

**Essays on Managerial Cognition, Diversity
and Business Model Innovation**

**Essays on Managerial Cognition, Diversity
and Business Model Innovation**

Essays over managementcognitie, diversiteit
en bedrijfsmodelinnovatie

Thesis

to obtain the degree of Doctor from the
Erasmus University Rotterdam
by command of the
rector magnificus

Prof. dr. R.C.M.E. Engels

and in accordance with the decision of the Doctorate Board.

The public defence shall be held on
Thursday, 28th May 2020 at 13:30 hrs

by

Somendra Narayan
born in Jaipur, India

Erasmus University Rotterdam



Doctoral Committee

Doctoral dissertation supervisor:

Prof. dr. H. W. Volberda

Prof. dr. J. S. Sidhu

Other members:

Prof. dr. C. Baden-Fuller

Prof. dr. S. Ansari

Prof. dr. D. Stam

Erasmus Research Institute of Management – ERIM

The joint research institute of the Rotterdam School of Management (RSM)
and the Erasmus School of Economics (ESE) at the Erasmus University Rotterdam
Internet: www.irim.eur.nl

ERIM Electronic Series Portal: repub.eur.nl/

ERIM PhD Series in Research in Management, 497

ERIM reference number: EPS-2020-497-S&E

ISBN 978-90-5892-567-1

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Design: PanArt, www.panart.nl

Cover: Original Artwork © Hitoshma Singh Chouhan

This publication (cover and interior) is printed by Tuijtel on recycled paper, BalanceSilk®

The ink used is produced from renewable resources and alcohol free fountain solution.

Certifications for the paper and the printing production process: Recycle, EU Ecolabel, FSC®C007225

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This work is dedicated to my late grandfather,
Shri Mata Deen ji Sharma

All philosophies are mental fabrications.
Acharya Nagarjuna (150 - 250 CE)

ACKNOWLEDGEMENTS

To begin with, I would like to thank the people without whom this dissertation would be inconceivable in its current form – my doctoral supervisors, Prof. Henk W. Volberda and Prof. Jatinder S. Sidhu. Henk, not just your keen scholarly insights, but also your revitalizing guidance has been critical in my doctoral journey. I would like to convey my wholehearted gratitude to you. I also owe gratitude to my thesis co-supervisor, Prof. Jatinder S. Sidhu. You were always there to patiently address all my questions and concerns at each stage of the PhD. I thank you immensely for your constant support. Additionally, I would also like to thank Prof. Charles Baden Fuller for the insightful feedback and for the splendid opportunity to work with a great scholar such as himself. Further, I would like to thank the other honorable members of the doctoral committee Prof. Shahzad Ansari, Prof. Daan Stam, Prof. Lucas Meijs, and Dr. Yulia Snihur for their indispensable role in the formal assessment of this doctoral thesis.

Another person without whom the years of my doctoral journey would be inconceivable is my friend and colleague Mohammad Taghi Ramezan Zadeh. Many thanks Taghi, for the stimulating conversations and the heartfelt friendship. I would also like to thank Tatjana Schneidmüller, Lance Cosaert, Emre Karali, Agnieszka Genc, Krishnan Nair, Ilaria Orlandi, Radina Blagoeva, Saeedeh Ahmadi, Saeed Khanagha, Yik Kiu (Plato) Leung, Renée Rotmans, Fouad El Osrouti, Maria Rita Micheli, Hendra Wijaya, Stefan Breet, Ron Maas, Omar El Nayal, all my other PhD colleagues, and members of the faculty at the Rotterdam School of Management for the intellectually nourishing environment they contributed to. Thanks also to the Erasmus Centre for Business Innovation (INSCOPE) for their support. I would like to thank the Erasmus Research Institute of Management (ERIM) for their administrative, academic, as well as financial support during my doctoral trajectory. Many thanks to Balint Hardy and Kim Harte for putting in work in the publication of this dissertation despite the challenges of the uncertain times.

Finally, I would like to thank my family for all their love and support over the years. I would like to thank my father for his perpetual belief in my abilities. Papa, your encouragement to strive for the highest of standards and to pursue quality above all else is the true foundation of my achievements. I am forever grateful. My mother has always been an inspiration for me. Since I have come to understand my surroundings,

I have grown up watching her optimize her energies and skills to bring the most good to the most people. When as a young doctor she travelled through the rural reaches of India with an infant son at her chest, conducting research on public health, I got my first exposure to the thrills and rewards of research work. And this experience at barely three years old was one that has had a lasting impact on me. You have always been my first inspiration, Ma! Many thanks, with love.

Next, I would like to thank my dear wife, Hitoshma. No one has been exposed to the unintended side-effects of the long hours of research and writing required to produce this dissertation more than you. And yet no one has been more supportive of me in this endeavor. In my best times or worst, you have always been by my side with your calming words and a gentle smile. Your love is what keeps me going. I look forward to every new morning with you.

I would also like to thank my brother, Madhav for the engaging conversations on law, politics, administration, and society, which have helped me refine my ideas and shape my research better. I would like to thank my dearest sister, Shailja for being my family in country far away from home. I would also like to thank my sister, friend, and all-time favorite teacher, Monica didi for helping me understand what a good learning environment entails.

Lastly, but most importantly, my greatest gratitude goes to my late grandfather Shri Mata Deen ji Sharma, a great scholar of philosophy and languages. Thanks, Nanaji, for being the greenskeeper of my curiosity, and thence, a source of my intellectual being. I dedicate this dissertation to you.

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Chapter – 1

The Diversity Dilemma

Chapter – 1: The Diversity Dilemma

INTRODUCTION

Trajectories of technological evolution have rendered the modern workplace more dynamic than ever before. A continually evolving business landscape gives rise to a constant need for managers to update and innovate their way of doing business (Henry Chesbrough, 2007). Information technology and mobile connectivity have led to novel business models that are characterized by unprecedented access to transnational networks (Bouwman et al., 2018), lending them the ability to operate across the boundaries of traditional industries (Spieth et al., 2014). At the same time, societal changes, like generational shifts in career trajectories, aging populations, and mass migration patterns facilitate a more diverse workforce (Kirton & Greene, 2015). These developments bring together strategic teams composed of colleagues with different educational, professional, cultural, ideological, and socio-economic backgrounds. But what does all this diversity mean for teams of executives tasked with running organizations in an ever-changing business environment?

How does diversity among executives influence the way firms engage in strategic change or respond to disruption?

The Diversity Dilemma

Scholars across the field of strategy, organizational behavior, and psychology have argued that constructive differences among the members of decision-making teams are crucial for innovation and change processes (Goodstein et al., 1994; Kondra & Hinings, 1998; Østergaard et al., 2011; Talke et al., 2010, 2011; Triana et al., 2014; Wiersema & Bantel, 1992). Nonetheless, there remains widespread resistance against diversity and inclusion initiatives among practitioners and industry professionals (Chrobot-Mason & Hays-Thomas, 2008). Corporate as well as institutional initiatives for inclusion face relentless opposition, questioning the veracity of their claimed benefits. Particularly among the corporate leadership, the reluctance to sincerely follow targeted diversity management policies has been attributed to the lack of clarity

among practitioners regarding what diversity entails for organizational outcomes (Homberg & Bui, 2013; Wentling, 2004).

Foremost, this is because the creative dividends of individual level differences among members of strategic teams are not readily observable (Kearney et al., 2009). As explained by Martins, Rindova, & Greenbaum, (2015), the benefits of cognitive variety in a strategic team are manifested in the form of differences in the perception of organizational interdependencies, identification of unique opportunities and/or threats, and preference for distinct solutions to address them. These intangible benefits of executives' unique organizational insights often emerge in the form of team-level strategic outcomes resultant of a collective decision-making process (Bromiley & Rau, 2016; Schwenk, 1988). This makes it further difficult to reliably attribute such benefits to specific individual-level differences among team members.

On the other hand, the costs incurred in strategic change processes due to individual differences among collaborating decision-makers, typically manifest in the form of social identification with a sub-group within the team (Hogg & Terry, 2000; Tajfel & Turner, 1979) and can often lead to lack of group cohesion and conflict (Pelled et al., 1999; Thatcher & Patel, 2011) . Compared to the intangible beneficial effects of diversity, these detrimental effects of diversity take shape in clear view of the team members (van Knippenberg, Dawson, West, & Homan, 2010), are not temporally separated from the members' actions (B. Prasad & Junni, 2017), and are thus easily attributable to specific axes of individual differences (Kearney et al., 2009). Additionally, in an organizational setting, numerous markers of individual differences - with positive as well as negative effects - interplay and influence organizational outcomes simultaneously (Scully & Blake-Beard, 2006). This further enhances the complexity of predicting the real-world effects of the simultaneous positioning of different executives along the various different axes of individual differences.

In practice, members of executive teams are prone to differ on numerous factors influencing their cognitive development. Executives' educational, professional, cultural, and socio-economic background, among other factors indicate systematic differences in their lived-experiences, which play a crucial role in defining their cognitive biases and contributes to the development the personal cognitive lens they use to perceive the world through (Chattopadhyay, Glick, Miller, & Huber, 1999; Evans, 2001; Michie, Dooley, & Fryxell, 2006; van Knippenberg, De Dreu, & Homan,

2004). For instance, a top management executive, owing to her functional background, is repeatedly exposed to certain kinds of information and situations over the years. This selective exposure to specific situations defines the executive's professional beliefs and biases (Cannella, Park, & Lee, 2008; Pelled et al., 1999). Similarly, executives' educational background reflects the specialization and depth of their formal training, and has pivotal impact on the formation of the executives' cognitive biases and mental schemas of their professional surroundings (Nielsen, 2010; Shin & Zhou, 2007).

Markers of individual-level differences in sources of cognitive development imply unique configurations of access to information, skill, and cultural acumen among executives (Mezias et al., 2001; Rajagopalan & Spreitzer, 1997). In cases where a varied collection of cognitive lenses is available to executives engaged in strategic change processes, multiple perspectives become available for opportunity as well as threat recognition (Martins et al., 2015; Wei & Wu, 2013). In addition, a variety of cognitive resources imparts sophistication to the process of collective decision making for strategic change and adaptation (Bromiley & Rau, 2016). On the other hand, modern organizations also comprise of individuals who differ from each other in ideological affiliations, preferences, and goals (Finkelstein & Hambrick, 1996). This heterogeneity of values amongst the members of the top management team lends complexity to the process employed by executives in collectively making decisions (Cannella & Holcomb, 2005).

While theoretically these concepts (diversity of cognition and values) are distinct from each other, at the personal level, both are a result of unique personal trajectories of cognitive development (Bromiley & Rau, 2016). In practice, most marker of diversity reflect both cognitive and ideological differences among individuals (Homburg & Bui, 2013). Depending on the circumstances, firms may see substantially positive or negative dividends of executive diversity. The way diversity plays out in organizational settings is contingent on the strategic objectives of a team and the dominant team-level processes (Nielsen, 2010). Substantial empirical research has been conducted following the upper echelon perspective on the connection between the diversity of managerial characteristics and organizational outcomes (Hambrick, 2007). Although the impact of managerial diversity on strategic change processes is unmistakable, extant research in the field does not provide clarity regarding the conditions under which benefits of individual differences among executives may be optimized.

For strategy practitioners and industry professionals tasked with assembling and managing strategic teams in the information era marketplace, this poses serious issues in diversity management. The contemporary workforce is characterized by unprecedented levels of diversity and corporate leadership would prefer to optimize their inherent variety of cognitive resources for strategic goals. However, the confounding nature of academic findings and scholarly discourse on the topic of diversity provides little clarity in this pursuit. Further, owing to a lack of comprehensive understanding of the diversity phenomenon, individuals championing diversity initiatives in a backdrop of the popular negative associations of the ‘outsider’, find it difficult to substantively argue for and clearly illustrate the benefits of diversity initiatives.

Scholarly Roots of the Managerial Dilemma

These managerial issues are rooted in the theoretical understanding, or lack thereof, of the diversity phenomenon. Firstly, research in diversity has investigated effects of the various observable axes of diversity (Hornberg & Bui, 2013; S. Nielsen, 2010), often, by theorizing them as independent markers of individual level differences (Bunderson & Sutcliffe, 2002; Cannella et al., 2008; Nielsen & Nielsen, 2013; Shin & Zhou, 2007; Triana et al., 2014). However, in practice, multiple axes of diversity, such as age, gender, educational specialization, educational level, functional background, and cultural background intersect at the individual level. The unique insights that any executive’s brings to the strategic decision process is a product of multiple key sources of knowledge, perspective, and lived-experiences (Schwenk, 1988). Pointing this out, some recent studies have indicated a need for a holistic conceptualization of the diversity of thought.

Another crucial source of differences in opinion and insights is the diversity of values. Studies in the field of finance (Hong & Kostovetsky, 2012; I. Kim et al., 2013) have highlighted the influence of ideological diversity among executives on investment performance and overall firm performance. However, the influence of diversity of values on strategic outcomes, such business model innovation has been largely overlooked in scholarly research. Diversity of political affiliation is an effective method of operationalizing diversity of values among a team. Recent strategy research on individual-level categorization of executives as either liberals or conservatives has been shown to reflect systematic differences to executives’ strategic positions (Briscoe &

Joshi, 2017; Chin et al., 2013; A. Gupta et al., 2017). Viewed at the team level, the diversity of political affiliations – as embodied in a mixed liberal-conservative team – reflects a diversity of cognitive biases and schemas, particularly in highly polarized political societies.

Further, while normally a reductionist simplification, conceptualizing differences among executives along one single core axis might be relevant in certain circumstances. Particularly, in cases when one individual among a team stands out based on one of the markers of their identity, and is perceived as the outsider (Audretsch et al., 2010; Tibau & Debackere, 2008; Zhang & Rajagopalan, 2010). There is evidence that other factors reflecting the historically unique development of their individual mental schemas, may become less influential, when the ‘outsider effect’ is salient and in action (Graham et al., 2012; Hogg & Terry, 2000; Tajfel & Turner, 1979). While there has been substantial previous research on the effect of such forms of diversity on strategic outcomes (Homberg & Bui, 2013), it has been predominantly based on a study of corporate leadership in industrialized economies. As a result of this, such research has focused on race, gender, and other visible forms of diversity relevant among western populations (Horwitz & Horwitz, 2007; Nielsen, 2010). On the other hand, a large portion of the world’s economic activity, currently takes place in the semi-formal and informal sectors in emerging markets (Prahalad, 2006). There is thus a need to understand the consequences of diversity of socio-economic background, cultural differences, and other context relevant sources of differences in strategic teams in order to develop informed diversity management policies and practices for national governments as well as firms engaged in international business.

While there have been academic efforts to explain the mechanisms underlying the effects of the diversity of thoughts as well as values among a strategic team (Joshi & Roh, 2007; Miller et al., 1998; Pelled et al., 1999), ‘outsiders’, whether social or professional seem to be a special case. For these individuals, often a single marker of individual level differences defines their interactions with their colleagues and collaborators (Lau & Murnighan, 2005; Tsui-Auch, 2005). Based on the social identity-categorization perspective (Tajfel & Turner, 1979), it has been theorized that that their contribution to the decision making processes is also thus contingent on their salient identity (Hogg & Terry, 2000). However, there is lack of academic understanding of the unique cognitive contributions of these outsiders in strategic change processes. Thus, when adopting the cognitive perspective to explain the organizational effects of

diversity, the question emerges, ‘what is the differences between outsider and insiders’ cognitive schemas of a firm’s business model and its inherent interdependencies?’ This gap in the literature reflects a lack of academic research on the mechanism behind the outsider effect, and is a source of uninformed decision-making among professionals.

In this doctoral dissertation, I address the aforementioned theoretical issues and subsequently provide insights for practitioners by conducting four research studies. These are detailed in the following section.

Outline of the Dissertation

This doctoral dissertation explores the nuanced relationship between diversity in decision-making teams and organizational outcomes, such as business model innovation. The first of the four studies in the anthology, employs longitudinal data from the North American printing and publishing industry, to the effects of the diversity of cognition as well as political ideology, on the scope of managerial attention to as well as the intensity of business model innovation. In this study, a moderation effect of team longevity on the effect of cognitive and ideological diversity is also tested. In the second study, focusing on cognitive differences among executives, I explore the opposing effects of top management team cognitive diversity on innovative versus imitative business model renewal. Further, a positive moderation effect of structural interdependence among the teams on this relationship enriches the tested conceptual model. Further, the effects of diversity are known to vary with cultural and socio-political contexts. To identify and elaborate upon these context specific markers of diversity, the third study investigates the effects of socio-economic separation and sub-cultural diversity on the success of co-creative business models for sustainable forest management in India. Combined, these three studies result in a nuanced conceptual model of the dual nature of diversity among professionals. In the final study conducted in the context of the legal-tech sector, a cognitive perspective is adopted in an exploratory approach to investigate the effect of managers’ industry outsider status on the development mental schemas of their business models. Table I illustrates the various theoretical concepts studied in the four research studies and their theoretical underpinnings. Table II describes central research question, theoretical lens, an overview of the methods and main findings for each of the four studies.

Declaration of Contributions

In this section, I declare my contribution to the chapters of this dissertation and acknowledge the contribution of my supervisors.

Chapter 1

In this chapter, I introduce and describe the research question at the crux of this dissertation and its scholarly foundations as well as the theoretical and methodological perspectives adopted in the examination of the primary research question. Besides a discussion with my supervisors regarding the approach to the introduction, the chapter has entirely been developed by me.

Chapter 2

Containing my first study, this chapter investigates the effect of top management teams' cognitive and ideological diversity on their firms' attention to and outcomes of business model innovation. I came up with the idea as well as conceptualized the study. This study uses data from the North American publishing industry to investigate the above-mentioned relationship. I compiled the relevant top management team data as well as the business model innovation data from various sources. Further, I rated the various identified instances of organizational change along the theoretical elements of business model innovation. In the interest of interrater reliability, this rating was compared to a rating performed by a research assistant (master thesis student). Further, I conducted the data analysis and wrote the manuscript for this study. The development of this manuscript was an iterative process with an active advisory role played by my supervisors.

Chapter 3

This chapter consists of my second study. This study builds upon the data used in the first study to investigate the effect of structural factors on the relationship between top management team cognitive diversity and the business model innovation trajectory adopted by a firm. I came up with the idea for this study and collected all the supplemental data required. Further, I designed the methodology, analyzed the data and wrote the manuscript, albeit with the help of feedback from my supervisors.

Chapter 4

This chapter consisting of my third study, investigates cultural and status differences among mentors and participants and their influence on co-creative initiatives at the base of the pyramid. The study is set in the context of incubation of co-creative organizations for participatory forest management in forest fringe communities in India. I came up with the idea and designed the study. I also compiled all data required for this study and performed the analysis. The interpretation of the results was an iterative process involving several rounds of discussions with my supervisory team. I wrote the manuscript myself, with a facilitating role played by my supervisors.

Chapter 5

Consisting of my final study, this chapter investigates business model cognitive schemas of executives from the legal-tech industry. Using network analysis of cognitive schemas as well as an analysis of their content, this study uncovers systematic differences among industry-insider and outsider executives. I came up with this idea and conceptualized the study. The interviews used for this analysis were conducted by Mary Jutten for the podcast 'Evolve Law' with whom I have had no prior contact and were transcribed by me for use under the copyright fairuse doctrine. I developed the cognitive maps from these interview transcripts and performed the analysis. I also drafted the manuscript. My supervisors as well as Prof. Charles Baden-Fuller played an advisory role over the course of development of this study.

Chapter 6

In the final chapter, I compile my findings from the four studies and reflect on their contributions as well as limitations of this dissertation. This section has also been developed and drafted by me, with a facilitating and reflecting role played by my supervisors.

Table 1.1: Overview of studied concepts their theoretical underpinnings

Study	Managerial Concepts Studied	Individual level causes of differences	Organization Outcome Studied	Theoretical Concepts represented by the Dependent Variables	Level of Effect
Study 1	Cognitive and Ideological Diversity	Diversity in thought stemming from executives' varied life-experiences and diversity of political affiliation rooted in diversity of values.	Executive attention to business model innovation and business model innovation intensity	Team-level opportunity recognition, decision-making, and conflict	Team -level
Study 2	Cognitive Diversity and Structural Interdependence	Diversity in thought stemming from executives' varied life-experiences	Firm's choice between innovative/imitative business model innovation	Team-level opportunity recognition and decision-making	Team -level
Study 3	Social Outsider/Insider status	Out-/in-group membership of forest officers based on caste/culture/urban-rural background	Economic, social, environmental, and sustainability performance of forest management initiatives based on co-creative business models	Prejudice at the Executive/Team Interface and informational dividends of outsider status	Individual/Team Interface
Study 4	Industry Outsider/Insider status	Distinct cognitive heuristics among executives based their dominant function	Cognitive schemas representing executives' mental representation of their business model	Individual-level perception and understanding of business logic	Individual level

Table 1.II: Overview of dissertation studies

	Overarching Research Question(s)	Theoretical Lens(es)	Methods	Main Findings
Study 1	How does cognitive and ideological diversity affect the executive attention to business model innovation, and companies' actual business model innovation intensity?	Upper Echelon Theory Activity System view of Business Model Innovation	Panel of 156 TMTs in the US publishing industry Computer-aided text analysis (CATA) of annual reports Observational measure of Business Model Innovation Generalized Estimating Equation (GEE)	The scope of attention to BMI increases with cognitive diversity. When diverse teams have worked together for longer, their BMI intensity also increases. Ideological diversity has an inverted-U shaped relationship with BMI intensity.
Study 2	How does structural interdependence among TMT members influence the relationship between cognitive diversity and a firms' choice of imitative or innovative business model innovation processes?	Upper Echelon Theory Activity System view of Business Model Innovation	11-year panel of 23 firms in the US publishing industry (n=253) Observational measure of Business Model Innovation Multiple Correspondence Analysis K-means and Hierarchical clustering Multinomial Logistic Regression	Structural Interdependence among the TMT enhances the positive effects of cognitive diversity Cognitive diversity promotes innovative digitization as opposed to imitative digitization.

<p>Study 3</p>	<p>How do social outsider institutional mentors influence the performance of co-creative business models at the bottom of the pyramid?</p>	<p>Social Identity Theory Information Processing Theory</p>	<p>Cross-sectional sample of 222 mentor – mentee (government forest officer – elected forest management committee) dyads from Maharashtra, India Multiple linear regression Generalized estimating equation (GEE)</p>	<p>Caste prejudice and cultural differences have a negative effect on co-creative performance. While being caste insider in a community improves performance, urban outsider background also attenuates the negative effects.</p>
<p>Study 4</p>	<p>How do social and professional outsiders' cognitive schemas of their business models differ from insiders?</p>	<p>Cognitive view of Business Models Social Identity Theory Information Processing Theory</p>	<p>Secondary interviews with 30 executives in the legal-tech industry. Cognitive mapping of causal statement Network analysis of cognitive schema complemented with thematic content analysis of interviews</p>	<p>Industry outsiders compensate for outsidersness by proactively exploring the interdependencies in their new industry, resulting in a comprehensive and complex visualization of the business model and the surrounding ecosystem. Outsiders also tend to focus on a wider range of stakeholders, leading to the formation of business model cognitive schemas characterized by a distributed focus linking numerous aspects of the business, as opposed to a higher concentration of value chain connections linking to a few concepts.</p>

Chapter - 2

Diversity in Strategic Teams

Chapter – 2: Diversity in Strategic Teams

Study 1 – The Influence of Cognitive and Ideological Diversity in Top Management Teams on Business Model Innovation¹

ABSTRACT

As top management teams (TMTs) become progressively more diverse, an important question arises: how does greater TMT diversity affect a company's ability to innovate its business model? In answering the question, this article breaks new ground by studying the effect of cognitive and ideological diversity on TMTs' mental attention to business model innovation (BMI), and on companies' actual BMI intensity. The theory developed in the article is supported empirically. Analysis of eleven years of longitudinal data from companies in the U.S. printing and publishing industry shows that TMTs' BMI attention-scope increases with cognitive diversity, although it remains unaffected by teams' ideological diversity. We also find that companies' BMI intensity is higher when teams with greater cognitive diversity have worked together longer. Furthermore, companies' BMI intensity increases initially with ideological diversity, but decreases as ideological diversity becomes greater; TMT longevity checks this decrease, however. The study's contributions and implications are also discussed.

¹ An article based on this study has been submitted for publication and is undergoing the peer-review process at the time of writing. An intermediate version of this study was also presented at the Academy of Management Conference, 2017 held in Atlanta, USA

INTRODUCTION

Social, political, technological and economic currents are producing ever more diverse societies in the developed parts of the world. As a result, unlike earlier times, specialized knowledge and skill is no more the only salient factor that distinguishes between workers today. An increasing variety in the identities and mindsets shaped by age, culture, ethnicity, faith, gender, life-styles, and sexual orientation has also become a key hallmark of the labor pool. As workforce heterogeneity increases, the calls for representing this diversity in the upper echelons of corporate management have also grown. This makes it important to study whether diversity in top management teams (TMTs) is likely to have consequences, one way or the other, for firms' ability to deal with the demands of today's business environment. With this as backdrop, the present article explores the effect of TMT diversity on business model innovation (BMI), a crucial contemporary challenge for firms seeking to create competitive advantage by replacing dated models with newer ones. Building on Hambrick and Mason's (1984) upper-echelons framework and the TMT literature that has followed (e.g., Boone et al., 2018; Cannella et al., 2008; Hambrick et al., 2015; Wei and Wu, 2013), the article examines in particular how TMTs' cognitive and ideological diversity influence TMTs' attention to BMI and companies' BMI intensity.

The concept of business model refers to the content, structure, and governance of a company's value creating and capturing transactions with its environment (Amit and Zott, 2001; Teece, 2010). The literature on the topic identifies three basic elements that distinguish business models from one another; namely, the value proposition a firm's activities offer to customers, the value-chain structure underpinning the realization of the value proposition, and the mechanisms for capturing value (cf. Foss and Saebi, 2017; Zott et al., 2011). The interdependencies between these elements, because of how they are linked together in an architecture, make it difficult to alter a firm's business model to accommodate changes brought about by the evolution of technologies, customer needs and competitive dynamics (Chesbrough, 2010; Foss and Saebi, 2017). There is, thus, great interest in developing understanding of factors that enable innovation of a business model and factors that impede it (Bock et al., 2012; Saebi et al., 2017). One factor that can be anticipated to have a decisive influence on BMI is the composition of firms' TMT, the most powerful decision-making group in companies tasked with deciding strategy (Hambrick and Mason, 1984; Finkelstein,

1992). A rich stream of studies shows that diversity in TMTs affects strategic decisions, innovation and performance (e.g., Bantel and Jackson, 1989; Boone and Hendriks, 2009; Buyl et al., 2011; Cannella et al., 2008; Hambrick et al., 1996; Wiersema and Bantel, 1992), but so far there has been no investigation of TMT diversity's impact on BMI.

This article focuses on two forms of diversity in groups that have received much attention in recent years: cognitive diversity and ideological diversity. Cognitive diversity, also alluded to as diversity of thought, refers to variety in group members' knowledge and intellectual perspectives (Barkema and Shvyrkov, 2007; Østergaard et al., 2011) because of their different life-experiences as members of discrete socio-cognitive categories defined by age, education, functional specialization, gender, and nationality. Ideological diversity, in contrast, captures variety in group members' values about preferable modes of conduct and end-states of existence (Chin et al., 2013; Rokeach, 1973). In the field of management, people's position on the liberal-conservative spectrum of political beliefs has fast become the standard to identify the values they espouse vis-à-vis the full gamut of social and economic issues, including women's right to abortion, community welfare, maintenance of law and order, and free-market principles (Chin et al., 2013; Gupta et al., 2018). I study the effect of TMT cognitive as well as ideological diversity on BMI. In particular, I examine how these two forms of diversity affect TMTs' scope of attention to BMI – attention being a cognitive process involving noticing, interpretation, and devotion of time and effort to acquire information and knowledge (Li et al., 2013; Ocasio, 1997). In addition, at the level of the firm, I examine their effect on the intensity of BMI in terms of the number of innovations in business model introduced in the time a particular TMT was together.

To test the study's formal hypotheses, I employ longitudinal (2003-2013) panel data from firms in the U.S. printing and publishing industry. Confirming the hypothesis, TMT cognitive diversity has a significant positive effect on a team's BMI attention-scope, and the effect becomes stronger the longer a TMT has worked together. However, TMT ideological diversity does not seem to matter for team's BMI attention-scope. Interestingly, contrary to what was predicted, TMT cognitive diversity has a significant negative effect on a firm's BMI intensity, but TMT longevity (i.e., the span of time the TMT has been together) reverses this through a positive moderation effect. In line with predictions, I also find that while BMI intensity increases with some TMT

ideological diversity, it decreases when ideological diversity becomes greater and team members become polarized. In this case too, TMT longevity attenuates the negative effect of diversity on BMI intensity. The study's full set of results supports the theory presented in the article and it throws light on the slightly different consequences of TMT cognitive and ideological diversity for BMI in companies. In relation to the last, the theory and findings underscore the importance of being attentive to different forms of TMT diversity when examining *diversity's* influence on strategic decisions and innovation outcomes.

The article makes several contributions to the literature. This chapter advances the agenda of a new wave of diversity research in management studies by exploring the effects of both diversity in thought and diversity in values. One important message the article communicates is that despite the apprehensions expressed in some quarters about potential downsides of greater diversity, at least in the upper echelons of companies, diversity can be advantageous. Diversity in thought that stems from executives' varied life-experiences enables a TMT to recognize a broader set of issues and opportunities pertaining to firm's business model than a more homogenous team could. Importantly, even though cognitive diversity may hold back BMI, longer time spent together overcomes this problem. This underscores the point that there is value to cognitive diversity if it is managed well to harness its potential. Similarly, diversity in values can also be a positive force at the corporate top, albeit one must be mindful that ideological differences do not thwart change by spawning dysfunctional polarization in the TMT. The final section of the article discusses further the contributions to diversity research, the upper-echelons literature, and work on BMI. I also discuss the implications for management practitioners.

THEORY AND HYPOTHESES

TMT Cognitive Diversity and Ideological Diversity

Hambrick and Mason's (1984) upper-echelons framework has stimulated much research on the strategy preferences of executives. The framework offers a parsimonious account of how cognition and values form an executive's personal, idiosyncratic lens that affects strategic choices through perceptual filtering and behavior channeling (see also, Chin et al., 2013). Because the topmost executives in firms share tasks, responsibilities and power, upper-echelons research seeks to

understand how firms' strategic decisions, innovations and financial performance are affected by the diversity of thought and values in top management teams (Boone and Hendriks, 2009; Cannella et al., 2008; Carpenter et al., 2004; Chattopadhyay et al., 1999; Finkelstein and Hambrick, 1990; Hambrick et al., 1996; Heyden et al., 2012; Kor, 2003; Marcel, 2009; Wei et al., 2005). However, as it is usually not easy to observe and measure differences in mental make-up directly, cognitive diversity has usually been studied indirectly, as the unseen mechanism explaining the effects of diversity in executives' visible socio-demographic characteristics (Kilduff et al., 2000; Pfeffer, 1983). For example, the access provided by cognitive diversity to a wider range of information, knowledge and perspectives is suggested routinely as the underlying reason for functional heterogeneity's effects on firms' decisions and outcomes (Qian et al., 2013; Simons et al., 1999).

Similarly, researchers often ascribe the effects of observable TMT heterogeneity along other socio-demographic facets like age (Finkelstein and Hambrick, 1996; Wiersema and Bantel, 1992), education (Bantel and Jackson, 1989; Simons et al., 1999), gender (Opstrup and Villadsen, 2015; Quintana-García and Benavides-Velasco, 2016) and nationality (Boone et al., 2018; Nielsen and Nielsen, 2013) to team's cognitive diversity. In line with this and the broader research on human cognition, I conceptualize TMT cognitive diversity as variety in team members' knowledge and intellectual perspectives arising from members' different life-experiences as affiliates of specific categories defined by socio-cognitive variables such as nationality, gender, functional specialism, educational attainment and age cohort (cf. Barkema and Shvyrkov, 2007; Bussey and Bandura, 1999; Fiske and Taylor, 1984; Lewis and Brooks-Gunn, 1979; Østergaard et al., 2011). Differences in category affiliation are said to ingrain dissimilar knowledge structures, understandings and outlooks in people because of exposure to different information sets and meanings. Thus, executives from different nations can expand a team's cognitive diversity because of the unique imprints of their country and culture on their individual minds (Boone et al., 2018; Nielsen and Nielsen, 2013). Male and female team members, likewise, add to cognitive diversity by bringing mindsets forged by contrasting experiences through life (Hillman et al., 2002; Triana et al., 2013). In a similar vein, TMT cognitive diversity should be more when executives' have different understandings because of belonging to separate groups formed by age or generation (Jasper and Pieters, 2016; Yang, 2008), educational level (Finkelstein and Hambrick,

1996; Wiersema and Bantel, 1992) and functional area (Bantel and Jackson, 1989; Chattopadhyay et al., 1999).

TMTs can also differ with regard to the diversity of ideologies or values espoused by members about desirable modes of conduct and end-goals (Chin et al., 2013; Rokeach, 1973). Ideological diversity differs from cognitive diversity, in that it does not refer to team members' range of knowledge and intellect, but to their emotional disposition regarding human and social affairs that is rooted in an individual code of beliefs about right and wrong. Team members whose knowledge and intellect are comparable, may very well differ in their values. Value theorists (Feather, 1979; Schwartz, 1996) and political theorists (Jost, 2006; Tedin, 1987) argue cogently that one's core values can be determined by looking at one's political affiliation (Rosenberg, 1956; Tedin, 1987). In the U.S. context, the liberal-conservative political continuum, which finds expression in the socio-economic stances and agenda points of the Democratic and Republican political parties, and in these parties' secular versus religious orientation, has gained traction as a fruitful framework to establish the ideology one espouses (Jost, 2006; Schwartz, 1996). The framework is especially germane for business research because liberals and conservatives differ markedly with respect to the primacy they attach to free-market principles and their focus on protecting and promoting respectively, the interests of diverse business stakeholders versus primarily the interests of shareholders or owners (Graham et al., 2009; Jost et al., 2003; McClosky and Zaller, 1984). Studies show that business leaders' and executives' political ideologies can range from extremely liberal to extremely conservative (Francia et al., 2005; Tetlock, 2000) and that this guides their choices in relation to a variety of strategic issues ranging from executive compensation (Gupta and Wowak, 2017), to workforce downsizing (Gupta et al., 2018), to emphasis on corporate social responsibility (Chin et al., 2013). Building on this nascent body of work, I discuss later in the chapter how TMT ideological diversity is likely to influence innovations in firms' business models.

Business Models and Innovations in Business Models

A business model, in layman's terms, is the way in which a company conducts its business to generate profits within some larger web of economic relationships. More formally, the business-model concept refers to the content, structure and governance of a company's value creating and capturing transactions with its environment (Amit and Zott, 2001; Teece, 2010). Defined in this way, as Zott and Amit (2010) note, the

notion of a business model captures both the complex set of activities performed by a firm, and the resources and capabilities it has to perform them – either within the firm or beyond it through cooperation with partners, suppliers or customers. In line with this perspective, Massa et al. (2016) suggest that the notion encapsulates not only the activities a firm chooses to perform, but also how it performs them, who performs them, and when it performs them (see also, Casadesus-Masanell and Ricart, 2010). As a system of activities, a business model consists of three distinguishable components that are interconnected in one architecture: the *content* component comprising the specific activities performed; the *structure* component consisting of value-chain linkages that allow value creation and appropriation; and the *governance* component referring to the allocation of roles and responsibilities in the focal firm (Casadesus-Masanell and Ricart, 2010; Zott and Amit, 2010).

Unrelenting scientific and technological advances, altering customer needs, globalization and changing patterns of competition have, across industries, made timely business model innovation (BMI) a pressing issue for companies seeking to defend and improve their market position (Afuah, 2004; Johnson, 2010; Kim and Min, 2015; McGrath, 2010). Innovations in the business model can broadly range from relatively small changes in individual business model components to complete replacement of a business model with a new one (Bock et al., 2012; Khanagha et al., 2014). Typically, because of interlinkages between business model components and sub-components, BMI entails complex change involving multiple alterations in architecture, making successful innovation difficult (Baden-Fuller and Morgan, 2010; Foss and Saebi, 2017). In particular, multifaceted interdependencies between content, structure and governance elements make it challenging to orchestrate system-wide change that not only effectively repositions the firm for a better fit with the environment, but also meets the demands and expectations of partners, suppliers, employees and other key stakeholders (cf. Bouchikhi and Kimberly, 2003; Chesbrough, 2010). With this as background, I discuss next how greater TMT cognitive and ideological diversity are likely to affect BMI in firms.

