

**The promise and the perils of market creation in 'smart' categories: Examinations of  
smart manufacturing and smart cities**

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The candidate confirms that the work submitted is his/her own and that appropriate credit has been given where reference has been made to the work of others.

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## Abstract

The categorisation of new markets enables firms to survive and gain competitive advantage, yet the promises of new market creation can also be fleeting and politically perilous. This dissertation addresses the strategy and the politics of categorising new markets in an era of digitalisation through two studies set in the domains of smart manufacturing and smart cities.

The first study examines the strategic dimensions of market categorisation through an investigation of the role of cultural and firm-specific resources in processes of strategic categorisation. To develop a better understanding of what resources a firm requires to create and shape new market domains, an inductive single case study traces the efforts of a global provider of cellular networks to construct a new market in the domain of smart manufacturing. Findings of this research inform the development of a theoretical model of *strategic category shaping*, which theorises the need for three distinct configurations firm-specific and cultural resources (knowledge-led, culture-led, hybrid) necessary to demarcate symbolic boundaries, structure the value space and materialise defining category features and its fit within an ecosystem.

The second study challenges dominant conceptualisation of market categorisation and develops an alternative view of market categorisation as a deliberative political process. Using the case of a proposed smart city neighbourhood involving a public-private partnership between a local development agency and an Alphabet subsidiary, this study examines the politics of categorising new markets on the boundaries of the public and private. This study develops a theoretical model of *categorisation abandonment* showing when public and private actors are confronted with contestation, they pursue diverging political strategies of procedural reconfiguring and performative framing, which fail to resolve underlying tensions and ambiguities. This study further highlights how visuals are strategically used in performative framing as a strategy of depoliticisation.

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### List of Abbreviations

<b>Abbreviation</b>	<b>Key Term</b>
BTEB	Business Area Technology and Emerging Business
MIDP	Master Innovation and Development Plan
PDA	Partnership Development Agreement
RFP	Request for Proposal

## **Chapter 1: Introduction**

This dissertation explores the strategy and the politics of categorising new markets in the era of digitalisation. The current trend of digitalisation is converging with the two-decade-long interest among category scholars regarding how “market actors come to agree to trade products and services” within economic spaces recognised as ‘real’ and distinct (Kennedy, 2008; Durand and Khaire, 2017 p. 88). As socially constructed partitions, categories are essential to economic relations as they establish meaning systems and reflect agreements on what is being exchanged and why (Rosa et al., 1999; Rhee et al., 2017; Lo et al., 2019). Enabled by an assemblage of innovations (i.e., 5G, cloud computing and artificial intelligence) (Lanzolla, 2018), digitalisation is a generative force, creating and reorienting market categories by blurring the boundaries between the material and virtual (Yoo, 2012). Prior research has highlighted that digitalisation is reshaping the categorical boundaries between industries and sectors, as well as products and services (Porter and Heppelmann, 2014; Kumaraswamy et al., 2018).

The intersection of digitalisation and market categorisation is particularly evident in the proliferation of the label ‘smart’, which ranges in application from discrete products and product systems to industrial level ecosystems (Porter and Heppelmann, 2014). This convergence is catalysing the emergence of new actors and practices that are upending and replacing existing rules and norms within ecosystems and industries (Hinings et al., 2018 p. 53). The potential to modify market structures as well as to shape new economic spaces serves to condition “material bets” (e.g., investments, product launches) as companies seek to explore and exploit new market opportunities (Durand and Khaire, 2017 p. 103).

The ever-expanding frontiers of what can be categorised as a new market presents broader societal questions regarding the values that underpin specific categories, and the normative implications of such categorisation processes (Cornelissen and Cholakova, 2019; Delmestri et al., 2020 p. 916). ‘Home voice assistants’ (i.e. Google Home and Alexa), for example, now provide firms with greater ability to anticipate and monetise aspects of people’s personal lives without them necessarily knowing (Lynskey, 2019). In a similar vein, the recent emergence of ‘track and trace apps’ in response to COVID-19 has stoked tensions between the management of public health and democratic debates concerning privacy rights (Singer, 2020). The construction and categorisation of new markets, therefore, extends

beyond the boundaries of the market and into the politics and the political processes of the social context in which it is occurring (Glynn and Navis, 2013; Durand et al., 2017).

Past research has focused on the effects of established categories (Zuckerman, 1999; Hsu, 2006; Hsu et al., 2012), and at times, presenting a relatively static conception of reality (Kennedy et al., 2010; Alexy and George, 2013). In recent years, the attention of scholarship has shifted, placing greater emphasis on the dynamism of categories, and the explication of processes like category emergence, evolution and maintenance (Kennedy and Fiss, 2013; Glaser et al., 2020; Pedeliento et al., 2020; Slavich et al., 2020). This has brought with it an increased recognition of agency in the creation of new categories (Durand and Khaire, 2017) as well as in the ways actors seek to influence how a category is defined, valued and evaluated (Delmestri and Greenwood, 2016; Kodeih et al., 2018; Pontikes, 2018). Yet, the efforts of market actors to exert influence and advance favourable categories makes the process inherently political, which has renewed calls for scholarship to address the “big categorisation battles” taking place around the digital economy (i.e. privacy, employment rights) (Uzunca et al., 2018; Cornelissen and Cholakova, 2019 p. 3). Thus, underscoring the importance of enhancing the literature’s understanding of political contestation in processes of market categorisation.

The themes of strategy and politics intersect with two essential aspects of the social perspective on categorisation, the role of actors and social context (Durand et al., 2017). First, categorisation is driven by the motivations and goals of actors, which inform how they create and negotiate meanings in pursuit of their interests (Durand and Paoletta, 2013; Pontikes and Kim, 2017). Second, social contexts are critical sites for mean-making and as institutional backdrops shaping the normative expectations regarding the construction of categorical conventions and the processes of collective sense-making (Glynn and Navis, 2013; Grodal and Kahl, 2017). The role of actors and social context are important elements that inform the examination of the strategic and political aspects in the two separate cases that comprise this dissertation.

To explore the strategic and the political aspects of market categorisation two studies were conducted, one focusing the category of smart manufacturing and the second on smart cities. Both research projects adopt single case study designs (Dyer and Wilkins, 1991; Stake, 2003; Siggelkow, 2007) permitting the collection of rich qualitative data assembled over multiple years following the respective research phenomena in real-time. Smart manufacturing and smart cities are ideal contexts for examining the strategic and political

aspects of categorisation because they are vague labels referring to broad areas of activity (Pontikes and Barnett, 2015). Consequently, they are observed to be unsettled domains, characterised by definitional ambiguity and the absence of dominant schema (Snow et al., 2016; Strozzi et al., 2017; Zuzul, 2019). Thus, both categories provide conducive settings for observing ‘market-making’ in real time. Unsettled market domains are fraught with risk and uncertainty in the absence of guiding logics, infrastructure and agreed upon meanings (Aldrich and Fiol, 1994; Santos and Eisenhardt, 2009). The uncertainty of trying to create new markets is not limited to only the competitive concerns of firms, such as identifying prospective customers and suppliers but also managing the wider issues of political contestation that can arise from pursuing categorisations in the absence of guiding regulations. The two studies explore the themes of strategy and politics from contrasting perspectives highlighting the agency with which firms and stakeholders use, shape and contest categorisations in market settings, and on the boundaries of the market and state.

The first study (*Chapter 4*) explores the promises of market creation afforded by digitalisation through a single case study of a mobile infrastructure provider’s efforts to build a new market for 5G cellular technology in the domain of smart manufacturing. Focusing on Northern Telco (pseudonym), a company with a long history in communication, this study contrasts the popular narratives concerning the disruptive effects of digitalisation on established firms (Christensen, 1997; Christensen et al., 2015) by examining the company’s efforts to leverage its existing knowledge resources in constructing the market of “smart wireless manufacturing”. The study builds on the recognised importance of cultural resources in processes of strategic categorisation (Khaire and Wadhvani, 2010; Glynn and Navis, 2013; Zhao et al., 2013) by expanding the view of resources to include firm-specific ones as well. In the existing literature, market categorisation is viewed as a strategic act (Pontikes and Kim, 2017; Pontikes, 2018), however, there has been limited attention to the role of firm resources (as the enablers of strategy) in the creation of new market categories (Durand and Boulongne, 2017). To enhance the understanding of the role of resources in market categorisation, this study brings together insights from the literatures on *strategic categorisation* (Vergne and Wry, 2014; Pontikes and Kim, 2017; Pontikes, 2018), the *resource-based view* (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993), and the *cultural resource view* (Weber and Dacin, 2011) to investigate:

- How does a firm make strategic use of firm-specific and cultural resources to shape and define a new market category?

Addressing this question, the research contributes to a better understanding of strategic categorisation, specifically as a resource-laden process, utilising different configurations of cultural and firm resources to construct and favourably define a market domain. A theoretical model of *strategic category shaping* is developed, which connects three distinct resource configurations (cultural-led, knowledge-led, and hybrid) to three dimensions of category shaping (empathetic resonance, structuration of value space, reification of material space). These elements are theorised to enable firms to favourably define a new market category around their specific knowledge resources. The study further shows the strategic shaping of a category not only requires different configurations of firm-specific and cultural resources but also relies on different meaning-making modalities to enable key acts of category shaping. This highlights the importance of material mediation in situations where the object of categorisation is imperceptible, and the architecture of the market ecosystem is layered.

The second study in this dissertation (*Chapter 5*) problematises the conceptualisation of politics in the existing market categorisation literature. Politics is predominately viewed through an instrumental lens in which categorisation is a “competition” or “battle” among market actors to assert their interests and desired schema (Zhao, 2005; Negro, Koçak, et al., 2010; Ozcan and Gurses, 2018). Using the case of a smart city venture in Toronto, Canada, between a public development agency and an Alphabet subsidiary, the study highlights that not all categorisations are occurring in pure market contexts. As the role of business in society continues to evolve, processes of categorisation are shifting to the boundaries of the market and state. As such, this study is guided by the following research question:

- How does politics shape new market categorisation between the boundaries of the public and private?

Integrating insights from several literatures, including management research, political science and public administration, this study develops an alternative view of market categorisation as a deliberative political process. From such a perspective, government agencies and firms are political actors involved in a market categorisation, where their desired category schema are open to public scrutiny (Gutmann and Thompson, 2004). This ties the social legitimacy of a proposed categorisation to a firm’s earnest participation in public deliberations. Based on the research findings, it is shown that when firms approach categorisation as a market process rather than a political process, this can result in the deployment of strategies that are unable to resolve the underlying political contestations. This prevents the completion of the

categorisation process. Building on the findings of the study, a theoretical model of *categorisation abandonment* is developed.

As the preceding paragraphs have indicated, this dissertation is organised around of two different studies. It is comprised of six chapters in total. *Chapter 2* provides a foundational review of the market categorisation literature, which is the shared theoretical lens adopted for both studies. The chapter serves to complement the tailored reviews in each study and situates dissertation within the extant literature. *Chapter 3* provides an overview of the methodological design of the two studies that provides the foundation for the methodological sections contained in each study, in particular with regard to the overall case study design, data collection techniques, and ethical considerations. *Chapter 4* and *Chapter 5* contain the two constituting studies of the dissertation. The structure of both chapters is based on journal articles in management, complete with theoretical background, methods, findings, discussion and limitations. *Chapter 6* the presents a synthesising discussion of the findings from the two studies (subsections 6.1 and 6.2 respectively). This is followed by a reflection on the limitations of the dissertation (6.3), followed by a summary of the contributions made to the literature on market categorisation (6.4). The penultimate sub-section discusses implications for practitioners and provides recommendations for those working in government (6.5). Subsection 6.6 concludes.

## Chapter 2: Literature Review

This chapter provides a foundational overview of the market categorisation literature. It is intended to complement the tailored literature reviews conducted in each of the two studies (Chapters 4 and 5). This review is structured upon four theoretical themes that connect the two studies in the dissertation to the market categorisation literature. The four themes are presented in Figure 1 and indicate the order of discussion.

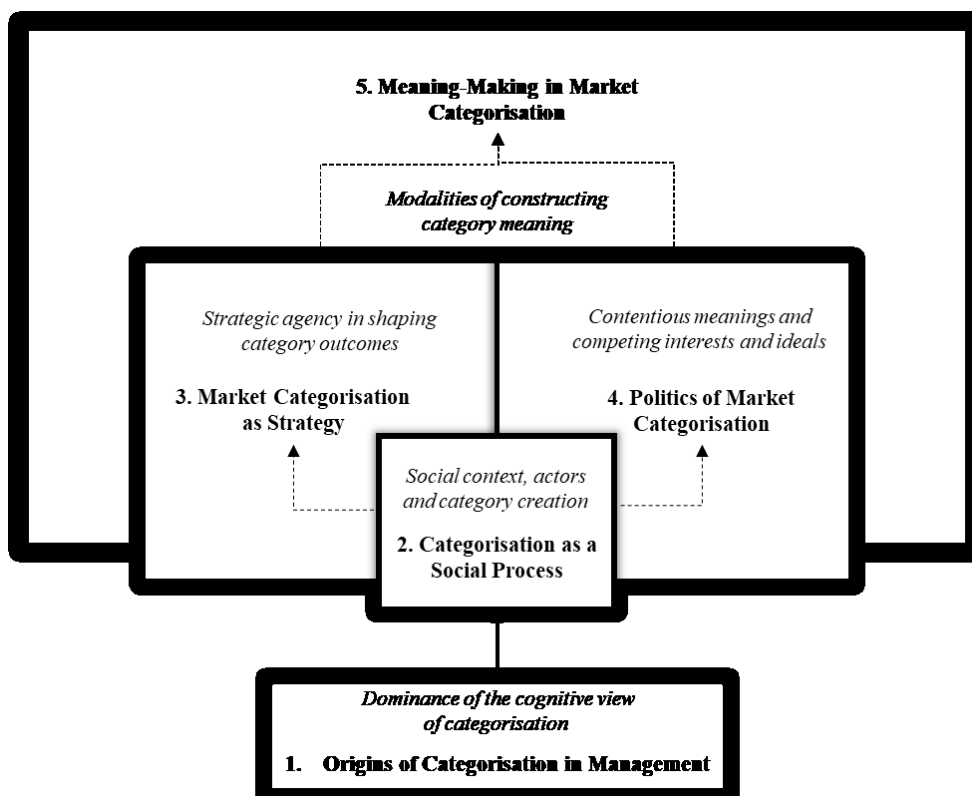


Figure 1 Theoretical themes in the examined literature review

### 2.1 Origins of Category Studies in Management Theory

The interest in categories and categorisation has grown steadily in recent years among management scholars, exemplified by featured debates and counterpoints (Durand and Paoletta, 2013; Glynn and Navis, 2013; Kennedy and Fiss, 2013), dedicated journal issues and compendiums (Negro et al., 2010; Durand et al., 2017; Delmestri et al., 2020; David et al., 2020), and a summative literature review (Vergne and Wry, 2014). Scholarly interest in categories is understandable because “[e]very move organizations make is in turn

categorized: product launches, environmental policy, outsourcing, diversification, internationalization” (Durand and Paolletta 2013, p. 1100). Categories are ubiquitous in markets. For example, categories group financial products according to risk profile (bonds vs currency swaps) (Lounsbury and Rao, 2004; Funk and Hirschman, 2014), classify wines by grape, region, and method of ageing (Zhao, 2005; Negro et al., 2011), and enable buyers to access the value of new genres of art (Khaire and Wadhvani, 2010), while permitting sellers to protect the market from speculators (Coslor et al., 2020). The salience of categories is what makes them consequential for the competitive dynamics within industries and among categories (Grodal et al., 2015; Cattani et al., 2017). By acting as “touchstones for organizational identity claims and for audience attention, legitimation, and valuation” (Glynn and Navis, 2013 p. 1124), categories lend stability and regularity to markets (Rhee et al., 2017).

Generally speaking, categories act to reduce uncertainty and ambiguity by addressing, “what is it or what kind of thing is it” (Glynn and Navis, 2013 p. 1125). In answering this question, categories group or lump like things together (Zerubavel, 1996; Bowker and Star, 1999), which enable actors to simplify complex situations, efficiently process information and to derive beliefs and expectations about organizations, including their characteristics and products (Durand and Paolletta, 2013; Kennedy and Fiss, 2013; Vergne and Wry, 2014; Granqvist and Ritvala, 2016). Therefore, categories serve to impose coherence and structure on the social world by providing anchors for making judgments related to value and worth (Vergne and Wry, 2014 p. 58) or distinguishing between legitimate and illegitimate entities (Jensen, 2010). Categories achieve this by maximising the difference between other categories while minimising the differences among members within a category. It is for this reason; categories can be thought of as both boundary markers, splitting-up dissimilar entities, and boundary objects facilitating interactions among various actors ( Glynn and Navis, 2013; Lo et al., 2019 p. 89).

For this dissertation, a market category refers to an economic exchange structure that initially emerges as “unstable, incomplete and disjointed conceptual systems” (Rosa et al., 1999 p. 64). A nascent market category is characterised by ambiguous meanings, unsettled boundaries, unclear market structure as well as missing product designs or dominant logic to guide actions (Santos and Eisenhardt, 2009 p. 644; Granqvist and Ritvala, 2016 p. 214). Over time, actors develop a degree of shared understanding of the meaning and defining characteristics, ultimately permitting a category to become a taken-granted element of



everyday life (Berger and Luckmann, 1967). Once established, market categories refer to the “conceptual schema that most stakeholders adhere to when referring to products that address similar needs and [organisations that] compete for the same market space” (Suarez et al., 2015 p. 438). Following Navis and Glynn (2010), market categories are defined as having two constituting properties: “1) constituent members, whose inclusion is defined by rules or boundaries about a common type of product or service, and 2) a concept, label, or identity that reflects the commonalities that link together the members of the category.” Together these properties form a ‘meaningful conceptual system’ underpinning the market category with a collective identity recognised by involved members and external audiences (p. 440). In other words, market categories can be understood as “social agreements about the meanings of labels assigned to sets of objects” and groups of organisations (Negro et al., 2010 p. 1400).

The development of the market categorisation literature has been driven by sociological perspectives rooted in organisational ecology and organisational institutionalism (Delmestri et al., 2020). Together these theories have emphasised the effects of categories on audience cognition and conformity to pre-existing prototypes, exemplified by the ‘categorical imperative’ (Zuckerman, 1999). In recent years, scholarship has sought to reorient the literature by relaxing the assumptions underpinning the categorical imperative (Durand and Paoletta, 2013; Paoletta and Durand, 2016) and addressing fundamental questions, such as “where do categories come from” (Durand and Khaire, 2017), how do new categories emerge (Navis and Glynn, 2010), and how do categories decline and fall out of use (Kennedy and Fiss, 2013; Lo et al., 2019). These efforts reflected a need to correct “simplistic applications” of general theories of categories (Durand and Boulongne, 2017), which were limiting attention to the consequences of stable classification systems at the expense of more a dynamic view of categories that would bring in processes of change (i.e., emergence, blending, dissolution) and contestation (Delmestri et al., 2020 p. 910).

While the cognitive approaches of organisational ecology and organisational institutionalism perspectives have predominated the literature (Vergne and Wry, 2014; Durand et al., 2017; Delmestri et al., 2020), a nascent stream of literature has emerged focusing on the social aspects of categorisations. An overview of the cognitive and social approaches to categorisation is presented in Table 1.

**Table 1 Summary of Cognitive and Social Approaches to Categorisation**

	Approach to Categorization	
	Cognitive	Social
<b>Focus</b>	<ul style="list-style-type: none"> <li>• Individual cognition</li> <li>• Audience perception/evaluation</li> <li>• Effects of established categories</li> </ul>	<ul style="list-style-type: none"> <li>• Actor-Environment</li> <li>• Interactions among Actors</li> <li>• Creation and evolution of categories</li> </ul>
<b>Mechanisms</b>	<ul style="list-style-type: none"> <li>• Family resemblance</li> <li>• Goals</li> <li>• Causal-Knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• Discourse/Narratives/ Frames</li> <li>• Rituals</li> <li>• Cultural Codes</li> </ul>
<b>Categorical Considerations</b>	<ul style="list-style-type: none"> <li>• Category boundaries</li> <li>• Individual theory of value</li> <li>• Conformity to category prototypes</li> <li>• Category spanning</li> </ul>	<ul style="list-style-type: none"> <li>• Stigma</li> <li>• Power</li> <li>• Socio-cultural context</li> <li>• Temporality</li> <li>• Actors</li> </ul>
<b>Examples</b>	<ul style="list-style-type: none"> <li>• Zuckerman (1999; 2000; 2004)</li> <li>• Hsu (2006; 2009)</li> <li>• Hannan (2010)</li> <li>• Negro et al. (2010)</li> </ul>	<ul style="list-style-type: none"> <li>• Rosa et al. (1999)</li> <li>• Khaire and Wadhvani (2010)</li> <li>• Bajpai and Weber (2017)</li> <li>• Kodeih et al. (2018)</li> <li>• Ozcan and Gurses (2018)</li> </ul>
Based on: Durand et al., 2017; Vergne and Wry, 2014		

### 2.1.2 Dominance of the Cognitive Approach to Market Categorisation

Early scholarship by Porac and colleagues (Porac et al., 1989; Porac et al., 1995) is credited with first integrating insights about categories from cognitive psychology into the management literature (Vergne and Wry 2014). The seminal work by Porac et al. (1989), argues the mental models used by decision-makers to interpret their environment informs how organisations self-categorise according to common attributes shared with competitors. In the case of Scottish knitwear producers, it was the beliefs regarding who was capable of producing high-quality cashmere sweaters and the view of such garments as not being high fashion, which influenced who was considered to be part of the industry and a competitive threat. The competitive area became defined around Scottish producers, excluding other producers of knitwear and pullovers from Asia and Europe (pp. 388, 406, 411). This line of research was instrumental in linking perceptions of industry structure to the cognitive categories used by organisations to identify competitors. Yet, it would be insights related to family resemblance (Rosch and Mervis, 1975), which instigate the migration of the prototypical view from cognitive psychology into the dominant sociological perspectives on market categorisation.

