and Bessant, 2005; Schneider and Spieth, 2013; Teece, 2014; Hossain, 2017). This entails BMI (Schneider and Spieth, 2013; Spieth *et al.*, 2014; Hossain, 2017). The motivations for firms to innovate their BMs may however be different in Incumbents and Start-ups (Sosna, *et al.*, 2010; Comberg *et al.*, 2014; Balboni and Bortoluzzi, 2015), but ultimately the goal is to strengthen the firm's competitive stance and financial performance (e.g., Chesbrough, 2010; Comberg *et al.*, 2014; Teece, 2018).

A BM represents the activity system of a firm, and BMI is the process of reconfiguring the activity system for the benefit of the firm (Amit and Zott, 2010; Zott *et al.*, 2011; Kesting and Gunzel-Jensen, 2015; Berends *et al.*, 2016; Foss and Saebi, 2017). This requires specific capabilities in order to achieve the intended outcomes (Helfat and Winter, 2011; Helfat and Martin, 2015). It is capabilities that enables a firm to respond quickly ahead of competitors (Demil and Lecocq, 2010; Teece, 2014). Developing the right capability requires a strategy and resource investments, and this in turn may influence what type of capability building is prioritized by the firm. However, before measures to improve capabilities can be prioritized, managers need to first understand what type of capabilities are missing or inadequate in the first place. This relates directly to discussions on the imitability of BMs by competitors (Chesbrough, 2010; Doz and Kosonen, 2010; Teece, 2010; Teece, 2018). For instance, Bjorkdahl and Holmen (2013) called for more understanding of the kind of capabilities required to protect a BM. Capabilities is clearly a key factor that makes a BM sustainable (Foss and Saebi, 2017).

Besides the challenge of protecting a BM, other challenges associated with BMI in firms were identified in the literature. Examples are; choosing the right BM, unawareness of the full potential of a BM, resource allocation to pursue BMI, gaining managerial attention, path dependence, inertia or the defence of current business logic, internal resistance, fear of the unknown (Chesbrough, 2010; Gambardella and McGahan, 2010; Bjorkdahl and Holmen, 2013; Kurti and Haftor, 2014; Foss and Saebi, 2017; Hossain, 2017). All of these challenges are associated with change and uncertainty, and managers need the right capabilities to navigate through, make the right decision, and ultimately take the right action. Especially because the actions taken may lead to changes in the existing capabilities or resource base (Ambrosini and Altintas; 2019). As Hossain (2017) noted, most studies on BMI describe successful cases, but pay too little attention to potential future emergence, and what managers should concentrate on.

DC have been identified as the type of capabilities needed by firms to transform their resource base and competencies in order to effect changes in their business environment (e.g., Teece *et al.*, 1997; Eisenhardt and Martins, 2000; Helfat *et al.*, 2007; Teece, 2007; Ambrosini and Altintas; 2019). DC were clearly differentiated from operational capabilities as higher order capabilities. Moreover, the role of managers with respect to abilities and skills was emphasized (e.g., Castanias and Helfat, 2001; Teece, 2007; Teece, 2018), which leads to the DMC' perspective (Adner and Helfat, 2003; Helfat and Martin, 2015).

It has been suggested that managerial cognition, social capital, and human capital, which makes up the main foundation of DMC, are not uniformly distributed among managers (Adner and Helfat, 2003; Martin, 2011; Helfat and Martin, 2015). Clearly these underpinnings are important and relevant for BMI, but is any of these more important than the others for BMI in start-ups? How are they related to each other? How should managers prioritize resource investments in capability building? Helfat and Martin (2015:1305) noted that greater managerial social capital and cognition increases human capital; but that extensive social ties could also be counterproductive because it may lead to information overload which may reduce the available cognitive capacity needed to process information regarding a particular issue. Considering managerial human capital as another example. It is primarily based on prior experience and education. Should top management (or founders) in start-ups rely solely on the profile of the personnel they recruit? How should they strategize for BMI with respect to ensuring the right capabilities?

Several researchers indicated in the concluding discussion of their articles that there still are significant gaps in the understanding of BMI with respect to capabilities. Foss and Saebi (2017) suggested that the DC literature will help gain new insights into the internal antecedents of BMI in the entrepreneurial context. Schneider and Spieth (2013) posed a question on how firms can recognize new opportunities and trends that are applicable to their current situation with respect to competences, resources, and capabilities. Spieth *et al.* (2014) wondered how firms can systematically engage in BMI within the structure of their overall innovation initiatives; and build it into an organizational capability.

Based on DMC theory, this study aims to fill the gap identified in the literature by exploring how capabilities influence BMI in start-ups.

This will be examined through the following research question: *What capabilities allow managers (e.g. founders, decision makers) in start-ups to innovate their BMs?*

The above-mentioned aim will be achieved through the following objectives:

1. Explore the factors that prompt managers in start-ups to innovate their business models
2. Examine how business model innovation unfolds in start-ups
3. Investigate how the capabilities of managers in start-ups influence business model innovation

### **3. Methodology**

In research projects, the nature of the research question is usually the main determinant of the choice of a research methodology (Noor, 2008). This requires the adoption of a philosophical paradigm that not only represents the researcher's point of view, but also determines the approach used for the research, with respect to data collection, analysis, and interpretation. In other words, endeavours in research requires adequate consideration of epistemological, ontological, and methodological issues. These are reflected respectively, in the researcher's basic assumptions of the constituents of knowledge, reality, and inquiry (Guba and Lincoln, 1994; Sobh and Perry, 2006; Lincoln *et al.*, 2011). Therefore, it is important that the research questions and objectives adequately fit the adopted philosophical paradigm, methodology and methods.

This section discusses the philosophical position and methodology to be adopted for this study.

#### **3.1 Philosophical paradigm**

A philosophical paradigm represents a conception of the world and how it works. It touches on the nature of reality and comprises of basic belief systems or views on how reality unfolds (Guba and Lincoln, 1994; Saunders *et al.*, 2019). The individual worldview of researchers together with the research objectives informs the adopted paradigm. This in turn implies commitment to a set of rules, because different paradigms have different underlying assumptions. Underlying different paradigms are ontological, epistemological, and methodological issues. These inform the execution of research projects, and attention is paid to how (or if) the findings may be generalized. Ontology relates to assumptions about reality, epistemology considers the relationship the researcher has with that reality, while methodology relates to the means or techniques by which the researcher attempts to determine or investigate that reality (Guba and Lincoln, 1994; Sobh and Perry, 2006).

Postmodernism, positivism, interpretivism, pragmatism, critical theory and critical realism are prominent paradigms in business research (Sobh and Perry, 2006; Saunders *et al.*, 2019). For this study, critical realism, is deemed to be a good fit, for reasons outlined in section 3.1.2. The methodology used within a research paradigm may be quantitative or qualitative. In quantitative research, data is elicited with the objective of gathering insights that may be generalized to a population. Therefore, large samples are required to test hypotheses, where

numbers are emphasized, and statistical procedures are utilized. Whereas qualitative research uses smaller samples in the attempt to deeply understand a phenomenon. Therefore, it is the meanings and words in the elicited data that is emphasized (e.g., Easterby-Smith *et al.*, 1991; Guba and Lincoln, 1994; Bryman and Bell, 2015; Saunders *et al.*, 2019). It is not uncommon for a mixed approach to answer a research question more suitably (Sobh and Perry, 2006). However, this study adopts a qualitative approach.

An inductive and/or deductive approach may be taken in research projects (Bryman and Bell, 2015). With the inductive approach, the context of every event is important, and theory emanates from observations in elicited data. On the other hand, the deductive approach follows a logical flow of event. It involves first developing a theory or hypothesis (based on, e.g., a literature review), and then collecting data to test the hypothesis which is either confirmed or rejected (Bryman and Bell, 2015; Saunders *et al.*, 2019). Unlike the generalization sought by a deductive approach, an inductive approach aligns more to a research endeavour aimed at deeply understanding a phenomenon (Miles and Huberman, 1994; Saunders *et al.*, 2019). Therefore, this study adopts an inductive approach.

### **3.1.1 Comparing alternative paradigms**

As mentioned earlier, postmodernism, positivism, interpretivism, pragmatism, critical theory and critical realism are prominent paradigms in business research. Critical realism has been chosen for this study. This section highlights and describes the difference between these paradigms (see e.g., Sobh and Perry, 2006; Creswell and Poth, 2018; Saunders *et al.*, 2019). In the next section, arguments are made regarding why critical realism is understood to be the best choice for this study.

Positivism assumes that there exists a singular objective reality that is not affected by the researcher, and neither does this reality affect the researcher. In positivism, the researcher is objective, and gathers facts about the social world to explain social life using facts and causality (Noor, 2008; Saunders *et al.*, 2019). Theories are applied to justify measurement of variables, and data is elicited from a sufficiently large sample using quantitative techniques (e.g., surveys). Statistical methods (e.g., frequency counts) are then applied with the goal of generalization through the confirmation or rejection of hypothesis (Saunders *et al.*, 2019). Interpretivism which is often referred to as social constructivism (e.g., Creswell and Poth, 2018) focuses on qualitative, subjective and context rich phenomena (Godfrey and Hill, 1995;

Creswell and Poth, 2018). It does not emphasize facts gathering and the measurement of frequency of patterns. It rather appreciates the various meanings and constructions that individuals place on their experience, as it is not about a reality that is objectively determined, but one that is socially constructed (Easterby-Smith *et al.*, 1991; Sobh and Perry, 2006; Noor, 2008). Therefore, the researcher is empathetic in his/her stance and becomes a part of the process, so as to gain a subjective and detailed understanding of the phenomenon (Saunders *et al.*, 2019).

Like in interpretivism, postmodernism is interested in detailed investigation of a phenomenon. Postmodernists challenge established or popular ways of thinking, in the quest for discovering or giving light to alternative suppressed perspectives (Saunders *et al.*, 2019). In postmodernism, the assumption is that language plays an important role; and truth is a collective choice influenced by power relations between the research participants and the researcher (Saunders *et al.*, 2019). Pragmatism emphasizes the need for practical outcomes of research endeavours. It assumes that the world may be interpreted in different ways, and that a complete picture cannot be obtained from a single perspective. Thus, the researcher does not focus on abstract concepts, but on how a research problem may translate to action that makes a difference in an organization (Saunders *et al.*, 2019). Critical theory assumes that realities are constructed by individuals as they interact in a social context. The researcher examines behaviours resulting from this constructed reality, which is different and incomparable from individual to individual (Sobh and Perry, 2006). With the goal of dealing with limitations placed on individuals, thereby empowering them (Creswell and Poth, 2018).

Critical realism assumes that a reality independent of observers is in existence out there, but at the same time admits that reality is socially constructed (Sobh and Perry, 2006; Easton, 2010). "It distinguishes between the real world, the actual events that are created by the real world, and the empirical events which can actually be captured and recorded" (Easton, 2010:128). In other words, this real world may not be perfectly understood (Guba and Lincoln, 1994). Critical realism employs causal language with thinking, as it attempts to "construe rather than construct the world" (Easton, 2010:122). It sees participants of this external reality (the real world) as objects whose interactions are real and enabled by structured mechanisms. Therefore, the perceptions of individuals are important, as it provides some insight into that fuzzy reality which is out there (Sobh and Perry, 2006).

Figure 3-1 below summarizes a comparison of the research paradigms.

<p style="text-align: center;"><b>Positivism</b></p> <p><b>Ontology:</b> Reality is real and apprehensible.</p> <p><b>Epistemology:</b> Findings true – researcher is objective by viewing reality through a “one-way mirror”.</p> <p><b>Common Methodologies:</b> Mostly concerns with a testing of theory. Thus, mainly quantitative methods such as: survey, experiments, and verification of hypothesis.</p>	<p style="text-align: center;"><b>Constructivism</b></p> <p><b>Ontology:</b> Multiple local and specific “constructed realities”.</p> <p><b>Epistemology:</b> Created findings – researcher is a “passionate participant” within the world being investigated.</p> <p><b>Common Methodologies:</b> In-depth unstructured interviews, participant observation, action research, and grounded theory research.</p>	<p style="text-align: center;"><b>Postmodernism</b></p> <p><b>Ontology:</b> Some meanings, interpretations, realities are dominated and silenced by others.</p> <p><b>Epistemology:</b> Findings focus on absences, silences and oppressed/repressed meanings, interpretations, and voices.</p> <p><b>Common Methodologies:</b> Typically, deconstructive – reading texts and realities against themselves. In-depth investigations. Range of data types, typically qualitative methods of analysis.</p>
<p style="text-align: center;"><b>Critical theory</b></p> <p><b>Ontology:</b> “Virtual” reality shaped by social, economic, ethnic, political, cultural, and gender values, crystallised over time.</p> <p><b>Epistemology:</b> Value mediated findings – researcher is a “transformative intellectual” who changes the social world within which participants live.</p> <p><b>Common Methodologies:</b> Action research and participant observation.</p>	<p style="text-align: center;"><b>Critical Realism</b></p> <p><b>Ontology:</b> Reality is “real” but only imperfectly and probabilistically apprehensible and so triangulation from many sources is required to try to know it.</p> <p><b>Epistemology:</b> Findings probably true – researcher is value-aware and needs to triangulate any perceptions he or she is collecting.</p> <p><b>Common Methodologies:</b> Mainly qualitative methods such as case studies and convergent interviews.</p>	<p style="text-align: center;"><b>Pragmatism</b></p> <p><b>Ontology:</b> Reality is the practical consequences of ideas.</p> <p><b>Epistemology:</b> Problem solving and informed future practice of findings – researcher seeks practical meaning of knowledge in specific contexts.</p> <p><b>Common Methodologies:</b> Range of methods: mixed, multiple, qualitative, quantitative, action research. Emphasis on practical solutions and outcomes.</p>

Figure 3-1: Comparing the research paradigms (adapted from Sobh and Perry, 2006; Saunders *et al.*, 2019)

### **3.1.2 Arguments for the chosen philosophical approach**

This study adopts a critical realism philosophical position in its aim of exploring the role of capabilities on BMI in start-ups. Based on the theory of DMC, the following research question will be addressed: *What capabilities allow managers (e.g. founders, decision makers) in start-ups to innovate their BMs?*

The research question is exploratory in nature, and the subject matter is complex. According to Berends *et al.* (2016), BMI is a complex process that involves cognition and action. It is not a simple process of conception, followed by execution, but rather a multi-step and multi-mechanism learning process. Along similar lines, Foss and Saebi (2017) acknowledged the path dependency and social complexity involved in BMI. Like in most business situations, the complexity of BMI must be viewed in context, as it is a function of the circumstances of the firm, as well as individuals/managers (Saunders *et al.*, 2019). The role of managers is at the centre of the DMC' perspective. DMC allow a firm to adequately respond to its external business environment. It is influenced by the experiences, knowledge, values, cognitive frames and/or belief systems of managers that has been accrued/shaped over time. This in turn influences managerial choices and decision making. DMC may therefore be considered a social phenomenon. Hence, a more subjective take to this study is justified. Moreover, BMI may be considered an organizational change process (Demil and Lecocq, 2010; Foss and Saebi, 2017) embedded in the context of a firm. Therefore, a holistic approach in examining how it unfolds is appropriate (Pettigrew, 1992). A suitable accompanying philosophical position when the objective is to obtain thoughtful and detailed understanding of a phenomenon is critical realism (Easton, 2010).

The exploratory, subjective, complex, and contextual nature of this study has been emphasised. This is clearly not in line with positivism, as positivism assumes an objective reality that can be accessed easily (Sobh and Perry, 2006). Moreover, the goal of this study is not to extensively test pre-developed theories or hypothesis. Neither is it foreseen that the outcome will be generalized to a population by statistical inference.

Furthermore, the objective of this study is not to devise or construct the reality of BMI in start-ups based on the joint perceptions or views of the researcher and start-up managers. Neither is it foreseen that the outcome will necessarily be based on consensus on specific constructs



between the researcher and start-up managers. Therefore, the interpretivism (or constructivism) and postmodernism paradigms are also not appropriate for this study.

Although the outcome of this study may potentially contribute to managerial practise of BMI in start-ups, the goal is not to actively influence the start-ups during this study. Therefore, the critical theory and pragmatism paradigms (e.g., action research) are also not appropriate.

The objective of this study is to understand, interpret, and explain BMI in start-ups as it is influenced by capabilities. The context and subjective experiences of the participating managers will be important, and the findings may be generalized analytically considering existing theories. This fits well with the critical realism paradigm which has been adopted for this study. Real business decisions are taken during BMI. These decisions are usually influenced by external environmental conditions. They are not taken haphazardly, but rather to achieve competitive advantage by meeting real customer needs. This study seeks to understand the reality of BMI as it relates to the capabilities of start-up managers. As such, from a critical realism philosophical position, “there is a real world out there to discover” (Sobh and Perry, 2006:1200).

### **3.2 Research strategy and methods**

This study seeks to understand BMI in start-ups through the DMC’ perspective. Due to the phenomenon to be explored, and the nature of the research question, this study adopts the case study methodology. Among the research methods available to researchers, case studies are particularly well suited for studying complex processes or activities in detail (Noor, 2008; Easton, 2010). This is in line with the goal of this study. Which is for the findings to provide a comprehensive understanding of the phenomenon, rather than high statistical representativeness. Moreover, it adequately suits the critical realism philosophical position under which this study is framed (Sayer, 2000; Sobh and Perry, 2006; Easton, 2010).

#### **3.2.1 The case study method**

The case study methodology is popular and frequently used in business and management research (Gerring, 2004). This is in part due to its versatility, as researchers may utilize a case study in different ways when trying to understand a phenomenon. For instance, Yin (2014) posits that case studies may be of four types: (1) a single and holistic case study, (2) a single embedded case study having multiple units of analysis, (3) a multiple case study having

multiple units of analysis, or (4) a multiple case study having a single unit of analysis. Importantly, with the case study methodology, the researcher is able to deeply examine a phenomenon within its real-life context (Noor, 2008; Yin, 2014). This is particularly relevant for this study because the context of the start-ups to be examined is relevant (with respect to their internal and external/business environmental conditions).

According to Easton (2010:119), case studies “involves investigating one or a small number of social entities or situations about which data are collected using multiple sources of data and developing a holistic description through an iterative research process”. Along similar lines, Yin (2014) asserts that the fact that various forms of evidence (e.g., observations, interviews, artifacts, documents) may be utilized in a case study is one of its distinctive strength. In addition to an entity or situation, a case may also refer to an individual, an event, or a unit of analysis (Noor, 2008; Yin, 2014). Yin (2014) argues that the design of a case study may be explanatory, descriptive, or exploratory. An explanatory design is suitable for research questions aimed at understanding “why” and “how”. A descriptive design aims to provide detailed and accurate accounts of the case. While an exploratory design enables “what” research questions to be answered. The nature of this study is exploratory; however, a mix of these approaches will be utilized.

The approach taken in a case study may be quantitative, qualitative, or mixed. Critical realism as a paradigm is tolerant to different research methods, such as qualitative and quantitative methods, so long as the choices are in alignment with the objective and nature of the study (Sayer, 2000). This study will use a qualitative approach given its exploratory nature. The unit of analysis are the start-ups, whose managers will provide elicited data. The perceptions, subjective experiences, and interpretations of the managers will be critical in answering the research question. To ensure richness in the data, and the corresponding pattern and understanding that may emerge from this study, a multiple cross-sectional case study strategy is adopted (Pettigrew, 1992; Yin, 2014). The multiple case approach will enable replication. This is intertwined with careful consideration of the cases, and it follows the replication logic rather than the sampling logic in positivism research (Yin, 2014). Emphasis is given to the relevance of the cases and not how representative they are. Within a critical realism research, replication may be literal or theoretical. In the sense that similar or contrary results may be obtained, respectively, for reasons that are predictable within the context of the study (Sobh and Perry, 2006).

Although the firms that will be involved in this study are all start-ups, their business, strategy, technology, market, competitors, complementors, and challenges are unique. This will contribute to the richness of this study.

### **3.2.2 Sampling strategy**

The research question will be answered through multiple exploratory cross-sectional case studies focused on start-ups in Norway. In this study, a start-up is seen as a firm that was recently founded and has started showing signs of future potential. In other words, there currently exist a market or potential market for its products and services, and there is room to scale-up (there is potential for more growth). The start-ups selected for this study are technology firms, and they were purposely selected from various industries.

Subtle inconsistencies, challenges, and contradictions in defining the term 'start-up' has been recognized in the literature. In other words, a systematic definition of the term is rare. For instance, some have alluded to start-ups as: a state of mind, a firm having a roughly finished product but with the ability to grow, a young firm with few employees, a creative firm working on disruptive technologies, etc. (e.g., Robehmed, 2013; Cockayne, 2019). On that note, based on an investigation into how research objects like start-ups are defined, Cockayne (2019:85), posits that "though defining terms like start-up is important in both a practical and communicative sense, such definitions should be open to revision and researchers should pay close attention to the side-effects of that definition in terms of how it may affect understanding later in a research project". He asserts that clearly defining a start-up might have a limiting effect methodologically. Particularly, when other geographical settings are considered. As differences may be wrongly pointed out between firms that are actually quite similar. So rather than seeing a start-up as a type of firm, it should be seen as an outcome or product of certain working practices. This study subscribes to this line of thinking. Nonetheless, for the purpose of clarity and transparency, the selection criteria for the start-ups to be included in this study has been adapted from Robehmed (2013) as listed below:

- 1) The firm is no more than ten years old
- 2) The firm has not been acquired by a larger firm
- 3) The firm has not acquired any other firm
- 4) The firm does not have more than one main office
- 5) The firm has less than 80 employees

- 6) The revenue of the firm is not more than twenty million US dollars annually
- 7) There are no more than five people sitting on its board
- 8) The founders have not sold their shares in the firm
- 9) The founders are still in control of the firm
- 10) The firm exhibits a potential for growth

In addition, the start-up must be familiar with the concept of BMs; and must have modified or changed its BM at some point since its inception.

### **3.2.3 *The case companies***

Access to the start-ups that participated in this study was gained through a Technology Business Incubator (TBI). The TBI is part of an incubator program that is partly funded by the government. They provide support services that help facilitate start-up development and growth. The services are paid for by the start-ups, and include access to office spaces, meeting rooms, banks, accounting firms, technology ecosystem, etc.

The TBI aided the start-up recruitment process by distributing an invitation letter (prepared by the author) to start-ups that matched the inclusion criteria. The author then contacted start-ups that indicated interest to make arrangements for data collection. A total of ten start-ups participated in this study. See section 5.1 for details. All questions and concerns of participants were addressed prior to signing a consent form.

### **3.2.4 *The multiple cross-sectional case study approach***

This study adopts a multiple cross-sectional case study approach. The effect of contextual issues to a phenomenon of study is vital for replication in critical realism research. As a result, it is good practise to use multiple cases, because it enables a more useful and relevant understanding of the fundamental mechanisms (Sobh and Perry, 2006; Yin, 2014). “Of course, a single case should provide more in-depth data than multiple cases can, within the time and resource constraints of a research project. However, relying on just one case to provide the contextual conditions investigated in a realism research project requires an extraordinarily rich case” (Sobh and Perry, 2006:1203). For this reason, a multiple cross-sectional case approach is deemed appropriate for this study.

According to Miles and Huberman (1994), the number of cases should be selected based on the degree of complexity envisaged. Particularly, in consideration of sampling within the cases. He suggests that the cases should be no more than fifteen if the complexity is high. So as to avoid a cumbersome study where there is too much data to go through. Moreover, the resources of the researcher should be considered in terms of time, finance, and other practical limitations. However, for multiple case study research, there are no hard and fast rules regarding the number of cases that is appropriate. Although it is recommended not to have fewer than four (Eisenhardt, 1989). Between four and ten cases adequately improves the possibility of theory generation from a study (Eisenhardt, 1989; Eisenhardt and Graebner, 2007).

This study will look into ten start-ups, and ten managers/decision makers will be interviewed. Purposive sampling will be used to secure the participation of managers from the selected start-ups. Each start-up will represent a single case that can stand on its own. However, the cross-sectional case studies will enable validation and generalisation of the results. The type of generalisation suited to this study is analytical generalisation, through careful comparison and analysis of the cases, based on the underlying theoretical framework of this study (Yin, 2014). See Figure 3-2 for a depiction of the methodological approach of this study.

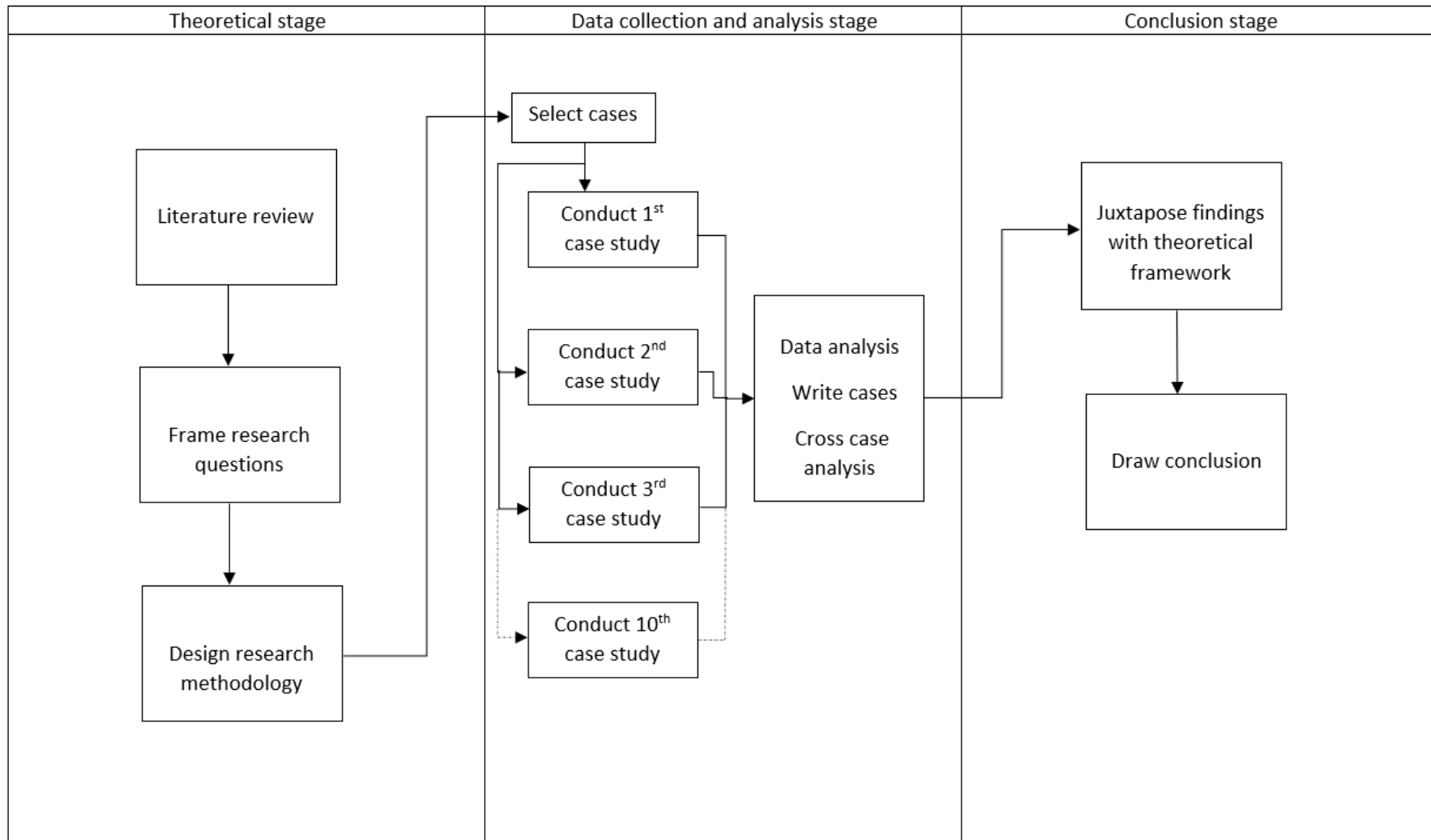


Figure 3-2: The methodological approach of this study (adapted from Noor, 2008)

### **3.2.5 Data collection**

The use of individual interviews to collect data is popular in qualitative research, as they allow greater access into the feelings, thoughts, and opinions of the research participants (Hove and Anda, 2005). Individual Interviews are of different types: structured, unstructured, and semi-structured (e.g., Hove and Anda, 2005; Baumbusch, 2010; Rubin and Rubin, 2011). With the structured interview both the questions posed to the research participant and an expected range of answers are pre-determined and specific. Here, the interviewer strictly follows a guide, and the interviewee chooses from a range of answers. The unstructured interview is more like an informal conversation with no specific or pre-determined questions, answers, and direction. A semi-structured interview is a mix of both approaches (Hove and Anda, 2005; Rubin and Rubin, 2011). Where both specific and open-ended questions are posed to elicit specific and elaborate information respectively (Hove and Anda, 2005). Among the variants of interviewing techniques, the semi-structured format is widely used in qualitative research (DiCicco-Bloom and Crabtree, 2006). This popularity may be linked directly to its flexibility and versatility. Using semi-structured interviews allows data to be elicited differently from different participants within the same study without losing coverage of the areas of interest in the data collection endeavour (Noor, 2008). The open-ended questions put forward to the research participants enables their spontaneity, which allows their perspective to be captured in a detailed and rich manner (Noor, 2008).

Due to the exploratory nature of this study, the semi-structured interview technique was deemed more appropriate. The primary source of data was individual managers. The type of data sought was the perception and subjective experience of the managers regarding BMI in their start-ups. The semi-structured interview format allowed detailed interviews, with mutual exchanges with the participants. An interview guide was used by the author to steer the conversations. The interview guide comprised of a list of questions that were pre-determined before the interviews, based on the objective of the study. However, the author exhibited some flexibility in following the interview guide. Adequate room was given to the participants to fully express themselves. Follow up questions were not always based on the interview guide. They were also based on the nature of the response to previous questions. This enabled natural and detailed conversations with each participant.

An iterative approach was used in creating the interview guide. The initial questions were chosen in line with the objective of the study. The interview guide was then piloted to test its

suitability in eliciting meaningful data. See section 4 for a description of the pilot study. Based on the outcome of the pilot study, the interview guide was updated to the version that was used in the main study.

The interviews were pre-arranged, and the participants were informed about their voluntary participation. The interviews lasted between fifty and ninety minutes. Permission to record and transcribe the interviews was sought in advance. In addition, confidentiality was assured; to the extent that the received data will not be used for purposes other than this study. Furthermore, measures were taken to anonymize the participants to ensure that they freely share their experience without fear of any form of repudiation. The received data were properly classified and stored in a safe and dedicated hard drive.

#### **3.2.5.1 Interview transcription**

Transcription plays a vital role in qualitative research. However, researchers do not always consider the transcription approach taken in their research projects as an important aspect of the research methodology (Oliver *et al.*, 2005). Hence, transcription is frequently treated as something to be done “behind the scenes”, and it is usually not adequately discussed and reported in research outputs (Oliver *et al.*, 2005; Davidson, 2009). Discussions in the literature regarding how transcription is understood, conducted, and reported raises a fundamental concern. Which is whether transcripts should necessarily be an exact write-up of interview recordings, or a combination of choices in the transcription process that require explanation. (e.g., Lapadat, 2000; Oliver *et al.*, 2005; Davidson, 2009). Although perspectives differ on how exactly transcription should be done, it is generally considered to be a representational, interpretive, selective, and theoretical process that enables a social phenomenon to be understood (Davidson, 2009). In practice, transcription relates to perspectives on how language is represented. It may be regarded as a continuum; with naturalism on one end and denaturalism on the other (Oliver *et al.*, 2005; Davidson, 2009). With naturalism, the transcriber strives to capture every detail of the interview. Including, for instance, pauses, laughs, stutters, etc. These are regarded as interview noise in denaturalism and are therefore removed. Moreover, denaturalism allows for the correction of grammar.

The transcription approach adopted in a research project is important because it determines the extent at which the data transcripts aligns with the objectives of the research (Lapadat, 2000; Oliver *et al.*, 2005). This is intertwined with the philosophical position of the research.



For instance, the objectivity in positivism lends itself to transparency where a researcher may opt for providing an exact account of interview recordings. While interpretivist consider transcripts as theoretical constructs, based on choices on how and what to report (Lapadat, 2000; Oliver *et al.*, 2005). Along similar lines, emphasis may be given to thorough descriptions of speech in conversational analysis. Whereas critical discourse analyst and grounded theorist may emphasize the meanings in the transcript (Oliver *et al.*, 2005).

This study explored the role of capabilities to BMI in start-ups. The focus was not on the mechanics of the conversation with participants, but rather on their perceptions and the meanings in the elicited data. Therefore, a hybrid approach that complemented the level of analysis in this study was used for the transcription. The transcription was done in a denaturalized manner, while retaining the transparency of the naturalistic approach (in that the content of the interviews were not changed). The transcriptions for all the interviews were done by the author as an important step in familiarizing with the data (Braun and Clark, 2006). No special convention or notation system was used in generating the transcripts. Vocalization other than speech (involuntary noises), such as: coughing, sneezing, laughing, stuttering, or non-verbal interactions such as: smiling and handwaving were not included in the transcripts, as they were not deemed relevant and necessary for the analysis required to answer the research question. Moreover, it made the transcripts easier to read. For consistency, grammatical errors made by the author (who was also the interviewer) and the participants were not corrected.

### **3.2.6 Data analysis**

Thematic analysis was the research technique of choice for this study because it enables focus on the qualitative aspect of the data analysis; with emphasis on context in searching for patterns and meanings. As opposed to content analysis that relies on quantification through frequency counts of codes (Loffe and Yardley, 2004; Braun and Clarke, 2006; Vaismoradi *et al.*, 2013). Thematic analysis is an important and popular research technique amongst qualitative researchers. It is not bounded to specific theoretical or epistemological positions, unlike techniques such as Interpretive phenomenological analysis (IPA) or discourse analysis (DA), that also search for patterns across a given data set. The flexibility of the thematic analysis technique renders it applicable across a range of research questions and epistemologies (Braun and Clarke, 2006).

From a critical realist perspective, thematic analysis was a suitable research technique as it allowed the author to analyze and explicate the reality and experiences of the participants. This was manifested as themes identified within the interview transcripts, which aided in producing a rich description and interpretation of the data in relation to the research question (Loffe and Yardley, 2004; Braun and Clarke, 2006).

In this study, the author followed a guide to thematic analysis proposed by Braun and Clarke (2006). The guide comprises of six comprehensive and distinct phases of thematic analysis as highlighted in Table 3-1 below.

Table 3-1: Phases of thematic analysis (Braun and Clarke, 2006:87)

Phase	Process Description
1. Familiarizing yourself with your data	"Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas."
2. Generating initial codes	"Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code."
3. Searching for themes	"Collating codes into potential themes, gathering all data relevant to each potential theme."
4. Reviewing themes	"Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis."
5. Defining and naming themes	"Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme."
6. Producing the report"	"The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis."

The thematic analysis of the data in this study unfolded in a non-linear manner, as the author navigated through the different phases, backward and forward, repeatedly (Braun and Clarke, 2006; Vaismoradi *et al.*, 2016). Triangulation was ensured through document review and cross case analysis (Sobh and Perry; 2006). More details about the approach taken by the author is described in section 5.

### **3.3 Ethical considerations**

This study complied with the ethical code of conduct at Heriot Watt University. The author duly informed all participants about; the research aim, why they were selected, the author's privacy and confidentiality obligations, and their right to withdraw from the study at any time. This was achieved through a detailed information sheet (see Appendix A) which was explained to each participant prior to obtaining formal consent (see Appendix B).

Given that this was a case study research, with the primary source of data being the subjective perception and experience of managers, the human aspect as a potential source of bias could not be ignored. Case study research have been criticized for their subjectivity and potential bias, especially because of the proximity of the researcher to the cases (Gerring, 2004; Noor, 2008). However, case study research still has considerable appeal in the social sciences (Gerring, 2004). Sarniak (2015) discussed different types of research bias that may arise from the respondents, interview questions, and/or researcher. For example, during the interviews, some managers may feel the need to answer questions in a way that puts them in a good light (social desirability bias), or provide superficial answers due to disengagement and/or fatigue (habituation bias). On the other hand, researcher bias may occur through unconscious confirmation of personal beliefs based on the response from the managers (confirmation bias). Furthermore, leading questions or the order in which questions are posed during an interview may result in prior responses influencing subsequent ones (Sarniak, 2015). There are no specific procedures that can be followed to systematically eliminate bias (Norris, 1997). However, bias may be minimized by researcher awareness and focus on its sources, as well as careful research design and prudent use of research techniques for data elicitation, analysis, and interpretation (Norris, 1997; Sarniak, 2015). Creswell and Poth (2018) put forward various validation strategies related to the researcher's own bias which is important to recognize and be aware of.

In this study, deliberate effort was made to ensure honesty and fairness in line with the critical realism philosophical position. The interview guide for the semi-structured interviews was carefully designed with respect to the questions to be asked, and how they were posed. For instance, the interviews started with one or two icebreaker questions to build rapport and put the participants at ease. It was reinforced that there are no right or wrong answers, and the participants were reminded of confidentiality. General questions were asked first, before going into the specifics, in a way that made the respondents feel comfortable. In addition, openness

and neutrality to the issues on the part of the author was important. Careful consideration was given to the timing of the interview, to ensure that it fit well with the schedule of the participants, and that they felt comfortable enough to express themselves without distortion. The elicited data was analysed and interpreted competently, with support and guidance from the assigned supervisor for this study. Moreover, the elicited data was triangulated against documentary evidence.

#### **4. Pilot Study**

The importance of pilot studies in research projects is well recognized. However, researchers are not always interested. Especially when the study is of a qualitative nature (Kim, 2011; In, 2017). This may in part be due to the progressive and emergent nature of the empirical work in most qualitative research. In the sense that imminent change regarding the collection and analysis of data is expected. Moreover, it is expected that the use of research techniques such as interviews will get better as the research progresses. Mainly because the experience and insights gained by the researcher from previous interviews enables the next ones to be improved (van Teijlingen and Hundley, 2001; Kim, 2011). Nonetheless, pilot studies are still essential in providing clarity and focus with respect to data collection for topics of interest in qualitative research (van Teijlingen and Hundley, 2001).

The scale of a pilot study is usually smaller in comparison to the main study. Still, it plays a vital role in ensuring an efficient and quality research project. It enables researchers to test and determine the procedures and methods that are to be applied. While increasing their experience and confidence in the process (van Teijlingen and Hundley, 2001; In, 2017). Consequently, researchers get the opportunity to fine tune, revise or adjust the procedures for the main study (Kim, 2011). Although success is not necessarily guaranteed by doing a pilot study, the chances of success increase when one is conducted (van Teijlingen and Hundley, 2001).

In preparation for the data collection and analysis of this study, it was deemed necessary to conduct a pilot study. The pilot exercise was undertaken to reflect the procedures highlighted for the main study. In order to ascertain whether they were indeed feasible (van Teijlingen and Hundley, 2001; Kim, 2011; In, 2017). The goal was to examine the practical arrangements made for the cases and participants, as well as the research instruments for data collection. This included testing the case and participant selection procedure, as well as the arrangements for participant interviews. Specifically, the emphasis was on: (1) case and participant selection, (2) the mode of conducting the interview, (3) the interview guide and questions, (4) the interview language, (5) time keeping, and (6) the nature of the responses obtained from participants. The pilot study was expected to uncover any practical challenges for resolution prior to the main study.