TMT Diversity and TMT BMI Attention-Scope

Attention is a key psychological construct, which captures the cognitive process of noticing and interpreting a specific cue or signal, and devoting time and effort to acquiring information and knowledge related to it (Kahneman, 1973; Ocasio, 2011).

Attention operates as an information filter that keeps cognitive load in check through the selective perception of some cues, as others in the environment are ignored (Driver, 2011; James, 1890). Studies show that executives' attention focus is an important precursor of the strategic actions they take (Cho and Hambrick, 2006), the identification of opportunities (Shepherd et al., 2017), and of innovation (Li et al., 2013). One's attention focus, and thus the cues one notes, is said to be a function of one's mental make-up in terms of knowledge, intellect and values (Hambrick and Mason, 1984; March and Olsen, 1976).

Individual executives, thus, may be attuned to different signals in the environment because of cognitive differences in knowledge and intellect produced by their different life-experiences. When executives work together as a team, we can expect the cognitive differences among them to result in a larger set of issues, events, threats and opportunities coming to the team's attention (cf. Narayanan, et al., 2011). As cognitively unlike TMT members notice different things and bring their distinctive information and understandings to team meetings and discussions, the team as a whole should become cognizant of and start noting a wider range of relevant contextual cues (cf. Curşeu et al., 2007). With respect to BMI, in particular, the likelihood of a TMT noting the fuller array of concerns and possibilities concerning the different architectural elements of a firm's business model should increase with TMT cognitive diversity (cf. Mitchell et al., 2018; Saebi et al., 2017). That is, the more cognitively dissimilar the team members, the greater should be the team's scope of attention in terms of noting, interpreting, and deliberating on distinct content, structure and governance-related signals picked up by team members. In contrast, the more cognitively alike the team members, the more likely that their similar attention focus will result in the team's attention being concentrated narrowly round particular business model facets while others are overlooked. In short, then, we anticipate that greater TMT cognitive diversity will expand TMT's BMI attention-scope. Formally:

Hypothesis 1: There is a positive relationship between TMT cognitive diversity and TMT BMI attention-scope.

Furthermore, TMT members are also likely to be attentive to different cues in the environment if their core values differ. Research suggests that an executive's attention

focus is directed by the organizational and social goals and the means to attain them that the executive believes to be proper and virtuous (Chin et al., 2013; Rokeach, 1973). Thus, executives who have a conservative ideological orientation differ from their more liberal peers with regard to the cues that catch their attention and prompt a response. Studies suggest, for example, that more conservative executives are attentive to issues that champion individualism, rights of business owners and shareholders, product and customer safety, and accountability attribution for performance outcomes (Gupta and Wowak, 2017; Jost et al., 2003). On the other hand, executives who are more liberal pay greater attention to issues related to equality of opportunity, safeguarding the interests of different business stakeholders, corporate social responsibility, and innovation (Chin et al., 2013; Gupta et al., 2017; Kashmiri and Mahajan, 2017).

The observation that executives' ideologies influence what information they note and gather resonates with what has also been found in the area of judicial research, namely that judges' ideology determines the information mixed judicial-panels consider when deciding cases (Haire and Moyer, 2015; Spitzer & Talley, 2013). It follows from our discussion that greater TMT ideological diversity can be expected to increase BMI attention-scope by bringing a wider range of pertinent factors to a team's awareness. When team members differ ideologically, the more likely that their different value orientations will lead them to note different problems and opportunities vis-a-vis how to create value and distribute it among various claimants, organize operations and activities, engage with customers, assign roles and responsibilities to individual officials, and so on. This increases the odds that the team's attention will circumscribe holistically different architectural components of the business model, and will not be directed narrowly to only the content, structure or governance aspect. Accordingly, we anticipate that TMTs that are ideologically more diverse will have a broader BMI attention-scope than those that are ideologically more homogeneous. Formally:

Hypothesis 2: There is a positive relationship between TMT ideological diversity and TMT BMI attention-scope.

In addition to the above, we expect the impact of TMT cognitive diversity and TMT ideological diversity on BMI attention-scope to be stronger if TMT members have

been together longer as a team. As compared to a new TMT, an appreciation for other member's way of being and doing, social bonds and trust should be stronger in teams that have worked and stayed together longer (Hambrick et al., 1998; Harrison et al., 2003). Moreover, when more experience has been gathered as a team, interaction norms become established, interpersonal communication improves and friction is reduced (Chatman and Flynn, 2001; Nielsen and Nielsen, 2013). As a result, sharing of information and perspective is likely to be more uninhibited and comprehensive. This should strengthen diversity's impact on BMI attention-scope by exposing the team to a wider range of information about issues and opportunities that cognitively and ideologically diverse members bring to the table (cf. Jehn et al., 1999). In a TMT that has been constituted more recently, it is quite plausible that newer members will have less room to share their unique insights and to find an ear for them given their relatively lower status (see also, Srikanth et al., 2016), because of which data and observations relevant for BMI may not find their way to the team's attention, resulting in a narrower BMI attention-scope. In the light of this discussion, we can predict that:

Hypothesis 3a: TMT longevity will positively moderate the effect of TMT cognitive diversity on TMT BMI attention-scope.

Hypothesis 3b: TMT longevity will positively moderate the effect of TMT ideological diversity on TMT BMI attention-scope.

TMT Diversity and BMI Intensity

TMT cognitive diversity can also be expected to determine BMI intensity, which I define as the number of BMIs introduced in a firm in the period a TMT is together. In contrast to BMI attention-scope, a cognitive outcome at the team level, BMI intensity implies a physical outcome at the firm level. Cognitive diversity in teams has long been suggested to foster creativity and innovation by providing varied ideas, knowledge and perspectives, which can trigger the ideation, pursuit and implementation of novel possibilities (Bantel and Jackson, 1989; Muira and Hida, 2004; Talke et al., 2010). In relation to BMI specifically, besides increasing TMT attention-scope, TMT cognitive diversity can produce new associations in members' mental

categories by exposing them to views and perspectives that differ from their own, sparking the conversion of a team's information and knowledge into innovations (cf. Nemeth, 1986; Paulus and Yang, 2000).

With greater cognitive diversity, therefore, TMTs should be less prone to groupthink (Janis, 1982) and better placed to work out of the box. Thus, as TMT members contemplate the content, structure and governance of their firm's business model, there is stronger likelihood of feasible innovation opportunities being identified and introduced – whether in the form of a new-to-the-world business model, or in the form of adopting effectively a new-to-the-firm business model initiated somewhere else – when members' cognitive make-up differs and there is synthesis of different understandings into a new whole. In addition, BMI entails a re-composition of complex interdependencies among multiple elements, which is less easily managed in the absence of requisite cognitive variety to envision and put in place a new architecture of structure, content and governance linkages. Based on these considerations, I expect TMTs that have greater cognitive diversity to be able to introduce more BMIs than others in a comparable time frame. Formally:

Hypothesis 4: There is a positive relationship between TMT cognitive diversity and BMI intensity in firms.

I additionally expect that BMI intensity will also depend on TMT ideological diversity. When TMT members' positions on the liberal-conservative spectrum differ, the team should be more easily able to turn its information and understandings into BMIs. TMT members' different weltanschauungs about desirable ends and means are bound to engender spirited exchange about the overall business model to adopt, the business model elements to retain or change, and the manner in which to change the elements and relink them in a seamless architecture. Rich and vigorous debate, which is less likely when team members share the same beliefs, should entail deeper interaction, more effort to explain ideas carefully, and better listening and feedback (Stahl et al., 2010). This should help surface feasible new ideas regarding business model change and their implementation in the company (cf. Hambrick et al., 1998; Simons et al., 1999). Importantly, however, I expect a positive effect on BMI intensity only up to a certain level of TMT ideological diversity.

Political and social psychology research indicates that when people do not share convictions because of their very different ideological positions, they may distance themselves from one another and become polarized (Abramowitz and Saunders, 2008; Brandt et al., 2014). Within a TMT, a downside of too much ideological division therefore is that it may produce polarization that hinders communication and cooperation. Past team research has indeed shown that when team members' value orientations and thus the ends they seek diverge a lot, the exchange and integration of information are disrupted (Kirkman and Shapiro, 2005; van Knippenberg et al., 2010), which does not bode well for team's ability to introduce BMIs. Furthermore, if there is a large rift in values, the absence of common ground may make it difficult to decide on ideas to build on, and team members may show bias against ideas that do not conform to their worldview, hurting BMI (see also, Harvey, 2013). Thus, as TMT ideological diversity increases beyond a moderate level that is beneficial, BMI intensity should begin to decline. This implies a non-linear, relationship between TMT ideological diversity and BMI intensity, such that the effect is positive to begin with, but then becomes negative. Formally:

Hypothesis 5: There is an inverted-U relationship between TMT ideological diversity and BMI intensity in firms.

Furthermore, I expect greater TMT longevity to positively moderate the effect of both TMT cognitive diversity and TMT ideological diversity on BMI intensity. Analogous to our earlier discussion of TMT longevity, I maintain that if executives spend more time as a team, communication and collaboration should improve as they gain experience of working together, and understanding and trust build (Harrison et al., 2003; Smith et al. 1994). Although because of collective accountability TMT members have an intrinsic motivation to work effectively as a crew, there can be initial hiccups and interpersonal frictions as a team comes together. As these issues dissipate with the passage of time (Eisenhardt and Schoonhoven, 1990; Michel and Hambrick, 1992), and the team becomes more cohesive and creative in building and elaborating ideas with one another (King and Anderson, 1990; Woodman et al., 1993), the positive impact of TMT cognitive and ideological diversity on BMI intensity should become more pronounced. Over time, TMT members should also develop a shared language,

routines, and protocols that facilitate collective action (see e.g., Schippers et al., 2003), which should again contribute to the positive effect of TMT cognitive and ideological diversity. Based on the above reasoning, one can also expect TMT longevity to counter the negative effect of high TMT ideological diversity on BMI intensity. As understanding, respect for one another’s views, and trust increase, productive relations should replace ideological divisions and biases, reversing the negative relationship between high TMT ideological diversity and BMI intensity. Harrison et al. (1998), somewhat similarly, found that work-group longevity increased the effect of “deep-level” diversity in beliefs and values (see also, Stahl et al, 2010). The preceding discussion leads us to predict that:

Hypothesis 6a: TMT longevity will positively moderate the effect of TMT cognitive diversity on BMI intensity

Hypothesis 6b: TMT longevity will positively moderate the effect of TMT ideological diversity on BMI intensity.

These hypotheses are summarized graphically in the conceptual model depicted in figure 1.

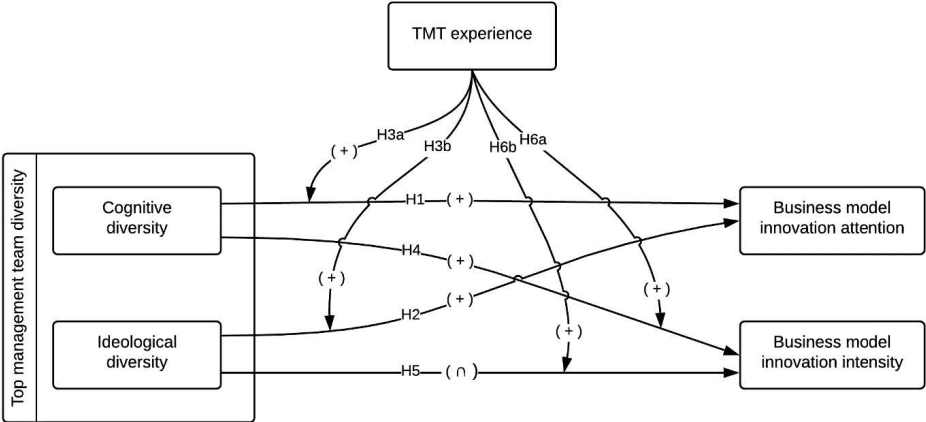


Figure 2.1 Proposed conceptual model and hypotheses

METHODS

Sample and Data Collection

For hypotheses testing, I focused on SIC 27 companies in the U.S. printing and publishing (P&P) industry. This sample seemed particularly appropriate because changes in technology, competition and customer needs have meant that BMI has been and remains a pertinent and important consideration for companies in the industry. Over the decades, a variety of changes have injected dynamism into the industry including, the 1980s superstore revolution in book retailing, Amazon's novel business model in the 1990s, and the rapid development of online shopping after 2000 (Greco et al., 2013). I included in the sample all 23 publicly listed firms that were operative for all years from 2003 to 2013, a period characterized by increase in online commerce and consumption, digitization of content, and emphasis on user involvement in output creation (Carreiro, 2010). This balanced panel provided us 253 firm-years of data pertaining to 156 TMT combinations in the sampled firms. In line with previous research, I used SEC filings (10-k forms) to identify TMT members as executives at the level of vice president or above in companies (Cho and Hambrick, 2006). The average TMT size was seven, and the range was 15. Furthermore, the length of time a TMT had been together ranged from one to 11 years.

The data for analyzes was collected from different sources. Information regarding the age, education, gender, functional expertise, and nationality of TMT members was obtained from and validated by consulting multiple data sources: BoardEx, ExecuComp, ThomsonOne, Bloomberg Businessweek archives, company websites, and the LinkedIn profiles of executives. Raw data to establish TMT members' conservative-liberal ideological orientation was sourced from the U.S. Federal Election Commission (FEC). To establish TMTs' BMI attention-scope, I examined the content of company Annual Reports. With respect to BMI intensity, I reviewed business-press archives, industry reports and the business literature to compile a list of all notable innovations in P&P firms' business model that were introduced from the year 1993 onwards. I used the validated list to determine which and how many of these innovations were introduced in a company in the period in which a specific TMT was in charge. This provided us an estimate of BMI intensity for all TMTs in the sample. Finally, companies' financial data was obtained from the income statements and balance sheets included in the company Annual Reports.

Variables and Measures

TMT cognitive diversity. Consistent with the variable's conceptualization as degree to which there is variety in team members' knowledge and intellectual perspectives, I developed a measure of TMT cognitive diversity by considering the variance in age, educational attainment, gender, functional specialism and nationality of team members. Simple geometric aggregation of variance vis-à-vis each of the five elements provided the overall measure. While with respect to team members' age I calculated the coefficient of variance, for the other four categorical indicators I employed Blau's index $1 - \sum p_i^2$ to determine variance, where p_i denotes the proportion of group members in the i th category. There were three categories of educational attainment – bachelor, (all TMT members in the sample had at least a Bachelor's degree), master and doctoral; two gender categories – male and female; six functional categories (Bunderson and Sutcliffe, 2002) – finance, general administration, manufacturing / operations, marketing and sales, technical, and other; and six nationality categories – Canada, China, Denmark, Netherlands, the U.K. and the U.S. (all TMT members in the sample represented one of these categories).

TMT ideological diversity. In line with recent studies (Chin et al., 2013; Gupta et al., 2018), I developed a measure of TMT ideological diversity by considering the degree to which team members espoused the more conservative stance of the Republican Party as opposed to the more liberal stance of the Democratic Party. Specifically, I assembled publicly available data on TMT members' donations to Republican and Democratic causes maintained by the U.S. Federal Election Commission (FEC). The FEC is an independent regulatory agency in charge of campaign finance monitoring; it records all individual contributions that exceed the amount of \$200, as well as the contributor's name, state, city, street address, zip code, occupation, employer, the name of the recipient, the donation amount, and the donation date. Using the FEC database, I established the pattern of donation of each executive in the sample by aggregating the donations he/she had made in the ten years prior to becoming a TMT member. Particularly, I calculated two indicators reflecting an executive's behavioral and financial commitment (Chin et al., 2013), and averaged them to arrive at an executive's ideology score on the conservative-liberal continuum.

As regards the first indicator, I calculated the number of donations an executive had made to the Democratic Party (i.e., to individuals, committees, and political action

committees (PACs) linked to the Democratic Party) and divided this by the number of donations he/she had made to both political parties. As regards the second indicator, I calculated the dollar amount of donations an executive had made to the Democratic Party and divided this by the dollar amount of donations he/she had made to both political parties. In relation to both indicators, to handle zero values I added 0.1 to all numerators and 0.2 to all denominators. The indicator scores ranged from zero to one; by construction, scores below 0.5 can be interpreted to reflect a greater degree of conservatism and scores above 0.5 a greater degree of liberalism. As the final step, to arrive at the TMT ideological diversity scores, I calculated the coefficient of variance of team members' individual ideology scores.

TMT longevity. I counted the number of years TMT membership had remained unchanged (Pelled et al., 1999) to measure TMT longevity. The value of the variable ranged from one to seven years.

TMT's BMI attention-scope. To determine a team's BMI attention-scope, I did a computer-aided text analysis (CATA) of company Annual Reports. CATA of company documents has become an accepted approach for studying attention focus of executives (Cho and Hambrick, 2006; Nadkarni and Barr, 2008). My analysis centered on determining whether TMTs' attention was relatively more concentrated or more distributed across business-model content, structure, and governance components (Zott and Amit, 2010). Towards this end, I sought to identify in Annual Reports the articulation of views and thoughts centering on changing or revising business-model content, structure, and governance elements, which would indicate a TMT's range of attention. The aim was to establish TMTs' BMI attention-scope on a four-point scale, with zero representing the absence of attention to changing any business-model element, and the maximum score of three representing attention to changing all three elements. To ensure that CATA would result in reliable and valid measurements, I developed a suitable search dictionary capable of identifying relevant references to changes in business-model elements in Annual Reports.

As the first step, because the content, structure, and governance elements refer respectively to the core *activities* constituting the business model, the *linkages* among them, and the *roles* and responsibilities assigned for carrying out the activities, I designated *activities*, *linkages* and *roles* as the basic search dictionary (SD) terms for identifying pertinent textual passages in the Annual Reports (Krippendorff, 2004).

Because the language used can vary, to ensure that CATA did not overlook relevant textual passages, I expanded the SD by including in it close synonyms and terms associated with the basic terms as indicated by the Cambridge business-English and Merriam-Webster dictionaries. To establish the SD’s face validity, I asked three colleagues knowledgeable about the business model literature to evaluate it for completeness and relevance. Based on their feedback, I removed five items from the SD that were either redundant or were not specific to one of the business model elements, and included three additional ones. The refined SD consisting of 22 terms is shown in Table I.

Table 2.I. CATA search dictionary – terms related to business model elements

Activities	Linkages	Roles
Activ*	Alliance	Authority
Project	Architecture	Contribut*
Scheme	Mechanism	Control
Task	Network	Duty
Undertaking	Partner*	Leadership
Venture	Provider	Position
	Supplier	Rol*
	Value chain	Responsib*

“*” CATA extracted all suffixes following the word stem.

With this SD, I ran sentence-level compound queries using ATLAS.ti 8 program to identify text in Annual Reports connected to one or more of the three business model elements. To identify textual material pertaining particularly to *change* in business model elements, the compound queries included stems of words linked to “change”, namely improv*, innov*, modif*, new*, novel*, replac*, simplif*, strateg*, transform*, unprecedent* (Krippendorff, 2004). To establish the validity of the CATA-identified texts, one of the authors of this article and a M.Sc. student familiar with the research topic manually inspected each CATA-identified text, independently of one another, to establish whether it was indeed connected to change in firm’s business model, and was thus relevant. The two reviewers were in agreement over the texts’ relevance in 96% of the cases. Considering only texts the reviewers agreed were relevant, a score of zero to three was assigned for TMT BMI attention-scope depending on how many of the three business-model elements had featured explicitly in a firm’s Annual Report in a given year.

BMI intensity. The variable was operationalized as the number of major BMIs introduced by a TMT in the period (in years) in which it was in charge in a company. To establish BMI intensity, I first reviewed business press archives, industry reports and the business literature to determine all major innovations in P&P firms' business model starting from the year 1993 (i.e., ten years before the panel-data period of 2003 – 2013). Following Baden-Fuller and Haefliger (2013), major BMIs are those that alter customers' identification and engagement with a company, or alter the company's value chain and linkages between value-chain activities, or alter the firm's revenue model in terms of the cost or pricing logic followed (see also, Foss and Saebi, 2017). I identified 15 such BMIs in the industry, which are shown in Table II. Two industry experts – a senior official at the trade association of Printing and Publishing companies and an academician who specializes in the publishing industry – verified that the list included all principal BMIs. At this point, one of the article authors and a M.Sc. student familiar with the research, independently of one another, reviewed Annual Reports of companies in the sample, press releases, and business news sources to establish in which year BMIs on the verified list had been introduced, if at all, in the sampled companies. There was a high level of inter-rater consistency, 0.92, and the few disagreements regarding the year in which a particular company had introduced a particular BMI were easily resolved. I tabulated this data to record BMI intensity as the ratio of BMIs a TMT had introduced in a company to the number of years this TMT had been together. Thus, if a TMT had introduced two BMIs in the four years it had been in charge in a company, the BMI intensity was recorded as $2 / 4 = 0.5$. BMI intensity ranged in my dataset from zero to five.

Control Variables. I controlled for a range of variables that may possibly affect TMTs' BMI attention-scope and BMI intensity. At the company level, I controlled for firms' age because older firms may face greater pressure to change their business models, which may influence attention scope and BMI intensity. Similarly, because firm size could affect the likelihood of change in business model, I controlled for it by taking firms' total assets (in millions of dollars) as the measure of size. Furthermore, because past performance may affect attention scope and BMI, I accounted for this by using the ratio of net income to sales as the indicator of firms' performance. Moreover, I controlled for firms' slack (i.e., the ratio of current assets to current liabilities) and firms' leverage (i.e., the ratio of total debt to total equity) because they indicate the financial resources available to a firm for innovation. At the TMT level, I controlled

for TMT longevity because teams that have been together longer may differ from others in their attention scope and BMI.

Table 2.II: Prominent business model innovations in Printing & Publishing Industry

Business model innovations	Early adopter	First adoption	No. of firms (2003-2013)
Editorial services	Wiley & Sons	Pre '03	3
E-learning resources	Pearson PLC	Pre '03	5
Adoption of e-commerce	Champion Industries	Pre '03	19
Interactive online platform	Champion Industries	Pre '03	18
Adoption of digital publishing	Multiple	2003	14
Marketing & distribution services	Ennis Corp.	2003	8
Hybrid publishing formats	Pearson PLC	2003	9
Non-linear publishing formats	Gannett Corp.	2003	2
Adoption of smartphone Apps	New York Times	2005	14
Digital-only subscription model	New York Times	2005	4
Web video as promotional tool	Thomson Reuters	2007	15
Online video as a product	Meredith Corp.	2007	2
Social-publishing formats	Multiple	2007	9
Social-media based marketing	Gannett Corp.	2008	16
Self-publishing & author services	Cenveo Corp.	2010	2

I also controlled for TMT size as the dynamics of larger teams could differ from those of smaller teams to affect attention scope and BMI intensity. In addition, I also controlled for possible time-related effects by including year dummies in the analyses.

ANALYSIS AND RESULTS

Because the longitudinal dataset includes repeated observations from the same companies over many years, I used the Generalized Estimating Equations (GEE) method for data analysis. The method is suitable for data such as ours because it can handle non-independent observations by allowing the estimation of the correlation structure of error terms (Liang and Zeger, 1986). The “xtgee” command was used in STATA 14.1. For all models that were estimated, I specified a Gaussian (i.e., normal) distribution, an identity link function, and an exchangeable correlation structure.

Furthermore, appropriately for a balanced panel such as ours, I used robust variance estimators (White, 1980). In addition, to avoid multicollinearity, I used mean-centered values of variables to create interaction terms for the testing of moderation effects.

For testing hypotheses about the effect of TMT diversity on BMI attention-scope, the 23 firms in the sample were treated as the panel variable and the firms' yearly observations from 2003 to 2013 as the within-panel time variable, providing 253 firm-year observations. Annual Reports, which were the source of data regarding TMTs' attention focus, are filed in the first quarter of a year. We, therefore, incorporated a one-year lag in the analysis by predicting BMI attention-scope in year t , based on the year $t - 1$ values of explanatory variables. To test hypotheses about TMT diversity's impact on BMI intensity, I organized the data a bit differently. As the dependent variable captured the number of BMIs introduced in the number of years a particular TMT was in charge in a company, the analysis centered on the 156 unique firm-TMT observations in the sample. The 23 firms in the sample were again treated as the panel variable, but I dispensed with the within-panel time variable, as it was not relevant for this specific analysis.

Table 2.III: Summary statistics

Variables	Mean	S.D.
1. Firm age	106.5	47.03
2. Firm size	127.0	73.20
3. Firm performance	0.04	0.14
4. Firm leverage	2.17	10.3
5. Firm slack	1.36	0.87
6. TMT size	6.47	3.35
7. TMT longevity	1.76	1.47
8. Cognitive diversity	0.10	0.24
9. Ideological diversity	0.29	0.32

Table III and IV show the descriptive statistics and bivariate correlations. There is sufficient variance in the measures of the study's variables and no correlation coefficient is unusually high. Table V presents the regressions results for TMTs' BMI attention-scope. Model 1 includes only the control variables; Model 2 includes the controls and the study's main explanatory variables – TMT cognitive diversity and TMT ideological diversity; Model 3, the full model, includes also the interaction terms

to test for the moderation effect of TMT longevity. Not very surprisingly, the results indicate that TMTs' BMI attention-scope tends to be significantly less in older firms and in larger firms. In support of Hypothesis 1, the results also show a significant positive effect of TMT cognitive diversity on BMI attention-scope ($b = 0.56$; $p < 0.01$). Hypothesis 2 is not supported, however; the coefficient for TMT ideological diversity is not statistically significant. As regards the moderating effect of TMT longevity, Hypothesis 3a is supported – greater TMT longevity strengthens the impact of TMT cognitive diversity ($b = 0.27$; $p < 0.01$). Hypothesis 3b concerning the moderating effect of TMT longevity on TMT ideological diversity is not supported. I reflect on these results in the concluding discussion.

Table 2.IV: Bivariate correlations

Variables	1	2	3	4	5	6	7	8	9
Firm age	~								
Firm size	-0.03	~							
Firm performance	0.08	-0.04	~						
Firm leverage	0.09	0.03	-0.10	~					
Firm slack	-0.25*	0.11	-0.08	0.01	~				
TMT size	0.49*	-0.32*	-0.02	0.07	-0.23*	~			
TMT longevity	-0.29*	0.21*	0.03	-0.01	-0.02	-0.31*	~		
Cognitive div.	0.44*	0.12*	0.14*	-0.07	-0.13*	0.17*	-0.01	~	
Ideological div.	0.19*	-0.14*	-0.03	0.01	0.08	-0.01	-0.16*	0.05*	~

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table VI presents the regressions results for BMI intensity. Model 4 in Table VI includes the firm-level and TMT-level control variables described earlier, as well as a control for TMT's average BMI attention-scope in the years it was in charge. Model 5 includes the controls, TMT cognitive diversity, and TMT ideological diversity and its squared term as predictors. In Model 6, the interaction terms to test for the moderation effect of TMT longevity are also included. The results indicate that BMI intensity is greater in the case of older firms, possibly driven by the necessity of switching over from dated business models to newer ones to remain competitive. Firm size, in contrast, appears to have a negative influence on BMI intensity, which is consistent with the frequent display of inertia by larger organizations. In addition, BMI intensity is less also when a firm is more leveraged, plausibly because of less willingness to assume BMI risk when there is more debt exposure. Furthermore, as may be expected,

BMI intensity is greater when TMTs' BMI attention-scope is broader. Notably, the results do not lend support to Hypothesis 4. TMT cognitive diversity's coefficient, rather than being positive as hypothesized, is negative ($b = -0.23$; $p < 0.10$).

Table 2.V. GEE results for TMTs' BMI attention-scope

	Model 1		Model 2		Model 3	
Firm age	-0.22*	(0.13)	-0.28**	(0.11)	-0.26**	(0.11)
Firm size	-0.01**	(0.00)	-0.01**	(0.00)	-0.01**	(0.00)
Firm performance	-0.23	(0.22)	-0.22	(0.21)	-0.22	(0.21)
Firm leverage	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
Firm slack	0.06	(0.12)	0.07	(0.12)	-0.07	(0.12)
TMT size	0.03	(0.03)	0.03	(0.03)	0.03	(0.03)
TMT longevity	-0.01	(0.03)	-0.12	(0.03)	-0.03	(0.03)
TMT cognitive diversity			0.57***	(0.16)	0.56***	(0.19)
TMT ideological diversity			-0.06	(0.25)	-0.18	(0.23)
TMT cognitive diversity x TMT longevity					0.27***	(0.06)
TMT ideological diversity x TMT longevity					-0.17	(0.12)
Intercept	3.27***	(0.65)	3.53***	(0.56)	3.47***	(0.57)
Wald's chi-square	61.75***		155.53***		596.80***	

*Note: $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$*

Interestingly, though, supporting Hypothesis 6a, TMT longevity does moderate the effect of TMT cognitive diversity positively ($b = 0.29$; $p < 0.01$), indicating that the latter can promote BMI when executives have been together longer as a team. Furthermore, results also show strong support for Hypothesis 5, which had predicted a nonlinear inverted-U effect of TMT ideological diversity on BMI intensity – the coefficient of the base term is positive and significant ($b = 0.66$; $p < 0.01$), that of the squared term is negative and significant ($b = -0.72$; $p < 0.05$). In addition, Hypothesis 6b is also verified – the interaction coefficients involving TMT longevity and the TMT ideological diversity base and squared terms are negatively ($b = -0.32$; $p < 0.05$) and positively ($b = 0.57$; $p < 0.05$) significant. TMT longevity would thus appear to attenuate the negative effect of high TMT ideological diversity on BMI intensity. The results are further discussed in the next section.

Table 2.VI. GEE results for BMI intensity

	Model 4		Model 5		Model 6	
Firm age	0.35***	(0.06)	0.20***	(0.04)	0.22***	(0.05)
Firm size	-0.01**	(0.00)	-0.00	(0.00)	-0.01*	(0.00)
Firm performance	-0.34	(0.28)	-0.23	(0.31)	-0.21	(0.33)
Firm leverage	0.01	(0.01)	-0.01**	(0.00)	-0.01**	(0.00)
Firm slack	0.11**	(0.04)	-0.06	(0.05)	-0.06	(0.04)
TMT size	0.02	(0.01)	0.01	(0.01)	0.01	(0.01)
TMT longevity	0.08***	(0.02)	0.02	(0.03)	-0.06	(0.04)
TMT BMI attention-scope	0.10***	(0.03)	0.07**	(0.03)	0.06**	(0.03)
TMT cognitive diversity			-0.27**	(0.12)	-0.23*	(0.12)
TMT ideological diversity			0.73***	(0.14)	0.66***	(0.13)
TMT ideological diversity squared			-0.84***	(0.30)	-0.72**	(0.27)
TMT cognitive diversity x TMT longevity					0.29***	(0.07)
TMT ideological diversity x TMT longevity					-0.32**	(0.14)
TMT ideological diversity squared x TMT longevity					0.57**	(0.24)
Intercept	-1.58***	(0.26)	-0.51*	(0.27)	-0.36	(0.28)
Wald's chi-square	200.8***		1976.5***		4375.6***	

Note: $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

DISCUSSION AND CONCLUSION

As societal developments continue to make the workforce more heterogeneous, calls have become stronger for greater representation of this diversity in the upper echelons of management. Although the pros and cons of diversity in organizations and in organizational work-groups have been studied for a long time, and have been the subject of much academic and public debate, relatively little is known about the consequences of cognitive and ideological diversity in the top management teams of companies – arguably because till the turn of the century, U.S. TMTs were not as diverse as they are today; and, because it has been challenging to identify and

empirically measure some centrally relevant ideology dimension with reference to which there are meaningful differences among executives (Chin et al., 2013). In this study, I therefore set out to examine how TMT cognitive and ideological diversity are likely to influence business model innovation in companies. Timely BMI is a crucial challenge for firms in today's competitive business environment, and one whose complexity requires TMT members to complement one another and work effectively as a team (see also, Foss and Saebi, 2017).

Building on the upper-echelons framework (Hambrick and Mason, 1984), I predicted the effects of TMT cognitive and ideological diversity on TMTs' BMI attention-scope – a team-level psychological construct, and on BMI intensity – a firm-level actual outcome. I also tested my predictions using longitudinal panel data from firms in the U.S. printing and publishing industry. While, overall, the empirical testing provides support for the predictions, it also reveals interesting unanticipated results that provide important insight into the effects of TMT cognitive and ideological diversity. As theorized, we found greater TMT cognitive diversity to increase a team's BMI attention scope, an effect that tends to become stronger with TMT longevity. These results show for the first time that variety in knowledge and intellectual perspectives attributable to team members' different life experiences, is of benefit. TMTs that are cognitively more diverse become cognizant of a larger set of BMI-related cues in the environment, which confers an informational advantage over other TMTs. Moreover, this advantage is amplified as TMT members continue to be a team for longer and gather experience of working with one another.

To my surprise, however, greater TMT ideological diversity did not affect teams' BMI attention-scope in the sample. Two possible explanations come to mind. It could be that although TMT members' positions on the conservative-liberal spectrum make them more attentive to specific cues, ideological diversity does not bestow an informational advantage because executives of all ideological persuasions tend to be aware, at the back of their minds, about the cues and perspectives that they are ostensibly “tuned to disregard” given the particular values they espouse. Thus, although signals about creating value through a greater CSR component in the business model are likely to catch a more liberal executive's attention (Gupta and Wowak, 2017), more conservative executives who are focused on value creation through better product quality are nevertheless aware of the CSR-linked options that they attach less importance to because of their ideology. It could also however be that in an

ideologically diverse TMT, members may be reticent to share their information and insight with those who subscribe to a different set of values because of fear it will generate friction (cf. Jehn et al., 1999; Klein et al., 2011). This might affect BMI attention-scope negatively. It is worth noting in this regard that TMT ideological diversity's regression coefficient was negative, albeit not at a statistically significant level.

As another surprising result, we found that greater TMT cognitive diversity affected BMI intensity negatively. Thus, even though there is an informational advantage to cognitive diversity (Jehn et al., 1999; Shin et al., 2012) because it expands TMT's attention-scope, cognitive diversity does not seem to provide an advantage in relation to actual BMI. This result echoes earlier reported findings of a negative effect of cognitive diversity, either because it impedes communication and interaction between team members who have different cognitive bases (cf. Miller et al., 1997; Østergaard et al., 2011), or because it triggers task-related conflict in the form of disagreements on the BMI course to follow (Olson et al., 2007; Pelled et al., 1999). Interestingly, as theorized, results indicate that the negative effect of TMT cognitive diversity on BMI intensity is moderated positively by TMT longevity. This finding is consistent with earlier work that has argued and found that the negative effect of cognitive diversity tends to disappear as team members accumulate experience of working together, and the initial difficulties of communication and interaction are resolved, and the team develops mechanisms to work through disagreements to achieve members' shared interest in the well-being of the company (Chatman and Flynn, 2001; Harrison et al., 2003).

Although we did not find an effect of TMT ideological diversity on BMI attention-scope, we did notably find that TMT ideological diversity has a curvilinear relationship with BMI intensity. As theorized, while greater ideological diversity is initially beneficial because the insightful point-counterpoint debates it fuels can help identify fruitful ideas concerning the introduction of business model changes, higher levels of ideological diversity are detrimental to BMI. Big discrepancies in the values espoused by executives on the conservative-liberal spectrum can reduce the amount and quality of communication between them, setting back the exchange and integration of information that could enable BMIs (cf. Brandt et al., 2014; van Knippenberg et al., 2010). This downside of ideological diversity, however, declines with TMT longevity's positive moderating influence. As TMT members work longer together, and develop

trust and productive relations, greater ideological diversity is beneficial even at higher levels. Because my study is the first one to examine the effect of TMT ideological diversity on BMI (and innovation, more generally), the study's findings offer unique insight, which seems especially relevant in today's politicized climate. Even large ideological differences, it appears, can be of value in organizations if harnessed to advantage through generating greater understanding and respect for alternative belief systems.

There has been surprisingly scant research on TMT diversity's impact on innovation in companies (e.g., Bantel and Jackson, 1991; Qian et al., 2013). Against this background, the inquiry into the effects of TMT cognitive and ideological diversity on business model innovation makes important contributions to the literature. In the upper-echelons framework, cognition and ideology are two core facets of executives' mental make-up, which determine firms' strategies and performance (Hambrick and Mason, 1984). Ideological and cognitive differences also increasingly lie at the heart of managerial diversity, as executives who have different value systems and who have gone through dissimilar life-experiences because of their connections with specific categories defined by age, education, functional specialization, gender, and nationality come together in the top layers of organizations. By focusing on both cognitive and ideological diversity in TMTs, this article underscores the value of examining the consequences of different diversity forms simultaneously. The effects of different forms, as my study shows, may vary across levels of analysis. While cognitive diversity has a positive effect at the TMT-level by expanding BMI attention-scope, its firm-level effect on BMI intensity is conditional on TMT longevity. Contrastingly, while ideological diversity has no noticeable effect at the TMT-level, its firm-level effect is curvilinear, but again conditional on TMT longevity. Understanding these differences and nuances is crucial for advancing the research agenda and for developing valid prescriptions for companies.