The prototypical view advanced by Rosch and Mervis (1975) is premised on the idea that categorisation is driven by family resemblance (i.e. commonality of attributes among

members) opposed to objects having identical features. Prototypes are an abstract representation of a category. They come to represent best an audience's "idea or image" of the category" (p. 575). In this respect, categories are presented as "information-rich clusters of attributes" that prototypes maximise to provide an "efficient processing mechanism" for comparing objects (pp. 601-602). Prototypes act to reduce the cognitive burdens by exhibiting the most salient familiar attributes of a category. The transcending idea, when applied to organisations and products in market settings is that audiences prefer objects with prototypicality because they are easier to recognise, learn and align with existing cognitive expectations (Durand and Paoella, 2013).

Both organisational ecologists and institutional theorists are observed to apply the principle of prototypicality in a disciplinary way. In organisational ecology, prototypicality relates to the "principle of allocation", which suggests, for generalist firms (i.e., "jack of all trades") operating in multiple categories, it impedes skill acquisition, consequently lowering performance capacities compared to specialists (Freeman and Hannan, 1983; Hsu, 2006; Negro et al., 2010). As a result, the offerings from producers spanning multiple categories is less attractive to audiences because they are less representative of the category (Negro et al., 2010). Similarly, from an institutional perspective, prototypicality is connected to perceptions of legitimacy, and audience understandings of appropriateness (DiMaggio and Powell, 1983, 1991; Zhao et al., 2013). Thus, organisations face pressures to conform to the prototypical identity of the category as a precursor to acquiring social approval and material resources (Vergne and Wry, 2014 p. 59-60). Accordingly, how audiences evaluate the prototypicality of an actor, organisation or product can have substantial economic consequences (Zuckerman, 1999, 2000; Hsu et al., 2009; Ruef and Patterson, 2009).

The influence of categories on market behaviour and market outcomes can be traced to the seminal articles by Zuckerman's (1999; 2000). Zuckerman (1999) found firms that did not fit within standard industry classifications were overlooked by security analysts, which reduced the attractiveness to investors contributing to lower, and more volatile, share prices (Zuckerman, 2004). This emphasis on coherent identities in market settings, in part, reflects the treatment of categories as external structures in a firm's environment. Categorisation is approached from the perspective of the audience (e.g., critics, regulators, employees and consumers). Audiences are assumed to determine "what is and is not acceptable for members of the category" (Hsu and Hannan, 2005 p. 477). Hence, scholarship premised on the prototypical view has stressed the importance of lessening the cognitive burdens upon

audiences by maintaining proximity to known prototypes. The stressed conformity to categorical codes is predicated on the understanding that audiences rely on category boundaries to make sense producers and products. Organisations, individuals or products spanning multiple categories is likely to create cognitive ambiguities, which can raise questions about competence and identity, and generate confusion among audiences, resulting in sanctions or penalties like being ignored or devalued (Leung and Sharkey, 2014; Durand and Boulongne, 2017). Across different contexts, such as movies (Hsu, 2006), wines (Negro and Leung, 2013), restaurants (Kovács and Hannan, 2010), food (Rao et al., 2005), and even careers (Zuckerman et al., 2003), empirical evidence indicates audiences penalise entities with multiple category associations. For instance, in comparing sellers on eBay who auctioned goods in multiple categories versus those focused on one category, Hsu et al. (2009) found generalised sellers were less likely to use of category-specific acronyms and quality descriptors, resulting in diminished success in auctions, especially where audiences valued category-specific identities (pp. 165-166). When viewed from this perspective, categories act to discipline producers because “audiences navigate better across markets and social worlds when categories are clearly marked and unambiguous” (Durand and Paoella, 2013, p. 1101).

Scholars have also sought to understand better the limits of the categorical imperative and the factors that moderate the severity of sanctions. The literature highlights several factors ranging from the needs of actors (Pontikes, 2012), the status of the actors (Phillips and Zuckerman, 2001; Zhao et al., 2013; Durand and Kremp, 2016), the categorical combination (Wry et al., 2014), the direction of spanning (i.e., vertically or horizontally) (Wry and Lounsbury, 2013; Paoella and Durand, 2016), and the maturity of the category (Ruef and Patterson, 2009). Examining the legal market and market for investment advice in Silicon Valley, Phillips and Zuckerman (2001), show that whether or not an actor violates the expectations of an audience is contingent on status. Middle-ranked actors face higher conformity pressures compared to high and low-status actors, who were least likely to conform to audience expectations (p. 421). Similarly, Zhao et al. (2013) show movie sequels that are part of a highly successful series are able to tap into the established reputation of prior films mitigating the penalties of straddling multiple categories. When studying the taxonomy used to assess the credit worthiness of American businesses in the 19<sup>th</sup> century, Ruef and Patterson (2009) found that category spanning is tolerated when classification systems themselves are emergent or in flux. Adding to this finding, Pontikes and Kim (2017)

note in their data that the presence of unclear boundaries did not affect Gartner's propensity for reporting on categories younger than 10 years old (p. 100). These examples suggest audiences are more accepting of category spanning and divergence than the literature has acknowledged at times (Durand and Paoletta, 2013 pp. 1101–1102).

Because of the strict assumptions of the prototypical model, scholars have taken a critical perspective in questioning the dominant wisdom regarding the detriments of category spanning (Kennedy et al., 2010; Durand and Paoletta, 2013; Paoletta and Durand, 2016). Paoletta and Durand (2016) note these assumptions can be challenged with everyday observations of companies, such as Google, Amazon, Apple, and GE, who are continuously combining categories to redefine their activity portfolios (p. 330). The assumptions of the prototypical model are further challenged by the dominant beliefs that innovation and creative destruction are essential drivers of competition and market transform (Schumpeter, 1934). Alexy and George (2013) point out if the legitimacy of products and organisations are tied to conforming to static prototypes, but novelty is rooted in blending categories or deviating from prototypes then how can an innovation ever be legitimate (pp. 173–174). The answer, according to Kennedy et al. (2010) is that it “depends on how clearly the category is defined and whether it is seen as positive or negative” (p. 387). Hence, for nascent categories that can acquire a clear meaning to reduce uncertainty, it can increase the “category currency”, consequently, off-setting the disadvantages of deviating from established categories (pp. 372–373). As the authors note, their explanation is premised upon viewing categories not as fixed but changing to reflect consensus (p. 370).

Challenging the consensus about the “categorical imperatives and market discipline”, Durand and Paoletta (2013) propose two alternative cognitive models, the causal-model and the goal-based model (p. 1100). The former is based on the prior knowledge and expertise of the audience, in which features are connected through chains of cause and effect. For instance, Alexy and George, (2013) find that membership in a novel category is viewed less negatively as the meaning clarifies, enabling audiences to rethink their causal modelling of category membership (p. 193). Comparatively, the latter suggests categorisation is contextual and driven by the objectives of the audience, for which they create ad hoc categories to achieve their goals (Durand and Paoletta, 2013 p. 1101). The goal-based model is particularly relevant in situations where audiences cannot rely on pre-existing prototypes or expertise and must develop their own theories of value upon which to categorise organisations and products (Durand and Bouloungne, 2017). For instance, using the services offered by law firms,

Paolella and Durand (2016) argue that when issues are complex (i.e. requiring a sophisticated set of services), clients place greater value on category spanners because they are seen as more capable in handling complex cases (p. 331). Given this, the literature suggests goal-based categorisation is likely to be used in response to a perceived need, whereas the prototypical approach is likely to be used to reduce ambiguity around a product or a producer (Durand and Boulongne, 2017; Durand et al. 2017). Efforts to relax the assumptions of the prototypical view have also allowed the repositioning of the role audiences play in the categorisation process. Specifically, audiences are no longer viewed as only reacting to what they encounter, but being active in the classification and evaluation processes based on their knowledge and theories of value (Durand and Boulongne, 2017).

Despite the contributions of cognitive approach in advancing the literature on categorisation, it is constrained by several limitations. The cognitive approach assumes that audiences screen and evaluate entities based on a “pre-fixed set of conditions” (i.e. conceptual combination or family resemblance), and the same cognitive process can be applied to individuals across a group (Durand et al., 2017 p. 23). Additionally, while prototypical approaches have tended to overemphasise the fixed nature of categories, goal-based categorisations potentially suffer from being “idiosyncratic” and “ad hoc”. Goal-based categories, therefore, can be inherently unstable as they differ between individuals and are contextually and temporally contingent (Glaser et al., 2020 p. 923 also see Durand and Paolella (2013) for theoretical limitations). Thus, bringing forward the principal limitation that the cognitive approach, it confines categorisation to “the black box of the mind”, thereby overlooking collective and social aspects (Blanchet, 2018 p. 376).

This criticism underscores shifting focus in the literature towards viewing categorisation as an “active social project” (Navis and Glynn, 2010 p. 440). Here, categories are outcomes of interactions among actors, who construct, share and negotiate meanings to form the boundaries of a category (Rosa et al., 2005; Weber et al., 2008; Khaire, 2014; Chliova et al., 2020). As such, the pivoting towards the social aspects of categorisation coincides with concurrent calls: 1) to move beyond treating categorisation as an “automated” or “mechanical” cognitive process focused on individual-level assessments (Durand and Paolella, 2013 p. 1005; Glynn and Navis, 2013 p. 1132; Durand et al., 2017 p. 8); 2) to expand investigations of processes that are “causally prior to [the] disciplining function of categories” (Kennedy and Fiss, 2013 p. 1142); and 3) to attend to the way market actors adopt proactive strategies to influence the social meaning around a market category

(Pontikes, 2018 p. 628). This dissertation contributes to ongoing efforts to rebalance the literature through the explication of the social aspects of categorisation, which is outlined next.

## **2.2 Categorisation as a Social Process: Rebalancing the Literature**

Stepping beyond individual cognitive processes and rigid assumptions of conformity enable us to illuminate the social world as more fluid and in flux, punctuated by the ongoing introduction of new categories and changes to existing ones (Kennedy and Fiss, 2013; Lo et al., 2019). When viewed through a social lens, categorisation becomes manifested in a diversity of processes that span the lifecycle: e.g. emergence, reinterpretation, evolution and decay. Whether emergence, obsolesce or a process in between categories appear as dynamic entities, continuously changing as they are reproduced through the interactions and negotiations among actors (Granqvist and Ritvala, 2016 p. 212). Contrasting with earlier more static conceptions, categories become “subject to challenge and vulnerable to change,” possibly even rejection (Kennedy and Fiss, 2013 p.1141). Studying processes of categorisation from a social perspective expands the range of considerations beyond questions of fit and effects to include, the historical and cultural context in which categorising is taking place (Khaire and Wadhvani, 2010; Pedeliento et al., 2020), categorising abstract concepts like “privacy” (Bajpai and Weber, 2017) or “social enterprises” (Chliova et al., 2020), and exercises of authority or power by certain market actors to influence the categorisation process (Ozcan and Gurses, 2018; Coslor et al., 2020). In this respect, the social perspective can be differentiated from by the cognitive approach based on the “entity to be categorized, the actors involved, their acts, and the context and timing” (Durand et al., 2017 p. 3). Moreover, the social processes of categorisation require a degree of cooperation between category members and relevant audiences, which is rooted in cultural understandings and expectations (Glynn and Navis, 2013, p. 1125). Thus, categorisation is not limited to what the audience decides, opening up a new perspective on recursive relationships between producers and audiences (Durand and Khaire, 2017). As the literature turns toward a more substantive investigation of social processes, it also provides the opportunity for scholars to examine the processes by which categories form and come to represent the interests and identities of their members (Jones et al., 2012).

### **2.2.2 The Formation of New Market Categories**

According to Kennedy and Fiss (2013), stable categories are “starting points” for explaining category emergence (p. 1140). Scholars have often pointed out that their, “understanding of categories is limited to established categories” (Jones et al., 2012 p. 1525), an observation that dates back to the seminal paper by Rosa et al. (1999), who noted that at the time research into categories “[focused] on those that already exist, and it typically [did] not inquire into the categories' origins or evolution” (p. 66). Emergent or nascent categories pertain to market categories at the early stages of development, which are characterised by ambiguity and uncertainty regarding the category’s meaning, symbolic boundaries, and social membership (Santos and Eisenhardt, 2009; Granqvist and Ritvala, 2016). Ambiguity in emerging categories is exemplified in competing narratives and frames contributing to the diverging understandings among audiences (Rosa et al., 1999; Granqvist and Laurila, 2011; Chliova et al., 2020).

Given the unsettled state of emerging categories, the road to maturity presents several challenges. Kennedy (2008) argues that a foundational hurdle facing market actors during the emergence stage is being perceived as doing something ‘worth seeing as real’ (p. 280). The problem of “getting counted” (Kennedy, 2008) brings forward the broader “conundrum” or “paradox” of emergence, specifically the need to simultaneously manage two inconsistent states, familiarity and novelty (Bingham and Kahl, 2013 p. 15). Elaborating further, Suarez et al. (2015) suggest emerging categories need to resolve the following duality: “1) distinctive enough that they convey the novelty of the underlying product and attract the attention of stakeholders, and 2) familiar enough to be easily comprehensible” (p. 440) (cf. Hargadon and Douglas, 2001; Rindova and Petkova, 2007). Scholarship suggests actors attempt achieve this balance through the selective uses of narratives as well as metaphors and analogies that make the unfamiliar recognisable and appealing (Martens et al., 2007; Navis and Glynn, 2010; Bingham and Kahl, 2013). The challenges of emergence relate to the notion of meaning-making, which is a point of discussion returned to in the final subsection of this review and Chapter 5.

The paradox of emergence directs focus on where new categories come from and how they form. The extant literature on category emergence highlights the role of social and identity movements, such as recycling (Lounsbury et al., 2003), nouvelle cuisine (Rao et al., 2003), microbrewing (Carroll and Swaminathan, 2000) in driving the formation of new categories. In many cases, categories springing from social movements typically arise in



opposition to established categories, for example, organic farming vis-à-vis corporate or industrial farming (Lee et al., 2017; Siltaoja et al., 2020) or bio-diesel (Hiatt and Carlos, 2019) and wind energy (Sine and Lee, 2009) as alternatives to carbon-intensive energy sources like coal or oil/gas. These categories typically develop around oppositional or identity “codes” that enable the construction of clear and crisp boundaries. To this end, microbreweries were distinct from corporate breweries based on being small-scale, producing beer with traditional “hand-crafted” methods and localising consumption to the site of production (Carroll and Swaminathan, 2000 p. 719).

Comparatively, new categories may also form based on technological innovation, reflected in the cases of electric lighting (Hargadon and Douglas, 2001), functional foods (Granqvist and Ritvala, 2016), nanotechnology (Granqvist and Laurila, 2011; Grodal, 2018) and cochlear implants (Garud, 2008). Technology-driven categories often form around enhanced material functionalities which displace or replace market offerings lacking those features. For instance, the introduction of the “smartphone” transformed the category mobile phones attenuating prior categories like “camera phone” or “flip phone” (Suarez and Grodal, 2015). Similarly, the introduction of the automobile in the early 20<sup>th</sup> century replaced horse-drawn carriages as the dominant mode of transportation (Rao, 2004).

Unsurprisingly, the literature also points to emerging categories based on creativity. For instance, modern architecture was accompanied by a new vocabulary (e.g. “skyscraper”) and experimentation with the new materials (e.g. steel and reinforced concrete) (Jones et al., 2012 p. 1524). Similarly, molecular gastronomy was driven by a mix of new ingredients (e.g. xanthan gum, agar-agar, and seaweed), novel techniques (e.g. spherification, sous-vide, and freeze-drying), and new equipment (e.g. Thermomix, food dehydrators, and Pacojets), which were used to transform fine dining into a performance intended to trigger emotional and intellectual responses among diners (Slavich et al., 2020 pp. 272, 276). In this respect, category emergence can be rooted in aesthetic or emotional responses that foster a connection between a product and an audience, such in the case of cool-climate wine, where the ritualistic performances during tastings helped to construct boundaries and meaning of the category (Massa et al., 2017).

These examples suggest different pathways for the introduction of new categories. However, Durand and Khaire (2017) argue that they are all the outcome of one of two formative processes: “category emergence” or “category creation”. A central contention of the authors is that prior research has tended to conflate the processes, despite distinct

ontologies, theoretical and empirical implications (p. 91). Accordingly, category emergence refers to instances when a category forms as a result of innovation's "hard to classify" material properties, which typically derive from elements exogenous to an existing market category. Therefore, category emergence proceeds from the insufficiency of existing categories to "address, express, represent, and communicate the essence of material distinction brought about by innovators" (p. 93). Category emergence is associated with peripheral actors who introduce a novel offering and new value creation models intending to upend established market categories by appropriating value from incumbents (p. 95). Examples from the literature include, "nouvelle cuisine" (Rao et al., 2003), "mini-van" (Rosa et al., 1999), non-kosher wine (Simons and Roberts, 2008) and nanotechnology (Granqvist and Laurila, 2011). For illustration, Rao et al. (2003) reveal in the emergence of "nouvelle cuisine" was brought about the by the introduction of ingredients, techniques and rules for cooking, and new role identities for chefs and wait staff that were alien to the category of classical French cuisine.

Category creation, in comparison, involves redrawing the cognitive boundaries around pre-existing attributes and features through redefinition, recombination or reinterpretation to generate new meanings and associations (p. 95). Thus, novelty is tied to discursively positioning previously disparate entities that when combined, are perceived as having value. Category creation is generally undertaken by existing producers and intermediaries to expand the value and the number of co-existing categories (p. 96). Select examples found in the literature include, "modern Indian art" (Khaire and Wadhvani, 2010), "light cigarettes" and "e-cigarettes" (Hsu and Grodal, 2015; Hsu and Grodal, 2020), and "post-colonial fiction" (Anand and Jones, 2008). For example, the immediate goal of the movement for grass-fed beef and dairy was to "add a market segment within a sector" not only to create a new bounded area of competition but to diffuse the associated practices in the hopes of transforming the entire agricultural sector (Weber et al., 2008 p. 532).

The literature on category emergence has gradually expanded its focus from how nascent categories become legitimised (Hargadon and Douglas, 2001; Navis and Glynn, 2010; Wry et al., 2011) to the trade-offs of attaining it for the actors involved (Lee et al., 2017). Specifically, Lee and colleagues (2017) explain in the development of the organic farming in the U.S. when the founders had to cede a degree of control over the category (i.e. diluting the collective identity) to state and federal regulators, in exchange for crisp boundaries and unambiguous meaning of "organic" (p. 461, 643). As such, the category was

able to grow not based on rigorous adherence to the founding principles of organic farming but on clear protocols for product certification, which solidified the boundaries of the category. Additionally, the scholars have highlighted the construction of value in nascent categories (Khaire and Wadhvani, 2010), which involves contributions of both entrepreneurs and field constituents (e.g. media, education institutes, retailers) to clarify boundaries, attributes and meanings through a process of “distributed sanctification” (Khaire, 2014 pp. 41–42). Scholars have also examined other issues, such as overcoming stigma (Siltaoja et al., 2020), labelling discrepancies between innovators and audiences (Slavich et al., 2020), and even the “limits of categorisation” (Vergne and Swain, 2017). In examining the media’s coverage of Bitcoin, the labels used were found to inadequately capture the entity’s goals, which resulted in a proliferation of labelling inconsistencies preventing the category from stabilising (Vergne and Swain, 2017).

Categories like Bitcoin, “modern architecture (Jones et al., 2012) and “social enterprises” (Chliova et al., 2020) all represent categories that have persisted despite them being subject to varying degrees of ambiguity. The existing literature typically views continued ambiguity as a detriment to the development of a category because it raises the likelihood of it being abandoned by stakeholders (Grodal et al., 2015). Jones et al. (2012) found that the plurality exemplars driven by clients were critical in preventing the boundaries of modern architecture from contracting, which ultimately infused the category with a “multivocal identity that enhanced its capacity to adapt and become a dominant style” (p. 1539). In the case of social entrepreneurship, the resonance of the pre-existing category “entrepreneurship” was found to mobilise valuable resources in support diverging frames, which sustaining the category’s ambiguity (Chliova et al., 2020 p. 1037). These examples contribute to understanding how categories continue to form despite unresolved ambiguities, but also raise the question the conditions under which a category fails to emerge.