#### **4.1 Case and participant selection**

Guided by the aim of this study which is to understand the influence of capabilities on BMI in start-ups, and the research design described in the methodology section above, it was necessary to select start-ups as cases for the pilot study. The main research instrument was in depth semi-structured interview, and it was the perspective of start-up founders and/or managers that was to be elicited. To achieve the goal of the pilot study, it was necessary for the start-ups chosen to fit the same criteria that was to be used in selecting start-ups for the main study (see section 3.2.2 above). However, the start-ups were not just waiting to be selected, they had to be found. Moreover, it was deemed wise to not select pilot cases from the TBI (the main study research site). Because the number of start-ups that would be willing to participate in the main study from the TBI was still unclear. Given that the main study results were not going to include those from the pilot study, not selecting any start-up from the TBI increased that chances of getting enough cases.

The recruitment of start-ups to participate in the pilot study was done through LinkedIn - a popular social network site for professionals. First, the author looked to his own network to see those who were founders or CEOs of start-ups. The plan was to contact them and ask for help with the pilot study. However, that plan was not followed through. Mainly because any pre-existing level of familiarity between the participant and the author may compromise the process. The approach adopted is as listed below:

1. A google search was done for start-ups in the area, and a list of potential recruits was compiled. In total, fifteen start-ups were on a short-list.
2. The websites of the start-ups on the short-list were examined to see if they possibly matched the case selection criteria. The short-list was then reduced to contain nine start-ups.
3. The Founders/CEOs/Managers of seven out of the nine start-ups were contacted on LinkedIn to ask for help with the Pilot study.

The managers were contacted on LinkedIn in the second week of December 2020. The generic email that was sent to the managers to solicit participation is shown in Appendix F. Out of seven managers contacted, four replied. Of the four that replied, three indicated some interest in helping with the pilot study, and they all had questions/concerns which were addressed. Subsequently, an information sheet containing detailed and relevant information about the

study was sent to them for their perusal (See Appendix A). The author emphasized that they could take as much time as necessary to make their decision regarding participation. Eventually, two managers committed to participate in the pilot. This was confirmed and formalized through a signed consent form (See Appendix B).

#### **4.2 Interview mode**

Face to face interviewing is a popular and widely accepted mode for conducting in-depth and semi-structured interviews in qualitative research (Sturges and Hanrahan, 2004; Irvine *et al.*, 2012). It helps researchers develop rapport and beneficial partnership of trust with research participants. This is necessary to ensure that obtained qualitative data are detailed and rich (Shuy, 2003; Irvine *et al.*, 2012; Seitz, 2016). However, over the years, qualitative data has increasingly been gathered by interviewing over the telephone. Sturges and Hanrahan (2004) examined the potential effects and differences between gathering data through semi-structured interviews by telephone and face-to-face. With respect to the depth, nature, quality, and quantity of obtained data. They concluded that there were inconsequential differences, indicating that telephone interviews are just as valuable and beneficial to data collection in qualitative research. They however acknowledged that the nature of a particular research endeavour, and accompanying practicalities must be considered in choosing the appropriate mode for a study. For instance, with ethnography it might be necessary for the researcher to be immersed in the environment of the participants. Hence, face-to-face interviewing may be more appropriate. Examples of other considerations might be; the sensitivity of the topic, ease of access to participants, safety, privacy, convenience, and cost (Sturges and Hanrahan, 2004). Creswell and Poth (2018) recognizes that a research participant's nonverbal and informal communication may be missed when interviewing by telephone; but assert that telephone interview is nonetheless suitable when the participant may otherwise not be reached. Drawing upon some conversational analysis techniques, Irvine *et al.* (2012) examined the nature of the interaction that occurs between researcher and participant when doing face-to-face interviews compared to telephone interviews. They identified differences in several aspects as shown in Table 4-1 below. However, for the purpose of both the pilot and main study, these differences were not perceived to be of major consequence.

Table 4-1: Researcher & participant interaction during face-to-face & telephone interviews (adapted from Irvine *et al.*, 2012)

Face-to-face interviews	Telephone interviews
Researcher more often helps complete or formulate participant response.	Participant more often asks for questions to be clarified.
Researcher more often vocally acknowledge the participant.	Participant more often check regarding the adequacy of their response.
Longer interviews.	Shorter interviews.

Due to the coronavirus pandemic which started in 2019, meeting face-to-face for the research interviews was out of the question. It was more a question of what meeting platform was appropriate. Should it be a telephone interview? Or should it be done using internet-based visual technology? The author is well familiar with Skype, as well as other similar software applications such as Microsoft Teams and Zoom. The author had used all three applications at work several times and on different occasions. Especially during the pandemic when working from home became the norm. Moreover, most people working in an office setting nowadays have access to and regularly use one form of internet video technology or another.

The use of internet-based visual or video technology (e.g., skype) for qualitative interview in research projects has become popular in recent years (Seitz, 2016). Using internet-based video technology for qualitative interview makes up for some perceived shortcomings of telephone interviews, as both the participant and the researcher are able to see each other (Seitz, 2016). Like telephone interviews, it has the advantage of cost effectiveness and convenience, allowing both the participant and the researcher to be stationed at any place of their choosing for the interview. After checking with the two participants for the pilot study regarding their preferred technology medium, Microsoft Teams was chosen, and the interviews were scheduled. Table 4-2 below outlines some details about the pilot interviews.

Table 4-2: Pilot study interview details

	Participant A	Participant B
<b>Current position:</b>	Founder/Owner	Chief Product Officer
<b>Start-up founding date:</b>	October 2010	April 2011
<b>Customer offerings:</b>	Consultancy Services	Payment, Retail, and Business Intelligence Solutions.
<b>Interview date:</b>	December 21 <sup>st</sup> 2020	December 23 <sup>rd</sup> 2020
<b>Interview duration:</b>	1 hour 19 minutes	1 hour 56 minutes

It is worth noting that using technologies like Microsoft Teams potentially have some disadvantages compared to face-to-face interviews. Some of which may be “dropped calls and pauses, inaudible segments, inability to read body language and nonverbal cues, and loss of



intimacy compared to traditional in-person interviews” (Seitz, 2016:230). Hence, it was important to adequately test this mode of interviewing during the pilot study.

#### **4.3 Interview guide**

As discussed in section 3.2.5, the semi-structured interview was considered the most appropriate interviewing technique for this study. Primarily because of its versatility and flexibility. This flexibility may sometimes be interpreted as ease of use, which is not necessarily the case. It is worth giving serious thoughts and considerations to various issues, including the required detail of collected data (Kallio *et al.*, 2016). This is where an interview guide comes in handy; to help steer a conversation and keep it from wandering away from the topic area of the research. Essentially, an interview guide comprises of a list of questions that a researcher uses to elicit data from a participant. These questions would usually be informed by the prior knowledge of the researcher, obtained from, e.g., a literature review, and are put together to cover the main areas of the research. Importantly, the questions are open ended, clearly worded, and not leading (Kallio *et al.*, 2016). Ultimately, a pilot test helps to ascertain the adequacy of the interview guide for the purpose of the research project.

The initial interview guide of this study comprised of four group of questions: (1) opening questions, (2) main questions, (3) elaborating questions, and (4) ending questions. See Appendix D. The purpose of the opening questions (e.g., *when did you start your company?*) was to get some general information about the participants and their start-ups. They were also to serve as ice breaker questions to help the author and the participants get comfortable with the conversation, before proceeding to the main questions of the study. The main questions (e.g., *can you describe your current business model?*) were centred around the area of interest in the study. This is where the participants were encouraged to pour out their opinions, perception, and subjective experiences. The elaborating questions (e.g., *can you please tell me more about that?*) were used to probe the participants on their responses to ensure detailed and rich data. They also helped keep the conversation in a good flow. The elaborating questions were not followed logical or sequentially, but as needed. Sometimes, the probing was also done spontaneously, based on the particular response of the participant. The ending questions (e.g., *is there anything that has not been said that you would like to say?*) were used to give the participants a final opportunity to provide additional input, and to get the opinion of the participants regarding the interview. It helped lead the conversation to a natural conclusion, while ensuring that nothing important had been left unturned.

#### **4.4 Interview language and Time management**

The two participants of the pilot study had Norwegian citizenship; however the interviews were conducted in English. This was in line with the plan for the main study. The participants probably would have been able to express themselves better in their native Norwegian language. But that was inconsequential for this study, as most Norwegians have good working knowledge of the English language. The participants of this study were no exception. Moreover, even though the author has a good working knowledge of the Norwegian language, he was more comfortable conducting the interviews in English. Considering also that this thesis is written in English.

The interviews were scheduled for 1 hour, however both interviews lasted for over an hour (between 1 and 2 hours to be precise, see Table 4-2 above).

#### **4.5 Pilot study outcome**

Doing the interview online was convenient. The video functionality helped make the interviews more personal and richer, as both the author and the participants could see each other, even though they were not sitting in the same room. Both the author and the participants could see each other's facial expression, hand movement, gestures, cues, and to some extent, body language. Though the focus of the interview was to elicit the verbal perception of the participants (not their nonverbal cues), seeing each other allowed for a more relaxed and engaging conversation. This was important, especially for breaking the ice and creating rapport at the beginning of the conversation. Small talks, jokes and laughs were shared between the author and the participants, which helped create a relaxed atmosphere before the interview commenced. It is worth noting that the messages exchanged between the author and the participant on LinkedIn when soliciting participation in the pilot study also helped establish rapport, as the participants had an idea of what to expect. Another aspect is that the participants were not native speakers of English, even though they could understand and speak English quite well. So, sometimes when the words got difficult to explain, non-verbal cues or gestures helped bring the point across.

There were no issues with internet connection or bandwidth during the interviews. After each interview, the recordings were almost immediately available on Microsoft stream. The author could then immediately verify the audio quality of the recording and save the video (.mp4) file

in a dedicated location on his personal computer (PC). The quality of the recordings was good and posed no issue for the author during the analysis of the interviews. The author reviewed the pilot interview recordings several times. Upon critical reflection, several realizations and areas for improvement were identified, which were considered in preparation for data collection in the main study. The following section discuss the realizations from the pilot interview recordings.

#### **4.5.1 The interview questions**

As discussed in section 4.3, the interview questions were listed in an interview guide, which the author referred to when conducting the interviews with the pilot study participants. This provided some structure to the interview. Even though the interview questions were open ended, they defined the confines within which the conversation during the interviews were held. This also helped maintain a natural flow to the conversation. In that after exhausting elaborating questions to responses provided by the participants, the author could look at the interview guide and pick the next question. However, upon reviewing the recordings of the interviews, the author noticed that there was room to improve the interview questions for the main study.

The author realized that he sometimes struggled to maintain an engaging conversation during some part of the interviews. At the same time, he felt like it would help to break down some of the main questions and/or include more questions. Taking the interview with *Participant A* as an example, it sometimes seemed like the author was trying not to exhaust all his interview questions before the time elapsed. The author sometimes hesitated while thinking of what next to ask. Furthermore, some of the main questions could have been arrived at more gradually, hence it was necessary to probe more. In addition, it was necessary to include more questions and break down some of the main questions in the interview guide. One of the feedback *Participant A* gave at the end of the interview was quote:

*"We have been all over the place today. You have to maybe find some more specific questions, and not give me that much time to stroll."*

The review of the pilot interview recordings, together with further reflection on how the responses would help answer the research question, informed the modification of the interview guide. See Appendix E. The updated interview guide contained thirteen main

questions which were worded to adequately facilitate the elicitation of relevant data for this study.

#### **4.6 Summary**

The goal of the pilot study was to test the key practical data collection arrangements for the main study, which were: (1) case and participant selection, (2) the mode of conducting the interview, (3) the interview guide and questions, (4) the interview language, (5) time keeping, and (6) the nature of the responses obtained from participants. The pilot study largely succeeded in testing these elements and provided useful outcomes (see section 4.5) which informed the arrangements and preparations for the main study. Furthermore, the author got an idea of how start-up managers may respond to a request for participation in this study. The realization was that to get enough start-ups as cases for the main study, at least three times the desired number of start-ups should be contacted. The pilot study also provided the opportunity to test the effectiveness of the prepared invitation letter, information sheet and consent form (see Appendix C, Appendix A and Appendix B respectively). Based on the interaction with the participants before the interviews, it was not necessary to update the invitation letter, information sheet and consent form for the main study. Importantly, the pilot study confirmed that start-up managers were willing to talk about their business endeavours, and that they can be comfortable sharing information with a researcher.

The pilot study ascertained that it was effective to conduct the interview online, and that Microsoft Teams was an adequate medium for the interviews. Furthermore, it enabled the author to assess the relevance of the data obtained using the interview guide to the aim and objectives of the study. As a result, the interview guide and questions were updated. The pilot study confirmed that conducting the interviews in English was fine. Moreover, it revealed areas where more work was needed on the part of the author. Essentially, the pilot study was effective in examining the ability of the author to carry out data collection for the main study. It was a helpful training experience for the author, as he experienced first-hand, the potential dynamics of the main study interviews. This was important because the author was new to conducting research interviews. Ultimately, the pilot study confirmed the feasibility of this study.

## 5. Data Collection and Analysis

This section describes the cases of the main study. In addition, it explains how data was collected and analyzed. As discussed in section 3.2.5, the main source of data was individual start-up managers. The data elicited was their subjective experience and perception regarding BMI in their start-ups. Company records/reports, website information and published local media articles were used for triangulation.

### 5.1 Research sample

Ten start-up companies participated in this study, and each start-up constituted a case. The ten cases were analysed individually. In addition, a cross case analysis was conducted. The multiple cases broadened the context from which data regarding BMI in start-ups was compared. See section 7 for the presentation of the findings.

The start-ups were selected using purposive sampling. A prerequisite was that the start-ups had changed their BM at least once since starting. This was part of the research strategy to ensure that the research question will be answered (Eisenhardt and Graebner, 2007; Bryman, 2012; Yin, 2014). The chosen sampling frame also allowed the author to select start-ups with different characteristics (e.g., industry, customer segment, deliverables). Doing this was deemed necessary to get a broader and richer understanding of the phenomenon in question.

The selected start-ups were technology and service companies operating in various sectors and industries. Such as health, finance, marine operations, information technology, industrial inspection, environment, and manufacturing. See Table 5-1 below for an outline of the profile of the start-ups. The start-ups were given pseudo names to protect their identity. The geographical location of the start-ups as it relates to the location and convenience of the author was considered in the selection process (Bryman, 2012; Bryman and Bell; 2015). For this reason, the start-ups were all based in Norway, and have their headquarters in the eastern region. The start-ups were founded between 2014 and 2020, and their number of employees ranged from three to fifteen.

Table 5-1: Characteristics of participating start-up companies

Firm*	Started (year)	Type of company	Focus area
Firm A	2018	Technology / Service	Software development, consulting

Firm B	2017	Service	Financial services, consulting, investing
Firm C	2017	Technology	Ocean technology, mitigating natural disaster, research, consulting
Firm D	2014	Service	Aerial technology, infrastructure inspection
Firm E	2015	Technology / Service	Digital technology, aesthetic medicine
Firm F	2018	Technology / Service	Ocean operations, data acquisition
Firm G	2020	Technology / Service	Digital technology, contact tracing, corona virus
Firm H	2019	Technology / Social enterprise	Digital technology, inclusion among children, fighting poverty
Firm I	2019	Technology / Manufacturing	Instrumentation, positioning and control solutions, autonomous systems
Firm J	2019	Technology	Ocean operations, instrumentation, data acquisition

---

\*the firm names are pseudo names for the purpose of confidentiality

## 5.2 Individual Interviews

Individual interviews with start-up managers was the primary source of data in this study. The collection of primary data took place between January and March 2021. Using semi-structured interviews as the main research instrument. The semi-structured interviews were aided by an interview guide prepared by the author based on the output of a pilot study that was conducted earlier. The pilot study is discussed in section 4. The interviews were conducted in English, as the participants were all proficient and comfortable speaking in English. All the interviews were conducted online using Microsoft Teams, an internet-based video technology. This was deemed appropriate based on the results of the pilot study. The interviews were recorded using in-built functionality in Microsoft Teams. The recordings were almost immediately available after each interview, in the form of a .mp4 file which was downloaded and stored in a secure location. Table 5-2 below shows an overview of the data collection through individual interviews.

Table 5-2: Overview of individual interviews

Firm*	Manager's designation	Date of interview	Interview Duration (hh:mm:ss)
Firm A	CEO	January 12, 2021	1:02:38
Firm B	Partner	January 14, 2021	1:10:06
Firm C	CEO	January 15, 2021	0:59:36
Firm D	CEO	February 12, 2021	0:52:49
Firm E	CEO	January 7, 2021	1:00:17
Firm F	CEO	January 19, 2021	1:22:34
Firm G	CEO	March 4, 2021	1:01:39
Firm H	CEO	March 10, 2021	0:55:43
Firm I	CEO	March 5, 2021	0:59:51
Firm J	CEO	March 29, 2021	0:57:28

\*the firm names are pseudo names for the purpose of confidentiality

The interviews were conducted with top managers who were also founders or co-founders of the start-ups. This was important to ensure the validity of the responses. In nine out of the ten cases, the participant was the CEO. In one of the cases, the participant was a Partner in the start-up.

The start-ups were initially contacted through a TBI. The invitation letter prepared by the author to solicit interest in the study (see Appendix C) was made available to the general manager of the TBI, who then forwarded the letter to the relevant start-ups. It was emphasized that participation is completely voluntary. The start-ups that indicated interested were contacted by the author via email to provide more information about the study. An information sheet was used for this purpose (see Appendix A). The information sheet provided detailed answers to potential concerns that the start-ups had about participating in the study. Among the start-ups that eventually reaffirmed interest in participating, ten were selected. Email correspondence continued between the author and the participating manager of the start-ups to schedule the interviews. Subsequently, consent forms (see Appendix B) were made available to the managers, which were signed and returned to the author before the interviews. The interview guide was not provided to the participants beforehand, so they did not know the specific questions that they were going to be asked during the interview.

### 5.3 Document review

To help the author further understand the context of the start-ups, and to corroborate some of the data received during the interviews, it was deemed necessary to conduct some document reviews. Most of the documents reviewed were publicly available. However, some were internal and cannot be described in detail in this thesis due to confidentiality

requirements. The documents included; reports and power point presentations, website information, as well as published media articles and videos. The document reviews enabled the author to further understand the workings of the start-ups and how the managers ran their business. Document review and analysis is well known to contribute to the richness and validity of qualitative research through the historical insight and information that can be gathered (Bowen, 2009; Yin, 2014). Essentially, for this study, the review of documents provided some clarity about the products, services, technology, and evolution of the start-ups, which was important to understand their BMI.

## **5.4 Analysis**

The analysis in this study was done in two main stages. The first stage was the individual analysis for each of the cases. The second stage was a cross analysis of all the cases. With the aid of Heriot Watt University, the author received access to the latest version of NVivo software, which made the process of managing and analysing the data easier and more efficient. It is noteworthy however, that the analysis was done in a manual and deliberate manner. No sophisticated or automatic feature of the software was used. NVivo was used mainly to organize the transcribed data, and to aid the data coding process. As well as to organize the codes and emerging themes. More detail (of the process) is provided in the following sections. As discussed in section 3.2.5, the author followed Braun and Clarke (2006) approach to thematic analysis, which consist of six distinct phases. Details about how the process unfolded is provided in the following sections.

### **5.4.1 *Familiarizing with the data***

Familiarizing with the data was an important first step in the process of data analysis. It began during the interviews, as the author took notes of some interesting points and comments made by the participants. The notes lent themselves to follow up questions during the interviews, and they were reviewed at the end of the interviews. After each interview, the recordings were downloaded and stored in a protected folder on the author's PC which only he had access to. The author was then able to play, listen and relisten to the recording multiple times. At first, listening to the recording was for two main reasons. The first reason was to verify the audio quality. Which was done by checking that there were no breaks in the recorded data. In addition, the volume of each recording was checked to ensure that it was sufficiently high, and that it would be possible to transcribe the recording. This was a vital step to ensure that nothing needed to be corrected or changed before the next interview. The



second reason was to scan and verify if relevant data was obtained during the interview, and whether clarifications were needed. This was necessary to ensure that sufficient and relevant data was obtained. The author went on to listen to each recording multiple times. During this process, notes were taken, and ideas were gathered which later informed the coding of the interview transcripts.

The total length of the interview recordings was ten hours, twenty-two minutes, and forty-one seconds. All of which was transcribed by the author, which resulted in ninety-eight pages of transcripts. The process of transcribing the data contributed to the author gaining more familiarity and understanding of the data. Because it required close attention to the details of the recording. Transcribing each interview took about eight hours on the average. Several aspects of the recording were replayed repeatedly, to ensure that no meaning or context was lost during the transcription.

As discussed in section 3.2.5, the focus of this study was to explore the role of capabilities for BMI in start-ups. The author was interested in the perception of the participants, and the meanings in the elicited data. So, it was not necessary to capture the dynamics of the conversation between the author and the participants during the interviews in the transcripts. As a result, the transcripts were not unnecessarily complicated. For instance, there was no need to use special notations to capture involuntary attributes of the conversations such as pauses, coughing, sneezing, laughing, or stuttering. Neither was there any need to capture non-verbal interactions like handwaving or smiling. At the same time, grammatical errors made by both the author and the participants were not corrected, as long as what was said was understandable. This constituted a hybrid approach to the transcription done in this study. Considering the opposing and extreme spectrum of naturalism and denaturalism as applied in the practise of transcription. See section 3.2.5 for more details. Essentially, the focus was on capturing what was said by the participants in the correct context.

After transcribing the recorded data, the transcripts were reviewed before proceeding to the coding phase. Section 5.4.2 below describes how the initial codes were generated.

#### **5.4.2 *Generating initial codes***

The author used NVivo software to manage the coding process. The transcripts for the individual cases which made up the data sets were saved in separate files created in the NVivo

software. Codes were then generated from interesting aspects or extracts of the data. The process was to right click on the interesting text in the transcript, click on the code option, give the code a name, and save the code. The generated codes were saved under nodes created for the individual cases in this study. The node for each case contained a main folder named after the case (e.g., Firm A). Under the main folder were two sub-folders: One of the sub-folders was named *Initial Codes*, and the other *Thematic Framework*. All the codes generated during this phase of the analysis were saved in the *Initial Codes* folder. The *Thematic Framework* folder was used when searching for themes as described in section 5.4.3 below.

For each case, the coding phase began by the author reviewing notes taken during the familiarization phase and summarizing key points and interesting features about the case. The data transcript was then read, repeatedly, as the coding progressed. Coding the data as part of the analysis was in a sense summarizing and organizing the data, with the view of highlighting key components and features that could be interesting in understanding the phenomenon of interest in this study. The themes that resulted from the analysis in this study were data driven (Braun and Clarke, 2006), in that they emanated from the data. This influenced the approach taken for the coding process, as there were no pre-identified themes to code around. So, every aspect of the data was considered to be potentially important. Therefore, the whole content of each transcript was coded.

The coding was done in an iterative manner, and it was not rushed. As the author read and reflected on the data, some codes were renamed. There was no set limit for the number of codes to be generated from each data set. In some cases, the same extract from a data set was coded multiple times to highlight different features. In total one thousand and eighty three number of codes were generated from the data. Table 5-3 below shows an example of codes generated from a data extract.

Table 5-3: Example of codes generated for a data extract

Extract from a transcript	Generated codes
Its because of all the failures that we had, and learning from them. Because we might be successful now, but it has taken a huge amount of time. And that is due to all the failures that we did. And all the wrongs that we did, earlier, in various ways. From how to deal with the crisis...oil crisis...to which people to trust, to which network you should have or not have, to agreements...which type of agreement works, which doesn't. So, we've gained all that experience throughout...for quite a few years. For each failure...that's why I strongly believe in talking more about failures	<ol style="list-style-type: none"> <li>1. how you approach failure is key to success</li> <li>2. the quicker you fail, the quicker you can learn, and the quicker you can succeed</li> </ol>

<p>than success. Because it is through the failures that you eventually will be succeeding. Very few people have success immediately. So, its all through failures, and what not to do. And we have had a huge amount of what not to do. And we are still learning. Even though we are kind of successful today, we haven't quite secured it completely. We still have a lot of work to do before we can say that we are a success...or that I can say that we are a success. We constantly fail on a lot of things. But what is important for us is...to be lean...is also to fail fast and learn faster. So, the quicker the fail, and the faster we learn, the quicker we can succeed. So, it's a bit more of how we approach failures, more than...that is...I believe it's the key to success. So, it's about learning from failures as a constructive method, rather than seeing a failure as a shame or something negative. Because a failing thing is a positive thing, because we learn from it. And we continue to fail all the time in different...various small things. But they are not these massive failures that we had previously. That I think...its probably one of the most important things...the failure.</p>	<ol style="list-style-type: none"> <li>3. failure is a positive thing because you learn from it</li> <li>4. we are still learning, and have a long way</li> <li>5. all the wrong we did earlier has helped us in succeeding now</li> </ol>
---	--

In the example above, five codes were generated from one data extract. In some cases, a data extract had one code. There were no hard and fast rules about the number of codes ascribed to a data extract. What was important was to highlight interesting aspects (or extracts) of the data that might contribute to relevant themes. Section 5.4.3 below describes how themes were found during the analysis.

### 5.4.3 Searching for themes

After the initial codes were generated, the author examined the codes to see what meanings they held, and how they related to the research question. This was a deeper level of analysis compared to the previous phase of generating initial codes, as it involved grouping related codes into themes. It was done iteratively on a case by case basis. At the end, each case had its own set of themes.

For each case, a sub-folder called *Thematic framework* was created under the node that contained codes for the case in NVivo. The *Thematic framework* folder was at the same level as the *Initial Codes* folder which contained all the codes that had been generated. Section 5.4.2 above describes how that was done. The codes that were in the *Initial Codes* folder were then copied into (duplicated in) the *Thematic framework* folder, where the process of further organizing the codes and searching for themes occurred. Copying the codes into the *Thematic framework* folder was done to ensure that changes made to the codes in this phase of the analysis did not affect what was done in the previous phase. Moreover, it ensured that the

workspace for searching for themes was different from that of generating initial codes. This was considered important for traceability.

The next step was to search for themes that may help answer the research question. The research question in this study is: *What capabilities allow managers (e.g. founders, decision makers) in start-ups to innovate their BMs?*

Upon further examination of the data and the generated codes in relation to the research question, four main categories were created for grouping the codes, namely: *What helps*, *What does not help*, *Me as a person* and *future plans*. These were created as sub-nodes within the *Thematic framework* folder in NVivo. As a first parse in this stage of the analysis, the generated codes were appended into either of these four categories. Which was vital in focusing the search for themes during the analysis. The search for themes continued in a systematic fashion, considering details within the codes. Codes were modified, merged, moved around, and collated as necessary, until relevant themes emerged from the data. Table 5-4 below presents an overview of the number of themes that were identified within the four categories mentioned above for the individual cases.

Table 5-4: The number of initial themes identified for each case

	What helps	What does not help	Me as a person	Future plans
Firm A	12	3	1	0
Firm B	8	3	3	0
Firm C	8	4	2	3
Firm D	7	5	2	0
Firm E	12	3	3	0
Firm F	11	8	2	0
Firm G	8	3	2	0
Firm H	10	3	1	0
Firm I	11	5	1	0
Firm J	10	3	3	0

Table 5-5 provides an example of one of the themes that was identified from the data of Firm B.

Table 5-5: Example of an identified theme

Identified theme	Related codes
Application of learned business concepts	1. BM toolbox learned at university is important to understand things as they unfold in the business

2. BM toolbox learned from university helped keep hope alive when things were difficult
  3. familiarity with lean start-up and customer development theories was vital
  4. had practical exposure to BM exercises with real companies at university
  5. had some courses at university about starting own business
  6. Had the option to create company as part of a course at university
  7. has a bachelor's degree in business administration
  8. have experience teaching a practical course on service design with a professor
  9. learned theories from university studies influenced ability to innovate BM
  10. Saw an obvious problem with raising capital in start-ups after connection with Incubator
  11. started first start-up when studying
  12. the professors at university seemed excited and interested on the subject they were teaching
  13. thought entrepreneurship and innovation module at university was interesting, and decided to choose it
  14. was very familiar with the BM concept through prior education
- 

After identifying relevant themes within the data set for each case, the next step was to review the themes. This is discussed in section 5.4.4 below.

#### **5.4.4 *Reviewing themes***

This phase of the analysis involved going through each of the themes identified for the individual cases and checking for consistency between the themes and the related codes, as well as the overall data set. This was an iterative process that involved constant pondering on the research question and the data. The codes and associated data extracts were read and reread to see if they indeed formed the pattern that had been highlighted with the theme. Ultimately, some of the themes and associated codes were modified or renamed. At the same time, duplicate themes were merged. This was in line with the inductive approach to thematic analysis discussed in section 3.2.5. The review of the themes was concluded when the author felt satisfied with the identified themes and felt comfortable moving on to the next phase of

the analysis, which was to define and name the themes. Section 5.4.5 describes how the themes were finally defined and named.

#### **5.4.5 Defining and naming themes**

The themes were further evaluated in this phase of the data analysis. The evaluation was done separately for the individual cases, and in relation to the research question of this study. With full consideration of the codes linked to the themes and their underlying data extracts. The themes for each case were examined to ensure that they were unique, and that there were no duplicates. Themes that were found to be somewhat similar to other themes, or not relevant, were removed. In those cases, their associated codes were linked to more relevant themes (when applicable). For instance, twelve themes were previously identified for *Firm A* under the *What helps* category described in section 5.4.3, but the number reduced to eight during this phase of the analysis. In addition, the themes were checked for clarity, and they were framed in a way such that their meanings could not be easily misconstrued.

Importantly, during this phase of the analysis, the themes were elaborated on, and documented in their context. Even though the themes were found inductively from the data, their content was summarized, and the themes were related to the theoretical framework that guides this study. That is the DMC theoretical framework. The process of further organizing and elaborating on the themes was done using Microsoft Excel. Table 5-6 below provides an example of a theme that was summarized in this regard.

Table 5-6: Defining and naming a theme

Theme	Activities	Outcome	DMC	DC
THE CAPACITY TO COLLABORATE WITH OTHER ORGANIZATIONS	(1) Collaboration with an IT vendor company (2) Partnered with crowdfunding platform providers to render knowledge services to investors and start-ups (3) Recently merged with another company that has existed for 25 years	(1) Ability to focus on own strength and orchestrate other resources towards the business goal (2) Expanded range of financial services offerings due to recent merger (3) Broader customer segment (4) Lots of learning for the young founders/partners	Social Capital	Seize/Transform

Upon completing this phase of the analysis, the next step was to write the report as described in section 5.4.6.

#### **5.4.6 Producing the report**

Producing the report was the final phase of the analysis in this study. It involved a broader exploration of the phenomenon of interest, and ultimately presenting and discussing what was found. The aim of this study was to explore how capabilities influence BMI in the development of start-ups. Using the DMC theory, the following research question was addressed: *What capabilities allow managers (e.g. founders, decision makers) in start-ups to innovate their BMs?*

Section 6 below describes the profile of the case study start-ups, and the findings from this study are discussed in section 7. It is noteworthy that the cross analysis between the cases was done during this phase. Prior to this phase, the analysis was done on a case by case basis.

## **6. Profile of the case study start-ups**

This section presents the profile of the start-ups that participated in this study. The start-ups were examined and the BMI that they have done were identified and explicitly described. Section 6.1 describes the framework that was used in classifying and describing the BMI of the start-ups. The BMI of the case start-ups are described in Section 6.2.

### **6.1 A framework for classifying BMI**

In order to describe the different start-ups in the context of this study, it was necessary to understand the type of BMI that occurred since their founding. This is in line with the aim of this study, which is to explore how capabilities influence BMI in start-ups. As discussed in section 2.6, BMI involves new, deliberate and significant changes to the major components and/or the architecture of a BM (Mitchell and Coles, 2003; Amit and Zott, 2010; Chesbrough, 2010; Bouncken and Fredrich, 2016; Foss and Saebi, 2017; Teece, 2018). Where the components include the value proposition, market segment, value chain structure and value capture routines. Which are non-simplistically interrelated or interdependent within the architecture of the BM. The resulting change from a BMI could be radical in terms of a totally new BM structure, or incremental through gradual adaptation of key components of the BM (Demil and Lecocq, 2010; Bocken and Geradts, 2019; Laasch, 2019; Torabi, 2020). As discussed in section 2.6, Foss and Saebi (2017), through their extensive systematic review of existing literature, came up with a classification for different types of BMI based on novelty and scope. This classification system was adopted in describing the start-ups in this study. See Figure 6-1.



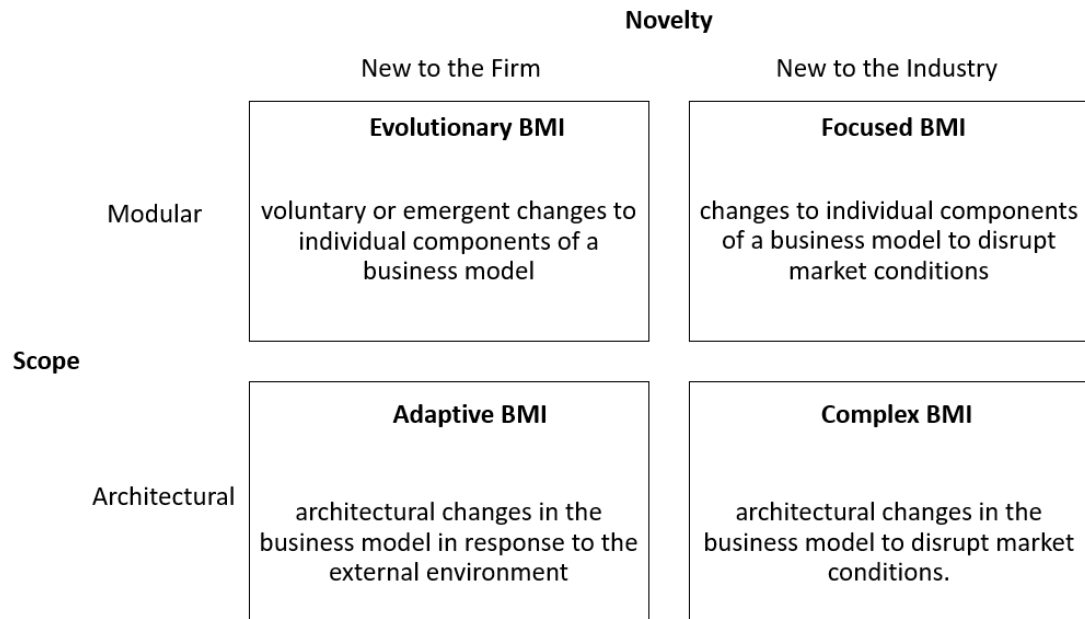


Figure 6-1: Classifying business model innovation (adapted from Foss and Saebi, 2017)

This study acknowledges that start-ups usually engage in uncertain activities as they try to find a viable BM through a search, learning, experimentation, and discovery process (McGrath, 2010). The extent to which different start-ups go through this process before arriving at a workable BM may vary. Moreover, start-ups often change and innovate their BM and value architecture during the early stages of their development, as they strive to manage and optimize scarce resources (McDougall and Oviatt, 1996; Ghezzi and Cavallo, 2020). For the sake of consistency, this study uses the founding date of the start-ups as a reference point in describing the BMI that occurred. Based on the interviews with the start-up managers, the BMI that took place in the respective start-ups was clearly outlined and classified by the author as discussed in section 6.2.

## 6.2 Describing the case study start-ups

The characteristics of the ten start-ups that participated in this study were outlined in section 5.1. The following sections provide more details about each of the start-ups, with emphasis on BMI.

### 6.2.1 Firm A

*Firm A* is a technology company that was founded in 2018. They specialize in developing software applications used in devices such as: computers, tablets, smartwatches, and

smartphones. Their customers are companies that need software applications. Essentially, their transaction with customers is business-to-business (B2B). They serve customers by assisting in various stages of the software application development process. From the design (where the idea is translated to a prototype), to the development, and launch. In addition, they offer consulting services to companies. Besides customer projects, they run their own internal projects, where they develop applications based on their own ideas. They have successfully launched several of their own software applications.

## **BMI**

*Firm A* started out with an idea to create a specific software application to solve a specific problem. Which was to make it easier for unemployed people to search for jobs. That effort was successful. They even won an innovation award from a governmental body because of that solution. However, after working on the idea for one year, their value proposition and market segment evolved. Instead of being a company that develops a single application for a single problem, they aspired to be an IT service company. They expanded their business to do consulting and software development for different customers, and at the same time develop applications based on their own ideas.

They pride themselves in innovativeness, simplicity, and creativity. Since they became an IT service company, their work processes have evolved. They put their customers first and help them innovate, just like they do when working on their own apps. They continuously deploy the latest technology and best practices in project management to deliver high quality codes to customers in less time. In describing some of the important changes that has happened to their BM since they started, the CEO of Firm A stated:

*“the consulting side....I think that’s the thing that has changed the most. In the beginning we didn’t have the mindset that we should innovate the customer’s product, because most IT firms or development studios, they just get the specification from the customer and then they develop it. We try to make the specification we get from the customer...both cheaper and easier...that’s one thing that we have changed...to be competitive”.*

*Firm A* focused more on delivering quality and premium products/services to customers, rather than trying to be cheaper than competitors. This influenced the revenue and pricing component of their BM, which also had to be innovated. Instead of only charging for hours

used on their customer projects, they tried to sell add-on services. For example, one of their major customers wanted a new app, but did not know how to get the best ideas for the app. This prompted *Firm A* to apply the concept of *user driven innovation* (UDI), by getting potential users directly involved in the process of creating the app. They did so by arranging a hackathon for the customer, where they set aside price money, and invited attendees who were to come up with the best ideas for solving the problem in forty-eight hours. Afterwards, they had an evaluation meeting, and discovered that some of the attendees were great coders, who were then hired to keep developing their ideas. So *Firm A*, made money from arranging hackathons for customers, developing their products, support activities and implementing future add-on features.

The gradual, emergent, and voluntary nature of the changes that occurred to the BM of *Firm A* is evident. Particularly, regarding their value proposition, market segment, and revenue stream. As such, the BMI type of *Firm A* is *Evolutionary*.

#### **6.2.2 Firm B**

*Firm B* was founded in 2017. They operate in the financial services sector and specialize in advisory services to companies or business owners. They provide a range of advisory services within: (1) cooperate finance, e.g., financing, valuation, mergers and acquisitions, etc., (2) corporate development, e.g., interim management, strategy, business development, and (3) deal sourcing, e.g., market analysis, investments/investor analysis. In addition, they actively own businesses through direct investments. Their customers operate in a wide range of industries such as banking, real estate, energy, and technology.