In relation to diversity research, this article speaks to and reinforces the recent call for a dynamic perspective on diverse teams (Srikanth et al., 2016) – one that takes the passage of time into account conceptually and methodologically. As Harrison and his colleagues (2002, p. 1029) note, “time serves as a medium for collaboration in teams”. The results show that diversity's effects can be either negative or positive, depending on the length of time team-members have worked together to accumulate learning and experience that allow them to collaborate effectively to reap the benefits of their

differences. In relation to methodology, field studies of managerial diversity have mostly been based on observations at a single point in time, which is not conducive to adopting a dynamic approach because changes over time in team, firm, and industry-level variables are ignored. The use of a decade of longitudinal data in this study lights the way for future research interested in modeling diversity's effects over time, perhaps in other settings and on additional variables such as product innovation and financial performance. In the meantime, the overall message to come from this study is one of optimism. Amidst all the impassioned rhetoric, championing either globalization or nationalism, monism or pluralism, supra or sub-identities, this research indicates that diversity in organizations can be a force for positive change – one that helps firms transform successfully in a mutating world. To have this effect, though, it would seem that diversity needs time and nurturing, to allow a better understanding to develop of the other.

This study also contributes to the upper-echelons literature. In the last few years, there has been great interest in understanding how the ideology of executives on the conservative-liberal axis affects strategic decisions and outcomes in companies. While some of this work has examined the impact of CEOs' personal ideology (e.g., Chin et al., 2013; Gupta et al., 2018), other studies have looked at the effect of the aggregate (i.e., average) ideology of directors on corporate boards (e.g., Gupta and Wowak, 2017), and the company as a whole (e.g., Gupta et al., 2017). This study adds to this stream of research by being the first to theorize and show that heterogeneity in the ideologies of senior-most executives is also very consequential, and thus deserving of attention. Although measures of central tendency undoubtedly provide important insights, it is also necessary to examine the effects of variance in the political ideology of decision makers because tensions and relational dynamics among executives, which determine cognitive and behavioral outcomes, may have origins in the degree to which executives hold similar or dissimilar values. Especially as people's positions on the conservative-liberal range have begun to play a bigger role in social interactions, it is important to look into the black box of TMT ideological diversity to find out how differences in values shape team dynamics and innovation outcomes.

As Foss and Saebi (2017) show in their exhaustive review of business model research, there is limited understanding currently about the administrative and organizational factors that foster and impede BMIs. What's more, even though strategy in companies is decided primarily by those who are in the topmost administrative layer, remarkably,

we know precious little about how executives' cognitive bases and values (Hambrick and Mason, 1984) come together to influence BMI. The present study, thus, makes an important contribution to the BMI literature by bringing to light that TMT diversity affects managerial attention to BMI and the intensity of BMI. In doing so, the study addresses the important gap in knowledge Foss and Saebi (2017) identify regarding managerial attention's relationship with BMI. It also gives support to the view ventured by Martins and his colleagues (2015) that BMI starts as a change in cognitive schemas, which is shaped by managerial attention. Furthermore, the study suggests interestingly that TMT cognitive diversity may serve as a transactive memory system that facilitates BMI as members note, encode, store and retrieve different bits of pertinent information. The study's findings also tantalizingly imply that TMT diversity, via the mediating effect of BMIs, may have bearing on firms' bottom-line performance, a line of investigation that researchers may wish to pursue in the future.

An important managerial implication of this study is that companies stand to gain from having a more diverse team of senior executives. As companies find themselves time and again under pressure to redesign their business model in response to competitive dynamics, having a TMT of executives whose mental make-up differs can potentially provide a competitive edge. Variation in executives' knowledge and intellect and values can lead to an information advantage as well as an advantage in ideating and realizing business model changes. There is, however, a caveat. The benefits of TMT diversity are conditional on the longevity of a team – the longer a team stays intact, the more the time for developing routines and practices that enable effective collaboration. Thus, to make TMT diversity work to advantage, a key challenge for companies might be to ensure that team members persevere together despite their cognitive and ideological differences and any initial difficulties of getting along. Administrators would do well to remember in this context that managing business model change involves managing the varied demands of different stakeholders and the fluctuating interdependencies in the marketplace, a balancing act that is probably best performed by a heterogeneous team.

Limitations and Avenues for Future Research

It is said that no scholarly investigation is perfect and complete on its own – this is also true of the present study. Several shortcomings of this work provide fruitful opportunities for future research. In the first place, this study's data for hypotheses

testing was from a single industry. To ascertain whether the proposed theory also holds in other settings, it would be very useful to examine the impact of TMT cognitive and ideological diversity on business models in different industries. Next, with respect to the measurement of variables, it should be of value to consider measuring TMT cognitive and ideological diversity using additional approaches and proxies. Although the path I followed is well grounded in the literature, confirmation of the results using other methods and instruments could provide valuable corroboration. For instance, researchers could gather data on TMT cognitive and ideological diversity using psychometric scales, such as the scale used by Wei and Wu (2013) to operationalize differences in executives' ways of thinking and the values inventory proposed by Rokeach (1973). A downside of surveys however is that it precludes the collection of longitudinal data about past TMTs, and is dependent on the commitment of multiple respondents in a company, which may not be easy to ensure.

An additional measurement-related concern might be that I relied on document analysis to gauge TMTs' BMI attention-scope. Although analysis of the content of companies' Annual Reports and Letters to Shareholders to determine executives' attention focus enjoys the scientific community's approval, it would be wise to cross-check the present findings using a supplementary method. For instance, advances in neuroscience afford opportunities to measure attention by recording patterns of brain activity using functional magnetic resonance imaging. Again, though, the disadvantage of such an intrusive measurement approach is that past attention patterns cannot be established, and securing the commitment of busy executives may be difficult. On a separate note, this study did not distinguish between TMT diversity's effect on new-to-the-world and new-to-the-firm BMIs. To the extent that the issues and challenges surrounding these two types of BMIs differ, it is possible that the two may be affected somewhat differently by TMT cognitive and ideological diversity. It would be interesting, therefore, to explore the effects of different forms of TMT diversity on different types of BMIs in future research. Furthermore, this study did not account for two important variables that can potentially moderate the effect of TMT diversity on BMI by affecting team dynamics, namely, CEO power and personality (Chin et al., 2013; Gupta et al., 2018). Thus, an attractive opportunity exists to extend the present study by including CEO power and personality variables into the model.

Chapter – 3

Different Yet Connected

Chapter – 3: Different Yet Connected

Study 2 – Cognitive Diversity, Structural Interdependence and Innovative/Imitative Business Model Innovation

ABSTRACT

The previous chapter established that a firm's trajectory of business model innovation is influenced by the cognitive diversity among their top management team. Using a similar conceptualization of cognitive diversity as the previous chapter, this chapter explores the influence of team-level structural factors on the relationship between TMT cognitive diversity and a firm's choice of imitative or innovative business model innovation processes. This chapter shows that TMT structural interdependence, resulting from a TMT's structural hierarchy, functional structure, and reward co-dependence, exacerbate the positive effects of cognitive diversity, albeit in different ways. While the analysis utilizes the same dataset as chapter 2 (supplemented by moderating variable data), the team level theoretical constructs under scrutiny are distinct and crucial for the business model innovation process.

Also distinct from the previous chapter, this study focuses on classification analysis to identify a firm's path to business model innovation as opposed to counting their intensity of implementing it. Herein the analysis illustrates how TMT cognitive diversity promotes increased managerial orientation towards business model innovations that consider market and industry specific factors, resulting in innovative digitization, as opposed to imitative digitization. More importantly, the results show that interdependent teams are able to make better use of the available cognitive diversity in their functioning. The results also show that cognitive diversity has a positive effect on a firm's ability to adopt a hybrid approach, adopting both kinds of business model innovations simultaneously.

INTRODUCTION

While business model innovation (BMI) can be critical for a firm's competitive position, firms often find it difficult to innovate their business model (Cucculelli & Bettinelli, 2015; Foss & Saebi, 2017; Zott et al., 2011). This difficulty arises from the fact that implementing business model innovations in organizations is a complex endeavor involving activities that range from “incremental changes in individual components of business models, extensions of the existing business model, introduction of parallel business models, right through to disruption of the business model, which may potentially entail replacing the existing model with a fundamentally different one” (Khanagha et al., 2014). Further complicating the playing field, the evolution of technology and widespread digitization have made opportunity recognition and exploitation an ever more nuanced yet urgent concern for management practitioners as well as scholars. Executives in today's digital marketplace face increasing complexity in coping with changes in their business environment. In addition to traditional market forces imparting uncertainty to incumbents firms' future, in recent times, digitalization – “the process of employing digital technologies and information to transform business operations” (Muro et al., 2017) – has presented additional challenges for managers in determining the trajectory of their business model innovation.

Innovation and imitation (often phrased as adaptation) are the two primary responses to “strategic discontinuities and disruptions, convergence and intense global competition” (Doz & Kosonen, 2010) facing extant business models. New business models may derive inspiration from market-pull, technology-push, or a combination of these forces (Zott & Amit, 2007) to facilitate superior value creation (Morris et al., 2005). Depending on the specific business model, the mechanism of creation of this value may be based on the principles of transaction cost economics (efficiency) or driven by Schumpeterian theory of innovation (novelty). The value drivers may also find their roots in the resource-based theory (complementarities) or be inherent in strategic networks (lock-in) (Zott & Amit, 2013). Regardless of the nature of specific tools and linkages used by a firm to generate value, today's dynamic business environment characterized by blurring industry boundaries mandates managers across industries to constantly transform by adapting and reconfiguring the content, structure, and governance of their business models. In case of the U.S. publishing and printing

industry in 2000s, a technologically driven change in the ecosystem (e-books and the internet) resulted in innovation of business models transcending the boundaries of the traditional industry. The evolution of business models in the publishing and printing industry over the past two decades is but an illustration of the interdependencies and complementarities at play between a firm, its customers, and/or third. The coexistence of Amazon's self-publishing service as well as traditional players such as Pearson PLC in the book publishing space points to the insight that firms sharing the same ecosystem may be able to sustain vastly different business models with different levels of penetration in various lines of business. Research suggests that in these ambiguous circumstances, "the actions of core firms in business ecosystems can have widespread and severe effects on complementors, and monitoring and understanding the actions of these core firms must be of primary importance to managers" (Desbonnet & Costa-Pierce, 2008). The question that naturally arises at this point is that how can managers decide when and how to adapt one's business model in response to the ecosystem's focal firms?

A long-standing managerial dilemma lies in pre-empting, or better so, defining the trajectory of upcoming changes in the firm's business ecosystem. From the theoretical perspective, the answer to this dilemma, lies in the answer to the question, 'How do successful executives "think" in the digital era?' The individual as well as team level processes of opportunity recognition and exploitation in the digital era are a subject of keen interest for scholars and practitioners alike.

This chapter suggests that the process of opportunity recognition as well as the reconfiguration of organizational resources in order to seize the opportunities available in a firm's ecosystem is dependent not only on the diversity of cognitive resources accessible to the firms' top management team, but also structural elements dictate the conditions under which these cognitive resources interact and co-create. The central role of top management cognition is demonstrated in previous research, such as the case study of Nokia, where differences in TMT cognitive processes are shown to have an impact on business model transformation decisions (Aspara et al., 2013). Taking this further, a systematic relationship between cognitive diversity among the top management team and the business model innovation trajectory of a firm is anticipated, deciding whether a firm prioritizes innovation over imitation in their business model innovation strategy or the other way around.

Building on previous research (Hambrick, Humphrey, & Gupta, 2015), I propose structural interdependence as an indicator of the structural incentive for cognitive resources to collaborate in a strategic setting. In other words, when faced by the “transform or perish” dilemma, the executives’ incentives for collaboration and thus the effects of cognitive diversity are moderated by structural characteristics of the given organizational setting. Structural factors such as a team’s structural hierarchy, functional structure, and reward co-dependence among the members influence the interaction between the team members, and provide a stage for the interaction of the cognitive resources for strategic decision-making. This chapter shows the simultaneous effect of diversity of age, gender, education, functional expertise, and nationality of TMT members and its conditioning by structural interdependence among TMT members, in an attempt to elaborate how firms determine their business model innovation trajectory as they adapt in response to external influences.

The hypotheses testing is done using longitudinal panel data from incumbent firms in the U.S. printing and publishing industry, in the years of industry evolution following Amazon’s initial success in the industry (2003-2013). Substantiating the hypotheses, we see that TMT cognitive diversity has a significant effect on a firm’s adoption of an imitative or innovative digitalization approach to business model innovation (or a combination of both). While a cognitively diverse team is more likely to adopt a hybrid approach combining both kinds of business model innovations, less cognitively diverse teams tend to be primarily imitative as opposed to innovative in their approach to digitalization. Importantly, we also find that structural interdependence among the top management teams, with regards to organizational structure, organizational hierarchy, and interdependent reward structures, has a positive moderating effect of the role played by cognitive diversity in determining the trajectory of BMI. Seen as a whole, the results from this study, support the theoretical framework presented in this chapter and illustrate the nuances in the effect of cognitive diversity in decision making teams on business model innovation. My theory and findings reiterate the value of diverse yet interconnected top management teams in a business environment characterized by the digital revolution.

This study makes numerous contributions to the literature. In relation to the cognition literature, it advances the understanding of the process of opportunity recognition and exploitation in the digital era by investigating the business model innovation trajectories pursued by executive in the publishing industry in response to Amazon

and the digital revolution. This article conveys a crucial message with regards to the consequences of diversity. In a business environment characterized by polarized popular perceptions of diversity, this study illustrates that the relationship between diversity and organizational outcomes is more nuanced than popular simplifications of the objective reality. Overall, this study reconfirms that greater diversity – at least in strategic decision-making teams – helps a firm’s adoption of a holistic approach to digital transformation. Diversity of cognitive resources, rooted in managers’ diverse life-experiences, is shown to enhance the understanding of the marketplace and thus helps in executing new business models that utilize a combination of imitation and innovation to create value. The results illustrate the value of cognitive diversity in the context of widespread digitalization, facilitating efficient allocation of human resources in purposed top management teams. The concluding section of the chapter contains further discussion over the contributions of this study to diversity, cognition, as well as digital transformation. I also discuss potential implications of my research for management practitioners.

THEORY AND HYPOTHESES

Cognitive Diversity and Innovative/Imitative Digitalization

Organizations comprise of individuals who differ from each other in values, preferences, and goals (Finkelstein & Hambrick, 1996). Diversity among these individuals, particularly the top executives entails that the complexity associated with studying the managerial antecedents of organizational outcomes is enhanced. However, this complexity extends to the understanding of strategic decision-making processes in organizations. For instance, TMT members are prone to differ on several significant mental models and beliefs structures. Depending on their functional background, over their career, an executive is exposed to a certain kind of information and/or situations. This selective exposure to situations influences the formation and updation of an individual’s cognitive lens (Chattopadhyay et al., 1999). In the past, Hambrick et al. (1996) have elaborated on the positive effects of TMT diversity on firm performance because of greater diversity of perspectives and knowledge. Further, a firm’s exploratory behaviour is known to be influenced by diversity among the top management (Alexiev et al., 2010). Previous research has also indicated that job-related TMT diversity moderates the relationship between strategic change and firm

performance (Naranjo-Gil et al., 2008). In the aforementioned study by Hambrick et al. (1996), the authors found that TMT heterogeneity is related to greater competitive behaviour by the firm. Hereby, heterogeneity in the TMT is seen as an indication of a pool of varied cognitive perspectives and is thought to encourage innovation and creativity. Using this perspective to address an issue crucially relevant for today's business environment, this study is focused on the following primary research question.

What are the key factors that moderate the influence of cognitive diversity among a firm's top management team (TMT) on the firm's trajectory of business model innovation?

This chapter posits that an answer may lie in an exploration of the group dynamics that catalyze the interactions between executives and consequently influence top management team decision. More specifically, I propose that cognitive diversity among top management teams enhances innovation orientation in business model innovation and digitalization processes. Diversity of experience and education implies a variety in cognitive resources. This entails a variety in the potential approaches members of the top management take to process and utilize the information that they are faced with. Diversity of lived experiences and expertise among TMT members is likely to result in diverse mental representations and understandings of the business model of the firm. In order to successfully implement innovative digitalization-oriented BMIs, the members of the top management team need to have a certain knowledge of a variety of aspects of the firm's business model as well as its wider business environment. This variety of cognitive resources is imperative to be able to recognize business model elements that may impart an innovative advantage to the firm. A greater variety of cognitive resources among executives regarding the business ecosystem, can be expected to result in an enhanced ability of managers to recognize merit in an innovative business opportunity and reconfigure available resources into a viable business model. This ability of the TMT facilitates the combination of technology and marketplace related cognitive resources to culminate in more innovative digitalization process.

Thus, cognitive diversity is expected to promote innovative digitalization-based business model innovations as well as hybrid business model innovations. Supplementarily, as cognitive diversity of a top management team increases, the

increased pool of cognitive resources also leads to a reduction in the firm's proclivity for adopting only imitative digitization processes. Thus, I present the following hypotheses.

Hypothesis 1: Cognitive diversity among the top management team has a positive effect on the implementation of innovative digitalization-oriented business model innovations

Hypothesis 2: Cognitive diversity among the top management team has a negative effect on the implementation of imitative digitalization-oriented business model innovations

Hypothesis 3: Cognitive diversity among the top management team has a positive effect on the implementation of both innovative and imitative digitalization-oriented business model innovations simultaneously

The Role of Structural Interdependence among Executives

Top management team members, whether diverse or not, don't make decisions in a vacuum. Research suggests that they are driven by team level factors such as the nature of their interactions and their structural interdependence (Stewart & Barrick, 2000). What this means in practice is that managers who are more dependent on each other are have a greater need as well as proclivity to collaborate and voice their opinion. In a review of the early upper echelon literature, Milliken & Martins (1996) illustrates that diversity in the composition of top management teams affects organizational outcomes through their diverse impacts on affective, cognitive, symbolic, and communication processes. The above discussed effects of top management diversity on business model innovation, while driven by diversity of expertise and understanding of the different aspects of the business model, are highly dependent on the group processes active within decision making teams. A conceivable resolution to the contradictory findings of empirical studies using the upper echelon perspective lies in the fact that in different firms TMTs are structured differently (Hambrick et al., 2015). Some TMTs are organized such that individuals work semi-autonomously with low dependence on one

another, while others are such that several aspects of their work are profoundly associated. These TMTs differ in their structural interdependence on each other.

According to Hambrick et al., (2015), structural interdependence (or TMT interdependence) can be defined as “the degree to which roles and administrative mechanisms are arranged such that members of an executive group affect each other”. They list three different kinds of interdependence as Horizontal, Vertical and Reward interdependence. The first form of interdependence, horizontal interdependence is “the degree to which roles are arranged such that the action and effectiveness of peers affect each other” (Hambrick et al., 2015). Apart from the functional/divisional characteristics of a TMT imparted by the firm’s organizational structure, there is another important factor that can contribute in TMT structural interdependence. TMTs are often structured hierarchically which can be distinguished by their rank designations. Vertical interdependence is the degree to which TMT members are peers as opposed to hierarchically structured (Hambrick et al., 2015). The third form of interdependence, Reward interdependence, is the degree to which TMT member’s payoffs are dependent on each other. This refers to a distinction between individual performance-based rewards and group performance-based rewards. Studies on executive compensation have previously investigated this aspect, however not with regard to the impact of TMT heterogeneity (Devers et al., 2007).

In the aforementioned study, Hambrick et al., (2015) have shown a moderating effect of structural interdependence on the impact of TMT diversity on the departure rates of TMT members as well as on firm performance. Other scholars have suggested that TMT demographic effects are likely to be stronger when interdependence amongst TMT members is high (Stewart & Barrick, 2000). Team interdependence been considered an important characteristic of TMTs as “it determines the degree to which members need to rely on one another to complete projects and fulfil member needs” (Barrick & Bradley, 2007). The logic behind the moderating role of structural interdependence begins from the influence of TMT diversity on decision processes by facilitating a more diverse pool of perspectives and knowledge (Homberg & Bui, 2013). The differences in values, perceptions and experiences present in a diverse group of individuals gives rise to a unique configuration and alignment of opinions and ideas, resulting in the group’s perspective/decision (Wei & Wu, 2013). Members of a top management team contribute their part in this group perspective by direct and indirect contact and dependence on each other. Barrick and Bradley (2007) find that in highly

interdependent TMTs, team mechanisms such as cohesion and communication lead to higher team performance when compared with TMTs with low levels of interdependence. They explain this finding using the argument that TMTs with higher cohesion and communication will be able to collaborate and work towards shared goals in a way that is required of interdependent teams. The logic works the other way around as well. Interdependent teams – where their structural characteristics require a greater level of communication – are more likely to be active and promulgate their opinions with greater vehemence. In other words, TMT structural interdependence entails that executives may be contribute to group decisions with greater interest more because they are on the same vertical ladder, or their work is more intertwined, or their compensation is dependent on how well the team performs. In such cases of high interdependence, we expect that more of the individual's opinions will come out in a discussion and more strongly. Thus, the effect of diversity of expertise will be more salient in highly interdependent teams. This brings us to the hypotheses.

Hypothesis 4a: Structural interdependence among the TMT strengthens the relationship between TMT cognitive diversity and the implementation of innovative digitalization-oriented business model innovation

Hypothesis 4b: Structural interdependence among the TMT strengthens the relationship between TMT cognitive diversity and the implementation of imitative digitalization-oriented business model innovation

Hypothesis 4c: Structural interdependence among the TMT strengthens the relationship between TMT cognitive diversity and the implementation of hybrid business model innovation

The conceptual model in figure 1 illustrates the tested relationships.

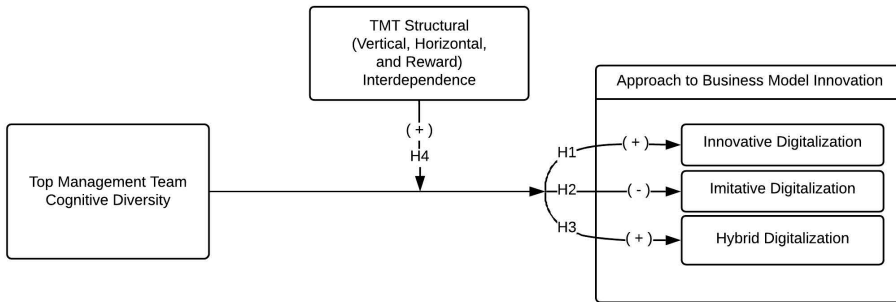


Figure 3.1: Conceptual model and hypotheses

METHODS

In order to study the effect of top management team cognitive diversity and structural interdependence on the choice of the type of business model innovations adopted by a firm, I first conducted exploratory analysis to identify clusters of BMIs adopted by incumbent firms in innovating their business model in response to disruption brought about by e-book technology and online retailing of books by Amazon. Using multiple correspondence analysis on a contingency table of firm-wise adoption of the 15 business model innovations observed in the industry (illustrated in table I), I was able to reduce the data into two dimensions, which facilitated ease of visualization in addition to preparing the data for cluster analysis. I further used k-means clustering to identify groups of business model innovations adopted by firms in conjunction with each other. This revealed two primary paths adopted by firms; a digitization-oriented approach to BMI centered on redesigning the firm’s business model by utilizing advancements in digital technology, and second a marketplace-oriented approach involving identification of emergent opportunities in the market resulting in vertical integration, horizontal integration, or market-centric technological adaptations in the business model. To analyze the effect of top management team diversity and structural interdependence on the path adopted by a certain top management team, I use multinomial logistic regression. This technique facilitates the prediction of probabilities of distinct outcomes of in case of a categorical distributed dependent variable, when regressed on multiple continuous independent (and moderating) variable. The following sections include detailing of the sample and data

collection process, identification of different approaches to business model innovation, and hypothesis testing using multinomial logistic regression.

Sample and Data Collection

In order to conduct the analysis, I collected data from 23 firms active listed in NYSE under the publishing and printing industry (SIC 27) throughout the eleven-year period of 2003 – 2013. Following the success of Amazon’s radical business model and introduction of the e-book technology, the study period was particularly characterized by an increasing focus on the involvement of the consumer in the value creation process as well as a need for swift reconfiguration of incumbent business models to incorporate digital means of value creation, value capture, and value delivery (Carreiro, 2010). Following previous research, I used SEC filings (10-k forms) for the identification of TMTs as teams of executives at or above the level of vice president in a firm (Cho and Hambrick, 2006). The average TMT size in the sample was seven with the largest team comprising of 15 members. Furthermore, the span of time a certain group of executives were together ranged from one to 11 years.

I collected data on the age, education, functional expertise, compensation and their formal titles of TMT member from multiple archival sources, including Execucomp, Bloomberg Businessweek archives, BoardEx, ThomsonOne, Thomson One Banker, Thomson Research, respective firm websites, and the executives’ public social media profiles (LinkedIn). In order to observe patterns in actual adoption of business model innovations, I undertook a thorough review of academic literature, industry reports, business press archives, and case studies. I thus compiled a list of business model innovations in the printing and publishing industry and the years in which these were adopted by firms in the sample. Our 253 firms-years of data covered 86 unique business model innovation adoption events, with 65 of them occurring within a year of a change in the composition of the TMT. The average number of BMIs adopted in an event was 1.74 with the highest number being 5 innovations adopted simultaneously in one year. I also used income statements and balance sheets, as reported in the firms’ annual reports, as a source of firm level financial data as well as executive compensation data.

Measurement of the Independent Variable: Top Management Team Cognitive Diversity

In order to measure top management cognitive diversity, I consider five key markers of diversity along which team members may differ. These namely, age, educational level, functional expertise, gender, and cultural / national heritage (D. Hambrick & Mason, 1984; Hillman et al., 2002). I estimated team diversity along each of these individual measures before developing a formative measure of *TMT cognitive diversity*. I used the coefficient of variance of team members' age, a continuous variable, along with the Blau's index for the other four categorical markers of diversity. This was calculated using the equation $Diversity = 1 - \sum_{i=1}^N p_i^2$, where p_i denotes the proportion of group members in the i^{th} category and N denotes the total number of categories. Educational level is conceptualized in terms of the highest degree awarded to the executives with the three categories being holders of bachelors, masters, and doctoral education. There were no executives in the sample without a bachelor's education. Following Bunderson & Sutcliffe (2002), I measured functional expertise of the executives by categorization of an executive's dominant previous work experience into of the following six categories, finance, marketing and sales, technical, operations or manufacturing, general administration, and other areas. I consider the dominant function of an executive to be the field where they spent the largest proportion of their professional career. I measured gender diversity based on the relative proportions of male and female members in the executive teams. Lastly, for the measurement of nationality diversity, I noted the executives' nationality of origin as reported in the database BoardEx. The executives in the sample originated from six different countries: Canada, China, Denmark, Netherlands, the U.K., and the U.S. Finally, to arrive at the composite variable for *TMT cognitive diversity* I calculated a simple product of these five measures.

Measurement of the Moderating Variable: Structural Interdependence

I followed Hambrick and his colleagues (2015) in operationalizing the vertical, horizontal and reward independence dimensions of structural interdependence. For the measurement of *vertical interdependence*, two indicators were used: the number of hierarchical levels in a certain TMT, and dummy whether a COO/CFO is present in the sample. The presence of the second indicator would imply an additional level of hierarchy. Thus, these two indicators were added, standardized and reversed, such that

a greater score reflects a greater interdependence (and a flatter hierarchy). The measurement of *horizontal Interdependence* was done using a dummy variable for whether a specific team has entirely functional posts or comprises of a divisional or mixed (matrix) structure. The measurement of *reward interdependence* was based on the coefficient of variance of the proportion of team members' non-cash pay, bonus pay and total pay. These indicators were then standardized and averaged. The three interdependence indicators reflect a TMT's influence upon each other due to the structural characteristics of their interdependencies, with a higher score on a 0 – 1 scale representing TMT higher interdependence.

Measurement of the Dependent Variable: Approach to Business Model Innovation

This study identifies two distinct approaches adopted by firms in the publishing and printing industry in innovating their business model, innovative digitalization-oriented BMI and imitative digitalization-oriented BMI. To observe the patterns and clusters in how firms approach business model innovation, I began with a scrupulous review of business press archives, case studies, industry reports, and academic literature and compiled a list of all innovations in the printing and publishing sector from 1995 onwards. Following the business model conceptualization of Baden-Fuller and Haefliger, (2013), I based my list of innovations that changed a firm's customer identification and engagement, the linkages in their value chain processes, and their revenue model with regards to the cost or pricing logic followed (see also Foss and Saebi, 2017). As illustrated in Table II, I identified 15 innovations influencing the core elements of a business model in the publishing industry between 2003 and 2013. Using this list, myself and an M.Sc. student familiar with the research, independently explored firms' annual reports, industry reports, and business news archives to determine whether in a particular year one or more of the innovations on the list had been also introduced in a company in the sample. We found a high level of consistency, 0.92, between the two ratings. The few instances of discrepancies regarding the year of adoption of an innovation by a specific firm were promptly resolved. Table I shows the firm wise adoption (or non-adoption) of each business model innovation.

Table 3.1 – Firm-wise Contingency Table of Business Model Innovation Adoption Events

Company Name																
Cenveo Inc.	0	0	0	1	1	1	0	1	0	0	0	1	0	0	5	
Champion Industries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Courier Corp.	0	0	0	1	0	1	1	1	0	1	0	0	0	0	5	
Deluxe Corp.	0	1	1	0	0	1	1	0	1	0	0	0	0	0	5	
DH Corp.	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	
Donnelley & Sons	0	1	0	0	0	0	0	0	1	1	0	0	0	0	3	
Ennis Inc.	0	0	1	0	0	1	1	0	1	0	0	0	0	0	4	
Gannett Corp.	0	1	1	0	0	1	1	1	1	1	1	0	1	1	11	
Glacier Media	0	1	1	0	0	1	1	1	0	1	0	0	1	1	9	
Lee Enterprises	0	1	1	0	0	1	1	1	0	1	0	0	0	0	7	
McClatchy Corp.	0	1	1	0	0	1	1	1	0	1	0	0	1	0	8	
Meredith Corp.	1	1	1	0	0	1	1	1	1	1	1	0	1	0	11	
Multi-Color Corp.	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	
New York Times	1	1	1	0	0	1	1	1	0	1	0	0	1	0	9	
Pearson PLC	0	1	1	0	1	1	1	1	0	1	0	1	1	0	9	
Schawk Inc.	0	0	1	0	0	0	0	0	1	0	0	0	0	0	2	
Scholastic Inc.	0	1	1	0	1	1	1	1	0	1	0	0	1	0	8	
Standard Register	0	1	1	0	0	1	1	0	1	0	0	0	0	0	5	
Thomson-Reuters	0	1	1	0	0	1	1	1	0	1	0	0	1	0	8	
Torstar Corp.	1	1	1	0	0	1	1	1	0	1	0	0	1	0	9	
Tufco Technologies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Wiley & Sons	1	1	1	1	1	1	1	1	1	1	0	0	0	0	11	
Wolters Kluwer	0	1	1	0	1	1	1	1	0	1	0	0	0	0	7	
	Digital-only subscription model	Use of Web video as promotional	Social-media based marketing	Editorial Services	E-learning Resources	Adoption of e-commerce	Interactive online platform	Adoption of digital publishing	Marketing and distribution services	Adoption of smartphone Apps	Online video as a product	Self-publishing and other author	Hybrid publishing formats	Non-linear publishing formats	Social-publishing formats	Total

I conducted Multiple Correspondence Analysis of this data in order to observe patterns of co-adoption of innovations across firms. Multiple correspondence analysis (MCA) is seen as an extension of the correspondence analysis for visualizing and summarizing data comprising of more than two categorical variables. The objective for using MCA in this study is to identify groups of associated innovations as determined by the co-occurrence of instances of their adoption.

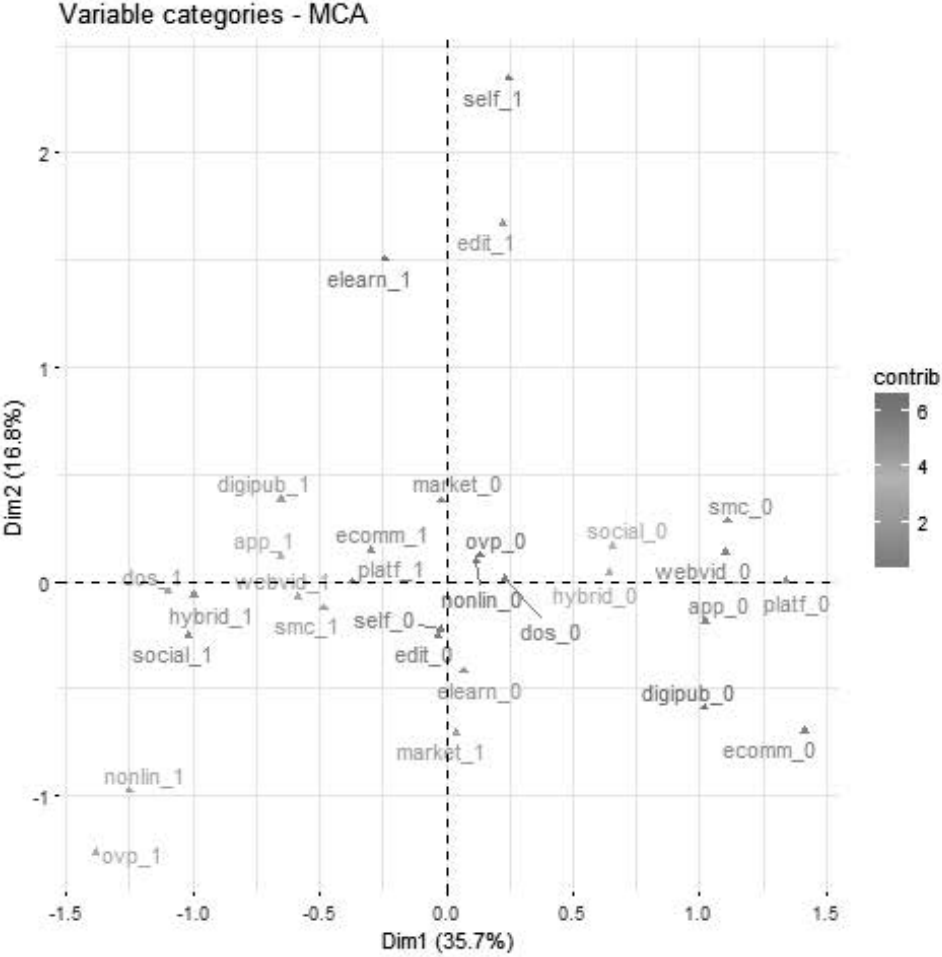


Figure 3.2 – Multiple Correspondence Analysis of business model innovation adoption and (non-adoption) events

The plot in Figure 2 shows the relationships between variable categories. Herein, the variable categories with a similar profile are grouped together. Negatively correlated variable categories are positioned on opposite sides of the plot origin (opposed quadrants). The distance between category points and the origin measures the quality of the variable category on the factor map.

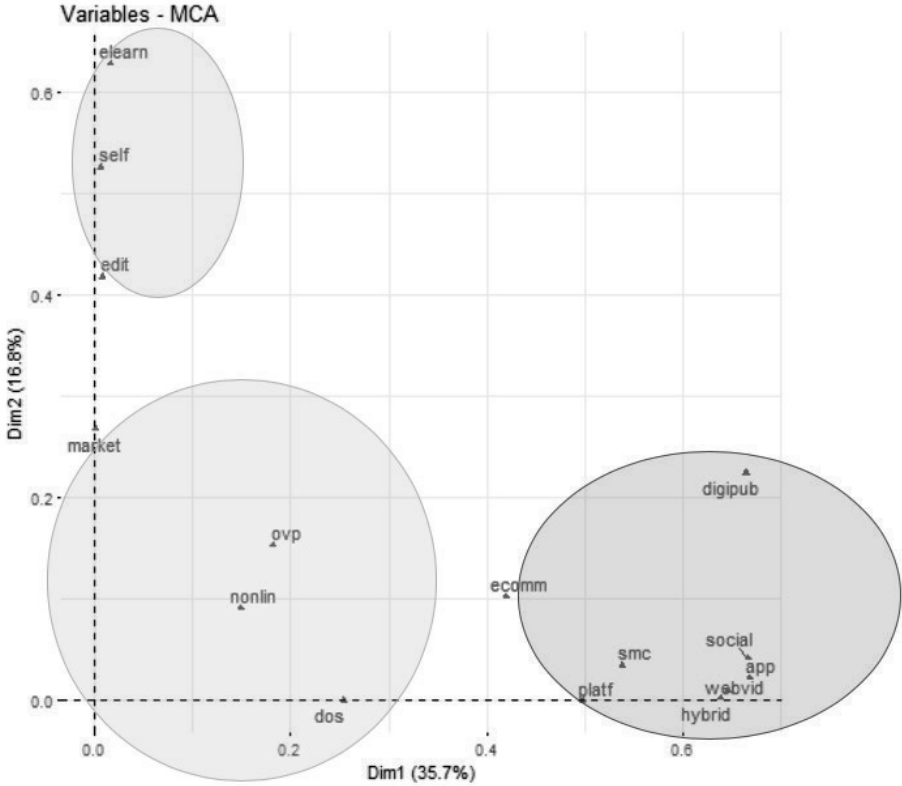


Figure 3.3 – Multiple Correspondence Analysis - Variable and the principal dimensions

Category points that are away from the origin are well represented on the factor map. The variable categories with the larger value of ‘contrib’, meaning that contribute the most to the principal dimensions (Dim.1 and Dim.2) are the most important in explaining the variability in the data set.