The market literature has generally favoured instances of successful emergence. With that said, the literature suggests a category may fail to emerge if it cannot achieve a coherent meaning set around a particular knowledge-base, practice or identity that contrasts other domains (Granqvist and Ritvala, 2016 p. 215). For instance, Navis et al. (2012) attribute the “non-emergence” of online grocery shoppers in the 1990s to conflicting collective identity frames (“online grocers” vs “e-commerce enterprises”) which prevented the formation of a unifying category frame needed to delimit the boundaries and practices. The absence of a categorical identity provoked confusion about meanings, consequently creating the

perception of the category being inchoate. Santos and Ozcan (2015) suggest the failure of the mobile payments market to emerge was rooted in the inability of dominant players from disparate industries to compromise on the market architecture, which created a cycle of resource allocation deferment. In this respect, the non-emergence was as a matter of socio-political dynamics opposed to unresolved ambiguous meanings.

This section has provided an overview of the emergence and evolution of market categories. Despite a growing number of contributions in recent years, the literature remains in its infancy. Gaps persist in our understanding of how categories are defined, persist, or change through processes of re-evaluation, recombination, or recategorization (Zhao et al., 2018 p. 607; Delmestri et al., 2020 pp. 909, 911). The question of how categories are created and defined is germane to this dissertation, and builds on the observation of Suarez et al. (2015):

Categorical emergence is not purely determined by technological characteristics but is also created by firms' deliberate attempts to claim advantageous market positions and stakeholders' efforts to make sense of an evolving categorical space (p. 443).

As such, this represents the second theoretical link between the market categorisation literature and the research studies in this dissertation. Specifically, market categorisation as a strategic process, which is examined next.

### **2.3 Market Categorisation as Strategy**

Viewing categorisation as a social process reorients scholarship away from viewing market categories as exogenous structures in a firm's competitive environment. Instead, market categories, are better understood as "bounded yet fluid environments" (Zhao et al., 2018 p. 607) which are malleable enough to be "morphed, defended, and preserved by organizations" operating in them (Durand and Khaire, 2017 p. 88). The way categories emerge or evolve is rooted in the goals and interests of market actors, which informs "how, why, and when" they engage in market categorization (Granqvist and Ritvala, 2016; Durand et al., 2017 p.10). In many respects, categorisation is not just agentic but often inherently strategic (Pontikes and Kim, 2017). Market categories are spaces of economic competition with material implications for the survival of firms (Granqvist and Ritvala, 2016). As Glynn and Navis (2013) observe, "categories are not merely devices used by the audience to understand and sort organizations, but also resources that organizations can appropriate to their advantage" (p. 1134). This directs attention to the "occasions and motivations" that market actors use as well as invoke new categories (Kennedy and Fiss, 2013).

In the last few years, market categorisation as a strategic pursuit has moved from an implied understanding to a formalised stream research, i.e., “strategic categorisation”. Strategic categorisation involves firms manipulating their category membership to gain a competitive advantage over rivals (Cattanti et al. 2018; Barlow et al. 2019). Pontikes and Kim (2017) define strategic categorisation as aiming to: “convey information about the producer and/or the market and (2) promote a categorical system that is favourable to the organization or person” (p. 73). This aligns with the understanding that firms “try to shape category systems and influence the choice of categories into which they are classified” as this has consequences for the social, cultural and material resources available to them (Negro et al., 2010, p. 4). Delmestri and Greenwood (2016) illustrate this point in the recategorization of grappa, which became a cultural exemplar of Italian lifestyle on par with premium spirits like cognac. Before the 1970s, however, it was a drink shunned at dinner parties (p. 523).

Accordingly, the extant literature features several instances where organisations have used strategic categorisation as a tool to both defend and advance their competitive interests. For instance, Hsu and Grodal (2015) highlight how cigarette producers were able to take advantage of the taken-for-granted assumption by audiences that the categorisation of “light” implied a healthier option. As a result, this permitted producers to consistently increase the level of nicotine and tar to satisfy consumer tastes. Past research has also found to avoid being as branded as a “merchant of death” companies like Lockheed Martin and Boeing may claim membership in categories like “aerospace” to dilute the stigma of being associated with the arms industry (Vergne, 2012). Additionally, under the threat of anti-trust lawsuits, Microsoft, infamously claimed it was not in the “operating system” or “application software” business but the “information at your fingertips” market (Kennedy and Fiss, 2013 p. 1143). In a similar vein, the literature has shown that firms may seek to protect their competitive interests by influencing the categorisation processes of other actors (Lounsbury and Rao, 2004; Montauti and Wezel, 2016; Ozcan and Gurses, 2018). For example, incumbent firms in the electronic music market were observed to strategically engage category recombination to make the market appear more ambiguous, in order to discourage potential entrants (Montauti and Wezel, 2016). These examples underscore the use of categories as strategic resources (Glynn and Navis, 2013), which can be used in advancing defensive responses to changes in their competitive environment.

The literature also suggests that strategic categorisation can be opportunistic, particularly where organisations attempt to access to new resources (Granqvist et al., 2013;

Grodal, 2018). Examining the labelling strategies of executives, Granqvist and colleagues (2013) found that some of the organisations that claimed membership in the nanotechnology category did so without having the requisite capabilities. This in part, reflects the tendency entrepreneurial firms seek out “resource-rich” market categories they can enter with their novel products, gain traction and ultimately dominate (Pontikes and Barnett, 2017 p. 141). Firms engaging in strategic categorisation to establish markets for new or existing products (Hargadon and Douglas, 2001; Santos and Eisenhardt, 2009; Kodeih et al., 2018; Barlow et al., 2019) can opt to either anticipate the shape the of the market or proactively attempt to influence it (Suarez et al., 2015 p. 445). Given the interest of this dissertation in the latter, it proceeds from the observation that “firms shape the markets they eventually inhabit” and that as inhabitants of new market categories, they “have both a material interest and a very real say in [their] construction” (Kennedy, 2008 p. 290).

For firms seeking to create and favourably shape new market categories in line with their interests, the literature suggests they are likely to select domains that are unsettled and/or characterized by high degrees of leniency (Pontikes, 2012; Pontikes and Barnett, 2015; Suarez et al., 2015). Pontikes and Barnett (2015) argue that lenient categories are attractive environments for strategic categorisation because they afford producers flexibility, which creates the space to define the category around a firm’s activities (p. 1416). Organisations may seek to influence a category’s definition by invoking their desired label to communicate specific meanings and features, demarcate boundaries and articulate a collective identity (Glynn and Abzug, 2002; Navis and Glynn, 2010; Granqvist et al., 2013). Firms may also contribute to shaping the definition of category by providing the vocabulary to describe the domain as well as the evaluative criteria (Durand and Khaire, 2017). For instance, Burton, the company credited with coining the term “snowboard”, came to dominate the category through its shaping strategy. This is exemplified in its popularising of the term “to shred” referencing a fast and aggressive style of snowboarding. In turn, this informed the design of the company’s products (e.g., boards, bindings and boots) to enable riders to achieve greater control at high speeds, when “shredding”. Together these elements permitted Burton to shape the meaning of how the sport is practised, particularly through the sponsorship of extreme snowboarding events and elite riders (Suarez and Grodal, 2015 p. 27). Additionally, firms can influence the categorical definitions through public discourse, such as disseminating stories (real or fictitious) to create awareness about the firm and to communicate distinguishing aspects about the market and its identity (Santos and Eisenhardt, 2009 p. 649).

There is a limited understanding of how firms shape the category definitions to advance their strategic interests, in part because it is understudied (Pontikes, 2018), but also because of the literature's focus on the use of available cultural resources to balance novelty and familiarity (Hargadon and Douglas, 2001; Khaire and Wadhvani, 2010; Giorgi, 2017). Viewing strategic categorisation through a shared cultural lens is beneficial in understanding how new economic spaces become socially recognised and are made meaningful; however, it ignores what firm-specific resources are required to construct a new market category and what firm resources may contribute to shaping its definition (Durand and Boulongne, 2017). As such, the literature has yet to fully address the role of the strategic use of resources (Barney, 1991) in the categorisation of new markets. This gap in the literature is addressed and explored in more detail in *Chapter 4*. The construction of new market categories brings forward not only the strategic considerations but also the political aspects of market categorisation, which are discussed in the next section.

## **2.4 Market Categorisation as Politics**

Although Chapter 5 offers a more fulsome critique of the literature's treatment of politics, the intention at present is to highlight the various ways market categorisation becomes "suffused with traces of political and social work" (Bowker and Star, 1999 p. 49). In general, market categorisation is often political due to diverging interests (e.g., economic, moral/ethical), conflicting cultural ontologies (worldviews, values or beliefs) and unequal power relations among actors (Bowker and Star, 1999; Granqvist and Laurila, 2011; Quinn and Munir, 2017; Arjaliès and Durand, 2019). As previously discussed, for categories created in opposition to the established order, politics is typically baked into the goals, identity and practices that define the category. For instance, the literature features numerous of examples of market categories whose influences and aims are tied to the aspirations of the environment movement or environmentalism, i.e., organic farming (Lee et al., 2017; Siltaoja et al., 2020), recycling, wind energy and green building (Lounsbury et al., 2003; Sine and Lee, 2009; York and Lenox, 2013; Jones et al., 2019). Similarly, categories such as ethical fashion (Blanchet, 2018) and socially responsible investment funds (Arjaliès and Durand, 2019) offer additional instances that link categorisation to specific normative and moral ideals about how things ought to be. Drawing on the case of grass-fed beef and dairy, activists constructed alternative logics in opposition to industrial agriculture (e.g. authenticity vs manipulation, sustainability vs exploitation, and natural vs artificial), which provided members with a means to diagnosis

the deficits of the existing system, and offer a prognosis of what an alternative system should look like (Weber et al., 2008 pp. 538, 561). Given the associations with social movements, the above examples highlight market categorisation as a form of organised politics concerning an unmet social need or perceived injustice.

In other instances, politics is tied to specific category properties that are perceived as transgressing broader notions of social and moral appropriateness and legality. Past examples from the literature, include gay bathhouses (Hudson and Okhuysen, 2009), arms dealers (Vergne, 2012) and depending on the point in time, nuclear energy (Garud et al., 2010; Piazza and Perretti, 2015). These examples connect acute forms of disapproval (i.e., “stigma”) to enduring meanings that are politically contentious. This can be especially problematic in the development of new legal markets for goods that were previously “off-limits”, such as medical cannabis (Lashley and Pollock, 2020) and cadavers for medical education (Anteby, 2010). In the case of medical cannabis and cannabis more generally in the U.S. where a growing number of states have legalised the sale, the core stigma remains, and federal laws have remained unchanged. Cannabis businesses are prevented from utilising financial services or pay taxes through conventional means (Lashley and Pollock, 2020). This shows, politics can be associated with categories that are socially contaminated or vilified (Vergne, 2012).

The literature also suggests that the stigmatization of a category can be politically motivated insofar as an outcome of a campaign to discredit and devalue. The emergence of organic farming in Finland posed a threat to conventional practices. In response, politicians, scientists, industrial actors deployed discourses painting proponents as charlatans, and the practice of organic farming not only as old fashioned but a fundamental threat to national competitiveness and food security (Siltaoja et al., 2020 pp. 1005–1006). Similarly, the emergence of gin in 18<sup>th</sup> century England as a sovereign drink and material signifier of Protestantism triumph, would later in the 19<sup>th</sup> century become socially devalued, associated with the poor and needing to be restricted (Pedeliento et al., 2020). Pedeliento et al. (2020) highlight that the opposition to gin was driven by economics and rooted in class politics of the time. Gin was a favoured drink of poor and a substitute for beer, which was typically produced by wealthy upper-class landowners. Subsequently, this sparked a series of moves intended to control the production of gin and marginalize it in British society by associating it with the lower class. The cases of organic farming and gin highlight instances where stigma



is intentionally constructed to protect the economic and material interests of certain groups of actors at the expense of others.

The politics of categorisation can also be viewed from the perspective of how actors use categories as “political devices” to legitimate (nascent) practices or discourses (Quinn and Munir, 2017). Humpreys (2010) found that industry advocates were able to successfully legalise “casino gambling” by intentionally positioning the category as a solution to the budget constraints of governments. As a new source of tax revenue, the category became politically and socially palatable to public officials and the public (p. 14). The literature also features several examples where categories are used as political devices to evade scrutiny and justify objectionable actions (Funk and Hirschman, 2014; Quinn and Munir, 2017; Cornelissen and Cholakova, 2019). Quinn and Munir (2017) observe categories can be used as political resources to gain legitimacy and maintain power, particularly in weak institutional settings. The authors show how the New Forest Company’s membership in the “impacting investing” category enabled the firm to maintain its privileges as being the category exemplar which is used to conceal its efforts to delegitimise land claims and displace local populations in Uganda (p.129, 138-139). More recently, scholars have highlighted Uber’s political fight not only concerning its regulatory classification as a “taxi company” or a “technology company” (Vergne & Wry, 2014) but whether its drivers are “employees” or “independent contractors” (Cornelissen and Cholakova, 2019). Both examples underline the company’s use of different category labels to shape the political discussion around its regulatory compliance and compensation policies.

The question of what Uber is illuminates situations where innovations challenge existing regulatory categories. When examining the deregulation of derivatives, Funk and Hirschman (2014) found that when novel and ambiguous financial products (i.e., interest rate and foreign exchange swaps) remain ambiguous of regulatory categories (i.e., futures, securities, loans), it enables market actors to evade regulatory scrutiny, and even engage in activities that might otherwise be prohibited or restricted (p. 670). The authors further argue that firms may attempt to disrupt regulatory categories by using innovation as a form of “corporate political action” (p. 694). When a target of categorisation is reasonably understood like the case of dietary supplements in the U.S., firms try to undermine unfavourable regulation by mobilising political support from customers and other state actors to overpower regulators (Ozcan and Gurses, 2018).

Overall, the politics of categorisation has driven a range of factors reflecting the goals and ideologies of actors as well as conflicts with institutionalised meanings (e.g. social mores). As such, politics is tied to varying degrees of agreement and disagreement regarding a market category, how it should be regulated (or whether at all) and how prevailing tensions are resolved or not (Jones et al., 2012; Rhee et al., 2017; Slavich et al., 2020). Subsequently, this highlights not only the intentions of an actor but the perceived degree of change (radical vs reformer) (Rao, 1998; Lounsbury et al., 2003) and how meanings come to be negotiated and regulated in the public realm among actors (Slavich et al. 2020). An implicit thread running through many of the examples discussed is the conceptualisation of politics as a battle or adversarial contest between actors (Negro et al., 2010; Ozcan and Gurses, 2018). While such articulations are suitable in competitive market environments, they may not capture the political aspects of categorising new markets on the boundaries of the state and market. As such, this represents the third theoretical link between the literature on market categorisation and this dissertation, specifically, the role of politics in shaping the categorisation of new markets. This question is returned and explored in more detail in Chapter 5. This section has highlighted the centrality of meaning in the politics of categorisation, which segues into the next section examining meaning-making in market categorisation.

## **2.5 Meaning-Making in Market Categorisation**

The construction of meaning is an essential aspect of categorisation because the process seeks to “render an entity more understandable” (Glynn and Navis, 2013). Meaning is not limited to clarifying what an object of categorisation is or does but more importantly explaining “how and why they become consequential” (Grodal and Kahl, 2017 p. 152). Scholars have been concerned with how distinct meanings come to be associated with categories and how they acquire cultural relevance (Negro et al., 2010; Kennedy and Fiss, 2013). As the literature has shifted from studying the cognitive effects of categories to social processes of categorization – this has brought about a shift from ‘meaning-applying’ to ‘meaning-making’. The former refers to how and to what end actors apply existing categorical systems and logics to products, organizations, industries. In contrast, the latter refers to the construction of meaning through combining different symbolic and material elements to guide the understanding of audiences (Mitnick and Ryan, 2015 p. 143,148).

Meaning-making is causally prior to meaning-applying and is an essential activity in the social processes of categorisation.

Markets need stable cognitive categories underpinning them, and stability is created through meaning-making activities among market actors (Rosa et al., 1999; Kennedy, 2008). Meanings arise through interactions among producers and audiences as they are collectively created and shared (Koçak et al., 2013 p. 766). This underlines the observation of Negro et al. (2010) that “research on categories is distinctive in its focus on meaning” (p. 9) because how meaning created is critical to establishing minimum degrees of shared understandings regarding the symbolic boundaries and material practices of a category. Because categorisation is understood as a social process of communication (Cornelissen et al., 2015; Durand et al. 2017), the construction of meaning has typically focused on the use of language and discursive devices (Khair and Wadhvani, 2010; Kennedy and Fiss, 2013; Grodal and Kahl, 2017; Siltaoja et al., 2020). This exemplified in the treatment of categories as ‘semantic objects’ (Negro et al., 2011 p. 1145) and reflected in the examination of vocabulary (Loewenstein et al., 2012), narratives and stories (Rosa et al., 1999; Wry et al., 2011; Koçak et al., 2013), metaphors and analogies (Navis and Glynn, 2010; Bingham and Kahl, 2013), and frames (Lounsbury et al., 2003; Hiatt and Carlos, 2019; Chliova et al., 2020).

The literature offers several reasons why the construction of category meanings typically favour linguistic approaches. Siltaoja et al., (2020) argue “language use not only reflects the interests of actors but also creates novel understandings and challenges existing meanings by (re)constructing categories and their boundaries”. As such, discourse plays a critical role in defining the identity, membership and meaning of a category (p. 998). From a strategic perspective, a discursive lens emboldens the agency of market actors, particularly in how they use and shape categories (Grodal and Kahl, 2017 p. 174). Similarly, Rosa (1999) observes the role of language, specifically in stories, which act as critical sense-making tools to explain the features and benefits of market offerings. Equally, it is a cultural medium that can be shared publicly, and rebroadcast to other actors enabling understandings and meaning to crystallise around a new category (p. 68).

In their advocacy for a discursive approach to studying processes of categorisation Grodal and Kahl (2017) argue for greater attention to the social and material context. It is essential to consider the broader cultural context in order to understand which category meaning diffuse and become accepted (p. 160). Khair and Wadhvani (2010) study similarly show how the term “modern Indian art” only had meaning against the backdrop of the

historical development of concepts of modernism and traditionalism in fine art” (p. 1285). Categorising is embedded in social contexts (Glynn and Navis, 2013), underscores not just the cultural milieu in which it is occurring but also the physical setting. Different social settings can influence the categorisation process, depending on what cognitive processes are activated or the institutionalised expectations of a given context (Durand et al., 2017, p. 13). The importance of investigating the role of social settings in the categorisation of new markets shines a light on a related blind spot in the literature. Specifically, scholars acknowledge that categories and categorisation are anchored not just in language but also in visual symbols and artefacts (Delmestri et al., 2020 p. 910). The literature, however, has typically downplayed the contribution of non-linguistic modes of meaning-making, even when material elements are central to the categorisation process. For instance, the reinterpretation of Barolo and Barbaresco winemaking that divided modernists and traditionalists was explicitly tied to the material elements of the category, specifically the size and wood of the ageing barrels, and the flavour profiles of wines (Negro et al., 2011 pp. 1452–1453).

Although scholars have yet to embrace the contribution of other meaning-making modes fully, there are instructive examples in the literature. For instance, Jones et al. (2012) highlight the role of building materials (e.g. steel, glass, concrete) in embodying the competing logics that shaped the different styles that contribute to the development of modern architecture. Similarly, in an effort to alter the perceptions of grappa as a low-class spirit, producers opted to redesign the bottle as a means visually signalling its association with premium spirits like whiskey and cognac (Delmestri and Greenwood, 2016). The case of Modern Indian draws attention to the role of exhibitions and auctions as spaces for educating prospective collectors and facilitating purchasing as well as auction house catalogues in describing the artist’s career and aesthetic style (Khaire and Wadhvani, 2010). Producers of cool-climate wine used a variety of material forms to bestow meaning and legitimacy upon the emerging practice, such as ritualized ceremonies (i.e. ‘staged encounters’ in the form of wine tastings, tours, and winemaker dinners) along with artefacts like unique wine glasses and décor to complement descriptive language and stories to foster an emotional connection with audiences (Massa et al., 2017, p. 462, 465, 471). More recently, in examining the labelling controversies underlying “molecular gastronomy” Slavich and colleagues (2020) found that visual and material artefacts were deliberately used by chefs to communicate their desired meanings with audiences. However, in doing so, the artefacts became

“spokespersons” representing the category symbolically, embodying identities, and supporting processes of meaning construction and legitimation (p. 285). These examples demonstrate that market categorisation and the construction of meanings are not limited to the stories actors tell. Yet still, we know “little about the way categories are achieved through artefacts, devices, spaces, bodies and visuals” (Blanchet, 2018 p. 376). As such, this represents the fourth theoretical link between the market categorisation literature and the studies in this dissertation, specifically, the role of non- linguistic modes of meaning-making in the categorisation of new markets.

## **2.6 Conclusion**

In summary, this section sought to provide a foundational review of the market categorisation literature. By doing so, four theoretical themes were identified linking this dissertation to the literature: 1) focusing the social aspects market categorisation; 2) exploring the strategic category creation of new markets; 3) expanding the socio-political understandings of categorising new markets, and; 4) examining the contributions of visual and material artefacts in the construction of category meanings. The next section (Chapter 3) describes the research design supporting the two studies presented in Chapters 4 and 5.

### **Chapter 3: Methodology**

This section provides an overview of the methodology concerning the two studies which comprise this dissertation, including the guiding ontological and epistemological underpinnings of the research design. Both studies share a common research design. The intention of this section is to provide summaries to highlight details not included in the respective studies. The subsequent subsections hence both anticipate as well as fill in any gaps regarding the philosophical positioning and the research designs.