#### **BMI**

The founders of *Firm B* started the company while they were still studying at the university. Since the inception of company, the BM has been innovated several times. For about three years, they focused on solving the problem of raising capital for start-ups and small businesses in their community. Their initial hypothesis was that local people want local growth and local value creation. So, they worked towards creating a crowdfunding platform. After a while, they somehow transitioned from a crowdfunding platform company to a media content provider. This was in part due to governmental regulatory hurdles they experienced while trying to establish a viable crowdfunding platform. As well as interest from customers. The companies

and business owners that *Firm B* dealt with usually needed a website, and had to make presentations of themselves, their idea, and their company, using various media. Due to numerous requests from customers that needed help with their presentations, *Firm B* drifted more towards that part of the business, which completely changed their BM. One of the founding partners of *Firm B* described the change as follows:

*“We were working with that for like 1.5 years, we started our business with one business model. And in this business model we were using different channels to reach out to our customers. One of the most important things there was video...video creation. Because we saw that we have the right resources to create video, because some of the partners, they had experience with video creation and stuff like that. To create video and content for different social medias, etc. So, people started more and more to ask if we can help them to make business presentations on video, and create films or videos around that, and help them with some websites and different stuff”.*

Creating video presentations for customers helped *Firm B* earn more money which was much needed to keep the company running. However, after another year went by, the founding partners decided to focus more energy on their initial idea. Which was to find an innovative way to solve the problem of raising capital in start-ups through crowding funding. However, they discovered that there were now a lot of crowdfunding platforms from different providers. This resulted in another BMI, as they tried to identify what they missed during their absence, as well as the kind of issues potential users of crowdfunding platforms were dealing with. They realized that on one hand, companies feared having a lot of investors. On the other hand, investors feared potential complications with many other investors. So, *Firm B* realized that what everyone needed was knowledge. Potential users needed more information about how crowdfunding works and the different ways of doing crowdfunding. For example, crowdfunding can be done by selling shares (equity crowdfunding), by pre-selling a product, donations, lending, etc. Based on their research, they determined that both potential investors and companies that need money were skeptical because they did not have sufficient information. They saw that people had heard about crowdfunding platforms like *Kickstarter*, but not much else. *Firm B* exploited that gap. On one end were investors that look to invest their money, on the other end were companies that need money, and somewhere in the middle were several crowdfunding platforms. So *Firm B* teamed up with different crowdfunding platforms through partnership arrangements. This gave them access to different platforms, and they did not need to create their own platform. Which was beneficial because

the different platforms had their pros and cons. So, *Firm B* would run cases on various platforms, among those they collaborate with, so as to pick the best platform for the right customer and investor. This completely transformed their brand and their BM. They were now in the business of knowledge sharing, and matching start-ups to investors.

*Firm B* further innovated their business after some time by adding more service offerings to their portfolio. People got in touch with them because they were focused on crowdfunding. However, they realized that crowdfunding was not ideal in every circumstance, and that they were losing a lot of leads by only focusing on crowdfunding. So, they decided to build their own investor portfolio, where they could introduce interesting cases that do not necessarily have anything to do with crowdfunding to potential customers. In 2020, *Firm B* merged with another financial services company. The number of partners (top management) increased from two to four, and the merger introduced even more and newer offerings and capabilities. Including everything from corporate financial services like management buyouts, to business brokerage, validations financing, value creation, strategic advisory, business development, restructuring and interim management. In addition, they had their own investments. Through investment communities and companies that invest in other start-ups and growth companies.

In summary, *Firm B* innovated their BM more than once, in different stages since their inception. They delivered various value offerings that required different activities, resources, and channels to different customer segments. The architectural links between various components of their BM was changed in response to what was happening in their business environment. They were involved with different stakeholders, partners, and customers, and worked with them differently in line with the focus of the company at any given point in time. Ultimately, they completely transformed their BM through the merger. Hence, their BMI can be described as *Adaptive*.

### **6.2.3 Firm C**

*Firm C* is a research and technology company that was founded in 2017. They combine deep domain knowledge, research, and technology to develop solutions for reducing the devastating consequences of natural disasters. Specifically, weather phenomena such as hurricanes and typhoons. They have developed a unique and promising technological solution that can potentially prevent loss of lives, as well as economical or environmental losses in the event of hurricanes or typhoons. Together with several service providers, research partners,

and investors, they work actively to test their solution on a large scale in environments where hurricanes or typhoons naturally occur. Besides their main mission of mitigating losses from hurricanes and typhoons, they also do consulting. Where they provide competence and knowledge to customers regarding other potential application of their unique technology. Their customers are companies that operate in the ocean space (e.g., oil companies, fish farms, municipalities, governments, etc.).

## **BMI**

*Firm C* is taking on an enormous challenge of trying to mitigate the effect of a natural weather phenomenon, and they are doing so in a way that has never been done before. Their unique solution is a product of rare competencies and rigorous research, which has shown promising test results. The scope of their pursuit is large. Verifying their technology on a large scale requires a lot of funding for more research, documentation, and demonstration. Although they successfully secured some funding from research institutions, governmental institutions, and investors, funding still proved to be a challenge. This has led *Firm C* to further innovate their BM, even as they continue pushing towards the big goal of a scalable solution that will either prevent hurricanes or mitigate its consequences. They capitalized on the knowledge-based aspect of their company and expanded their value proposition by introducing new value offerings targeting different market segments. This has led to new sources of revenue. Essentially, they established a consulting business. They put together a team of consultants and scientists, paid by the hour, to offer competence on other applications of their unique technology. The CEO described the experience as follows:

*“So, we are trying to get revenue by doing projects in the consulting business. We actually made a name of ourselves here in the country. Our last application for a project was to do a plastic project in rivers. There we have teamed up with several notable organizations, including a very big oil service company and another start-up here in our region. So, it’s a coalition. So now, If people or someone is searching for things on the net that has something to do with our unique concept or technology, they will find us and call us for help. So its more and more hits on possible work actually”.*

They were able to secure more work with different customers and expanded their offerings within the consulting business. Which included consulting within plastic collection, noise mitigation, coral reef revival, fish guiding and containment. In addition, they established a

business structure (opened a branch office) in one of the countries where hurricanes quite often occur. This improved their presence and visibility and facilitated fund raising efforts in that country. Based on the architectural changes that occurred in the BM of *Firm C*, as well as their disruptive technology, and the rare competencies they offer through their consulting business unit, their BMI can be considered *Complex*.

#### **6.2.4 Firm D**

*Firm D* is a service company which was founded in 2014. They specialize in the use of unmanned aerial technology for industrial and infrastructural inspection. Their solution allows data collection in real time using drones, and subsequent analyses through their software suite. Their customers own and manage large infrastructures which usually requires routine maintenance, and they operate in various industries. Such as power generation, oil and gas, and critical infrastructures (e.g., buildings, bridges, etc.).

#### **BMI**

*Firm D* operates in an industry where the number of competitors or potential competitors have grown quite substantially in recent years. When they started, there were about a hundred and seventy-three drone companies in the country. That number grew quite substantially to about six thousand. The drone companies are however grouped into three categories, and *Firm D* operates in the third category, which is for those that do the heaviest, most advanced, and difficult jobs. There are fewer drone companies in that category; about a hundred and thirty. Since the inception of *Firm D*, they decided to differentiate themselves with a unique value proposition, which is the quality of the data they capture with their solution. The CEO put it this way:

*"A lot of our competition is like people that have flown helicopters and stuff, since their childhood, and now they want to make a living off of it. But we don't have that. We just wanted to capture good data. Its not about the flying, its about the data. And I think that's been a forte of ours from the beginning. That its all about the data. Its not about that its so cool to fly around. Its like, no, but we are getting good actionable data"*

*Firm D* exhibited *Evolutionary* BMI, as they have deliberately changed their customer base. At the beginning they did surveying jobs, but they do not do those anymore. Mainly because

there are now a lot of companies with cheaper drones that can do those kinds of jobs. Moreover, data quality is not a priority for the customers in those jobs, because the customers usually just want the layout of the land. So *Firm D* switched focus to larger technical inspection jobs with clients operating in industrial sectors, such as oil and gas, where data quality is important. As a result, their key activities have evolved as well. They started with airborne drone systems, but they recently built a large rover to send into tunnels and unsafe structures, as well as a remote-controlled boat-based drone to get under bridges.

#### **6.2.5 Firm E**

*Firm E* was founded in 2015. They provide digital technology services to customers through their unique solution. Their customers are aesthetic clinics, and their solution solves a specific problem for the customer. Which is to obtain and manage patient treatment consent more efficiently. Patient consent has become even more critical due to recent standards and regulations in the industry. The solution that *Firm E* provides is easy to use. It simplifies the workflow for the customers, helping them get a better overview. Furthermore, the data is securely stored and archived.

#### **BMI**

*Firm E* was founded with the aim of solving a unique problem that was not being paid attention to in a specific industry. The idea came randomly, but the founder acted on it and came up with a solution that has proved vital to companies operating in that business area. However, the solution evolved over time. Over the last couple of years, *Firm E* expanded their solution with more features for additional value offerings. In addition, *Firm E* innovated their revenue model. The CEO described that change as follows:

*“We actually have flat prices, but since November, we have started with a new pricing model, where we actually charge every consent form that gets signed. So, we charge directly from the patient’s mobile phone. It is some innovation. It is still the same flow regarding using the product, but we get more money for it”*

The solution of *Firm E* evolved to the point where they felt like it was becoming universal, and that other branches could benefit from it. They began targeting new market segments. The plan was to retain happy customers within aesthetic medicine, and at the same time land



customers in new branches, e.g., dental clinics, physiotherapist, etc. The BMI of *Firm E* can be classified as *Focused* because what they offer is new to the industry, even though the changes were limited to individual components of the BM.

#### **6.2.6 Firm F**

*Firm F* is a technology company that operates in the maritime industry. It was founded in 2018, and they are working on a unique solution to help customers reduce the cost of their ocean operations with respect to data acquisition. The solution is a platform that will enable vessels to be operated seamlessly with other unmanned technologies, such as drones. They target mature markets like research, fishery, seabed mapping, meteorology, and aquaculture. As well as emerging markets such as offshore wind and marine minerals. Their solution can be customized for customers based on specific needs or applications.

#### **BMI**

The founder of *Firm F* was able to identify several key challenges that vessel operators in the ocean space commonly encounter. Such as high cost, limited energy storage, reliance on fossil fuels, and limited alternatives for monitoring. They are putting together a solution that will help address all the issues at the same time. The CEO described the problem they are trying to solve for customer as follows:

*“what we’ve seen is the very limited energy available out to sea. When you are utilizing these autonomous platforms, you have a very limited energy available. So that’s kind of the key point that we are kind of selling in or solving. That we are providing energy for out in the maritime space, and due to the fact that we deliver sufficient energy, we can also undertake more advanced offshore operations like: Inspection tasks, diving down with an ROV (for example to do inspections), more heavy or energy demanding hydro acoustics (like utilizing a multi-beam sonar). Those kinds of operations”*

The value proposition of *Firm F* is unique in that they seek to combine new capabilities with those of traditional service vessels into one autonomous platform. Their innovative and modular technology will help tackle the issue of energy by reducing consumption, and by regeneration and augmentation. This puts them in a unique position in the industry. There exist substitutes to their solution, but no direct competitors. Sail buoys and sail drones

somewhat compete on what *Firm F* defines as the low-end market for research and simple hydroacoustic tasks. However, there are not many solutions that implement capabilities required for tasks requiring more energy, which *Firm F* defines as the high-end market. Moreover, *Firm F* has two patents for the innovations they have done regarding the energy issue. Which is of high technical complexity. Although they acknowledge that it might be possible for other companies to achieve the same thing in different ways.

*Firm F* made some changes to their revenue model. Initially, they adopted approaches that have been used by sail drone and sail buoy companies, which is to rent out or sell the vessel. However, upon several iterations and internal discussions, they determined that it would be more beneficial for them to help the customer with the entire operation. Furthermore, after several discussions with potential customers, they realized that most customers prefer not to operate the vessels and would like it to be handled by professionals. So, they ended up with a revenue model of a complete service package. In addition, *Firm F* made changes to their cost structure. Despite the high technical complexity of their solution, they tried to use standardized off the shelf components which are cheaper and readily available from different producers (to avoid dependence on a particular producer). However, there has been instances, where they had to develop their own components. For instance, they developed a hybrid gear box.

The uniqueness of the solution provided by *Firm F* to the industry is evident, and they have innovated individual components of their BM. As such their BMI can be classified as *Focused*.

#### **6.2.7 Firm G**

The idea for the creation of *Firm G* came to life because of the corona virus pandemic. It was founded in 2020. They provide a simple and user-friendly online platform for tracing the spread of corona virus among citizens. Their customers are companies or organizations that deal with people coming together at specific locations. For example, a sports club or a coffee shop. Customers register their company or organization on the platform and receive a QR code which can be displayed anywhere in their vicinity. Visitors can then register themselves easily using their mobile phones. The platform has an innovative solution for verifying the identities of visitors, such that no false identify can be registered. The registered data are encrypted and safely stored. Due to privacy regulations, the data is automatically deleted after a set duration of fourteen days. If an outbreak of corona virus occurs before the duration elapses, the data is

made available to the authorities to facilitate contact tracing. Customers pay a monthly subscription fee for the solution. They can choose between three different tier-based packages based on their needs. The different packages are priced differently and offer different amounts of check-in points for visitors.

## **BMI**

The online platform that *Firm G* provides is based on technologies that were in existence before the pandemic. However, such a platform that contributes specifically to contact tracing regarding the spread of corona virus was new. But even though it was a new concept in 2020, *Firm G* was not the only company delivery a contact tracing platform. Since *Firm G* started, they have had to change their targeted customer segment due to competition in the market. The CEO described the experience as follows:

*“So basically, when we started the company, we had a hypothesis that we would go after the restaurant market, because that was where the government wanted more control. We saw that they recommended restaurants, etc., to have more knowledge about who had actually been to their restaurants, to do contact tracing. But after some time, we actually realized that there were two big competitors that we didn’t know about before we started the company. So, we actually had to change strategy quite fast in the beginning. Because in the beginning, we were thinking of targeting restaurants, and pubs and stuff like that. But when we started researching and contacting people, we saw that people used another vendor that we didn’t know about, who had already taken that market. So, we had to straightaway just pivot to a more generic solution for other types of businesses”*

*Firm G* engaged in an *Evolutionary BMI* by modifying their customer segment.

### **6.2.8 Firm H**

*Firm H* is a social enterprise that was founded in 2019. They are in business to make profit, but also to make a positive social impact on the lives of children. Especially those from low income families. Their mission is to try to bridge the social and economic gaps among children. Specifically, they work to ensure that children from low income families are also able to participate in leisure and cultural activities in their communities. They do this through their digital platform. Their customers are municipalities who pay a subscription fee for the platform

and use it to offer activities to children based on their interest. The offers are either free or discounted.

## **BMI**

The digital platform provided by *Firm H* enables municipalities to manage children activities in a simple and effective way. The municipalities get a good overview of all activities and can measure the effect. Furthermore, the municipalities make the platform available to service providers in the community, who are then able to promote their activity offerings.

*Firm H* was instituted to replace a previous organization that worked with municipalities to offer children leisure and cultural activities. Essentially, *Firm H* transformed the BM of a pre-existing organization into something new. The CEO described it as follows:

*“We started our company based on a business model, and a business that already had existed for 10 years. But it was organized as an organization, not as a company. So, last year summer, we transformed it into this company that we are today. And because we are starting a digital development with an App, instead of a physical card”*

The system that *Firm H* provides is unique in that there are no other systems in the market that directly targets and give activities to kids from poor families. The BMI is *Adaptive*, as they changed the architecture and individual components of a pre-existing BM. They turned an organization that had worked in a specific way for years into a technology company. They digitalized pre-existing activities and introduced new activities. At the same time, they expanded the value offerings, as they worked with different service providers and partners.

### **6.2.9 Firm I**

*Firm I* is a technology company founded in 2019. They specialize in positioning and control solutions for autonomous systems. They develop a broad range of standardized off the shelf products which can be used in a large variety of applications for Original Equipment Manufacturers (OEMs). Examples of areas where their solutions may be applied include autonomous or semi-autonomous systems such as drones, vehicles, and robots. Their products are essentially devices or units, which when embedded in an object, does the navigation from one point to another. And at the same time ensures complete control over the object. Their

products comprise of high-tech components and technologies, including solid-state semiconductor sensors, artificial intelligence, and internet of things.

## **BMI**

*Firm I* utilize propriety technology in their products to offer capabilities that are not readily available in the market. Their products are uniquely able to address safety and security concerns in newer applications. As well as new regulatory, agility and accuracy requirements. The CEO of *Firm I* had extensive experience of about forty years in the industry. In 1985 he founded a company in the same industry, which he successful managed until 2016 when he decided it was time to do something else. He then got together with some old colleagues to establish *Firm I*, with the goal of modernizing the traditional instrumentation industry.

Compared to the previous company that the CEO founded and managed, the activities of *Firm I* is one level higher in the value chain (one step closer to the applications). Besides the performance of the innovative sensors which are higher, they added a lot of value to their products by embedding intelligence. There are several competitors in the industry in which *Firm I* operate. However, *Firm I* have made it their mission to outdo their competition on price performance and innovation. The CEO described their approach as follows:

*"We are approaching a large variety of market areas of applications. So, the competitors are very fragmented. Depending upon where you are in the value chain. But of course, it's a lot. It is a lot of companies working with the same area...the same functionality, the same performance. However, with a totally different product price or selling price. So, if you look at our business plan, the first target is to compete basically on price performance. So we deliver a function and performance for a fraction of what is available in the marketplace today....like 20%. So that's an economic motivation enough for existing users to change. That's the first target.*

*But the second is really to be an enabler. To enable completely new solutions for our customers. And that means...far beyond state-of-the-art performance or price functions to what is available. To give you an example, an MRU unit...which means motion reference unit...for instance, a large multinational company is making something like that today that cost half a million. We will provide the same product which will...instead of 7 kilos, weigh 50 grams and cost fifty thousand or one-tenth. This is the order of magnitude of quality innovation. And how is this possible? Well it's a...sort of a disruptive technology. That we are stretching a technology*

*derived from semi-conductor industry. A function that we have in all our mobile phones, but it costs nothing. But we stretch the accuracy up to 3 order of magnitude better. And then of course you can charge much more than mobile phone producers have to pay. However, it is far less costly than traditional instrumentation industry is charging today”*

The nature of the BMI of *Firm I* is *Adaptive*. They modified previous activities of the BM and introduced new activities. They are active in technology development and have changed the BM architecture and linkage between various components. They work with partners in different parts of the world, and even had to open an office in South East Asia. Their value proposition is different compared to that of the previous start-up founded by the CEO and his team, and they target a new market segment.

#### **6.2.10 Firm J**

*Firm J* is a technology company that was founded in 2019 and operates in the ocean space. They develop solutions that enables the capture of valuable data in challenging ocean environments. Their solution comprises of sensors, as well as positioning, communication, monitoring and data management systems. Which enables ocean resources to be managed in a safe and effective way. Ultimately, their solution enables customers to optimize their processes for increased profitability and impact. Among the areas of application of their solution are: (1) seaweed farm management, where sensors and communication systems for buoys enable remote surveillance and tracking of seaweed farms, (2) geophysical or seismic surveying, by tracking and positioning floating assets, and (3) tracking and positioning for recovery of subsea assets, e.g. remote operate vehicles (ROVs).

#### **BMI**

The founding of *Firm J* was more like a re-birth. The founders originally started the company in 2010, but it was purchased by a venture company. They bought back the company in 2019 and restarted everything from scratch. Since the founders bought back the company, they have transformed it into what it is today. They began with a cleansing phase, by taking everything that was good from the original company and removing everything they did not need to have. Essentially, they removed legacy items that were cost ineffective, and built a brand-new technology platform which is the foundation of all their new solutions. Among which is an ocean data management system that is primarily for the seaweed industry.

The ocean data management system helps seaweed farmers manage their farms in a cost-effective way, by enabling a complete remote profiling of their farms based on critical parameters, and at the same time eliminating manual processes. This constituted an architectural change to the previous BM. The process of *Firm J* arriving at the ocean data management system for the seaweed industry also involved and triggered some innovations to the value proposition and market segment component of their BM. This was described by the CEO as follows:

*"I think one of the things that has changed.... that has shaped us a bit is more of the ocean data management, like the analytics part. Because we had more focus on creating the hardware earlier, and not so much on the software and analytics. So, that has been something that has shaped us throughout the journey of the seaweed industry. Because we also see that the product that we have developed for the seaweed industry can be utilized for environmental monitoring as well. And for the oil and gas industry if you may. For detecting changes in the nutrition level...temperature water level, etc. So, then you will need a good analytics tool.*

*So, you can implement 3rd party data, and you can make prediction tools. It is called...it is like a weather forecast, subsea. So, that is something that we originally...originally was not what we believed was interesting. But that turns out to be actually one of the most interesting things that we see now...the actual data visualization and tool. So, that's been a fantastic journey. So, we are working much more on the data analytics, and tools for that"*

The BMI of *Firm J* can be considered *Adaptive*, given the architectural changes that occurred to its BM as they explored new solutions and new markets.

Table 6-1: profile of the case study start-ups

<b>Firm*</b>	<b>Started (year)</b>	<b>Type of company</b>	<b>Focus area</b>	<b>Clientele</b>	<b>Type of BMI</b>
Firm A	2018	Technology / Service	Software development, consulting	Companies in need of software applications	Evolutionary
Firm B	2017	Service	Financial services, consulting, investing	Business owners	Adaptive
Firm C	2017	Technology	Ocean technology, mitigating natural disaster, research, consulting	Governments, states and/or oil companies	Complex
Firm D	2014	Service	Aerial technology, infrastructure inspection	Companies that own or manage large industrial infrastructures	Evolutionary
Firm E	2015	Technology / Service	Digital technology, aesthetic medicine	Clinics	Focused
Firm F	2018	Technology / Service	Ocean operations, data acquisition	Companies with significant ocean operations	Focused
Firm G	2020	Technology / Service	Digital technology, contact tracing, corona virus	Companies or organizations that transact with people at a specific location	Evolutionary
Firm H	2019	Technology / Social enterprise	Digital technology, inclusion among children, fighting poverty	Municipalities	Adaptive



Firm I	2019	Technology / Manufacturing	Instrumentation, positioning and control solutions, autonomous systems	Original Equipment Manufacturers	Adaptive
Firm J	2019	Technology	Ocean operations, instrumentation, data acquisition	Companies operating in the ocean space with assets that require surveillance or tracking	Adaptive

---

\*the firm names are pseudo names for the purpose of confidentiality

## 7. Findings

This section presents the findings from this study. The themes that emerged from the individual case analyses are presented in section 7.1 (more details are provided in Appendix G). Moreover, the overarching themes that emerged from this study based on cross analysis between the individual cases are discussed in section 7.2.

### 7.1 Results from the individual cases

The following sections present the themes that emerged from the analysis of the individual cases of this study. Themes were sought from the data to help answer the research question. As previously discussed, this study draws from the theory of DMC, with the following research question: *What capabilities allow managers (e.g. founders, decision makers) in start-ups to innovate their BMs?*

A capability has been defined as the capacity to utilize resources to perform a task or activity in a reliable manner, even in the face of opposing circumstances (Helfat and Winter, 2011; Teece, 2014). Where the task or activity is being done for a specific purpose, and for an expected outcome (Helfat and Martin, 2015). DC has been defined as a special capability that enables a firm to modify its resource base or existing capabilities over time (Ambrosini and Altintas; 2019). Which is expressed in the ability of the firm to sense, seize and transform opportunities (Harreld *et al.*, 2007; Teece, 2007; Teece, 2018; Bocken and Geradts, 2019). While DMC describe “the capacity of managers to create, extend or modify the way in which a firm makes a living” (Andersson and Evers, 2015:262). As enabled by three main antecedents: managerial human capital, managerial social capital, and managerial cognition (Adner and Helfat, 2003; Martin, 2011; Helfat and Martin, 2015). In light of this, the next sections present the themes found for the individual cases in this study. The activities of the start-up managers that led up to the BMI of their start-ups, as well as the resulting outcomes are outlined in the summary table for each theme. Furthermore, the exhibited DC and DMC are highlighted.

#### 7.1.1 Case1 - Firm A

The following themes were identified for *Case1 - Firm A*.

Table 7-1: Themes found for *Case1- Firm A*

Identified themes for <i>Case1- Firm A</i>	
1.	The capacity to join and utilize innovation and business networks or environments
2.	The capacity for education, learning and the pursuit of personal interest

- 
3. The capacity to focus on the customer and want the best for them
  4. The capacity to maximize individuality, complementary skills, and internal collaboration.
  5. The capacity to maximize own resources
  6. The capacity to research, test and validate
  7. The capacity to apply proven tools and concepts
- 

The attributes of these themes are summarized below. Appendix G provides a more detailed description with representative quotes from the data.

## 1. The capacity to join and utilize innovation and business networks or environments

The composition of this theme is outlined in Table 7-2 below.

Table 7-2: *Case1 – Firm A*: The capacity to join and utilize innovation and business networks or environments

Firm	Activities	Outcome	DMC	DC
<i>Firm A</i>	(1) Presence at a university environment (2) Location in an innovative environment comprising of several other start-ups (3) Access to an International network of businesspeople and companies	(1) Aspired to establish themselves as an IT service company (2) Overcame the hurdle of cost and quality trade-off through outsourcing. (3) Actively used existing network to gain insight regarding trends, competitors, capabilities, and cost.	Social Capital	Sense/Seize

## 2. The capacity for education, learning and the pursuit of personal interest

The composition of this theme is outlined in Table 7-3 below.

Table 7-3: *Case1 – Firm A*: The capacity for education, learning and the pursuit of personal interest

Firm	Activities	Outcome	DMC	DC
<i>Firm A</i>	(1) The CEO has a technical background. He previously designed games as a hobby (2) The co-founder is a coder (3) Both the CEO and co-founder are studying for masters and bachelor's degree respectively on the side	(1) Took a chance while studying because of the inner desire and passion to do something (2) Ability to do creative work (3) Positive change in mentality due to a failure that was experienced (4) Acquired skills from side studies makes the CEO work more systematically	Human Capital / Cognition	Sense/Seize

	(4) Both founders are interested in innovation and developing products (5) Both founders constantly learn from failings	(5) Openness to change and active use of processes and tools, such as BMC to explore avenue for change		
--	--	--	--	--

### 3. The capacity to focus on the customer and want the best for them

The composition of this theme is outlined in Table 7-4 below.

Table 7-4: *Case1 – Firm A*: The capacity to focus on the customer and want the best for them

Firm	Activities	Outcome	DMC	DC
<i>Firm A</i>	(1) They actively work with different customers through the consulting side of their business.	(1) The mindset to always deliver quality (2) The mindset to innovate the customer's product (or help the customer innovate) like it is their own (3) Innovated their pricing model.	Cognition	Seize

### 4. The capacity to maximize individuality, complementary skills, and internal collaboration

The composition of this theme is outlined in Table 7-5 below.

Table 7-5: *Case1 – Firm A*: The capacity to maximize individuality, complementary skills, and internal collaboration.

Firm	Activities	Outcome	DMC	DC
<i>Firm A</i>	(1) Clear responsibilities among employees, including the co-founders (2) Clear procedures for dealing with disagreements (3) Focus on the wellbeing of employees	(1) Good internal collaboration, expressed in the ability to come up with ideas and do the creative work.	Cognition	Transform

### 5. The capacity to maximize own resources

The composition of this theme is outlined in Table 7-6 below.

Table 7-6: *Case1 – Firm A*: The capacity to maximize own resources

Firm	Activities	Outcome	DMC	DC
------	------------	---------	-----	----

<i>Firm A</i>	(1) Cost reduction mentality (2) Active pursuit of available business options	(1) Two focus areas: Consulting work for customers and internal development projects (2) Revenue generation from customer projects, while working to launch own products.	Human Capital	Seize/Transform
---------------	--	---	---------------	-----------------

## 6. The capacity to research, test and validate

The composition of this theme is outlined in Table 7-7 below.

Table 7-7: *Case1 – Firm A*: The capacity to research, test and validate

Firm	Activities	Outcome	DMC	DC
<i>Firm A</i>	(1) Market and competitor research (2) Dialogue with contacts in own network to gather insights	(1) Better insight when addressing issues in both customer and internal projects (2) The ability to better innovate for the customer and themselves.	Human Capital	Sense

## 7. The capacity to apply proven tools and concepts

The composition of this theme is outlined in Table 7-8 below.

Table 7-8: *Case1 – Firm A*: The capacity to apply proven tools and concepts

Firm	Activities	Outcome	DMC	DC
<i>Firm A</i>	(1) Usage of the innovation process called “User driven innovation” (2) Usage of tools like the BMC	(1) A systematic approach to exploring ideas and exploiting opportunities	Human Capital	Sense/Seize

### 7.1.2 Case2 - Firm B

The following themes were identified for *Case2 – Firm B*.

Table 7-9: Themes found for *Case2- Firm B*

Identified themes for <i>Case2- Firm B</i>
1. The capacity to apply learned business concepts
2. The capacity to collaborate with other organizations
3. The capacity to learn, identify gaps and work hard in pursuit of area of interest
4. The capacity to be in an innovation environment and network

The attributes of these themes are summarized below. Appendix G provides a more detailed description with representative quotes from the data.

## 1. The capacity to apply learned business concepts

The composition of this theme is outlined in Table 7-10 below.

Table 7-10: *Case2 – Firm B*: The capacity to apply learned business concepts

Firm	Activities	Outcome	DMC	DC
<i>Firm B</i>	(1) Studied business administration at university (2) Learnt about the BM toolbox at university (3) Learnt about lean start-up and customer driven innovation	(1) Saw an obvious problem around raising capital in start-ups while studying at the university (2) Used the lean approach when building their crowdfunding platform (3) Applied background knowledge to find a way out when stuck (4) Willingness to innovate the BM	Human Capital	Sense

## 2. The capacity to collaborate with other organizations

The composition of this theme is outlined in Table 7-11 below.

Table 7-11: *Case2 – Firm B*: The capacity to collaborate with other organizations

Firm	Activities	Outcome	DMC	DC
<i>Firm B</i>	(1) Collaboration with an IT vendor company (2) Partnered with crowdfunding platform providers to render knowledge services to investors and start-ups (3) Merged with another company that had existed for 25 years	(1) Ability to focus on own strength and orchestrate other resources towards the business goal (2) Expanded range of financial services offerings due to recent merger (3) Broader customer segment (4) Lots of learning for the young founders/partners	Social Capital	Seize/Transform

### 3. The capacity to learn, identify gaps, and work hard in pursuit of interest

The composition of this theme is outlined in Table 7-12 below.

Table 7-12: *Case2 – Firm B*: The capacity to learn, identify gaps, and work hard in pursuit of interest

Firm	Activities	Outcome	DMC	DC
<i>Firm B</i>	(1) Active learning about focus business area (2) Dialogue with customers to gather feedback (3) Reflection on current and future directions	(1) Several BMIs	Human Capital / Cognition	Sense/Seize

### 4. The capacity to be in an innovative environment and network

The composition of this theme is outlined in Table 7-13 below.

Table 7-13: *Case2 – Firm B*: The capacity to be in an innovative environment and network

Firm	Activities	Outcome	DMC	DC
<i>Firm B</i>	(1) Being out there, getting to know people, getting the message across (2) Participation in different seminars and events for start-ups (3) Location in an environment comprising of other start-ups, a university, and service providers	(1) Important collaborating partners (2) Fund raising	Social Capital	Sense

#### 7.1.3 Case3 - Firm C

The following themes were identified for *Case3 – Firm C*.

Table 7-14: Themes found for *Case3- Firm C*

Identified themes for <i>Case3- Firm C</i>
1. The capacity to be flexible and adapt
2. The capacity to capitalize on background, experience, and expert competence
3. The capacity to research, learn and test
4. The capacity to be present at the right channels and/or location to spread the word
5. The capacity to network
6. The capacity to collaborate and be visible in partnerships

The attributes of these themes are summarized below. Appendix G provides a more detailed description with representative quotes from the data.

### 1. The capacity to be flexible and adapt

The composition of this theme is outlined in Table 7-15 below.

Table 7-15: *Case3 – Firm C*: The capacity to be flexible and adapt

Firm	Activities	Outcome	DMC	DC
<i>Firm C</i>	(1) Pursued other business opportunities without losing focus on the main value proposition	(1) Established a consulting business to provide customers with knowledge about potential application of their unique technology (2) Generated much needed funds	Human Capital / Cognition	Seize / Transform

### 2. The capacity to capitalize on background, experience, and expert competence

The composition of this theme is outlined in Table 7-16 below.

Table 7-16: *Case3 – Firm C*: The capacity to capitalize on background, experience, and expert competence

Firm	Activities	Outcome	DMC	DC
<i>Firm C</i>	(1) Expert understanding of the problem area (2) Awareness of, and access to relevant, proven, and potentially applicable domain expertise from other industries (3) Access to key human resources	(1) Sensed and developed a unique solution to the problem (2) Ability to generate revenue from endeavours in consulting	Human Capital	Sense / Seize

### 3. The capacity to research, learn and test

The composition of this theme is outlined in Table 7-17 below.

Table 7-17: *Case3 – Firm C*: The capacity to research, learn and test

Firm	Activities	Outcome	DMC	DC
------	------------	---------	-----	----



<i>Firm C</i>	(1) Research to ensure the right technology and approach (2) Preparations for large scale testing	(1) A technology that matures as more knowledge is acquired. Thereby strengthening the value proposition	Human Capital	Sense
---------------	--	--	---------------	-------

#### 4. The capacity to engage stakeholders using the right channels

The composition of this theme is outlined in Table 7-18 below.

Table 7-18: *Case3 – Firm C*: The capacity to engage stakeholders using the right channels

Firm	Activities	Outcome	DMC	DC
<i>Firm C</i>	(1) Active presence on the internet; including social media platforms (2) Public relations strategy	(1) A popular brand (2) Public support both home and abroad (3) Intentional agreements with organizations in different parts of the world for future collaboration (4) A business structure in the US	Social Capital	Seize

#### 5. The capacity to network

The composition of this theme is outlined in Table 7-19 below.

Table 7-19: *Case3 – Firm C*: The capacity to network

Firm	Activities	Outcome	DMC	DC
<i>Firm C</i>	(1) Contact with researchers at leading research institutions (2) Deliberate effort to grow network	(1) Access to relevant information (2) Opportunities to collaborate	Social Capital	Sense

#### 6. The capacity to collaborate and be visible in partnerships

The composition of this theme is outlined in Table 7-20 below.

Table 7-20: *Case3 – Firm C*: The capacity to collaborate and be visible in partnerships

Firm	Activities	Outcome	DMC	DC
<i>Firm C</i>	(1) Actively sought out potential competitors and/or complementors to collaborate	(1) Worked with multiple partners on different projects executed by the consulting business unit	Social Capital / Cognition	Seize

	(2) Shared and gave information in collaborative partnerships	(2) Intentional agreements for collaboration with complementors (3) Moved further by partnering with an external investor group		
--	---	--	--	--

#### 7.1.4 Case4 - Firm D

The following themes were identified for *Case4 – Firm D*.

Table 7-21: Themes found for *Case4 - Firm D*

Identified themes for <i>Case4 - Firm D</i>	
1.	The capacity to focus on own strengths
2.	The capacity to network and be in a network
3.	The capacity to build a solid foundation through planning and research
4.	The capacity to capitalize on unique and complementary skills
5.	The capacity to adapt

The attributes of these themes are summarized below. Appendix G provides a more detailed description with representative quotes from the data.

#### 1. The capacity to focus on own strengths

The composition of this theme is outlined in Table 7-22 below.

Table 7-22: *Case4 – Firm D*: The capacity to focus on own strengths

Firm	Activities	Outcome	DMC	DC
<i>Firm D</i>	(1) Differentiation from competitors by exploiting key strengths.	(1) Reputation for good service quality (2) Returning customers	Cognition	Seize

#### 2. The capacity to network and be in a network

The composition of this theme is outlined in Table 7-23 below.

Table 7-23: *Case4 – Firm D*: The capacity to network and be in a network

Firm	Activities	Outcome	DMC	DC
<i>Firm D</i>	(1) Founders met through a common friend (2) Company location is in an entrepreneurial environment	(1) Access to key human resources (2) Access to vital information on technical aspects of running the company (3) Brand building	Social Capital	Sense/Seize

	(3) Participation in knowledge sharing and networking events.			
--	---	--	--	--

### 3. The capacity to build a solid foundation through planning and research

The composition of this theme is outlined in Table 7-24 below.

Table 7-24: *Case4 – Firm D*: The capacity to build a solid foundation through planning and research

Firm	Activities	Outcome	DMC	DC
<i>Firm D</i>	(1) Necessary research and planning before engaging in activities	(1) A functioning system that enables projects to be executed satisfactorily for customers	Human Capital	Sense/Seize

### 4. The capacity to capitalize on unique and complementary skills

The composition of this theme is outlined in Table 7-25 below.

Table 7-25: *Case4 – Firm D*: The capacity to capitalize on unique and complementary skills

Firm	Activities	Outcome	DMC	DC
<i>Firm D</i>	(1) Clearly defined roles based on prior experience and background. (2) Usage of the right resources for the right task	(1) Competitive advantage through the ability to produce good quality data	Human Capital	Seize

### 5. The capacity to adapt

The composition of this theme is outlined in Table 7-26 below.

Table 7-26: *Case4 – Firm D*: The capacity to adapt

Firm	Activities	Outcome	DMC	DC
<i>Firm D</i>	(1) Built new equipment for specialized tasks (2) Improved the main equipment used for data collection (3) worked to introduce latest technological capabilities to customer offerings	(1) Improved capacity for different types of jobs	Human Capital/ Cognition	Seize/ Transform

### 7.1.5 Case5 - Firm E

The following themes were identified for Case5 – Firm E.

Table 7-27: Themes found for Case5 - Firm E

Identified themes for Case5 - Firm E	
1.	The capacity to utilize own network
2.	The capacity to care and focus on the customer
3.	The capacity to manage resources and exploit own strength
4.	The capacity to learn and adapt

The attributes of these themes are summarized below. Appendix G provides a more detailed description with representative quotes from the data.

#### 1. The capacity to utilize own network

The composition of this theme is outlined in Table 7-28 below.

Table 7-28: Case5 – Firm E: The capacity to utilize own network

Firm	Activities	Outcome	DMC	DC
<i>Firm E</i>	(1) Built and maintained relationships (2) Was open to ideas coming from own network (3) The two original co-founders were childhood friends	(1) Access to key resources through contacts within own network	Social Capital	Sense

#### 2. The capacity to care and focus on the customer

The composition of this theme is outlined in Table 7-29 below.

Table 7-29: Case5 – Firm E: The capacity to care and focus on the customer

Firm	Activities	Outcome	DMC	DC
<i>Firm E</i>	(1) Seriousness with customer service (2) Listening, availability, commitment, and consideration towards the customer (3) Relationship building (4) Tailored approach to different types of customers	(1) Satisfied and paying customers (2) Good reputation (3) Increased confidence in own product	Cognition	Sense/Seize

### 3. The capacity to manage resources and exploit on own strength

The composition of this theme is outlined in Table 7-30 below.