The plot in Figure 3 shows associations between helps to identify the different innovations that are the most correlated with the estimated principal dimension. Herein, the squared correlations between variables and the dimensions are used as coordinates. It can be seen that, the variables the adoption of a self-publishing-based model, providing editorial services to authors and providing e-learning resources as products are the most correlated with dimension 1. Similarly, the development of a smartphone app, the use of web video as a promotional tool and social media-based publishing are the most correlated with dimension 2.

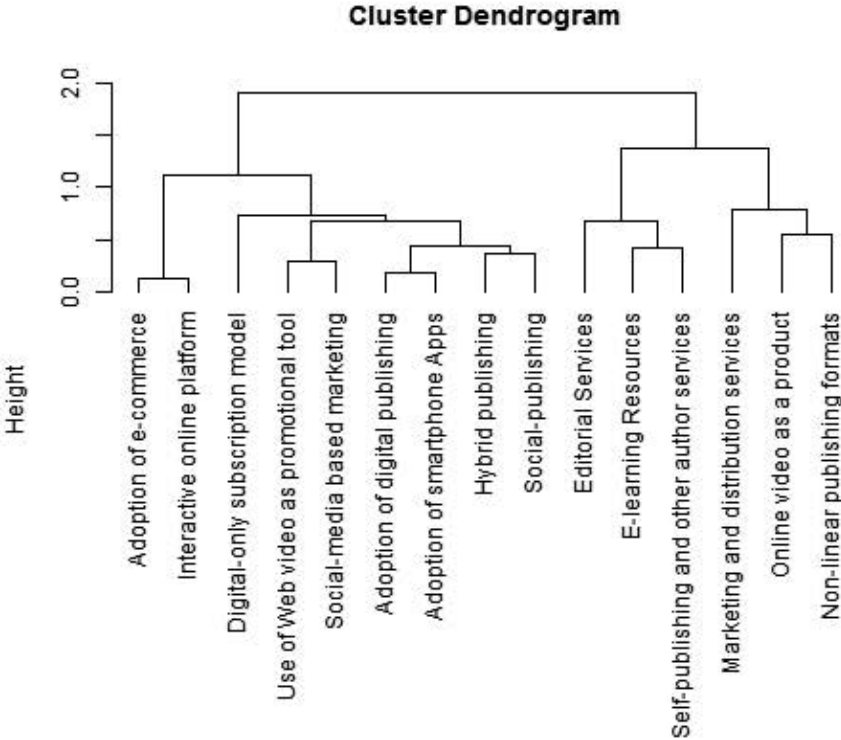


Figure 3.4 – Hierarchical clustering of business model innovation adoption events

I further used agglomerative (bottom-up) hierarchical clustering to group the associated innovations into two distinct categories. K-means clustering showed further formation of sub-groups in alignment with the findings from the Multiple Correspondence Analysis. The analysis revealed that individual business model

innovations are adopted by firms in clusters of associated innovations that reflect the direction of a firms' renewal strategy and thus the renewal path adopted.

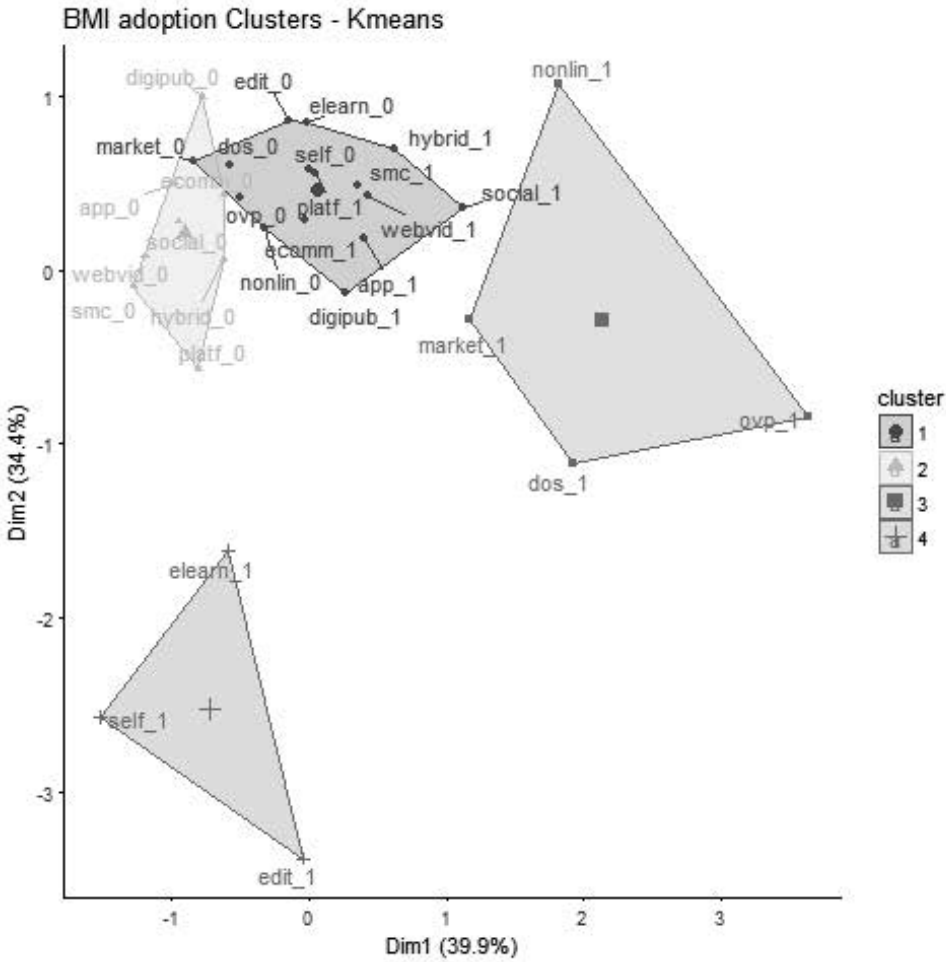


Figure 3.5 – K-means clustering of business model innovation adoption events

Figures 4 and 5 illustrate the hierarchical and k-means clustering while the observed clusters of BMIs are detailed in Table II. Set memberships for innovative and imitative digitalization-oriented business model innovation were determined based on whether a TMT in the sample adopted at least one of the innovations associated with these categories. A total of 67 out of 86 TMTs implemented imitative digitalization-oriented changes in their business model, 19 firms focused on primarily on addressing the needs of the innovative digitalization, and 7 firms were able to adopt innovations associated

with both the paths. Membership of *innovative digitalization-oriented BMI* set indicates the adoption of at least one such innovation by the given TMT, while the member of *imitative digitalization-oriented BMI* indicates a corresponding adoption event.

Table 3.II: Clusters of BM Innovations in the Printing and Publishing Industry

Business model innovations	Early adopter
<u>Cluster 1: Imitative Digitalization</u>	
Adoption of e-commerce	Champion Industries
Interactive online platform	Champion Industries
Adoption of digital publishing	Multiple
Adoption of smartphone Apps	The New York Times
Hybrid publishing	Pearson PLC
Social-publishing	Multiple
Web video as promotional tool	Thomson Reuters Corp.
Social-media based marketing	Gannett Corp.
<u>Cluster 2: Innovative Digitalization</u>	
Marketing & distribution services	Ennis Corp.
Non-linear publishing formats	Gannett Corp.
Digital-only subscription model	The New York Times
Online video as a product	Meredith Corp.
Editorial Services	Wiley (John) and Sons
E-learning Resources	Pearson PLC
Author services & self-publishing	Cenveo Corp.

Results

Table III shows the descriptive statistics and bivariate correlations. We can observe considerable variance in the measures of the study’s variables and no correlation coefficient is unusually high. Table IV presents the multinomial logistic regressions results for TMT’s choice of approach to business model innovation. Whereas only the control variables are included in Model 1, Model 2 also includes TMT cognitive diversity variable as a predictor. In Model 3, the full model is tested, including the interaction terms to test the moderation effect of *TMT vertical interdependence*, *TMT horizontal interdependence* and *TMT reward interdependence*.

Table IV. Multinomial Logistic Regression - Choice of BMI Approach

	Business Model Innovation Type													
	Model 1			Model 2			Model 3							
	Innovative	Imitative	Digitalization	Hybrid	Digitalization	Innovative	Imitative	Digitalization	Hybrid	Digitalization	Innovative	Imitative	Digitalization	Hybrid
Firm Age	0.907 (0.786)	-0.303 (0.312)	0.032 (0.582)	0.899 (0.788)	-0.419 (0.307)	-0.021 (0.577)	0.507 (0.652)	-0.273 (0.318)	-0.337 (0.536)					
Firm Size	-0.002 (0.005)	-0.002 (0.002)	-0.005 (0.004)	-0.002 (0.005)	-0.003 (0.002)	-0.005 (0.004)	-0.003 (0.005)	-0.002 (0.002)	-0.006 (0.004)					
Firm	2.690 (4.000)	0.899 (1.380)	-1.210 (1.320)	2.750 (4.040)	0.640 (1.310)	-1.280 (1.310)	4.030 (4.690)	0.835 (1.26)	-1.560 (1.370)					
Performance	0.007 (0.032)	0.018 (0.014)	-0.018 (0.034)	0.008 (0.032)	0.02 (0.014)	-0.017 (0.035)	0.009 (0.032)	0.015 (0.014)	-0.011 (0.035)					
Firm Slack	0.308 (0.357)	-0.302 (0.215)	-0.182 (0.355)	0.311 (0.357)	-0.305 (0.217)	-0.18 (0.356)	0.323 (0.484)	-0.365 (0.232)	-0.263 (0.402)					
TMT Size	-0.031 (0.114)	0.098* (0.055)	0.051 (0.093)	-0.031 (0.114)	0.093* (0.055)	0.049 (0.092)	-0.159 (0.160)	0.147** (0.061)	0.009 (0.101)					

TMT Cognitive	11.200***	85.000***	40.700***	49.100***	-124.000***	55.800***
Diversity	(0.046)	(0.013)	(0.02)	(0.054)	(0.017)	(0.025)
TMT Vertical				-1.170	1.150	-0.84
Interdependence				(1.930)	(0.879)	(1.380)
TMT Horizontal				1.750**	0.068	0.525
Interdependence				(0.838)	(0.368)	(0.600)
TMT Reward				4.880**	-1.390	2.370
Interdependence				(2.160)	(1.140)	(1.750)
CD x VI				42.200***	23.100***	263.000***
				(0.033)	(0.012)	(0.018)
CD x HI				90.100***	197.000***	-16.500***
				(0.0580)	(0.016)	(0.018)
CD x RI				46.100***	-46.900***	51.100***
				(0.010)	(0.003)	(0.005)
Constant	-7.090**	0.073	-2.100	-6.870*	-0.543	-0.704
	(3.600)	(1.410)	(2.650)	(3.680)	(1.640)	(2.800)
Akaike Inf. Crit.	472	472	472	495	495	495

*Note: p<0.1; *p<0.05; **p<0.01; ***p<0.001*

Table 3.III: Summary Statistics and Bivariate Correlation Table

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9
Firm age	106,570	47,031	~								
Firm size	127,000	73,179	-0,03	~							
Firm performance	0,042	0,141	0,08	-0,05	~						
Firm leverage	2,200	10,251	0,09	0,03	-0,1	~					
Firm slack	1,360	0,871	-0,25***	0,11	-0,08	0,01	~				
TMT size	6,470	3,351	0,49***	-0,32***	-0,02	0,07	-0,23***	~			
TMT cognitive diversity	0,001	0,002	0,44***	0,12*	0,14*	-0,07	-0,13*	0,17**	~		
TMT Vertical Interdependence	0,596	0,204	-0,25***	0,05	-0,13*	0,05	0,20**	-0,33***	0	~	
TMT Horizontal Interdependence	0,502	0,501	-0,12	0,16**	-0,07	0,07	0,24***	-0,19**	0,1	0,19**	~
TMT Reward Interdependence	0,346	0,161	0,13*	-0,19**	-0,11	0,01	-0,05	0,36***	-0,43***	-0,14*	-0,18**

Note: *p<0.1; **p<0.05; ***p<0.01

Supporting Hypothesis 1, we find a significant positive effect of TMT cognitive diversity on the adoption of an innovative digitalization-oriented BMI ($b = 49.10$; $p < 0.01$). Also supporting Hypothesis 2, we find that there is a significant negative relationship between TMT cognitive diversity and the adoption of imitative digitalization-oriented BMIs ($b = -124.00$; $p < 0.01$). TMT cognitive diversity is also found to have a significant positive effect on a TMT's adoption of BMIs from both clusters ($b = 55.80$, $p < 0.01$), indicating that cognitive diversity facilitates a hybrid approach to BMI and supporting hypothesis 3.

In relation to the moderation effect of the three forms of TMT structural interdependence, there is strong support for Hypothesis 4a – greater TMT vertical interdependence ($b = 42.20$; $p < 0.01$), greater TMT horizontal interdependence ($b = 23.10$; $p < 0.01$) and greater TMT reward interdependence ($b = 42.2$; $p < 0.01$) all enhance the positive effect of TMT cognitive diversity on the adoption of innovative digitalization-oriented BMI. While we also find partial support for Hypothesis 4b, indicating that vertical interdependence and horizontal interdependence reduce the negative effect of cognitive diversity on imitative digitalization-oriented BMI. Contrary to expectations, TMT reward interdependence seems to further accentuate the negative effects of TMT cognitive diversity on the adoption of imitative digitalization-oriented BMI, as indicated via a significant negative moderation effect ($b = -46.90$, $b < 0.01$). Further, supporting Hypothesis 4c, TMT vertical interdependence ($b = 263.00$, $b < 0.01$) and reward interdependence ($b = 51.10$, $b < 0.01$) both have a significant positive effect on the adoption of a hybrid approach BMI. However, we find that horizontal interdependence negatively moderates the relationship between TMT cognitive diversity and their adoption of BMIs from both the identified clusters of BMIs. We further reflect on the counterintuitive finding in the concluding discussion.

DISCUSSION AND CONCLUSION

Innovation and imitation are the two strategies extant firms often adopt as a response to “strategic discontinuities and disruptions, convergence and intense global competition” (Doz & Kosonen, 2010). Research indicates that firms are more likely to change their business models under conditions of perceived threats than opportunities (Saebi et al., 2017). In line with this, the threat to incumbent firms brought about by industry-spanning digital business models has led to extensive evolution in the business

models employed by long-stable industries, including the publishing industry. Building on this perspective, this study finds that cognitive diversity among the TMT – the group responsible for formulation and implementation of business model innovation related strategic decisions – has a significant influence on the firm’s choice of imitative or innovative digitalization.

The results from the multinomial logistic regression of a sample of North-American publishing firms – as illustrated in the conceptual model in figure 6 – show how diversity and interdependence among a TMT affect a firm’s business model innovation trajectory. Firms in the modern business environment can benefit from effective and efficient collaborations among

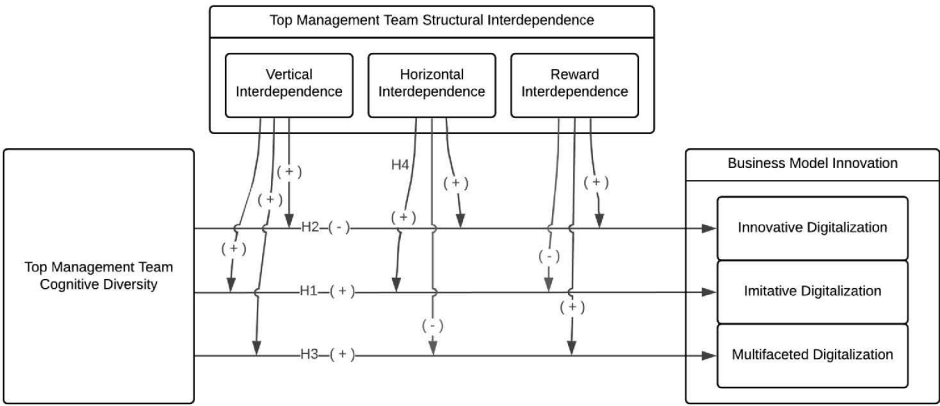


Figure 3.6: Detailed conceptual model depicting confirmed hypotheses

managers with different expertise and areas of knowledge. A digital business model, such as that of the transportation giant Uber requires the TMT to encompass expertise ranging from an understanding of state-of-the-art mapping technologies to information technology capabilities and an awareness of laws and cultural norms across the numerous countries of their operation in order to effectively modify and adapt their business model(s). Similarly, diverse areas of required expertise and awareness can be identified for other firms whether it be Tesla, Total, or Thomson Reuters. This phenomenon presents a pragmatic demand for understanding how diversity in the upper echelons of management impacts business model innovation decisions and outcomes. Adding to the substantial past research into the effects of TMT diversity on strategic outcomes such as competitive strategy (e.g., Hambrick et

al., 1996), exploratory behaviour (Alexiev et al., 2010), and firm performance (Buyl et al., 2011), I elaborate the relationship between TMT diversity and a firm's choice of business model innovation trajectory. Against the backdrop of rapid digitalization of business processes, this study shows that TMT cognitive diversity significantly increases a firm's proclivity for adopting innovative as opposed to imitative digital transformation processes.

As BMI efforts are, essentially, a collective managerial response to environmental changes or technological disruptions (Foss & Saebi, 2017), the lack of scholarly attention to role of structural interdependence among managers is unsettling. This chapter highlights this gap in the literature by illustrating the crucial role of top management structural interdependence in strategic decision process such as business model innovation. The results show a significant and overall positive moderation effect of structural interdependence on the relationship between top management team cognitive diversity and the type of business model innovation adopted by the firm. However, we also find that not all forms of interdependence among top management team members have the same effect on the firm's digital transformation trajectory.

Vertical interdependence, i.e. that is the extent to which the top management team is characterized by a flat hierarchy has a positive moderation effect on the adoption of innovative, imitative, as well as hybrid digitalization trajectories. On the other hand, while horizontal interdependence, "the degree to which roles are arranged such that the action and effectiveness of peers affect each other" (Hambrick et al., 2015), has a significant positive effect on both the adoption of innovative as well as imitative digitalization focused business model innovation, it is found to have a significant and negative interaction effect with the adoption of hybrid digitalization. This form of interdependence being associated with the organizational structure of the organization, the results indicate that while a divisional organizational structure (with lower horizontal interdependence among top management team members) facilitates the adoption of hybrid digitalization-based business model innovation. In distinction with these two forms of interdependence, we find that high reward interdependence (i.e., co-dependent reward structures) enhance the effects of cognitive diversity in a strategic decision-making process resulting in increased adoption of innovative and hybrid business model innovation (and reduced adoption of imitative digitalization).

In addition to the theoretical contribution to the study of upper echelons, this study employs a novel and objective technique for the measurement of the adoption of business model innovation. This measurement of business model innovation is based on the exploration of the established precursors of business model innovation, such as technologically driven ecosystem change (e-book and tablet technology) and access to new markets (bottom-of-pyramid markets gaining access to e-books). The technique proceeds to identify all pertinent changes in the industry over a certain period and then classify them as business model innovation, or not. Objective data on BMI is collected by following the adoption of these technologies by individual firms over the period of study (2003-2013). Although, not very suitable for studying the more secretive industries, such as Aerospace or Defense, this technique can be replicated in several many industries and business ecosystems. I hope that such measurement will become easier in the future with the increased availability of artificial intelligence and machine learning applications for contextual research.

I acknowledge the several limitations to this study. Firstly, this chapter develops a measure for business model innovation that may not be suitable for some contexts. An assessment of changes occurring in the industry with time requires a certain level of openness, at least among the focal players in the industry. Thus, the measurement technique may need to be modified to study other contexts. Secondly, despite the recent scholarly shift away from the use of demographic characteristics in top management research, I further the use of these proxies. Although, I acknowledge the shortcomings of this method, I do think that the method has some merits. For instance, this method, as is the case for this study, makes it easy to connect previous exposure to specific information with an individual's knowledge/expertise and subsequently their contribution to the strategic decisions. In order to address the limitations of my study and take the field further, I suggest further exploration of the managerial antecedents of business model innovation and the group processes that influence managerial decision making. A study at a larger scale or in a different industrial context would reinforce these findings and provide further insight into the factors resulting in the innovation of business models.

Chapter - 4

Social Outsiders in Strategic Teams

Chapter – 4: Social Outsiders in Strategic Teams

Study 3 – The Effect of Caste Hierarchy, Cultural Differences and Urban-Rural Divide on Co-Creative Forest Management in India

ABSTRACT

This chapter argues that the success of co-creative initiatives at the base of the pyramid is negatively affected by cultural and social-status differences among the institutional mentors and the participating community. I analyze data from 220 village-level forest management committees in Maharashtra state of India to investigate socio-cultural asymmetries in the effectiveness of mentors and success of co-creative forest management initiatives. As expected, committees working with cultural outsiders and mentors with lower perceived caste status perform worse when compared to cultural insiders and higher-caste status mentors, respectively. I suggest that identity-related prejudice leads to a reluctance among members of the community to collaborate with a mentor perceived as an outsider or as lower status. Confirming the hypotheses, I uncover a positive interaction effect between both caste and cultural separation and the urban exposure of mentors. We also find that the negative effects of officers' lower caste status are exaggerated in caste diverse villages. The chapter concludes by discussing how context-relevant consideration of socio-cultural asymmetries among people groups is crucial for effective diversity management and community engagement in co-creative business models.

INTRODUCTION

Different societies are characterized by distinct axes of discrimination, and unique challenges to inclusion (McSweeney, 2009; Tsui-Auch, 2005). A cornerstone of diversity research is the question – ‘what are the individual-level markers of diversity that are relevant to organizational and societal outcomes?’ Sub-cultural differences, socio-economic hierarchy, and the associated power dynamics are central to base-of-the-pyramid (BOP) societal structures, resulting in systemic prejudice against a large segments of the population (Suddaby et al., 2018). However, markers of socio-economic stratification and sub-national cultural differences have been largely absent from the conceptualizations of diversity in management research until recently (Audretsch et al., 2010; Damaraju & Makhija, 2018; Kish-Gephart & Campbell, 2015). Nevertheless they remain a foundational determinant of collaboration in work environments across the world (Acker, 2006). Thus, the lack of academic understanding of the organizational influences of the various markers of differences is exacerbated by the fact that antecedents of such hierarchies among teams are vastly different across cultural contexts (McSweeney, 2009). With increasing participation of the bottom of the pyramid markets in the global economy, it has become paramount to incorporate locally relevant markers of diversity into the theoretical understanding of diversity management. This chapter explores differences along context-specific social stratification, sub-cultural differences, and urban-rural divide among elected forest management committees and their institutional mentors in the context of co-creative forest management.

Across the world, different status is accorded to people of various backgrounds, albeit not without consequences for collaborative processes and organizational outcomes. Social status and the associated hierarchy are contingent on multiple intersecting identities resulting in an amalgamation of multiple intersecting power structures (Essers & Benschop, 2007). In large parts of Asia and Africa, and particularly in India, caste systems provide the underlying social mould in which other individual identities take shape, providing a contextually-relevant and closely linked counterpart to the western concept of class (Varman & Chakrabarti, 2004). A caste is “a small and named group of persons characterized by endogamy, hereditary membership, and a specific style of life which sometimes includes the pursuit by tradition of a particular occupation and is usually associated with a more or less distinct ritual status in a

hierarchical system” (Beteille, 2012). Distinct from the Marxist concept of class, based primarily upon the ownership of the means of production or the lack of it (Singh, 2017), the informal institution of caste is characterized by a semi-flexible hierarchy of status, connecting the mentioned groups of people along vertical as well as horizontal levels (Desai & Dubey, 2012; M. Srinivas, 1957, 1994; Vissa, 2011). While, caste-based discrimination is a punishable offence in India since the country’s independence from the colonial occupation, such discrimination has been found to be a recurring feature of Indian labor markets and business economy (Banerjee & Knight, 1985; Ito, 2009; Thorat & Attewell, 2007). Calling for intergovernmental attention to the issue, Mosse (2018) asserts that far from being an archaic ritual system, caste is a persistent dynamic aspect of modern economies.

Adding to the caste-based social stratification, base of the pyramid economies are characterized by other unique dimensions of diversity. Historically path-dependent relationships between geographically-separated people groups combined with non-uniform trajectories of economic growth and urbanization can lead to a variety of systematic differences across the various linguistically-homogenous sub-national cultures. For instance, identities, knowledge, and world-views associated with an individual’s sub-national regional/cultural heritage and urban versus rural background constitute important axes of insider/outsider categorization, including in professional contexts. Facing such unique dimensions of diversity in novel contexts, Mosse (2018), among others, has recently pointed to a need for policy innovation in order to manage market and non-market discrimination to ease social barriers .

In this study, set in the context of co-creative forest management in India, I explore the relationship between caste identity, cultural identity, rural/urban background of officers of the Indian government’s forest department and the caste demographics in forest-fringe villages with regards to its effect on co-creative forest management initiatives. The analysis employed individual-level data on forest department employees and quantitative data on socio-economic impact created by 220 village level forest management committees (FMCs) in the western Indian state of Maharashtra, as facilitated by the Ministry of Environment & Forests (Government of India). Corresponding to one of the core areas identified by the United Nations in its sustainability agenda (UNSDG, 2015), this study provides an interesting setting to examine the effect of diversity and inclusiveness with profitable models for environmental conservation. On the other hand, the setting of the study also facilitates

a reflection upon the long-term efforts by the Government of India to foster diversity and inclusiveness by mandating proportional representation of individuals from different backgrounds in public employment, including forest management leadership teams.

A generalized estimating equations (GEE) analysis of the data reveals support for the hypotheses. Firstly, we find that forest management committees working with mentors perceived to be lower on the caste hierarchy tend to have lower performance in collaborative forest management involving the state forest department and forest-fringe communities. We also find a negative effect of cultural differences between the mentor and local community on the co-creative forest management performance. In the context of rural India, where the sample is derived from, these results are indicative of an extant prejudice against and reluctance to work with officers who are perceived to be culturally different or lower on the caste hierarchy. Further substantiating this assertion, the results indicate that FMCs led by an officer associated with the marginalized castes have further reduced performance of such community engagement-driven forest management in so-called caste-diverse villages, where the community is composed of a majority of non-marginalized castes. Additionally, we find evidence that while both *caste outsiders* and *cultural outsider* forest officers negatively influence the success of co-creative forest management, this effect is reduced if the officer belongs to an *urban background*. The concluding section of this chapter discusses the theoretical and policy implications of the findings at length.

OUTSIDERS IN ACTION – CASTE, CULTURAL, AND URBAN OUTSIDERS

Economically Integrated Co-creative Forest Management in India

The United Nations' 'Sustainable Development Goals' (SDG) have placed special importance on sustainable forest management. In addition to the focus on afforestation, the target 15.2 seeks to, "promote the implementation of sustainable management of all types of forests" (UNSDG, 2015). The Indian National Forest Policy of 1988 intended a similar shift from exploitation-oriented colonial-era policies to an emphasis on the people's participation in sustainable forest management (*National Forest Policy*, 1988). The policy document envisions a co-creative relationship between the forest administration and the local communities. By encouraging local

communities to identify with the goal of development and protection of forests, the policy proposes joint management of forests by the state forest administration and the local community, who share the conservation and management responsibility as well as economic benefits of the forest resource. In the western state of *Maharashtra*, the joint forest management program is responsible for the conservation and management of 2.4 million hectare of forest land by facilitating economically viable and environmentally responsible co-creative business models.

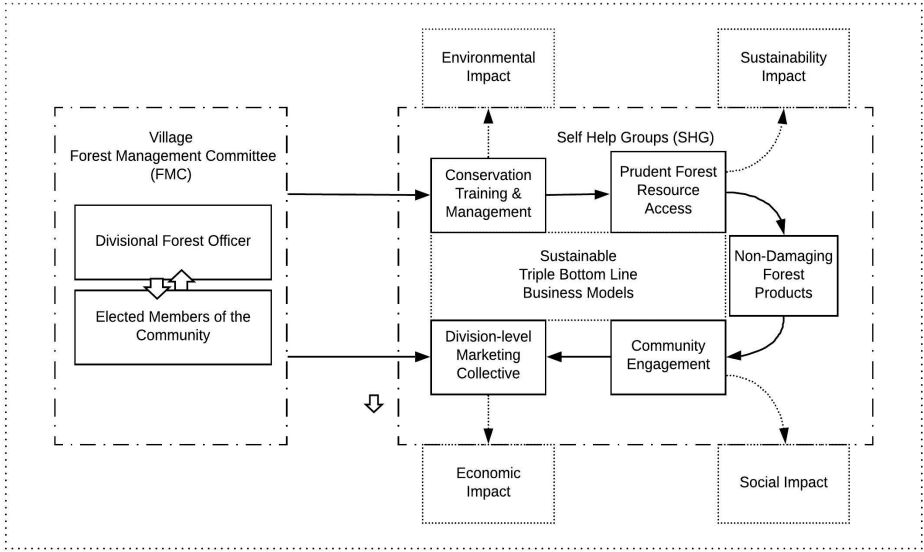


Figure 4.1: The Joint Forest Management Operational Framework

Joint forest management (JFM) initiatives function by entrusting village communities with the management and protection of forests in the area (DasGupta & Shaw, 2017). Between 1988 and 2011 the state forest departments of 33 states (and union territories) of India have facilitated the formation of a total of 118,213 self-sustaining village-level forest management committees. Headed by the Divisional Forest Officer (DFO), these joint forest management committees aim to support the incubation and sustenance of co-creative and collaborative business models that combine environmental, social, and economic benefits through the establishment of semi-independent entrepreneurial ventures called ‘Self Help Groups’ (SHG). The SHGs are afforded preferential access to the forest resources and act as small-scale enterprises producing non-damaging

forest products (NDFPs). The operational model and the underlying sustainable triple bottom line approach of the JFM program, as described by the Chief Conservator of Forest for the state of Rajasthan in a 2018 interview with the one of the researchers, is illustrated in Figure 1.

The goal of these JFM initiatives is to support the self-help groups in developing self-sustaining co-creative business models that combine environmental management and wildlife conservation with harvesting of non-damaging forest outputs for economic sustainability (Bhattacharya et al., 2010). According to Patra (2015), the basic underpinning of the Joint Forest Management initiatives is the collaboration between the divisional forest administration and the local communities to protect forests from poaching, fire, illegal grazing, and timber cutting. Hereby, these communities benefit in the form of non-timber forest products from the area (Hannam, 2000).

Divisional Forest Officer (DFO), a mid-career executive largely independent of the civic administration, manages each forest division and is responsible for implementation of the national forest policy with substantial autonomy to account for local circumstances. Officer recruits are trained for two years in 57 diverse subjects related to forestry, biodiversity conservation, administration, and security at the Indira Gandhi National Forest Academy consummating in a master's degree. The recruitment process for the forest officers is characterized by affirmative action for members of disadvantaged castes while the centralized nature of the forest service ensures regional and urban/rural diversity. Joint Forest Management initiatives require the DFO to engage with the community and create systems for sustaining economic benefit from environmental conservation. Their responsibilities include creating awareness among local communities, inspiring engagement in forest management activities, and facilitating fair use of forest resources (*National Forest Policy*, 1988).

While a variety of JFM programs have been observed in different parts of the world (Leventon, Kalaba, Dyer, Stringer, & Dougill, 2014; Shi et al., 2016), Indian JFM programs use a joint venture approach, a hybrid between top-down and bottom-up community management schemes (Patra, 2015). Depending on the nature of forest and wildlife in a certain division, a Divisional Forest Officer, is responsible for developing and maintaining the socio-economic as well as administrative links necessary for effective co-creative forest management. According to Singhal & Rishi's (2003) survey of the 'indicators of participation in joint forest management programs',

out of the 40 factors investigated, the individual-level factor with the greatest influence on the local communities was ‘trust in the concerned forest officer’, indicating the crucial role of communication between the forest officer and the members of the village-level forest management committee.

Caste Hierarchies in the Indian Context

The caste system in modern India is a hierarchical network of communities based on a socio-cultural intersection of a four-layered class hierarchy (termed *varna*) with endogamous occupational people groups (termed *jati*) (Jogdand et al., 2016). The system is based on the doctrine of occupational purity with certain occupations being valued higher than others (C. Prasad, 2008). According to the 2011 census of India there are over 3000 *jati* (ORGI, 2011), embodying socio-economic, linguistic, and cultural differences between people groups (Desai & Dubey, 2012). These may be compared to the semi-distinct immigrant communities in North America, characterized by unique endogamous sub-cultures. Unlike immigrant communities in North America, most of these *jati* (or sub-castes) are further classified into four major stratas based on occupational hierarchy, namely *Brahmin* (scholars and priests), *Kshatriya* (warriors, rulers and administrators), *Vaishya* (merchants), and *Shudra* (laborers and workers). Numerous *jati* span across multiple *varnas* based on their traditional occupations, however, there are also several *jati* that are positioned outside this four-rung classification. These *Dalit* sub-castes and several groups of indigenous tribal peoples (*Adivasi*) have been historically disadvantaged and oppressed by the castes placed favorably in the hierarchy as well as by colonial governments (Jogdand et al., 2016; Rafanell & Gorringe, 2010; Vaidya, 2018). These castes have also historically been subject to the practices of mandatory segregation and untouchability. While these practices are illegal today, a large portion of the *Dalit* and *Adivasi* of the population of India continues to live either in separate *Dalit/Adivasi* villages or at the outskirts of *caste-diverse* villages.

Rooted in one among the numerous Ancient Indian ‘treatises on duty’ – *Manusmriti* (the laws of Manu), the doctrine of occupational purity places individuals belonging to castes associated with the so-called ‘impure occupations’ (such as those dealing with animal slaughter, leather, waste disposal) as lower in social status than others (C. Prasad, 2008). Sociologists and historians have pointed out that while the caste system finds its roots in ancient religious texts, the British colonial preoccupation with neat

classification of the Indian ethnic groups and various communities' success/failure in lobbying efforts for a caste classification favorable for economic opportunities added new complexities to the concept of caste (Dirks, 2011; Ghurye, 1932; Vaidya, 2018). For instance, the *Maratha* are a people group of *Marathi*-speaking peasant warriors categorized today as a socio-economically and educationally deprived caste despite their relatively high position on the *varna* hierarchy due to their history of militant opposition to colonial rule and the resultant systematic subjugation during the British Raj (Deshpande, 2004).

A prolific school of academic thought, championed by Nicholas Dirks (1988) argues that caste hierarchies were characterized by a greater level of flexibility before the colonial exercise of formalized stratification of thousands of *jati* into one of the four *varna*. Lubin, Davis, & Krishnan (2010) point towards the existence of other influential ancient Indian 'treatises on duty', for instance as the *Yagyavalkeyasmriti* (the laws of *Yagyavalkeya*), which have been considered more sophisticated, liberal, and humane source of legal theory than *Manusmriti*. 'The laws of Manu', however, were used by the British colonial administration, as the basis for the formulation of the so-called 'Hindu law'. The subsequent categorization of many *Dalit* castes and *Adivasi* tribes as hereditarily criminal (Daly, 1928) has been often criticized as being at the root of the economic manifestations of caste differences in modern India (Nigam, 1990; Tolen, 1991). In practice, however, the caste hierarchy is been maintained by the upper castes (*savarna*) using segregation and restrictions on social intercourse, choice of profession, and marriage outside one's caste (Vaid, 2014).