Management research has been and continues to be shaped by a diversity of philosophical traditions and their corresponding assumptions that inform how scholars regard the nature of reality, how it can become known and how they can access it (Guba and Lincoln, 1994 p. 108). Although, Denzin and Lincoln (2018) suggest that older paradigms of inquiry are being “reconfigured” with hybrid ones emerging, for the sake parsimony, the prominent paradigms of management research can be divided into three approaches: positivism, constructionism and critical realism (Myers, 2013). This research is specifically rooted in the constructionist paradigm reflecting the understanding that knowledge about the world is social constructed (Berger and Luckmann, 1967), characterised by multiple and at times conflicting social realities. The relativist orientation of constructionism shifts the aim of research from the discovery of objective truth through measurable occurrences and abstracted variables towards understanding and reconstructing multiple subjective meanings particular to a selected research context (Guba and Lincoln, 1994; Gioia et al., 2013). Thus, the basis for judging what is “real” is derived from community consensus of what is useful or what has meaning. The making of meaning is hence of central interest to the constructionist view (Denzin and Lincoln, 2018 pp. 219–220).

The constructionist paradigm is well established within the market categorisation literature (cf Glynn and Navis, 2013; Khaire, 2014; Granqvist and Ritvala, 2016; Ozcan and Gurses, 2018; Siltaoja et al., 2020) reflecting the understanding the categories that structure and shape social realities of economic life are not given but the outcomes of interactions and communicative processes that enable actors to develop a shared understanding of what an entity is. As such, a constructionist ontology is commensurate with the qualitative research designs to studying processes of market categorisation (cf Lounsbury et al., 2003; Rao et al., 2003; Delmestri and Greenwood, 2016; Lee et al., 2017).

Qualitative research is regarded as an “umbrella term” covering a range of interpretive techniques employed to explore and explain the meaning of a social phenomena (Van Maanen, 1979; Gephart, 2004). In particular, the interpretive dimensions of qualitative research enable investigations of a phenomena in the environments they occur permitting both the recovery and preservation of meanings actors ascribe to actions and settings (Gephart, 2004 p. 455). The flexible and emergent character of qualitative research equip researchers with methods related to data collection and analysis necessary to enable the generation of theoretically plausible and reasonable explanations (Van Maanen, 1998 p. xi; Shah and Corley, 2006 pp. 1823, 1826). With that said, qualitative research is diverse, thus it is necessary to ensure the alignment between methodological approach is informed by the research objectives to ensure the “principle of appropriateness” is satisfied (Flick, 2018). Since the unifying theme of this dissertation pertains how market actors attempt to create and shape new market spaces an inductive approach (Pratt, 2009; Bansal and Corley, 2012; Gioia et al., 2013) focusing on the ways in which meaning is constructed, disseminated and even contested. Adopting a qualitative research approach enables the researcher to interpret meanings in context and enable the organisation of observations and conceptualisations to be derived from the collected data to support theory generation (Andersen and Kragh, 2010).

### **3.1 Case-Study Approach**

Both studies comprising this dissertation adopt inductive, single case-study designs (Dyer and Wilkins, 1991; Stake, 1995; Siggelkow, 2007). In depth single case studies have a historical legacy of building and elaborating of theory because the design enables “researchers to see new theoretical relationships and question old ones” (Dyer and Wilkins, 1991 p. 614). The research design employed a purposeful case selection (Patton, 1990), reflecting objective of generating new knowledge through sharpening existing theory while filling identified gaps (Siggelkow, 2007 p. 21). Decisions concerning research design in both studies reflected rationales related to unique access to data as well as ability for the case to be observed for an extended period of time, which enabled the phenomenon to be examined at a fine grained level (Yin, 2014; Ozcan et al., 2017). For instance, in the case involving the creation of smart wireless manufacturing, the researcher was able to gain access to the company for 18 months enabling the collection internal documents as well external facing documents accessible only to employees. The case-study method is well suited to investigating and understanding the contemporary, real-world events at centre of each study,

such as the politics of constructing a smart city or building a new market for a novel technology during a period of industry evolution.

As a research design, the case study involves “confronting’ theory with the empirical world” (Piekkari et al., 2009 p. 569), however, do to so effectively requires the researcher to make key decisions at different phases of the case study process (Piekkari et al., 2010). Since case-study research relies on immersion in multiple data sources (Eisenhardt and Graebner, 2007), a key decision for both studies in this dissertation regarded the approach to incorporating the plethora of visual artefacts found in the field (e.g., PowerPoint presentations, blogs post, Twitter posts, photographic images). To address this question, this dissertation draws guidance from the typology of visual approaches identified by Meyer et al. (2013), and the complementarity of combining approaches in a case-study design (p. 519). The decision was taken to combine aspects of the archeological and strategic approaches as both treat visual materials as naturally occurring, insofar as being pre-existing artefacts to be collected and interpreted by the researcher (p. 504). From a research design perspective, the archeological approach assumes visual artefacts retain information which provide a “window” into particular “versions” of reality. When collected, visual artefacts enable the retrospective reconstruction of meaning structures in organizations, fields, and society. Because of the market settings of both studies, incorporating elements of the strategic approach reflects the treatment of visuals as devices used in claims-making in order to persuade or influence audience’ perception and evaluation of reality (pp. 505, 513). Together the archeological and strategic approaches inform the orientation of the dissertation towards the collection of visuals as elements of an actor’s discursive activities (Hardy and Thomas, 2015). As such, the case-study designs in this dissertation actively seek to include visuals without claiming a multimodal design.

### **3.2 Data Collection Techniques**

The two studies in this dissertation follow emergent processes of categorisation using single study designs which require the collection multiple complementing sources of data for in depth understanding of the research phenomena and to enable triangulation (Eisenhardt and Graebner, 2007; Granqvist et al., 2018). Common to both studies is the extensive



collection of archival data (Shah and Corley, 2006).<sup>1</sup> This included a range of documents directed toward communicating defining features of a proposed categorisation to external audiences, such as PowerPoint presentations, blog posts, marketing reports, social media posts, and press releases. The literature suggests such documents are key tools for shaping perceptions and disseminating cultural meanings as the texts provide audiences with the labels and narratives emphasising the distinctive attributes and contributing to the demarcation of category boundaries (Navis and Glynn, 2010; Koçak et al., 2013; Pontikes, 2018). In addition, numerous video recording of public and semi-public presentations, keynote addresses and archival interviews were collected to capture the narratives and market-market claims being disseminated. These sources were also collected to gain access to high profile individuals, who speak from positions of authority and in turn have influence on the perceptions of audiences. For example, this included senior executives like the Chief Operating Officer of Northern Telco and Sidewalk Labs as well as other executives from the respective organisations where it was not possible to arrange an interview.

The next main source data collected was from semi-structured interviews. Semi-structured interviews are established technique of qualitative research, which provides a tool for asking informants who are presumed to be “knowledgeable agents” to explain their “thoughts, emotions, intentions, and actions” with respect to the research phenomenon (Alvesson, 2003; Shah and Corley, 2006; Gehman et al., 2018 p. 291). In both studies interviews were essential not only in accessing potentially different interpretations of shared events or issues but also gaining contextual insights into how certain events unfolded the way they did, particularly, where the researcher could not observe them first-hand. Interviews in this respect were used to both add context as well to unlock information that would be considered not public knowledge.

### **3.3. Ethical Considerations**

Case-study one, was part of a bigger European Union-funded project (№675866 — COINS). Most ethical considerations for the case study were addressed as part of a consortium agreement between Leeds University Business School and Northern Telco. The consortium agreement also covers the approval for using the data obtained during the

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<sup>1</sup> The method sections in Chapters 4 and 5 include summary inventories of all data collected and the role in the analysis.

research project in this PhD thesis and subsequent academic publications. Additionally, prior to entering the field, the researcher obtained ethical approval from the (reference LTLUBS-181) from the Leeds University Research Ethics Committee (see Appendix 1). It should be noted that as part of the project, the researcher was granted “internal status” status thereby providing daily access the company’s office along with a corporate email address. Despite this, the researcher was not considered an employee of the company and received no rewards or compensation from the host the company. The discretion observed by the researcher has prevented any conflicts of interest.

Case study two, the researcher obtained ethical approval (reference LTLUBS-328) from the Leeds University Research Ethics Committee (see Appendix 2). In comparison to the preceding study, the second study relied almost exhaustively on publicly available data. That said, the study did draw upon interviewees with select informants. The recruitment of informants and obtainment of consent was undertaken in the following steps: first, relevant informants were identified from secondary materials and depending on the availability of their contact information were messaged via email or direct message on social media (i.e. Twitter); second, invitations sent to solicit participation included an overview of the research and why they were being asked to participate. The invitation was accompanied with an information sheet and consent form (see Appendix 3); and three, prior to commencing the interviews all participants were asked to consent for the conversation being recorded.

## **Chapter 4: Creating markets from scratch: Strategic category shaping in smart manufacturing**

*We have to do a lot of heavy lifting and promote why factories should go wireless and why they should choose cellular. We have to create the new market from scratch.*

*- Marketing manager, Oct. 2018*

### **4.1 Introduction**

A firm's competitive environment is no longer looked upon by scholars as simply an "exogenous selection regime" that is imposed and responded to (Gavetti et al., 2017 p. 195; Pontikes, 2018). Firms have a choice in what market categories they enter; furthermore, they have a hand in shaping the environments in which they compete (Kennedy, 2008; Pontikes and Kim, 2017; Pontikes, 2018; Pontikes and Rindova, 2020). The growing attention to the agentic maneuverings of firms has crystallised around a burgeoning stream of literature on *strategic categorisation* (Vergne and Wry, 2014, Pontikes and Kim, 2017; Kodieh et al., 2018; Barlow et al., 2019). Strategic categorisation directs attention to how firms manipulate their category memberships and exploit "windows of opportunity" that characterise the malleability of nascent or unsettled categories to capture value (Pontikes, 2012; Suarez et al., 2015 p. 443; Cattani et al., 2017 p. 86). Research into strategic categorisation has highlighted how firms move between established categories, such as 'arms producer' and 'commercial aircraft maker' (Vergne, 2012) or 'drug' and 'food' (Ozcan and Gurses, 2018), others explored how firms navigate the uncertainties of emergent categories in pursuit of their interests (Granqvist et al., 2013).

The strategic categorisation literature suggests the degree acceptance or contestation regarding a firm's membership claims is contingent on the plausibility of its fit with a category (Cattani et al., 2017; Pontikes and Kim, 2017). This emphasis on fit implicitly ties strategic categorisation to notions conformity and legitimacy, and also to the role of categories in shaping audience perceptions of a firm. By approaching strategic categorisation as a matter of 'fitting in', it downplays the creative agency of firms in perturbing and transforming market spaces. Additionally, in many cases, firms are not just seeking to be accepted. They want to win the economic battles and to dominate the categories they operate

in (Santos and Eisenhardt, 2009; Pontikes, 2018), and thus advancing the literature on strategic categorisation requires examining the ways firms shape how audiences think about and receive market offerings (Pontikes, 2018). While the literature on market categorisation has traditionally been concerned with the “[artefacts] to which the world reacts”, this paper directs attention to the role of strategic categorisation in “impacting how the world reacts to what is provided” (Levinthal, 2020 p. 147). In doing so, it is possible to address the limited understanding in the literature regarding how market categories are defined and changed through different processes (e.g., re-evaluation, recombination, or recategorization) (Delmestri et al., 2020 p. 911). This investigation is increasingly relevant when set against the ongoing transformations to the economy and society resulting from wide-spread digitalisation.

Digitalisation is blurring the boundaries between industries and sectors as well as products and services (Kumaraswamy et al., 2018); consequently, instigating both the emergence and evolution of market categories, such as fintech and smart manufacturing. Textbooks are replete with case studies of the disruptive innovations brought by digitalisation, often exemplified by the obsolescence of incumbent firms (Christensen, 1997; Tripsas and Gavetti, 2000; Danneels, 2010; Raffaelli et al., 2019). Yet, for established firms specialising in information, computing, communication, and connectivity technologies, digitalisation affords new opportunities (Hinings et al., 2018; Vial, 2019), specifically to leverage existing knowledge resources to “reshape market structures and chart new courses” beyond their traditionally recognised categories (Pontikes and Rindova, 2019 p. 60). In such cases, firms are approaching strategic categorisation as a means to gain competitive advantages by exploiting anticipated “spillovers” in capabilities or status (Perretti et al., 2008; Kodeih et al., 2018), which is enabled by their specific resource base. The literature on market categorisation has typically pointed to the importance of discursive and cultural resources, leaving the contributions of firm-specific resources under-examined (Durand, 2012; Durand and Boulongne, 2017). Consequently, this has provoked calls for scholars to explore the white spaces between the resource endowments of firms and their category claims (Cattani et al., 2017 p. 86).

This paper examines strategic categorisation by coupling two converging theoretical themes: one, the need to examine how firms shape the definitions of new market categories and; two, how digitalisation is enabling established firms to leverage existing knowledge resources to construct new markets. For the purposes herein, strategic categorisation is

conceptualised as being constituted by two underlying activities: *advantage seeking*, that is the pursuit of competitive benefits, and *meaning-making*, that is the generation of meanings that guide audience understandings. This paper shows how these two elements of strategic categorisation rely on distinct types of resources, firm-specific resources and cultural resources. Drawing on the resource-based view (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993) and cultural view of resources (Swidler, 1986; Weber and Dacin, 2011), strategic categorisation is defined as a process aiming to:

- a) increase the value of a firm's knowledge resources by promoting a favourable categorical system utilising the deployment and combination of organisational and cultural resources;
- b) create resonant meanings from discursive and material elements necessary to shape symbolic boundaries and social membership; and
- c) and enable firm offerings to be grouped with but differentiated from rivals to stimulate demand for market exchange (Pontikes and Kim, 2017; Pontikes, 2018; Lo et al., 2019).

Accordingly, this paper investigates, *how does a firm make strategic use of firm-specific and cultural resources to shape and define a new market category?*

This question is explored through an inductive, case-study following the efforts of Northern Telco, a leader in 5G technology, as it attempts to position cellular as the connectivity technology of the 4<sup>th</sup> Industrial Revolution (Industry 4.0),<sup>2</sup> under the category label of "smart wireless manufacturing". This case was intentionally selected for its theoretical relevance (Siggelkow, 2007) as it provided a representative instance of an established firm engaging in strategic categorisation driven by the relevance of its knowledge resources in a new market. Additionally, the unsettled conditions of smart manufacturing afford fertile grounds to observe how a firm utilises different resources in seeking to favourably define a market. In the examined case, this pertained to shaping the connectivity layer of the smart manufacturing ecosystem.

This paper contributes to the literature on strategic categorisation through the development of a theoretical model of strategic category shaping. The proposed model emboldens the importance of viewing strategic categorisation as a resource intensive process

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<sup>2</sup> Smart manufacturing is most commonly associated with the onset of the 4<sup>th</sup> Industrial Revolution or Industry 4.0 which first originated in 2011 in Germany. The defining aspect of Industry 4.0 is the progression toward full digitalisation. This contrasts previous industrial paradigms: steam (Industry 1.0), electricity (Industry 2.0), computerisation (Industry 3.0). Industry 4.0 is synonymous with smart manufacturing.

by connecting specific configurations of firm-specific and cultural resources to three dimensions category shaping: 1) empathetic resonance; 2) structuration of value space; and 3) reification of material space. These dimensions contribute to understanding how firms attempt to shape symbolic and material boundaries, as well as social membership category around their core knowledge resources.

## **4.2 Theoretical Background**

This section integrates insights from strategic management and organisational theory by reviewing the literatures on *strategic categorisation*, the *resource-based view of the firm* and the *cultural resource view*. The literature review seeks to first problematise limited attention to both how firms shape social definitions of categories and to the of role resources in processes of categorisation. This is followed by an examination of resource-based and cultural resources views to justify why organisational and cultural resources are needed when firms engage in strategic categorisation to create new markets.

### **4.2.1 Strategic Categorisation of New Markets**

Categories help to differentiate “objects, people, practices, and even time and space” (Lamont and Molnár, 2002 p. 168). In market settings, categories provide both structure and meaning by guiding understandings of the symbolic and material attributes of firms and products as well as anchoring perceptions of value and worth (Vergne and Wry, 2014; Durand and Thornton, 2018). Recent efforts to shift analytical focus from the study of “categories to categorisation” (Durand, Granqvist and Tyllstrom, 2017) has directed attention toward the origins and emergence of new categories (Durand and Khaire, 2017; Kennedy and Fiss, 2013; Rhee et al., 2017). Categories are not given structures but malleable, social constructs, whose meaning and boundaries are shaped through the agentic efforts of motivated actors or groups of actors (Durand and Khaire, 2017 p. 103). When categorisation is viewed as an agentic activity, firms are not limited to only reacting to changes in market conditions but can decide to “shape market categories, so that environmental forces evolve in their favour” (Pontikes, 2018 p. 628). This affirms the understanding of market categories as dynamic and competitive spaces of economic activity, making them inherently strategic and consequential to the survival of the firm (Granqvist and Ritvala, 2016; Cattani et al., 2017; Pontikes and Kim, 2017).

The existing literature presents several rationales as to why firms may engage in strategic categorisation. For instance, firms may seek to alleviate competitive pressures

(Pontikes and Kim, 2017), influence regulatory processes (Kennedy and Fiss, 2013; Ozcan and Gurses, 2018) and neutralise unwanted associations (Vergne, 2012; Delmestri and Greenwood, 2016). Firms may also engage in strategic categorisation to introduce a new product or service or to open “new worlds” for existing ones (Navis and Glynn, 2010 p. 441). Durand and Khaire (2017) note the objectives and outcomes of strategic categorisation are likely to differ between established and entrepreneurial firms. Principally, they suggest incumbent firms tend to create new markets through reinterpreting or combining existing but previously disparate elements that deliver novelty and value when brought together. The aim for incumbents is to create new market orders within existing markets, in order to expand market share and increase profitability. This is typically achieved by reorienting meaning systems and reconfiguring value scales (pp. 96-98). Since, incumbent firms are starting from established positions and knowledge bases, they are in better a position to influence the definition of the market spaces they enter.

It has been shown that periods of technological change and discontinuity can encourage strategic categorisation as firms may enter new domains to gain access to new resources (Grodal, 2018) or search out growth opportunities in “hot markets” (Pontikes and Barnett, 2017 p. 140). With the promises of new market frontiers also come emerging or unsettled economic spaces, lacking clear-cut boundaries and distinct material and symbolic features, typically presenting a range of ambiguities (e.g. cognitive, processual, competency) (Grodal et al., 2015; Granqvist and Ritvala, 2016; Zuzul, 2019). Prior research points out that unsettled conditions create the space and leeway for strategic objectives (Pontikes and Barnett, 2015; Pontikes and Kim, 2017). Some firms act as ‘market-makers’ by redefining market structures to capture advantageous positions in a new or changed domain (Pontikes, 2012). Based on their examination of the semiconductor industry, Carnabuci et al. (2015) argue poorly defined market spaces are attractive environments for established firms because it provides opportunities to leverage pre-existing identities, resources and capabilities from their categories of origin to frame an unsettled domain to their advantage. To this end, the emergence of the commercial television industry in the U.S. was found to be significantly influenced by the entry of established firms from radio broadcasting, who viewed television as a natural extension of their domain. This enabled radio firms to create a commercial structure and candidate identity for the category aligned with audience expectations (Perretti et al., 2008). The strategic leeway afforded by weakly defined categories corresponds with the understanding that the ability to influence the requirements of a category and expectations

of audiences is greatest prior to the introduction of a dominant design or schema (Grodal et al., 2015; Suarez et al., 2015).

The extant literature is clear with respect to the type of categories established firms tend to enter, when and even why. It offers less guidance, however, regarding how firms strategically define the lens through which audiences evaluate their categorisations (Pontikes, 2018 p. 621). On this point, the literature does recommend the adoption of a proactive strategy of influence to draw audiences and stakeholders around a firm's market vision (Suarez et al., 2015 p. 445). For instance, Kodeih et al. (2018) highlight HEC business school intentionally positioned its Grande Ecole programme in the Master of Science in Management category because it afforded the perceived opportunity to dominate and frame the lower status category to the organisation's advantage (p. 1001). To do so, HEC pursued an 'audience-centric' strategy of emboldening the visibility of the category, sharpening its boundaries and mobilising the support of intermediaries (p.1007).

Adding further insights, Pontikes and Rindova (2020) propose the ability of firms to shape market categories is tied to distinct forms of agency. They identify "constructive agency" as the basis upon which firms develop strategic positions with the aim of influencing others and transforming market spaces. It involves constructing and applying novel pairings of schemas and resources. As largely cultural representations reflecting theories or conceptions of the world, schemas enable firms to combine and use available resources. The authors also identify "interactive agency", as the means by which firms seek to increase support for and influence market-level outcomes through the adoption of their desired schema (pp. 150, 156). Together, constructive and interactive agency enable firms with a means to obtain an improved position by advancing a schema-resource pairing. This involves firms "[reconfiguring] a market space and [altering] collective interpretations of value and resources—and thus the dimensions of evaluation" (p. 155). Pontikes and Rindova's theorising affirms the importance of cultural resources and the need for greater consideration of the specific resources a firm mobilises when strategically categorising.