Table 7-30: *Case5 – Firm E*: The capacity to manage resources and exploit own strength

Firm	Activities	Outcome	DMC	DC
<i>Firm E</i>	(1) Focused on one product (2) Used own money and time (no external investors) (3) Exploited unique and complementary skills of employees	(1) Low cost (2) Focus on reducing waste (3) Innovation of pricing model	Human Capital/ Cognition	Seize/ Transform

### 4. The capacity to learn and adapt

The composition of this theme is outlined in Table 7-31 below.

Table 7-31: *Case5 – Firm E*: The capacity to learn and adapt

Firm	Activities	Outcome	DMC	DC
<i>Firm E</i>	(1) Learnt about users through market research (2) Conducted adequate due diligence regarding rules and regulations in the industry (3) Continuously learnt and gathered feedback from customers	(1) Better understanding of customer need (2) Focus on a niche solution and market (3) increased confidence in own product	Human Capital/ Cognition	Sense/ Seize

#### 7.1.6 Case6 - Firm F

The following themes were identified for *Case6 – Firm F*.

Table 7-32: Themes found for *Case6 - Firm F*

Identified themes for <i>Case6 - Firm F</i>	
1.	The capacity to capitalize on unique technical competencies and specialized resources
2.	The capacity for commitment, flexibility, and agility
3.	The capacity to have a personal network and be present in an innovative environment

The attributes of these themes are summarized below. Appendix G provides a more detailed description with representative quotes from the data.

### 1. The capacity to capitalize on unique technical competencies and resources

The composition of this theme is outlined in Table 7-33 below.

Table 7-33: *Case6 – Firm F*: The capacity to capitalize on unique technical competencies and resources

Firm	Activities	Outcome	DMC	DC
<i>Firm F</i>	(1) Founder with strong technical competencies (2) Knowledgeable consultants (3) Proficient welders working on the vessels	(1) Ability to put together a technically complex system (2) Two patents which improved competitive advantage (3) Access to vital information, and awareness regarding key issues	Human Capital	Sense/Seize

### 2. The capacity for commitment, flexibility, and agility

The composition of this theme is outlined in Table 7-34 below.

Table 7-34: *Case6 – Firm F*: The capacity for commitment, flexibility, and agility

Firm	Activities	Outcome	DMC	DC
<i>Firm F</i>	(1) Flexible organization structure and work culture (2) Proactively seeking potential partners for possible collaboration (3) Self driven employees (4) Stamina and a forward-looking mindset	(1) The ability to change the BM (e.g., cost structure, revenue model, key partners) (2) Collaboration with the right partners	Human Capital/ Cognition	Seize/ Transform

### 3. The capacity for a personal network and presence in an innovative environment

The composition of this theme is outlined in Table 7-35 below.

Table 7-35: *Case6 – Firm F*: The capacity for a personal network and presence in an innovative environment

Firm	Activities	Outcome	DMC	DC
<i>Firm F</i>	(1) Maintained good relationships (2) Presence in an innovative environment	(1) Access to investors (2) Access to information and key resources (e.g., suppliers, consultants)	Social Capital	Seize

### 7.1.7 Case7 - Firm G

The following themes were identified for *Case7 – Firm G*.

Table 7-36: Themes found for *Case7 - Firm G*

Identified themes for <i>Case7 - Firm G</i>	
1.	The capacity to utilize accrued experiences and education
2.	The capacity to learn, experiment, and adapt
3.	The capacity to be present in a personal, professional and innovation network
4.	The capacity to exploit own strength

The attributes of these themes are summarized below. Appendix G provides a more detailed description with representative quotes from the data.

#### 1. The capacity to utilize accrued experiences and education

The composition of this theme is outlined in Table 7-37 below.

Table 7-37: *Case7 – Firm G*: The capacity to utilize accrued experiences and education

Firm	Activities	Outcome	DMC	DC
<i>Firm G</i>	(1) Co-founder with business education, and experience from a large company (2) Highly technical co-founder	(1) Ability to put together a solution to bring about change (2) Forward looking mindset	Human Capital	Seize

#### 2. The capacity to learn, experiment, and adapt

The composition of this theme is outlined in Table 7-38 below.

Table 7-38: *Case7 – Firm G*: The capacity to learn, experiment, and adapt

Firm	Activities	Outcome	DMC	DC
<i>Firm G</i>	(1) Created a solution to help tackle a problem that nobody had much experience about (2) Problem solving approach (3) Flexibility (4) Trial by error	(1) Gathered useful feedback that moved the solution forward (2) Informed decision to target different market segment (3) The mindset to continuously innovate the BM	Human Capital/ Cognition	Sense/Seize

#### 3. The capacity to be present in a personal, professional and innovation network

The composition of this theme is outlined in Table 7-39 below.

Table 7-39: *Case7 – Firm G*: The capacity to be present in a personal, professional and innovation network

Firm	Activities	Outcome	DMC	DC
<i>Firm G</i>	(1) Maintained relationship with personal contacts (2) Maintained relationship with contacts in the business community (3) Location in an innovation environment comprising of other start-ups	(1) The co-founders got to meet each other (2) Publicity about customer offering through efficient channels (3) New customers (4) Access to vital supporting resources and information	Social Capital	Sense/Seize

#### 4. The capacity to exploit own strength

The composition of this theme is outlined in Table 7-40 below.

Table 7-40: *Case7 – Firm G*: The capacity to exploit own strength

Firm	Activities	Outcome	DMC	DC
<i>Firm G</i>	(1) Bootstrapping (2) Solution development without external resources (3) Used widely available technology (4) Saved all generated revenue in the company	(1) Low cost (2) Flexibility in decision making (3) Learning and effective utilization of complementary skills	Human Capital/ Cognition	Seize

#### 7.1.8 Case8 - Firm H

The following themes were identified for *Case8 – Firm H*.

Table 7-41: Themes found for *Case8 - Firm H*

Identified themes for <i>Case8 - Firm H</i>
1. The capacity to capitalize on professional background and experience
2. The capacity for commitment and focus on the customer
3. The capacity to collaborate with partner organizations
4. The capacity to learn, research and plan
5. The capacity to pay attention in a personal, professional or innovation network

The attributes of these themes are summarized below. Appendix G provides a more detailed description with representative quotes from the data.



### 1. The capacity to capitalize on professional background and experience

The composition of this theme is outlined in Table 7-42 below.

Table 7-42: *Case8 – Firm H*: The capacity to capitalize on professional background and experience

Firm	Activities	Outcome	DMC	DC
<i>Firm H</i>	(1) The CEO had an interest in IT since he was a child (2) The CEO had a bachelor's degree in IT development and project management (3) The co-founder was experienced in the sector	(1) The CEO and co-founder combined their competencies and experience to transform an existing organization into a new company	Human Capital	Sense/Seize

### 2. The capacity for commitment and focus on the customer

The composition of this theme is outlined in Table 7-43 below.

Table 7-43: *Case8 – Firm H*: The capacity for commitment and focus on the customer

Firm	Activities	Outcome	DMC	DC
<i>Firm H</i>	(1) Passion to make societal impact through their solution (2) Customer proximity (3) Openness to customer feedback and easy to use solution (4) Proper onboarding, support, and training of customers	(1) A unique solution for customers, targeted towards children from poor families (2) Societal support due to the impact of solution, and the perceived commitment of the team	Human Capital/ Cognition	Sense/Seize

### 3. The capacity to collaborate with partner organizations

The composition of this theme is outlined in Table 7-44 below.

Table 7-44: *Case8 – Firm H*: The capacity to collaborate with partner organizations

Firm	Activities	Outcome	DMC	DC
<i>Firm H</i>	(1) Outsourced solution development (2) Tried to partner with firms that target the same customer segment with their own offerings	(1) Access to needed skills and resources to quickly put together an effective solution in a cost-efficient way (2) Ability to focus on core competencies and expand solution offerings	Social Capital/ Cognition	Seize

	(3) Tried to collaborate with a research department at a local university (4) Constantly searched for information and programs regarding social impact	(3) Participation in a structured start-up development program organized by a reputable organization that focuses on social entrepreneurs		
--	---	---	--	--

#### 4. The capacity to learn, research and plan

The composition of this theme is outlined in Table 7-45 below.

Table 7-45: *Case8 – Firm H*: The capacity to learn, research and plan

Firm	Activities	Outcome	DMC	DC
<i>Firm H</i>	(1) Did necessary planning and research prior to solution launch to ensure a market (2) Experienced entrepreneur as mentor (3) Dialogue with potential customers to inquire about work processes, as well as existing and complementary systems (4) Engaged potential customers to get feedback on MVP	(1) Informed decision making (2) A robust and effective system that solidified the value proposition	Human Capital/ Cognition	Sense

#### 5. The capacity to pay attention in a personal, professional or innovation network

The composition of this theme is outlined in Table 7-46 below.

Table 7-46: *Case8 – Firm H*: The capacity to pay attention in a personal, professional or innovation network

Firm	Activities	Outcome	DMC	DC
<i>Firm H</i>	(1) Co-founders met through a mutual friend (2) Location in an environment comprising of other start-ups	(1) Access to vital information relevant to different aspects of the business (2) Access to key resources and partners	Social Capital	Seize

### 7.1.9 Case9 - Firm I

The following themes were identified for Case9 – Firm I.

Table 7-47: Themes found for Case9 - Firm I

Identified themes for Case9 - Firm I	
1.	The capacity to build on extensive industry experience
2.	The capacity to plan and research
3.	The capacity to device a clear and workable competitive strategy
4.	The capacity to put together a strong team that works towards a common goal
5.	The capacity for networking and partnership

The attributes of these themes are summarized below. Appendix G provides a more detailed description with representative quotes from the data.

#### 1. The capacity to build on extensive industry experience

The composition of this theme is outlined in Table 7-48 below.

Table 7-48: Case9 – Firm I: The capacity to build on extensive industry experience

Firm	Activities	Outcome	DMC	DC
<i>Firm I</i>	(1) Experience from previously starting and running a company in the same industry for several decades (2) Background in a technology area that is applicable to the new solution being developed (3) Core team of 5 people with cumulative experience of about 150 years in the industry (4) Previous experience with orchestrating many processes at the same time	(1) Reduced likelihood of making mistakes that inexperienced entrepreneurs make (2) Quickly obtained results with less effort in some areas (3) Ability to get attention and be taken seriously by stakeholders (4) Understanding of market conditions in different parts of the world (5) Understanding of applicable political situation in countries of interest (6) Combining components and technology from other industries to create products with enhanced performance	Human Capital	Sense/Seize

## 2. The capacity to plan and research

The composition of this theme is outlined in Table 7-49 below.

Table 7-49: *Case9 – Firm I*: The capacity to plan and research

Firm	Activities	Outcome	DMC	DC
<i>Firm I</i>	(1) Systematic approach (including research and planning) to make crucial decisions	(1) A workable product roadmap (2) Understanding of where the customers are in their development and how it may be exploited to gain market share (3) Expenditure that is fairly in accordance to plan (4) Progress that is close to expectations (5) Understanding of cultural, practical, and political issues in countries of interest	Human Capital	Sense

## 3. The capacity to device a clear and workable competitive strategy

The composition of this theme is outlined in Table 7-50 below.

Table 7-50: *Case9 – Firm I*: The capacity to device a clear and workable competitive strategy

Firm	Activities	Outcome	DMC	DC
<i>Firm I</i>	(1) Strategy to differentiate themselves from major players in a global market (2) Planned outsourcing of key activities (3) A lean approach of getting product to market (4) Communication and presentation to build trust and confidence with stakeholders (5) Access to / Insight from customer processes (6) Emphasis on positioning and timing (7) Focused patent strategy	(1) Ability to develop needed products, in line with business goals (2) Ability to compete on price performance and innovation (3) Stayed ahead of the game through valuable customer insights (4) Access to key resources (5) Technology and products that cannot easily be copied	Human Capital/ Cognition	Sense/Seize

#### 4. The capacity to put together a strong team that works towards a common goal

The composition of this theme is outlined in Table 7-51 below.

Table 7-51: *Case9 – Firm I*: The capacity to put together a strong team that works towards a common goal

Firm	Activities	Outcome	DMC	DC
<i>Firm I</i>	(1) Co-founders that worked together for 40 years (2) A transparent and open way of working (3) Interest in a motivated, cross functional and multi-cultural team	A small, flexible, and fast-moving company, with lean processes	Human Capital/ Cognition	Seize/ Transform

#### 5. The capacity for networking and partnership

The composition of this theme is outlined in Table 7-52 below.

Table 7-52: *Case9 – Firm I*: The capacity for networking and partnership

Firm	Activities	Outcome	DMC	DC
<i>Firm I</i>	(1) Founding team consisting of former colleagues (2) Big network through business history (3) Location in an innovative environment	(1) Access to several strategic partners and resources for different aspect of the value chain (2) Access to vital information that moved the company forward	Social Capital	Seize

##### 7.1.10 *Case10 - Firm J*

The following themes were identified for *Case10 – Firm J*.

Table 7-53: Themes found for *Case10 - Firm J*

Identified themes for <i>Case10 - Firm J</i>
1. The capacity for learning and dedication
2. The capacity to exploit own strength, background, and experience
3. The capacity to involve and engage the customer
4. The capacity to identify a problem or opportunity and address it uniquely
5. The capacity to restructure and adapt
6. The capacity to utilize own network or community

The attributes of these themes are summarized below. Appendix G provides a more detailed description with representative quotes from the data.

## 1. The capacity for learning and dedication

The composition of this theme is outlined in Table 7-54 below.

Table 7-54: *Case10 – Firm J*: The capacity for learning and dedication

Firm	Activities	Outcome	DMC	DC
<i>Firm J</i>	(1) Positive mindset towards failure (2) Learnt from failure on different initiatives (3) Learnt through research (4) Learnt from professional network (5) Learnt from customers (6) Continuous learning to improve team performance	(1) A lean, fast moving, and agile company (2) A forward-thinking company (3) Success attributed to learning from past failures (4) The ability to re-invent and innovate the BM for effective competition in the industry	Cognition	Sense/Seize

## 2. The capacity to exploit own strength, background, and experience

The composition of this theme is outlined in Table 7-55 below.

Table 7-55: *Case10 – Firm J*: The capacity to exploit own strength, background, and experience

Firm	Activities	Outcome	DMC	DC
<i>Firm J</i>	(1) Founders that previously started and sold a few companies (2) Founders that grew up in a technology-based family business (3) Founders that developed an aptitude for technology at an early age (4) Experts in ocean technology (5) CEO previously worked as commercialization manager for a start-up incubator	(1) Experience with starting and running a company (2) Passion to create things (3) The ability to efficiently work with partners and orchestrate solution development (4) The ability to quickly put together solutions needed to demonstrate a concept	Human Capital/ Cognition	Sense/Seize

### 3. The capacity to involve and engage the customer

The composition of this theme is outlined in Table 7-56 below.

Table 7-56: *Case10 – Firm J*: The capacity to involve and engage the customer

Firm	Activities	Outcome	DMC	DC
<i>Firm J</i>	(1) Showed concern, was present, and put the customer first (2) Considered customer feedback in product development (3) Kept in touch with customers and kept them informed (4) Participated in a coalition that raised customer awareness (5) Simple solution designed to free customers from complexities	(1) Successful products optimized for customers (2) Customer loyalty and trust (3) Good reputation	Cognition	Sense/Seize

### 4. The capacity to identify a problem or opportunity and address it uniquely

The composition of this theme is outlined in Table 7-57 below.

Table 7-57: *Case10 – Firm J*: The capacity to identify a problem or opportunity and address it uniquely

Firm	Activities	Outcome	DMC	DC
<i>Firm J</i>	(1) Saw ways of working in the seaweed industry that could be better (2) Saw the potential for the seaweed industry in the country (3) Sensed potential future trends with respect to technology (4) Converted feedback, learning, and customer input into solution improvement	(1) Created solutions with optimized processes that eliminated manual labour to help the seaweed industry flourish (2) Created decision tools to help seaweed farmers reduce risk and increase profitability (3) Effective low-cost solutions that were easy to use (4) Unique solutions based on low cost components (5) Flexibility to spin out new products with the same components to different industries, and price differently (6) Improved profitability (7) Increased focus on developing software solutions	Human Capital/ Cognition	Sense/Seize

		(not just hardware) that added value to customers		
--	--	---	--	--

## 5. The capacity to restructure and adapt

The composition of this theme is outlined in Table 7-58 below.

Table 7-58: *Case10 – Firm J*: The capacity to restructure and adapt

Firm	Activities	Outcome	DMC	DC
<i>Firm J</i>	(1) Reacquired <i>Firm J</i> from the investment company it was earlier sold to (2) Redeveloped legacy products from the original company (3) Created a brand-new technology platform (4) Adapted an existing solution to create one for seaweed farmers (5) Gave all employees a stake in the company	(1) A competitive company that thrives in its industry (2) Improved profitability	Human Capital/ Cognition	Seize/ Transform

## 6. The capacity to utilize own network or community

The composition of this theme is outlined in Table 7-59 below.

Table 7-59: *Case10 – Firm J*: The capacity to utilize own network or community

Firm	Activities	Outcome	DMC	DC
<i>Firm J</i>	(1) Presence, visibility, and accessibility in professional network (2) Participation and sharing in networking events (3) Founding member of the seaweed for Europe coalition (4) Active role in raising awareness about the seaweed industry	(1) Game changing input and/requests from customers. (2) Trust and good relationship with customers (3) Access to key resources	Social Capital	Sense/Seize



## **7.2 Cross case analysis**

The cross analysis described in this section built on the ten individual case analyses discussed in section 7. The cases are described in detail in section 6.2. Although some of the start-ups exhibited different types of BMI (see section 6.1), they were all alike in terms of having a flat organizational structure with the founders as the final decision makers. Furthermore, they shared similar innovative and entrepreneurial attributes. The cross analysis was done across the cases by examining the similarities and differences between the themes identified during the individual case analysis. As guided by the research question of this study, the themes were then grouped into overarching themes that highlighted the capabilities that were relevant to the BMI of the start-ups. See Table 7-60 below. The capabilities were evident across the cases as discussed in the following sections.

Table 7-60: Emergent themes from the cross-case analysis

Themes	Sub-themes	Components (i.e. themes from the individual case studies)
Collaboration Capabilities	Networking	<p>The capacity to join and utilize innovation and business networks or environments (<i>Firm A</i>)</p> <p>The capacity to collaborate with other organizations (<i>Firm B</i>)</p> <p>The capacity to be in an innovation environment and network (<i>Firm B</i>)</p> <p>The capacity to network (<i>Firm C</i>)</p> <p>The capacity to collaborate and be visible in partnerships (<i>Firm C</i>)</p> <p>The capacity to network and be in a network (<i>Firm D</i>)</p> <p>The capacity to utilize own network (<i>Firm E</i>)</p> <p>The capacity for a personal network and presence in an innovative environment (<i>Firm F</i>)</p> <p>The capacity to be present in a personal, professional and innovation network (<i>Firm G</i>)</p> <p>The capacity to pay attention in a personal, professional or innovation network (<i>Firm H</i>)</p> <p>The capacity for networking and partnership (<i>Firm I</i>)</p> <p>The capacity to utilize own network or community (<i>Firm J</i>)</p>
	Commitment	<p>The capacity to focus on the customer and want the best for them (<i>Firm A</i>)</p> <p>The capacity to be present at the right channels and/or location to spread the word (<i>Firm C</i>)</p> <p>The capacity to focus on own strengths (<i>Firm D</i>)</p> <p>The capacity to care and focus on the customer (<i>Firm E</i>)</p> <p>The capacity to learn and adapt (<i>Firm E</i>)</p> <p>The capacity for commitment and focus on the customer (<i>Firm H</i>)</p> <p>The capacity to collaborate with partner organizations (<i>Firm H</i>)</p> <p>The capacity to device a clear and workable competitive strategy (<i>Firm I</i>)</p> <p>The capacity for learning and dedication (<i>Firm J</i>)</p> <p>The capacity to involve and engage the customer (<i>Firm J</i>)</p>
	Internal Cooperation	<p>The capacity to maximize individuality, complementary skills, and internal collaboration (<i>Firm A</i>)</p> <p>The capacity to capitalize on unique and complementary skills (<i>Firm D</i>)</p> <p>The capacity for commitment, flexibility, and agility (<i>Firm F</i>)</p> <p>The capacity to put together a strong team that works towards a common goal (<i>Firm I</i>)</p> <p>The capacity to restructure and adapt (<i>Firm J</i>)</p>

Capitalization Capabilities	Experience	<p>The capacity to apply proven tools and concepts (<i>Firm A</i>)</p> <p>The capacity to apply learned business concepts (<i>Firm B</i>)</p> <p>The capacity to capitalize on background, experience, and expert competence (<i>Firm C</i>)</p> <p>The capacity to utilize accrued experiences and education (<i>Firm G</i>)</p> <p>The capacity to capitalize on professional background and experience (<i>Firm H</i>)</p> <p>The capacity to build on extensive industry experience (<i>Firm I</i>)</p> <p>The capacity to exploit own strength, background, and experience (<i>Firm J</i>)</p>
	Searching	<p>The capacity to research, test and validate (<i>Firm A</i>)</p> <p>The capacity for education, learning and the pursuit of personal interest (<i>Firm A</i>)</p> <p>The capacity to learn, identify gaps and work hard in pursuit of area of interest (<i>Firm B</i>)</p> <p>The capacity to be flexible and adapt (<i>Firm C</i>)</p> <p>The capacity to research, learn and test (<i>Firm C</i>)</p> <p>The capacity to build a solid foundation through planning and research (<i>Firm D</i>)</p> <p>The capacity to adapt (<i>Firm D</i>)</p> <p>The capacity to learn and adapt (<i>Firm E</i>)</p> <p>The capacity to learn, experiment, and adapt (<i>Firm G</i>)</p> <p>The capacity to collaborate with partner organizations (<i>Firm H</i>)</p> <p>The capacity to learn, research and plan (<i>Firm H</i>)</p> <p>The capacity to plan and research (<i>Firm I</i>)</p> <p>The capacity to identify a problem or opportunity and address it uniquely (<i>Firm J</i>)</p>
	Maximizing Resources	<p>The capacity to maximize own resources (<i>Firm A</i>)</p> <p>The capacity to focus on own strengths (<i>Firm D</i>)</p> <p>The capacity to capitalize on unique and complementary skills (<i>Firm D</i>)</p> <p>The capacity to manage resources and exploit own strength (<i>Firm E</i>)</p> <p>The capacity to capitalize on unique technical competencies and resources (<i>Firm F</i>)</p> <p>The capacity to exploit own strength (<i>Firm G</i>)</p>

### **7.2.1 Collaboration Capabilities**

The *collaboration capabilities* exhibited by the start-ups are discussed under the sub-themes of *networking*, *commitment*, and *internal co-operation*.

#### **7.2.1.1 Networking**

Prior relationships and connections, as well as active networking was essential to the social capital of the start-up managers. They positioned and located themselves in innovative environments and took advantage of their interactions to grow their social capital, which enabled them to sense and seize opportunities that were vital to their BMI. For instance, *Firm A* had their office in an environment comprised of other start-ups through a technology incubator. The founders of *Firm A* got introduced to the technology incubator through their network at the university where they studied. Interactions and sharing of ideas, rooted in similar interest in innovation, contributed to the ability of the founders of *Firm A* to transform a small company focused on one specific product to an IT service company. Where they executed projects for customers, and at the same time developed and brought their own applications to the market. Even as they continued to gain insights in their industry with respect to trends, competitors, capabilities, and costs.

The CEO of *Firm D* actively participated in networking events where he got the opportunity to share knowledge with peers and learn about industrial trends, as well as technologies that may impact the business. He met one of his co-founders (who was particularly skilled at flying drones) during one of those events, and that influenced the way they carried out their inspection activities going forward. Active networking, together with the CEO's relationship building and public speaking skills enabled *Firm D* to innovate their BM and change their customer segment. Similarly, the partners of *Firm B* actively participated in events and seminars for start-ups. Particularly because the target customers for their crowdfunding platform were start-ups and investors. They acknowledged that networking was crucial for their survival and growth. One of the partners of *Firm B* took time to interact and get to know people, while getting the message about what they do across. Through networking, *Firm B* got the opportunity to co-operate with an IT vendor, who eventually became a key partner in developing their solutions. It was also through their networking that they got the opportunity to merge with an established financial services company. *Firm C* and *Firm H* got several partners that they collaborated with through their network. In the same manner, *Firm F* got the opportunity to work with a local university to develop an autonomous sailboat.

The ability to maintain already established relationships was also important. The extensive network that the CEO of *Firm G* acquired during his time working for a large multinational company proved helpful to his start-up's BMI. *Firm G* was able to establish themselves as the main provider of their solution within the car dealership space because of the CEO's acquaintance with the head of communication of one of the largest car dealerships in the country. *Firm G* seized the opportunity to partner with this car leadership and put word out in the form of press releases and newspaper/car magazine articles which attracted more customers. Through contacts with researchers at a research institution, the CEO of *Firm C* was able to maintain knowledge about technological advancements and developments related to the problem he was trying to solve. Both *Firm E* and *Firm F* were able to get vital resources and ideas that helped with their BMI through the relationship their CEO had with individuals in their network. The visibility of *Firm J* in their network allowed them to be approached by a seaweed farmer to explore ideas for solutions to optimize their processes. The CEO of *Firm J* seized that opportunity to innovate the BM and targeted the seaweed industry with data management systems. She went on to become a founding member of the seaweed for Europe coalition. Which was an opportunity to promote the seaweed industry, keep in touch with customers, and gather vital inputs (which influenced their BMI). *Firm I* had a founding team comprised of former colleagues with extensive business network in their industry. They leveraged their network to secure key partners that worked to bring their disruptive solutions to the market.

#### **7.2.1.2 Commitment**

The start-up managers exhibited commitment towards the goals of their companies and their customers. That was an important aspect of managerial cognition that allowed them to sense and seize opportunities to innovate their BM. For *Firm A* to be more competitive, they developed the mindset to help their customers innovate their products and solutions, rather than focusing solely on delivering requested services as specified. As a result, they innovated the revenue stream component of their BM. Driven by passion to make a social impact, *Firm H* worked closely with customers to ensure that their solution accommodated the important characteristics of the different customers in the simplest way possible. They continuously tried to access and analyse the work processes of their customers to find avenues to renew their value proposition and create more value. *Firm J* showed commitment by putting their customers first and involving them in their product development. They continuously explored

new ways of raising awareness and keeping in touch with customers, which resulted in valuable inputs that contributed to their BMI. Similarly, *Firm E* exhibited commitment by listening, being available, and showing consideration to their customers. This exposed customer pains that were considered in innovating their BM. Out of commitment to the mission of preventing hurricanes, *Firm C* developed a mentality to freely share information with stakeholders which resulted in important partnerships that helped them innovate their BM.

#### **7.2.1.3 Internal cooperation**

The ways in which the start-ups worked was important to their ability to innovate their BM. Given that the managers were responsible for their teams, setting the tone and driving the working culture was a vital managerial capability. *Firm A* allowed flexible and remote working conditions which enabled more idea generation and creative outputs from employees. In addition, the co-founders of *Firm A* were able to exploit their complimentary skills and personal attributes as they ran the company. They had clear procedures for dealing with disagreements regarding what endeavours should be prioritized. Similarly, the co-founders of *Firm D* had clearly defined roles based on their background and prior experience. Which ensured that the right person was responsible for the right things. This enabled *Firm D* to introduce key activities regarding the way they provided their services to customers, and that was one of their strengths compared to competitors. The founding team of *Firm I* introduced a transparent and open work culture among multicultural and cross functional teams. The sharing and open communication that ensued was instrumental in their ability to innovate their BM. Similarly, *Firm F*, *Firm C* and *Firm G* had a flexible organizational structure and work culture, with self-driven employees and a forward-looking mindset which contributed positively to their ability to innovate their BM.

#### **7.2.2 Capitalization capabilities**

The *capitalization capabilities* exhibited by the start-ups are discussed under the sub-themes of *experience*, *searching*, and *maximizing resources*.

##### **7.2.2.1 Experience**

The education and past experiences of the start-up managers contributed to their managerial human capital and cognition, which impacted their ability to seize opportunities and innovate

their BM. *Firm A* had founders that were technology savvy. The CEO previously designed video games as a hobby, while his co-founder was a good software developer. Having experience with creative work made it easier for them to understand customers and generate ideas. Due to an experience of losing a tender for a big project to a competitor, the founders of *Firm A* developed a new and positive mindset towards their customers. Which was to actively participate in the innovation journey of their customers. In turn, *Firm A* innovated their revenue model. They actively organized hackathons for customers to come up with the best possible ideas to implement. In addition, they provided customers with options for new support activities and add-on services.

The founders of *Firm A* consistently applied concepts and tools such as UDI and BMC as they worked to innovate their BM. Moreover, they continued studying part-time at a university to develop more skills and knowledge even as they ran the company. The CEO of *Firm G* had degrees from reputable business schools and previously worked in a strategic position at the corporate level of a large multinational company. He had experience as an intrapreneur where he drove several change initiatives with multiple stakeholders. His co-founder on the other hand was more technical and good at implementing solutions. Their experiences combined, was vital in sensing when to change the customer segment of *Firm G*, and in seizing the opportunity to do so when it arose. *Firm B* had two partners with university degrees in business administration. During their studies, they learnt about business development approaches like the BM concept, lean start-up, and customer driven innovation. In addition, they gained practical exposure by helping real companies explore different BMs. The familiarity of the partners of *Firm B* with the concept of BMs made them willing to continuously explore avenues to innovate their BM. Furthermore, it made them resilient when they encountered challenges with their initial BM. Because they knew that they could possibly find a way out by re-invention. For *Firm H*, the prior and long experience of one of the co-founders in their business sector, combined with the experience of the CEO in IT development and project management, enabled its transformation.

The CEO of *Firm I* previously started a company in the same industry. He managed the company for several decades before selling it to an acquiring company. *Firm I* had a founding team of five people (including the CEO). Together they had a cumulative work experience of more than one hundred and fifty years. Their experience was related directly to the new technology and solution that *Firm I* developed, and it was instrumental to their BMI. Especially regarding securing key partners, choosing strategic locations to base their activities, creating

new value propositions, and creating new activities. The founders of *Firm J* previously started and sold several companies. They developed a keen interest in technology from an early age because of their upbringing; growing up in a technology-based family business. The experience and background of the co-founders was important to the BMI of *Firm J* as they expanded their activities and created new value propositions for new markets. *Firm J* seized the opportunity to go into the seaweed industry and moved quickly to develop the market and offer solutions to help optimize the processes of their customers. The CEO of *Firm F* had strong technical competencies and he chose the problem area to focus on based on his experience. In addition, he worked with knowledgeable consultants. Their experience contributed to the ability of *Firm F* to change the revenue model and cost structure components of its BM. *Firm C* was on a mission of trying to prevent the devastating effect of hurricanes, and they had a CEO who understood the phenomenon and how things worked in the ocean. That understanding was a result of the long experience of the CEO (spanning a few decades) in the Navy. The CEO also knew how and where to get information and resources. Which was important when *Firm C* innovated their BM and started a consulting business unit to offer various services to customers. The new services were rooted in the technology that was being developed for hurricane mitigation and it was a good boost to the value offerings of *Firm C*.

#### **7.2.2.2 Searching**

The start-ups managers were proactive in their search for information and insight. Which helped them sense and seize opportunities as they innovated their BM. *Firm A* paid attention to their external environment. Through their own research, and by utilizing their network, they tried to stay in tune with the latest technological developments that were relevant to their business. Moreover, they capitalized on gathered insights through a systematic approach of testing and validation. *Firm D* spent time doing research through visitation and dialogue with prospective partners. This helped shaped their unique value proposition as they focused on the data quality aspect of their solution, which also led them to change their customer base. In the attempt of *Firm G* to tackle a problem that nobody had much experience about, they exhibited flexibility and used a problem-solving approach (including trial by error) as they innovated their BM. *Firm B* actively tried to understand the current state of their chosen industry as well as the future landscape. That made it easier for them to make the initial transition from a crowdfunding platform company to a media services company. Deliberate efforts to keep abreast with ongoing developments within the crowdfunding space made *Firm B* realize when to return to the scene. Moreover, that understanding helped *Firm B* to realize



what was missing in the industry, and where to channel their efforts. It was also instrumental to *Firm B* securing key partners as they innovated their BM.

*Firm H* actively searched for insight through research and dialogue with potential customers, as they worked to innovate their activities and value offerings. Similarly, *Firm I* engaged in research to understand how their customers were developing and how they could fit into that development process. *Firm J* actively looked ahead of time with respect to technology and industrial trends as they considered potential offerings to customers. This resulted directly in *Firm J* differentiating themselves by using components which they perceived as future standards for their solutions. In addition, *Firm J* was able to innovate their customer segment and provided solutions to the seaweed industry by seizing an opportunity to properly investigate the market. The CEO of *Firm E* took initiative and went about knocking on the doors of clinics to learn more about consent forms. He also made sure to have an overview of changing rules and regulations in the industry. The insights gathered enabled *Firm E* to expand their offerings thereby adding more value to customers. *Firm C* actively conducted research to find a viable technology and approach to help mitigate the formation and consequences of hurricanes. Aided by funding from governmental and research organizations, they were able to develop and test their technology. Furthermore, they shared knowledge about this technology and applied it to different scenarios, which was a major component of the services they provided when they started the consulting part of their business.

#### **7.2.2.3 Maximizing Resources**

The ability of the start-up managers to orchestrate, optimize and maximize their resources was an important component of their managerial capabilities. *Firm A* continuously exploited avenues to reduce cost. At the same time, they moved fast to seize viable business opportunities. This resulted in *Firm A* innovating their BM to focus on two main business areas: consulting work for customers and internal development projects. They adeptly distributed funds received from external investors to the right part of the business, even as they managed to reduce cost through outsourcing. *Firm D* was able to exploit their key strength in producing high data quality to differentiate themselves and offer a unique value proposition. *Firm G* built their solution without funding from external sources. They relied on the technical competencies of the co-founder and widely available technology. Moreover, when they changed their customer segment and started generating revenue, they saved all the revenue generated back into the company to facilitate growth. *Firm F* focused on one product and was

able to capitalize on access to very skilled human resources as they built their solution. The founders of *Firm I* had access to vital resources such as manufacturers and distributors through their global network; built over decades in the industry. Furthermore, they used a lean approach to get their product to the market, as they worked with stakeholders to build trust and confidence. *Firm J* seized the opportunity to go into the seaweed industry by quickly mobilizing their technical competencies to put together a potential solution for the problem they were presented. Furthermore, *Firm J* had a forward-looking mentality, and worked to develop low cost solutions with emphasis on simplicity and usability for the customers, even though the solutions were technically complex.

### 7.3 Summary

Using the DMC theory, this study explored the capabilities that allowed managers in start-ups to innovate their BMs. This was done in line with the following objectives:

1. Explore the factors that prompt managers in start-ups to innovate their business models
2. Examine how business model innovation unfolds in start-ups
3. Investigate how the capabilities of managers in start-ups influence business model innovation

The findings highlight two main themes: *collaboration capabilities* and *capitalization capabilities*. The *collaboration capabilities* comprise of sub-themes related to *networking*, *commitment*, and *internal cooperation*. While the *capitalization capabilities* comprise of sub-themes related to *experience*, *searching*, and *maximizing resources*. Figure 7-1 below summarizes the findings of this study in consideration of the research question and objectives.

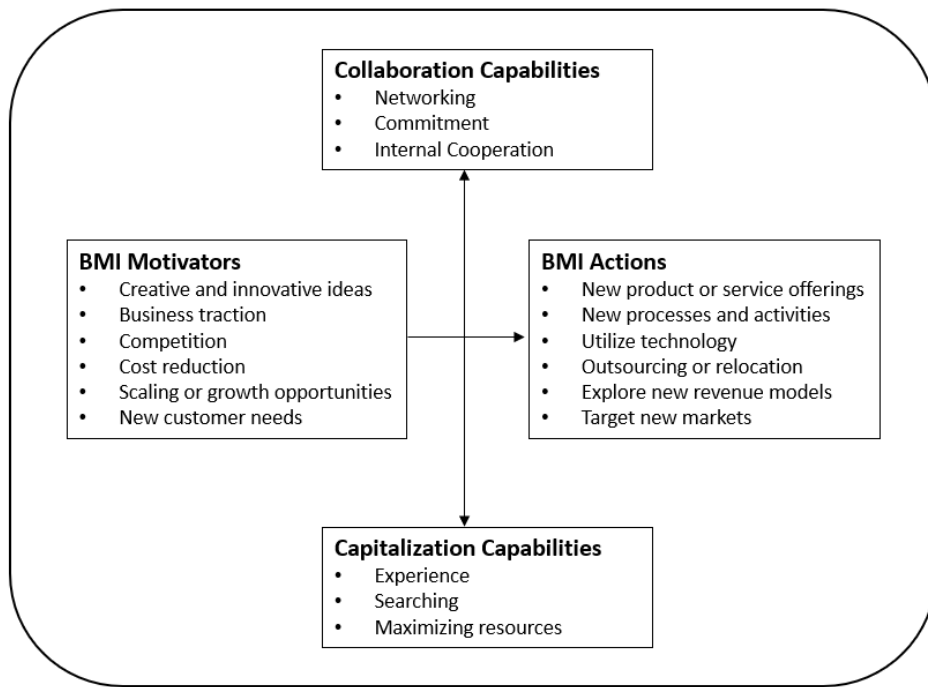


Figure 7-1: Summary of findings (Author)

Furthermore, the findings show how the managers used their DMC of human capital, social capital, and cognition to innovate their BMs. This is discussed in detail in section 8.

## 8. Discussion

As discussed in section 2, the concept of BMs is getting increasingly popular among practitioners and researchers in the business world (George and Bock, 2011; Klang et al., 2014). Moreover, BMI is getting increasingly appreciated as a means for firms to improve their financial performance and competitive advantage (Andries and Debackere, 2013; Spieth et al., 2014; Foss and Saebi, 2017; Hossain, 2017). This is further evident in the increasing number of literature and empirical studies on BMI. However, most of the empirical studies on BMI are related to large incumbent firms (Johnson *et al.*, 2008; Amit and Zott, 2010; Chesbrough, 2010; McGrath, 2010; Koen et al., 2011). Even though BMI is just as relevant to start-ups (Comberg et al., 2014; Klewitz and Hansen, 2014; Foss and Saebi, 2016; Foss and Saebi, 2017; Ghezzi and Cavallo, 2020). In response to the gaps identified in the literature, this study examined the influence of capabilities on BMI using the DMC theory. This gap has also been echoed by several researchers who called for more understanding of BMI with respect to capabilities, as well as the development of practical approaches and tools that may aid the process of BMI (e.g., Trimi and Berbegal-Mirabent, 2012; Schneider and Spieth, 2013; Spieth *et al.*, 2014; Foss and Saebi, 2017; Ghezzi and Cavallo, 2020). DMC describe “the capacity of managers to create, extend or modify the way in which a firm makes a living” (Andersson and Evers, 2015:262). It has three main underpinnings namely: managerial human capital, managerial social capital, and managerial cognition (Adner and Helfat, 2003; Martin, 2011; Helfat and Martin, 2015).