With an intent to make reparations for the caste system and generations of caste associated systematic mistreatment of a vast segment of the population, the Indian constitution guarantees 'reserved' access to public education, public employment, political office, and the judiciary for the scheduled castes and tribes. (Deshpande, 2017). This policy of affirmative action – locally known as the '*reservation*' system – has its roots in a preliminary version instituted by the former-princely state of Kolhapur (part of modern-day Maharashtra, India) in 1902. The Protection of Civil Rights Act, 1955 and the Scheduled Castes and Tribes (Prevention of Atrocities) Act, 1989 terms most of the *jati* (occupational groups) associated with *Brahmin*, *Kshatriya* and *Vaishya* classes as *forward* (or *general*) castes. While all the *Dalit* castes, *Adivasi* tribes as well as a several of the *Shudra* (worker) castes are categorized as *scheduled castes* (*SC*) and *scheduled tribes* (*ST*) (also collectively called *reserved castes*). *Other Backward Class* (*OBC*) is an official

term encompassing a range of educationally or socially disadvantaged castes. The OBCs, the *Maratha* caste, and *religious minorities* are together considered *other castes* for the purposes of this study. At the time of data collection, in the state of Maharashtra, the distribution of reserved public sector employment was 13% for SCs, 7% for STs, 32% OBC, 16% *Marathas*, with the remaining 32% positions being open for all.

Sub-National Cultural Differences and Urban-Rural Divide

Cultural and linguistic differences have long been known to influence functioning of cross cultural teams (Cox & Blake, 1991; Ely & Thomas, 2001). In a study of rural entrepreneurship in Bangladesh, Mair and Marti (2009) explain as institutional voids emerge in the absence of satisfactory formal institutions, informal institutions address this gap by facilitating uncertainty avoidance and enabling stable economic activity. This has led academics to conclude that an understanding of socio-cultural categorization and the associated informal institutions are integral to the understanding of the development of a collaborative professional network (Fletcher & Fang, 2006; Sanchez & Ricart, 2010). Besides this several researchers have explored in detail, a relationship between culture, decision-making, and strategic partnership (Cox & Blake, 1991; Ely & Thomas, 2001; Hofstede, 1991; Kogut & Singh, 1988). However, with a focus on international cultural diversity, these studies are likely to overlook nuances in cultural differences rooted in sub-national regional diversity. National cultures tend to be comprised of numerous interrelated sub-cultural identities, in a way that considerations to sub-national and other socio-cultural distinctions among collaborators are likely to lead to a greater predictive ability of theoretical models (Audretsch et al., 2010). This is particularly true in case of co-creative or participatory initiatives like the Indian government's joint forest management (JFM) program, where actual interactions among collaborating individuals usually take place in the context of rural communities with limited cultural exposure.

This leads to another important factor responsible for cultural as well as professional differences among individuals, urban/rural divide. In many developing countries, including India, access to educational as well as commercial opportunities differs greatly between urban, semi-urban, and rural areas (Hnatkovska & Lahiri, 2012). While the literacy rate in urban areas was 84.1% in 2011, the rural literacy rate was 67.8% (ORGI, 2011). According to a 2018 report by Internet and Mobile Association of India, the internet penetration in urban areas was 64.84%, drastically different from

20.26% in rural areas (IAMAI, 2009). While substantial stretches of rural areas are still in need of basic sanitation and/or transportation infrastructure, urban areas – cities with population in excess of one million – have substantially superior access to educational as well as commercial opportunities (Hnatkovska & Lahiri, 2012). In this settlement hierarchy, villages and small towns have remained disadvantaged with a substantially lower economic growth and standard of living when compared to the larger cities. Due to these differences, individuals with an urban origin develop a distinct cultural identity from those of rural background. This difference is exacerbated by a rural families' poor access to educational facilities (Agrawal, 2014) as well as the prevalence of child labor (Ersado, 2005). Further, access to public services and amenities is also known to be vastly different across settlements of different populations. Consequently, rural and urban residents are likely to hold divergent opinions with regards to critical issues. These differences extend to individual beliefs, knowhow, and expressed behaviors (Pradhan et al., 2000).

HYPOTHESES

Caste-diverse Communities and Forest Officers' Caste Associations

A fundamental social framework underlying the Indian society as well as contemporary politics is the caste system (Beteille, 2012). Caste, particularly in rural India, forms the basis of an institutionalized system of beliefs and practices concerning division of labor and occupational purity, and hierarchical prejudice in the complex Indian social structure (Deshpande & Palshikar, 2017). Academics have argued that the caste-related status is a creation of an orientalist legal theory that privileged some castes over others by primarily by disregarding claims of ideological superiority from the castes considered lower (Carroll, 1978; Dirks, 1988, 2011; Jogdand et al., 2016). While researchers have found support for this idea in metropolitan India, in rural and semi-rural settings, the occupational hierarchy associated with an individual's caste remains a factor in determining workplace interactions (Arora & Sanditov, 2015).

As a result of the institutionalized hierarchy of purity of occupation, the caste system establishes expectations regarding social roles associated with different caste identities (Beteille, 2012). In an experimental study, Brooks, Hoff, & Pandey (2018) found that among rural Indian men, while lower caste status individuals were willing to cooperate both with lower as well as higher caste status individuals while performing an outdoor

task, high caste status individuals were not willing to cooperate with lower caste status individuals. Recent research in psychology have also found evidence of exaggerated negative stereotyping (black sheep effect) against lower caste status individuals leading to prejudice regarding criminal behavior and abilities (Sankaran et al., 2017). Such prejudice underlies the challenges faced by *Dalit* and *Adivasi* individuals in roles of leadership (Arora & Sanditov, 2015; Damaraju & Makhija, 2018; Halim et al., 2016; Philip, 2017).

Academics also argue that caste in contemporary India shapes perceptions of self-worth by purporting caste related hierarchies of individual societal value. Empirical evidence indicates that among the self-employed, those associated with lower-status castes perceive lower amounts as being appropriately remunerative (Deshpande & Goel, 2016). Subsequently, in a collaborative work environment, individuals associated with higher status castes may expect those associated with lower status castes to be deferential to them, owing to a difference of social status and perceived social value. Considering such difference in status among members of a collaborative team, members associated with lower status castes may withhold ideas and be reluctant to openly put forth their views. Often, in an innocuous attempt to conform to tradition and be respectful to the higher status committee member (Rafanell & Gorrige, 2010). The other way around, those associated with higher status castes may exclude lower status members from crucial decisions because of perception of lower intellectual and professional worth, particularly with respect to strategic leadership. As a result, forest management committees are likely to be less effective in eliciting public engagement if there is a caste differential between forest officer and other members.

J.K. Philip's (2017) aptly titled study of caste, power, and formal authority in rural India – *‘Though he is a landlord, that Sarpanch² is my servant!’* illustrates that this status hierarchy is most salient when an individual from a historically oppressed caste, discriminatorily considered inherently inferior, is in a leadership position among a general population. Owing to prejudiced opinions and cultural stereotypes, an officer associated with one of the reserved castes is likely to face greater resistance from the other committee

² A *Sarpanch* is an elected head of the village-level constitutional body of local self-government called the *panchayat*.

members as well as the broader community (Mosse, 2018). Due to the increased social status differential between the collaborators and the resulting hindrances to efficient communication, caste differences may be expected to reduce engagement and volunteering in forest management activities, negatively influencing the performance of the forest management committee. In other words, forest management committees working with *Dalit* or *Adivasi* forest officers are likely to be less effective in eliciting community participation in co-creative business models for sustainable environmental conservation compared to those working with forward caste forest officers.

Hypothesis 1a: Caste separation between the institutional mentors and the local community decreases engagement in co-creative forest management initiatives.

Recent research in sociology illustrates that despite decades of constitutional and governmental efforts towards the disintegration of the caste as an institutionalized system, caste as a form of identity is experiencing a form of renaissance in contemporary India (Deshpande & Goel, 2016; Gupta, 2005; Sankaran et al., 2017). Further, caste has been persistently intertwined with political activity in India through prevalent identity-oriented discourse and caste-based political coalitions (Ruparelia, 2015; E. Sridharan, 2003; Eswaran Sridharan, 2018). This accentuates the effects of individuals' identification with caste-based identities, by catalyzing the similarity-attraction effect – the empirically substantiated proclivity of people to be attracted to those who happen to be similar to themselves, particularly in the respects considered important (Byrne, 1997; Clore & Byrne, 1974; Damaraju & Makhija, 2018). In the context of forest management in rural India, where collaborators from the same caste not only share a social identity but also often concur with respect to political inclinations and affiliations, a forest officer closer to the local population on the social status hierarchy would be likely to elicit greater participation in collaborative efforts for sustainable forest management.

These status hierarchies associated with the caste identity remains particularly salient in the rural communities in India, where a combined population of over 800 million reside in either caste-diverse or caste-homogenous village communities (ORGI, 2011). The latter happen to be predominantly populated by members of the *Dalit* and *Adivasi*

communities, and were formed as a result of a long history of segregation of those engaged in supposedly impure occupations into separate villages (M. Srinivas, 1957). These marginalized villages tend to be historically disadvantaged. Despite being the focus of political rhetoric in recent years, they have seen lower improvement in economic or social conditions when compared to caste-diverse villages (Beteille, 2012). These disadvantaged communities are expected to perform lower on average at the sustained maintenance of a collaborative model for sustainable forest management, primarily due to social segregation combined with mistrust of the governmental systems and lack of motivation to collaborate (Arora & Sanditov, 2015).

However, a higher level of community engagement among the residents in these caste-homogenous villages can be expected when forest management committee members belonging to a disadvantaged caste are working with *caste insider* officers, i.e. officers closer to the local community on the caste hierarchy. Empirical studies shows scheduled caste and scheduled tribe legislators in rural areas are able to elicit improved engagement of marginalized castes in primary schooling in India due to increased understanding of the extant reality in disadvantaged communities (Halim et al., 2016). Similarly, with a greater sensitivity for the needs and requirements of the beneficiaries of governmental initiatives, individuals belonging to reserved castes are expected to be able to communicate better with an officer sharing an identity with them. As a result, we expect that village-level committees may be more successful in co-creative forest management when the caste related status difference between the committee members and the mentoring forest officer is low and the officer may be considered a *caste insider* by the local community. In other words, forest management committees in caste-diverse villages working with an SC or ST forest officers are expected to display lower performance in community engagement-driven co-creative initiatives for sustainable forest management, while those from lower caste status villages are expected to display improved performance. This brings us to the next hypothesis.

Hypothesis 1b: The effect of forest officers' lower caste status on the performance of co-creative forest management is exaggerated in communities where the officer is a *caste outsider*.

Sub-national Cultural Differences among Collaborators

Individuals hailing from different sub-cultural regions encounter different cultural narratives throughout their lives (Audretsch et al., 2010). For instance, despite being categorized under the national identity 'American', the normative social, cultural and historical narratives encountered by a resident of the San Francisco Bay area are vastly different from those common in the mining towns in the American Mid-West. Over time, these narratives shape how each individual perceives the world differently based on different cognitive schemas and belief structures (Martins et al., 2015). As previous research has also suggested, distinct cognitive schemas are associated with different sub-national cultural identities, and lead to systematic differences in individual opinion with regards to certain issues and ideas (Stahl et al., 2010). In this regard, the *Maharashtra* state of India is generally divided into 5 main sub-cultural regions, namely Khandesh, Konkan, Marathwada, Vidarbha, and Western Maharashtra (Desh). While people from these different regions speak the same language (or mutually intelligible dialects of the same language), they associate with distinct cultural-historic narratives and associated identities (Singh & Mehta, 2004).

Particularly when operating in a rural context, the sub-national cultural differences between the joint forest committee members and an outsider forest officer are particularly salient. As all other members of the committee are of local origin, an officer with a different sub-national cultural background is likely to lack relevant social capital leading to the categorization as a *cultural outsider* (Hnatkovska & Lahiri, 2012; Kramer et al., 2012; Panda & Gupta, 2004). Rural members often also lack previous experience in working with *cultural outsiders*. In such conditions, sub-national cultural diversity between the collaborating representative of the governmental forest management institution and the local community has potential to instigate conflict and misunderstanding. Such conflict may originate from members' lack of trust in the forest officer owing to the cultural differences or from presumptions based in cultural stereotypes (Ely & Thomas, 2001; Jehn & Mannix, 2001; Zhang & Rajagopalan, 2010). Regardless, the potential for reduced communication and/or cohesion is expected to result in a negative effect of the sub-national *cultural outsider* officer on the performance of co-creative forest management initiatives.

Hypothesis 2: Forest management committees working with a *cultural outsider* forest officer are likely to be effective in co-creative forest management.

Urban-Rural Divide and the Effect of Urban Outsiders

Due to the differences in access to education, information, commercial opportunities, and the standard of living, collaborators with an urban background have distinct life experiences, beliefs, and behaviors when compared to their rural counterparts (Agrawal, 2014; Beaudoin & Thorson, 2004; Hnatkovska & Lahiri, 2012). As the difference between the sizes of two population centers increases, the incidence of shared experiences, knowhow and cognitive schemas among their residents reduces (Hnatkovska & Lahiri, 2012). Building on previous research, I suggest that in societies characterized by disparity across their geography, collaborating individuals' awareness of opportunities and threats as well as their professional network may also depend on the urban/rural nature of their place of origin (c.f. Bhalla, 1990; Pradhan, Roy, Saluja, & Venkatram, 2000). At high levels of this urban-rural divide among collaborators, for instance, a forest officer with a metropolitan background working with elected members from a small village or a hamlet, these differences are likely to result in substantially greater exposure of the officer to urban environments and networks.

Performance in joint forest management is related to providing mentoring and support for forest management committees' activities in addition to the core task of facilitating community engagement (Singhal & Rishi, 2003). A forest officer from a larger town is likely to have a greater level of professional expertise and a broader scope of awareness to opportunities and threats (Pal & Ghosh, 2007), when compared to an individual from a forest fringe village. In addition, being in a larger professional center also entails the possibility of developing a wider network with far-reaching social connections (Beaudoin & Thorson, 2004; Hofferth & Iceland, 1998; Sharp & Smith, 2003). Combined, these factors are likely lead to a diverse joint forest management committee with access to enhanced mentoring, decision-making and innovation capabilities for the development of self-sustaining co-creative models for triple bottom line impact (environmental, social, and economical). Thus, owing to the increased access to relevant information and useful social networks forest officers originating from larger centers of population are likely to overcome the negative effects of caste or regional differences on Joint Forest Management. Thus, I hypothesize the following.

Hypothesis 3a: The effect of forest officers' *caste separation* from the community on the performance of co-creative forest management is reduced in communities where the officer has a greater *urban exposure*.

Hypothesis 3b: The effect of forest officers' *cultural separation* from the community on the performance of co-creative forest management is reduced in communities where the officer has a greater *urban exposure*.

These hypotheses and the underlying framework of the joint forest management program are illustrated in figure 2.

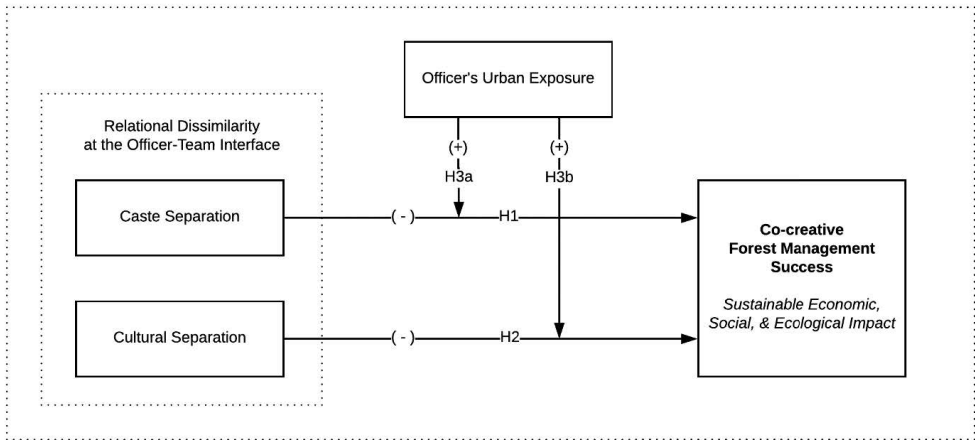


Figure 4.2: Conceptual model indicating the tested hypotheses

METHODS

Sample and Data Collection

To test my hypotheses, I used data provided by the Ministry of Environment, Forests and Climate Change of the Government of India. After removing two outliers from the data, I studied a sample of 220 village-level forest management committees (FMCs) in the western Indian state of *Maharashtra*, engaged in joint forest management (JFM) initiatives. I compiled village forest management committee level data detailing community participation in forest management, environmental growth/deterioration in the area, economic outputs of the joint forest management program resource

availability in the village and community demographic statistics (including caste statistics) from various sources including the Open Government Database of India, Reports of the National Census Bureau, and Annual Reports of the Maharashtra State Forest Department.

Encompassing 22 forest divisions, the sample comprises of village forest management committees in areas with inadequate environmental conservation infrastructure. These villages were nominated for assistance from the central government in 2006, working with a five-year strategy to develop self-sustaining forest conservation and management infrastructure. The state forest department, locally led by the divisional forest officer, was responsible for the incubation of participatory/co-creative business models that link environmental and socio-economic goals by facilitating social mobilization, supporting the formation of self-help groups (SHG), and providing training and support. Table I provides details of the forest divisions and their respective divisional forest officers included in the sample. I collected data on the forest officers' regional background, hometown, details of education and work experience, and caste associations by consulting the Indian Forest Services Information Portal, in addition to the declarations by the Maharashtra State Forest Department facilitated under the 'Right to Information' Act, 2005.

Variables and Measures

Independent and Moderating Variables. In order to measure *cultural differences* between the forest officers and FMC members, I used the prevalent regional categorization dividing the *Maharashtra* state of India into five culturally-distinct regions. These are Khandesh, Konkan, Marathwada, Vidarbha, and Desh (Singh & Mehta, 2004). I coded officers as *cultural outsiders*, when the associated village was located in a different region from the origin of the forest officer. In the sample, 129 out of the 222 FMCs (58.11%) were working with *cultural outsider* officers.

In order to measure the *urban-rural divide*, I recorded the contemporary population of the forest officers' hometown of origin. As the population of settlements of origin varied drastically resulting in skewness, I used a logarithmic transformation of the population figure to develop a scale of urban-rural divide score for each officer's origin. This variable was found to have a bimodal distribution, and thus was transformed into a binary dummy variable indicating the *urban outsider* categorization of officers to facilitate alignment with the assumptions of multiple linear regression.

Table 4.I: Forest Divisions in Maharashtra state with reported participation in Joint Forest Management initiatives (2006-2011)

Forest Division	No. of FMCs	Sub-Cultural Region	Forest Officer's Designation	Forest Officer's Profile
Ahmednagar	3	Khandesh	Deputy Director	Social Forestry
Alibaug	8	Konkan	Deputy Director	Social Forestry
Amravati	6	Vidarbha	Deputy Director	Social Forestry
Aurangabad	12	Marathwada	DC of Forests	Territorial Forestry
Beed	10	Marathwada	DC of Forests	Territorial Forestry
Buldhana	5	Vidarbha	Deputy Director	Social Forestry
Chandrapur	22	Vidarbha	Deputy Director	Social Forestry
Dhule	16	Khandesh	Deputy Director	Social Forestry
Gondia	6	Vidarbha	Deputy Director	Social Forestry
Hingoli	8	Marathwada	DC of Forests	Territorial Forestry
Jalgaon	16	Khandesh	Director	Forestry Institute
Mewasi	12	Khandesh	Deputy Director	Social Forestry
Nagpur	10	Vidarbha	Deputy Director	Social Forestry
Nanded	2	Marathwada	Deputy Director	Social Forestry
Nandurbar	16	Khandesh	Deputy Director	Social Forestry
Osmanabad	12	Marathwada	DC of Forests	Territorial Forestry
Parbhani	2	Marathwada	Deputy Director	Social Forestry
Roha	6	Konkan	Deputy Director	Social Forestry
Shahapur	7	Konkan	Deputy Director	Social Forestry
Wardha	10	Vidarbha	Deputy Director	Social Forestry
West Nashik	19	Khandesh	DC of Forests	Territorial Forestry
Yawal	14	Khandesh	Director	Forestry Institute
Total	222			

*DC of Forests = Deputy Conservator of Forests

I operationalized the *caste-status prejudice* associated with individual forest officers by recording the caste/tribal associations of each forest officer and ascribing a score based on the caste hierarchy. Officers associated with the *scheduled castes* and *scheduled tribes* were coded as being perceived lower on the status hierarchy, in relation to those from *other backward castes*, and *general castes*. Out of the 222 FMCs, 78 were working with officers belonging to the general castes (*perceived caste status* = 1), 67 with reserved caste officers (Scheduled Castes and Scheduled Tribes; *perceived caste status* = 0), and 77 with officers of other castes (*perceived caste status* = 0.5). For additional analysis of the specific

effects of different caste associations, I also analyzed forest officer's caste as a categorical variable. Following the precedent of the Socio-economic and Caste Census of India – 2011 (ORGI, 2011), I coded local communities with greater than 80% population belonging to a reserved caste as a *caste-homogenous villages*. The rest were characterized as *caste-diverse* villages. Out of the 222 studied villages, 121 (54.5%) were *caste-homogenous villages*.

Dependent Variable. In order to effectively measure the performance of the forest management committees, I scored them along four groups of indicators of co-creative forest management success as laid out by the National Forest Policy of 1988. These include markers of economic impact, environmental impact, social impact, and sustainability impact. Table II elaborates the details of the scoring of the different individual markers comprising the dependent variable. Following the Ministry of Environment, Forests and Climate Change – Government of India's precedent, these scores on performance markers for individual FMCs were added and then standardized to arrive at the JFM performance scores. In the sample, the performance varies between 0 and 1 with a mean of 0.59 and standard deviation of 0.19. Figure 3 illustrates the distribution of the dependent variable – co-creative forest management performance along the 22 forest divisions.

Control Variables. I controlled for a range of variables that could have a bearing on the *performance of joint forest management initiatives*. At the village level, I controlled for *per capita availability of forest land* as the extent of available forest cover in and around a village is likely to influence community engagement in forestry. The size of the village, measured in terms of *village population* as per the national census of 2011, might also influence the economic opportunities available to the residents and consequently their motivation for joint forest management. I also control for the *total natural regeneration* (in hectares) by region to ensure that climatic and geographic factors influencing forest management success are taken into account. At the level of the forest division, I control for the specifications of the role of the district forest officer (DFO). A total of 131 out of 222 of the forest management committees investigated were managed by a DFO with a role profile focusing on 'Social Forestry', while the remaining managed a territorial forest division with duties extending beyond the implementation of joint forest management. Finally, I included the *distance from the nearest market* (in kms) among the control variables to take the FMC's ease of access to commercial activity in account.

Table 4.II: Indicators of Joint Forest Management Success

<i>JFM Success Marker</i>	<i>Conceptual Underpinning</i>	<i>Details of the Indicator</i>	<i>Details of Coding (1/0)</i>
Economic Impact	Sources of Economic Benefit	Earnings from Non-Timber Forest Produce	Source Active/Inactive
		Earnings from Timber	Source Active/Inactive
		Earnings from Bamboo	Source Active/Inactive
Social Impact	Number of active business units	Number of Self-Help Groups	Greater/less than average
	Member engagement	Number of FMC Meetings in a year	Greater/less than average
	Employment generation	Human-Days of Volunteering	Greater/less than average
Environmental Impact	Indicators of change in environmental status	Growth in Forest Cover	Positive/negative change
		Growth in Indicator Species	Positive/negative change
		Growth in Valuable Tree Species	Positive/negative change
Sustainability Impact	Forest use rights	Is the pertaining forest area exclusively for use under the JFM?	Yes/No
	FMCs ability to protect forest resources	Were informal rules developed to exclude outsiders from using JFM resources?	Yes/No
	FMCs ability to protect forest resources	Does FMC's have a right to employ sanctions against members for illegal felling, grazing or for not providing volunteers for preventing forest fires?	Yes/No
	Restrictions faced by FMCs in access to market	Do FMCs have the right to auction non-timber forest produce (NTFP)?	Yes/No
	Community contentment with rights facilitated by Forest Department	Were any complaints registered against the forest department for undermining of rights?	Yes/No

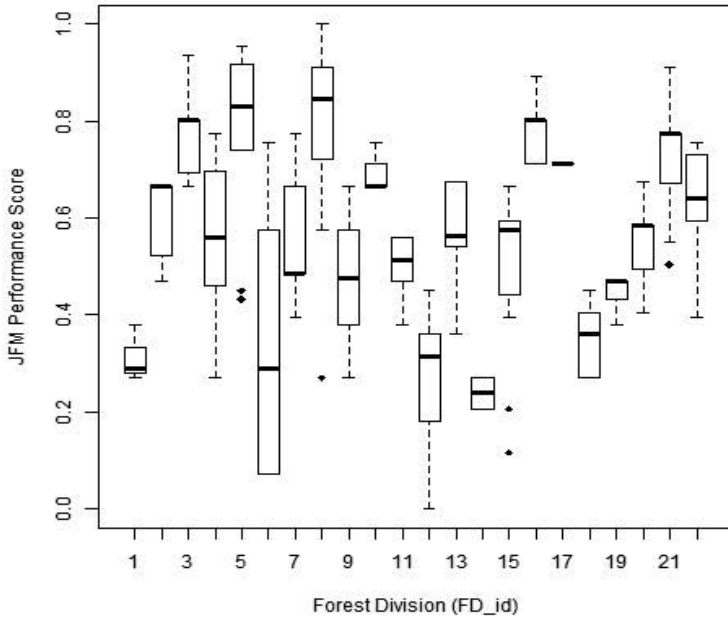


Figure 4.3: Distribution of Joint Forest Management Performance Score across Forest Divisions

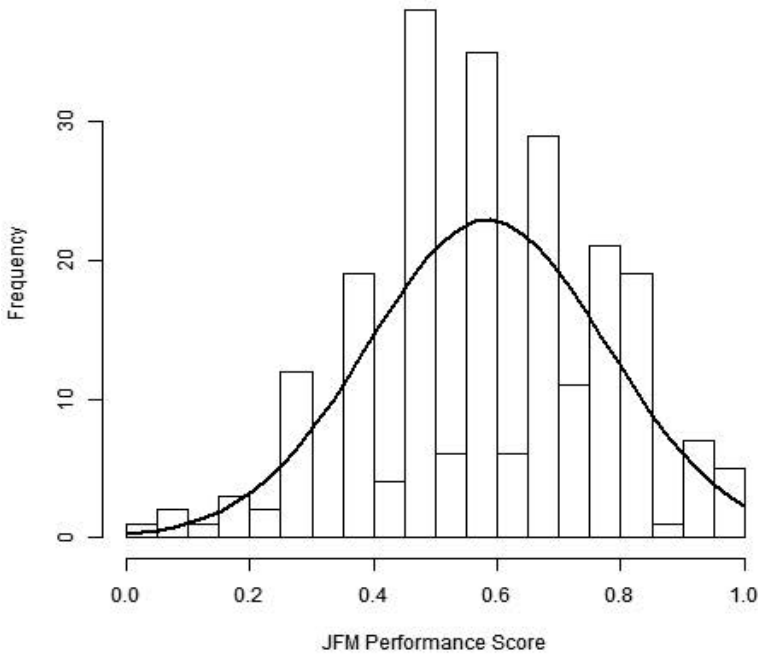


Figure 4.4: Histogram of Joint Forest Management Performance Score

Analytical Strategy

I conducted multiple linear regression analysis to test the model using the 'lm' function in R. As the data for examining the effects of caste hierarchy, regional differences, and urban-rural divide comprises repeated observations of the same forest divisions (and thus forest officers), I conducted additional analysis using generalized estimating equations (GEE) – 'gee' and 'geepack' packages in R (Halekoh et al., 2006) – to leverage its ability to accommodate non-independent observations by permitting the specification of within-group correlation matrix for panels (Liang & Zeger, 1986). Considering the frequency distribution of the dependent variable (see figure 4), I specified a normal distribution (Gaussian) distribution with an exchangeable correlation structure, an identity link function, and robust variance estimators (White, 1980). I specified the 22 forest divisions in the sample as the panel variable. For developing additional insights on the differences among the distinct caste categories, this study also included additional multiple linear regression analysis including the officers' caste as a categorical variable.

RESULTS

Figure 5 shows joint forest management performance plotted along the forest officers' castes, cultural differences between the forest officer and the local community, caste diversity in local community, and logarithm of the population of officer's hometown caste diversity in local population. Table III shows the bivariate correlations matrix. We find considerable variance across the different measured variables and no correlation coefficient is found to be unusually high. Table IV illustrates the multiple linear regression models for analyzing the effect of caste role prejudice, cultural differences between the FMCs and their forest officers and the forest officers' outsider status on JFM performance. Model 1 includes only the control variables, while model 2 also includes the caste separation and cultural separation between the forest officer and the local community. In model 3, the moderating variable urban exposure of the forest officer is added. Further, model 4 tests the full model including the caste separation, cultural separation, and their interactions with officers' urban exposure, using generalized estimating equations analysis. Next, in model 5, the individual effects of an SC/ST or others category officer is tested in comparison with officers from the general category. Model 6 further includes the moderating effects of the demography

of the village in concern. Lastly, model 7 tests the complete model including the effect of officers' caste (as categories), their interaction with caste diversity of the community, cultural separation between the officer and the village, as well as the officers' urban exposure (see Table V).

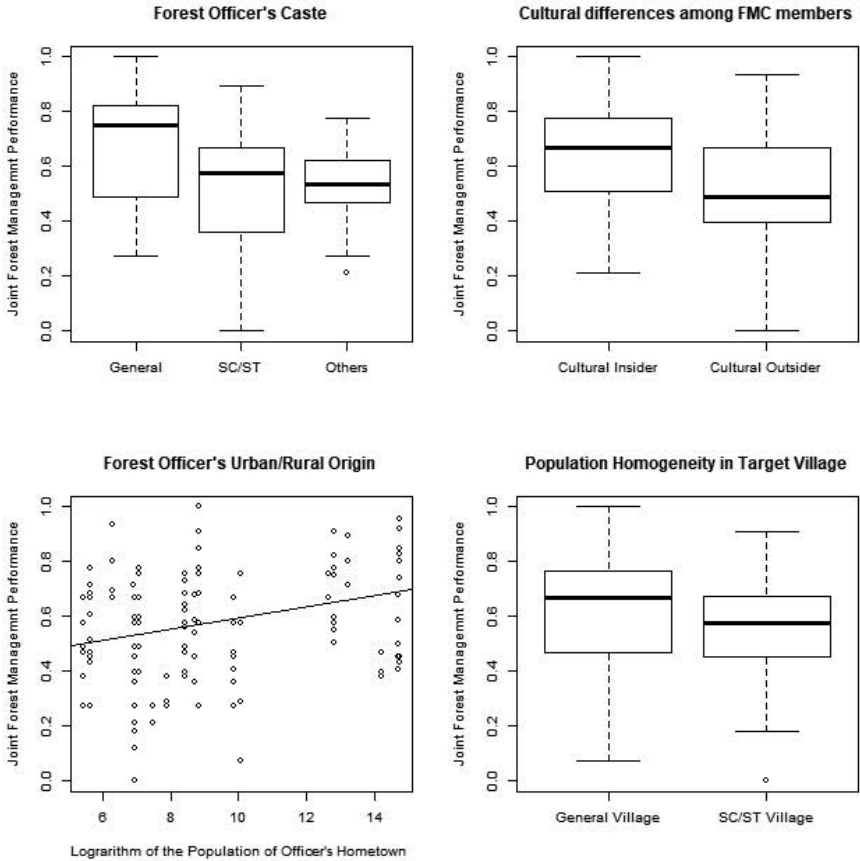


Figure 4.5: Plots depicting distribution of Joint Forest Management along the various independent and moderating variable

Table III: Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9
1. JFM Performance									
2. Village Population	0.20**								
3. Available Forest Land per Capita	-0.08	-0.45***							
4. Natural Regeneration (past 5 years)	-0.07	-0.03	0.06						
5. Dedicated Social Forestry Profile	-0.34***	0.40***	0.26***	-0.15*					
6. Market Access	-0.20**	0.06	-0.02	0.04	0.04				
7. Regional Diversity	-0.36***	-0.26***	0.20**	-0.21**	0.56***	0.21**			
8. Urban-Rural Divide	0.33***	0.06	-0.13	-0.06	-0.21**	-0.21**	-0.25***		
9. Caste Status Prejudice	-0.14*	0.02	-0.04	0.26***	-0.20**	-0.01	-0.25***	0.15*	
10. Caste Diverse Village	-0.15*	-0.12	0.16*	0.25***	0.12	0.09	-0.02	0.11	0.58***

Note: *p<0.1; **p<0.05; ***p<0.01

Table 4.IV: Multiple Linear Regression results for Joint Forest Management Performance

	(1)	(2)	(3)	(4)
	OLS			GEE
Village Population	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
Available Forest Land (per capita)	0.02 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
Natural Regeneration	-0.0003 ⁺ (0.0002)	-0.0004 ^{**} (0.0001)	-0.0005 ^{***} (0.0001)	-0.0005 [*] (0.0002)
Social Forestry Focus	-0.13 ^{***} (0.03)	-0.12 ^{***} (0.03)	-0.15 ^{***} (0.03)	-0.15 ^{***} (0.04)
Remoteness (Distance from Market in kms)	-0.004 ^{**} (0.001)	-0.003 [*] (0.001)	-0.003 [*] (0.001)	-0.003 [*] (0.001)
Caste Separation		-0.27 ^{***} (0.03)	-0.66 ^{***} (0.13)	-0.66 ^{***} (0.19)
Cultural Separation		-0.12 ^{**} (0.03)	-0.38 ^{***} (0.10)	-0.38 [*] (0.17)
Urban Exposure (log)			-0.02 ^{**} (0.01)	-0.02 [*] (0.01)
Caste Separation x Urban Exposure			0.04 ^{**} (0.01)	0.04 [*] (0.02)
Cultural Separation x Urban Exposure			0.02 [*] (0.01)	0.02 ⁺ (0.01)
Constant	0.69 ^{***} (0.04)	0.84 ^{***} (0.04)	1.12 ^{***} (0.11)	1.12 ^{***} (0.16)
Observations	220	220	220	220
R ²	0.17	0.39	0.43	
Adjusted R ²	0.15	0.37	0.40	
Residual Std. Error	0.18 (df=214)	0.15 (df=212)	0.15 (df=209)	
F Statistic	8.90 ^{***} (df=5; 214)	19.73 ^{***} (df=7;212)	15.79 ^{***} (df=10;209)	

Note: $p < 0.1$; $*p < 0.05$; $**p < 0.01$; $***p < 0.001$

Table 4.V: Multiple Linear Regression results for Joint Forest Management Performance

	(5)	(6)	(7)
Village Population	0.0000	0.0000	0.0000
Available Forest Land Per capita	0.01	0.02	0.02
Natural Regeneration	-0.0003 ⁺	-0.0003 [*]	-0.0003 [*]
Dedicated Social Forestry Profile	-0.16 ^{***}	-0.11 ^{***}	-0.11 ^{***}
Distance from nearest market	-0.004 ^{**}	-0.002 ⁺	-0.002 ⁺
Caste Status			
Other Castes	-0.13 ^{***}	-0.04	-0.02
Scheduled Caste and Tribes	-0.18 ^{***}	-0.08 [*]	-0.11 ^{**}
Cultural Separation		-0.15 ^{***}	-0.20 ^{***}
Caste Diverse Village		0.10 [*]	0.12 ^{**}
Other Caste Mentor x Caste Diverse Village		-0.08	-0.12 [*]
Scheduled Caste and Tribes Mentor x Caste Diverse Village		-0.24 ^{***}	-0.24 ^{***}
Urban Exposure			-0.04
Urban Exposure Cultural Outsider x Urban Background			0.16 ^{**}
Constant	0.81 ^{***}	0.76 ^{***}	0.79 ^{***}
Observations	220	220	220
R ²	0.33	0.43	0.46
Adjusted R ²	0.31	0.40	0.42
Residual Std. Error	0.16	0.15	0.15
	(df=212)	(df=208)	(df=206)
F Statistic	14.76 ^{***}	14.50 ^{***}	13.26 ^{***}
	(df=7; 212)	(df=11; 208)	(df=13; 206)

*Note: p<0.1; *p<0.05; **p<0.01; ***p<0.001*

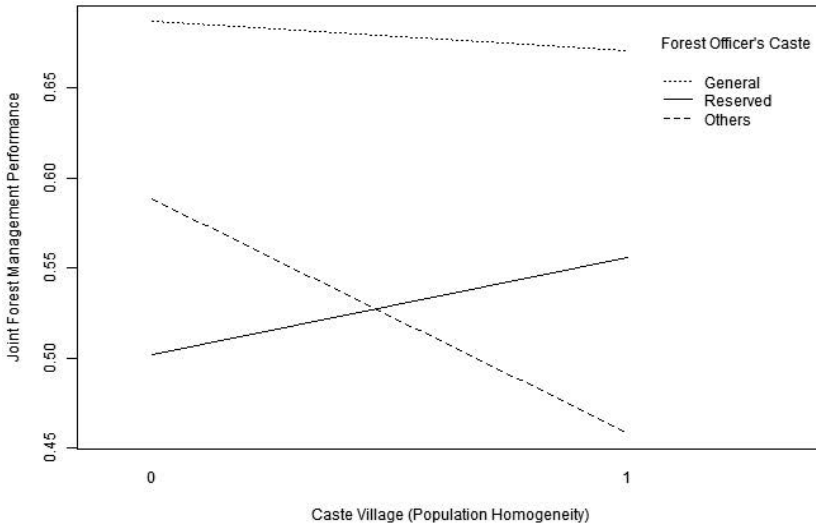


Figure 4.6: Interaction between Caste Village status and Forest Officer's Caste Category

In the results of these analyses, we find strong support for hypothesis 1a, as caste separation between the forest officer and the local community has a significant negative effect on the performance of co-creative forest management ($b = -0.66$; $p < 0.001$; model 4). Further, we find support for a systematic difference between the performance of committees led by *SC/ST* forest officers when compared with *general castes* officers ($b = -0.18$; $p < 0.001$; model 5), in such a way that *other castes* officers have a relatively smaller negative effect on joint forest management performance ($b = -0.13$; $p < 0.001$; model 5). Thus, confirming hypothesis 1a. Also, in support of hypothesis 1b, we find a significant interaction effect among officers' *caste status* and the *caste diversity* in the community such that joint forest management efforts coordinated by *SC/ST* officers ($b = -0.24$; $p < 0.001$; model 8) and other caste officers ($b = -0.12$; $p = 0.04$; model 8) tend to be further less successful in *caste diverse villages* as opposed to villages where the local community is predominantly comprised of members of the *SC/ST* castes. The interaction plot illustrating the moderation effect of *caste heterogeneity* in the local community on the forest officer's caste of origin is further illustrated in figure 6. Further, we find evidence for a highly significant negative effect of cultural differences between the forest officer and the local community on joint forest management performance ($b = -0.38$; $p < 0.001$; model 4). This substantiates the

hypothesis 3, indicating that forest management committees working with a *cultural outsider* forest officer exhibit lower performance in co-creative forest management. Finally, we also find support for hypothesis 3a ($b = 0.04$; $p = 0.007$; model 4) and 3b ($b = 0.02$; $p = 0.012$; model 4), indicating a significant positive moderation effect of officers' urban background on the negative effect of caste and cultural separation on the success of co-creative forest management initiatives.