Despite the general centrality of resources in the competitive strategies of firms (Barney, 1991; Miller, 2003), the literature on strategic categorisation has yet to holistically examine the what, how and why certain resources are used. Such questions are symptomatic of a blind spot in the market categorisation literature more broadly, which is reflected in foundational questions concerning what resources are required to create a new category? Or what is the relationship between a firm's material aspects (i.e. structure, tangible resources or



identity) and its involvement in processes of categorisation (i.e. creation, adoption, abandonment) (Durand and Boulongne, 2017 p. 662)? As suggested in the preceding paragraph, resources are not a trivial matter in strategic categorisation as they underpin a firm's ability to update, replace or extend category schemas, and ultimately influence a market's definition (Pontikes and Rindova, 2020 p. 153). To address the role of resources, the literature on the resource-based view of the firm and cultural resource view are reviewed next in relation to the two key elements of strategic categorisation, advantage-seeking and meaning-making.

#### **4.2.2 Advantage Seeking: The Role of Firm Resources in Strategic Categorisation**

Resources enable firms to distinguish themselves from competitors and inform the conception and implementation of value creation strategies (Hall, 1992; Barney and Arikan, 2001 p. 138; Bingham and Eisenhardt, 2008 p. 243). Thus, from the perspective of the resource-based view, how firms use categorisation to advance their interests is connected to their specific stock of resources that can be deployed in the creation and shaping of a new market. The resource-based view, specifically, highlights the centrality and fungibility of core knowledge resources as a source of competitive advantage, which can be leveraged across different products and markets (Grant, 1996; Miller, 2003; Bingham and Eisenhardt, 2008). When firms strategically create new categories, it is enabled by a "deep knowledge of a few highly developed core skills" (Mehra, 1996 p. 308), corresponding with the recognized market identity of the firm. A firm's resource base, therefore, introduces a certain degree of path dependence (Collis, 1991; Barney, 2001) with respect to what categories firms can potentially create or enter in seeking new competitive advantages. As such, firms are likely to pursue strategic categorisation to "exploit [their existing] resources and capabilities relative to external opportunities" (Grant, 1991 p. 115) in order to expand their market's total value as well as to establish advantageous positions within the new market categories they create (Durand and Khaire, 2017).

The resource-based view is instructive in linking strategic categorisation to a firm's desire to leverage its core knowledge resources to create and capture value in new markets. It focuses on firms operating in existing markets, and therefore, assumes market categories are established and recognized (Struben et al., 2020). Consequently, this limits considerations of entrepreneurial acts (Alvarez and Busenitz, 2001) and the interactions of the firm with the wider social environment (Oliver, 1997; Maurer et al., 2011). As a result, the resource-based view "understate[s] the role of cultural elements [...] in driving economic value" (Maurer et

al., 2011 p. 432), and the importance of managing the institutional environment surrounding a firm's resource decisions (Oliver, 1997). Past scholarship seeking to expand the applicability of the resource-based view has highlighted the need to integrate elements from the external social context with organisational resources. Specifically, Maurer et al. (2011) argue the creation of value and generation of competitive advantages cannot rely on firm-specific resources alone and requires the incorporation of other resources, principally cultural to align market strategies with the values of a target audience. This line of thought emboldens the second constituting element of strategic categorisation, meaning-making and the corresponding role of cultural resources in contributing to the shaping of new market domains. The next section discusses the role of cultural resources in meaning-making and why it is integral to processes strategic categorisation.

#### **4.2.3 Meaning-Making: The Role of Cultural Resources in Strategic Categorisation**

Growing attention to processes of categorisation has been accompanied by a related shift from assessing how meaning is *applied* to processes of how meaning is *made* (Suddaby, 2010; Mitnick and Ryan, 2015; Purdy et al., 2017). Meaning-making is an essential aspect of (strategic) categorisation, particularly in gaining the acceptance of new audiences as well as shaping and demarcating boundaries of a category (Negro et al., 2010; Kennedy and Fiss, 2013; Grodal and Kahl, 2017). In this paper, meaning-making is grounded in the use of cultural resources, including narratives, metaphors and analogies, visual symbols, artefacts, practices and representations at the societal, industry or firm level (Rindova et al., 2011; Glynn and Watkiss, 2012). Culture is understood as a symbolic meaning system that market actors can use in strategic and pragmatic ways to achieve their goals (Lounsbury et al., 2019).

In organisational theory, it is cultural resources that provide the 'raw materials' of meaning-making during categorisation (Glynn and Navis, 2013). From this perspective, firms are presented as skilful operators who stitch together "bits of culture" (Weber and Dacin, 2011; Glynn and Watkiss, 2012; Gehman and Soublière, 2017) from 'toolkits' (Swidler, 1986) and repertoires (Rindova et al., 2011; Weber, 2005) in order to define "conceptual distinctions between objects, people and practices" (Giorgi et al., 2015 p. 7). For example, Swiss watchmakers were able to fend-off being supplanted by producers of quartz watches by redefining meanings and values around the industry's history of craftsmanship and precision, and symbolic associations of luxury, to reinvigorate the category of mechanical watches (Raffaelli, 2019).

In the context of market categorisation, cultural resources contribute to building the meaning and boundaries of nascent and unsettled market spaces. For instance, Navis and Glynn (2010) highlight how producers of satellite radio used metaphors invoking comparisons to the transformation of television to bolster perceptions of feasibility to enhance the category's appeal to investors. Creators of the Booker Prize for postcolonial fiction constructed the category's identity around the historical ties and cultural experiences of authors in living Commonwealth countries (Anand and Jones, 2008). Khaire and Wadhvani (2010) show how art historians and auction houses appropriated the evaluative criteria used in assessing European art to shift the historical valuations of Indian art from "provincial" to "modern". These examples highlight the important role of cultural resources in creating and communicating resonant meanings that enable a category's identity to cohere around distinctive attributes and practices, while also serving to inform perceptions of value (Gehman and Soublière, 2017).

Cultural resources provide market actors with essential materials to cultivate intersubjective agreements with audiences and to foster acceptance and legitimacy. They are resources that are external and publicly available for all actors to deploy (Glynn and Watkiss, 2012; Ravasi et al., 2012). Consequently, control over the meaning of a cultural resource is tenuous, which can result in competing interpretations of a categorisation (Williams, 1995 p. 127). For example, the emergence of nanotechnology in the U.S., was initially driven by the futurist community's framing of "self-replicating intelligent nanomachines" which attracted attention and resources to the nascent field. However, the notion of "self-replication" when it was later used by scientists created confusion for audiences making difficult for them to differentiate between scientific and futurist notions of self-replication (Granqvist and Laurila, 2011 p. 269). In response to the problem of appropriability, Ravasi et al. (2012) suggest the value creation potential of cultural resources "derives less from their possession, and more from [...] their systematic identification, development and integration with other organisational resources" (p. 235). Therefore, how firms select and integrate organisational and cultural resources influences not only the nature of the meanings created but the potency, in terms of a proposed category schema 'striking a chord' or 'clicking' with a target audience (Snow et al., 1986; Giorgi, 2017; Baden and David, 2018). The challenge for firms is how to leverage their core knowledge resources to present a category schema that is novel, while incorporating cultural elements that make it familiar and congruent with audience expectations (Hargadon and Douglas, 2001; Rindova et al., 2007).

In summary, this section brought together the literature on strategic categorisation with the resource-based view of the firm and the cultural resource view to theoretically ground the constituting elements of advantage seeking and meaning-making to specific types of resources. It has been shown for firms to create and define new markets requires consideration of both firm specific and cultural resources, exemplified by the schema-resource pairing proposed by Pontikes and Rindova (2020). While the resource-based view offers relevant insights as to why a firm may pursue the strategic categorisation, it does not address how the category schema firms advance are made meaningful to new audiences. As such, this requires the integration of cultural resources, which provide the symbolic content to enable meaning-making. When firm-specific resources and cultural resources are brought together, it provides firms with the means to shape the categorisation of a new market.

### **4.3 Method and Research Design**

This section describes the methodological approach of the study and the analytical steps taken to answer the identified research question. It begins with summary of the research setting, followed by the case selection justification. Next, the data collection process is described, and the final subsection details the steps in the analysis of the case.

#### **4.3.1 Case Selection**

To investigate how a firm strategically deploys organisational and cultural resources to shape the definition of a market category, a micro-level account is developed using an inductive, single case study (Dyer and Wilkins, 1991; Stake, 2003; Siggelkow, 2007). Specifically, this research focuses on Northern Telco's efforts to establish smart wireless manufacturing. This case was purposefully selected (Patton, 1990), and informed by several theoretical consideration from the literature. First, the interest in strategic categorisation and market definition underscores the understanding that categorisation is an "intentional process at the level of each actor [...] motivated by strategic and competitive considerations" (Durand and Khaire, 2017 p. 89). The proposed category of smart wireless manufacturing is a representative case of strategic categorisation as it concerns a firm's decision to leverage its core knowledge resources to create a new market in the pursuit of competitive advantages. Second, the 'revelatory' benefits of single cases are linked to a researcher having a degree of access to a phenomenon that may not be easily observable to outsiders (Ozcan et al., 2017 p. 94). To this end, the author was able to gain access to Northern Telco during the company's entry into the smart manufacturing category, which not only made the phenomenon of

interest “transparently observable” (Eisenhardt, 1989 p. 537) but afforded the opportunity to examine the strategic categorisation activities of the firm as they were happening. This was beneficial in helping to avoid respective bias as the analysis was not proceeding from a known outcome. Additionally, access to Northern Telco enabled the researcher to gain a deep understanding of the empirical context and provided for the assembly of a rich database of qualitative materials.

### **4.3.2 Research Setting**

Northern Telco is a global leader in mobile cellular technology and provider network infrastructure. For 140 years, the company has developed telephony and mobile telephony technology, becoming the largest holder of standard essential patents for mobile communication (54,000 patents) (Press Release, 2019-06-10). Globally, more than 40 per cent of mobile traffic passes through the company’s networks, supporting over 2.5 billion subscribers (Industry Connect Fact Sheet, 2019).

In 2017, following successive quarters of losses, Northern Telco launched a focused strategy for returning to profitability. The strategy emphasised increased investments in research and development, focusing on 5G and ‘growth bets’ in select emerging business areas (Annual Report, 2017). The pursuit of new market opportunities is driven by the projected stagnation in its core business, i.e., developing and selling network infrastructure to mobile network operators (e.g., Vodafone, Verizon, Rogers, Telefonica, etc.).<sup>3</sup> As part of its strategy to drive growth in new areas, Northern Telco established a new business area, Technologies and Emerging Business (BTEB), responsible for identifying and creating new markets for cellular technology. In support of BTEB’s mission, a subunit, Advanced Industries was formed focusing on growth bets related to the introduction of cellular into industrial domains. The company had specifically targeted the domain of smart manufacturing and the set goal of becoming the number one supplier of industrial wireless connectivity (Internal Presentation, 2017-11).

Smart manufacturing presents a significant growth opportunity reflecting the increasing requirement for enhanced connectivity as millions of factories around the world are digitalising their operations. Recent forecasts project the smart manufacturing market to

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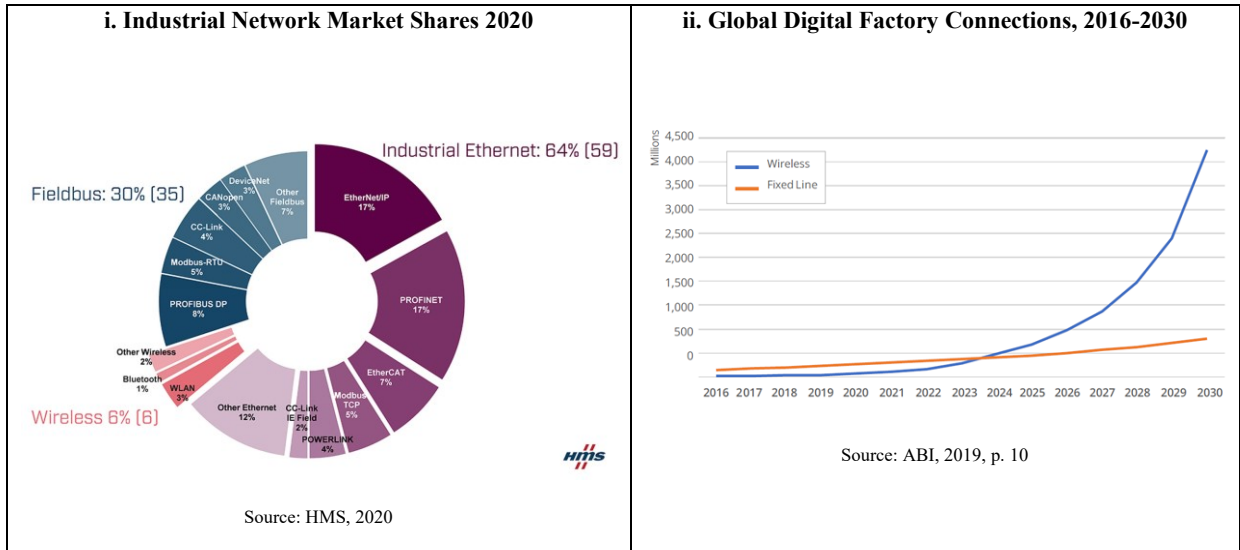
<sup>3</sup> Additionally, Northern Telco projected the growth rate for its primary customers, mobile network operators was projected to be 1.5 per cent per annum from 2016-2026 (The Guide to capturing the 5G industry digitalization business potential, 2018).

grow to USD 1 trillion by 2030 and with revenues from connectivity reaching USD 35 billion (ABI Research, 2020). The hype aside, smart manufacturing remains a ‘category in the making’ (Garud et al., 2010). exemplified by conceptual ambiguities (Strozzi et al., 2017; Buer et al., 2018; Kusiak, 2018), and highlighted in a plethora of associated terms, (“connected factories”, “Industry 4.0.”, “industrial IoT”, “intelligent manufacturing”, “digital manufacturing”). As a journalist noted, the meaning of these terms is “something of an open question” (IoT World, 2019-05-30). From an operational perspective, available evidence underscores the nascency of smart manufacturing. Specifically, a survey of manufacturing firms, conducted by McKinsey (2018) found the majority of firms (approximately 70 per cent) are still in the early stages of their progressing towards smart manufacturing with 40 per cent engaging in extended pilots, while 30 per cent had yet to start piloting.<sup>4</sup> The unsettled state of smart manufacturing provides suitable conditions for strategic categorisation, especially as advancements in 5G cellular technology present the opportunity to redefine the connectivity landscape in the manufacturing industry.

The connectivity landscape in manufacturing is populated by a range of incumbent connectivity solutions. The dominant solution being cabled technologies (i.e. Industrial Ethernet) with a small percentage of fragment wireless technologies (i.e. RFID, Zigbee, Bluetooth, LORA) of which Wi-Fi is the most dominant. Industry data presented in Figure 2 shows that wireless technologies only account for 6 per cent of the current market share among connectivity technologies, however, over the next decade the growth in wireless connections in manufacturing sites is expected to surpass wired connections in 2023.

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<sup>4</sup> McKinsey. 2018. Blog. The Fourth Industrial Revolution and the factories of the future.

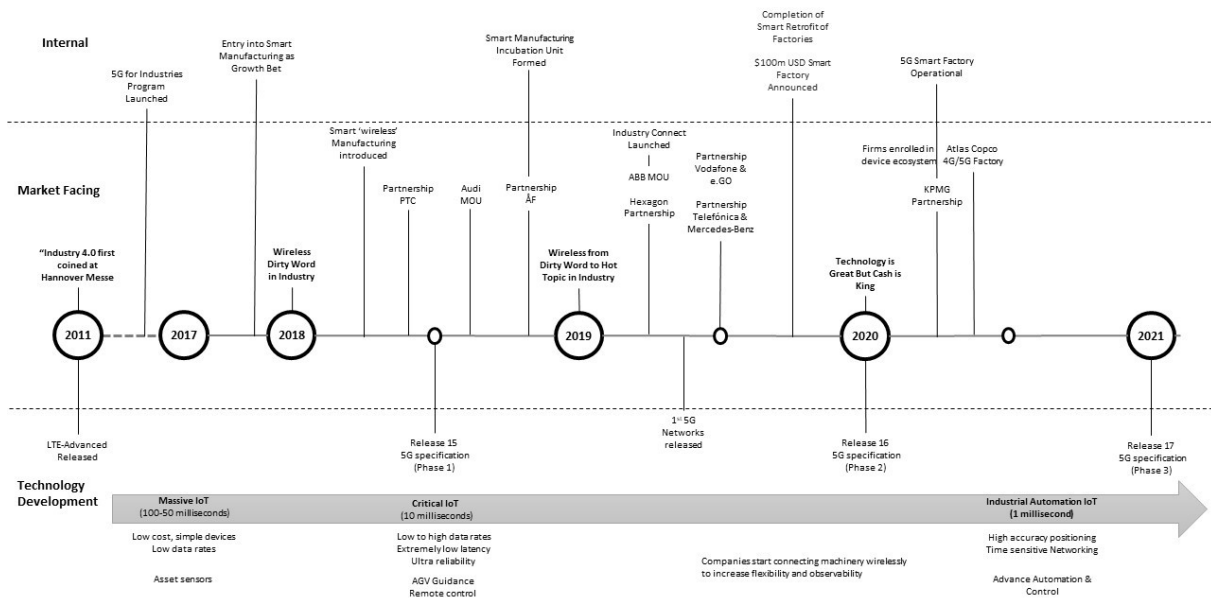


**Figure 2 Connectivity Landscape in Manufacturing**

The anticipated release of 5G was a catalysing factor driving Northern Telco’s ambitions to redefine connectivity in smart manufacturing around the cellular. As the next generation of cellular technology, 5G is a step change compared to previous generations of cellular technology (i.e. 3G, 4G). One of the defining characteristics of 5G is speed. It will be 10 to 100 times faster than 4G, exemplified by eventual latency rates down to one millisecond allowing connected things to communicate instantaneously in real-time. It is advancements in speed as well as network capabilities that make 5G a relevant technology for the manufacturing industry’s vision for smart manufacturing – the shift beyond traditional automation toward the creation of a fully flexible and adaptable production system (Deloitte 2017 p. 2).<sup>5</sup>

According to internal documents, in the fall of 2017, Northern Telco formally entered the domain of smart manufacturing under the category label of “smart wireless manufacturing. Up to this point in the company’s history, it had focused on consumers. Subsequently, it had to construct a new market category for cellular “from scratch” (Email, 2018-10-05). A timeline highlighting key events in the development of smart wireless manufacturing is presented in Figure 3.

<sup>5</sup> Deloitte. 2017. The Smart Factory.



*Figure 3 Timeline of Smart Wireless Manufacturing*

### 4.3.3 Data Collection

This research is based on a diverse range of archival data, and 31 semi-structured interviews with Northern Telco employees engaged in advancing smart ‘wireless’ manufacturing. The author gained access to Northern Telco from September 2017 to February 2019 as part of a European Commission-funded project, and during this time was embedded within the company at their headquarters in Stockholm, Sweden. Data collection began in March of 2018 and proceeded until July 2020. During the months preceding data collection, the author spent time developing an understanding of the research context, attending research days and events, BTEB employee briefings and received internal newsletters and reoccurring communiques from the CEO.

The data collection began with the gathering of archival data, whereby the author was given access to the internal SharePoint site of the smart manufacturing team. The SharePoint site was instrumental for the collection of internal presentations, briefing materials and meeting minutes as well as external stakeholder presentations, product guides, marketing materials and posted links to media articles regarding Northern Telco’s efforts to establish smart wireless manufacturing. As the SharePoint had been created when the smart manufacturing team had started working, it allowed the author to go back in time and collect all pertinent and available documentation from inception. Data collection continued on a weekly basis as



the categorising efforts progressed. This was complemented by searches of the company's intranet enabling the collection of press releases, presentations, videos of recorded events, memos and other internal documentation. All video recordings from research days related to IoT and smart manufacturing, "BTEB Talks" and staff webinars concerning smart manufacturing as well as other internal promotional videos were transcribed by the author.

The author also collected archival data from external sources, specifically utilising Google searches and searches of social media (i.e. YouTube, Facebook, LinkedIn, Twitter) to identify archival interviews with relevant Northern Telco executives, recorded conference presentations and keynote addresses and industry webinars relating to the company's efforts in smart manufacturing. All archival recordings were transcribed by the author. The collection of industry media was also enabled by an internal media monitoring service, which the delivered daily results involving Northern Telco, filtered terms, such as "smart manufacturing", "Industry 4.0", "smart wireless manufacturing". Additionally, Google and social media searches were used to identifying commentary from Northern Telco executives in industry publications, such as RCR Wireless News, Enterprise IoT Insights, Light Reading, Fierce Wireless, and Mobile World Live.

In addition to archival materials, the author also conducted 31 semi-structured interviews with 23 different informants, who were predominately employees from the incubation unit working on the market development of smart wireless manufacturing.<sup>6</sup> Complementary interviews were also conducted with individuals involved in related research collaborations with manufacturers. A concerted effort was made to interview a diverse range of informants with respect to both role (e.g. product development, marketing, business development) and authority (employees and managers). The majority of interviews were conducted between May 2018 and January 2019, and four follow-up interviews were conducted between February 2020 and June 2020 enabling the author to understand how the company's categorising efforts were progressing as well as to ask additional questions that had emerged during the data analysis.