This section discusses the findings of this study as it relates to the research question: *What capabilities allow managers (e.g. founders, decision makers) in start-ups to innovate their BMs?*

By exploring the BMI of ten case start-ups using a cross-sectional case study methodology, this study uncovered detailed insights about specific capabilities that allowed the start-up managers to innovate their BMs. Based on the cross-case analysis of this study, evidence was found for two main dimensions of capabilities that allowed the start-up managers to innovate their BM. These are *collaboration capabilities* and *capitalization capabilities*, the components of which are discussed below.

## 8.1 Collaboration Capabilities

This study finds evidence that *collaboration capabilities* is one of the main dimensions of capabilities that enabled the start-ups to innovate their BMs. In this study, *collaboration capabilities* is an umbrella term that includes specific capabilities exhibited by the start-up managers as they collaborated with stakeholders to innovate their BMs. These specific capabilities are *networking*, *commitment*, and *internal cooperation* as discussed in sections 8.1.1, 8.1.2, and 8.1.3 below. The *collaboration capabilities* were not necessarily pre-existing, but rather developed continuously and in parallel with the start-up's development. These capabilities enabled the start-ups to engage in beneficial interaction and collaboration with stakeholders, which ultimately influenced their BMI. Essentially, the resulting collaboration resulted in the creation of new capabilities.

*Collaboration capabilities* result in learning and knowledge in highly uncertain and dynamic environments (Blomqvist and Levy, 2006). These are often the environments in which technology start-ups operate. For most start-ups, given their usually limited resources, collaboration is often not much of a choice, but a necessity (Audretsch, 2007; Carree and Thurik, 2010; Klewitz and Hansen, 2014; Slavik, 2019; Ghezzi and Cavallo, 2020). When collaboration is effective, it may result in improved firm performance and competitive advantage (Blomqvist and Levy, 2006; Allred *et al.*, 2011). However, there often are obstacles or challenges to effective collaboration. Consequently, effective collaboration is not so common (Allred *et al.*, 2011). Partly due to, for instance, conflicting interests between firms or functions within firms. This highlights the need for firms to be able to collaborate effectively. The ability of firms to collaborate effectively has been recognized in the literature as a dynamic capability (Teece *et al.*, 1997; Eisenhardt and Martin, 2000; Allred *et al.*, 2011; Ambrosini and Altintas; 2019). This applies also to the context of the individual start-up managers (Blomqvist and Levy, 2006). As they exhibit the capacity to build relationships through collaboration within their firms and externally with other firms. Based on the findings of this study, Table 8-1 below summarizes the specific components of the *collaboration capabilities* exhibited by the start-up managers. Pointing out how they relate to DMC and DC.

Table 8-1: Collaboration capabilities and dynamic managerial capabilities

Collaboration capability	DMC	DC
Networking	Managerial Social Capital	Sense & Seize
Commitment	Managerial Cognition	Seize
Internal Cooperation	Managerial Human Capital	Seize & transform

The *collaboration capabilities* of the start-up managers allowed them to build and share relevant expertise with collaborators. This enabled them to innovate their BMs. Sections 8.1.1, 8.1.2, and 8.1.3 discusses the *collaborative capabilities* in detail.

### **8.1.1    *Networking and Managerial Social Capital***

This study found evidence of the importance of the social capital of start-up managers when engaging in BMI. Managerial social capital allowed access to useful and timely information that enabled the managers to sense and seize opportunities to innovate their BM. Essentially, the social capital of the managers helped mobilize resources that were not within the firm. Furthermore, it helped the managers navigate uncertainty as they learnt from their interactions and collaborations with individuals and organizations outside their firm. The start-up managers exhibited this capability as the capacity to actively network in their personal and professional circles, as well as the capacity to build more networks and connections. This is in line with research that has shown the enhancing effect of networking on the social capital of individuals (Adler and Kwon, 2002; De Janasz and Forret, 2008). In turn, social capital enables learning through access to vital information and resources (Adler and Kwon, 2002; De Janasz and Forret, 2008; Steinfield *et al.*, 2009).

Networking involves building and maintaining mutually beneficial relationships with others. To do so effectively and comfortably requires willingness on the part of managers, as well as the right skills and knowledge (De Janasz and Forret, 2008). Some individuals are more naturally skilled at networking, as it relates also to personal characteristics. For instance, an extrovert is more likely to engage in networking than an introvert. However, for most individuals, the skills required to network effectively can be gained and nurtured through training, education, practice, and feedback (De Janasz and Forret, 2008). As such, “networking is a key human capital skill that is unique in its ability to increase an individual’s social capital” (De Janasz and Forret, 2008:630). This throws some light on how the managerial human capital and managerial social capital antecedents of DMC relate to each other when it comes to networking. This study found evidence that the start-up managers benefited from their networking in the form of vital information, support, sponsorship, ideas, and collaborative partnerships as they innovated their BMs.

The deliberate effort by the managers to be present and alert in their networks, even as they tried to grow their network describes one of the components of the *collaboration capability*

dimension uncovered in this study. To enable the networking and interactions that led to helpful information and made way for useful collaborations, the managers took some specific actions. For instance, the start-ups positioned themselves in innovative environments and made effort to interact, build and maintain relationships. Part of that interaction involved sharing ideas with peers both at the working environment and during formal networking events. Which was done through dialoguing and formal public speaking. The managers also exhibited proactiveness by asking for specific information within their network, which in some of the cases resulted in important partnership. For instance, one of the partners of *Firm B* got direct contact with an IT vendor with whom they collaborated, thereby changing their cost structure and key activities. The CEO of *Firm C* continuously got insight about the state of technology development in his area of interest by asking someone he knew at a research institution.

Keeping in touch and maintaining existing relationships was another specific action taken by some of the managers. For example, *Firm G* was able to break into the car dealership market with their solutions through the acquaintance of the CEO with a former colleague that was working in that industry. Furthermore, some of the start-up managers were visible and accessible in their network. For instance, a seaweed farmer was able to easily contact *Firm J* for help in solution development. *Firm J* seized that opportunity to create new solutions and innovate their BM. The visibility of *Firm I* in their network and industry gave them access to important collaborative partners. It is evident from the cases in this study that the information and resources that resulted from managerial social capital through networking, combined with the ingenuity of the start-up managers was vital for their BMI.

### **8.1.2 Commitment and Managerial Cognition**

The findings of this study indicate that managerial cognition is another important aspect of DMC that allows start-up managers to innovate their BMs. The cognitive capabilities of the managers helped them make necessary adjustments as they worked to move their firms forward in the face of uncertainty. This study finds evidence that on several occasions some of the managers adapted their mental models, which allowed them to sense and seize opportunities that were important for their BMI. For instance, the CEO of *Firm A* developed a new mindset to play a more active role in the innovation endeavours of their customers through collaboration, and that helped them innovate their revenue model. The CEO of *Firm J* had a forward-looking mindset that informed how they approached solution development.

*Firm J* thought through how they could develop highly technical solutions that are cost efficient for their customers. As a result, they used standardized low-cost components which they also felt would be the norm in the future. This resulted in competitive advantage through cost efficiency. Furthermore, *Firm J* was able to distinguish themselves from competitors by their ability to come up with new solutions for different markets based on the same components. The CEO of *Firm E* had the mentality to always be available for customers, and to continuously support and engage them. This resulted in useful feedbacks that helped expand their value offerings and revenue model. The CEO of *Firm C* had a sharing and giving mentality which resulted in useful collaborations that helped innovate the BM. For instance, *Firm C* started a consulting business and deployed their technology to solve problems outside their original scope. The CEO of *Firm I* had the mindset that competition is global and made deliberate effort to understand what their customers may be looking for a few years ahead. So, *Firm I* collaborated with customers in an open and transparent manner that allowed them to gain valuable information and feedback.

There is evidence in this study that suggest that the start-up managers shared a similar mental model about what their firms needed to survive, and that presented itself in the form of commitment, both to their firms and their customers. The managers saw the value in collaborating with customers and they were able to sense and seize opportunities that resulted from their collaborations. Commitment describes the extent to which managers persistently pursue activities geared towards specific goals. It represents a cognitive state influenced by the manager's mindset which may derive from passion, obligation, desire or need (Sharma and Irving, 2005). Furthermore, it reflects an attitude or attachment to an idea or goal and reinforces managerial action to make it a reality. As such, commitment informs managerial intentions and decisions that are important for value creation (Smith *et al.*, 2009). Moreover, the intentions or decisions may be reinforced by negative or positive experiences. For instance, the bid that *Firm A* lost to a competitor prompted a change in approach towards customers, and the opportunity that *Firm J* got to explore the seaweed industry prompted involvement in a coalition that was beneficial to customer engagement. The commitment showed by the managers enabled them to collaborate effectively with customers, as they remained open to feedback and learning which allowed them to innovate their BM. Some of the managers were able to build trust by showing that they cared enough, and through their interest in delivering quality solutions. This translated to solutions that were customer centric and easy to use. The commitment shown by the start-up managers describes one of the components of the *collaborative capability* dimension uncovered in this study.



### **8.1.3 Internal Cooperation and Managerial Human Capital**

The study finds evidence that internal cooperation between managers and employees in the start-ups was vital for their BMI. The ability of the managers to introduce and facilitate a cooperative atmosphere internally was important, and in some cases resulted in fruitful external collaborations. The inclination of the managers to cooperate and/or ensure internal cooperation in their firms made up part of their managerial human capital (Huang, 2004). Moreover, cooperating internally further increased the human capital of the managers as they harnessed the knowledge transmission and learning that ensued. As the start-ups worked to collaborate with external partners and customers to innovate their BMs, their alignment internally, served as a bedrock to facilitate those initiatives. This is in line with studies that have explored the relationship between firm internal and external cooperation. The linkage between internal and external cooperation is in the context of effectiveness and efficiency, as “relationships with external parties need to be coordinated internally to be successful” (Hillebrand and Biemans, 2003:738). For instance, *Firm I* had several activities (manufacturing, etc.) in Thailand with different partners, and those engagement were coordinated primarily by the CPO who travelled there frequently. That was as per understanding between the managers in the firm, and it highlights internal cooperation in the form of clear roles and responsibilities, as well as willingness to cooperate, which was instrumental in their innovation effort.

Internal cooperation is just as critical for start-ups with few employees (where individuals often represent business functions) as it is for incumbent firms having several business units with hundreds or thousands of employees. The need for survival and growth in start-ups makes internal cooperation indispensable. As such, some of the start-up managers in this study put in deliberate effort to ensure that internal cooperation. Which in turn influenced how they were able to innovate the way they created, delivered, and captured value with their offerings. For Instance, the founders of *Firm A* took time to put together clear procedures for dealing with disagreements regarding what activities to focus on. *Firm D* took advantage of the complimentary skills and abilities within the company to ensure that their services were always performed with the right person doing the right activities. This was particularly important for their unique value proposition, which was the ability to produce high quality data. Furthermore, the start-ups in this study had a flexible work culture, where sharing and open communication was encouraged.

## 8.2 Capitalization Capabilities

The other dimension of capabilities that enabled the start-up managers in this study to innovate their BMs is *capitalization capabilities*. This set of capabilities enabled the start-up managers to proactively create opportunities and capitalize on opportunities that presented themselves. In addition, the capabilities were further enhanced through learning, as the start-ups developed. The specific elements of the *capitalization capabilities* are *experience*, *searching* and *maximizing resources*, as discussed in sections 8.2.1, 8.2.2 and 8.2.3 respectively. These elements played unique roles in enabling the start-up managers to recognize opportunities for BMI and take necessary actions to seize those opportunities. Furthermore, they relate to the DMC of the start-up managers. Table 8-2 shows an overview of this relationship.

Table 8-2: Capitalization capabilities and dynamic managerial capabilities

Capitalization capability	DMC	DC
Experience	Managerial Human Capital & Cognition	Sense & Seize
Searching	Managerial Human Capital & Cognition	Sense & Seize
Maximizing resources	Managerial Human Capital	Seize

Great managerial capabilities positively influence the capacity for early stage start-ups to capitalize on opportunities (Choi and Shepherd, 2004). In the context of this study, ‘to capitalize’ means ‘to take advantage of’. This is different from how the term is applied in the field of finance. Where capitalization usually refers to the valuation of firm assets, and translating that value into capital. However, it has been noted in the literature that the concept of capitalization does not pertain only to the field of finance (Muniesa *et al.*, 2019). That it is rather prevalent in different works of life, as it relates to configuring reality in particular ways based on the perspective of the actors involved in the value creation or investment efforts. This forms the lens through which this study views the dimension of *capitalization capabilities* that enabled the start-up managers to innovate their BMs. Essentially, the managers were able to sense and seize opportunities, and assess those opportunities for potential future reward by tapping into their existing *capitalization capabilities*. Sections 8.2.1, 8.2.2 and 8.2.3 discusses the *capitalization capabilities* in detail.

### **8.2.1 Experience and Managerial Human Capital / Cognition**

The knowledge that the start-up managers acquired through prior experience was important to the BMI of their firms. That experience included business skills and technical knowhow obtained through education, prior entrepreneurial activities, and previous professional engagements. It also included specific industrial, market, research, and geopolitical experience. These experiences were a vital aspect of the managerial human capital that enabled the managers to sense opportunities and capitalize on them as they innovated their BMs. For instance, the co-founders of *Firm A* built on their technology background in developing their start-up which became an IT firm providing services to customers and running internal application development projects. Their experience with creative work aided their ability to come up with good ideas and interact effectively with customers. The CEO of *Firm G* had experience driving change initiatives as an intrapreneur in a large and reputable company, and he capitalized on that experience in his start-up. Moreover, *Firm G* benefited directly from the social capital acquired by the CEO in his previous role. Similarly, *Firm H* benefited from the long industry specific experience of one of the co-founders in transiting from a physical card issuing organization to a service providing technology company. The co-founders of *Firm I* capitalized on their long experience in the industry to move fast with bringing their technological solution to the market. Their vast experience as well as the social capital they acquired over the years made it easier to recognize, analyse and solve problems. Furthermore, it gave them access to useful information and key resources. So clearly, the effect of human capital composed of the experience of the managers is vital, and it is consistent with literature that suggests that the ability to provide services of good standards correlates positively with human and social capital (Nahapiet and Ghoshal, 1998; Kor and Sundaramurthy, 2009).

This study also finds evidence that as the managers worked to build their firms, they gained more experience through learning, which allowed them to make adjustments that were important for their BM. For instance, when the co-founders of *Firm B* returned to the crowdfunding platform business (after they ventured into providing media services to other start-ups), they capitalized on the experience and learning they had from their initial BM. That informed their decision to offer services to customers by collaborating with other platform providers, instead of building their own platform. Learning from experience and gaining more experience from learning in the search for viable BMs proved vital to the BMI of the start-ups. This was an important aspect of managerial cognition.

The findings of this study reveal that managerial cognition linked to the experiences of the managers played a major role in the efforts of managers to innovate their BMs. The recognition of previously experienced or familiar patterns by some of the managers during interactions in their business environments enabled them to sense and seize opportunities. For instance, when *Firm J* got introduced to the seaweed industry, they recognized a similar pattern to what they observed in the fish farming industry fifteen years earlier. Where farmers were operating in silos with manual and cost ineffective processes. As such *Firm J* sensed the need for more technology, streamlined processes and automation. This opened new doors to *Firm J* as they decided to capitalize on the opportunity and innovated their BM to expand their activities and value offerings. This is in line with suggestions in the literature that managers may sense opportunities through their ability to deliberately tap into their mental models in different contexts (Gavetti, 2012; Helfat and Martin, 2015). Furthermore, the perception that it might be worth pursuing the opportunity is a dynamic managerial capability informed by managerial cognition (Beck and Wiersema, 2013). The founders of *Firm B* exhibited problem solving and reasoning cognitive capabilities by applying BM and start-up development concepts learnt during their education at the university. Furthermore, the practical exposure they had working with the BMs of real companies during their studies helped them form a mental model or belief system that enabled them to navigate through the challenges they had with their crowdfunding business. They basically believed that they could innovate themselves out of the situation, which they did. Essentially, the combination of the unique abilities of the managers together with their individual life experiences contributed to their ability to innovate their BMs.

### **8.2.2 Searching and Managerial Human Capital / Cognition**

The capacity to search for information enabled the start-up managers to sense and seize opportunities to innovate their BM. The managers capitalized on their human capital and made deliberate efforts to gather information and gain insight about various aspects of their business. Their effort also brings to light managerial cognition, and how it influences the act of searching for, interpreting, and utilizing information (Helfat and Martin, 2015). Which consequently influences further building of managerial human capital. So, it can be argued that the ability to search effectively is influenced by managerial human capital and cognition (Beck and Wiersema, 2013). Moreover, it is vital for competitive advantage, because it enables early sensing and seizing of opportunities (Beck and Wiersema, 2013).

This study finds evidence that the start-up managers used various approaches to search for the opportunities that translated to their solution/service portfolios and value offerings. For instance, the co-founders of *Firm A* capitalized on several aspect of their managerial cognition, including the ability to pay attention to relevant business and technological issues in their network. In addition, they used learned skills to collate information, and performed necessary testing and validation of ideas. That was an important aspect of managerial human capital. Other approaches used by the start-up managers in this study included dialoguing, problem solving, trial by error, forward thinking and formal research. The managers capitalized on their presence in innovation environments to engage in fruitful dialogues with peers and collaborators. In addition, they actively engaged in dialogue with customers and potential customers. Such dialogues sometimes resulted in important feedback, learnings, and ideas that the managers were able to build on. This is in line with literature that suggests that insights and learnings gained from stakeholder dialogue may lead to valuable innovations. Hence, the ability to gain insights from stakeholder dialogue is a dynamic capability (Ayuso *et al.*, 2006). This further highlights the importance of considering perceptions and insights that emanate from sources outside the firm. As well as constructive dialogue within the firm, which is also crucial.

Conducting research was another means of searching that the start-up managers employed; from market and customer research to formal experimental research. For example, *Firm C* engaged in several formal funded research projects in their attempt to develop suitable technology to help mitigate the effect of hurricanes. In addition, they did customer/stakeholder research to explore avenues to fully capture the value of their offerings. The CEO of *Firm E* visited several clinics to interact and gain insight when iterating on their solution. Similarly, *Firm D* spent time travelling in Europe to assess potential collaborating partners or vendors for drone technology. Other approaches used included problem-solving and forward thinking. For instance, when *Firm G* noticed that there was a more dominant player in their target market, they quickly resorted to problem solving techniques (including hypothesis testing and trial by error) to find the next target market. They ended up gaining ground in the car dealership market with their solutions. In like manner, the partners of *Firm B* managed to find their space within the crowdfunding business by capitalizing on the knowledge they developed about the industry over time. As well as new knowledge acquired through deliberate efforts to understand the problems in the industry. This fits well with literature that points out the importance of problem-solving (through the recombination of new and existing knowledge) to the creation of new solutions and the innovation of existing

solutions (e.g., Marsh and Stock, 2006). *Firm J* had a focused approach (with a forward-looking perspective) to their search effort. They tried to think years ahead regarding the technologies and components applied to their solutions, while considering the benefits to customers. Such as reduced cost, increased flexibility, and increased customer value. The effort on the part of the start-up managers to search for valuable information and insight helped them innovate their BMs.

### **8.2.3 Maximising resources and Managerial Human Capital**

Start-ups require important resources as they strive to innovate their BM and further develop their business. Among the needed resources are expertise, information, decision support, knowledge, finance, and relationships (Jones and Li, 2017). This study finds evidence that some of the start-up managers successfully deployed their managerial human capital to effectively manage available and limited resources. Which consequently enabled them to seize opportunities to innovate their BMs. This is consistent with literature that suggests that effective founders do not always put emphasis on finding the optimal solution. Instead they maximize their limited resources and make compromises based on the best available information (Baker and Nelson, 2005; Jones and Li, 2017). For instance, the co-founders of *Firm G* built their solution using their own expertise and limited financial resources (without support or funding outside the firm). Along the way, they relied on experimentation and hypothesis testing to refine their solution and customer segment. The CEO of *Firm D* who was a trained photographer, capitalized on his expertise to focus the value proposition of his firm. That focus was to distinguish *Firm D* from competitors by producing high quality data. As a result, *Firm D* introduced new activities and changed their customer segment to focus on opportunities where data quality was a priority.

Some of the start-ups displayed the ability to innovate their BM and generate revenue by leveraging their expertise in other endeavours besides their main mission. For instance, *Firm A* developed their business to provide IT consulting services to customers, and at the same time developed their own software applications. Similarly, *Firm C* leveraged their unique technology and knowledge to provide consulting services to customers outside their original scope. Outsourcing to vendors in low cost countries was another approach taken by some of the start-ups to maximize their financial resources. For example, *Firm A*, *Firm B*, and *Firm H* outsourced major aspects of their solution development activities. *Firm I* outsourced some aspect of its manufacturing activities. This is in line with literature that suggests that start-ups

usually try to gain complementary resources (e.g., expertise, finance, etc.) from firms with more resources, which ultimately increases their firm's DC (Jones and Li, 2017). The effective partnership with vendors, together with the ability of the managers to effectively orchestrate the resulting activities, shows the benefit of strong relationships in maximizing resources. Another way in which the start-ups maximized resources was by capitalizing on important information and taking decisive actions. For example, both *Firm J and Firm G* moved quickly when they sensed the potential opportunity to explore a new industry and start a new business. They did so by calling on the expertise they had available to quickly address the opportunity.

DC are requisite for translating resources that are available to start-ups into competitive advantages and performance (Wu, 2007; Jones and Li, 2017). This study finds evidence that maximizing available resources was a vital DMC that enabled the start-ups to innovate their BMs.

### **8.3 Summary**

This study aimed to explore the influence of capabilities on BMI in start-ups. Drawing from the DMC theory, the findings provide useful insights into specific capabilities that are relevant to start-ups. Figure 8-1 shows the summary of the findings which has been discussed. Clearly, start-up managers require different types of capabilities to successfully innovate their BMs. Based on the start-ups that were investigated in this study, these capabilities can be grouped as *collaboration capabilities* and *capitalization capabilities*.

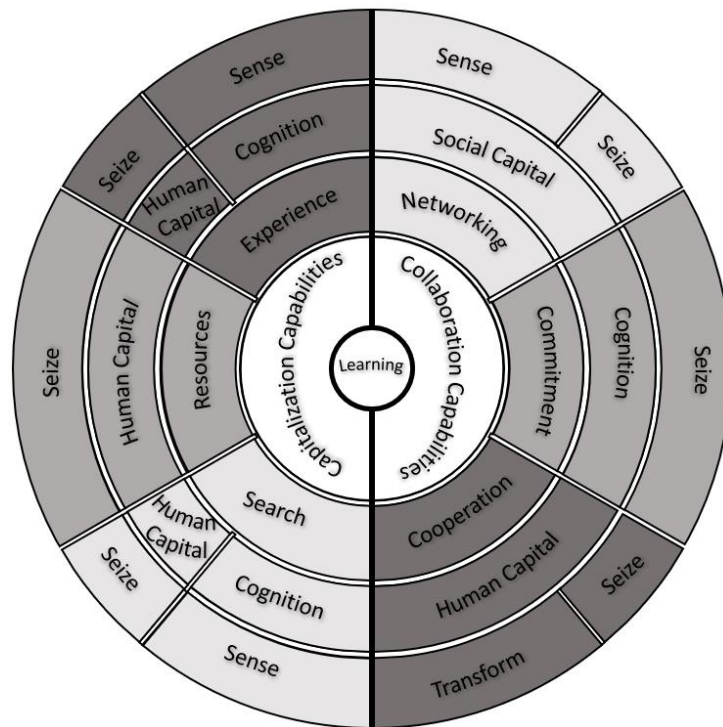


Figure 8-1: Capabilities that influence BMI in start-ups (Author)

It is noteworthy that the collaboration and capitalization capabilities are related. They produce learning outcomes that build on each other, as they are called upon to sense and seize opportunities for BMI. With *Networking, Commitment, and Internal Cooperation*, there is continuous learning from external interactions, customers, and peers, respectively. Capitalizing on *Experience* to innovate the BM leads to more experience through the learning that takes place in the process. *Searching* which involves taking advantage of learned skills to gather insight is all about learning. *Maximizing resources* entails making the best use of available resources such as information or expertise, and to be able to do so involves learning. So, essentially, the deliberate effort of the managers to learn is central to the collaboration and capitalization capabilities that enable them to innovate their BMs. This is in line with the nature of start-ups where learning plays a crucial role in the developmental process (Eisenhardt and Martin, 2000; McGrath, 2010). Furthermore, the learning contributes to increased DMC (O'Reilly and Tushman, 2008; Helfat and Martin, 2015; Ambrosini and Altintas, 2019).



## 9. Conclusion

This study explored how capabilities influence BMI in start-ups. This was done through the research question: *What capabilities allow managers (e.g. founders, decision makers) in start-ups to innovate their BMs?*

The review of the literature revealed that BMs and BMI deserve more attention, especially in start-ups, because of their relevance to firm performance and competitive advantage. It also revealed that it is worthwhile for firms to develop relevant capabilities to successfully innovate their BMs. The link to DC was evident from the literature, as it enables firms to anticipate opportunities and respond quickly. However, it is the decisions and actions of managers in firms that ultimately inform any response to opportunities needed to innovate the BM. The relatively small size of start-ups compared to incumbents, as well as the little or non-existent resistance to change, magnifies the role of start-up managers in the decision making and action taking process. Start-up managers play active roles in the day to day activities of their firms. This active involvement is vital to the success of BMI (Chesbrough, 2010; Zott and Amit, 2010). Hence, the DMC perspective was crucial in this study.

The DMC perspective served as the theoretical framework from which the capabilities exhibited by the start-up managers were examined. A cross-sectional case study methodology under a critical realism philosophical paradigm was used. Data was gathered and analysed from ten technology service providing start-ups, and the findings revealed new insights into the capabilities that enable BMI in start-ups. Managerial human capital, managerial social capital, and managerial cognition, which are the three main underpinnings of DMC were discussed in tandem with the findings of this study.

The aim and objectives of this study were attained, and the research findings clearly identified specific capabilities that allowed the start-up managers to innovate their BM. As discussed in section 8, these can be grouped into two main dimensions; *collaboration capabilities* and *capitalization capabilities*. Where *collaboration capabilities* comprise of *networking*, *commitment*, and *internal cooperation*. While *capitalization capabilities* comprise of *experience*, *searching* and *maximising resources*. Consequently, this study draws attention to how start-ups may succeed in their attempts to innovate their BMs, and it reinforces the theoretical understanding of the process.

Section 9.1 below discusses the implications of this study to practice, while section 9.2 highlights the contributions to research. Section 9.3 addresses the limitation of this study, and section 9.4 points out some recommendations for further research.

### **9.1 Implications for practice**

The outcome of this study offers several implications to managers. It reinforces the need for managers to know how to develop and innovate their BMs. It emphasizes the role of capabilities on BMI. Particularly, DMC, and points out some of the specific capabilities that managers should pay attention to if they are to successfully innovate their BMs. Given that the context of this study was BMI in start-ups, the implications to founders and aspiring founders is profound. Early stage start-ups usually experience constant uncertainty and change. This means that not every aspect of the start-up development can be foreseen. Nevertheless, there is need for continued action and movement towards the immediate goals, and this study throws light on how founders and/or CEOs may exploit specific capabilities to steer their firms towards a viable BM.

The findings of this study suggest that collaboration and capitalization capabilities are key to successful BMI in start-ups. Importantly, these capabilities should be leveraged in an integrated and simultaneous manner, such that managers take full advantage of the resulting learning by feeding it back into their activities. *Collaboration capabilities* is not only about collaborating with actors external to the firm, but also internal stakeholders, with the customer as the focus. See Figure 9-1. *Networking* plays an important role in sensing and seizing opportunities for BMI. It allows important relationships to be built and provides access to useful information and resources. Therefore, managers need to develop the skills required to network effectively. These skills may be developed through practice and training. Managers need to be visible in innovative environments and make deliberate efforts to interact and build relationships. In addition, being open to share ideas and speak publicly is an advantage.

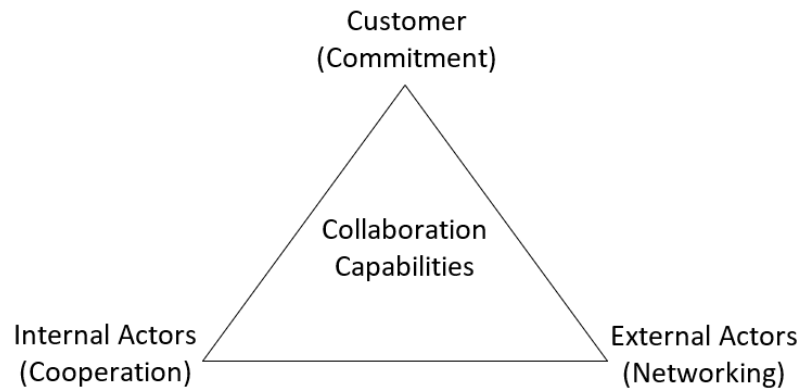


Figure 9-1: Collaboration Capabilities Triangle (Author)

*Commitment* is indispensable in the process of innovating the BM. It is about willingness and deliberate effort to understand the customer and modelling the activities of the firm towards gathered insights and learnings. Managers will benefit from developing this cognitive capability, by framing their mental models and regulating their mindset and emotions to be persistent in efforts to satisfy customer needs. This involves attentiveness, openness, trust, and flexibility, which helps to discover new customer needs, and meet those needs. When it comes to *internal cooperation*, managers will do well to ensure that they have a coherent and functioning team where everyone works towards the same goal. This is vital in orchestrating collaboration with external actors and/or customers. *Internal cooperation* may manifest in the form of clear roles and responsibilities, strategies to resolve conflicts or disagreements, sharing, flexible working culture, open communication, and taking full advantage of complementary abilities.

Managers need to equally pay attention to *capitalization capabilities* and make deliberate efforts to develop them. *Capitalization capabilities* emphasize adequate utilization of available resources and experience while searching for new resources. This is represented graphically in Figure 9-2. As managers engage in efforts to innovate their BMs, it will benefit them to reflect on their *experience* and choose activities accordingly. Managers should see how they can leverage their prior and recent experience and turn them into strengths. *Experience* may include skills and knowledge developed over time from personal and professional settings. Managers that operate based on personal experience or within their sphere of expertise are likely to be more alert to relevant developments in the business environment, which is necessary to sense opportunities. At the same time, they are more likely to be able to seize the opportunities that present themselves.

Seizing opportunities also involves *maximizing resources*. This is essential for start-ups due to their usually limited resources. So, managers need to be adept in utilizing available resources (e.g., expertise, money, information, connections) and making up for unavailable resources. This may reveal itself in the form of; prudent decision making through experimentation, exploiting (or focusing on) key strengths, partnering and orchestrating associated activities, as well as leveraging flexibility and unique competencies to quickly address opportunities. The attempt to maximize resources may also trigger new opportunities to innovate the BM.

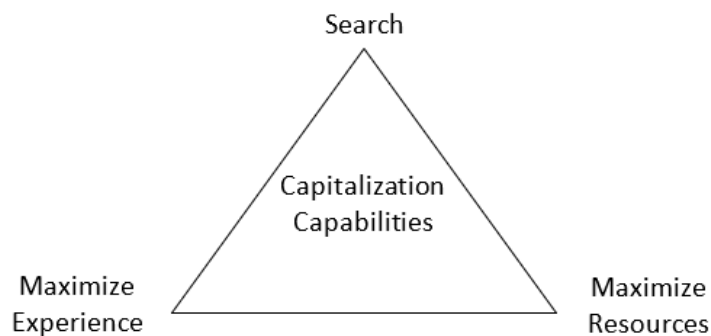


Figure 9-2: Capitalization Capabilities Triangle (Author)

*Searching* is another vital aspect of *capitalization capabilities* that managers should consider. It entails continuously looking out for opportunities to innovate the BM. In addition, it requires managers to be attentive in their business environment, and to always be ready to test and validate ideas. Discussions with relevant stakeholders both within and outside the firm (e.g., customers) is relevant in this process, and the use of basic techniques such as brainstorming, dialoguing, problem solving, and research may prove useful.

In summary, this study offers concrete suggestions about the capabilities that managers aspiring to innovate their BMs should be attentive to. This has implications for planning, team formation, and competency building for managers in firms. Moreover, it is relevant not only to start-up managers, but managers in general. Section 9.2 discusses the implications of this study for research.

## 9.2 Implications for research

This study makes notable theoretical contributions to the literature. First, it contributes to the wider literature on BMs and BMI which is still developing albeit gaining increasing attention. It

resounds the criticality of BMI to firm competitiveness. In addition, it outlines motivators and actions by which efforts in BMI may succeed (see Figure 7-1). Second, this study addresses the role of capabilities in BMI which has not received enough attention in the literature (Brink and Holmen, 2009; Bjorkdahl and Holmen, 2013; Foss and Saebi, 2017). It does so in the context of start-ups which has also received little attention, as researchers have prioritized research on the BMs of large incumbent firms. Even though start-ups play a crucial role in the development of an economy by exploring new markets and introducing novel ideas, products and services (Chesbrough, 2010; McGrath, 2010; Koen *et al.*, 2011; Comberg *et al.*, 2014; Klewitz and Hansen, 2014; Foss and Saebi, 2016; Foss and Saebi, 2017). This study identifies and highlights specific capabilities (collaboration and capitalization capabilities) that influence BMI in start-ups (as depicted in Figure 7-1). Moreover, it emphasizes the need for continuous development of these capabilities. Third, this study adopts the DMC theoretical framework, which throws more light on the linkage between DC and BMI, especially regarding the role of individual managers. It links the components of the highlighted collaboration and capitalization capabilities to specific underpinnings of DMC and DC exhibited by the managers. This is depicted in Figure 8-1. For instance, *Networking*, which is a component of *collaboration capabilities*, is a manifestation of managerial social capital which in turn enables start-up managers to sense and seize opportunities for BMI. Similarly, *Commitment* is related to managerial cognition and it allows managers to seize opportunities. In the same vein, *internal cooperation* may result from managerial human capital which could lead to the ability of start-up managers to transform the organization and seize opportunities. With regards to *capitalization capabilities*, *Experience* and *Searching* can be considered outcomes of both managerial human capital and cognition, and these allow start-up managers to sense and seize opportunities for BMI. In addition, *maximizing resources* draws from managerial human capital and it is vital for seizing opportunities.

Essentially, this study addresses a prominent gap in the literature of BMs, BMI, and DC by focusing on start-ups. Although there are discussions in the literature on the need for start-ups to develop and enhance DC due to its influence on BMI (e.g., Naeini and Ahmadkalaei, 2021; Teixeira *et al.*, 2021), the specific capabilities are not always clearly explicated. This study contributes to breaking down existing knowledge from the literature about DC and DMC, by pointing out specific capabilities that enable start-ups managers to innovate their BMs. The findings highlight the role of the manager by addressing the qualities they display as well as specific actions taken to innovate the BM. This study confirms that managerial cognition, managerial human capital, and managerial social capital, the three underpinnings of DMC, play

vital roles in the ability of start-up managers to sense and seize opportunities to innovate their BMs. Ultimately, this study contributes to a greater understanding of BMI in start-ups.

### **9.3 Limitations of the study**

One limitation of this study is the approach used for sampling. Even though all the participating start-ups in this study fit the inclusion criteria discussed in section 3.2.2, they were all associated in one form or another with one technology business incubator. This was practically convenient, and it ensured a suitable sample size and access to relevant data. However, it imposed some constraints on the generalization of the results by virtue of the context in which the study was done. Nevertheless, the qualitative approach and case study methodology adopted allowed the demonstration of analytical generalization and validity, through careful analysis and comparison of the cases based on the theoretical framework (Yin, 2014).

Another limitation of this study was that there was one participant from the different start-ups. Each start-up made up one case. So, for a total of ten cases there were ten participants. The number of cases falls within the limit recommended for multiple case studies (Eisenhardt, 1989; Eisenhardt and Graebner, 2007). However, another approach could have been to gather the perception of other participants from each start-up. That approach was not feasible due to the busy schedule of the start-ups and the limited capacity of the author. Having said that, the CEOs of the start-ups were the participants. Given that they are responsible for all activities in the firm, they were deemed the most important participants, and they provided the primary data. Moreover, triangulation was achieved through reviews of records, reports, websites, and local media articles.

The philosophical paradigm of critical realism adopted for this study acknowledges that there is a reality out there, and that what is observed may imply causality, but that reality is also socially constructed. So, in as much as the perceptions of the CEOs that led to the findings of this study is valuable, there is still a chance that the reality has not been perfectly understood (Guba and Lincoln, 1994; Sobh and Perry, 2006; Easton, 2010).

### **9.4 Recommendation for further research**

This study identifies specific capabilities that enable managers in start-ups to innovate their BMs, and by doing so it indicates several potential avenues for further research.

A cross-sectional multiple case study approach was adopted to explore the role of capabilities on BMI in start-ups. Further studies could adopt a longitudinal case study approach. This could help provide more insight into how start-up managers develop and nurture capabilities over time, as well as the long-term effect it may have on the process of innovating the BM.

This study identifies *collaboration capabilities* and *capitalization capabilities* as two dimensions of capabilities that enable start-up managers to innovate their BMs. Further research is needed to investigate the mechanisms through which they develop, as well as the dynamics between them, and the consequent effect on BMI. This could be investigated through a case study that follows one specific start-up for a period of time. In addition, the perspectives of several managers within the start-up could be elicited and analysed to frame a more holistic understanding.

Since this study was carried out in Norway, further research could investigate start-ups in different environments to account for contextual factors. Further research could consider contextual factors such as the political/geopolitical landscape or economy of the country where the start-up is located. These contextual factors could potentially influence dynamic capabilities and the capacity of start-ups to innovate their BMs.

The conception and execution of activities needed to innovate BMs are complexly intertwined. As such, this exploratory study is a good step in trying to uncover how it unfolds. Notwithstanding, it is worthwhile for further research to broaden the scope through quantitative studies based on a large population of start-ups. This will also be a good step towards generalization of the findings.

## **9.5 Concluding remarks**

The aim and objectives of this study has been vigorously pursued. The research question has been examined and addressed. The findings have been discussed in tandem with the literature, and the implication for practice and research has been delineated. The limitations of this study have also been presented and recommendations for future research highlighted.

This has been an exciting, challenging, engaging, and thrilling journey for the author. It has been a period of learning, growth, and fulfilment. Managing the entire research process has

been revealing, the discipline required fortifying, and the skills acquired timely. The author aspires to build on this work, and continually pursue his passion for knowledge and discovery, both as a practitioner and researcher.