DISCUSSION AND CONCLUSION

I hypothesized that caste hierarchy, cultural differences, and urban-rural divide are significant factors in determining performance of co-creative forest management initiatives. Based on the results of the analyses of the sample of 220 elected forest management in forest fringe rural communities, we find that caste identity related status of the institutional mentor has a strong influence the success of community participation-driven initiatives. Extending previous research on the role of caste status diversity among collaborators (Dumont, 1980; Philip, 2017; Sahay & Walsham, 1997; N. Srinivas, 2013; Varman & Chakrabarti, 2004), we find that the performance of committees tasked with facilitating co-creative business models for sustainable forest management is significantly lower when being led by individuals associated with a lower caste status. Forest management committees in caste diverse villages working with forest officers from a scheduled caste and scheduled tribe background are found to score lower in comparison with those working with general castes officers. However, the results also indicate that marginalized caste officers working with villages populated by other marginalized castes inspire greater community engagement in co-creative forest management initiatives.

In recent times, the benefits and continuing need for the reservation system have been repeatedly questioned. It has been argued that the benefits of the affirmative action are limited to a small portion of *Dalits* and *Adivasis* who already have the means of attaining the education and qualifications necessary to be able to benefit from recruitment in administrative and leadership positions (Tagade, 2016). Further, the efficiency and robustness of a non-meritocratic system of employment has been the question of academic as well as parliamentary debates (Noon, 2010). The joint forest management program in the *Maharashtra* state of India incorporates co-creative generation of all three forms of value (environmental, economic, and social) with a primary focus on

environmentally-aligned adaptations in the value chain as well as facilitation of local self-sustaining forest management committees. This provides excellent grounds for studying the effect of social separation between collaborators on collaborative performance in an organizational context comprised of multiple business units with varying degrees of economic/social/environmental focus in their activities.

The original goals of the reservation system – the eradication of caste-status related injustice – however, are found in this study to be unfulfilled. In modern India, caste continues to engender a hierarchical network of semi-flexible identities that underlie community narratives, political discourse, and social interactions (Deshpande & Palshikar, 2017; Rafanell & Gorringer, 2010; Sahay & Walsham, 1997). Based on the doctrine of ritual purity, certain occupational groups in the caste hierarchy continue to have a higher perceived social status than others (Damaraju & Makhija, 2018; Rafanell & Gorringer, 2010; Sankaran et al., 2017). In this valuation of social contribution, scholarly and military pursuits are prioritized over artisanal and agrarian professions that engage in supposedly ‘less pure’ professional activities and associated lifestyles (Bouglé, 1968). Historically, caste identity was inculcated in the general populace through social norms and regulations prescribing the conduct of individuals belonging to different castes. Particularly among the remote rural communities, caste is still “etched into the social fabric by codes of conduct governing modes of address, attire and physical positioning” (Gorringer & Rafanell, 2007). Individuals with lower perceived caste status in positions of leadership among a general community face resistance from upper caste subordinates, as caste informs perceptions of individual social and professional roles. Perceptions regarding caste roles have persisted despite the constitutional and legal provisions for their eradication due to engrained societal prejudice stemming from a belief in hierarchy of occupations and pursuits. The pervading influence of these perceptions of caste related social roles is reflected in a study of Indian cinema and television productions over the years 2013-14, which uncovers that 82.2% of educated professionals and other ‘wealthy’ characters portrayed on screen had family names indicative of general castes, as opposed to 4.4% characters with SC/ST associated family names (Maurya, 2016).

While seven decades of constitutionally warranted reparative policy in India has led to unprecedented representation of historically disadvantaged castes in politics, government, and public sector employment (Vikas et al., 2015), on average – and particularly in rural areas – these communities remain marginalized and subject to

prejudice (Ito, 2009; Vaid, 2014). As the results indicate, officers with shared social identity with the local community are able to perform better in bringing marginalized communities into the mainstream fold. In the bigger picture, while caste-status related prejudice against individuals in positions of leadership may translate into reduced efficiency of policy goal attainment, inclusion of the marginalized sections of the society is crucial for the holistic implementation of the policy.

Seen in light of the socio-economic material ownership perspective to caste, caste-based reservations – as instituted by the Indian constitution are reparations for systematic historical mistreatment (Gang, Sen, & Yun, 2011). These structured institutional efforts towards the inclusion of historically disadvantaged castes over the past decades have led to a more equitable representation of reserved castes in public employment, resulting in further positive outcomes such as increased engagement in co-creative forest management among disadvantaged caste-based forest fringe villages. The results entail that systematic efforts towards inclusion in public employment are an effective tool to counter systemic injustice.

Interestingly, a majority of the villages in the sample were lower caste status villages, i.e. settlements populated by with more than 80% individuals belonging to scheduled castes or scheduled tribes. For effective management of public initiatives in such communities, it becomes essential to ensure continued representation of disadvantaged communities in public employment. The social experiences of the members of these communities are dictated by their caste affiliations and the associated positioning on the caste hierarchy (Beteille, 2012; Philip, 2017). This results in a natural affinity among individuals placed similarly on the social hierarchy (Wills, 2008). Results show that making optimal use of affinity towards caste insiders in marginalized communities and the policy of legally mandated inclusion in public employment is beneficial in inducing further inclusion.

The results from the analysis of forest management initiatives in the Maharashtra state of India also show a negative effect of cultural differences between the forest officer and the elected joint management committee on the co-creative forest management performance. This indicates that institutional mentors' cultural insider/outsider categorization associated with regional and linguistic similarity with the local communities is an important factor to consider for improving community engagement driven initiatives. In case of the joint forest management in India, the centralized nature

of the organization – in a diverse country like India – by definition facilitates regional diversity (Hannam, 2000).

While on the outset, forest management committees where the mentors are caste or cultural outsiders tend to perform worse at encouraging co-creative forest management, having an outsider mentor may not necessarily be a negative factor. As evidenced by the positive moderating effect of urban exposure, differences also entail access to unique information and perspectives which may add value to a diverse team working towards a strategy formulation goal (Ely & Thomas, 2001; B. Nielsen & Nielsen, 2013; Stahl et al., 2010). Consequently, there is a need for further research to explore strategic activities wherein diverse teams may be able to fruitfully utilize members' differences in background as an asset.

Additionally, from the analysis of the control variables included in the analysis, we may derive some interesting auxiliary insights. Firstly, among the sample, 131 out of the 222 forest management committees worked with a forest officer with a role focusing on 'Social Forestry'. The remaining 91 committees worked with territorial forest divisions where the DFO's responsibilities included other projects/tasks in addition to co-creative forest management. The analysis indicates that territorial forest divisions tend to perform better than divisions with dedicated social forestry profiles. Generalized estimating equations analysis of the data also indicates that *distance from the nearest market* (included as a control variables) has a marginally negative effect on community engagement in co-creative forest management. This may be explained by the fact that communities with a ready access to market towns may already have greater opportunities for economic activity when compared to remote villages. Thus, a greater value is provided to communities with market access when engaged in the form of co-creative forest management initiatives.

In conceptualizing the social insider/outsider view to caste hierarchy, cultural differences, and urban/rural background, I view diversity as an intersection of the various markers of concurrence or novelty of thoughts, knowledge, and values. The findings confirm that teams in which collaborators differ from each other experience an increased potential for conflict, harming eventual team performance (Tsui et al., 1995). Thus, social insiders in roles of power may be suitable for inducing public collaboration in marginalized communities. I also conclude that systematic differences in managers' opinions can be expected due to differences in previous experience and

exposure, as reflected by patterns in the success of sustainable forest management initiatives for managers working across the urban/rural divide. Overall, this research breaks new ground by offering an outsider status related explanation for variance in environmental conservation performance and shared value creation among forest fringe village communities.

Chapter - 5

Professional Outsiders in Strategic Teams

Chapter – 5: Professional Outsiders in Strategic Teams

Study 4 – How do Cognitive Schemas of Industry Insiders and Outsiders Differ? A Cognitive Mapping Approach to Understanding the Micro-foundations of Variation in Industry Business Models³

ABSTRACT

In order to understand the differences among executives', developing an understanding of business models as managerial cognitive schemas is crucial. A business model cognitive schema represents a mental map of value-creating, value-delivering and value-capturing activities of the firm and the linkages between them. An important question in the literature on business models as cognitive schemas is whether and how business model schemas differ across executives of firms in an industry and whether these differences are connected to the variation observed in actual business models in the industry. In this study I examine, in particular, in which ways do the BM schemas of executives who are industry insiders differ from those of industry outsiders. Building on interviews with top executives from 30 legal tech firms, I develop and analyze executives' cognitive maps of the causal interdependencies in and around their business model. The findings show that while outsider executives take a technology-centric approach to addressing widespread problems that affect large segments of the legal industry, insiders tend to focus on niches within established markets.

³ A book chapter based on this study has been submitted for publication and is undergoing the peer-review process at the time of writing.

INTRODUCTION

Past research on the content of business models has led to an extensive understanding of the various elements and components of business models (Baden-Fuller & Haefliger, 2013; Casadesus-Masanell & Ricart, 2010; Rosca et al., 2017; Smith et al., 2010; Teece, 2010; Zott et al., 2011). Executives' cognition is known to play a crucial role in the conception of new business models as well as evolution and innovation in existing business models (Aspara et al., 2013; Baden-Fuller & Morgan, 2010; H Chesbrough, 2010; Martins et al., 2015; Tikkanen et al., 2005). However, the scholarly understanding of the link between an individual's acquired cognitive biases and heuristics (such as those associated with a certain professional background) and the differences in strategic cognition among distinct individuals is yet unclear.

The professional context in which an individual has accumulated work experience and acquired expertise influences these cognitive biases and the framing of problems and solutions (Hitt & Tyler, 1991; Sutcliffe & Huber, 1998; Tuggle et al., 2010). Over time, professionals develop a cognitive lens, which is an agglomeration of the long-term effects of field-specific education and prolonged engagement with an industry, including the development of common beliefs about business activities, potential business opportunities, and networks of value creation (Helfat & Peteraf, 2015; Tikkanen et al., 2005). An individual's understanding of relevant concepts, their relationships, and resulting payoffs is filtered through this cognitive lens. This selective exposure to certain kinds of ideas and information contributes to the development of individual-level heuristic logics – cognitive shortcuts codifying real world business interdependencies into simplified mental schemas. These cognitive schemas have been defined as “knowledge about specific stimuli as well as the organization of knowledge in larger structures” (Martins et al., 2015) in other words, and individuals' concepts as well as theories regarding their world (Fiske & Taylor, 2013).

As managers transfer, modify, and integrate knowledge from one domain to the other using processes of generative cognition (such as analogical reasoning⁴ or conceptual

⁴ The use of the knowledge from schema concerning one domain to interpret information in another domain

combination⁵), they update and evolve their understanding of their business environment by visualizing and capitalizing on the potential for novel linkages in the existing models of value creation (Martins et al., 2015). Viewing business models as a system of managerial heuristic logics connecting technical potential with the realized economic value (H Chesbrough & Rosenbloom, 2002), this chapter explores the cognitive structures underlying novel linkages in networks of value creation by developing and analyzing the graphical representations of the business models based on interviews with top executives of 30 legal-tech firms.

A business model cognitive schema is a “graphical representation of an entrepreneur or top manager’s beliefs about the causal relationships inherent in that business model” (Furnari, 2015). This mapping approach seeks to integrate insights from the strategic cognition literature and business model research to understand business models as comprising of not only its content, but also its structure and mechanisms. These cognitive maps are graphical representations of the structure of individuals’ domain specific belief systems (Nadkarni & Narayanan, 2005) and elaborate business model mechanisms by portraying “the causal aspects of the structure of the belief system.” (Axelrod, 1976). Cognitive schemas (also called fuzzy cognitive maps or mental maps) are signed fuzzy digraphs (Axelrod, 1976). Per graph theory, digraphs are directed graphs, which are composed of a set of vertices (nodes) connected by edges (links) with specified direction.

Using business model cognitive maps as dynamic tools that can be manipulated as well as reasoned with to investigate and answer questions (Baden-Fuller & Morgan, 2010; Furnari, 2015), this chapter illustrates several ways in which the BM schemas of industry insiders and outsiders differ. Primarily, while industry insider executives predictably rely on their own professional experience in the industry to drive the company’s legal expertise, many also rely on their own (often assumed) technical acumen to drive expertise management and acquisition for the firm. On the other hand, industry outsiders are more conscious of the limits of their expertise and lack of legal experience. Further, this chapter uncovers systematic differences among insider

⁵The process of new concept creation by combination of a focal concept with a modifier concept

and outsider executives' opportunity recognition and customer identification. While insiders' motivation behind their business are primarily inside-out narratives – driven by personally experienced or observed problems – outsiders lay a greater focus on outside-in narratives – such as optimal use of technology or societal well-being.

Thirdly, industry outsiders lean towards a broader value offering encompassing a wider range of legal tasks, while insiders focus on establishing competitive superiority in a niche market. While both insiders and outsiders claim to simplify their customers' legal tasks and processes, the trajectories adopted by each are distinct. Outsider executives are likely to prioritize innovation-driven and/or market-driven business models, while executives with extensive legal experience tend to prioritize automation to replace repetitive human tasks. Outsiders also lay disproportionate focus on cost-saving as a value proposition when compared with legal industry insiders.

Further, these emergent themes from the interview data show the distinctly different ways in which executives find novel connections among value drivers in their business environment, leading to a systematic difference in their choice of the type of business model with outsiders adopting for product-driven business models and insiders prioritizing partnerships as a business model driver, resulting in solutions or matchmaking/platform business models. This chapter shows that outsiders, in an attempt to secure their position in the business ecosystem, are likely to focus on a wider range of stakeholders as well as value offerings. This leads to the formation of business model cognitive schemas characterized by a distributed focus with business model linkages encompassing multiple aspects of the business, as opposed to a higher concentration of value chain connections linking to a single concept. On the other hand, industry outsiders also make attempts to compensate for their outsider-ness by proactively exploring the interdependencies in the legal industry better, eventually resulting in a complex understanding of the business model and the surrounding ecosystem.

An important message conveyed by this chapter is that despite the shortcomings of being an outsider – such as lack of industry acumen and deficient social networks (Tibau & Debackere, 2008) – industry outsider executives are able to achieve comprehensive understanding of the business model and its surrounding ecosystem. These comprehensive mental schemas, developed by incorporating novel-to-context knowledge into cognitive processes of perception and interpretation underpin business

model evolution. Diving into the individual level cognitive differences between industry insiders and outsiders, this chapter cements an intersection between strategic cognition and business model research using theories of generative cognition (Martins et al., 2015) and highlights the value of outsider executives' for business model innovation. In this sense, the primary theoretical contribution of this chapter is to the business model literature. However, by expounding upon the differences between cognitive schemas among insiders and outsiders, the chapter also contributes to the literature on (managerial) cognition.

INDUSTRY SETTING AND RESEARCH BACKGROUND

Many industries and professions, over the past decades, have had to contemplate and implement drastic business model change to compete in a business environment dominated by technological evolution. Constant access to a global marketplace of products, services, as well as information has transformed how both customers and businesses conceptualize themselves and their interaction with each other. Case in point, until recently, the legal industry had largely resisted major changes in their generations old business models. However, recent industry reports indicate an emerging gap, with up to 55% of traditional law firms no longer meeting the expectations of their customers (Altman Weil, 2017; Deloitte, 2016). In 2016, while 28% of the investigated in-house legal teams already replaced some form of previously human tasks by technology, 77% had plans to either begin or increase the use of cutting edge technology in their operations (Deloitte, 2016). The coming-of-age of artificial intelligence and the increasing pressure on lawyers to do more for less means that the top management in the legal industry face an imminent need to innovate their business models (Altman Weil, 2017). Foremost, such changes in the central logic of longstanding industries and professions as result of the digital revolution require a re-conceptualization of managers' cognitive models of the value drivers in a firm's business environment and the interdependencies among them.

Business Models: Cognitive Representations of Complex Activity Systems

Theories of technological evolution and business model innovation suggest that as computation and communication capabilities of everyday devices continues to increase, new business models will emerge to provide an optimal interface between technology and firm performance (Baden-Fuller & Haefliger, 2013). However, the

relationship between technological evolution and business models is not unidirectional. At their core, business models are managerial cognitive schemas codifying the complex set of activities forming a firm's network of value creation, capture and delivery into simplified managerial heuristics and biases (Schneckenberg et al., 2019; Teece, 2010). When viewed holistically, these schemas provide an insight into an individual's cognitive lens – their mind's eye (Furnari, 2015). Executives perceive their business environment through their own personal cognitive lenses, by categorizing real-life information (situational cases) into existing cognitive categories (concepts and relationships) (Aversa et al., 2015). From this cognitive perspective, a business model is a managers' mental representation of the complex system of real-life activities that interlink drivers of value creation (Baden-Fuller & Morgan, 2010).

These processes of perceptual cognition and conceptual categorization reduce cognitive load associated with decision-making by organizing learning processes and simplifying recall of existing knowledge (Martins et al., 2015). However, this reduction of cognitive load has significant cost in terms of loss of objectivity in decision-making (Grégoire et al., 2010). As executives' perception as well as processing of new information are defined by their personal cognitive schema of their business model (Clarke & Mackaness, 2001; Furnari, 2015), so is the rationale underlying their executive decisions (Schneckenberg et al., 2019). As distinct executives have their own distinct perception of reality, their cognition has a deep impact on executive decisions and organizational performance (H. Thomas & Porac, 2002). Each individual has a unique view of reality based on their knowledge and beliefs regarding causal interdependencies in their environment (Tikkanen et al., 2005). In the context of business models, this entails that managers conceptualize different schemas of interdependencies in their business environment, based on the understanding of cause-effect relationships between the different components, elements, and actors in their business model (J. E. Dutton & Jackson, 1987). Firstly, the cognitive framework employed by an executive to understand and explain their business not only guides the search for opportunities and threats in the business environment, but also provides a framework for the categorization of observed information (Grégoire et al., 2010). Secondly, an individual's mental understanding of their business model lends structure to their framing of the value propositions as well as influence the variety of value propositions in their pitch for their business (Baden-Fuller & Mangematin, 2013). Third, an individual's cognitive biases influence their perception of their own abilities

and expertise as well as their assessment of organizational capabilities and the need for expertise acquisition (Das & Teng, 1999; Kaplan, 2011; Tripsas & Gavetti, 2000). Fourth, the drivers of change prioritized by an executive when evolving and redesigning their business model are a product of the individual's past professional experiences and their perception of extant business interdependencies (Eggers & Kaplan, 2009). Above factors in regards to an executive's cognition play a crucial role in the development of a firm's business model value network.

Chesbrough and Rosenbloom (2002) state that business models are 'focusing device' that connect technological evolution with economic value. While both technological evolution and economic value creation are observable real world activities, the focusing referred to in this definition takes place at the level of an individual executive's cognition, before being implemented tangibly (Baden-Fuller & Morgan, 2010). In their review of the business model literature, Tikkanen et al. (2005), differentiate between the cognitive and material aspects of business models. Building on this, Doz & Kosonen (2010) distinguish between the objective versus the subjective elements of business models. Here, the objective elements represent the interdependent relation between the firm's business model and the internal as well as external actors engaged in it. This includes, the firm, its internal units and departments, customers, external partners, as well as other stakeholders. On the other hand, the subjective elements of a business model are the nodes and links in its cognitive representation in the minds of managers. Teece (2010) proposes a purposive classification of these subjective elements in three categories, namely value creation, value capture, and value delivery.

At the core of these each of these business model elements, connecting them with each other, is the firm's value proposition. Martins et al. (2015) elaborate how managers develop novel value propositions using a combination of various processes of generative cognition. Their paper highlights that managers use their existing cause-effect beliefs as ingredients in analogical and combinative cognitive processes while designing novel propositions of value. This idea is in accordance with Casadesu-Masanell and Ricart (2010) who view business models as reflections of managerial interpretations and choices. More recently Schneckenberg, Velamuri, & Comberg (2019) have identified six cognitive processes that influence managerial reasoning in the development of their business model schemas. These include processes of dominant logic used for deductive reasoning – namely, analogical transfer, learned heuristics – as well as emerging logic (inductive reasoning), including problem sensing,

considering adaptation, intuitional insights, integrating customer perceptions. In combination with these (and potentially more) cognitive processes, a manager's mental schema of their business model lends them a cognitive framework to develop heuristics for strategic activities. In the next section, I discuss the content and structure of the business model cognitive schemas (mental heuristics and biases as well as associated causal networks) and review the literature on the cognitive underpinnings of these crucial business model activities.

Heuristic Patterns and Network Structure in Cognitive Schemas

Cognitive mapping has been used by strategy scholars to plot the knowledge structures of executives engaged in decision making (Axelrod, 1976; Clarke & Mackaness, 2001; Furnari, 2015; Nadkarni & Narayanan, 2007). Cognitive schemas, acting as frameworks for perception and interpretation of novel information, influence strategic outcomes in three ways (Jane E. Dutton et al., 1983). Firstly, an individual's cognition influences scanning, i.e. identifying new information and determining its relevance (Forbes, 1999; J. B. Thomas et al., 1993). Second, diagnosis, i.e., an individual's existing knowledge/belief regarding cause-effect relationships in the real world influences their assessment and categorization of observed information (Jane E. Dutton et al., 1983). And finally, an individual's cognitive schema is the base for their identification of and prioritization among choices of alternatives for any given strategic decision (Bromiley & Rau, 2016; Kaplan, 2011). In tandem, these three effects of differences among individual managerial cognition, dictate variance in strategic action, such as customer identification and market opportunity recognition, framing of value propositions, the perception of in-house expertise and knowledge acquisition, business model evolution, and the choice of business model type (dyadic product/dyadic solution/triadic matchmaking platform) (Baden-Fuller et al., 2017; Kaplan, 2011; Tikkanen et al., 2005; Vergne & Depeyre, 2016).

The structure of an individual's mental representation of their business model can be summarized and interpreted using four key network characteristics with precedent in literature, comprehensiveness – the size of their cognitive schema network (Calori et al., 1994; Clarke & Mackaness, 2001), complexity – the average degree of connectedness of the nodes for any given schema (Calori et al., 1994; Furnari, 2015), centrality– the extent to which the causal assertions in a cognitive schema are distributed across varied aspects of the business (K Carley & Palmquist, 1992; Eden et

al., 1992; Nadkarni & Narayanan, 2007), and causal network density – the ratio of causal links in a schematic network to the maximum possible links for the given number of nodes. These structural features of a cognitive representation have critical effects on heuristics and biases employed in individual-level decision making.

For instance, the availability heuristic refers a cognitive shortcut that entails overvaluing the information conveniently available to oneself. Extant knowledge structures, thus, restricts the scope of top management executives' causal assertions in organizational settings. Rooted in the differences between objective reality and executives' perception of the reality, this bias is reduced as the variety and connectedness of concepts in a cognitive map increase. Increased comprehensiveness and complexity in cognitive maps enables managers to use a greater number of categories and relationships to categorize information extracted from real world scenarios (Bogner & Barr, 2000) (Bogner and Barr, 2000). Comprehensive and complex cognitive schemas provide a greater initial set of causal assertions and thus reduce the negative effects of the availability heuristic on executive decision making. Individuals engage in cognitive processes such as environmental scanning, diagnosis, and choice of alternatives using their individual cognitive representations of reality. An executive with a narrow view of the value independencies in their business model is likely to have limited perception of opportunities and threats in their business environment. Previous research has elaborated further upon the effect of a complex and comprehensive understanding of the business model on managers' performance. Complex cognitive maps have been found to enable rapid response to priority situations, greater flexibility in decision making, increased creativity in business model design, and implementation of novel business model elements (Rodan & Galunic, 2004). Further, increased cognitive complexity also improves an executives' absorptive capacity, enhancing acquisition of industry acumen, resulting in a positive feedback loop (Cohen & Levinthal, 1990).

Further, an executives' focus in their business model cognitive schema is an important determinant of executive decision making and strategic action. A cognitive schema indicates a high degree of centrality (or monofocality) if the causal relations therein are structured around one central concept or are distributed along multiple key concepts (Nadkarni & Narayanan, 2007). Such a characteristic network of perceived causal links in the business environment is likely to have a bearing on the scanning of the business environment, diagnosis of the key issues, as well as choices of alternatives to address

these issues. Previous literature has made a distinction between core concepts and peripheral concepts in a cognitive schema. While both kinds of concepts are results of long-term learning, elaboration, and feedback processes (Prahalad & Bettis, 1986), they play distinct roles in managerial decision making. In the processes of sensing opportunities, seizing them, and reconfiguring the firm's existing business model to achieve these goals, core (central) concepts play a more important role than peripheral concepts.

This emphasis on central concepts in a large number of cognitive processes is called perceptual salience. Perceptual salience is driven by the prominence of concepts and relations in an executives' past experiences. This creates a preference among executives for ideas and value chain linkages that are eye-catching and easy to discern for them (Kahneman & Tversky, 1982). When an individual has extensive experience in a context, they are more likely to have salient concepts that are associated with their specific role within the business ecosystem. While this ability to rapidly identify opportunities and threats in an individual's surroundings is an essential cognitive mechanism useful for the allocation of attentional resources, in the context of decision-making, it may manifest in the form of the salience bias. Owing to the focus on a few central concepts, executives with focused cognitive schemas are susceptible to cognitive inertia (Carley & Palmquist, 1992). This cognitive inertia – a tendency for endurance of links in a cognitive schema once formed – may lead executives to unwittingly ignore viable business opportunities, limit the scope for the framing for value propositions, and restrict trajectories of business model evolution. A lower degree of focus on a manager's cognitive map of their business model makes it likely that the manager would consider a diverse perspective in executive search and decision-making processes. As managers routinely prioritize information which they consider most relevant and leave out other potentially fruitful information, they narrow down the firm's scope of business opportunity scanning as well as their choices of alternatives.

Further, densely-mapped cognitive schemas reduce the cognitive inertia inherent in decision making processes by facilitating a greater variety of alternatives (J. E. Dutton & Jackson, 1987). Firms led by executives with highly dense cognitive schemas have access to a greater depth of knowledge regarding a larger proportion of potential connection among the given concepts. These executives, characterized by greater extent of coverage of the causal network in a schema have experience with and are

aware of deep and underlying issues in a domain. Such executives can identify potential market opportunities which address customers' key pain points. This also has a direct effect on strategic decision making and actions of these executives. Dense cognitive schemas facilitate more targeted scanning of environmental opportunities, and effective diagnosis leading to a bearing on the future trajectory of business model evolution. Dense cognitive representations reflect a variety among managerial perspectives and promote the consideration of new alternatives in the strategic decision making process (Hodgkinson, 1997). Overall, owing to the increased likelihood that real life information observed within the given domain has a suitable category to be employed in its interpretation, density of cognitive maps is helpful in environmental scanning within the domain. However, for scanning opportunities and threats beyond the domain, diagnosing industry-spanning issues, and making the choice of action from a wide range of alternatives, a dense cognitive schema isn't helpful. The effects of the density of business model schemas are thus limited by their comprehensiveness.

DATA AND METHODS

This chapter explores the cognitive differences among insider/outsider executives based on a series of interviews from the legal-tech ecosystem and other publicly available data, such as industry reports, media reports, and firm annual reports. The interviews were conducted by Mary Jutten of the legal innovation organization, 'Evolve the Law' based in New York, USA. These interviews have been published as a part of a podcast series 'Evolve Law' with the support of the legal media website 'Above the Law'. This study has no direct association with the interviewers or the interviewees. This chapter builds on an analysis of the transcripts of the publicly broadcasted interviews (podcasts) under a copyright fair use doctrine. The dataset includes 30 interviews, conducted between March 2016 and February 2017, with CEO/Founders of firms operating in the legal-tech sector. As part of data preparation for this study, these interviews were transcribed, coded for causal assertions along a number of conceptual themes, and transformed into business model cognitive schemas. The resultant business model cognitive schemas were then analyzed along their structure (characteristics of the value network) and content (recurring patterns underlying value creation/capture/delivery) to identify cognitive differences among executives owing to their professional background. Information required for developing these business

model cognitive schemas can be retrieved from text or speech where top managers describe their business model. Thus, cognitive mapping has been used in a variety of fields as a simple yet reliable tool to understand the construction and accumulation of mental structures of knowledge and belief.

To improve internal validity, mapping and network analysis of executives’ business model cognitive schemas is complemented with thematic content analysis of the interview data. As the aims of this chapter include the elucidation of the structure as well as content of cognitive differences among individuals owing to their professional experience, the data was coded for a two-pronged analytic approach. For a detailed evaluation of the research design, Table I enumerates the primary methodological concerns associated with the cognitive mapping methodology (Nelson et al., 2000) and their treatment in this study.

Table 5.I – Methodological considerations and research design for cognitive mapping

Methodological Concern (Nelson et al, 2000)	Explanation of Issue	Criterion for Addressal	Treatment in this Study
Research Focus	What are the aims of this study?	To identify specific and measurable aims of cognitive mapping	To identify cognitive differences between industry insiders and outsiders
Choice of Source	Does the source provide relevant information?	Interviewee selection by Industry Experts and Peers	Interviewees selection by members of the professional legal-innovation community
Sampling Strategy	How are the research objectives incorporated in sampling?	Interviewees must address myriad aspects of their business model	Interviews with Executives originally target their peers as audiences, ensuring specific, detailed, and verifiable communication

Construction of Maps: Categories Operationalization of Constructs Operationalization of Linkages	How is theoretical and conceptual relevance of the categories ensured? How are relevant theoretical concepts identified? How are linkages among the theoretical concepts identified?	Identifying causal statements from interview data Ensuring inter rater reliability of coding Interpreting of concepts and relationships using suitable existing theory	Two raters (the doctoral candidate and a master student familiar with the research) independently extracted causal statements from the interview data Existing theories of business model process elements, technological evolution, and generative cognitive were used to inform the coding process
Unit of Analysis	Does the level of analysis suit the investigated constructs?	Ensuring a theoretically reasonable and empirically evidenced level of analysis to aggregate various constructs	Interpretation and investigation of the cognitive representation of team, organizational, and industry, level constructs at the executive level
Convergence	Is there consistency in insights reached using different sources?	Use of auxiliary sources of information	Use of content analysis to support findings from cognitive schema analysis
Validity of findings	Are the findings accurate in representing the reality?	Ensuring conceptual consistency in coding interpretation	Use of content analysis facilitates nuanced interpretation of cognitive schema analysis results

Data on executives' individual level characteristics was retrieved from company websites, media publications, and social networking sites. Information regarding executives' age, educational and background, domain and tenure of previous work

experience, tenure at current firm was retrieved from LinkedIn, among other sources. Top managers' educational background is categorized into six categories, humanities, business, economics, engineering/science, formal legal education, and law-related humanities education. Similar to the measurement of educational background, executives' functional background is also categorized into five categories, namely engineering, finance, general management, law, marketing. Table II provides an overview of key characteristics of the interviewed executives' and their firms. Executives were categorized as industry insiders if they had previously directly worked for either a law firm or as/for an in-house general counsel. This is categorization is regardless of an individual's formal legal education or qualifications.

Table 5.II: Summary of managerial and firm characteristics for the sample

	Mean	St. Dev.	Min.	Max.
Executive's age	41.77	7.42	30	62
Executive's work experience (in years)	14.84	7.12	2.30	33.28
Proportion of work experience gained at the current firm	0.27	0.21	0.01	0.73
No. of previous employers	4.03	2.67	1	12
Firm age (in years)	7.77	10.01	0	45
Firm size (No. of employees)	60.93	158.34	1	800

Table III shows the details of the data sample including a brief description of the firm's business model, the location of the firm, and the designation of the interviewee with the firm.

Table 5.III: Summary of firms and respondents in data collection

Firm Code	Brief Description	Position of interviewee	Location
Alpha	Legal practice management software and customer relationship management	Marketing Communications Manager	San Diego, USA
Beta	Legal market information, legal research, litigation support, document e-discovery/assembly/review	(Co)Founder	Detroit, USA

Gamma	Cloud based legal practice management and document management software	CEO	New York, USA
Delta	Legal practice management, client relationship management, and workflow automation tools	CEO	San Diego, USA
Epsilon	Digital consulting for law firms focusing on innovation, marketing, design and web development	(Co)Founder	Los Angeles, USA
Zeta	Automated/do-it-yourself start-up incorporation tools for founders	CEO	New York, USA
Eta	Legal social network and collaboration platform for law firms	CEO	San Francisco, USA
Theta	Web-based remote deposition and litigation support software	VP - Marketing	Encino, CA, USA
Iota	AI based contract lifecycle management software platform	(Co)Founder	San Mateo, CA, USA
Kappa	Contract analysis software, legal enterprise solutions, and other customized solutions	(Co)Founder	Indianapolis, USA
Lambda	Online legal media production and delivery network	CEO	Denver, USA
Mu	Service of process and lawsuit delivery management software	CTO	Denver, USA
Nu	Online legal appointment booking management software	(Co)Founder	Melbourne, Australia
Xi	Artificial intelligence powered contract analytics and management software	(Co)Founder	Boston, USA
Omicron	Cloud based legal case and practice management software	CEO/Founder	Vancouver, Canada
Pi	Case chronology software for reviewing evidence, organizing facts, and identifying trends	CEO/Founder	Atlanta, USA

Rho	Case research, tracking, management, and analytics platform	CEO	Los Angeles, USA
Sigma	Cloud based legal case and practice management software	(Co)Founder	Belfast, UK
Tao	Artificial intelligence powered legal service discovery platform	CEO/Founder	San Clemente, USA
Upsilon	Predictive legal technology solutions and innovation advisory	CEO	Telluride, Colorado, USA
Phi	Legal operations management, knowledge management, reporting, and analytics	CEO	San Francisco, USA
Chi	Legal transaction management and security platform	CEO	Indianapolis, USA
Psi	Litigation filing, automated conflict checks, and court information management	CEO	New York, USA
Omega	Web domain security, brand tracking, and liability management	(Co)Founder	New York, USA
Tartarus	Browser based patent research and management tools	(Co)Founder	Arlington, VA, USA
Gaia	Legal chatbot development and automation consulting	(Co)Founder	Vancouver, Canada
Eros	Electronic signature management and automated client intake tools	(Co)Founder	Atlanta, USA
Erebus	Document analysis, discovery, and, management system	VP - Marketing	Seattle, USA
Nyx	Full-service legal coverage platform based on a multilevel marketing model	CEO	Ada, Oklahoma, USA
Oneiroi	Legal service discovery, communication, and practice management platform	(Co)Founder	Atlanta, USA

Mapping of Business Model Cognitive Schemas

Business model cognitive schemas are typically mapped using qualitative information gathered from the observation top managers explaining their company's business models (Furnari, 2015). Figure 1 illustrates this process using an example from the dataset.