In complementing the above data sources, the author attended tours of the company's facilities, specifically, Northern Telco's smart factory in Sweden, which is used in the creation of large-scale demonstrations. The author also toured the Northern Telco Studio where conference demos are displayed as well as the innovation centre in Silicon Valley,

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<sup>6</sup> Summary of conducted interviews is provided in Appendix 4.

where small-scale collaborations with industry are tested. Being able to see and touch what was being shown to audiences was helpful in further sensitising the author to the capabilities of the cellular and market claims being made. A full data inventory and along with a summary of how each data source was used in the analysis, is presented in Table 2.

**Table 2 Summary of Data Inventory**

Document Type	Total Items	Total Pages	Recorded Time (hr:m)	Use in analysis
<i>Semi-Structured Interviews</i> (n = 23)	32	249	20:37	<ul style="list-style-type: none"> <li>How messaging in presentations is constructed and why certain frames are emphasised</li> <li>Exploring why and how certain resources were used (e.g. narrative of Industry 4.0, Northern Telco factories, artefacts) in shaping meaning for cellular for a new audience</li> <li>Market challenges faced and positioning in relation to competing connectivity technologies</li> </ul>
<i>Archival Interviews</i>	30	90	6:19	<ul style="list-style-type: none"> <li>Identify market claims</li> <li>Explaining technology capabilities</li> <li>Explanation of conference demos</li> </ul>
<i>Media articles</i>	74	173		<ul style="list-style-type: none"> <li>Quotes from executives regarding development of smart wireless manufacturing</li> <li>Identify market positioning and technical differentiation of cellular in comparison to other technologies</li> <li>Identify use of cultural resources in market claims like analogies, industry narratives</li> </ul>
<i>Recorded Presentations</i> • Keynotes & Panel Discussions	21	122	6:41	<ul style="list-style-type: none"> <li>Category claims in context to audience</li> <li>Responses to media questions about role of cellular in manufacturing</li> <li>Identify cultural resources used to convey meaning about core resource to target audience</li> </ul>
<i>Marketing and Research Documents</i> • Promotion Materials • Blogs • Research Articles/Reports • PowerPoint Presentations	19 41 39 31	37 90 702 893	0:29	<ul style="list-style-type: none"> <li>Identify market positioning and technical differentiation of cellular in comparison to other technologies</li> <li>Capturing use of cultural resources in the describe</li> <li>Identifying supporting visual evidence of identified dimensions like “technological emplotment”</li> <li>Capturing instances of cultural resources (narratives, symbols) being used in relation to firm resources</li> <li>Construction of presentations, specifically order of slides helps to identify Northern Telco’s category story</li> </ul>
<i>Press Releases</i>	59	130		<ul style="list-style-type: none"> <li>Identifying key events like partnerships reflecting to build smart wireless category</li> <li>Capturing organisational identity claims i.e. who is Northern Telco to a new audience</li> <li>Framing of the value of cellular narratives</li> </ul>
<i>Internal documents</i> • Communiques & emails • PowerPoint presentations • Recorded Presentations and videos	34 26 8	96 564 74	2:53	<ul style="list-style-type: none"> <li>Used to identify events related to entry into smart manufacturing domain</li> <li>Capture insights strategic direction regarding “growth bets”</li> <li>Capture identity claims</li> <li>Identify narratives and massaging being prepared for external audiences</li> </ul>

### 4.3.4 Data Analysis

The analytical approach adopted was inductive and iterative (Charmaz, 2006; Gioia et al., 2013) and involved alternating between the data and the literature as part of emergent, multi-stage research design process with four stages. All documents were uploaded into NVivo to support the organisation of data and the analysis process.

*Stage 1:* To understand how different organisational and cultural resources were being used to construct a new market domain, the initial entry point into the data was guided by the question, ‘what resources are they using?’ The analysis began with external-facing documents, such as marketing and stakeholder presentations, because this was a primary medium for communicating with audiences about the category of smart wireless manufacturing. Additionally, the ability of PowerPoint presentations to combine discursive and visual elements have been shown to contribute meaning-making during strategic processes (Knight and Paroutis, 2018). At this stage text and visuals<sup>7</sup> were coded thematically under types of resources, which were provisionally organised into firm resources (e.g., “knowledge resources”, “Northern Telco factories”, “cellular expertise”), firm repertoire (e.g., “company history”, “categories of connectivity”, “post-phone era) and industry repertoire (e.g., “connectivity foundation”, “mass customisation”, “industry vocabulary”). The analysis provided a useful starting point and delivered initial insights into the types of firm and cultural resources that were being used; however, the codes lacked nuance.

*Stage 2:* The second stage focused on recoding the thematic groupings generated in the previous step. A grounded coding approach was adopted that sought to maintain a closeness to the text to retain the original meaning. As the aim was to understand how the resources were being used in the categorisation of a cellular, generated codes were intentionally action-oriented and coded as gerunds (Charmaz, 2006). For instance, in unpacking the previous code of “Northern Telco factories” elicited alternative codes like “convincing the market”, “eating own medicine”, “speaking as a manufacture”. These codes, along with others, would later inform the second-order code of “claims of shared identity”. Similarly, for cultural resources, like “IT frame” was reintegrated to generating new codes, such as “simplifying telco product”, “novel packaging”, “connectivity in a box”, “simplified for scaling”. These codes would, in turn, be collapsed under “emulating IT product” and contribute to the second-order code of “objects of translation”. As the data set was re-interrogated to better capture how different firm and cultural resources were being used, codes were grouped and merged to increase the analytical distinctiveness. By doing so, three overarching themes began to emerge related to attention and alignment of cellular with Industry 4.0, the benefits of cellular, and the use of material elements.

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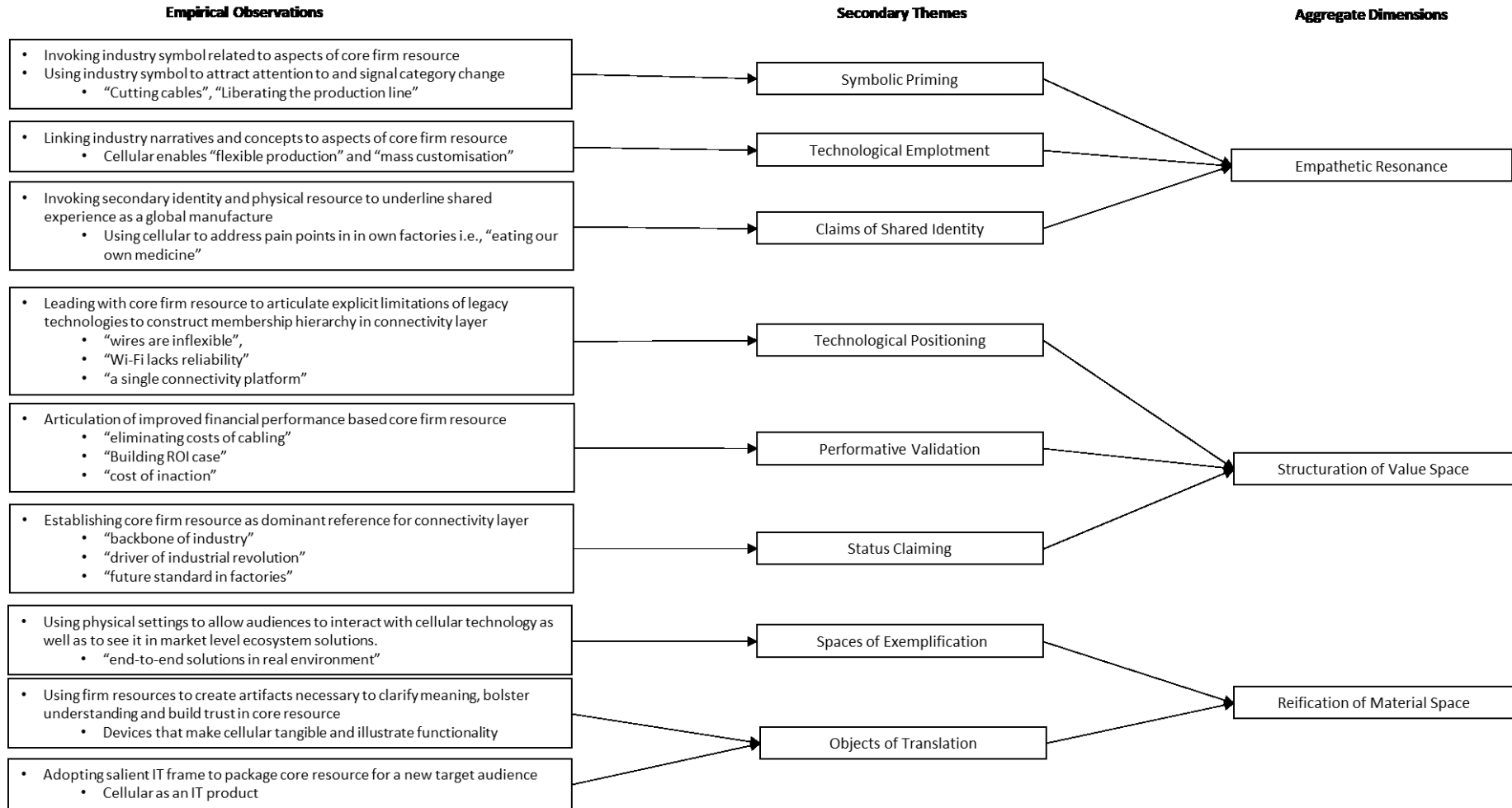
<sup>7</sup> Overall, the codes for visuals were derived from hashtags or text in the case of Twitter, titles on slides in PowerPoints labels, or description of an image (e.g. “cutting cables”, “mass customisation narrative”). The intention was not interpret the image but to describe what it is showing.

*Stage 3:* In the third stage, the focus of the analysis shifted towards refining the emergent theoretical framework by asking, how do each of three themes drive categorisation and what specific resource configurations do they rely on? Linkages between the second-order codes, and between second-order codes and the aggregate dimensions were examined more clearly. This contributed to the partial stabilisation of the data structure. For instance, the first aggregate dimension “empathetic resonance” was derived from three second-order codes, specifically “symbolic priming”, “technological emplotment” and “claims of shared identity” all of which related to Northern Telco’s efforts to set the stage for categorising relying cultural resources to create attention and corresponding meanings. The second dimension, “structuration of value space” was generated by relating three second-order codes, “technological positioning and differentiation”, “performative validation” and “status claiming” capturing Northern Telco’s intention of prominently positioning its core resource within the connectivity layer of smart manufacturing ecosystem.

*Stage 4:* The final stage focused on the last aggregate dimension, “reification of material space” because it provisionally had been derived from three second-order codes “immersive spaces”, “objects of expression” and “objects of translation”. However, noticing the analytical overlap, particularly, between the two objects of expression and translation, the decision was taken to collapse them into one theme, under ‘objects of translation’ and to relabel immersive spaces as “spaces of exemplification” to strengthen the analytical distinctiveness. This decision reflects the theoretical importance of clearly differentiating between the role of material artefacts in emboldening a defining feature of the category on a prototype or product level and creating meaning at an ecosystem level. The final data structure is presented in Figure 4.

To help ensure the credibility of the findings, the author conducted two member-checks with representatives from Northern Telco in March 2020 (Stake, 1995). The first involved approximately a 20-minute presentation followed by a 30-minute discussion with six members of the smart manufacturing team. Overall, the interviewees felt the presented findings were an accurate reflection of their actions. The discussion provided a useful opportunity to gain further insights into the case as well as to inform questions for subsequent interviews. This led to a more refined understanding of how they arrived at the slogan of “cutting the cables” and what significance it had for them. The second member check was with a research manager responsible for the company’s 5G for Industry program. This

individual was given an identical presentation and provided affirmative feedback. The findings of the analysis are presented in the subsequent section.



*Figure 4 Data structure for developing theoretical inferences from raw data*

## 4.4 Findings

This section captures Northern Telco's efforts to construct a new market for its cellular technology under the category label of 'smart wireless manufacturing'. The findings reflect the company's market categorisation activities from the introduction of the category in October 2017 up to July 2020 when the doctoral research concluded. It should be noted, the company's efforts to build the category remain ongoing at the time writing. The findings are organised and discussed according to the following aggregate dimensions: *empathetic resonance*, *structuration of value space* and *reification of material space*. Together, the three dimensions were used to inductively derive a theoretical model of *strategic category shaping*, which explains how a firm makes strategic use of firm specific resources and available cultural resources to shape and define a new market category. The first dimension of *empathetic resonance* is presented next.

### *Empathetic Resonance*

Empathetic resonance refers to a firm's appeals to shared experiences in order to push a market audience to (re)evaluate their expectations and cultural schema regarding what is possible, and desirable. In turn, the aim is to open-up a particular scope for how a new category could be defined, while closing down existing definitions. This dimension relies predominately on the deployment of cultural resources in order to attract attention to the role of connectivity in smart manufacturing, while simultaneously beginning to demarcate the symbolic boundary of smart 'wireless' manufacturing. Based on the analysis, empathetic resonance is comprised of three supporting elements: 1) *symbolic priming*; 2) *technological emplotment*, and 3) *claims of shared identity*. Illustrative quotes and visuals underlying each of the second-order concepts is presented in Table 3.

**Table 3 Supporting Evidence for Aggregate Dimension: Empathetic Resonance**

2 <sup>nd</sup> Order Themes	Illustrative Quotes
<p><i>Symbolic Priming</i></p>	<p>“Cut the cables, unleash Industry 4.0” (Presentation, MWC Shanghai, 2018, 06-2018)</p> <p>We’re cutting cords to capture new value in smart wireless manufacturing at #MWC19 (Company Twitter, 2019-02-28)</p> <p>“So, the future of manufacturing, since we are only contributing with the communication side. Of course, my vision is that in the future, we will laugh about how much cabling we were putting in there. No one will buy a fixed telephone in your home today, why are we still doing it in the factories” (Keynote, HxGN Live 2019, 12-06-2019).</p> <p>Once upon a time, a connected device just meant being plugged in. Today, we're asking who needs wires? #Industry40 (Company Twitter Account 2019-03-29)</p>
<p><i>Technical Employment</i></p>	<p>“...there has been an increasing need for customization to allow manufacturers to differentiate from competitors and broaden their product offerings [...] The final step of the trend is “personalized production.” [...] current processes need to be adapted to be more flexible and customizable [...] High speed wireless infrastructure such as 5G networks can facilitate the modification (required by customized products) of OEM machines with minimal impact” (Company Publication, 5G and Industry 4.0 and Robotics, 2018)</p> <p>“We are talking about wireless connectivity for industrial applications. Third one [...] is about flexibility. We are approaching a new era or machine intelligence and we are building industrial automation for Industry 4.0. This requires much more flexibility in our future factories meaning that we can do mass production of one single unit, on demand for our customers. We believe 5G is the new technology that can solve all these three things” (Promotional Video, 2019-03-25)</p>
<p><i>Claims of Shared Identity</i></p>	<p>...we are not a huge name in manufacturing but we [...] have our own pain points. So, we are not completely a stranger to what it means to be a manufacturer (Interview, 03-12-2018).</p> <p>“Yeah so that is to bring credibility, so if we can show that we are using our own technologies and that we actually we know things about production. Then we are more credible in our message [...] the other side is of course to help our own production increase the productivity in combination by pushing our technology. They can have access to the latest technology from [...] They can feed back into the development loop. They can be very open with its what works and what doesn't work, and they can be open with all the numbers and know exactly how much the savings are and where they are and so on, which might be harder with an external customer.” (Interview, 31-01-2019)</p> <p>“We are also ourselves a major manufacturer of advanced equipment. Northern Telco factories around the world continuously test 5G-enabled technologies.” (Company Website, 2018)</p>

*Symbolic Priming*

At Hannover Messe 2019, the world’s premier industry tradeshow and fair, Northern Telco, and its partner ABB, ceremonially severed an industrial Ethernet cable – the dominate means of connecting machines in factories today and symbolic legacy of Industry 3.0. As an explicit manifestation of Northern Telco’s category label “smart wireless manufacturing”, this symbolic act was a mainstay of the company’s market-making strategy, and consistently re-enacted at press events and media photo-ops (as presented in Figure 5). The gesture was further bolstered by the accompanying metaphor of “cutting the cables”. Together there were employed to draw the attention of manufacturers to the foundational layer of smart manufacturing, connectivity. This was motivated by the relative unimportance assigned to connectivity by



manufactures as well as the predominance of cabled solutions, underscoring the marginal standing of wireless solutions. Northern Telco's slogan was intentionally "in your face" as one Interviewee recounted because "we needed to make some noise" (Interviewee 7b). Given this imperative, metaphors like 'liberating the production line' (Presentation, 09-2019) and 'cables are holding the IoT prisoner' (Executive, IoT Podcast, 08-05-2019) were also deployed to reinforce the idea of not just "untangling" industrial networks but fundamentally "becoming limitless" without cables. From this perspective, the employment of symbolic acts and sharp, provoking metaphors helped to instigate a symbolic break with the boundaries that defined the connectivity landscape within manufacturing (i.e. cabled/wired).



Source: Company Twitter 2019-04-04



Source: Company Blog, 2020-03-06



Source: LinkedIn 2019-09

**Figure 5 Symbolic Priming - "Cutting the Cables"**

While the use of attention-grabbing metaphors reflected the need to direct the gaze of manufactures towards connectivity, at the same time, Northern Telco needed to soften the bluntness of the boundary shift. To do so, it contextualised cutting the cables within the larger

historical evolution of consumers from wired to wireless communication. For instance, conference and client presentations would often feature a black and white image of Stockholm in 1887, depicting a telephone tower with reams of telephone lines connecting to adjacent buildings. The goal of which was to illuminate that manufactures in their personal lives had already cut the cables. This analogy is illustrated from an excerpt from a conference keynote address:

But let's take a step back where do we come from. I mean, based in Stockholm, Sweden, and this is 100 years before I was born. The reality of connecting telephony, which means you put the cable to each and every house. And here it's around 2400 cables to each and every house, initially here in Stockholm. Reality back in the days. Consumers, you are now all wireless. Why would you ever buy fix telephone into your home? I don't think you do that anymore. But the reality in factories is that when you step in there, there are kilometres and kilometres of cabling and as soon as you started connected and the full world of industry 4.0 with IT and OT communication coming together means more and more cabling. So, that's why I have my vision of cutting cables and enabling a full wireless communication for industrial sites (Presentation, IIOT World, 2020-01-16)

This historical analogy and image provided a complementing visual signal to audiences. It by presented the manufacturing industry's transition to wireless connectivity as part of society's continued evolution away from wired connectivity, thus bridging the past with the projected future represented in Northern Telco's category account.

Although the image of discarding wired communication in their private lives serves to cultivate a sense of familiarity, the underlining intention is to begin preparing manufactures to conceive of a world without cables, and what that may mean to them. As an Interviewee shared:

What we are trying to do here with respect to you know removing of cables [...] What happens when you remove all the cables? Then a lot of these customers start talking [...] because that brings the aha factor [...] then it's not about a technical discussion or a technology discussion like what can 3GPP technology do? It's more like a-ha, okay that's the agility you are talking, got it. And then they start discussing. (Interview12).

To this end, symbolic priming involves giving a new audience “a picture they didn't even think of” (Interview 14a) based on existing experiences. Thus, the goal is to begin redefining perceptions of what is possible, while subtly aligning the new symbolic boundary with Northern Telco's core expertise. The next aspect of empathetic resonance uses performance-based concepts from the manufacturing industry to begin explicitly linking the symbolic boundary of wireless connectivity to cellular technology through technological employment.

### Technological Emplotment

To foreground connectivity and the defining element of ‘wireless’ in smart manufacturing, technological emplotment integrates a firm’s core knowledge resource with the aspirational narratives and symbols of a target audience. To begin making wireless connectivity essential and indispensable to manufactures, Northern Telco aligned the trends of 5G and Industry 4.0 using the ‘Industry 4.0 Maturity Index’(Schuch et al., 2017). As a graphical illustration, it lays out a six-stage journey from computerisation (stage 1) to adaptability (stage 6) – the realisation of smart manufacturing (as presented in Figure 6). Importantly, the second stage in the Industry 4.0 Maturity Index is connectivity. This imbued Northern Telco’s claims that “connectivity is the first barrier to Industry 4.0” (Internal Presentation, 2018) with a degree of credibility and provided a cultural resource to frame the discussion on wireless connectivity:

From my perspective, this is fantastic because now we have an industry who have developed the model, which is super smart and the first thing they need or second thing they need is to connect things. Perfect. So, we don't need to develop a model we just have to in quotation marks need to support the industry in the best possible way. So, they have created the demand for solutions, which is pretty good (Interview 23a).