## 10. References

- Adler, P.S., and Kwon, S.W. (2002) 'Social capital: Prospects for a new concept' *Academy of Management Review* 27(1) pp 17-40.
- Adner, R. and Helfat, C.E. (2003) 'Corporate effects and dynamic managerial capabilities'. *Strategic management journal* 24 (10) pp 1011-1025.
- Afuah, A. and Tucci, C.L. (2003) *Internet Business Models and Strategies: Text and Cases*. Boston: McGraw Hill.
- Afuah, A (2019) *Business Model Innovation: Concepts, Analysis, and Cases*. New York: Routledge.
- Allred, C.R., Fawcett, S.E., Wallin, C., and Magnan, G.M. (2011) 'A Dynamic Collaboration Capability as a source of competitive advantage'. *Decision Sciences* 42 (1) pp 129-161.
- Ambrosini, V. and Altintas, G. (2019) *Dynamic managerial capabilities*. Oxford Research Encyclopedia of Business. [Online] Available at: <https://oxfordre.com/business/view/10.1093/acrefore/9780190224851.001.0001/acrefore-9780190224851-e-20> [Accessed 16 January 2020].
- Amit, R. and Zott, C. (2010) 'Business model innovation: Creating value in times of change' Working Paper, No. WP-870. IESE Business School, Spain.
- Amit, R. and Zott, C. (2012) 'Creating value through business model innovation'. *MIT Sloan Management Review* 53(1) pp 41-49.
- Andersson, S. and Evers, N. (2015) 'International opportunity recognition in international new ventures – a dynamic managerial capabilities perspective'. *Journal of International Entrepreneurship* 13 (3) pp 260-276.
- Andries, P. and Debackere, K. (2013) 'Business Model Innovation: Propositions on the Appropriateness of Different Learning Approaches'. *Creativity and Innovation Management* 22 (4) pp 337-358.
- Audretsch, D.B. (2007) 'Entrepreneurship capital and economic growth'. *Oxford Review of Economic Policy* 23 (1) pp 63-78.
- Ayuso, S., Rodriguez, M.A., and Ricart, J.E. (2006) 'Using stakeholder dialogue as a source for new ideas: a dynamic capability underlying sustainable innovation'. *Corporate Governance* 6 (4) pp 475-490.
- Baden-Fuller, C. and Morgan, M.S. (2010) 'Business models as models'. *Long Range Planning* 43(2-3) pp 156-171.

- Baker, T. and Nelson, R.E. (2005) 'Creating Something from Nothing: Resource Construction through Entrepreneurial Bricolage'. *Administrative Science Quarterly* 50 (3) pp 329-366.
- Balboni, B. and Bortoluzzi, G. (2015) 'Business model adaptation and the success of new ventures'. *Journal of Entrepreneurship, Management and Innovation* 11 (1) pp 119-140.
- Baumbusch, J. (2010) 'Semi-Structured Interviewing in Practice-Close Research'. *Journal for Specialists in Pediatric Nursing* 15 (3) pp 255-258.
- Beck, J.B. and Wiersema, M.F. (2013) 'Executive Decision Making: Linking Dynamic Managerial Capabilities to the Resource Portfolio and Strategic Outcomes'. *Journal of Leadership & Organizational Studies* 20 (4) pp 408-419.
- Berends, H., Smits, A., Reymen, I., and Podoynitsyna, K. (2016) 'Learning while (re)configuring: Business model innovation processes in established firms'. *Strategic Organization* 14 (3) pp 181-219.
- Bjorkdahl, J. and Holmen, M. (2013) 'Business model innovation – the challenges ahead'. *International Journal of Product Development* 18 (3) pp 213-225.
- Blank, S. (2006) *The four steps to the epiphany: Successful strategies for startups that win* (2nd ed.). San Francisco: CafePress.com.
- Blank, S. and Dorf, B. (2012) *The Start-up Owner's Manual. The Step-by-Step Guide for Building a Great Company*. Pescadero: K&S Ranch Publishing Division.
- Bocken, N.M.P. and Geradts, T.H.J. (2019) 'Barriers and drivers to sustainable business model innovation: Organization design and dynamic capabilities'. *Long Range Planning*. [Online] Available at: <https://doi.org/10.1016/j.lrp.2019.101950> [Accessed 9 January 2020].
- Borseman, M., Tanev, S., Weiss, M., and Rasmussen, E.S. (2016) 'Lost in the canvases: Managing uncertainty in lean global startups'. *Proceedings of the ISPIM Innovation Forum: Charting the Future of Innovation Management*, Boston, USA on 13-16 March 2016.
- Bouncken, R.B. and Fredrich, V. (2016) 'Business model innovation in alliances: Successful configurations'. *Journal of Business Research* 69(9) pp 3584-3590.
- Bowen, G.A. (2009) 'Document Analysis as a Qualitative Research Method'. *Qualitative Research Journal* 9(2) pp 27-40.
- Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology'. *Qualitative Research in Psychology* 3(2) pp 77-101.

- Brink, J. and Holmen, M. (2009) 'Capabilities and radical changes of the business models of new bioscience firms'. *Creativity and innovation management* 18 (2) pp 109-120.
- Brush, C.G., Greene, P.G., Hart, M.M. (2001) 'From initial idea to unique advantage: The entrepreneurial challenge of constructing a resource base'. *Academy of Management Executive* 15(1) pp 64-80.
- Bryman, A. (2012) *Quantity and Quality in Social Research*. London: Routledge, 1988. Social Research Methods. Oxford: Oxford University Press.
- Bryman, A. and Bell, E. (2015) *Business Research Methods*. Fourth Edition. Oxford University Press.
- Bucherer, E., Eisert, U., and Gassmann, O. (2012) 'Towards systematic business model innovation: Lessons from product innovation management'. *Creativity and innovation management* 21 (2) pp 183-198.
- Castanias, R.P., Helfat, C.E. (2001) 'The managerial rents model: theory and empirical analysis'. *Journal of Management* 27 (6) pp 661-678.
- Carree M.A., Thurik A.R. (2010) *The Impact of Entrepreneurship on Economic Growth*. In: Acs Z., Audretsch D. (eds) *Handbook of Entrepreneurship Research*. International Handbook Series on Entrepreneurship, vol 5. Springer, New York, NY.
- Casadesus-Masanell, R. and Ricart, J.E. (2010) 'From strategy to business models and onto tactics'. *Long Range Planning* 43 (2-3) pp 195-215.
- Chesbrough, H. and Rosenbloom, R.S. (2002) 'The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies'. *Industrial and Corporate Change* 11 (3) pp 529-555.
- Chesbrough, H. (2006) *Open business models: How to thrive in the new innovation landscape*. Boston MA: Harvard Business School Press.
- Chesbrough, H. (2007) 'Business model innovation: it's not just about technology anymore'. *Strategy & Leadership* 35 (6) pp 12-17.
- Chesbrough, H. (2010) 'Business Model Innovation: Opportunities and Barriers'. *Long Range Planning* 43 (3) pp 354-363.
- Ching, H.Y. and Fauvel, C. (2013) 'Criticisms, variations and experiences with business model canvas'. *European Journal of Agriculture and Forestry Research* 1 (2) pp 26-37.
- Choi, Y.R. and Shepherd, D.A. (2004) 'Entrepreneurs' Decisions to Exploit Opportunities'. *Journal of Management* 30 (3) pp 377-395.

- Cockayne, D. (2019) 'What is a startup firm? A methodological and epistemological investigation into research objects in economic geography'. *Geoforum* 107 (1) pp 77-87.
- Comberg, C., Seith, F., German, A., and Velamuri, V.K. (2014) 'Pivots in Startups: Factors Influencing Business Model Innovation in Startups'. *Proceedings of the XXV ISPIM Conference – Innovation for Sustainable Economy & Society*, Dublin, Ireland on 8–11 June 2014.
- Coombes, P.H. and Nicholson, J.D. (2013) 'Business models and their relationship with marketing: A systematic literature review'. *Industrial Marketing Management* 42 (5) pp 656-664.
- Corbett, A.C. (2007) 'Learning asymmetries and the discovery of entrepreneurial opportunities'. *Journal of Business Venturing* 22 (1) pp 97-118.
- Creswell, J.W. and Poth, C. (2018) *Qualitative Inquiry and Research Design*. 4th edn. Thousand Oaks: Sage.
- Davidson, C. (2009) 'Transcription: Imperatives for Qualitative Research'. *International Journal of Qualitative Methods* 8 (2) pp 35-52.
- De Faria, V.F., Santos, V.P., and Zaidan, F.H. (2021) 'The Business Model Innovation and Lean Start-up Process Supporting Start-up Sustainability'. *Procedia Computer Science* 181 (1) pp 93-101.
- De Janasz, S.C. and Forret, M.L. (2008) 'Learning The Art of Networking. A critical Skill for Enhancing Social Capital and Career Success'. *Journal of Management Education* 32 (5) pp 629-650.
- Demil, B. and Lecocq, X. (2010) 'Business model evolution: In search of dynamic consistency'. *Long Range Planning* 43(3) pp 227-246.
- Desyllas, P. and Sako, M. (2013) 'Profiting from business model innovation: Evidence from pay-as-you-drive auto insurance'. *Research Policy* 42 (1) pp 101-116.
- DiCicco-Bloom, B. and Crabtree, B.F. (2006) 'The qualitative research interview'. *Medical Education* 40 (4) pp 314–321.
- Doll, J. and Eisert, U. (2014) 'Business Model Development & Innovation: A Strategic Approach to Business Transformation'. *360° – the Business Transformation Journal* 11 (8) pp 7-17.
- Dopfer, M. (2018) *Why business model innovation matters to startups*. In Richter, N., Jackson, P., and Schildhauer, T. (Eds.), *Entrepreneurial innovation and leadership: Preparing for a digital future*: pp 77-86. Cham: Palgrave Macmillan.

- Downing, S. (2005) 'The social construction of entrepreneurship: Narrative and dramatic processes in the coproduction of organizations and identities'. *Entrepreneurship Theory and Practice* 29 (2) pp 185-204.
- Doz, Y.L., and Kosonen, M. (2010) 'Embedding strategic agility: A leadership agenda for accelerating business model renewal'. *Long Range Planning* 43(2-3) pp 370-382.
- Easterby-Smith, M., Thorpe, R. and Lowe, A. (1991) *Management Research. An Introduction*. Sage: London.
- Easton, G. (2010) 'Critical realism in case study research'. *Industrial Marketing Management* 39 (1) pp 118-128.
- Echambadi, R., Bayus, B. L., and Agarwal, R. (2008) 'Entry timing and the survival of startup and incumbent firms in new industries'. Working paper – University of Illinois [Online] Available at: [https://www.researchgate.net/publication/228855312\\_Entry\\_Timing\\_and\\_the\\_Survival\\_of\\_Startup\\_and\\_Incumbent\\_Firms\\_in\\_New\\_Industries](https://www.researchgate.net/publication/228855312_Entry_Timing_and_the_Survival_of_Startup_and_Incumbent_Firms_in_New_Industries) [Accessed 11 August 2020].
- Eisenhardt, K.M. (1989) 'Building Theories from Case Study Research'. *Academy of Management Review* 14 (4) pp 532-550.
- Eisenhardt, K.M. and Martin, J. A. (2000) 'Dynamic capabilities: what are they?'. *Strategic Management Journal* 21(10–11) pp 1105-1121.
- Eisenhardt, K.M., and Graebner, M.E. (2007) 'Theory Building from Cases: Opportunities and Challenges'. *Academy of Management Journal* 50 (1) pp 25-32.
- Eisenmann, T. (2021) *Why Start-ups Fail – It's not always the horse or the jockey*. Harvard Business Review. [Online] Available at: <https://hbr.org/2021/05/why-start-ups-fail> [Accessed 12 August 2022].
- Foss, N.J. and Saebi, T. (2016) 'Why business models are important in entrepreneurship research: what we have learned and where do we go from here?'. Norwegian School of Economics, Bergen.
- Foss, N.J. and Saebi, T. (2017) 'Fifteen Years of Research on Business Model Innovation: How Far Have We Come, and Where Should We Go?'. *Journal of Management* 43 (1) pp 200-227.
- Francis, D. and Bessant, J. (2005) 'Targeting innovations and implications for capability development'. *Technovation* 25 (3) pp 171-183.
- Gambardella, A. and McGahan, A.M. (2010) 'Business model innovation: General purpose technologies and their implications for industry structure'. *Long Range Planning* 43 (2-3) pp 262-271.

- Gassmann, O., Frankenberger, K., and Csik, M. (2014) 'The St. Gallen business model navigator'. *Working Paper – University of St. Gallen* [Online] Available at: <https://www.thegeniusworks.com/wp-content/uploads/2017/06/St-Gallen-Business-Model-Innovation-Paper.pdf> [Accessed 20 January 2020].
- Gavetti, G. and Levinthal, D.A. (2000) 'Looking forward and looking backward: cognitive and experiential search'. *Administrative Science Quarterly* 45(1) pp 113-137.
- Gavetti, G. (2012) 'Toward a behavioral theory of strategy'. *Organization Science* 23 (1) pp 267-285.
- George, G. and Bock, A.J. (2011) 'The business model in practice and its implication for entrepreneurial research'. *Entrepreneurship Theory and Practice* 35 (1) pp 83-111.
- Gerring, J. (2004) 'What is a case study and what is it good for?'. *American Political Science Review* 98 (2) pp 341-354.
- Ghezzi, A. and Cavallo, A. (2020) 'Agile Business Model Innovation in Digital Entrepreneurship: Lean Startup Approaches'. *Journal of Business Research* 110 (1) pp 519-537.
- Giesen, E., Riddleberger, E., Christner, R., and Bell, R. (2010) 'When and how to innovate your business model'. *Strategy & Leadership* 38 (4) pp 17-26.
- Girotra, K. and Netessine, S. (2014) *Four Paths to Business Model Innovation*. Harvard Business Review. [Online] Available at: <https://hbr.org/2014/07/four-paths-to-business-model-innovation> [Accessed 20 September 2020].
- Godfrey, P.C. and Hill, C.W.L. (1995) 'The Problem of Unobservables in Strategic Management Research'. *Strategic Management Journal* 16 (4) pp 519-533.
- Guba, E.G. and Lincoln, Y.S. (1994) *Competing paradigms in qualitative research*. In Denzin, N.K. and Lincoln, Y.S. (Eds.), *Handbook of Qualitative Research*: pp 105-117. Thousand Oaks: Sage.
- Gross, J. J. (2015) 'Emotion regulation: Current status and future prospects'. *Psychological Inquiry* 26(1) pp 1-26.
- Harreld, J.B., O'Reilly III, C.A., and Tushman, M.L. (2007) 'Dynamic capabilities at IBM: driving strategy into action'. *California Management Review* 49 (4) pp 21-43.
- Huang, F. (2004) 'Social Trust, Cooperation, and Human Capital' Working paper. 1-36. Research Collection School Of Economics. Singapore Management University.
- Helfat, C.E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D., and Winter, S. (2007) *Dynamic capabilities: Understanding strategic change in organizations*. Malden, MA: Blackwell Publishing.

- Helfat, C.E. and Winter, S.G. (2011) 'Untangling dynamic and operational capabilities: Strategy for the (n)everchanging world'. *Strategic Management Journal* 32(11) 1243-1250.
- Helfat, C.E. and Martin, J. A. (2015) 'Dynamic managerial capabilities: Review and assessment of managerial impact on strategic change'. *Journal of Management* 41(5) pp 1281-1312.
- Helfat, C.E. and Peteraf, M.A. (2015) 'Managerial cognitive capabilities and the microfoundations of dynamic capabilities'. *Strategic Management Journal* 36 (6) pp 831-850.
- Hillebrand, B. and Biemans, W.G. (2003) 'The relationship between internal and external cooperation: literature review and propositions'. *Journal of Business Research* 56 (9) pp 735-743.
- Holtstrom, J., Bjellerup, C., and Eriksson, J. (2019) 'Business model development for sustainable apparel consumption: The case of Houdini Sportswear'. *Journal of Strategy and Management* 12 (4) pp 481-504.
- Hossain, M. (2017) 'Business Model Innovation: past research, current debates, and future directions'. *Journal of Strategy and Management* 10 (3) pp 342-359.
- Hove, S.E. and Anda, B. (2005) 'Experiences from conducting semi-structured interviews in empirical software engineering research'. *Conference paper: the 11th IEEE International Software Metrics Symposium (METRICS 2005)*, Como, Italy.
- In, J. (2017) 'Introduction of a pilot study'. *Korean Journal of Anesthesiology* 70 (6) pp 601-605.
- Irvine, A., Drew, P., and Sainsbury, R. (2012) 'Am I not answering your questions properly? Clarification, adequacy and responsiveness in semi-structured telephone and face-to-face interviews'. *Qualitative Research* 13 (1) pp 87-106.
- Johnson, M., Christensen C.M., and Kagermann H. (2008) 'Reinventing your business model'. *Harvard Business Review* 86(12) pp 50-59.
- Johnson, M. W. (2010) 'The time has come for business model innovation'. *Leader to Leader* 57 pp 6-10.
- Jones, O. and Li, H. (2017) 'Effectual entrepreneuring: sensemaking in family-based start-up'. *Entrepreneurship & Regional Development* 29 (5-6) pp 467-499.
- Jurgens, J. (2022) *How startups drive economic recovery while growing responsibly*. World Economic Forum. [Online] Available at: <https://www.weforum.org/agenda/2022/05/how-startups-help-drive-economic-recovery-and-growth> [Accessed 12 August 2022].

- Kallio, H., Pietila, A., Johnson, M., and Kangasniemi, M. (2016) 'Systematic methodological review: developing a framework for a qualitative semi-structured interview guide'. *Journal of Advanced Nursing* 72 (12) pp 2954-2965.
- Karimi, J. and Walter, Z. (2016) 'Corporate entrepreneurship, disruptive business model innovation adoption, and its performance: the case of the newspaper industry'. *Long Range Planning* 49 (3) pp 342-360.
- Kesting, P. and Gunzel-Jensen, F. (2015) 'SMEs and new ventures need business model sophistication'. *Business Horizons* 58 (3) pp 285-293.
- Kim, Y. (2011) 'The Pilot Study in Qualitative Inquiry'. *Qualitative Social Work* 10 (2) pp 190-206.
- Klang, D., Wallnöfer, M., and Hacklin, F. (2014) 'The business model paradox: A systematic review and exploration of antecedents'. *International Journal of Management Reviews* 16 (4) pp 454-478.
- Klewitz, J. and Hansen, E.G. (2014) 'Sustainability-oriented innovation of SMEs: A systematic review'. *Journal of Cleaner Production* 65(1) pp 57-75.
- Koen, P.A, Bertels, H.M.J., and Elsum, I.R. (2011) 'The three faces of business model innovation: Challenges for established firms'. *Research-Technology Management* 54(3) pp 52-59.
- Kor, Y.Y. and Sundaramurthy, C. (2009) 'Experience-Based Human Capital and Social Capital of Outside Directors'. *Journal of Management* 35 (4) pp 981-1006.
- Kor, Y.Y. and Mesko, A. (2013) 'Dynamic managerial capabilities: Configuration and orchestration of top executives' capabilities and the firm's dominant logic'. *Strategic Management Journal* 34 pp 233-244.
- Kraaijenbrink, J. (2012) *Three shortcomings of the Business Model Canvas*. Kraaijenbrink Training & Advies. [Online] Available at: <http://kraaijenbrink.com/2012/07/shortcomings-of-the-business-model-canvas/> [Accessed 18 October 2013].
- Kurti, E. and Haftor, D. (2014) 'The role of path-dependence in the business model adaptation: from traditional to digital business models'. *Conference Proceedings: Mediterranean Conference on Information Systems (MCIS) 2014. Paper 28, Verona, Italy*.
- Laasch, O. (2019) 'An actor-network perspective on business models: How 'Being Responsible' led to incremental but pervasive change'. *Long Range Planning* 52 (3) pp 406-426.



- Lapadat, J. C. (2000) 'Problematising transcription: Purpose, paradigm and quality'. *International Journal of Social Research Methodology*, 3 (3) pp 203-219.
- Lincoln, Y.S., Lynham, S.A., and Guba, E.G. (2011) *Paradigmatic controversies, contradictions, and emerging confluences, revisited*. In Denzin, N.K. and Lincoln, Y.S. (Eds), *The Sage Handbook of Qualitative Research*: pp 97-127. California: SAGE Publications, Inc.
- Loffe, H. and Yardley, L. (2004) *Content and thematic analysis*. In Marks, D.F. and Yardley, L. (Eds). *Research Methods for Clinical and Health Psychology* (1st edn): pp 56-69. London: SAGE Publications, Inc.
- Lumpkin, G.T. and Lichtenstein, B.B. (2005) 'The role of organizational learning in the opportunity-recognition process'. *Entrepreneurship Theory and Practice* 29 (4) pp 451-472.
- Maritan, C.A. (2001) 'Capital investment as investing in organizational capabilities: An empirically grounded process model'. *Academy of Management Journal* 44 pp 513-531.
- Marsh, S.J. and Stock, G.N. (2006) 'Creating Dynamic Capability: The Role of Intertemporal Integration, Knowledge Retention, and Interpretation'. *The Journal of Product Innovation Management* 23 (1) pp 422-436.
- Martin, J.A. (2011) 'Dynamic managerial capabilities and the multibusiness team: The role of episodic teams in executive leadership groups'. *Organization Science* 22(1) pp 118-140.
- Mason, K.J. and Leek, S. (2008) 'Learning to Build a Supply Network: An Exploration of Dynamic Business Models'. *Journal of Management Studies* 45 (4) pp 774-799.
- Masrani, S.K., McKiernan, P., and McKinlay, A. (2018) 'Strategic responses to low-cost competition: Technological lock-in in the Dundee jute industry'. *Business History* 62 (6) pp 960-981.
- Maurya, A. (2012) *Running lean. Iterate from Plan A to a Plan That Works*. Second Edition, O'Reilly Media, Inc.
- McDougall, P.P. and Oviatt, B.M. (1996) 'New venture internationalization, strategic change, and performance: A follow-up study'. *Journal of Business Venturing* 11(1) pp 23-40.
- McGrath, R.G. (2010) 'Business models: A discovery driven approach'. *Long Range Planning* 43(3) pp 247-261.

- Mezger, F. (2014) 'Toward a capability-based conceptualization of business model innovation: insights from an explorative study'. *R&D Management* 44 (5) pp 429-449.
- Miles, M. B. and Huberman, A. M. (1994) *Qualitative Data Analysis*. Thousand Oaks: Sage.
- Mitchell, D. and Coles, C. (2003) 'The ultimate competitive advantage of continuing business model innovation'. *Journal of Business Strategy* 24 (5) pp 15-21.
- Mitchell, D. and Coles, C. (2004) 'Business model innovation breakthrough moves'. *Journal of Business Strategy* 25 (1) pp 16-26.
- Morris, M., Schindehutte, M., and Allen, J. (2005) 'The entrepreneur's business model: toward a unified perspective'. *Journal of Business Research* 58 (6) pp 726 – 735.
- Muniesa, F., Doganova, L., Ortiz, H., Pina-Stranger, A., Paterson, A.B., Ehrenstein, V., Juven, P., Pontille, D., Sarac-Lesavre, B., and Yon, G. (2019) 'Capitalization: A Cultural Guide'. *European Journal of Cultural Studies* 22 (4) pp 484-490.
- Naeini, A.B. and Ahmadvakalaei, S.H.J. (2021) 'The role of dynamic capability on a business model in knowledge-intensive firms'. *Kybernetes* Vol: ahead-of-print pp: ahead-of-print.
- Nahapiet, J. and Ghoshal, S. (1998) 'Social capital, intellectual capital, and the organizational advantage'. *Academy of Management Review* 23 (2) pp 242-266.
- Noor, K.B.M. (2008) 'Case Study: A Strategic Research Methodology'. *American Journal of Applied Sciences* 5 (11) pp 1602-1604.
- Norris, N. (1997) 'Error, bias and validity in qualitative research'. *Educational Action Research* 5 (1) pp 172-176.
- Oliver, D.G., Serovich, J.M., and Mason, T.L. (2005) 'Constraints and Opportunities with Interview Transcription: Towards Reflection in Qualitative Research'. *Social Forces* 84 (2) pp 1273-1289.
- O'Reilly, C.A. and Tushman, M.L. (2008) 'Ambidexterity as a dynamic capability: Resolving the innovator's dilemma'. *Research in Organizational Behavior* 28 pp 185-206.
- Osterwalder, A., Pigneur, Y., and Tucci, C.L. (2005) 'Clarifying Business Models: Origins, Present, and Future of the Concept'. *Communications of the Association for Information Systems* 16 (1) pp 1-25.
- Osterwalder, A. and Pigneur, Y. (2010) *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. John Wiley & Sons.
- Paradkar, A., Knight, J., and Hansen, P. (2015) 'Innovation in start-ups: Ideas filling the void or ideas devoid of resources and capabilities?'. *Technovation* 41-42 (2) pp 1-10.

- Pettigrew, A.M. (1992) 'The Character and Significance of Strategy Process Research'. *Strategic Management Review* 13(1) pp 5-16.
- Prahalad, C. K. (2004) 'The blinders of dominant logic'. *Long Range Planning* 37(2) pp 171-179.
- Riani, A. (2019) *11 Surprising And Insightful Statistics About Start-ups*. Forbes. [Online] Available at: <https://www.forbes.com/sites/abdoriani/2019/10/24/11-surprising-and-insightful-statistics-about-startups> [Accessed 12 August 2022].
- Ries, E. (2011) *The Lean Start-up*. New York: Crown Business.
- Robehmed, N. (2013) *What Is A Startup?* From Forbes.com. [Online] Available at <https://www.forbes.com/sites/natalierobehmed/2013/12/16/what-is-a-startup/#63eaace54044> [Accessed 10 July 2020].
- Rubin, H., and Rubin, I. (2011) *Qualitative interviewing: the art of hearing data*. Sage Publications: Thousand Oaks, California.
- Sako, M. (2012) 'Business models for strategy and innovation'. *Communications of the ACM* 55(7) pp 22-24.
- Santos, J., Spector, B., and Van der Heyden, L. (2009). 'Toward a theory of business model innovation within incumbent firms' (Working Paper No. 16). Fontainebleau, France: INSEAD.
- Sarniak, R. (2015) *9 types of research bias and how to avoid them*. From Quirks.com [Online] Available at <http://www.quirks.com/articles/2015/20150825-2.aspx> [Accessed 4 March 2020].
- Saunders, M., Lewis, P., and Thornhill, A. (2019) *Research Methods for Business Students*. 8th edn. Pearson Education Limited.
- Sayer, A. (2000) *Realism and social science*. London: Sage.
- Schneider, S. and Spieth, P. (2013) 'Business Model Innovation: Towards an integrated future research agenda'. *International Journal of Innovation Management* 17 (1) pp 1-34.
- Seitz, S. (2016) 'Pixilated partnerships, overcoming obstacles in qualitative interviews via Skype: a research note'. *Qualitative Research* 16 (2) pp 229-235.
- Shafer, S.M., Smith, H.J., and Linder, J.C. (2005). 'The power of business models'. *Business Horizons* 48 (3) pp 199-207.
- Sharma, P. and Irving, P.G. (2005) 'Four Bases of Family Business Successor Commitment: Antecedents and Consequences'. *Entrepreneurship Theory and Practice* 29 (1) pp 13-33.

- Shuy, R.W. (2003) *In-person versus telephone interviewing*. In: Holstein, J.A and Gubrium, J.F. (Eds.) *Inside Interviewing: New Lenses, New Concerns*: pp 175-193. Thousand Oaks, CA: Sage.
- Slavik, S. (2019) 'The business model of start-up – structure and consequences'. *Administrative Sciences* 9 (3) pp 69.
- Smith, J.B., Mitchell, J.R., and Mitchell, R.K. (2009) 'Transaction commitment and entrepreneurial cognition: Cross level theory development and implications'. *Entrepreneurship Theory and Practice* 33 (4) pp 815-844.
- Sobh, R. and Perry, C. (2006) 'Research design and data analysis in realism research'. *European Journal of Marketing* 40(11-12) pp 1194-1209.
- Song, C., Luob, J., Hölta-Ottoc, K., Ottod, K. (2014) 'Product Innovation Differences between New Ventures and Incumbent Firms'. *Conference paper: the 74th Academy of Management Annual Meeting*, Philadelphia, Pennsylvania, USA.
- Sosna, M., Trevinyo-Rodriguez, R.S., and Velamuri, S.R. (2010) 'Business model innovation through trial-and-error learning: The Naturhouse case'. *Long Range Planning* 43 (2-3) pp 383-407.
- Spieth, P., Schneckenberg, D., and Ricart, J.E. (2014) 'Business model innovation – State of the art and future challenges for the field'. *R&D Management* 44 (3) pp 237-247.
- Startup Genome (2021) *The Global Startup Ecosystem Report GSER 2021*. Startup Genome.
- Steinfeld, C., DiMicco, J.M., Ellison, N.B., and Lampe, C. (2009) 'Bowling online: social networking and social capital within the organization'. *C&T '09: Proceedings of the fourth international conference on Communities and technologies*, University Park PA, USA on 25-27 June 2009.
- Sturges, J.E. and Hanrahan, K.J. (2004) 'Comparing telephone and face-to-face qualitative interviewing: a research note'. *Qualitative Research* 4 (1) pp 107-118.
- Sydow, J., Schreyögg, G., and Koch, J. (2009) 'Organizational path dependence. Opening the black box'. *Academy of Management Review* 34 (4) pp 689-709.
- Taran, Y., Goduscheit, R.C., and Boer, H. (2019) 'Business Model Innovation – A Gamble or a Manageable Process?'. *Journal of Business Models* 7(5) pp 90-107.
- Teece, D.J., Pisano, G., and Shuen, A. (1997) 'Dynamic capabilities and strategic management'. *Strategic Management Journal* 18(7) pp 509-533.
- Teece, D.J. (2007) 'Explicating dynamic capabilities: the nature and micro foundations of (sustainable) enterprise performance'. *Strategic Management Journal* 28 (13) pp 1319-1350.

- Teece, D.J. (2010) 'Business Models, Business Strategy and Innovation'. *Long Range Planning* 43 (3) pp 172-194.
- Teece, D.J. (2012) 'Dynamic capabilities: Routines versus entrepreneurial action'. *Journal of Management Studies*, 49 pp 1395-1401.
- Teece, D.J. (2014) 'A dynamic capabilities-based entrepreneurial theory of the multinational enterprise'. *Journal of International Business Studies* 45 (1) pp 8-37.
- Teece, D.J. (2016) 'Dynamic capabilities and entrepreneurial management in large organizations: Toward a theory of the (entrepreneurial) firm'. *European Economic Review* 86 pp 202-216.
- Teece, D.J. (2018) 'Business models and dynamic capabilities'. *Long Range Planning* 51 (1) pp 40-49.
- Teixeira, E.G., Moura, G.L., Lopes, L.F.D., Marconatto, D.A.B., and Fischmann, A.A. (2021) 'The influence of dynamic capabilities on startup growth'. *RAUSP Management Journal* 56 (1) pp 88-108.
- Torabi, N. (2020) A startup's guide to disruptive business model innovation. From medium.com. [Online] Available at <https://medium.com/@neemz/thinking-of-disruptive-innovation-for-entrepreneurial-success-3982f9b5e4bc> [Accessed 9 September 2020].
- Trimi, S. and Berbegal-Mirabent, J. (2012) 'Business model innovation in entrepreneurship'. *International Entrepreneurship and Management Journal* 8 (1) pp 449-465.
- van Teijlingen, E. R. and Hundley, V. (2001) *The importance of pilot studies*. In: Gilbert N (ed.), Social Research Update Issue 35. Guildford, UK: University of Surrey. [Online] Available at: <https://aura.abdn.ac.uk/handle/2164/157> [Accessed 20 March 2021].
- Vaismoradi, M., Turunen, H., and Bondas, T. (2013) 'Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study'. *Nursing and Health Sciences* 15 (3) pp 398 - 405.
- Vaismoradi, M., Jones, J., Turunen, H., and Snelgrove, S. (2016) 'Theme development in qualitative content analysis and thematic analysis'. *Journal of Nursing Education and Practice* 6 (5) pp 100-110.
- Winter, S.G. (2003) 'Understanding dynamic capabilities'. *Strategic Management Journal* 24 (10) pp 991-995.
- Winter, S. G. (2006) 'Toward a neo-Schumpeterian theory of the firm'. *Industrial and Corporate Change* 15(1) pp 125-141.

- Wu, L. (2007) 'Entrepreneurial resources, dynamic capabilities and start-up performance of Taiwan's high-tech firms'. *Journal of Business Research* 60 (2007) pp 549-555.
- Yin, R.K. (2014) *Case Study Research: Design and Methods, 5th edition*. London: Sage.
- Yunus, M., Moingeon, B., and Lehmann-Ortega, L. (2010) 'Building social business models: lessons from the Grameen experience'. *Long Range Planning* 43 (2) pp 308-325.
- Zahra, S., Sapienza, H., and Davidsson, P. (2006) 'Entrepreneurship and dynamic capabilities: a review, model and research agenda'. *Journal of Management Studies* 43 (4) pp 917-955.
- Zott, C., and Amit, R. (2007) 'Business model design and the performance of entrepreneurial firms'. *Organization Science* 18 (2) pp 181-199.
- Zott, C. and Amit, R. (2009) *The business model as the engine of network-based strategies*. In Kleindorfer P.R. and Wind Y.J. (Eds.), *The network challenge*: pp 259-275. Upper Saddle River, NJ: Wharton School Publishing.
- Zott, C., and Amit, R. (2010) 'Business model design: An activity system perspective'. *Long Range planning* 43 (2-3) pp 216-226.
- Zott, C., Amit, R., and Massa, L. (2011) 'The Business Model: Recent Developments and Future Research'. *Journal of Management* 37 (4) pp 1019-1042.

## Appendix A – Information Sheet

**Research title:** Understanding business model innovation in start-ups – A dynamic managerial capabilities perspective

**Institution:** Heriot-Watt University / Edinburgh Business School

**Researcher:** Iroro Emmanuel Eradajaye

**Supervisor:** Dr Swapnesh Masrani

**Contact information:** [iee5@hw.ac.uk](mailto:iee5@hw.ac.uk), +47 9583 1672

I am currently conducting a doctoral research project in business administration at Edinburgh Business School. The research aims to understand how business model innovation unfolds in start-ups from the theoretical perspective of dynamic managerial capabilities. To achieve this aim, I humbly invite you to participate in an individual interview, which will focus on your experience with business model innovation in your start-up. Participation is voluntary. Please carefully go through the information presented below to get some context.

Potential concern	Answer
Why is this study being undertaken?	This study is being undertaken with the aim of understanding the views of managers in start-ups regarding business model innovation. The researcher would like to ask you about your thoughts and experience on business model innovation in your start-up.
Is there a reason I have been invited to participate?	Yes, you have been invited to participate because: <ol style="list-style-type: none"><li>1) You are currently a manager in a start-up.</li><li>2) You have some experience with business models and business model innovation.</li></ol>
Must I participate?	No, you are not obligated to participate in this study. If you decide to participate, you are free to change your mind and withdraw at any time. You do not have to provide a reason for withdrawal.

What happens If decide to participate?

The researcher will contact you to agree on a convenient place and time for the interview. The interview will last for about an hour. The location for the interview is completely up to you. It could be at your office, a nearby café, or online (using Zoom, Skype, or Teams).

What exactly will my participation entail?

The researcher will ask you questions about your experience on business model innovation in your start-up. There is no right or wrong answer. Before commencing the interview, a consent form will be presented for your perusal and signature. With your consent, the interview will be audio recorded.

What will happen to the information I give the researcher?

The provided information will form the basis of the data which will be analysed and used in the researcher's thesis. The thesis will be made available to the public. The provided information may also constitute part of the information in articles published in national and international peer-reviewed journals. Note that the information will be anonymised prior to any write up and publication. The provided information will contribute to the findings of this study which will add to the body of knowledge on business model innovation.

Who will have access to the information I give the researcher?

The researcher will have access to the raw data. The rest of the research team (e.g. supervisor) will only have access to anonymised data.



Can I have my contribution anonymised?	Yes. The researcher will make sure that all the information given during the interview cannot be traced back to you.
Can I disengage from the study if I wish?	Yes, at any time without providing a reason. The disengagement will not affect your current position with your company. There will be no repercussions. Participation is completely voluntarily.
If I disengage from the research what will happen to the information I have provided?	<p>If you wish to disengage from the study, you have the right to also withdraw the information you provided, without giving a reason. If that is the case, you just need to contact the researcher.</p> <p>There is room to withdraw your response to the interviews even after the study is completed. However, for practical purposes, you will have until the 31st of August 2022 to do so.</p>
Are there any risks of participating in this study?	None is anticipated.
Are there any benefits of participating in this study?	<p>No direct benefit is anticipated. However, this study may allow the participants to reflect on how they perceive business models and business model innovation.</p> <p>The findings of this study will contribute to the body of knowledge on business model innovation in start-ups.</p>
What happens if there is a problem?	No problem is anticipated. However, please contact the researcher should there be any concerns regarding this study.

Am I assured confidentiality?

Yes. Strict confidentiality is assured. Your identity will be codified, and none of the information you provide will be traceable to you.

Has this study been reviewed?

Yes, this doctoral study has been reviewed by the Edinburgh Business School Doctoral Review Committee.

---

## Appendix B – Consent Form

**Research title:** Understanding business model innovation in start-ups – A dynamic managerial capabilities perspective

**Institution:** Heriot-Watt University / Edinburgh Business School

**Researcher:** Iroro Emmanuel Eradajaye

**Supervisor:** Dr Swapnesh Masrani

**Contact information:** [iee5@hw.ac.uk](mailto:iee5@hw.ac.uk), +47 9583 1672

To ensure that you have received sufficient information to make an informed decision about voluntarily participating in this study, it is important to obtain your written consent. Signing this consent form confirms that:

1. You have carefully read and understood the provided information sheet for this study.
2. You have been informed of the purpose, benefits, and risks of participating in this study.
3. You understand what your involvement entails.
4. Your questions have been answered satisfactorily.
5. You understand that your participation is voluntary, and that you may withdraw at any time if you feel uncomfortable.
6. You understand that the interview will be recorded, and that the information you provide will be treated in a strictly confidential manner.
7. You have the contact information of the researcher in case you need to clarify anything or make a complain.

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **Appendix C – Invitation Letter**

### **An invitation to take part in a research project on: Understanding Business Model Innovation in Start-ups – A Dynamic Managerial Capabilities' Perspective.**

Dear <Name>

I would hereby like to invite you to participate in a doctoral research project which aims to contribute to the understanding of business model innovation in start-ups, with emphasis on the role of capabilities.

Business model innovation in start-ups is a topic that has been relatively understudied. It has not been given sufficient attention by researchers, and I hope that you can help me contribute to the literature and knowledge base by participating and sharing your experience on business model innovation.

I would like to conduct an individual interview with you because you are a manager in your start-up. The interview is anticipated to last between 45 to 60 minutes. If you agree to participate, the interview will be conducted by Iroro Eradajaye, who is a Doctoral Student at Edinburgh Business School. The interview can be done at a convenient time and place of your choosing. Due to the Covid-19 situation, it may be more practical to do it online (via Zoom, Skype, or Teams).

Silicia Technology Incubator is a collaborating partner in this research project. Furthermore, this research project has received ethical approval from the Doctoral Review Committee of Edinburgh Business School.

Please do not hesitate to get in touch if you would like to hear more about this research project.