As figure 1 illustrates, using this process of mental mapping, the interview transcripts were transformed into a graphical schema of the business model in four steps (c.f., Barr, Stimpert, & Huff, 1992; Calori et al., 1994; Furnari, 2015). The first step after transcribing the interview is identifying causal statements in the transcription. This includes identifying assertions that the researcher considers to have an effect on other things. In step 2, concepts based on the identified causal statements were codified into a table where each row consists of a cause concept, an effect concept, and the type of relationship. Next, the core concepts are organized into theoretical categories of business model elements (step 3). For this purpose, this study employs an business model conceptualization with its process elements categorized as value creation, value delivery, and value capture (H Chesbrough & Rosenbloom, 2002; Teece, 2010). This study maps these three elements around the firm's value proposition. Moreover, I also distinguish between value creation for the direct client and value creation for the end user in the mapping. Thus, step 3 adds theoretical categorization to each conceptual relationship observed in the data. In the last step (step 4), the executive's cognitive map is developed using a network analysis software, UCINET. This software visualizes the cognitive schema as a network map. Every causal statement reflects a relation, the cause-effect relation, which is visualized in the schematic network. Moreover, this visualization shows the organization of each concept into the conceptual business model categories.

Figure 2 illustrates an example business model cognitive map. The BM cognitive map in figure 2 reflects the manager's understanding of their business model. Here, the circular nodes represent causal concepts, square nodes represent effect concepts and consequently each relationship represents a causal assertion as perceived by the interviewed executive. An illustrative case elaborating the mapping of the cognitive schema is also provided in appendix A.

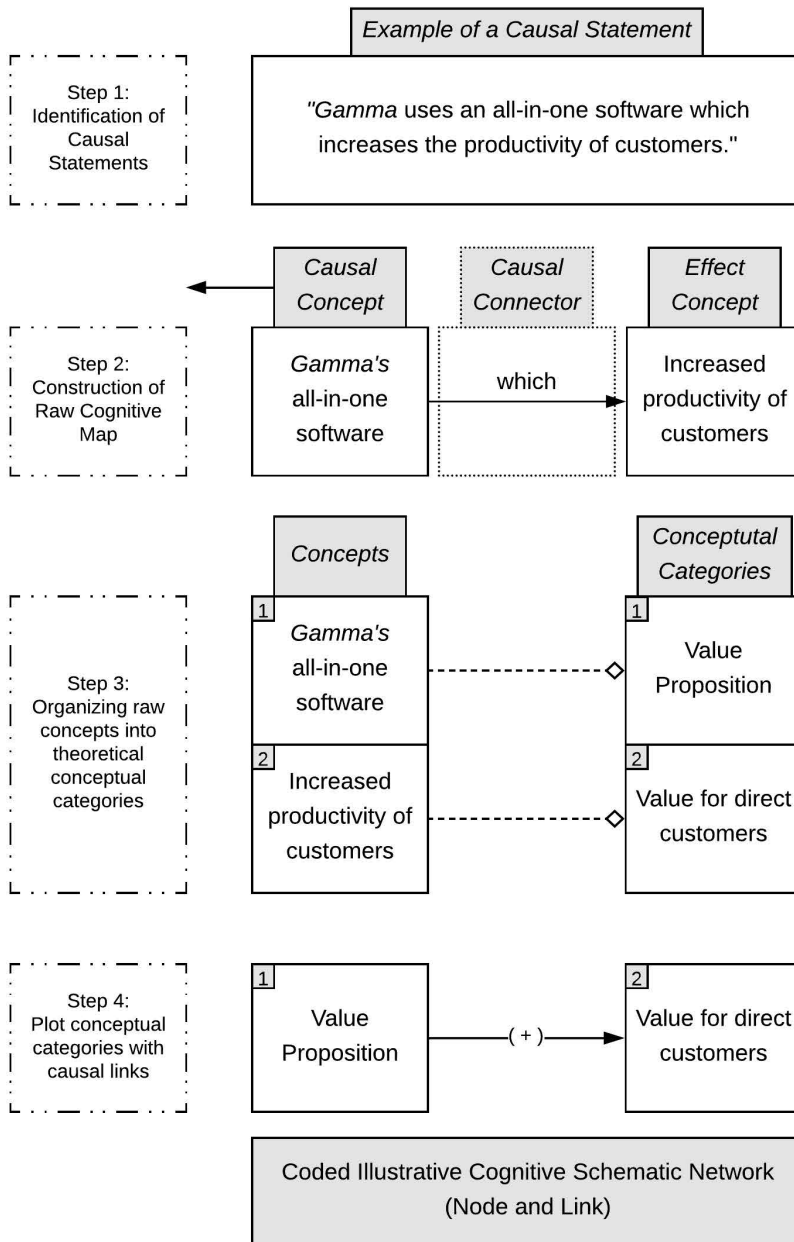


Figure 5.1 – Four step procedure of mapping a cognitive schema from textual assertions

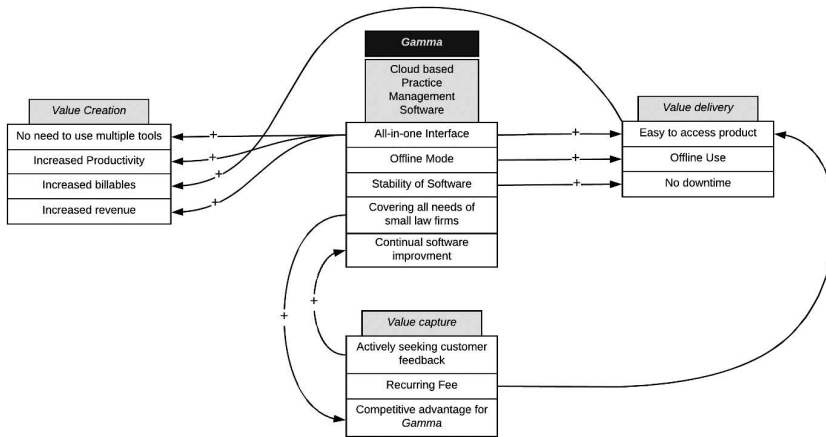


Figure 5.2 – Example Business model cognitive map
 (derived from the interview with the CEO of Gamma)

Network Analysis and Contextual Interpretation of Cognitive Schemas

The cognitive schemas mapped following the above-mentioned steps are subsequently analyzed as networks in order to reveal key insights regarding the structure of the business model. The results are interpreted with the context of the thematic analysis of the interview responses for improved internal validity.

The comprehensiveness, centrality, connectedness, and density of a cognitive map is calculated using methods commonly adopted in network science strategic cognition literature (Furnari, 2015; Nadkarni & Narayanan, 2007). Network comprehensiveness is measured as the number of nodes (N) in a network, i.e., the number of concepts in a given cognitive schema in relation to the other cognitive schemas in the sample (Nadkarni & Narayanan, 2007). Network connectedness is measured as the average number of edges connected to each node in a given network (E/N), i.e. the number of linkages in the map divided by the total number of concepts in the map (Nadkarni & Narayanan, 2007). This ratio reflects the connectedness of concepts in the cognitive schema and thus its degree of complexity (Calori et al., 1994). Density of the schematic network is a ratio of the number of edges to the maximum possible number of edges in a network with N nodes (E/E_{max}) (Kathleen Carley & Palmquist, 1992). This can be calculated (in network analysis for simple graphs) using the following formula; $D = \frac{2*(E-N+1)}{\{N(N-3)+2\}}$. The degree centrality of any node is the number of links

incident upon it, i.e., the total number of relationships that a concept has (Valente et al., 2008). As an indicator of the overall focus in a business model cognitive schema, this study takes the product of the number of nodes with degree centrality greater than three and the highest degree of any given node in the schema. This measure reflects the cognitive map's centralization and prioritization of one concept over others. Using the number of nodes with high degree centrality a certain concept is associated with, the cognitive maps were also classified into two categories; singular-focus business models and distributed-focus business models (Pokorny et al., 2018). For the analysis of the difference of means of the network characteristics among outsider and insider executives this study uses Walsh's two sample t-test as well as logistical regression using generalized linear models.

Next, thematic content analysis of the interviews responses was used to compare and categorize a wide range of causal statements by insider and outsider along a number of themes. Subsequent to the identification of causal concepts and relationships in the interview data, the statement was coded along theoretically salient themes at the individual case level. These themes are centered around four key executive processes of opportunity identification, value framing, expertise acquisition, and business model evolution. Further, the business models in each of the schemas were coded based on the number of value creators and the direction of the value flow into core theoretical business model types including dyadic product, dyadic solutions, triadic match-making, triadic multisided (Baden-Fuller et al., 2017). This was followed by a cross-case analysis, wherein the emerging patterns from thematic analysis were used to summarize the main themes of differences between industry insiders and outsiders.

The reliability of the coding was ensured through independent rating of the interview data by the doctoral candidate as well as a master student familiar with the dataset. Both the coders engaged, in parallel, in the identification of causal statements, their cause and effect components, and the nature of the relationship between the concepts. While the final decisions on the coding approach and rating of empirical data were taken by the doctoral candidate, frequent discussions over the coding of causal statements occurred until the researchers reached consensus on the key codes.

RESULTS

Network Analysis of Business Model Cognitive Schema

The analysis of the executives’ cognitive schemas resulted in the identification of key differences in the content as well as structure of the mental representations of their business models. As the primary mode of analysis, the network characteristics of these business model cognitive schemas, such as comprehensiveness, complexity, centrality, and density were compared across industry insider versus industry outsider executives. A summary of the findings of this schematic network analysis is provided table IV.

Table 5.IV: Network Analysis results for Business model Cognitive Schema Network

Network Characteristics	Conceptual Variable	Insider	Outsider	Welch t-test (t)	GLM (b)
Size	Comprehensiveness	Low	High	-1.96*	-0.17*
Complexity	Connectedness	Low	High	-2.11**	-0.16**
Centrality	Focus Distribution	High	Low	1.82*	0.18*
Linkage Density	Depth of Understanding	High	Low	2.52**	0.20**

p<0.1, **p<0.05, *p<0.005*

Our results show that industry insider executives have a significantly lower network comprehensiveness in their business model cognitive schemas (t = -1.96, b = -0.17). This indicates a lower degree of differentiation among the concepts included in an insider executives’ managerial cognitive schema. In other words, outsiders have a larger number of nodes/concepts in their mental representation of their business models due to their experience with a wider range of concepts beyond the legal industry. This is also illustrated by the frequency distribution of the business model cognitive schema comprehensiveness in figure 3.

In addition to this, the results show that industry outsider executives have a significantly higher network complexity in their business model cognitive schemas. The frequency distribution of the business model cognitive schema complexity in figure 4 presents a visualization of this difference. As the comparison of means of the average degree of connectedness (E/N) of the network indicates, outsiders have better-connected nodes in their mental representations of their business models. They include a greater average number of links/relations connected to each node/concept

in their business model cognitive schemas. Table IV shows that there is a significantly lower average degree of connectedness of the concepts in an insider executives' managerial cognitive schema ($t = -2.11, b = -0.16$).

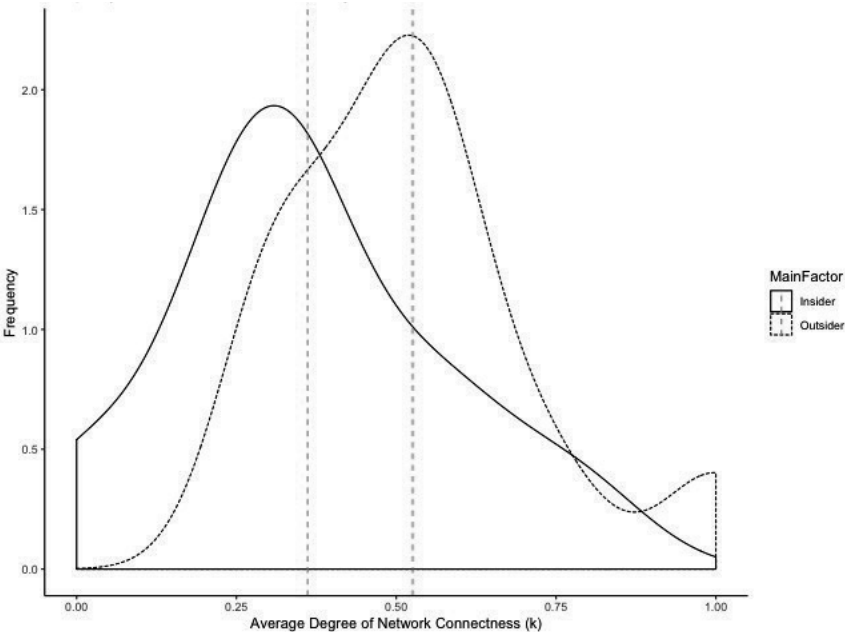


Figure 5.3 – Comprehensiveness of Executive’s Business Model Cognitive Schema

Further, the centrality in business model cognitive schema reflects the number of highly connected nodes in a cognitive schema. Results of the statistical analyses show that insiders have a higher number of nodes in their cognitive schemas which have a high degree of centrality compared to outsiders ($t = 1.82, b = 0.18$). As figure 5 illustrates, outsiders are more likely to have multiple ‘central nodes’ – nodes which are connected to three or more links – in their cognitive schemas than insiders. In the context of business model cognitive schemas, this means that industry insiders are more likely to have a unifocal business model cognitive schemas – focusing on a single idea or concept as causally connected with a wide range of other value creation, capture and delivery concepts.

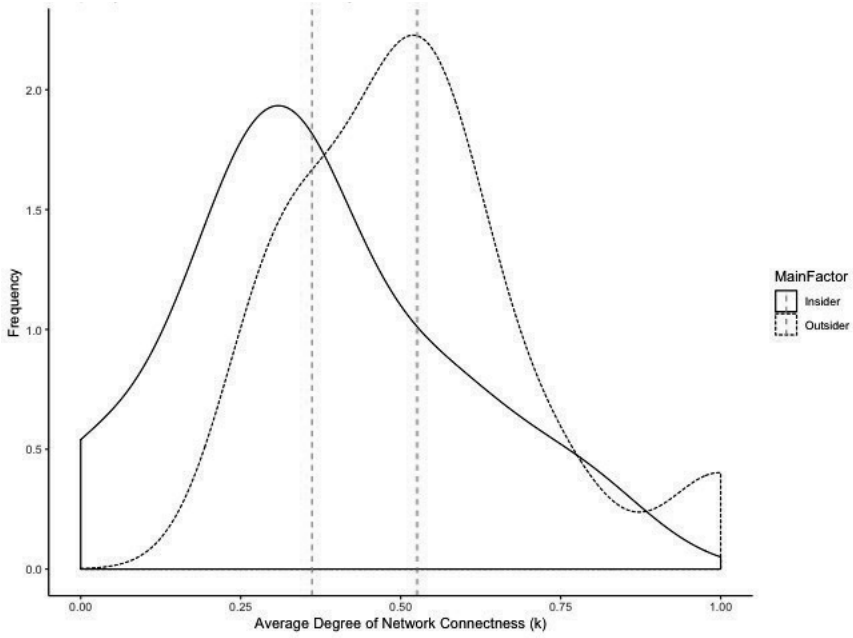


Figure 5.4 – Complexity of Executive’s Business Model Cognitive Schema

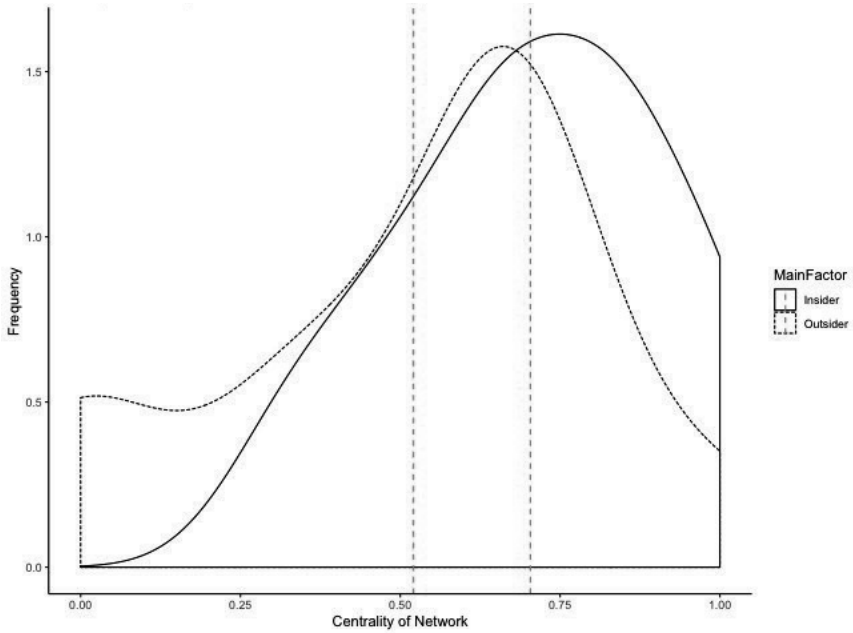


Figure 5.5 – Centrality of Executive’s Business Model Cognitive Schema

Lastly, we find that the density of the business model cognitive schemas, that is the proportion of potential links in the value chain identified by the executive is significantly higher among industry insider executives ($t = 2.52, b = 0.20$). This entails that insider executives are able to recognize a greater number of relational links within a given number of conceptual nodes. This is shown in the frequency distribution of the density of executives' cognitive maps in figure 6.

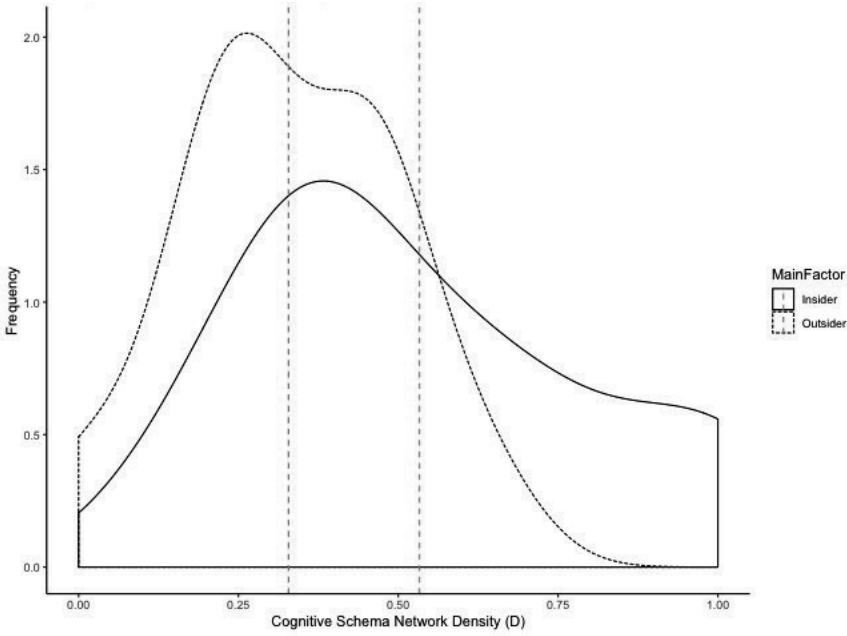


Figure 5.6 – Density of Executive’s Business Model Cognitive Schema

In the context of business model cognitive schemas, density of the schematic network may be interpreted as the depth of knowledge in an individual’s field of focus. An individual’s depth of previous understanding of the industry and its business interdependencies facilitate triadic relations and bidirectional dyadic relations among business actors as opposed to unidirectional dyadic models driven by technology push. When interpreted in light of (Baden-Fuller et al., 2017) theoretical classification of business model types, we can state that insiders are more likely to adopt triadic matchmaking platform type or bidirectional dyadic solution type business models. On the contrary, as shown by figure 7, outsiders tend to perceive and explain their businesses in terms that signify a unidirectional dyadic product model.

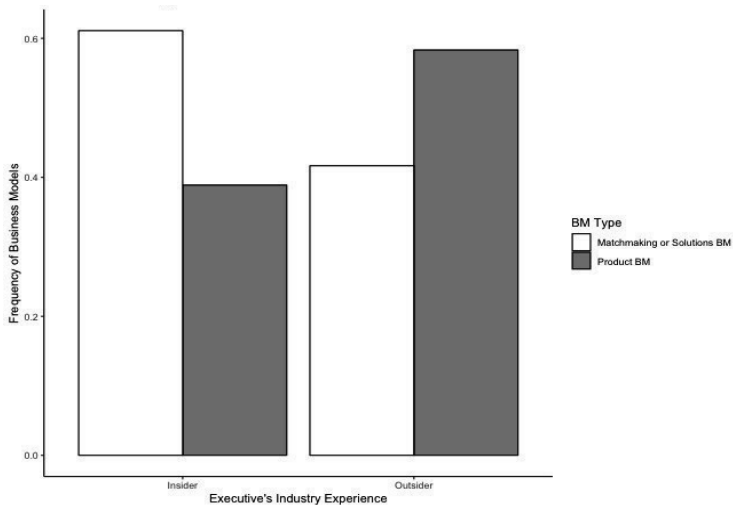


Figure 5.7 – Business Model Types in Cognitive Schema

Thematic Content Analysis of Business Model Cognitive Schemas

Complementary to the above described network analysis of the business model cognitive schemas of executives in the legal tech industry, a thematic content analysis of the interview transcripts was conducted. The interview responses were coded along four key themes, namely opportunity recognition and customer identification, framing of value proposition, expertise and knowledge, and trajectory of business model evolution. A summary of the findings of this thematic content analysis is provided table V.

Opportunity Recognition and Customer Identification

In the thematic analysis of the cognitive maps, the first theme related to the cognitive processes of scanning, resulting in influence over firm’s market opportunity recognition, customer identification, and executives’ understanding of their customers’ specific needs. Firstly, the results indicate that industry insiders employ personally driven narratives when explaining their market gap identification. These narratives tend to center around the problems either directly faced by the executive or observed by them during their tenure in the industry. The following quote is an illustrative example of this personally motivated elaboration of environmental scanning by an industry insider.

Table 5.V: Thematic content analysis results and cognitive differences among industry insiders and outsiders

	Insider	Outsider
Opportunity Recognition	Narratives centred around personally experienced or observed problems	Narratives built around the optimal utilization of technology and overall societal good
	Opportunity identification centred around potential customers and their needs	Balance of Customer-driven, solution-driven, and technology driven opportunity identification
	Primarily targeting legal professionals as customers	Targeting non-lawyers as customers in addition to legal professionals
	Attention to law firms as well as in-house general counsels as customers	Focus on law firms as potential legal clients; likely to ignore in-house counsels
Value Framing	Automation of redundant task as value driver	Cost saved by customers as a metric of value
	May rely on a single form of value driver such as resolving specific customer needs and pain points	Consistent addressal of both customers and task simplification as value drivers
Expertise Perception	Expected reliance on executives' own legal expertise	Acquisition of team/network of qualified attorneys
	Reliance on executive's assumed technical expertise	Expected reliance on executives' own technical expertise
Business Model Trajectory	Personal drive and experimentation as a main driver of changes in the business model	Access to digital resources as the main driver of changes in the business model
	Focus on customer feedback as other key drivers of change	Technology and partnerships are acknowledged as other key factors
Business Model Type	Depth of industry acumen facilitates both dyadic and triadic relationships among actors (solution and matchmaking type business models)	Predominantly, dyadic relationships among actors leads to inclination towards product type business models

“I left my law firm about three years ago. I just finished up a CFA designation, was excited about FinTech. (I) simply exit from law. I was very interested in generalized models of companies. So, what I did about for about a year is (I) build valuation models with company public data. (I) built standardized financial statements, code for updating that, updating the models. This (firm) is a really big model of compromise.” – CEO of *Zeta*

As evident from this quote by CEO of *Zeta*, the identification of the opportunity for the business model was driven primarily by the CEO’s interest, their personal motivation, and their struggle with the adjustments and compromises. In contrast, industry outsiders place greater emphasis on the benefits of optimal use of technology and the general need in the legal industry to undergo digital transformation.

For instance, in the following quote, the co-founder of *Epsilon* elaborates their process for reevaluating their value offerings.

“And so, what my team and I do often times for legal tech clients is, go in and really understand what the software does, how it is supposed to make life easier for the user? It really creates a user experience that accomplishes an easier life for the end user.” – Co-founder of *Epsilon*

Another emergent pattern among outsider executives is the use of philanthropic narratives motivating their business model by asserting their customers’ right over their self-proclaimed superior products and services. This is illustrated by the following quote.

“He (the founder) formed Alpha from the thought that lawyers need to be educated and provided with robust software that can run their entire firm.” – Head of Marketing at *Alpha*

Owing to this preference among insider executives for personally-motivated narratives and outsider executives for superior-offering narratives leads to systematic differences in the executives’ perspective to issue formulation. Insiders, having identified the business opportunity from within the legal industry value network, adopt a customer centric view to problematization of the market gap that the firm addresses.

“We actually discovered this problem as a client. We had a time sensitive need in Boston.” – Founder of *Nu*

The above quote provides an example of such identification of the market gap in the executives' professional environment. The founder of *Nu* goes on to elaborate that:

“Obviously you can use directories online. There is a directory but there is no way to see a lawyer’s availability; for either a phone call or at their office. ... I can book a doctor, I can book a dentist. But I can’t book a lawyer? How can we make this better for the legal industry?”

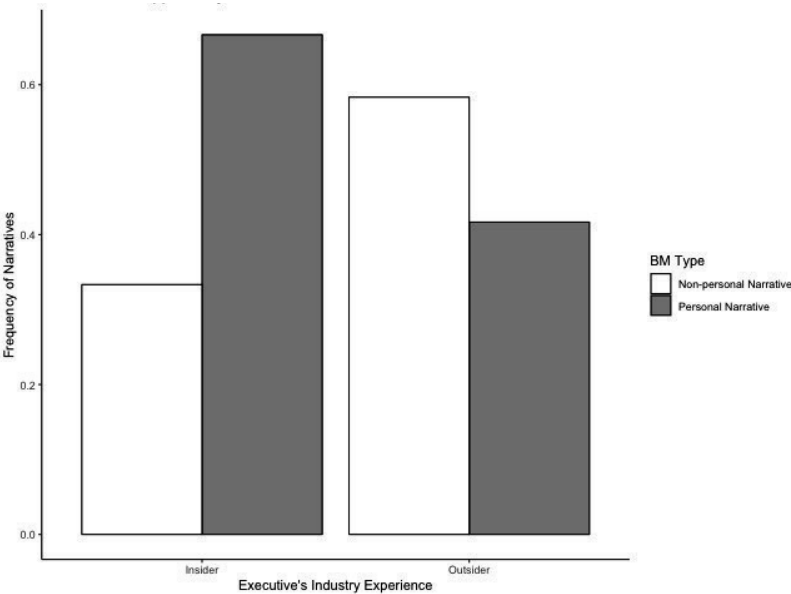


Figure 5.8 – Narratives in Opportunity Recognition

As inferred from the above quote as well as the trend illustrated in figure 8, an industry insider executive finds themselves in the requisite scenarios over their career and can use their personal experience to identify business model opportunities by scanning the professional environment around them. On the other hand, industry outsiders face a need to proactively try to understand the business environment. The resultant knowledge is more likely to impart a balanced understanding of the value chain interdependencies, often also starting at the customers' expectations, followed by a proposal of a feasible solution, and complemented with an elaboration of the added value of the technological advancement. For instance,

“We typically see our customers are selling up the market, so selling to larger customers, which involves a lot of contract negotiation. And sometimes third-party

papers coming from the customer, which involves a lot of negotiation. The problem that comes is tracking that after the fact, you have loads of outcomes that have been negotiated in those contracts. Businesses don't know (remember) what they agreed to. That is where we come in with our analysis tools, and search report functionality that allows folks to quickly find key answers to information without taking a week in the conference room for a whole team of people.” – Co-founder of *Xi*

The above elaboration of the motivation for behind the business model, as provided by the co-founder of *Xi*, begins with describing the nature of their customer's needs. However, it further goes on to describe the solution to the encountered market gap and the firm's approach to it. This is shown in figure 9 as an illustration of how insider/outsider executives use customers, solutions, and/or technology driven narratives to explain their opportunity identification.

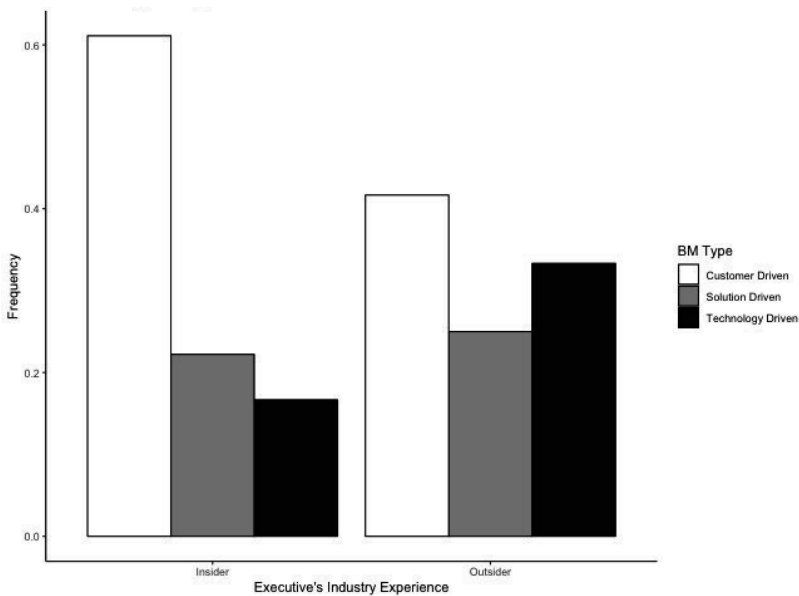


Figure 5.9 – Drivers of opportunity recognition

The interview responses also indicate a systematic difference between the primary customers identified by insider and outsider executives. With the added industry acumen, insiders have a greater depth of knowledge regarding the needs and interdependencies in the business model. This is also substantiated by the network

analysis of the business model cognitive maps detailed in another section of this chapter. An illustrative example of this industry acumen is as follows:

“There are a lot of amazing products, services, and software coming out of legal tech. But often times, the product or services are also designed by the developers. So, they are very technical, very difficult to use. When you target law firms, we know from our past experience, that often times law firms have been a little slow to adopt technology.” – Co-founder of *Epsilon*

In this case, an industry insider is able to evaluate products and services developed by independent developers with regards to marketability. This industry acumen leads to targeted business models focusing on niche segments of the industry.

“In terms of offering the solutions that we do, we came right out of the gate, these are not new innovations for us, we just knew the industry needed to adopt it.” – Co-founder of *Epsilon*

The above quote illustrates an understanding of the customers’ willingness to adopt a new technology. However, insiders also benefit from the knowledge of the dynamics of the industry. As the co-founder of *Epsilon* goes on to explain their choice of primary customers:

“The small firms, because they are not committee driven, they don’t have the same kind of reluctance. They make decisions more quickly.”

Interestingly, as industry insiders focus on legal professionals as customers, due to their personally-motivated approach to business environment scanning and industry acumen, they are liable to ignore potential customers who are not legal professionals. While both insiders and outsiders target legal professionals as customers, outsider also identify non-lawyers as customers. This is illustrated in figure 7, as well as the following quote.

“We know that there are 57 million North Americans that have at least one legal issue every year. It is not because they are not law abiding, again this could be divorce, adoption. But you know, only 60% according to the ABA really ever get the necessary services of a lawyer.” – CEO of *Njx*

Further, we find that while both insiders and outsiders identify legal professionals as customers, within the industry, insiders have a balanced approach incorporating law

firms as well as in-house general counsels for other firms. While outsiders lay disproportionate focus on law firms and litigators as customers, largely ignoring firms' in-house counsels and other legal professionals.

Overall, the content analysis of the business model cognitive schemas suggests that firstly, industry insiders explain their motivation for their business model in terms of personally experienced or observed problems, while outsiders use narratives built around the optimal utilization of technology. Second, owing to their personally motivated narratives, insiders base their opportunity identification on potential customers and their needs. On the other hand, outsiders undergo a proactive exploration of their new industry of operation and thus have a balanced approach combining customers' needs, their solutions, and the facilitating technology. Third, outsider executives, owing to their unique professional experiences and distinct cognitive schemas, identify potential links in the value chain unlike industry insiders. While insiders tend to overlook non-lawyers as customers of legal-tech firms, outsiders are able to prioritize a range of non-legal customers. Finally, an executives' previous industry experience facilitates targeting a wider range of customers within their professional domain.

Framing of Value Proposition

The next theoretical theme along which the interview data was coded is the executive's framing of their firm's value proposition (indicating their diagnosis of and addressal for the market opportunity). There were four categories of value propositions emergent from the coding, task automation, cost saving, customer driven, workflow simplification. Among these insiders predominantly propose automation of redundant legal tasks as the primary driver of value for the customer. This is in accordance with the insiders' personal approach to motivating their business model, and is often shown to be a result of pain points identified by the executives themselves. As illustrated in the following quote.

“I rather invest time and energy into developing some tools that automatically do it the third time, and after that it is free.” – CEO of *Psi*

On the other hand, outsiders disproportionately focus on cost and time saved by their clients as a metric of the value provided by them. This is in stark contrast with the industry insiders, who chose to largely ignore this form of value propositions. The

following quote from the co-founder of *Xi*, an industry outsider clearly defines this focus.

“That is really the major driver that we are seeing with our customers, the time and costs that they save each year, by using our tool.”

Further, while both insider and outsider executives address customer driven value propositions in their interviews, insiders rely on resolving customer needs or pain points. For instance,

“*Eros* seeks to automate all those duties so the administrative personnel can be more productive, reduce error, and of course make the customer experience as well happy for the customer and happy for the administrator.” – Founder of *Eros*

Here, the emphasis on the happiness of the customer as well as the administrator indicates a customer driven value proposition, while maintaining a focus on an operational niche, i.e. administrative tasks at law firms. On the other hand, the Head of Marketing at *Alpha* – an industry outsider – provides an example of a less specific, more holistic description of their business model. They state,

“We give companies sustainable and predictable performance gains, while decreasing operational cost related to managing complex IT infrastructure, and data center operations on their own.” – Head of Marketing at *Alpha*

Overall, while outsiders consistently elaborate value propositions from two different perspectives, encompassing customer centric and task centric value, insiders address their value propositions differently. Some executives address only one form of value and build on the same to provide a narrow yet powerful narrative. On the other hand, several outsider executives address multiple forms of value simultaneously (customer centric, task centric, technology centric, cost centric). The following is an example of such as case.

“Our solution allows organizations to reduce costs, increase productivity, make data driven decisions, and identify market opportunities. We work on analytics for that, we are one of the first companies releasing our alpha for state analytics. If you want to know your opposing counsel, what types of cases he handled in the past, who his clients been, outcome of the cases, judgment, trail, settlement dismissal, different metrics within the life cycle of the case.” – CEO of *Rbo*

Expertise and Knowledge

In the next theme of coding, the responses were rated with reference to legal, technical, and cross-domain expertise of the executives' themselves, expertise available in-house at their firm, and the expertise that they acquired. Among the investigated firms, executives derive legal expertise from reliance on executive's legal experience, executive's industry experience (not as a lawyer), external partnership for in legal expertise, inhouse team of attorneys, network of attorneys. Similarly, executives derive technical expertise from reliance on executive's technical expertise, reliance on executive's entrepreneurial experience, in-house technology teams, and partner executive's technical expertise.

While some executives are found to take a self-conscious approach to legal and technology knowledge acquisition, others base their business model on distributed expertise among executive team. Other emergent drivers of cross-domain expertise in legal tech firms are the executive's own cross-domain expertise, executive's entrepreneurial acumen, technology-driven expertise acquisition, technology hosted network of legal experts. The case-wise results of this coding are detailed in the table VI.

The data indicates that a systematic and planned acquisition of both legal and technical expertise, beyond the individual expertise of the executives is perceived to be the ideal set-up. This is illustrated by the following quote.

“It has been a mix of the legal mind and the technology experts coming together to provide customers with the best possible marriage of legal technology and security.”