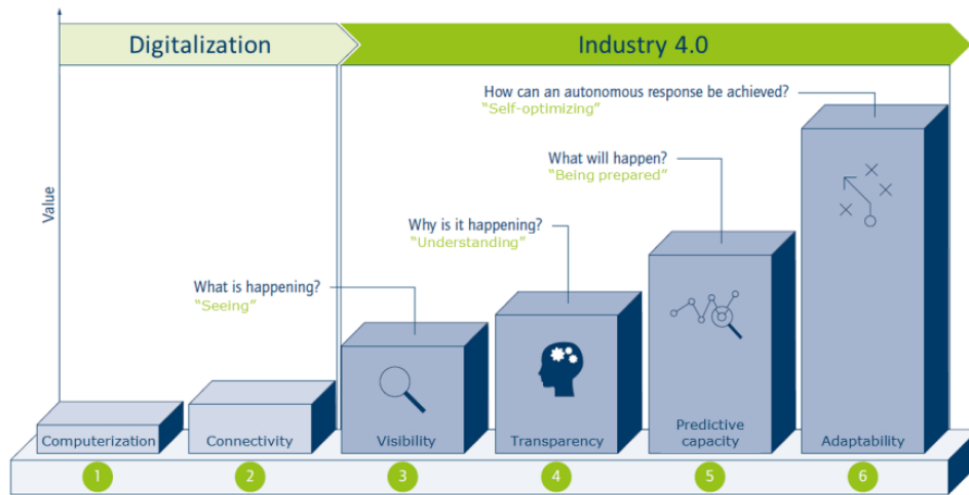


Figure 6 ‘The Industry 4.0 Maturity Index’, Source: Conference Presentation, 2018

While the maturity index reaffirmed the importance of connectivity, it is agnostic regarding the enabling technology. Given the ubiquity of wired solutions, the manufacturing industry was already connected. In order to emphasise the defining attribute of ‘wireless’ connectivity within smart manufacturing, Northern Telco began to directly link wireless, cellular

solutions with the aspirational concepts of “mass customisation” and “flexibility”. This is exemplified in the following two passages, the first is from internal messaging prepared in advance of Mobile World Congress, one of the world’s largest telecommunications trade shows, and the second is an excerpt from a trade publication blog authored by a Northern Telco executive.

*Excerpt one:*

There are 10 million factories in the world today battling bottlenecks, errors and downtime. Combined with an increasing demand for tailored products, there are new requirements for intelligent automation and flexible production. Currently, production lines are wired and contributing assets and workflows are unconnected or unsecure given the limitations of alternative wireless solutions. Leveraging cellular capabilities on the shop floor, manufacturers can redesign their operations with one dedicated wireless network. By replacing wires, interconnecting processes and replacing unnecessary human tasks, we will demonstrate the seamless future of flexible production (Internal Messaging, 2019).

*Excerpt two:*

Powered by innovative cellular IoT solutions, breakthroughs in digitalisation and automation will enable fully digital manufacturing, allowing production to change mid-stream without any disruption. This shift to an ultra-connected, flexible manufacturing process will power hyper-customisation, allowing the end-customer’s product to be uniquely tailored for specific requirements all while meeting demands. Today, when consumers visit big-box stores to purchase a piece of furniture, they can only select from the options the manufacturer has pre-selected. In the future, customers will be able to customise every aspect of that piece of furniture from color to material to fixtures. Only a smart connected manufacturing floor without cables will be suited for this task (Op-ed Smart Industry, 2020-01-10).

The above passages reflect efforts to embed wireless cellular technology into the storyline of manufacturing narratives of flexibility and mass customisation. In doing so, Northern Telco framed cellular as the wireless technology to unlock the “holy grail of Industry 4.0: namely flexibility” (Blog, 12-04-2019).

From a market categorisation perspective, tapping into the aspirational narrative of mass customisation and flexibility serves to not only reinforce the defining symbolic boundary of smart wireless manufacturing, but it begins to articulate to manufactures why the requirements of mass customisation need wireless connectivity. To make manufactures more open and receptive to a new category schema, it was critical for Northern Telco to discursively construct existing

cabled or fixed connections as fundamentally unable to “modernise the factory floor” (Blog, 2020-07-07). By doing so, served to rationalise the need for wireless, cellular technology in smart manufacturing by using aspirational narratives and concepts from the manufacturing industry.

### *Claims of Shared Identity*

In contrast to the first two elements of empathetic resonance, claims of shared identity shifts the strategic focus from provoking audiences to consider an alternative view of what industrial connectivity should be like to why they should believe Northern Telco to deliver on this vision. Claims of shared identity involve a categorising firm invoking a secondary identity aligned with the target audience, in order to bolster the cultural credibility of its proposed category. Outside the domain of smart manufacturing, Northern Telco steadfastly championed its 140-year history of “connecting buildings, people and now things” (Archival Interview, 2019-02-20), subsequently presenting itself as a “leading provider of [ICT]” (Press Release, 26-03-2019) and as a “world leader in 5G” (Press Release, 18-10-2018). Interestingly, throughout Northern Telco’s efforts to construct the category of smart wireless manufacturing, it has frequently claimed to be “one of the truly global manufacturing companies” (Presentation, 2018-02-15). This was illustrated during Hannover Messe in 2019, by a Northern Telco representative, who began her presentation by saying to the crowd:

To those of you thinking what does Northern Telco know about manufacturing, we are a manufacturer [...] We used to make 30 products when we started in the 1800s, now our product portfolio has over a 1000 different products (Presentation, Hannover Messe, 2019).

This identity claim tackles the reality of Northern Telco being relatively unknown within manufacturing circles. In the absence of an established reputation in manufacturing, Northern Telco faced a credibility gap in attempting to create and define a new market for cellular in smart manufacturing:

...so in that respect we don’t have the credibility [...] if we go into the manufacturing business [...] we could help them connect the shop floor, creating again really good logistics solutions or asset management solutions for production flow. Again, we knock on the door of Volvo, and we tell them we can help with manufacturing. They will say we have never ever bought anything from you. We have never heard about you being involved in manufacturing ever before, so why should we trust you (Interview 2).

In response, Northern Telco started to refer more frequently to its own factories in Sweden, China, Estonia and the U.S. as part of an effort to build its perceived credibility with the new target audience. This strategy was explained to Northern Telco employees during an internal information session:

And so, what is Northern Telco's role in all this [smart manufacturing]? Most of you are from Supply, so you are ready know this. But this is to show you when we are talking to external customers, to show that we are a relevant player in manufacturing and we know what we are talking about (Internal presentation, 2018-01).

Based on the above passage, Northern Telco's sought to communicate its understanding of the issues and pressures facing manufactures, not just analytically but through its own lived experience as a manufacturer:

If I go now to a factory and say like, hey we worked in our factory, and we have some use cases, and perhaps something makes sense to you, and the reason we got that success is because we are using a cellular network and then you can have much better. Then you are not talking as a seller. You are more talking about like I have a factory; you have a factory. We have some common problems, let's discuss about this (Interviewer 13).

In this respect, Northern Telco's factories are not just a physical manifestation of the claimed identity as a manufacture, but an important strategic asset that enables them to present themselves as a market insider. They can understand the challenges facing factories because they can talk with production engineers in Tallinn or Nanjing and "they will immediately tell us the issues they are facing, and then when we go to...potential customers, we can talk the same language" (Interviewer 12). In addition to providing a culturally appropriate vocabulary, Northern Telco's factories enable the company to present itself as the lead user of cellular technology through deployments in their own manufacturing operations. By doing so, Northern Telco is attempting to shape end-user perceptions not only through enticing words but demonstrated actions. As a Northern Telco executive commented:

We put our money where our mouth is. So, we test our own systems in our own factories, where we produce Northern Telco products, and we try all things ourselves (Archival Interview, 2019-02-24).

In sum, the three aspects of empathetic resonance discussed – *symbolic priming*, *technological emplotment* and *claims of shared identity* – are important in attracting the attention of a new target, preparing them for category change, while at the same time bolstering perceptions of cultural credibility of the categorising firm. This section focused on Northern

Telco's efforts to set the symbolic boundary for the connectivity in smart manufacturing by layering different cultural resources over the top of its firm resources. The significant use of cultural resources reflected the immediate need to make wireless connectivity relevant to an audience unfamiliar with cellular and Northern Telco. The following section addresses the internal structuring of the proposed category of smart wireless manufacturing by attending to the competitive positioning and social hierarchy.

### ***Structuration of Value Space***

The structuration of value space refers to establishing an internal hierarchy within a proposed category by shaping the criteria audiences use to compare membership claims around the defining attributes of firm's core knowledge resource. This serves to enhance the coherence of a proposed category by grouping technologies likely to claim membership, enabling the differences among category members to be amplified with the goal of presenting rivals as inferior. In the case, the structuration of the value space is primarily driven by the advantages of cellular relative to identified rivals. Accordingly, this dimension is associated with three elements: 1) *technological positioning*; 2) *performative validation*, and 3) *status claiming*. Illustrative quotes are presented in Table 4.

**Table 4 Supporting Evidence for Aggregate Dimension: Structuration of Value Space**

<b>2<sup>nd</sup> Order Themes</b>	<b>Illustrative Quotes</b>
<b>Technical Positioning</b>	<p>“This technology has many network characteristics that are essential for Industry 4.0 with increasingly flexible and complex production processes. It allows for faster data throughput rates and more network capacities, as well as promising highly secure availability. Moreover, ultra-low latency ensures fast response times between equipment in the factory system” (Press Release, 02-08-2018)</p> <p>“Many factories try to connect things via Wi-Fi but are not very successful – because it’s unlicensed and doesn’t scale. It just crashes when it comes up to a certain load. There are no scheduling mechanisms; it’s by best effort [...] With 5G, you cannot lose the connection, you can deliver the reliability, and low latency, and you can also solve the positioning piece. You can combine all of that into one technology” (Executive, IoT Enterprise Insights, 2018-12-03)</p> <p>“Thanks to the ultra-low latency and reliability of 5G URLLC, if a factory worker reaches into the cell the robot will instantly stop, making it safe for personnel not to be harmed whilst working with the machines. This instant response with guaranteed reliability is not possible through traditional Wi-Fi or previous-generation mobile networks, meaning that these machines have historically required restrictive wired technology.” (Company website, 2020)</p>
<b>Performative Validation</b>	<p>“The 5G-enabled blisk case alone can save approximately EUR 27 million for one single factory, and up to EUR 360 million globally [...] From a sustainability perspective, CO2 emissions from both the production of blisk and their operation in jet engines can be reduced by some 16 million tons annually on a global basis” (Press Release, 23-04-2018).</p> <p>The advantage of wireless is that it eliminates the need for costly wiring and cabling. This is not only more expensive and time-consuming to implement (USD 1,500 per workstation), but also more complicated and inflexible in the long run (Blog 2019-11-14)</p> <p>“Based on our calculations, a factory can achieve daily savings of 1 dollar per square meter thanks to 5G technology, which in a factory of 10 000 m2 would equal annual savings of approximately \$4 million” (Report, 2019)</p>
<b>Status Claiming</b>	<p>“So, in one way we believe 5G will have the same fundamental transformation power as electricity, steam and silicon had for the three previous industrial transformations” (Executive Emerging Business, Keynote, Dublin Tech Summit 19, 09-05-2019)</p> <p>“Think how manufacturing was transformed by the first Industrial Revolution. Well 5G will transform industries. It's a global game changer, changer...” (Company Podcast, 23-11-2017)</p> <p>“I think another important aspect, [...] this is not just another network. It’s a platform. I would say it’s the backbone for innovation that will power [...] industrial transformation” (Executive Emerging Business, Conference panel discussion, 28-02-2019)</p> <p>“Or connecting an emergency stop button that is now wireless. When you have as reliable, stable communication you dare to move fully wireless” (Presentation, 2020-07-15)</p>

*Technological Positioning*

*Technological positioning* refers to communicating the distinctive features of a firm’s core knowledge resource to attenuate claims of competitive rivals. Empirically, this reflects the observation that not all connectivity technologies are equal. Therefore, the “choice of connectivity matters” as it determines the “quality and flexibility of a manufacturer’s digital foundation” (Mobility Report 2019 p. 14). As such, Northern Telco’s strategic goal was not only



to establish the superior technical capabilities of cellular but to align its defining attributes as the evaluative criteria manufactures use when assessing connectivity technologies. This was generally tied to casual, evidence-based argumentation reflecting physical properties, drawing attention to features that are quantifiably superior to alternative connectivity technologies, such as speed and network reliability. For instance, one executive recounted during an interview:

...we are just amazed how they [manufactures] come to us and say ... we can't use cabling to all our machines because they move, and they break and can't be maintained. And we can't use Wi-Fi either because it is not reliable enough or it's not short-latency enough, so not fast enough response time (Archival Interview, 2019-02).

Northern Telco associated the distinguishing physical features of cellular with the industry's desired aim of full flexibility and adaptability:

5G technologies provide the network characteristics essential for manufacturing. Low latency and high reliability are needed to support critical applications. High bandwidth and connection density secure ubiquitous connectivity. These are requirements that manufacturers currently rely on fixed-line networks. The mobile 5G technology will allow for higher flexibility, lower cost, and shorter lead times for factory floor production reconfiguration, layout changes, and alterations (Company Website, 2019).

By matching the needs of flexibility and adaptability in factories to the capabilities of 5G, Northern Telco's underscored its technical claim that the physical limitations of competing solutions make the achievement of adaptive and flexible production impossible. For instance, while cables may provide speed and reliability, they are inherently inflexible, placing restrictions on what things in a factory can be connected. Comparatively, existing wireless solutions (e.g. Wi-Fi, Bluetooth, Zigbee, RFID) are constrained by network limitations like speed, coverage, stability which prevents the adoption in support of critical applications and processes in factories (e.g. robots, fabrication). As a result, manufacturers may often rely on a combination of wired and wireless solutions reflecting the need to address both data-intensive (i.e. critical) and non-intensive (i.e. massive) processes. Northern Telco sought to further distinguish cellular by framing it as a "complete digital infrastructure" that provides "one simple, wireless solution" necessary to digitalise industry (Blog, 2018-04-17). The positioning of cellular's capabilities subsequently was not limited to making "wires redundant" but to establish 5G as "a single infrastructure so powerful that it can serve massive, critical and industrial automation use cases" (Report, 2019-02).

The ability of cellular to support the gamut manufacturing applications was tied to cellular solutions using regulated radio spectrum. Northern Telco positioned licensed cellular connectivity as a differentiating technical boundary. Unlicensed solutions like Wi-Fi are subject to “dead spots”, interference and network congestion making it less predictable. As a respondent explained, cellular networks using licensed spectrum give users a degree of control over what things are connected and what the quality of connectivity they receive:

You have an unlicensed solution that is impossible for you to deterministically, to tell, to give your resource directly where you would like to have it. That is your challenge. With then a cellular solution, it will be possible for you to have a deterministic solution. We can say, yes, you will get 20gbps, and you will have a latency of 1ms. And you will get that, independent of what is happening around us. That is impossible with Wi-Fi (Interviewee 14a).

Northern Telco’s emphasis on licensed spectrum aimed at maximising the performance benefits of cellular and differentiating it from other wireless solutions that historically failed to meet the demands of manufacturing environments.

To help validate the technological performance of cellular in manufacturing, Northern Telco pursued a number of high-status partnerships and collaborations with automobile manufactures likes Audi, Mercedes and Volvo, industrial robotics firms such as Comau and ABB, and others like SKF and Atlas Copco. Northern Telco entered over 40 5G industrial collaborations, providing important proof for both manufactures and Northern Telco. Collaborations were observed to fulfil a number of functions in addition to demonstrating the capabilities of cellular, such as developing appropriate technical requirements, informing product development and getting manufactures to begin experimenting with of 5G “to see what is possible” (Press Release, 2018-08-02; Enterprise IoT Insights, 2018-08-08). These relational arrangements were critical in boosting the visibility of Northern Telco and 5G. For instance, an Interviewee noted that following the announced partnership with ABB, “Siemens was knocking at our door the very next day” (Interview 7b). The partnerships were equally essential to validating the technological case for adopting cellular.

### *Performative Validation*

As a necessary complement to the technological positioning and differentiation discussed above, *performative validation* strikes at the heart of why a manufacture should adopt cellular-enabled solutions. In other words, “if we invest in a private cellular network, what is the business

impact on our bottom line?” (LinkedIn Post, 2020-03-19). Performative validation involves translating the capabilities of a firm’s core knowledge resources into demonstrated and recognisable performance benefits. Northern Telco had consistently associated the adoption of cellular with performance goals of enhanced productivity, efficiency and profitability. However, the generation of observable results and proof of added value turned out to be a gradual process, which is still ongoing at time of writing. This reflects the nascency of 5G and the extensive trial periods needed.

Stepping beyond the high-level projections from market analysts regarding the anticipated benefits of smart manufacturing, Northern Telco initially highlighted cost savings from eliminating cables. For instance, allowing manufactures to “decrease costs by removing cables and maintenance [...] the cost for installing cables are approx. 200€ per meter” (Internal Business Guide, 2018-03). Additionally, Northern Telco also highlighted the comparatively higher cost of ownership of Wi-Fi, reflecting on average the need for four times as many access points to support a network in a typical factory (Report, 2020). To elaborate on the performative benefits of going wireless, Northern Telco would often draw upon on a case from its Nanjing factory, where the connection of a 1,000 precision screwdrivers with cellular-enabled sensors permitted the tools “to be recalibrated based on their actual use rather than on a predetermined periodic basis” which “cut manual maintenance work in half, saving US\$10,000 annually” (Report, 2018).

Northern Telco pursued a number of profile-raising collaborations to showcase the performative benefits of cellular adoption. For example, a collaboration with a jet engine manufacturer involved connecting sensors to a precision milling machine with a 5G network. This enabled real-time monitoring and for optimising the production process of a jet engine turbine blade. The technical attributes of 5G (i.e. ultra-low latency and high reliability), allowed for decreases in the process design time by 75 per cent, generating an estimated annualised savings of EUR 27 million for a single factory (Report, 2018). While this case was able to demonstrate the business of the value of 5G networks, it represented an “extreme example”. As such, to help cement the value of cellular, Northern Telco partnered with market intermediaries to act as validators of the economic benefits of adopting cellular.

Towards the end of 2019, Northern Telco began commissioning reports from ABI Research, with the first report (November 2019) addressing “why and how connectivity drives

future profitability and growth”. The second report (May 2020) sought to project the return on investment for specific smart manufacturing use cases (e.g. asset tracking, augmented reality, condition-based monitoring) enabled by cellular connectivity. Together these reports provided an independent source of validation that contributes to building the empirical credibility of Northern Telco’s market claims. For instance, ABI Research calculated that the move to private cellular has the potential to increase a factory’s gross margins by 5-13 per cent (Report, 2019). In addition, Northern Telco partnered with KPMG (March 2020) to further articulate the business value of cellular and 5G enabled solutions. The aim of the partnership is to develop tailored 5G uses cases that generate quantifiable values for implementing manufactures. This testifies to a gradual effort to demonstrate the economic value of adopting cellular technology, first by delivering on examples from its own factories, and then gradually through the work with intermediaries that help to deliver generalised business cases for manufacturers at large.

Given the emerging technological and economic evidence indicating both the suitability and value of cellular, Northern Telco used this empirical foundation to lay the groundwork for claiming 5G as the dominant referent for connectivity in smart manufacturing.

### *Status Claiming*

*Status claiming* refers to efforts to position a firm’s core knowledge resource as the dominant referent for a category. From an advantage seeking perspective, status claiming serves to reinforce the positioning and the performative value of cellular. Specifically, it represents another means of influencing the social hierarchy within the category. Northern Telco frequently leveraged the anticipated and demonstrated capabilities of 5G to pre-emptively project its historical legacy not just as another G but the one that transformed industry. In this respect, the role and significance of 5G is proposed to extend beyond “opening the door to a new era in manufacturing” (Press Release, 2019-06-20) but fundamentally establishing a new “digital backbone” for industry. When speaking at conferences, Northern Telco representatives would embolden the centrality of cellular in smart manufacturing, presenting 5G in a line of historical succession alongside technologies of past industrial revolutions, which is illustrated in the quote below:

So, in one way, we believe 5G will have the same fundamental transformation power as electricity, steam, and silicon had for the three previous industrial transformations (Keynote, 09-05-2019).

This assertion regarding the consequential impact of 5G is further exemplified during a recorded panel discussion in which a Northern Telco executive declared, “Industry 4.0 will not happen without Northern Telco. The industry needs connectivity with 5G” (Panel Discussion, 2019-02-04).

Accordingly, the status claiming observed can be understood as serving two functions. First, the repeated references to 5G being the technology of the industrial revolution contributes to affixing associations of cellular connectivity with the domain of smart manufacturing. This generated new symbolic associations with cellular beyond consumers and handsets. Specifically, reflecting Northern Telco’s ambitions to show audiences that previous generations of cellular were made for humans, 5G is “made for machines” (Internal presentation, 2018-01). This emphasis on 5G as an industrial-grade connectivity technology further distinguished it from “office” or “home” technologies like Wi-Fi.

Second, the status claims are part of an effort to construct a favourable schema where 5G leads connectivity technologies in smart manufacturing. To cultivate the perception of 5G as an apex technology, Northern Telco attempted to amplify the distinctive technological capabilities of 5G by suggesting manufactures can now make wireless emergency stop buttons (as presented in Figure 7):

What is the killer application with 5G, and you start to think about let’s have that robot moving around, and they do crazy stuff, and I mean then it turned out to be something that is so small like this [holding emergency stop button]... this is an example of when wireless communication becomes so stable, reliable and secure that you dare to cut the wire to an emergency stop (Presentation, IIOT World, 2020-01-16).



*Figure 7 Making the Emergency Stop Wireless, Webinar 2020-07-15*

By invoking a visual symbol intimately tied to safety and welling workers in industrial environments reflected a deliberate attempt to reinforce the differentiating capabilities of 5G. Additionally, it severed to build the intensity of the category's symbolic boundaries. Status claiming acts to reinforce the technological positioning and performative benefits of 5G within the category of smart wireless manufacturing.