Yours sincerely,

Iroro Emmanuel Eradajaye  
Doctoral Student at Edinburgh Business School

E: [iee5@hw.ac.uk](mailto:iee5@hw.ac.uk)

M: +47 9583 1672

## **Appendix D – Initial Interview Guide**

Thank you for participating in this interview.

There are no right or wrong answers.

I am interested in hearing your perspectives and experiences.

### Opening questions

- When did you start your company?
- How many employees do you currently have?
- How many co-founders/managers do you currently have?
- What motivated you to start your company?

“Thank you. I will now like for us to talk about your perspectives on business models and business model innovation.”

### Main questions

- Can you describe your current business model?
- How has your business model changed over time?
- What drove you to make the changes?
- What phases or processes did you go through in changing your business model?
- What do you feel are some of the reasons you managed to successfully change your business model?

### Elaborating questions

- How did that feel?
- What did you think about that?
- Can you please tell me more about that?
- Do you have any examples of that?
- What has been helpful to you?
- What has been challenging to you?

### Ending questions

- What did you experience as important in this interview?
- Is there anything that has not been said that you would like to say?

## **Appendix E – Updated Interview Guide**

Thank you for participating in this interview.

There are no right or wrong answers.

I am interested in hearing your perspectives and experiences.

### Opening questions

- When did you start your company?
- How many employees do you currently have?
- How many co-founders/managers do you currently have?
- What motivated you to start your company?

### Main questions

- What does your company do?
- How are you organized? Where do you perform your activities?
- How did you find your space in a crowded field in the Industry?
- How has your business model changed over time? Have you changed how your business operates since you started? Has there been a change in how you deliver value to your customers?
- What drove you to make the changes?
- How has new technology or market environments affected the way you conduct your business?
- Has there been any influence from customers on what you deliver or develop?
- What phases or processes did you go through in changing your business model?
- How did you study your environment or sense opportunities?
- Who are your partners/suppliers/competitors/complementors?
- How is your value chain?
- How has your company finance affected what you do?
- What do you feel are some of the reasons you managed to successfully change your business model? Experience? Capabilities?

### Elaborating questions

- How did that feel?
- What did you think about that?
- Can you please tell me more about that?

- Do you have any examples of that?
- What has been helpful to you?
- What has been challenging to you?

Ending questions

- What did you experience as important in this interview?
- Is there anything that has not been said that you would like to say?

Thank you.

## **Appendix F – Pilot study Invitation Letter**

Dear <name>

I am writing to ask you whether you would like to participate in my research. I am currently doing a part-time doctorate degree in business administration with Edinburgh Business School. My research title is: "Understanding business model innovation in start-ups - A dynamic managerial capabilities perspective". I am done with the course stage, and I plan to start the data collection stage in January 2021. Please find the research abstract attached.

I'm collaborating with a Technology Business Incubator, so I will be interviewing a couple of start-up founders that are associated with them as part of my data collection. However, I would like to do a pilot study before commencing the main study. This is where I thought about you....

The pilot study will help me do a preliminary evaluation of my research theory and research instruments (which is mainly semi-structured interviews). If you don't mind, I would like to interview you (for about 1 hour) about business model and business model innovation in your start-up.

I'll be asking you broad questions focused on this topic (nothing specific about technology, etc), and it will be informal. I know this will eat up some of your precious time, but I will really appreciate it. I can send you some more details if necessary.

Thanks.

Regards,

Iroro



## Appendix G – Results from the individual case analysis

This appendix is an extension of section 7.1 where the themes found during analysis of the individual cases are presented. The context for each theme is further described below.

### Case1 - Firm A

#### **1. The capacity to join and utilize innovation and business networks or environments**

The co-founders of *Firm A* met while they were studying at the university and found that they had similar interest in innovation. It was at the university that they conceived the idea of starting the company, as they brainstormed ideas and capitalized on their prior experiences. In describing how it unfolded, the CEO stated:

*“It started when I lived in Oslo. I’m Swedish by the way...I moved to Norway 5 years ago, and so..em..it started when I lived in Oslo, and had a salesman’s job, and I was thinking I had to collaborate with some smart people and start making apps...that would be very fun...So..then I went here studying, and em...I met some nice people here, and many within IT. And at one party I talked to mr X, my co-founder, and we became friends that day, and we talked about what we had done before, what business ideas and business we had before. I had a small marketing business when I lived in Sweden, and he had a company within IT support, a small company as well. So we discussed that, and we both like innovation”*

*Firm A* started small. First, they were building websites for customers, and then they went on to develop a software application that would make job search easier. They participated in an innovation contest (a hackathon) organized by the university based on this idea. *Firm A* has however evolved into the IT service company that it is today.

Not long after *Firm A* was founded, they became a part of a technology incubator which was close to the university. In essence, they became a part of an innovation environment together with several other start-ups and business partners. This had a positive effect on their development. As the start-ups inspired and learnt from each other. The proximity of *Firm A* to the university gave them access to key human resources (employees) that worked to drive their solutions forward. Some of these employees worked while they were still studying (with a flexible schedule), and they were excited to be a part of a company that sprung out of the university and is being run by fellow students. The student network also helped *Firm A* get some customers that wanted to be active within the student environment.

In addition to delivering IT and consulting services to customers, *Firm A* also had internal projects where they developed their own applications (e.g. a social media site). They outsourced the development work for their internal projects to a vendor located abroad. This was critical for their growth as a company because it helped them deliver high quality solutions at relatively lower cost. Hence, increasing their competitive advantage. They got to know about the vendor to whom they outsourced development work through someone in their network. The same person was instrumental in facilitating the outsourcing process. They currently have a good working relationship with this vendor and have worked with them for more than one year. On describing the situation with how they got to outsource some of their activities, the CEO stated:

*"We looked at the prices and the quality, and we couldn't afford to outsource the work in Norway. So we went and talked to some guys that we had in our network in Ukraine. And then...we have collaborated with them now for one year now...so its very good. And one of our team members have been there before the corona virus and stuff"*

The network of *Firm A* was also instrumental in helping them gain insight to necessary developments in their industry; with respect to competitors, technology, and cost. This was vital to their BMI.

## **2. The capacity for education, learning and the pursuit of personal interest**

Both founders of *Firm A* had technical backgrounds, with keen interest in innovation and product development. The CEO had a strong interest in user experience design for software solutions. In the past he actively designed video games as hobby. On the other hand, the co-founder liked to code. This served as a solid foundation in their endeavour to build an IT service company, as they were able to do and direct the creative work by understanding customers, coming up with ideas, and implementing solutions. Their interest in innovation and product development was what drove them to take a chance in starting their company in the first place. Their journey however was not without failures or disappointments, but they overcame such failures or disappointments by learning from them. For instance, they once lost a bid for a big job to an established competitor. That experience completely changed their mentality and prompted them to value existing agreements with customers even more. They developed the mentality of focusing more on customers and playing an active role in their innovation efforts. This influenced the revenue stream component of their BM, as they

emphasized delivering quality over being cheaper than competitors. As such, they introduced other creative ways of generating review.

The two founders of *Firm A* indulged in continuous learning. They were both pursuing formal university degrees even as they ran the company. The CEO was working towards his masters, while the co-founder was pursuing his bachelor's degree. The skills they acquired through their studies contributed positively to how they ran their company. The CEO described this experience as follows:

*"I have taken my skillset that I got from the economic studies into the work, and I have grown as a leader, and I think I work more systematic now also. I have better control...I mean..the days are stressful with this job. So, I've also learned ways to lower the stress and I have more control, so that's not a problem anymore. That's one of the core things that is most important to me as a person. I've also developed some skills within technology and marketing, and also user interface and user experience...very much in that area...so...em..yeah..."*

The founders of *Firm A* constantly learnt, and they kept up to date with technology and other developmental trends in their industry. They remained open to changes even as they actively used processes and tools such as the BMC to explore avenues to further innovate their BM.

### **3. The capacity to focus on the customer and want the best for them**

This theme reflects a capability that *Firm A* developed over time. Mainly through the innate desire of the founders to deliver quality, the lessons learned from prior experiences with customers, and the need to differentiate themselves for competitive advantage. *Firm A* developed a peculiar mentality to help customers innovate their products or solutions. It became a part of their value proposition. As they put the customer first, they tried to deliver a good blend of quality and simplicity, just like they did in their own internal projects. The CEO described some of the important changes that happened to their BM as follows:

*"I think that's the thing that has changed the most. In the beginning we didn't have the mindset that we should innovate the customer's product, because most IT firms or development studios, they just get the specification from the customer and then they develop it. We like try to make the specification we get from the customer...both cheaper and easier...that's one thing that we have changed...to be competitive"*

The determination and ability of *Firm A* to focus on customers and contribute to their innovation efforts resulted in the innovation of their pricing model. They discovered and adopted creative ways of generating revenue. So, besides making money from doing the development work for customers, they made money through UDI by organizing hackathons. As well as selling add-on functionality and support activities.

#### **4. The capacity to maximize individuality, complementary skills, and internal collaboration**

The two co-founders had a good working relationship; with clear roles and areas of responsibilities in the company. They also got involved in the technical aspects of their projects. The CEO did some of the designing work, in addition to administrative tasks needed to run the company. His co-founder did some of the coding and facilitated other technical aspects. They both had different personalities and characteristics (personal attributes). For instance, the CEO was very ambitious and had the propensity to want to do everything as quickly as possible. While the co-founder was more critical of the ambitions and held back to ensure that the right things were done. They however had similar values and had similar ways of thinking about the business. Importantly, they had clear procedures for dealing with disagreements, and would usually come to consensus through thoughtful discussions and dialogue. They also cared about their employees and showed it. They spent money on their employees to make them happier and keep them engaged. The CEO put it this way:

*"I use a lot of money sometimes on my employees to make them more happier. If you look only at cost...that's unnecessary cost. But it makes more money if I use money on them. So, if I know that this employee needs a keyboard....I can buy a keyboard for him for 300 kroners or I can buy an Apple magic keyboard for 1300 kroners. I will buy him the Apple keyboard because I know that he will be more happy for that...on his set-up. And before corona, we had a lot of events and stuff. On Friday evening, we often come up with....if guys were here after 4 pm...when guys were ready...we gave them beers if they wanted to. We put a lot of money into like...Christmas dinner...the summer party and stuff also...and they like it"*

In addition, they have flexible working hours and allow remote working conditions. Due to the flexible hours, the employees did the creative work better. Because they were not focused on working time, but rather on doing the work when they were in the right mindset. All these contributed to the ability of *Firm A* to come up with ideas based on something they experienced, and then do the market and competitor research together, before developing and testing the concept.

## **5. The capacity to maximize own resources**

*Firm A* actively tried to reduce the cost of their operations. Although they did not hold back much when it was about investing in their employees. Speaking about how they did this, the CEO said:

*"I try to lower cost in a way. Like...I try to lower cost by making my employees work more effective...and I have a way within salary....how I try to maximize the work they do for the salary they get...in a good way. That's one part. But Its not a complete strategy, but its like a mentality that we have here. And...so...I mean...we try to lower rental cost by having smaller offices, for example. We try to not waste money. I have a mindset that 50 kr...5 euros is a lot of money"*

Besides the active effort of *Firm A* to reduce cost, they actively pursued available business options. It is for this reason that the company had two focus areas, one towards working for customers, and the other towards developing and launching their own products. This was beneficial to *Firm A*, as they made money from customer projects, even as they worked to launch their own products and solutions. They developed the capacity to handle and orchestrate these two aspects of their business. For instance, they did not have investors on the consulting side of the business where they worked for customers, but they had external investors who invested millions of kroners (through a separate company where they had shares) on their internal projects (where they developed their own software applications). For their internal projects, they managed to reduce cost by outsourcing some of the development effort.

## **6. The capacity to research, test and validate**

The founders of *Firm A* keep an eye on competitors and tried to keep abreast of the latest technologies, functionalities, and costs. As such they positioned themselves to better address problems or issues for their customers as well as their own projects. On describing how they went about their research activities, and what they gained from it, the CEO stated:

*"We take a look at the competitors, and see if what we are thinking is possible. We get to know how much a function or something will cost, and whether its possible. Basically, we get to know how much it will cost to develop. For example, if you want to develop a very safe Norwegian payment service through bank ID, you have to probably invest 400,000*

*kr.. you know...like that. And then, after, we contact our network and see if there is anyone within that area, to see if we can get any insight from there”*

They did their research, testing and validation in a systematic manner. First, they did research regarding what they had experienced or what they were thinking. Then they decided whether it was worth working more with the idea. Before proceeding to test and validate the idea using mock-ups and basic coding. They then involve a small group of people within the company to make a final decision whether to proceed further or not. This gave them a solid foundation when they went about their efforts in innovation.

## **7. The capacity to apply proven tools and concepts**

The founders of *Firm A* knew about the UDI process and used it to address the problem of helping customers generate ideas for their software application. Their knowledge of UDI resulted in *Firm A* organizing hackathons to gather ideas, which contributed to the innovation of their pricing model. The CEO described how that unfolded as follows:

*“from one big customer that we have...they wanted a new app, and they didn’t know how...how to get the best ideas and stuff. So, we were thinking like user driven innovation. So we arranged a hackathon, for the customer, where we said....we had a price money, and the attendees would like in 48 hours come up with the best ideas to solve this problem. And after that, we had an evaluation meeting, and then we had some...some of those attendees were also great coders. So we hired them also, so they could keep developing their ideas, and so em...yeah...so we make money from arranging a hackathon, then we make money from developing the product, and then we make money from support stuff and add-on features later”*

They actively use the BMC to explore avenues for potential change and innovation. This made their idea exploration more systematic.

## **Case2 - Firm B**

### **1. The capacity to apply learned business concepts**

The founding partners of *Firm B* obtained degrees in business administration from the local university. They took courses on entrepreneurship and innovation. Which was instrumental in their personal development, and in the development of *Firm B*. The partners of *Firm B* started the company while studying at the university. Where they learnt about interesting business concepts such as the BM concept, lean start-up, and customer driven innovation. They obtained practical exposure to the BMs of real companies through the university, aided by professors that were excited about the subject. One of the partners of *Firm B* had the opportunity to teach a course on *service design* for three years at the university. It was a practical course where, together with other students, he worked with different companies and explored different BMs. As part of one of the courses at the university, the partners were given a choice to start a real company. This led directly to the creation of *Firm B* to address the problem of raising capital in start-ups.

Familiarity and background knowledge about BMs and other tools, guided the partners of *Firm B* in setting up their company. It also made them willing to continuously innovate their BM. They continuously explored the consequences of changing certain elements of their BM. This experience was particularly useful when they innovated their BM and moved away from their original crowdfunding platform business. At some point they got stuck, but their background knowledge and exposure helped them understand that they could find a way out. One of the founding partners of *Firm B* describes this experience as follows:

*"I think...about business models and this toolbox I have after my studies...It is really important and it helps you to know what you are doing. To...maybe be familiar with things that happen when you are doing changes and em...Because I think if I didn't have this experience from the studies, I would say that...after we have tried this crowdfunding part and saw that..ok..its not working...then we would not have thought...ok...how can we innovate to use what we have to do something else. So I think to have these tools and theories and stuff...as a basement...It helps to understand that if you get stuck in a corner, there is always a way out...you just have to figure out how to do it. Other people that don't have this experience would perhaps have said.....this is not working, ok, we close our business, we try something else later, or....go back to work....or...look for a job or something"*

The ability of *Firm B* to apply the concepts that they learnt was beneficial to their BMI.

## **2. The capacity to collaborate with other organizations**

*Firm B* benefited from a strong network which paved way for important partnerships in different aspects of their business. Earlier, when they focused solely on providing crowdfunding services, they partnered with crowdfunding platform providers to render tailored services to customers. After the subsequent merger with an established company, a broad range of services were added to their catalogue. However, they continued to partner with key stakeholders to create and deliver value. For example, *Firm B* invested in another start-up that created a unique social media solution. The project was managed by one of the founding partners of *Firm B* who was able to secure partnership with an IT vendor company located abroad to help with the solution development. That was an important achievement. Because they initially struggled to get resources with the required competence to work on the project. One of the founding partners described that experience as follows:

*“Before we hired all those guys down there...we tried freelancers. That didn’t work really well. Because we had some internal issues. People that told us that they know more than what they actually know. So, they kind of said that they will do something, but they wasn’t capable or they didn’t have the right resources to do it...or the right capabilities. But in the time we was raising money for development. I got contacted by a person I once had an interview with, and he told me that he had started to work in a Ukrainian company with 250 employees. We set up a meeting, then we started the cooperation with them”*

The founding partner attributed his ability to get the partnership needed to develop the solution to being open minded, extroverted, and willing to search for new experiences.

After the merger of *Firm B* to a more established financial services company, two older and more experienced partners became part of the leadership team. As a result, *Firm B* was able to get bigger customer projects that they may not have gotten otherwise. One of the founding partners described how the merger affected his position as follows:

*“I think my role is pretty the same. We are four partners in the firm and we are all responsible for the daily operations, and the daily things that happen. If I were to change something, instead of two people that are taking the decision, we are now four. But I have all the same influence now that I had back then. I’m pretty excited about it. The only thing is when we’re working on a project now, I have someone to ask and someone to lean on”*



The merger expanded the offerings of *Firm B* and broadened their customer segment. Moreover, they capitalized on the good reputation of the company they merged with to get more projects. The merger helped the young partners to further develop their experience, as they learnt by doing, while retaining their role and influence. *Firm B* also developed a good collaborative working relationship with their IT vendor company. Which was instrumental in helping them focus on what they are good at, while orchestrating other resources.

### **3. The capacity to learn, identify gaps, and work hard in pursuit of interest**

The founding partners of *Firm B* actively and continuously made effort to learn about their business. They maintained constant dialogue with customers to gather feedback, and they built on those feedbacks. At the early stages of *Firm B*, as they tried to break new grounds with crowdfunding solutions, they actively spoke with public financial departments and lawyers to gain more insight into what they were trying to do. They eventually encountered hinderances with respect to governmental laws and regulations (the country was basically not ready at the time). However, they were able to innovate their BM and make a transition into providing media services. Instigated by numerous requests from customers.

Despite the changed focus of *Firm B*, the partners did not lose their original passion to address fund raising in start-ups through crowdfunding. On returning to the scene after one year, they discovered that things were different. There were now multiple crowdfunding platforms. However, the partners were able to identify gaps. They understood that investors and start-ups needed more knowledge to benefit from crowdfunding. So, they studied the strengths and weaknesses of the different platforms, and further innovated their BM to provide crowdfunding knowledge services. The value proposition was providing customers (investors and start-ups) with enough knowledge to make informed decisions. *Firm B* dropped the idea of building their own platform and went on to partner with different crowdfunding platform providers. They used those platforms to run cases for customers. The goal was to help customers choose the right platform, considering the advantages and disadvantages of the different platforms.

In addition to crowdfunding services, *Firm B* built a broader investor portfolio and developed new services for new markets based on gathered business insight. This was described by one of the founding partners as follows:

*“We were in business, and we saw that a lot of people that got in touch with us....did so because we were just focused on crowdfunding. Crowdfunding don’t fit everyone. So, we saw that were losing a lot of leads by only focusing on crowdfunding. So we decided that we can build our own investor portfolio, and introduce interesting cases for those that don’t fit into crowdfunding”*

The partners of *Firm B* constantly reflected on the current state of their business and where they wanted to be. Even as they made sure to learn from their mistakes. For instance, they quickly turned to outsourcing their solution development when it was not going well with inhouse freelancers. As part of the consulting activities of *Firm B*, the partners got the opportunity to work on cases where they had to investigate the customer’s BM and provide advice. That in turn enhanced learning and the ability to innovate their own BM.

*Firm B* was able to find a good market position compared to competitors. They did not try to win huge projects (or cases) involving huge sums of money. Neither did they work on too many cases at the same time. Because they simply did not have the capacity to do so. They instead defined an area of operation for themselves and tried to provide more personalized services. As *Firm B* learned, they innovated their BM several times.

#### **4. The capacity to be in an innovative environment and network**

The founding partners met while studying at a university located close to a technology park. There were several companies (including start-ups) in that environment. The partners were introduced to a nearby start-up incubator company by the university, at the early stages of *Firm B*’s development. That incubator eventually invested in *Firm B*. As the partners built the company, they expanded their network. Which included several other start-ups and service providers. One of the founding partners attributed most of their success to networking, as he described below:

*“During my first three years I would say the most important thing that I did was networking. Get known with a lot of people. Picking up my phone and try to call. To be around in different seminars and events for start-ups and everything. We have been on a lot of different places like this where people meet. Networking has been really important....I think what happened, it could be a result of networking”*

A previous interaction between one of the partners and someone in his network led directly to a collaboration agreement between *Firm B* and an IT vendor company. *Firm B* got the opportunity to merge with a more established financial services company through their innovation network. Furthermore, they successfully raised funds from investors through their network.

### **Case3 - Firm C**

#### **1. The capacity to be flexible and adapt**

*Firm C* took on the challenge of developing technology to combat natural phenomena like hurricane and typhoons. A lot of funding was required to verify and validate their solution on a large scale, and that proved to be one of the main challenges for *Firm C*. It however, caused *Firm C* to be more flexible and adaptive. *Firm C* showed this by innovating their BM. They established a consulting business unit and introduced new value offerings to various market segments. They provided knowledge services centred around other potential applications of their unique technology. Nonetheless, they did not lose sight of their original focus. This experience was described by the CEO as follows:

*“So, we are trying to get revenue by doing projects in the consulting business. We actually made a name of ourselves here in the country. Our last application for a project was to do a plastic project in rivers. There we have teamed up with several notable organizations, including a very big oil service company and another start-up here in our region. So, it’s a coalition. So now, If people or someone is searching for things on the net that has something to do with our unique concept or technology, they will find us and call us for help. So its more and more hits on possible work actually”*

The willingness of the managers of *Firm C* to search for new experiences, coupled with their unique knowledge and technology, allowed *Firm C* to adapt to their situation.

#### **2. The capacity to capitalize on background, experience, and expert competence**

As previously discussed, the mission of *Firm C* was to mitigate the effect of natural phenomena like hurricanes and typhoons. The idea that led to the formation of the company came through expert understanding of the problem. Speaking about the motivation to start the company, the CEO mentioned:

*“It was...kind of an idea I got in 2005...when the hurricane Katrina was very devastating. It took about 1800 lives. And it was a very big.....one of the ten biggest natural disasters in the world by now. But there was a problem with a very warm sea surface temperature. And I knew that temperature is lower below the sea surface. Its colder as you go deeper, so why don’t we lift it up? I thought...”*

The CEO understood ocean dynamics because of his background and experience, which he described as follows:

*“I have been in the Navy for 30 years. I have also been two years on a submarine. So, I know a little bit about the ocean and how the layers...and how the temperatures...and how the things are working in the ocean. Oceanography its called”*

The CEO did not work much with the idea initially because he prioritized other things. Ten years later, he checked with research institutions and saw that there were no major advancements in that area. Other actors had not managed to come up with the right approach and technology to solve the problem. So, he started working on the idea again.

*Firm C* also benefited from the availability of strong domain competence in the country where it is located. There were several oil and gas companies and research institutions with long experience in offshore operations. *Firm C* tapped into that engineering experience, as some of the knowledge used in the oil and gas business could be applied in their solution development. As a result, *Firm C* entered into an agreement with a local engineering company that helped with various aspects, including technical drawings, models, etc. The expertise of *Firm C* combined with those of their collaborators was instrumental in success. For instance, when they started their consulting business unit, they got a good scientist with special expertise onboard. That boosted their value offering and translated to more revenue. They provided consulting services within plastic collection, noise mitigation, coral reef revival, fish guiding and containment. Essentially, the capacity of *Firm C* to capitalize on their background, experience, and expert competencies, enabled them to sense unique opportunities as they innovated their BM. They offered a unique solution to mitigating the effect of hurricanes and typhoons.

### **3. The capacity to research, learn and test**

*Firm C* actively undertook research in their effort to find the right approach and technology for mitigating the effect of hurricanes. They were able to secure funding from governmental and research organizations, which helped to prove the potential of their technology. They did a couple of research projects (in phases) to; prove the principle, calculate dimensions, perform simulations, and test. Furthermore, they worked towards testing their solution on a larger scale.

#### **4. The capacity to engage stakeholders using the right channels**

*Firm C* had an active presence on social media, and their following continuously increased over time. They had a detailed and informative website which saw a large amount of traffic. In addition, they focused heavily on public relations. They created a business structure in the US and used specialists to help build trust and raise funds. They put out several media campaigns on different outlets (e.g., television), which was effective and helped gain support. Eventually, their brand got popular, to the point that on several occasions, companies in different parts of the world reached out to them to explore the possibility of future collaboration.

#### **5. The capacity to network**

After initially conceiving the idea for the formation of *Firm C*, the CEO did not take any action for some years. However, he kept in touch with some acquaintances working at a research institution. Through this relationship, he maintained knowledge about developments and technology within the field, which was instrumental in the development of *Firm C*. Essentially, networking played a key role in the success of *Firm C*. Through networking *Firm C* got relevant information that helped them receive several grants and funding from different governmental and research institutions.

As *Firm C* grew their network nationally and internationally, they got collaborative partners. The CEO stressed the importance of networking as follows:

*"Networking is very important. I take that very seriously and I have still contact with the first ones I contacted. I try to keep the network growing all the time. We have network now with...there have been some hurricane prevention...hurricane stop project earlier on in 2009. We have been able to contact all of them. People that have already given up...it's another technology of course...another way to do it...but they have given up. Yeah....I think we have a bigger and bigger network"*

Through networking, the CEO was able to rekindle the interest of some earlier actors in this space, some of whom *Firm C* collaborated with.

#### **6. The capacity to collaborate and be visible in partnerships**

The CEO of *Firm C* had a sharing and giving mentality. That was one of the things he attributed to the success they have attained, as he described below:

*"I think its focus on sharing and collaboration, and giving. Be open and not afraid of losing the technology. Because we don't know...there may be another company coming up...ok...we can do this they can say. It wouldn't help. Because you have to convince the right people. You have to have the license to operate from normal people. People have to want it, and the government have to want it. So its more about the process than the technology. That's our focus. To not be afraid of giving information, and trying to convince people that we are just nice guys, that we are not here for the money to get rich"*

The CEO of *Firm C* did not see the need to hoard information, despite the effort and hard work it took to develop their solutions. Because he believed that sharing and giving results in receiving. *Firm C* actively looked out for opportunities to collaborate with competitors and complementors. On the consulting part of their business, they worked with multiple partners on different projects. For example, on one of their projects regarding plastic collection in rivers, they teamed up with five different organizations: two research companies, a service provider to the municipality, a big oil and gas service company, and a start-up focused on environmental issues. That contributed to the popularity and favourable reputation of *Firm C* in the country. Furthermore, they had collaborative agreements with some companies that deployed similar technology to smaller problems. On some occasions, *Firm C* gave away customer requested projects to partnering companies, due to insufficient capacity (including time and resources) to fulfil the request. *Firm C* also managed to secure partnership with an external investor group which took them a step further.

*Firm C* worked to engage big research companies in the world regarding the hurricane problem. They developed project and research plans and worked to get research companies in the US and Europe to participate in the studies.

#### **Case4 - Firm D**

##### **1. The capacity to focus on own strengths**

*Firm D* had a unique ability to produce high quality data. That was one of their key strength compared to competitors. The CEO described it as such:

*"A lot of our competition is like people that have flown helicopters and stuff, since their childhood, and now they want to make a living off of it, right. But we don't have that. We just wanted to capture good data. Its not about the flying, its about the data. And I think that's been a forte of ours from the beginning. That its all about the data. Its not about that its so cool to fly around. Its like no....but we are getting good actionable data"*

*Firm D* competed against some large companies in their industry on several occasions and was preferred because of data quality. That was instrumental in their BMI, as they changed their value proposition and customer segment to focus on projects where data quality is a priority. Over time *Firm D* built their reputation for delivering good service. As a result, they had returning customers. Including some that had gone out to try other companies. As the founders of *Firm D* built the company, they did not obsess with what other companies were doing. The CEO put it this way:

*"We stay in our lane, and make sure that we provide a good service, right. And then we are getting feedback, especially from the big contracts we are doing, where we are not the only supplier, like we are getting feedback that our data is supreme compared to the other suppliers, right. So, ok, that's how it should be"*

*Firm D* has a quality mindset and showed interest in the success of their customers. As a guiding principle, they would rather under promise and over deliver, than make big promises and not follow through. Their attitude towards quality was noticed by customers, and the customers returned. Even as *Firm D* focused on their key strength to differentiate themselves in the market, they considered customer input and collaborated to come up with the best approach for every job.

##### **2. The capacity to network and be in a network**

The CEO of *Firm D* met his co-founder through a common friend. The CEO described how they met as follows:



*"We actually met each other at like a part-time job. We had a common friend. Long story. We had a common friend. He has a friend who ran a temp agency. But he didn't really have a lot of people in the temp agency. So, every time he got a job, he's like "oh...does anybody know anybody? He didn't really have people working for him. So, it was like a mad scramble every time he got a job....to find some people to do the job. So, he was looking for people to do service jobs at breweries. And me and the guy I co-founded with, we got picked out. So we did that job for a couple of years. On like weekend, and stuff. So, we got to know each other there. He got hired by the company, and then he was laid off, and then he came to me with the idea about drones...like...this drone thing...that's going to go places...do you want to start a company with me?"*

*Firm D* was in a start-up incubator environment together with other start-ups. That was helpful in their development. Through their association with the start-up incubator, they got help on several technical aspects of running their company. Regarding, e.g., laws, regulations, available governmental grants, etc. They also had the opportunity to exchange ideas with other start-ups in their network.

The CEO of *Firm D* actively participated in networking and knowledge sharing events. That was how he met the third co-founder of *Firm D*, who was very skilled in flying drones. The CEO is comfortable sharing ideas and being around people, and has no problem with public speaking (e.g., at conventions or other formal speaking events). That was critical in their effort to make the market realize the full potential of their offering. The ability of the CEO to make a good impression in public, helped *Firm D* innovate their BM by changing their customer segment. *Firm D* was able to demonstrate good return on investment (ROI) with their approach and how it complimented existing practices.

### **3. The capacity to build a solid foundation through planning and research**

The founders of *Firm D* took time to do necessary planning and research before engaging in major activities. For instance, when they started, they travelled around Europe, visiting different companies to figure out what type of drone use. The time they took to get some major decisions right gave *Firm D* some stability. Things mostly went according to plans. Most components of their BM remained unchanged. Except their customer segment. Over time, the operational cost of *Firm D* reduced. Their system was functional and capable of delivering their services to the required standard. As such, they could focus more on maintenance rather than rebuilding.

#### **4. The capacity to capitalize on unique and complementary skills**

The founders of *Firm D* exploited their unique and complementary skills to provide good service quality to customers. For instance, the CEO had a background in photography. The second co-founder was very structured, and the third co-founder was a good pilot. They all contributed with their prior experience and expertise. For every job that *Firm D* did, they operated with different specialists that had clearly defined roles. For instance, one specialist was to collect the data, another one to fly the drone, and another one to do the back-office operations. *Firm D* acknowledged the need for competent people and did not rely solely on advance technology. The CEO attributed this to their competitive advantage as he described below:

*“We have competed against companies that use the same systems that we use. And they are still not able to get the quality that we get, because they don’t understand photography. So, there are two companies in the world....the two largest companies in the world right now, and have been for years. They also have...fly the same drones that we do. They have 2-man teams, and we still beat them every time on data quality. Because the person behind the camera is an engineer. So, that guy, he knows what he is looking for, he knows what he wants to look at. But he has no idea how to get a good photo of what he want to look at. So, no question, that’s our strength. And our 2-man team are always one pilot and one photographer. And sometimes we need an engineer, but then that engineer is standing next to us, looking at a separate screen telling us what to do. But he is not capturing, he is not collecting any data, he is just saying what he wants. And a lot of companies don’t get that. So, that’s the secret sauce”*

Essentially, *Firm D* managed to capitalize on the unique and complementary skills of their human resources to produce good data quality for customers. Hence, they retained customers in the target segment.

#### **5. The capacity to adapt**

*Firm D* paid attention to new developments in their industry, with respect to; suppliers, regulations, and available technological functionalities. They continuously worked to improve their systems accordingly. They built new equipment for specialized tasks and improved their main equipment for data collection. Which Improved their capacity for various job types. Furthermore, they worked on adding artificial intelligence capabilities to their offerings.

## **Case5 - Firm E**

### **1. The capacity to utilize own network**

The CEO of *Firm E* benefited from ideas that came from his own network in several ways. He recounted one episode as described below:

*"I had this girlfriend at that time, she was a nurse working in Aesthetic medicine, and one day she actually asked me.....hey, I need a consent form!. I was like, ok, consent form for what? She was like we need a consent form for a medical procedure. And she was asking me If I could make her one, and I was like, shouldn't you be able to make your own by yourself? She was like no, I don't know what I should write, I don't know what the content should be. I was like, hmm, that's weird. Then I actually went to a clinic, and said to someone, 'my girlfriend, she works as a nurse, and she needs a consent form'. And then they gave me a consent form, and I just looked at it. It was so bad. It was translated from English to Swedish, and then from Swedish to Norwegian. So, the language was really boring, it was bad, and I thought....for a client to have received that form, they would not understand anything. So, then It just popped in my head, maybe this could be something. And I have to be honest. All my life I have been having this vision or dream to start something for myself and do something for myself. I'm not that too good with authorities. So, I want to be my own boss, and create my own success"*

During the early stages of *Firm E*, the CEO pitched his ideas to contacts in his network for feedback and advise. To grow his company, he needed additional human resources. So, he asked around in his network, and got introduced to several people. Eventually, he found two people that he decided to work with in building the company. One of those people previously worked for a large IT company and was introduced to him by his childhood friend. Essentially, the key human resources of *Firm E* were obtained through the CEO's personal network. He described another example as follows:

*"we have this guy. His name is Y, he is an older guy. He has a lot of experience in business. He's been working in corporate finance for many many years...and two years ago I had a meeting with him....a really really good guy....and he wanted to take part in our journey. So, he joined the company....last year. So, we got a new team member.*

*The way we met is really crazy,...I knew someone else who asked me about a software called Trello. It's a project management tool. And I recommended it him. Then again he*

*recommended it to his friend called Y. So, and then suddenly, this guy Y called me and was like yeah, I heard that you are an expert on Trello.....you know....I'm not an expert on Trello.... And he was like can you come down to my office and show me? So, I went down and showed him how to use Trello. And he was like what do you do? I was like I have this little start-up. He was like, ok, that sounds cool. A coincidence once again"*

The CEO of *Firm E* believed in building strong relationships with his customers. Furthermore, he drew inspiration from a friend who owned an importation business.

## **2. The capacity to care and focus on the customer**

*Firm E* exhibited hard work, drive, and commitment towards their customers. They showed their customers that they are valued and taken seriously. Moreover, they did their best to be available for their customers to ensure that they were satisfied. Essentially, they worked to maintain good relationships with their customers. They considered feature requests from customers in their development, especially when many customers were making similar requests. At the same time, *Firm E* tailored their approach to different customers in their customer segment. For instance, they sometimes adapted their solution to fit the routines of specific small and large clinics. The CEO described it as follows:

*"For instances, take a big clinic with twenty employees, they have like a different work flow, they have like a different set of routines, from a little clinic with one employee who started yesterday. So we have to like....how should I say this?...make Firm E fit into their daily routine. How can I do that?...you have to like play it down to the small clinic, because the small clinic is like....no, I don't need that...I'm a small clinic. I try to say that many of my customers are small, and that Firm E is just like them. I try to say that...that I know the struggle. And for the big clinic, I look more on money, what they are earning, the value, their time.... So, we have like a different set of strategies regarding to what kind of customer it is"*

In the same vein, *Firm E* showed understanding and consideration to customers during the corona virus pandemic by postponing / freezing payment from smaller clinics.

The founders of *Firm E* continuously thought of ways to add more value and provide better services to their customers. This started at the early stages, when the CEO went around knocking on doors to do market research and look for potential customers. Even though it was difficult to find people willing to give their time, he pushed on through commitment. The CEO

always had the drive to make something lasting and meaningful. That translated to the kind of service that *Firm E* provided to customers.

### **3. The capacity to manage resources and exploit on own strength**

*Firm E* focused on developing one solution for customers; and that was *consent forms*. They aspired to be the best at it. In so doing, they tried to make the best use of their human and financial resources. Especially because they did not have any external investor. Team members contributed with what they were good at. Furthermore, *Firm E* had a flexible working culture which helped to get the best out of their employees. The co-founders all had different backgrounds, but together they moved the company forward by utilizing their complementary skills. For instance, when the CEO started the company, he got one of his childhood friends who he knew was more structured to be his co-founder. That was because he realized that he would need some structure to start a business. The working relationship between the co-founders was good, and they had clearly defined responsibilities. Moreover, they put in place a system for decision making, to guard against diverging ambitions for the company.

*Firm E* did not actively try to get investors. The founders spent their own money and time. Their belief about the firm's mission made it easier to do so. As a result, their cost was low. The CEO described this experience as follows:

*"Yeah, I think its like...when we first started we had this vision. We just get an investor and everything will be fine. But along the way, you learn a couple of things. Its not that easy just to get an investor, and the investor wants a lot of return. So, we spent a lot of our own money, basically. And for the most of all, we spend our own time. So, the cost was pretty low at the beginning. We have an IT guy in our company. Who has done like all like development, so we didn't spend any money there. So its like minimal, and the small piece that had to be paid for, we took it from our own pocket"*

The limited resources of *Firm E* encouraged the founders to try to get things right the first time. Even as the founders invested in their company, they tried to manage their private economies better. Through carefulness and not engaging in activities with high financial risk. The need for *Firm E* to better manage their resources also caused them to innovate their pricing model to generate more revenue.

#### 4. The capacity to learn and adapt

During the early stages of *Firm E*, the CEO took time to do some groundwork. He did market research and went about knocking on the doors of several clinics to ask questions and learn about their workflows. He then built on what he learnt about potential users and created a solution. Besides learning about the users, the CEO took time to understand the industry, with respect to applicable rules and regulations. For instance, *Firm E* proactively put together good routines to comply with the General Data Protection Regulation (GDPR). Overtime, through further learning, the CEO determined that it was best for *Firm E* to focus on their niche solution and market. Resisting the temptation to include more solutions, which he thought would attract unnecessary attention and competition. Some of the other learning experience of the CEO was described as follows:

*“As I told you earlier, I don’t like numbers. I don’t like math at all. But of course I had to get some kind of relationship to it....or a feeling of what the numbers actually mean. That’s really important for growth and stuff like that. I also learnt a lot of technical solutions, how to build, how many hours it actually takes, how complex stuff are. I also learned like the really really really important thing.....about being there for your customers. Because I was like.....If I tell you something once, I take it for granted that you know it. But a customer may have so many questions, and in many many cases they don’t ask the questions if they have something they are wondering about. Or they just don’t dare, because they don’t want to be stupid, so they don’t ask. So, I have learnt to be really really close to your customers. Its so so important. Like, when you think you have done a good onboarding, you haven’t done enough. You have to call them the next day. Like, don’t be afraid to pick up the phone and call your customers”*

*Firm E* constantly learnt from customers and considered their ideas for further development. That paid off in their solution development effort, as they better understood customer concerns and identified missing gaps. As *Firm E* learnt and grew, they got more confident in their solution. They considered extending their *consent form* offering to other branches within the healthcare industry (e.g., physio, dentistry, etc).