– Head of Marketing at *Alpha*

Industry outsiders, such as the head of marketing at *Alpha* in the above quote and the vice president of *Theta* in the quote below, seem to recognize the gap between their own legal/industry expertise and the level of expertise required for successful strategic decision making.

“The only way I can become an expert in something is to listening to the people who are there every single day, and try to put together a game plan, to give them a competitive advantage against the other players out there.” - Vice President at *Theta*

On the other hand, some industry insiders display a casual indifference towards their own lack of expertise beyond their professional domain.

Table 5.VI: Executive's Perception of Expertise and Approach to Cross-domain Knowledge Acquisition

Firm Code	Executive's Background	Legal Expertise	Technical Expertise	Cross Domain Expertise
Alpha	Outsider	Relied on Executive's Legal Experience	Technical Expertise Not Explicit	Cross-domain Expertise Not explicit
Beta	Insider	In-house Team of Attorneys	Technical Expertise Not Explicit	Cross-domain Expertise Not explicit
Gamma	Insider	In-house Team of Attorneys	In-house Technology Team	Balanced approach to legal and technology knowledge acquisition
Delta	Insider	Relied on Executive's Industry Experience	Relied on Executive's Technical Experience	Cross-domain Expertise Not explicit
Epsilon	Insider	Relied on Executive's Legal Experience	Technical Expertise Not Explicit	Executive's Cross-domain Expertise
Zeta	Insider	Relied on Executive's Legal Experience	Relied on Executive's Technical Experience	Executive's Cross-domain Expertise
Eta	Insider	Legal Expertise Not Explicit	Relied on Executive's Technical Experience	Cross-Domain Expertise Not Explicit
Theta	Outsider	Legal Expertise Not Explicit	In-house Technology Team	Executive's Cross-domain Expertise
Iota	Outsider	In-house Team of Attorneys	Relied on Executive's Technical Experience	Cross-domain Expertise Not explicit
Kappa	Insider	Relied on Executive's Legal Experience	Relied on Executive's Technical Experience	Cross-domain Expertise Not explicit

Lambda	Outsider	Relied on Executive's Legal Experience	Technical Expertise Not Explicit	Executive's Cross-domain Expertise
Mu	Insider	Network of Attorneys	Relied on Executive's Entrepreneurial Experience	Cross-domain Expertise Not explicit
Nu	Insider	Relied on Executive's Legal Experience	External Partnership for Technical Expertise	Distributed Expertise among Executive Team
Xi	Outsider	Legal Expertise Not Explicit	Relied on Executive's Technical Experience	Cross-domain Expertise Not explicit
Omicron	Outsider	Legal Expertise Not Explicit	Technical Expertise Not Explicit	Cross-domain Expertise Not explicit
Pi	Insider	Relied on Executive's Legal Experience	Driven by Executive's Technical Experience	Executive's Cross-domain Expertise
Rho	Outsider	Relied on Executive's Industry Experience	External Partnership for Technical Expertise	Executive's Cross-domain Expertise
Sigma	Insider	Relied on Executive's Legal Experience	Technical Expertise Not Explicit	Not Cross-domain Expertise Not explicit
Tao	Insider	External Partnership for in Legal Expertise	Technical Expertise Not Explicit	Technology driven expertise acquisition
Upsilon	Outsider	External Partnership for in Legal Expertise	Relied on Executive's Entrepreneurial Experience	Distributed Expertise among Executive Team
Phi	Outsider	Legal Expertise Not Explicit	Relied on Executive's Technical Experience	Distributed Expertise among Executive Team

Chi	Insider	Relied on Executive's Legal Experience	Relied on Executive's Technical Experience	Cross-domain Expertise Not explicit
Psi	Insider	Relied on Executive's Legal Experience	In-house Technology Team	Technology driven expertise acquisition
Omega	Insider	Relied on Executive's Legal Experience	In-house Technology Team	Executive's Entrepreneurial Acumen
Tartarus	Insider	External Partnership for in Legal Expertise	External Partnership for Technical Expertise	Not explicit
Gaia	Insider	Relied on Executive's Legal Experience	In-house Technology Team	Executive's Entrepreneurial Acumen
Eros	Insider	Relied on Executive's Legal Experience	Relied on Executive's Technical Experience	Distributed Expertise among Executive Team
Erebus	Outsider	Relied on Executive's Legal Experience	Technical Expertise Not Explicit	Balanced approach to legal and technology knowledge acquisition
Nyx	Outsider	Network of Attorneys	Driven by Executive's Technical Experience	Technology hosted network of legal expertise
Oneiroi	Outsider	Legal Expertise Not Explicit	Technical Expertise Not Explicit	Not explicit

“My cofounder (an insider) ... likes to say that serves of process is a black hole, of sorts. Law firms have no idea what happens with the summons and complaint, or subpoena that leaves their law firm.” – Chief Technical Officer and Co-founder at

Mu

Outsiders on the other hand, are shown to engage in proactive learning and exploration of the novel context, resulting in an active process of industry acumen acquisition. As the following quote illustrates.

“We spend more time than anyone we know, learning from how people agree, where negotiations get stuck.” – Co-founder of *Iota*

However, improving the expertise of the existing employees is not the only viable option. As evidenced by the following quote from the CEO of a full-service legal coverage platform, there are alternate ways adopted by industry outsiders to acquire the necessary expertise for running a large scale legal-tech operation.

“We have about 1000 lawyers at our law firms that are committed and dedicated to serving our members. And another 7000 attorneys across north America, that either because of their expertise or geography are also (indirectly) serving our members.” –

CEO of *Nyx*

At a smaller scale, other firms also similarity acquired expertise from across the domains through networks, partnerships, or talent recruitment. As the industry outsider vice president of Seattle based document management software states,

“... They brought in developers who had deep expertise in the technology side, they brought in expertise in the legal side. So, what we created is a solution but developed by lawyers for lawyers with the latest technology.” – Vice-president at *Erebus*

However, insider executives across the sample seem to overestimate, or at least exaggerate, their technical skills and acumen. The following quotes by executives with a legal professional background illustrate this point.

“I guess I don’t like to see myself as a legal expert. I like to think of myself who likes math, modelling, digging deep into problem solving.” – CEO of *Zeta*

“So, I am a techy, I have to admit that I didn’t code this chatbot. That is a little beyond me. It is python. My training is with CSS HTML and a little PHP. But I have to admit this is beyond me. So, I had to hire help.” – Founder of *Gaia*

Overall, while industry insiders predictably rely on their own legal expertise to drive their firm's business models, outsiders rely on their own past experiences for technical and/or entrepreneurial acumen. However, while outsiders acknowledge the limits of their legal expertise, lawyer executives (insiders) are likely to underestimate the expertise required for the technical and entrepreneurial aspects of their business.

Trajectory of Business Model Evolution

Our analysis of the final textual coding theme – the executives' choice of trajectory of business model evolution – revealed that in line with the preceding findings, insiders prioritize their personal motivation and experimentation as one of the main drivers of business model design. For instance, the following quote by the founder of a start-up that offers the automation administrative process in the legal industry shows the role played by the executives' personal motivation in the evolution of the business model.

“I started my practice a few years back. And when I started the practice I decided to distinguish myself not necessarily by having the best real estate (for the) office. I focused, with developers, on building a solution that enables me to have a virtual presence. A year later we started licensing the app to other firms, they said ‘Hey! That is very cool. I’d like to use that as well.’ And that is how our company went from being an in-house law firm technology team to *Eros* serving other firms, both lawyers and accountants.” – Founder of *Eros*

Here the industry insider executive and their personal preferences for a certain trajectory of evolution of the firm and the feedback they received is seen to be at the core of the development of the business model. Other insider executives are also seen to use personal narratives to describe a product which is claimed to have originated from the executive's own experimentation at their former workplace. As an illustration, the following quote from the CEO of a firm that brought to market an automated litigation filing system, shows how the product as well as the business model came to be.

“I actually started this while I was still working at the law firm. In that sense it has been around for a while, but kind of grew organically. I started use it (the software) personally. When a partner would ask me questions about a judge, I would be able to give them an answer very quickly. Then all of a sudden, I was the go-to person for these types of questions. ... I was able to answer to a variety of questions that put me in a good spot. Then other people at the law firm started to using it. Slowly, by word

of mouth it spread outside the firm. I didn't market it at all, that was maybe two years ago. About one year ago I quit the law firm and started doing this full-time. Now it is in about one year since the sparks been out." – CEO of *Psi*

On the contrary, my results show that outsiders prioritize other outside-in factors in the evolution of their business models. For instance, while motivating the trajectory of development of their business model, the CEO of *Rbo* – a case tracking and analytics software – lays primary importance on the access to data and the potential applications of digital resources.

"So primarily, this data was not readily available in any large scale. ... We went on a project to start acquiring that data. And as we started acquiring that data, we realized that there is so much value around that data. All the data coming out of the state federal courts. So, we started building, it spun into *Rbo*, today it is a large platform." – CEO of *Rbo*

Other outsiders, such as the founder of *Tao* – a legal service discovery service and the co-founder – the artificial intelligence-based contract management software provider *Iota*, also highlight their lack of initial industry expertise, their learning orientation, and focus on the role of technological evolution in bringing about their business model.

"Even though I have to say, in order to get where we are in terms of evolution of the processes and technology, it was more useful to assume we didn't know anything and go out of the box to get the answers." – Co-founder of *Iota*

"That was when I started realizing there was space in the market and space for (this) technology to be applied to the practiced of law. Now fast forward (to today), chatbots and artificial intelligence make it much better than the experience we were delivering. It was just not as stable as it could be now." – Founder and CEO of *Tao*

The various drivers of the trajectories of business model innovation and a summary of the executives' description of the primary activities associated with the evolution of their business model into its current form is provided in the Table VII below.

Table VII: Trajectories of Evolution of Business Model

	Firm Code	Executive's Industry Experience	Primary Driver of Business Model Evolution	Trajectory of Business Model Evolution
1	Alpha	Outsider	Personal Drive and Experimentation	Broadening of technological offerings
2	Beta	Insider	Customer Feedback	Redesign of client discovery
3	Gamma	Insider	Personal Drive and Experimentation	Focus on niche group of customers
4	Delta	Insider	Customer Feedback	Focus on limited yet top-end offering
7	Eta	Insider	Customer Feedback	Complete business model redesign
8	Theta	Outsider	Customer Feedback	Incremental improvement in business model
9	Iota	Outsider	Digital Resources	Improvement in the AI based on increased data availability
11	Lambda	Outsider	Personal Drive and Experimentation	Growth and legitimization by being acquired by an established brand
12	Mu	Insider	Customer Feedback	Partnership with institutional actors
13	Nu	Insider	Growth and Partnerships	Customer acquisition and growth leading to changes in business model
14	Xi	Outsider	Customer Feedback	Improvement in value proposition based on direct feedback
15	Omicron	Outsider	Growth and Partnerships	Expansion of compliance and ethical needs of software due to geographical expansion
16	Pi	Insider	Growth and Partnerships	New firm - Recently implemented business model
17	Rho	Outsider	Digital Resources	Acquisition of digital resources and integration into business model to provide novel value

19	Tao	Insider	Digital Resources	Technological development has led to improved value proposition, business model change follows
20	Upsilon	Outsider	Customer Feedback	Business model experimentation and pilot projects with close partners
21	Phi	Outsider	Growth and Partnerships	Not Explicit
22	Chi	Insider	Growth and Partnerships	Partnership and resource recombination in business model
23	Psi	Insider	Personal Drive and Experimentation	Scaling up business model to respond to market demand
25	Tartarus	Insider	Customer Feedback	Business model redesign to refocus on market niche
27	Eros	Insider	Personal Drive and Experimentation	Expansion by licensing technology rights to other firms
29	Nyx	Outsider	Growth and Partnerships	Growth with the extant business model

In sum, the results indicate a systematic difference among industry insiders and industry outsiders in the way they approach opportunity identification, framing of value propositions, perception of available expertise, and their choice of trajectory for business model evolution. Insiders are shown to prioritize personally motivated opportunity identification narratives, task automation-based value propositions, exaggerated perception of the executive's expertise, and a customer feedback and personal experimentation-based business model evolution trajectory. On the contrary, it is found that outsiders attempt to compensate for their outsider-ness by proactively exploring the industry and consequently adopting a more balanced approach to their business model innovation. Outsiders prioritize technology driven opportunity identification narratives, cost saving based value propositions, and self-conscious legal and technical expertise management. Further, outsiders are likely to prioritize access to digital resources, and technological evolution as primary drivers of business model evolution.

DISCUSSION

This study takes forward the stream of research on BM as cognitive schemas by identifying important dimensions along which the schemas of industry insiders and outsiders differ. Building on research in heuristics and biases from the field of cognitive psychology, the results suggest systematic differences among industry insider and outsider executives with regards to the content as well as structure of their mental representation of the interdependencies in their firm's business model(s). We find that outsiders and insiders adopt different approaches to opportunity recognition, value framing, expertise assessment, and business model evolution. This comparative analysis of executive's cognitive schemas is in response to Furnari's (2015) call to explore structural cognitive factors influencing the business model of a firm and Schneckenberg et al's (2019) call to identify cognitive processes of business model evolution in industry and dynamism specific contexts. The results both confirm and broaden the inquiry on how executives with distinct professional experiences differ in the way they perceive their firm's business models.

Our study builds on and extends Martins et al's (2015) explanation of the generative processes of cognition underlying design of new business models. We find that industry insiders – executives with previous professional experience in the focal industry – have narrower, denser, and more centralized cognitive schemas of their business models. This is opposed to outsiders perceiving their business models in schematic networks that include a wider range of relatively sparsely connected concepts. As the business is a dynamic entity, undergoing continual reinterpretation and reconfiguration, these characteristics of the structure of executives' mental representation of the business model have an influence on the further development of the content of the business model. An executives' generative processes of cognition simply work with the ingredients emergent as a result of their perception. With distinct mental schemas of their business model, insiders and outsiders focus on different concepts and relationships when attempting to visualize novel links in the value chain. Rooted in distinct approaches to opportunity identification and expertise assessment, the value framing developed by executives with past experience in a relevant professional context systematically differs from that developed by outsiders. Further, this managerial perception of outward and inward opportunities and threats influences a firm's trajectory of business model evolution (or business model renewal).

Firstly, this study empirically illustrates that, at its core, the process of opportunity recognition in organizations is of a cognitive nature (Zagorac-Uremović & Marxt, 2018). The findings resonate with previous research suggesting that previous knowledge among executives and selective exposure to certain situations has a pivotal effect on perception of opportunities in their business environment (Grégoire et al., 2010; J. B. Thomas et al., 1993). Further, in showing that the identification of the focal customer segments within as well as beyond a firm's industry of operation is contingent on the causal association in the top executives' perception of their business models, the findings contribute to the microfoundations of customer recognition and opportunity identification.

Secondly, the content analysis results support that idea that the framing of a firm's value proposition is a reflection of the managerial diagnosis of the issue/market gap as well as the organizational response considered suitable (Jane E. Dutton et al., 1983). The findings show that as insiders and outsiders are different in the way they perceive and detect issues in the first place, the frameworks as well as the information used to develop their value propositions is also systematically distinct. Insiders use their own experience as well as a deep understanding of the pain points faced by actors in the industry to identify and frame the value proposition of their firm. This also entails that they are likely to focus on a narrower range of value propositions when compared with outsiders.

Thirdly, I explore the managerial business model schemas with regards to the role of knowledge acquisition and cross-domain balancing of expertise in industry-spanning firms. We find that heuristics and cognitive biases play an important role in determining a manager's perceptions of their own expertise, the expertise available within the firm and the required expertise. Insiders' experience in the context of the legal industry leads to confidence in the firm's legal expertise and overconfidence in the firm's non-legal capabilities. This entails that an executive's industry experience has an influence on the firm's absorptive capacity by influencing the perception of available expertise and thus skewing the drivers of acquisition of new talent.

Fourth, we find that as the approach taken to opportunity recognition, perception of one's potential value offering, and the perception of expertise differ across insiders and outsiders, the way business models evolve also reflects the structural differences in the cognitive schemas. Insiders prioritize subjective drivers of business model evolution,

such as personal experimentation, executive's motivation, or customer feedback. Outsiders on the other hand, lacking in deep contextual knowledge of the domain, are driven by technological development, access to (digital) resources, and partnerships with legal partners in their firm's strategic renewal process.

Lastly, in context of Baden-Fuller et al's (2017) theoretical classification of business model types, we find that insiders are more significantly more likely to adopt bidirectional dyadic (solution) or triadic (matchmaking) type models. I suggest that due to a deeper experiential understanding of the dynamics of the legal industry, insiders are able to form novel links in the business model connecting a greater variety of stakeholders and multiple directions of the flow of value. Contrarily, using the technological differential between the legal industry and other industries, outsiders are able to use causal concepts and links from a wider range of unrelated domains. Thus, they are more likely to adopt a unidirectional dyadic (product) type business model. Overall, this chapter identifies cognitive differences between outsider and insider executives and theorize its role in the evolution/renewal of business models.

This study is not free of limitations. As is often the case in qualitative research, the interview sample was relatively restricted. The podcast series 'Evolve Law' – the source of interview data – is limited by design to interviews with legal tech executives. Future research may focus on a holistic sample including a wider range of industry-spanning businesses to further develop and quantitatively test the theorized relationships. Another avenue for future research is to explore whether different kinds of outsiders (social as opposed to professional) and their distinctly different cognitive schemas have different effects on the managerial perception and the renew trajectory of business models.

Cognition is gaining increasing interest and acceptance as an explanatory factor behind strategic-decision making and actions. However, the extant research at the intersection of business models and cognition lacks a clear elaboration of the individual level differences in the way executives perceive their businesses and its feedback effect on business model evolution/renewal. This study addresses this gap and elaborates the systematic differences in insiders/outsider executives' approaches to opportunity recognition, expertise assessment, value framing and business model evolution.

Chapter - 6

Conclusion

Chapter – 6: Conclusion

This doctoral dissertation extends the understanding of the role played by cognitive, ideological, and identity-related differences among executives in strategic change processes, such as business model innovation, digitalization, and the design of co-creative business models. The four studies elaborated in the previous chapters were conducted with the following research objectives in mind.

1. To extend a holistic scholarly understanding of the influence of executive diversity on opportunity recognition and strategic change processes (Study 1,2,3,4)
2. To specify a distinction between diversity of cognition and values among strategic teams (Study 1)
3. To specify a distinction between mechanisms underlying executive scanning for strategic change, change trajectory of the firm, and the intensity of the firm's strategic change actions (Study 1,2)
4. To investigate the effect of structural and temporal characteristics of strategy making teams (Study 1,2)
5. To identify the organizational effects of the simultaneous positioning of individual executives at the intersections of a variety of markers of diversity (Study 1,2,3)
6. To investigate the context specific nuances of diversity in Non-western organizational setting and identify context specific nullifiers of the negative effects of individual level differences among collaborators (Study 3)
7. To explore the microfoundations of the differences among the cognitive schemas held by insiders and outsiders (nature and structure) (Study 4)
8. To illustrate that selective exposure to specific professional situations and information plays a role in the development of distinct cognitive schemas among managers. (Study 4)

This final chapter summarizes this dissertation's addressal of these objectives and contributions of the four studies comprising this doctoral dissertation.

Each of the four studies address different aspects of the diversity dilemma mentioned in the introductory chapter of this thesis. For instance, the first study conducted as a part of this doctoral work, tests the effect of cognitive diversity and ideological diversity among top management team members on their attention to business model innovation as well as their firm's intensity of business model innovation adoption. In exploring the effects of both cognitive as well as ideological diversity among top management team members, this chapter contributes to the nuance in the field of diversity research. While previous research has substantially investigated the effect of the diversity of managers' individual demographic characteristics on organizational outcomes, this chapter builds on the upper echelon literature by studying the simultaneous effect of managers' cognition as well as their values. We find that while cognitive diversity among top management executives leads to increased scope of managerial attention to business model innovation (cognitive outcome), it has a negative effect on the intensity of actual business model innovation implementation (behavioral outcome). This finding entails that the effect of managerial cognitive diversity on organizational outcome depends on the nature of organizational outcome studied.

Further, we find that diversity of political ideology among TMT members has a curvilinear effect on the implementation intensity of business model innovations, such that the BMI intensity first increases and later decreases with an increase in TMT ideological diversity. This inverse-U effect indicates that an increase in the ideological diversity among the members of a top management team initially leads to greater adoption of novel business model innovations, owing to a constructive increase in the variety of viewpoints among the team. However, at high levels of ideological diversity among the team, ideological differences have the potential of reducing the team coordination, and consequently the business model innovation adoption intensity. These negative effects of ideological diversity are reduced as top management teams work together over the years. The results of the GEE analysis also indicate that the negative effects of cognitive diversity on BMI intensity also declines as team members gain experience of working together, while its positive effects on attention to business model innovation are enhanced.

The second study focuses on cognitive diversity among top management team members and its effect of firms' choice of imitative or innovative business model innovation in response to the threat of a rapidly digitalizing industry. The results

indicate that cognitive diversity facilitates the adoption of innovative digitalization processes as opposed to imitative digitalization. Viewed together, the first two studies of this dissertation make a distinction between the effect of top management team cognitive diversity on strategic scanning, strategic change trajectory, and strategic change intensity. While cognitive diversity is shown to have an unambiguous positive effect on the executives' attention to business model innovation, we also find that cognitive diversity promotes the adoption of an innovative approach to responding to the exogenous need for digitalization as opposed to an imitative approach. However, cognitive diversity may have a negative influence on the intensity of adoption of business model innovations. From these results we may infer that while the variety of cognitive perspectives is beneficial for the innovativeness in strategic scanning, issue diagnosis, and determining the choice of alternatives, diversity slows down the actual implementation of the decisions that result from these processes. As discussed in the introductory chapter of this dissertation, one of issues with the extant literature in the field of diversity is the segregated treatment of the various key markers of individual background. With the conceptualization of cognitive diversity as the multiplicative product of the diversity of age, gender, education, dominant function, and nationality, this thesis aims to capture the simultaneous effects of the intersection of these demographic indicators of professionally relevant lived experience and cognitive development.

Further we find that while vertical interdependence among the top management teams have an overall positive moderation effect on the adoption of BMIs whether innovative, imitative or a combination thereof, horizontal interdependence reduces the adoption of the hybrid business model innovations. Finally, while reward interdependence among the TMT shows a positive interaction effect with TMT cognitive diversity in the adoption of innovative as well as hybrid business model innovations, the two constructs have a negative interaction effect in case of the adoption of imitative business model innovations. From this we can infer a few key insights. Firstly, structural factors in strategic teams, such as vertical, horizontal, and reward interdependence, are found to significantly influence the relationship between diversity and a firm's trajectory of business model innovation.

Second, not all forms of structural interdependence among strategic teams have the same effect on the studied effect of cognitive diversity. We find that a low level of hierarchy among the top management team (the condition of high vertical

interdependence) leads to an enhancement in the effects of TMT cognitive diversity of business model innovation trajectories across the board. In teams of executives characterized by a flatter organization structure we find a significant ability to capture the value provided by their cognitive diversity leading to a prioritization of hybrid business model innovation trajectories combining both innovative and imitative digitalization-oriented business model innovations. On the other hand, the interdependence of executives' tasks, such as in a firm structured along functional profiles as opposed to divisions and/or subsidiaries, leads to the prioritization of imitative business model innovation and a move away from hybrid digitalization. Finally, we also find that the when top management team members' have interdependent structures of financial compensation, as reflected in the co-movement of their basic pay, bonuses, and proportion of non-cash pay, the effects of diversity are enhanced across the board, in the form of the adoption of innovative and hybrid approaches to business model innovation as well as the non-adoption of imitative business model innovation. These findings highlight the importance of the structural configuration of a decision-making team in its ability to effectively utilize the cognitive resources availed by a diversity of members' backgrounds. In this way this dissertation contributes to the literature on upper echelon theory by investigating and empirically testing organizational and team level factors that moderate the investigated upper echelon relationships.

In addition to this, the third study in this dissertation investigates context specific markers of diversity in the facilitation of co-creative business models for the sustainable forest management in India. The study not only provides evidence for a negative effect of socio-economic and cultural differences among collaborators, but also highlights that an individual's exposure to urban experiences and networks, lends them a different salient identity than the usual dominant identity used for social categorization. The inclusion of this unconventional organizational setting was motivated by the fact that much of the extant research in field of strategy over the past decades has been based on empirical investigation of western corporate organizational settings. However, a large proportion of economically productive work as well as vast new emerging markets are characterized by distinct nature of collaboration, unique organizational structures, and culture specific markers of individual identity.

In this study, we find that firstly, collaborating members of the team who happen to be in positions of power despite a low caste status categorization, are able to induce

significantly lower participation in institutional initiatives among members of the general community. However, as this effect wanes away when the same individuals are working with communities with a shared (low status) caste identity. On the other hand, individuals hailing from different regions than where they were assigned to at the time of the study, also faced similar prejudice, resulting in reduced success of participatory forest management initiatives. These results result can be inferred as indicative of an inherent prejudice in the general community, resulting from a range of contextual, historical, and socio-political factors. Additionally, the results indicate that as the urban background of a low status or cultural outsider officer counterbalances the costs of socio-cultural outsider status. This indicates that there are context specific remedies possible for the negative effects of individual level differences among members of strategic teams.

Finally, in order to illustrate the microfoundations of cognitive diversity, the fourth study focuses on the differences between the cognitive schemas of business models as perceived by industry insider and outsider executives. Using a network analysis of the business model cognitive maps of executives from the legal tech industry this study identifies the key cognitive underpinnings of individual differences in the way executives understand and explain the causal relationships in and around their firm. With the results indicating a systematic preference for personal experience and expertise driven approaches by insiders throughout the lifecycle of the business model, this study shows that selective exposure to certain professional situations and knowledge plays a crucial role in the formation of an individual's cognitive lens.

The results of the network analysis indicate that while outsiders have more comprehensive and more connected mental maps of their business models, insiders have more focused and dense conceptualizations of their business model. As the subsequent content analysis indicates, industry insiders rely on their own professional experience as the source of opportunity recognition as well as that of contextual expertise, outsiders are more conscious of their limitations. As opposed to insiders' personally driven opportunity recognition narratives, outsiders prioritize external factors, such as optimal use of technology, in their narratives. This results in outsider executives leading their firms toward a broader value offering, as opposed to insider's prioritization of niche markets presented by specific problems faced by industry insiders. As may be expected, this systematic difference is also reflected in the executives' choice of customers as well as their firms' propositions. While insiders'

executives focus of creating value by automation of repetitive human tasks, insiders prioritize innovation-driven and/or market-driven business models. Overall, we find that while insiders are more likely to be able to identify pain points faced by customers in the industry, outsiders have access to a more extensive network of value creation/capture/delivery links. This entails that a team comprising of a combination of insiders and outsiders is likely to have a wider range of attention when engaged in strategic scanning, a greater ability to observe patterns of cause and effect in value chains, and wider array of alternatives for responding to the identified opportunity/issue.

In conclusion, this doctoral dissertation explores various facets of the relationship between diversity of cognition, values, and identity among top management teams engaged in business model innovation. Table I summarizes central research question and main findings for each of the four studies.

Table 6.1: Main findings and dissertation summary

	Overarching Question(s)	Research	Main Findings
Study 1	How does cognitive and ideological diversity affect the executive attention to business model innovation, and companies' actual business model innovation intensity?		The scope of attention to BMI increases with cognitive diversity. When diverse teams have worked together for longer, their BMI intensity also increases. Ideological diversity has an inverted-U shaped relationship with BMI intensity.
Study 2	How does structural interdependence among TMT members influence the relationship between cognitive diversity and a firms' choice of imitative or innovative business model innovation processes?		Structural Interdependence among the TMT enhances the positive effects of cognitive diversity. Cognitive diversity promotes innovative digitization as opposed to imitative digitization.
Study 3	How do social outsider institutional mentors influence the performance of co-creative business models at the bottom of the pyramid?		Caste prejudice and cultural differences have a negative effect on co-creative performance. While being caste insider in a community improves performance, urban outsider background also attenuates the negative effects.
Study 4	How do social and professional outsiders' cognitive schemas of their business models differ from insiders?		Industry outsiders compensate for outsidersness by proactively exploring the interdependencies in their new industry, resulting in a comprehensive and complex visualization of the business model and the surrounding ecosystem. Outsiders also tend to focus on a wider range of stakeholders, leading to the formation of business model cognitive schemas characterized by a distributed focus linking numerous aspects of the business, as opposed to a higher concentration of value chain connections linking to a few concepts.

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Summary

Modern organizations function in increasingly dynamic and continually evolving environs. Along with technological evolution, disruptive societal changes, such as generational shifts in career trajectories, aging populations, and mass migration patterns continue to facilitate a more diverse workplace. These alterations in the workplace also bring together strategic teams composed of colleagues with different educational, professional, cultural, ideological, and socio-economic backgrounds. But what does this amplified diversity mean for teams of executives tasked with running organizations in a constantly evolving business environment?

How does diversity among executives influence the way firms engage in strategic change or respond to conditions of change?

This doctoral dissertation titled, 'Essays on Managerial Cognition, Diversity, and Business Model Innovation' addresses this question in an anthology comprising four empirical studies. The first empirical study in this anthology investigates the process of business model innovation and digital transformation in the North American publishing and printing industry in the wake of technological disruption brought about by Amazon. The ensuing chapter (chapter 2), illustrates the similarities as well as differences among innovation opportunity identification and implementation processes. Using computer-aided text analysis to develop a measure for business model innovation this study shows that top management teams' attention-scope increases with cognitive diversity, while remaining unaffected by teams' ideological diversity. This study also shows that distinct from the scope of managerial attention, companies' business model innovation intensity increases initially with ideological diversity, but decreases as ideological diversity becomes greater. The second study, elaborated upon in chapter 3 of this dissertation, utilizes dimension reduction and clustering techniques to identify two distinct paths adopted by publishing firms on their digital transformation trajectory. Further, this study elaborates upon the contrasting effects of top management team cognitive diversity on these two paths, innovative versus imitative digital transformation. Together, these two studies result in a nuanced conceptual model for the role of diversity in strategic decision-making in western

professional contexts. However, the role and effect of diversity are contingent on a myriad of cultural and socio-political factors. To further clarify this, the third study (chapter 4) of this anthology focuses on the effects of socio-economic separation and sub-cultural diversity on the performance of co-creative initiatives for joint social and environmental impact in the context of sustainable forest management in India. In the fourth and the final study, a cognitive perspective is adopted to explore in detail the differences among managers' visualization of their business models arising from the differences in their cognitive conditioning. To achieve this, this study maps managers' cognitive schemas of their business models based on interview data to examine the effect of their outsider status on their organizations' business model innovation. The result is a systematic elaboration of the differences in managers' opportunity recognition, value framing, expertise perception, business model innovation trajectory, and prioritization of certain business model types over others. Overall, this dissertation explores the nuances of the relationship between diversity (cognitive, ideological, socio-economic, and cultural) and organizational change processes (such as business model innovation, digital transformation, incubation of social enterprises, and evolution of a new industry). The dissertation concludes with a summary of the findings and their contextual interpretation.

Samenvatting

Moderne organisaties werken in steeds dynamischere en zich voortdurend ontwikkelende omgevingen. Zowel technologische ontwikkelingen als ontwrichtende maatschappelijke veranderingen zoals generationele verschuivingen in loopbaantrajecten, verouderende bevolkingsgroepen en massamigratiepatronen zorgen voor een diversere werkplek. Deze veranderingen op de werkplek zorgen ook voor de vorming van strategische teams die bestaan uit collega's met verschillende educatieve, professionele, culturele, ideologische en sociaal-economische achtergronden. Maar wat betekent deze toegenomen diversiteit voor teams van leidinggevendenden die zijn belast met het besturen van organisaties in een voortdurend veranderende zakelijke omgeving?

Hoe beïnvloedt diversiteit onder leidinggevendenden de manier waarop bedrijven zich bezighouden met strategische verandering of reageren op veranderende omstandigheden?

Dit proefschrift met de titel 'Essays on Managerial Cognition, Diversity, and Business Model Innovation' behandelt deze vraag in een anthologie bestaande uit vier empirische studies. De eerste empirische studie in deze anthologie onderzoekt het innovatieproces op het gebied van bedrijfsmodellen en digitale transformatie in de Noord-Amerikaanse uitgevers- en druksector als gevolg van de technologische ontwrichting die door Amazon is teweeggebracht. In het daaropvolgende hoofdstuk (hoofdstuk 2) worden de overeenkomsten en verschillen beschreven tussen processen gericht op de identificatie en implementatie van innovatiekansen. Aan de hand van computerondersteunde tekstanalyse om een maatstaf voor bedrijfsmodelinnovatie te ontwikkelen, wordt in deze studie aangetoond dat het aandachtsbereik van topmanagementteams toeneemt met cognitieve diversiteit, terwijl dit niet wordt beïnvloed door de ideologische diversiteit van de teams. Deze studie toont ook aan dat de innovatie-intensiteit van bedrijfsmodellen, anders dan het aandachtsbereik van het management, in eerste instantie toeneemt met de ideologische diversiteit, maar afneemt wanneer de ideologische diversiteit nog groter wordt. In de tweede studie, die wordt besproken in hoofdstuk 3 van dit proefschrift, wordt gebruik gemaakt van dimensiereductie en clustertechnieken om twee verschillende traject te identificeren die uitgeverijen hebben gevolgd tijdens hun digitale transformatie. Verder gaat deze studie dieper in op de contrasterende effecten die de cognitieve diversiteit van het

topmanagementteam op beide trajecten heeft: innovatieve versus imitatieve digitale transformatie. Deze twee studies leiden samen tot een genuanceerd conceptueel model voor de rol van diversiteit bij strategische besluitvorming in westerse professionele contexten. De rol en het effect van diversiteit zijn echter afhankelijk van een groot aantal culturele en sociaal-politieke factoren. Om dit verder te verduidelijken, richt de derde studie (hoofdstuk 4) van deze anthologie zich op de effecten van sociaal-economische scheiding en subculturele diversiteit op de resultaten van creatieve samenwerkingsinitiatieven op het gebied van zowel sociale gevolgen als milieueffecten in het kader van duurzaam bosbeheer in India. In de vierde en laatste studie wordt een cognitief perspectief gehanteerd om in detail te onderzoeken welke verschillen er zijn in de manier waarop managers hun bedrijfsmodellen visualiseren als gevolg van de verschillen in hun cognitieve conditionering. Hiertoe brengt deze studie op basis van interviewgegevens de cognitieve schema's in kaart die managers hebben van hun bedrijfsmodellen, zodat kan worden onderzocht in hoeverre hun status als buitenstaander effect heeft op de innovatie van het bedrijfsmodel van hun organisatie. Het resultaat is een systematische uitwerking van de verschillen tussen managers op het gebied van de herkenning van kansen, waardebeoordeling, perceptie van expertise, het innovatietraject van het bedrijfsmodel en prioritering van bepaalde soorten bedrijfsmodellen boven anderen. Al met al worden in dit proefschrift de nuances verkend van de relatie tussen diversiteit (cognitieve, ideologische, sociaal-economische en culturele) en organisatorische veranderingsprocessen (zoals innovatie van bedrijfsmodellen, digitale transformatie, incubatie van sociale ondernemingen en het ontstaan van een nieuwe bedrijfstak). Het proefschrift eindigt met een samenvatting van de bevindingen en hun contextuele interpretatie.

About the Author



Somendra Narayan (Jaipur, 21st December 1989) received his Master of Science degree in Management of Technology with a specialization in Supply Chain Management from the Delft University of Technology (TU Delft) in the Netherlands and Bachelor of Engineering in Civil Engineering from the Sardar Vallabhbhai National Institute of Technology (SVNIT – Surat) in India before starting his PhD in Strategic Management at the Rotterdam School of Management. His research encompasses business model innovation & digital transformation, managerial cognition, top management team research, strategic decision-making, social innovation, machine learning in management research, predictive analytics, and mixed-methods analysis.

Somendra has presented his research at major international conferences, such as the Academy of Management (AOM), Strategic Management Society (SMS), European Group for Organizational Studies (EGOS), and the European Academy of Management, (EURAM) among others. At the time of writing, he also serves as an ad-hoc reviewer for the Journal of Management Studies, Journal of Organizational Change Management, the Asian Academy of Management and the European Academy of Management. Somendra is actively engaged in organizing sessions in academic conferences as well as in developing research proposals for national and European grants. He has taught several courses and supervised student thesis both at the bachelors and master's level.

Further, Somendra believes in making scientific research approachable for the general populace. In the past he has also worked with the Erasmus Research Institute in Management (ERIM) and Theatre in Context – Rotterdam to translate complex insights drawn from empirical research into an accessible form with the help of art, animation, and social media.

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