## **Case6 - Firm F**

### **1. The capacity to capitalize on unique technical competencies and resources**

The CEO and founder of *Firm F* previously worked with technology development. He had some experience with offshore vessels and operations, with a background in dynamic positioning. The direction he took with *Firm F* was based partly his experience, and he used an analytical approach to figure out what needed to be improved. The experience of the CEO was instrumental to the growth and development of *Firm F*. The CEO got heavily involved in planning and execution, and actively participated in the solution development. Although he relied on specialist to do a lot of the technical work (e.g., 3-D drawings, hardware related, etc.). *Firm F* got access to senior business expert through a governmental agency that promotes innovation. So, the CEO also relied on consultants for advice on different aspects of the business. Some of whom had extensive experience as entrepreneurs. Furthermore, *Firm F* got good resources specialized on welding techniques to work on their vessel.

The solution that *Firm F* put together was quite complex. They put in a lot of work and were able to get a patent during the development. The CEO described how it affected their competitive advantage as follows:

*"our focus is mainly inwards...at least for now. Just getting the development phase. And the reason why we are kind of like not really interested in the competitors, are the fact that we feel like the probability of the competitors being able to deliver the value that we can deliver is....very very minor. Because of the technical complexity, and the limitations in...you know...You can of course do stuff in many different ways, but we feel like we've kind of closed...and we have kind of put up barriers in terms of patents, and in terms of the development hours that we have put in, it is quite significant. So, we don't really see that bigger organizations will have the resources actually...to kind of do all of the iterations needed. Because, you know, when you have larger operations or big companies, yes they have a lot of resources, but they are not really equipped to do this agile iterations, as minor companies or small companies...start-ups. So, we feel like we have the advantage...at least there. If in no other way, but that's the one advantage we have"*

The technical complexity of *Firm F*'s offerings put them in a unique position in their industry. They did not have many direct competitors, but rather complementors.

## **2. The capacity for commitment, flexibility, and agility**

*Firm F* had a flexible organization. They did not have heavy processes, reporting structures, and overheads. At the same time, they were agile and avoided unnecessary formalities. For instance, reporting on every single change after every iteration. *Firm F* valued self-driven employees. As a team, they worked in an informal but efficient way. The CEO acknowledged that stamina was important in their endeavour. Because even though they did their best to plan, they could not really predict much. He acknowledged the difficulties they encountered along the way, and how they just needed to overcome them. That way of thinking shaped the mindset and culture of *Firm F*, and it helped them find trusted collaborating partners. The CEO described an experience with one supplier as follows:

*“Yeah, we burnt a lot of fuel on making a few wings....because this is a sail boat, and its kind of like for using wings. So, we used a really really bad supplier in that area. He was more into talking and invoicing than doing any work. So, we burned tremendous resources on that guy. And we ended up with a product that we can’t even use....we had to scrap it really. And that’s a lot of money. I just have to say, I think that’s maybe the most valuable kind of experiences, because then you also know which companies and which resources you want to keep on working with you know. And making any fuss about it is usually not the way to go, because its just burning even more resources out of the company. So, just forgive and forget, that’s kind of the...I guess the quickest approach. And just moving forward instead of looking back all the time”*

The CEO learnt a valuable lesson from this experience, and *Firm F* went on to collaborate with key resources that moved their solution development forward.

*Firm F* continuously sought out mutually beneficial partnerships with other companies to innovate their BM. For instance, they initiated dialogue with an aerial drone company to explore areas of collaboration. *Firm F* innovated their cost structure and made it leaner. Where possible, they used standardized, off the shelf components for their solution, which were cheaper and readily available from different producers. That was to avoid depending on one producer. In some cases, *Firm F* was forced to develop their own components. For instance, they developed a hybrid gear box. In addition, they innovated their revenue model to offer a complete service package to customers, rather than renting out their systems. This was based on internal discussions and customer dialogue.



### **3. The capacity for a personal network and presence in an innovative environment**

The CEO of *Firm F* maintained a good relationship with his former boss. That relationship availed him the opportunity to start *Firm F* while working fulltime at his previous job. His former boss eventually came on board as one of the main investors, owning fifteen percent of the company.

*Firm F* had their office in an environment ran by a technology incubator. It was an innovation environment comprising of other start-ups, and there was a university close by. That benefited *Firm F*, because they were able to share ideas and learn from other start-ups. Moreover, they got most of their employees through that innovation network. In addition, *Firm F* got the opportunity to collaborate with other organizations within that innovation network. For instance, they worked on a project with the university regarding the development of an autonomous sailboat.

## **Case7 - Firm G**

### **1. The capacity to utilize accrued experiences and education**

The CEO of *Firm G* obtained his bachelor and master's degrees from renowned business schools. He also previously worked in a strategic position at the corporate level of a large multinational media company. Where he learnt how to drive change, sell solutions, and navigate complex environments with multiple stakeholders. He was essentially an intrapreneur, and described some of that experience as follows:

*"I was part of strategy and digital transformation which was a new set-up...it was a new team. So, I came in as employee number 10 maybe, and we ended up being 750 employees within that division when I left. So we were kind of intrapreneurs. So, within a big company, we were tasked to kind of change the company from within. And we failed on a lot of different initiatives, but we also managed to kind of change the culture from within"*

On the other hand, the co-founder of *Firm G* had a technical background. He was responsible for all technical aspects of the solution offered to customers. The co-founder came up with the idea for the solution based on request from friends. He was able to put together a quick prototype using a unique user identification system to demonstrate the concept. The identification system was based on the application programming interface (API) of an established company. That got the attention of the company that owned the API, to the benefit of *Firm G*.

The co-founders of *Firm G* worked together to create a robust solution that helped their customers (and the authorities) better manage the corona virus situation. The CEO used his experience to drive the solution development. He managed the necessary iterations and steered their failures and successes. Moreover, he played a vital role in decision making in the face of uncertainty. Which proved important to their BMI. Especially when they changed their customer segment.

### **2. The capacity to learn, experiment, and adapt**

The solution that *Firm G* offered their customers was related to the coronavirus pandemic which was not previously a common everyday experience. So, as *Firm G* took decisions regarding solution development, they continuously learnt and adapted. The CEO described how they approached decision making as follows:

*"I don't think anyone has ever been in the kind of situation like us, to be honest. Or maybe they have....Its a completely new environment....its a pandemic. So I don't think any one of us have experienced that before. So its kind of treading new waters...or whatever you call it in English. You kind of have to throw away the playbook a little bit, and just think new, and be open to pivot when necessary. The way we've done it is formulating hypothesis, testing them, see if they work, if they don't, move to the next hypothesis, basically. So its kind of problem solving, I would say. So, of course we are influenced by the market, by our clients, by our users, and everything. But we gather that, form our own hypothesis, and then we move on"*

As the founders of *Firm G* built their solution, they tried different strategies, without knowing which one was going to be successful, as described by the CEO below:

*"We tried to partner with two other....what should I say...covid businesses. So, one was a company that counts customers in and out of a store with video cameras and an algorithm. Because at one point a lot of businesses got restrictions on how many customers can be in one store at any given point of time. So, we partnered with this company that does that, and did a pilot in my hometown, at a premium clothing shop. Where you could also check-in with our solution in the same kind of tv window...or ipad window. We haven't really gotten that much customers based on that project. So, we've kind of just put that on life support and moved ahead. And another type of project that we tried was working with a vendor that offers some type of solution that is sprayed upon you that removes particles....removes germs, basically. But they had two products. They had this tunnel where you could walk through, and then you were sprayed this solution, and then you would be virus free. And then the other solution was just kind of a wall where you had a temperature scanner...like a thermometer, and then also had an antibac solution, but it also had our QR code on that station so that you could check-in while you took your temperature or wash your hand. We haven't.....they were quite late into the market, so they only had their solution ready in January of 2021. I think they were too late to be honest....in the market, so we haven't really received any traction"*

The founders of *Firm G* had the mindset that it was about the journey, not the destination. So, they were willing to learn and gain valuable experience along the way. They recognized the need to be extremely flexible and always ready to innovate their BM. *Firm G's* first big customer was a student organization from which they gathered useful feedback that helped move their solution forward. Initially, they attempted to go after the restaurant market, because that was where the government wanted more control. Not too long after, they

realized that two competitors already took that market. So, they pivoted to a more generic solution for other market segments. *Firm G* once offered their solution for free to an Olympic committee, who again distributed it for free to soccer clubs to get people to experience the solution. The goal was to induce interest in the commercial solution from people in various business sectors.

*Firm G* recognized the need to adapt. So, they constantly reviewed their BM to explore ways of applying any lessons learned.

### **3. The capacity to be present in a personal, professional and innovation network**

The CEO of *Firm G* had an extensive network in the business community. Mainly because of the role he had in his previous job. That network proved very useful to *Firm G* as the CEO described below:

*“when you’ve worked in a large company....in a strategic position like the one I had, where I was in daily contact with a lot of different areas within the company...you get quite a big network. And I’ve used that network to both pitch the company, pitch the solution, and also try to see if its possible to get investors, or just general advise actually. So, in some ways, it helped us. For example, through the....the car dealership...I knew the head of communication. So when we signed the deal with them, I got them to be part of the communication strategy. Where we actually went to a local newspaper....or we sent a press release with their communication department. So, we got that picked up by local newspapers, and also by.....a car magazine. They wrote an article about our solution...that we partnered with the car dealership...one of the largest car dealers. And then we got a lot of different clients within the car space. And I knew that head of communication from my previous job, basically”*

The personal network of the CEO was also instrumental in the journey of *Firm G*. The CEO met his co-founder through his brother in-law who was managing a start-up incubator. *Firm G* eventually joined that incubator and became part of an innovation environment together with other start-ups. The incubator helped drive *Firm G* forward by believing in them, sponsoring some of their activities, and supporting with some equity. The incubator provided access to a network of partners for various things such as: accounting, marketing, website design, etc. In addition, the Incubator provided advice when needed. *Firm G* benefitted from being around other start-ups, learning and sharing ideas.

#### **4. The capacity to exploit own strength**

The founders of *Firm G* used a bootstrapping approach in building their company. They developed their solution themselves. In the process, they learnt to effectively exploit their complementary skills. The CEO took care of the business aspect, while the co-founder took care of the technical aspect. *Firm G* once tried to get a salesperson onboard, but that was not successful, which motivated the founders to fully utilize their own skills. The CEO described that experience as follows:

*“in terms of team members, its only me and my co-founder. Right at the start we tried to get in a sales person, but we needed that person to start straight away. So, we didn’t do any kind of big recruiting push. We used our own network to try and pin point a sales person. And we had one person in for interview, but since we couldn’t actually pay that person, we could only offer equity, he wasn’t interested. That meant that we had to kind of change our strategy a bit, and rely much more on word of mouth and google ads. And cold calling from me”*

Having no external investors made *Firm G* more flexible and agile with regards to decision making, which was critical in their ability to innovate their BM. The operational cost of *Firm G* was low, and the technology they used was widely available. However, *Firm G* implemented a unique method of user identification, which was one of their main differentiators from competitors.

## **Case8 - Firm H**

### **1. The capacity to capitalize on professional background and experience**

The two co-founders of *Firm H* had different and complementary competencies that worked well together in their company. The CEO (one of the co-founders) was an IT professional, while the other co-founder had extensive experience in the sector. Specifically, she worked for ten years with the organization that was transformed into *Firm H*. With *Firm H*, the co-founders digitalized the former offerings, included additional offerings, and created a system that was easier to use and manage. The CEO described that experience as follows:

*“So this has been organized from earlier in a physical...like a discount card that you got from your municipality, that you can take to the movies or take to the swimming hall, or other places. But last year, we started the process to transform this into an App,...to make it more administrable easy, and to make it more accessible for everyone, and easier for the municipalities to use. So, that’s our business idea”*

Both co-founders built on their experience from the previous organization in the transformation of *Firm H*.

### **2. The capacity for commitment and focus on the customer**

*Firm H* is a social enterprise that was looking to make an impact on society by contributing to the fight against poverty among children. They created a solution that made it easier for their customers (the municipalities) to offer leisure activities to children from poor family backgrounds. *Firm H* actively tried to stress the importance of their solution to the municipalities. That was not always easy. The CEO described some of the challenges encountered as follows:

*“Its to get them to understand the value of buying a system that...it doesn’t create any monetary value in the municipalities. It creates a social value. And it’s a preventive measure to take. So that....when they buy the system and...It has been a lot of research about poverty among children, and its possible that this creates ground for them to end up in the wrong environment, and continue on in life with crime and drugs, and other non-healthy things. So that they will be a liability and cost for the municipality in the future. So it is to get them to understand that when you buy this system for 50 thousand now, you will save 2 million in 10 years. That’s the....its not always easy to make them understand this. To convince them of something that you actually just don’t know”*

*Firm H* however took additional action. First, they developed the mentality of taking their customers more seriously. Then they made their solution more accessible and easier to use, while adapting to different characteristics of their customers. During the development of their solution, they shared the MVP with customers to gather feedback. After which they tried to accommodate functionalities that were talked about the most. *Firm H* ensured that their customers were onboarded properly and well trained. Furthermore, they worked hard to maintain a good relationship with their customers. In some cases, they explored the work processes of customers to see how their solution may combine with complimentary solutions from other vendors to add more value.

### **3. The capacity to collaborate with partner organizations**

*Firm H* outsourced the development of their solution to a partnering IT vendor located abroad. That was a cost efficient and effective approach that improved time to market (TTM). Which was important in ensuring continuity because of the transformative phase that *Firm H* was in. On several occasions, *Firm H* tried to partner with firms that target their customer segment with complementary solutions. They did that as a sale or market entry tactics, not necessarily to integrate the systems. It was a way to get firms already familiar with the market to speak positively about them. *Firm H* also contacted the research department of a local university to get an overview of available research on child poverty, and to do any necessary investigation. They did that with the hope that formal research would be important to back up their suggestions to customers.

In addition to partnering with vendors and complementors, *Firm H* partnered with an established investment company to further develop their overall BM and their standing as a social impact company. The CEO described that experience as follows:

*"We have also been invited to join....social impacting organization...we have been invited to join them in this program called "Impact Start-up". So we got picked out....of all the companies that applied....we are one of 10 companies that are into this program. So, over the months, from now in February, and until June, I think. We will be a part of that system, and have business developers, and we are working very thoroughly towards social impact management, and measurement of the social impact of our business"*

The CEO described how they got to know about the program as follows:

*“We are always kind of actively or passively searching for information and things regarding social impact, and programs like this. I think I stumbled upon some information about it, in some way. I don’t actually remember specifically where I found it. But I thought this was probably something good to apply to, and we got it.*

*We were invited, first, to a boot camp with 30 companies. And after one week of that, we got picked out to be one of the 10 that would be a part of the program. It’s a great value to us. Because they are a big robust company, that when you get approved by them, you can get a lot of credit with possible customers and other people”*

*Firm H* actively sought partnerships that would be mutually beneficial, even as they expanded their offerings and tried to expand their customer base. They were open to becoming part of a larger platform solution with other companies (e.g., competitors, complementors, service providers) to aggregate useful information in the municipality to the residents.

#### **4. The capacity to learn, research and plan**

The founders of *Firm H* did research and planning for about one year before they started the company. That was described by the CEO as follows:

*“We did a bit of planning and a bit of research with municipalities. And we had the process in advance of this start-up. So, we knew this is actually something the municipalities wants. We knew that its something the municipality wants to pay for. So, we did our research in advance for this. We also applied to a governmental innovation agency to get some funding. So, we got funding from them. We got some investors to pay...to invest some money in this, so we can develop the minimum viable product”*

As part of their research and planning, *Firm H* actively engaged in dialogue with potential customers to inquire about work processes, existing systems, and complementary systems. When their MVP became available, they were sure to gather feedback. *Firm H* continued to engage customers even after launching their solution, with the mindset of continuous innovation. *Firm H* constantly learnt about different aspect of the business as they developed. The network around them was helpful in their learning. For instance, *Firm H* had a successful entrepreneur as the leader of their board, and he was like a mentor to the CEO. They actively exchanged ideas, and discussed business related issues, which helped the CEO to develop in his role.



## **5. The capacity to pay attention in a personal, professional or innovation network**

The development of *Firm H* was impacted positively by the personal and professional network of the co-founders. Both co-founders got acquainted with one another through a mutual friend. They each owned one third of the company. With an external investor owning the last third. *Firm H* was located in an innovation environment comprised of several other companies and managed by a start-up incubator. That was important for the growth of *Firm H*. Because they were able to discuss issues and ideas casually and/or formally with other companies in that environment. When they faced challenges, they usually had the opportunity to discuss with companies that had gone through something similar. Which they did over lunch, by the coffee machine, or through formal meetings. The CEO acknowledged the valuable input they got from the start-up incubator. An example of which is access to key resources / partners, as he described below:

*"Its because of them that we have our developing partner now. Because we were in the same place as one that knew the ones we are in a partnership with now. They have supported us with their knowledge. They don't know very much about the social part of our system. So that's probably something they can learn about a bit from us. And for the business cases....we are new at creating businesses. So, they advise us on all the things we need there"*

Through their network, *Firm H* had the opportunity to discuss collaboration opportunities with other potential partners.

## Case9 - Firm I

### **1. The capacity to build on extensive industry experience**

The CEO of *Firm I* previously founded a company which he managed for several decades before selling it to a large company within the automotive electronics industry. The products which his previous company developed were embedded into the products of the acquiring company, with millions of units in production outputs per year. The CEO had a background in sensor technology (from his previous company) which was applicable to the products of *Firm I*.

*Firm I* was founded by the CEO and his co-founders (some of whom he had worked with in the past) to create new types of products using disruptive technology. That was possible because of the extensive experience of the co-founders. The core leadership team of *Firm I* together had about one hundred- and fifty-years' experience in their industry. That was advantageous to *Firm I* because it made costly mistakes due to inexperience avoidable. As they had encountered many of the typical issues previously in their professional life. As a result, *Firm I* achieved results faster in some areas, with less effort.

The experience and reputation of the founding team helped them get attention. They were taken seriously by stakeholders, among which was an important supplier needed to move their product development forward. The CEO described this experience as follows:

*"Its really to get attention form the right people, in a sense, fast enough. And I guess it boils down to how you approach and present yourself. They knew...from experience...that our guys are to be taken seriously. For instance, a supplier, he wants to hear that you are going to buy millions and millions of units. At least the value should be significant. And of course, you don't have these revenues the first 1, 2, 3 years in a start-up. And if you blend this with the fact that what we are doing is quite complex. So...since its complex and also to some extent includes technology development which is always the big unknown. Especially when it comes to timing. Both timing and cost. So, it's a complex task to get things off the ground, and to create confidence among the people you need to cooperate with to be successful. Having said that, we have been able to do so. So...the progress has been close to what we have been expecting"*

The leadership team of *Firm I* had been through the challenge of orchestrating many processes at the same time. They understood the market conditions in relation to their product offerings in different parts of the world. Based on their experience, they sensed that time to market would be shorter in Asia, because of the relative speed to which new solutions like theirs is

adopted in Asia compared to the west. So, *Firm I* established themselves in Asia. However, *Firm I* understood the political situation in China, and decided not to establish themselves there, but rather in another country. Ultimately, *Firm I* was able to provide a unique value proposition by putting together products with enhanced performance that serve the intended purposes for their customers.

## **2. The capacity to plan and research**

The co-founders of *Firm I* used a systematic approach when it came to decision-making. For instance, they spent more than one year researching and planning how to go about the company. They did a comprehensive feasibility study, where they considered, the structure of the company, product structure, selling arguments, differentiation, economics of scale, etc. Regarding their decision to be located in Thailand, they spent more than one year analysing the situation, considering technology adoption, suppliers, politics, culture, and other practical issues. At the end, they put together a comprehensive business plan. The money spent upfront on feasibility studies to evaluate things from different angles helped prevent the cost of wrong decisions.

One outcome of *Firm I*'s feasibility study was a product roadmap that contained four product categories, with two generations. They planned to build the products in a modular way, where one product builds on top of the next one. So, in total they had eight different products. *Firm I* took time to understand where their customers were in their development. They did not see market size and development as the main challenge, but rather how to time themselves into where the customers were in their development process. The CEO threw some light on this as follows:

*“you need to understand what your customers are looking for. Not today. What they are looking for 3, 4, 5 years ahead. This has to do with technology. Development is involved because it takes some time before you are ready to launch a product. And by that time you should have taken into account how the competitive situation looks like then, not today...that's too late. And then you need to have the ability to communicate with pilot customers in such a way that they are willing to share this information with you”*

*Firm I* understood the market. They understood that Asia was an emerging market that is faster than most parts of the world in technology adoption. Furthermore, they understood the cultural, practical, and political issues in the countries of interest in Asia. Which informed their

decision to be located in Thailand. Having a daughter company in Thailand was a good decision for *Firm I* as they got approval from the governmental board of investments, which was like a quality stamp. That opened a lot of doors to local institutes, cooperation partners, and local incentives (grants and support). It was also cost efficient to be based in Thailand. Besides taking advantage of an incentive program for foreign companies, *Firm I* managed to establish themselves in a tax-free zone through a governmental support program.

*Firm I* understood how to adapt the standardized products they were developing into different applications. Their expenditure was fairly in accordance with plan (even though they did not manage to raise funds fast enough). Essentially, the progress made by *Firm I* was close to expectations.

### **3. The capacity to device a clear and workable competitive strategy**

*Firm I* recognized that the market is global, and that there were no local competitors anymore. As such, they deliberately tried to differentiate themselves from competitors. Which the CEO attributed to one of the factors that contributed to their success, as described below:

*"I think its to address the right and the necessary topics, and at the right time. And to do something with it. A lot of start-ups, they end up making prototypes or something that is proving a concept, and they have to start over again because its not possible to produce it. Then you waste a lot of time and money. And actually very often...or sometimes this first proof of concept has no real value in a sense. Because you haven't really defined...how are you going to differentiate yourself in the market place from your competitors? What is unique with this? And of course, you have to take into account that there are no local competitors anymore. I mean...in our technologies, the market is global. End of story. So you have to take that into account. Which means you have to address the big and the best players. And try to understand.....if I'm looking out towards the competitors to understand what are they doing? Why are they doing it? And how can we differentiate from that? In a way that enables us to be a preferred supplier. So it's a lot of small elements that adds together"*

*Firm I* aimed to exceed state of the art performance with their products. They carefully planned out a product roadmap to help achieve that goal. The roadmap was based on rigorous research and planning that was done at the early stages of *Firm I*'s development. *Firm I* had a unique and innovative approach to lower cost and enhance performance. The founders built

on their extensive experience and desire to modernize the traditional instrumentation industry, coupled with insights gained from potential customers. In line with their business plan, which included creating standardized off the shelf products, *Firm I* devised a strategy to adapt their products to different applications for a large variety of market areas. They outsourced as much as possible, and that was vital in achieving economics of scale. The products of *Firm I* were manufactured in Thailand, and the founders actively travelled between Norway and Thailand to follow up on the activities. *Firm I* recognized the need to position and time appropriately to capture the market. They put in place a communication strategy to project themselves the right way, even as they capitalized on their industry experience. In addition, *Firm I* put in place a patent strategy that was focused. Such that only unique methodologies and concepts were patented. Processes were not patented, and that was to avoid disclosing too much information that competitors could walk around.

*Firm I* saw themselves as an industrial start-up. They put in place necessary structures to be an industrial company from their first product launch. They invested thousands of engineering hours into their products (embedded into the design) such that it would be very difficult to re-engineer. They planned to be a technology enabler to customers, even as they competed with competitors on price performance. They did so by delivering product functionality for a reduced cost compared to what is available on the market. *Firm I* put effort to understand the future competitive landscape, by paying attention to technological developments and communication with customers.

#### **4. The capacity to put together a strong team that works towards a common goal**

*Firm I* was a flexible and fast-moving company, with a core team of employees that had extensive experience in the industry. They knew that start-ups live or die during the first few years, and they deliberately put together a team that could drive the company to its goal. *Firm I* was interested in motivated employees that showed interest in their field. They put together a cross functional and multi-cultural team, where people had different skillsets. Especially since they worked with very different cultures. They emphasized the need for employees to work towards a common goal and be proud of the company.

*Firm I* had a transparent and open work culture. Strife, hoarding, and secrecy among employees was discouraged, and the leadership was transparent with their internal communication. They always tried to get everyone in the company to understand the actual situation of things. The co-founders of *Firm I* (the CEO and CPO) had known each other for a

few decades, and they capitalized on their complementary skills as they built the company. This was described by the CEO as follows:

*“My co-founder is...We are very complementary in a sense. He is extremely focused or....an extremely good manager to run projects, execute according to plans. On the operations side he is very focused. Where we have commonalities is of course on the strategic level. Yeah, I must say, we have been working together...he has been my CPO for 40 years. So, we understand each other in and out. So, we spend very little time to understand what the other guy is meaning or saying. And we know who is best to handle this case, what can I do, and what can he not do”*

The CEO had first-hand experience regarding how a small company can be successful. His previous company was acquired in 2003, and he followed that company as it transited to become part of a large company. He knew the difference in the ways of working; how large companies can be slower, with high overhead and non-productive costs.

## **5. The capacity for networking and partnership**

*Firm I* was founded by former colleagues that worked together for a long time. Their motivation was to contribute to modernizing the traditional instrumentation industry, and their professional network was key in achieving their goal. The CEO described it as follows:

*“It’s a big challenge being just a handful of people. But its doable because we have a huge network through our business history. Without that of course its not possible. All over the world we have access to the necessary competences needed to be successful in an international market”*

The network of *Firm I* gave them access to vital resources, partners, and information. For instance, they used their network to get valuable information about incentives provided by the Thai government to start-ups. They established a daughter company in Thailand and got some part of their product development effort funded by the Thai government. That further improved their reputation in Thailand.

*Firm I* had access to several strategic partners for different aspect of their value chain. As a result, they were able to do several activities in parallel. The CEO described one of their partnerships as follows:

*"We are dependant upon a supplier...Our products contain microelectronics, and something called "foundry services" which means that we design our product in an existing technology, and then we have this "foundry service" company...provider...that actually do the processing for us. This sounds maybe easy. But it's not when you are a start-up to get attention and to be taken seriously. But fortunately due to our CVs we were taken seriously although we were just 2 people at the time. Because they knew what we have been doing before. So, just now we have a team of....actually in the local institute "foundry service" company...Its up to 16 people that are working on our project"*

The co-founders of *Firm I* planned to use a global distribution channel for their products, as they knew several distributors from prior engagements. Their network also helped to secure agreements with several pilot customers who provided specific and valuable input. In addition, *Firm I* planned to partner the local university to develop advance solutions.

## **Case10 - Firm J**

### **1. The capacity for learning and dedication**

*Firm J* was founded by two siblings who grew up in a technology-based family owned business. As a result, the co-founders (siblings) developed a passion for technology from an early age. Though they did not have any formal education, they learnt about different technologies as they grew up. They basically thought themselves different things and they were able to fully develop their skills through hard work and dedication. Their aptitude for learning translated into the culture of their company. *Firm J* had a positive mindset towards learning and failure, which they attributed to their success as expressed by the CEO below:

*"Its because of all the failures that we had, and learning from them. Because we might be successful now, but it has taken a huge amount of time. And that is due to all the failures that we did. And all the wrongs that we did, earlier, in various ways. From how to deal with the crisis...oil crisis...to which people to trust, to which network you should have or not have, to agreements...which type of agreement works, which doesn't. So, we've gained all that experience throughout...for quite a few years. For each failure...that's why I strongly believe in talking more about failures than success. Because it is through the failures that you eventually will be succeeding. Very few people have success immediately. So, its all through failures, and what not to do. And we have had a huge amount of what not to do. And we are still learning. Even though we are kind of successful today, we haven't quite secured it completely. We still have a lot of work to do before we can say that we are a success...or that I can say that we are a success. We constantly fail on a lot of things. But what is important for us is...to learn...is also to fail fast and learn faster. So, the quicker we fail, and the faster we learn, the quicker we can succeed. So, it's a bit more of how we approach failures, more than...that is...I believe it's the key to success. So, it's about learning from failures as a constructive method, rather than seeing a failure as a shame or something negative. Because a failing thing is a positive thing, because we learn from it. And we continue to fail all the time in different...various small things. But they are not these massive failures that we had previously. That I think...its probably one of the most important things...the failure"*

*Firm J* was a forward-thinking company that anticipated the need of their customers by looking years ahead of time. As a result, they make deliberate effort to keep up to date with trends and technology development. For example, they did active research regarding the components (e.g., sensors) and technologies they used for their solutions. To be sure that they were in line with their perceived standards for the future. That was one of the ways in which they



differentiated themselves. The components that *Firm J* used for their solutions were not typically used by competitors. Another example is the way in which *Firm J* innovated their BM to target a new customer segment in the seaweed industry. When *Firm J* was approached by a seaweed farmer to discuss a challenge, they seized the opportunity to properly investigate the market.

In addition to learning through research, *Firm J* actively utilized their network to get information. Furthermore, they kept themselves updated through active participation in knowledge sharing events (e.g., exhibitions). Learning contributed to making *Firm J* a lean and agile company. Which allowed them to run faster and be cheaper than competitors. The co-founders of *Firm J* continuously learnt to be more effective leaders. Through learning, passion, positivity, hard work, and dedication, *Firm J* was able to re-invent themselves, innovate their BM, and compete effectively in their industry.

## **2. The capacity to exploit own strength, background, and experience**

The founders of *Firm J* were not new entrepreneurs. They had started and sold companies before. They originally started *Firm J* in 2010, and sold it to an investment company, before buying it back in 2019. The CEO described their entrepreneurial background as follows:

*"I think its...I think the interesting thing is that if you are growing up with the entrepreneurial spirit or the entrepreneurial mindset, its em...its kind of..yeah...I think at some point, we would have started something anyway. Because we are both...both myself and my brother, we have an entrepreneurial mindset. Whatever we do, we start something. Whether it's a company, or its a project, or its something...We know how to take the risk and do the development, and have the passion to do it. So, we've always been entrepreneurial. We've also started and sold a few companies earlier. So, we do have things in our backpack. Previously to purchasing back the company now in 2019"*

The founders of *Firm J* knew a lot about ocean technology (electronics for ocean environments). Because that was the focus area of the business their father owned. Which was essentially, technology development for the offshore industry. The founders built on this background and continued their entrepreneurial journey within the same industry.

The co-founders of *Firm J* exploited their background and experience in their BMI, as they expanded their activities and created new value propositions for new markets. For example,

the seaweed industry caught the attention of *Firm J* due to a request from a seaweed farmer. That opened new doors in their business, and they were able to develop the market. They targeted specific customers within the seaweed market with solutions that solve specific problems. They were able to seize that opportunity by moving fast, as described by the CEO below:

*"We were approached by a seaweed farmer about a year ago, that had lost their buoys, and on that buoy they have a rope, and on that rope it grows seaweed. And they had lost their buoy, so they had no means of finding their seaweed. So, we made within a week, the new deployment from that technology platform, which was a tiny positioning unit. Satellite and gsm, with some processing and internal battery. So, we popped that on the buoys, and then we started to investigate what else...what is seaweed? and what is your pain? And then it just opened a completely different world to us. We saw this seaweed industry the exact same way that we saw the fish farming industry 15 years ago. Every single farmer was doing their own little thing in the coast. But nothing was streamlined, nothing was automatized, there were barely any technology. So, it was a very manual, heavy laboured process that cost quite a lot. And this was the exact same thing that they were doing in the seaweed industry. So, we started to look at the potential. And in Norway, the potential is big, but they are fairly just starting. While globally the seaweed industry is completely booming. But one of the things that stops them from booming is because they have a huge amount of manual labour, and the processes are not streamlined and optimized. So, we saw that by implementing a technology, and shaping that alongside with the customer, we could help them scale up. And they could increase the profitability, they could overview the farm remotely, they could see the changes in the nutritional levels, and the environmental levels, which is very important for a seaweed farmer. And that was kind of how it just escalated into that particular product. But the interesting thing is that what we are merely giving them is a toolbox, and we have an analytics software that we are developing as well...based on that. But that toolbox of subsea sensors and communication units, positioning, is also being used for a huge amount of other purposes and markets. So, you can use that for basically everything from oyster farming, fish farming, environmental detection, monitoring.... but we had to start at some niche market in order to understand the customer properly"*

*Firm J* had a team of engineers who were locally sourced, and they built their solutions inhouse. They relied on suppliers to deliver some components. However, they sometimes developed their own firmware for some of the components to reduce cost.

### **3. The capacity to involve and engage the customer**

*Firm J* was able to develop successful products by putting customers at the centre of all they did. This was described by the CEO as follows:

*"We include the customer in the product development. So, its not just one customer, there are multiple customers. So, we know that we can....we are not locked into how one particular customer operates, but we are trying to gather the problems that the client base has overall. And then based on that we can make the product. And that is....at the end it is the customers who will be paying for the solution. So, if the solution is not optimized for the customer base, then you don't have a business, or a succeeding product. And also by having the customers join in into the development phase of such a new product, it also gives them some sort of ownership. And that ownership makes them want to purchase the product obviously. So, it's a very trust...in terms of gaining loyalty and creating relations within an industry. This is how we have done it, and we have succeeded each time we've done it. But as long as you have the customers with you all the time, and you see their pains and their needs, and you are trying to address them, then ultimately they will buy your product"*

*Firm J* made deliberate effort to keep in touch with their customers. They ensured that customers were updated regularly on project related status (with respect to, e.g., onsite assessment, testing, etc). They also exploited new and creative ways to raise awareness, which in turn led to valuable input that helped them innovate their BM. An example was provided by the CEO as follows:

*"One of the things that I have done within the seaweed industry is...I was one of the founding members in the seaweed for Europe coalition. Which is a heavy political coalition as well, within Europe. And I am a leader in one of the groups called raise awareness. So, everything that I do on LinkedIn and media is talking about the seaweed industry. Not in particular our customers, but the seaweed industry, lifting the seaweed industry. By doing that I am connected to everyone in the entire world in the seaweed industry. And that also has been a great plus in order for us to get inputs from customers, in order for us to get customers. And also continuously talking to the customers at all times...because this is part of my job as well...has been...is promoting the seaweed industry globally. So, that's where we keep in touch with customers on a daily basis. So, normally I sit on the evenings and weekends...i sit and talk to...have teams meetings or zooms meeting with...Australia, and Canada and America and you*

*know, everywhere, every time, for different types of customers within the seaweed industry. And that's how you gain trust as well. So yeah, you have to be present"*

*Firm J* was able to effectively engage their customers (and potential customers). In turn, customers reaped the reward of robust solutions that were easy to use and served the intended purpose.

#### **4. The capacity to identify a problem or opportunity and address it uniquely**

The founders of *Firm J* recognized a pattern in the seaweed industry that was similar to a pattern they saw in the fish farming industry fifteen years earlier. That pattern was that farmers were operating in silos. Things were neither streamlined nor optimized, and there was barely any technology. Rather, the farmers used costly manual and heavy laboured processes. This prompted *Firm J* to look deeper at the potential for transforming the industry. They saw that although the industry was booming globally, it could be better in the country. The remedy provided by *Firm J* was to address exactly what they found. They created streamlined and optimized processes that eliminate manual labour. Furthermore, they created a decision tool to help farmers reduce risk and gain more profit. The tool enabled the farmers to remotely monitor important parameters in their farms (e.g., environmental and nutritional levels).

The founders of *Firm J* had the mentality of trying to anticipate future needs in their industry. Which they incorporate into their product development by choosing the right technology and component. For instance, compared to their competitors, they used commodity components. This was described by the CEO as follows:

*"We have low cost components. That's kind of what we do throughout the entire value chain. Its low-cost commodity...components that we have made our own firmware for. So, that reduces the cost dramatically, compared to if we were to use those specialized systems for those particular ocean environments. So, our cost model is em...we have a very good profitability. One of the great things about having this base model...these building blocks that are fairly low cost...is that you can utilize the exact same product. Where you can spin out new products, based on the exact same thing, but for different markets that are paying differently. So, you can get 100 times the price in an oil and gas market, and on the exact same product that you can spin out and just call something else in a different market, you can get 50 times. So, you have a very flexible model for the pricing. Because the cost are merely the same, and*

*the components are merely the same, and the software is the same....so everything is based on the same package”*

*Firm J* developed low cost solutions that were technically complex but easy to use. Their solutions also helped customers to be cost effective. In addition, *Firm J* further innovated their BM and focused more on developing software solutions that add customer value. Some of the solutions they developed for the seaweed industry (e.g., the analytics software) could be used in several other industries.

## **5. The capacity to restructure and adapt**

The founders of *Firm J* made deliberate efforts to transform the company soon after it was reacquired. They developed a new technology platform and worked on redeveloping some of the existing products. At the same time, they got rid of things that were not needed. The restructuring gave *Firm J* a brand-new start and enabled their solution development effort to be focused on the market segment of interest.

The capacity for *Firm J* to restructure and adapt was also evident in the way they created a new solution for seaweed farmers based on an existing solution that was commonly being used by the farmers. This was described by the CEO as follows:

*“The metocean buoys is like this massive research buoys, which is 2, 3 meters tall, and have a huge amount of equipment that cost right about 1.5 million Norwegian kroner each. So, that was actually what the seaweed farmers were using, and they had one reference point...at a whole hectare. And we asked, well why can’t you have more of these reference points throughout the farm...and they say...because of the cost. So, we took the most essential part of the metocean buoy and made it tiny, and cost effective. So, it just cost a fraction of what the metocean buoy cost. But now you can have multiple reference points throughout the farm, instead of just that one. So, when you have multiple reference points, it generates what we believe is equally and more accurate data, than just that one very very good reference points. Because the ocean and the water level and the currents are constantly changing. So, even though it’s a great fit one place, a hundred meters further down its terrible, and you don’t know that if you just have one reference point...one data collection point”*

Since *Firm J* restarted, they have succeeded in several areas. To get the team even more motivated, the co-founders made sure that all employees had a stake in the company. An

external investor owns a minority share, while the co-founders themselves own the majority share.

#### **6. The capacity to utilize own network or community**

*Firm J* had a big professional network and they did their best to be present, visible, and accessible. That contributed directly to the ability of *Firm J* to innovate their BM. For instance, they positioned themselves in their network in a way that allowed a seaweed farmer to approach them regarding the possibility of developing new solutions, which opened new doors for them. In addition, their network played a key role in keeping them updated about latest developments in their industry.

*Firm J* actively participated in exhibitions and business networking events. The CEO was a founding member of the seaweed for Europe coalition, by which she promoted the industry and shared information with customers/potential customers, and at the same time received valuable inputs from customers/potential customers. The visibility and presence of *Firm J* in their network and community helped their business thrive, as they gained trust and maintained important relationships with customers. Furthermore, it gave *Firm J* access to key resources (e.g., the engineers that they employed).