Together the three elements discussed in this section – *technological positioning*, *performative benefits* and *status claiming* contribute to structuring the value space of the category by presenting audiences with criteria to both group like technologies as well as to stratify membership claims. The construction of value is relationally defined as the evaluative criteria Northern Telco is presenting to audiences is built on the relative benefits of 5G compared to with identified alternatives. Subsequently, this dimension is explicitly driven by Northern Telco's core knowledge resources with cultural resources being used in a supportive function. As such, this dimension can be understood as having an exposed resource structure, where the core knowledge resources of the firm are central and dominant.

The two aggregate dimensions of strategic category shaping discussed so far – *empathetic resonance* and *structuration of value space* – have established the defining symbolic features and the membership and social structure of smart wireless manufacturing. Comparatively, the next and final findings subsection, the *reification of material space* examines how Northern Telco uses different material elements to clarify the meaning of cellular connectivity and to shape perceptions of the category's fit within the smart manufacturing ecosystem.

### ***The Reification of Material Space***

This dimension addresses the link between the identity of the proposed category and its material form, thereby seeking to resolve questions, such as what does smart 'wireless' manufacturing look like and how does it work? The *reification of material space*, hence refers to the use of settings and artefacts to shape meaning with a view to enhancing the understanding of the attributes of the category and fit within an ecosystem. This requires the curation of firm and cultural resources to materially "show" solutions and to make the proposed category appear sufficiently "real". Accordingly, the reification of material space is comprised of two elements: 1) *spaces of exemplification*; and 2) *objects of translation*. These two elements are discussed in turn in the following paragraphs. Supporting evidence is presented in Table 5.

**Table 5 Supporting Evidence for Aggregate Dimension: Reification of Material Space**

2 <sup>nd</sup> Order Themes	Illustrative Quotes
<i>Spaces of exemplification</i>	<p>“The adoption of cellular networks for connectivity in the manufacturing industry is dependent on how well [...] smart wireless manufacturing is described in an actual manufacturing context” (Mobility report, Nov 2018 p. 27)</p> <p>“We show them what, how are we doing things [...] even if they know production very well, it's good to start with that. Then we show the cases that we have done and explain that they can start to imagine that on to their own production [...] we come down to the use cases much faster when we bring them into the real environment, and they start to see what things there are compared to only a PowerPoint” (Interview 21a)</p> <p>“And in this what we call the ecosystem where we have a large number of players that are represented for example on our production floor here. There are companies that are bringing different values. So, some are focused on the devices. Others are focused more on the control software. And then, we basically bring the ecosystem together to create an end-to-end system, so that values are created that are contributing to a digitalization, increased efficiency as an example [...] the automatically guided vehicles[...] this use case alone has a number of players [...] the manufacturers of the sensors, the manufacturers of the video cameras those that have actually the connectivity layer towards the 5G network, the AGV itself. So, I could list like 20 players that make up one of those use cases” (Centre of Excellence for Industry 4.0, YouTube)</p>
<i>Objects of Translation</i>	<p>“But the idea is that let's make it as simple as possible and therefore the leap in the technical understanding that your IT department has does it need to be a quantum. It can be like a small step to say, I know kind of how other wireless technology. So, if I put in a Wi-Fi, I kind of know how that works. I know how that works very well, therefore if I have a small step to get added security, better reliability all of those things and I conceptually have a very similar way of working, it's much easier grab for a bigger percentage of this customer market (Interview 19b)”</p> <p>“The Watchdog application does multiple jobs at once, main job is to provide measurements for the network quality, signal strength and latency [...] This is integral for the customers perception and experience of the system. Otherwise they don't get a quality feeling on the network at all. If anything is troubling, in any use case, it is always the new technology, the last, major change. With the watchdog we can show and prove the quality of the network and issues are more differentiated analyzed and not every trouble is related to the cellular network, especially if the watchdog proves good quality during any other issues. – important for acceptance of the solutions and transparency” (Email, 2020-06-22)</p> <p>“The demonstration [...] showcases human-robot collaboration and control over wide distances utilizing the real-time communication capabilities of 5G. Text and names can be written by visitors at one demo station and mirrored in real time by the second robot writing on sand 1.5km away [...] the demo is designed to show delegates the power of 5G to replace traditional wired industrial set-ups and to highlight the role of humans-robot collaboration in smart manufacturing” (Press Release, 2020-01-21)</p>

*Spaces of Exemplification*

Spaces of exemplification involve materialising the category’s identity through the creation of representative settings enabling audiences to interact with and experience a firm’s core resources as part of a market level ecosystem. Northern Telco’s effort to construct spaces of exemplification is demonstrated by the creation of its own 5G smart factories to show the commercial feasibility of cellular for smart wireless manufacturing:

We took the step to really start up a new factory, really showcase factory for the future [...] the factory in Lewisville, Texas where we will be producing our products – radios, basements in a fully automated factory. A real factory that shows what it would mean to produce for the future. So, production of our own equipment in the U.S. for the US in a factory of the future (Recorded Presentation, 2019-10-23).

Northern Telco's factories along with its 'Industry 4.0 Centre of Excellence' and its involvement in '5G-Industry Campus Europe' provided a range of immersive settings of varying scales (7,000m<sup>2</sup>-28,000m<sup>2</sup>) permitting audiences, such as network operators, manufactures, system integrators and solution providers to engage with a physical environment reflecting their category schema of smart wireless manufacturing. A key aspect of fostering the acceptance of a wireless vision of connectivity in smart manufacturing was to make it more tangible:

It's mostly to put them in the right environment [...] to bring them in a real environment where you can talk about the problems, you can get very hands-on, and you can see these are the problems you have with material handling. Here you can actually see the boxes. You can see how it [cellular] works with the screwdrivers, how they operate. So, it makes it [cellular] more concrete [...], so when you can talk about the challenges, in the real environment, it becomes really powerful (Interview 21b).

Spaces of exemplification enabled the development, testing and showcasing of end-to-end solutions involving contributions from the different layers of the smart manufacturing ecosystem. For instance, using its Swedish factory as a large-scale demonstrator, Northern Telco was able to materialise an end-to-end solution:

Of course, we already have a lot of people coming here walking through the factory. So, the idea is to build kind of a demonstrator for them to be able to look into all the different partnerships and basically to show how the end-to-end solution would look like in their own factory. Or, if there is one of our customers then they would look, how would this work for them, when they want to go to manufacture and sell this (Interview 5a).

From a Northern Telco perspective, the demonstrators were essential in demarcating the value of cellular as part of a smart manufacturing solution (e.g. asset monitoring, precise location, automated guided vehicles) while also emboldening its place within the ecosystem. The quote below testifies to the creation of an exemplar ecosystem with partners to show the fit of cellular:

The production facility in Kista [...] we're also talking to the partner ecosystem we have for our smart manufacturing system to say okay how do we can we show both of our strengths together here in this path [...] we will have more and more partners coming in installing their soft software solutions, together with our connectivity solution and then showing the value of cellular in combination with existing, I mean we have the shop floor, and we have applications that we are already running in the factory. So, you're basically stitching that together with the partners (Interview 8).

This quote underscores the necessity of constructing a facsimile market ecosystem in which stakeholders and audiences can understand and evaluate cellular as part of a total solution. Additional visual evidence of the ecosystem is presented in Figure 8. While Northern Telco



sought to use large-scale spaces to materialise the proposed category of smart wireless manufacturing, it also deployed other artefacts, specifically *objects of translation* to reinforce distinguishing aspects of the domain's identity, which is discussed next.

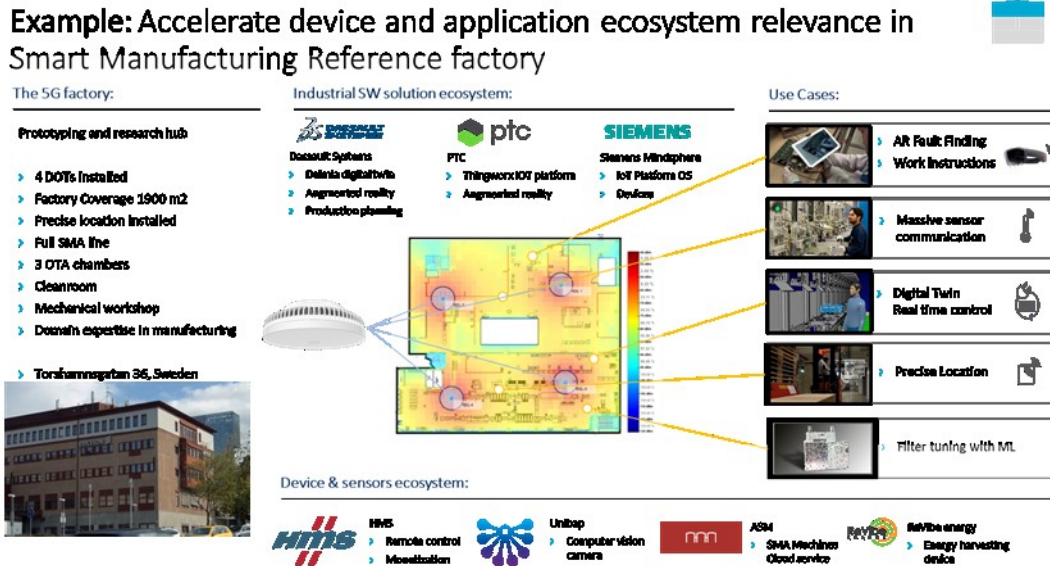


Figure 8 Smart Manufacturing Demonstrator, Internal Presentation 2018-01-27

### Objects of Translation

*Objects of translation* are artefacts illustrate defining aspects of a proposed category and advance designs aligned with the audience's cultural repertoire. In this respect, objects of translation are deployed to reduce cognitive uncertainties by providing audiences with material instantiations of the proposed category. They were used communicate defining features of cellular connectivity and to foster feelings of trust in the technology. The absence of tangibility of cellular connectivity takes on a degree of significance given the limited confidence in wireless technologies among manufactures as a result of historical experiences with technologies like Wi-Fi. Thus, the transition from cables to wireless requires instilling a sense of trust that the technology will work:

If you have cable. It's usually the physical feeling that I put in the cable. I know it works. It is the physical element. When you have connected it wirelessly, you can't really touch and feel it. So, there is an underlying uncertainty out there, if you connect stuff wirelessly, does it really work? (Webinar, 2020-06-10).

To address this concern, Northern Telco developed a smartphone application “The Watch Dog” designed to help users monitor their wireless network. As a diagnostic tool, it provides visual indicators of network quality like latency in terms of quantified measures or an overall status expressed in colours (red, yellow, green) (Internal User Guide, 2020). In turn, as an object of translation, the app enables users to “see the performance” of the network. This underlines an effort to cultivate a feeling or sense of comfort with going fully wireless given the departure from what manufactures are used to:

A good thing that we learned as we moved into industries, there needs to be a compliment because you can't really touch the wireless. While before you had a cable, it was very clear if it was connected or not. This helps you to get that feeling (Webinar, 2020-07-15).

Forms of expression were not limited to visualising how a network is functioning but critically demonstrating the capabilities of cellular by creating experiences where audiences can “feel the contrast in capabilities” (Blog 2019-04-12). Generally, this pertained to the development of conference demos, where the intention is to educate audiences about how the technology functions. By doing so, conference demos serve to illustrate the defining attributes of 5G that are essential to evaluating connectivity for smart manufacturing. For instance, at Mobile World Congress and Hannover Messe in 2019, Northern Telco demoed an eight-legged robotic spider with each limb individually connected to the cloud. With all the motion control in the cloud, the demo showed that when connected with 5G, all the robot's legs could be synchronised, enabling it to “dance” smoothly, in a prefigured pattern. When the robot was connected with 4G, however, it became “disjointed, slow, and unable to keep the beat” reflecting the higher latency (Blog 2019-02-27). The underlying intention of the demonstration was to create a “visible effect” that illustrates the importance of low latencies for industrial automation and the technical benefits of 5G (Blog, 2019-03-20). Given the newness of 5G and limited exposure to cellular in manufacturing settings, Northern Telco needed illustrative demos to instantiate meaning:

We have to demonstrate something [...] If you just talk about technology, what it has to offer that excites them. But that's not really enough to take the next step. But if you show them something, then the message starts getting through. (Interview 12).

In addition, Northern Telco also altered the market form or packaging of cellular to be commensurate with knowledge schema of manufactures, and new arrangements of exchange.

The element of translation underlines the change in developing and selling macro networks for mobile network operators to building miniaturised, private networks for new actors, such as system integrators and manufactures. The subsequent question became how to ‘productify’ cellular such that it can be easily adopted by manufactures and be distributed within the emerging smart manufacturing ecosystem. One of the immediate challenges confronting Northern Telco was its existing offerings were “high performing, but historically complex telco products” (Blog 2018-12-06):

...normally our products are quite powerful, and you can use them for a variety of use cases, but for this specific industry [manufacturing] you just don't want to configure 20,000 parameters, you just want to plug it in, and it should run (Interview 15a).

The need to reduce complexity was further exemplified during an internal employee briefing when an employee asked one of the participating executives if manufactures had the competence to manage their own networks:

*BTEB Executive:* ...based on the current offering, no, they don't. Actually, it is quite different compared to any network they have managed. That's why we are pushed back to that mission, how can you get a network that is so simple that a non-telco person can actually deploy it in one hour [...] it has to be a mindset now that a network can be managed and controlled by the local factory (Internal Event, 2018-11-12).

To convert a telco product into one appropriate for a manufacturing audience highlights the second association with objects of translation, emulation. Emulation was observed in Northern Telco's decision to package its new market offering – ‘Industry Connect’ in the form of an IT product. This reflected the understanding that in manufacturing plants, it would be IT departments who would typically be responsible for managing the network. Given this, the design of Industry Connect intentionally emulated the look and feel of a Wi-Fi product because as one Interviewee explained, only people in telecom have ever seen, run and maintained a cellular network. But “everyone knows about Wi-Fi, and they know they can set up a Wi-Fi hotspot or Wi-Fi at home quite simply” (Interviewee 13). Thus, the intention was to align Industry Connect with the existing knowledge-base in manufacturing:

The IT organization for a manufacturer [...] they are used to say running a Wi-Fi network, and there are certain things that they're used to doing, so we tried to base our system to look more like that. So, it's easy for them [...] There's a lot of things that just happen automatically to make it much easier to use (Interview 16).

The emulation of an IT product, specifically Wi-Fi, reflects its cultural salience as a technology with a socially recognised form and established practices (i.e. set-up and troubleshooting). Despite directly competing with cellular, and Northern Telco's efforts to highlight its inability to enable smart manufacturing, Wi-Fi was nonetheless the de-facto referent for wireless technology in manufacturing. This was evidenced in the Industry Connect business guide created for Northern Telco employees, which uses Wi-Fi as a point of reference for explaining aspects of the market offering. For instance, one excerpt in the document states, the "product provides [...] usability and IT integration points expected from modern enterprise Wi-Fi systems" while another states "like any modern Enterprise Wi-Fi system, Industry Connect keeps all industrial-traffic on-premise, and under enterprise IT control..." (Internal, Business Guide, 2019).

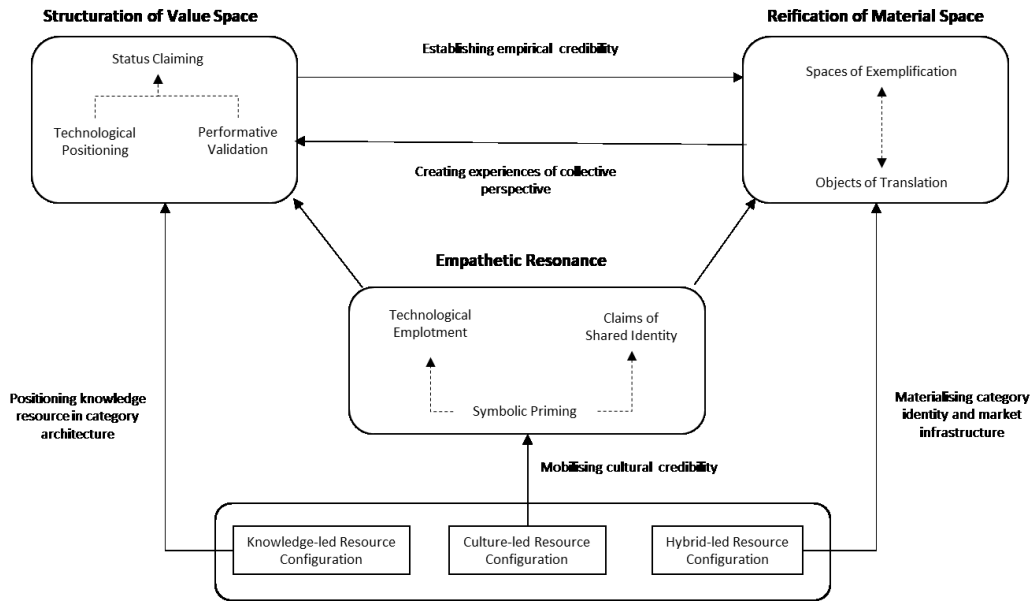
In summary, the *reification of material space* draws upon *spaces of exemplification* and *objects of translation* to clarify the meaning of cellular, the defining features of the category, and to show the fit within the smart manufacturing ecosystem. As such, this dimension relies on selective bundling of both firm-specific knowledge resources and cultural resources to construct both spaces and artefacts that provide tangible, guiding representations of the category.

When the three aggregate dimensions are viewed holistically, they each contribute to a critical aspect that enables the formation and shaping of a new market category. In bringing together the dimensions of *empathetic resonance*, *structuration of value space*, and *reification of material space*, a model of strategic category shaping is developed and is presented next.

#### **4.4.2 Theoretical Model: Strategic Category Shaping**

Based on the presented findings, this section introduces the theoretical model of *strategic category shaping* that explains how firms integrate firm-specific and cultural resources in their efforts to create and favourably define new categories. Specifically, the model theorises that firms attempt to combine different resources to shape the categorisation of new markets around their core knowledge resources. For the purposes of discussion, core knowledge resources are those that define the expertise of a firm, and upon which they seek to leverage competitive advantages from. The theoretical model incorporates three aggregate dimensions: *empathetic resonance*, *structuration of value space* and *reification of material space*. Each of the three dimensions is supported by a specific resource configuration: *culture-led*, *knowledge-led*, and *hybrid-led*. As depicted in the model, empathetic resonance is theorised as a precondition for

enabling the other two dimensions, which are discussed in turn. The theoretical model of strategic category shaping is presented in Figure 9.



**Figure 9 Model of Strategic Category Shaping**

*Empathetic Resonance: Mobilising Cultural Credibility*

Empathetic resonance refers to appeals to a shared experience in order to push a new market audience to re-evaluate their expectations and cultural schema regarding what is possible and how a new category ought to be defined. The generation of empathetic resonance is a dominant meaning-making activity characterised by a culture-led resource configuration. It relies on using available frames, narratives and visual symbols to attract the attention of a target audience and to build cultural credibility, such that a proposed categorisation is perceived to be “optimally novel” in solving an audience’s problem (McDonnell, 2014); while also being in “sync” with their experiences and the understandings of the prevailing social context (Giorgi, 2017). To do so, requires the selective packaging of cultural resources that are embed with references to a firm’s knowledges. Accordingly, the structure of this resource configuration is layered as a firm’s knowledge resources are concealed within cultural resources that are deployed.

A culture-led resource configuration is necessary during the initial stages of strategic category shaping because a firm’s knowledge resources may not immediately resonate or register

with a new target audience. Initially a firm's knowledge resources may be deemed incommensurate with the existing knowledge and experience of a target audience. While this may result in an initial misalignment, this is not necessarily detrimental because the intention is to present audiences with a novel schema that asks them to see their world in a new light (Bail, 2016; McDonnell et al., 2017; Pontikes and Rindova, 2020). Therefore, the aim is to attract attention, provoke interest and trigger a subsequent discussion enabling the introduction of a firm's core knowledge resources (Baden and David, 2018). It is for this reason that a firm's core knowledge resources are camouflaged, for instance, in the motivational or aspirational narratives and concepts familiar to the audience. This is essential for them to begin updating their beliefs regarding what is possible. Cultural resources are thus required to make a proposed categorisation enticing to the target audience but also to cultivate cultural credibility.

The resource configuration underpinning empathetic resonance contributes to strategic category shaping through the three corresponding actions. First, symbolic priming acts as a form of market staging, directing attention to a new point of symbolic demarcation. This lays the groundwork for introducing the knowledge resources of a firm. Second, technological emplotment addresses the issue of a categorising firm and its knowledge resources being perceived as unfamiliar or incommensurate to a target audience, by activating motivational or aspirational concepts from the audience's cultural repertoire in an effort to put them in "a high energy state" (Hannan et al., 2007 p. 45). This makes the audience more receptive to thinking differently about existing schemas and beliefs (Glynn and Navis, 2013; Hsu and Grodal, 2015). Third, claims of a shared identity invites the audience to feel more comfortable with a new category schema proposed by someone they can identify with (Heaney and Rojas, 2014). In such cases, the credibility of identity claims is likely to be tied to a firm's ability to demonstrate an empathetic understanding of the target audience.

#### *Structuration of Value Space: Positioning in Category Architecture*

Structuration of value space involves shaping the evaluative criteria used by audiences around the defining attributes of a firm's knowledge resources. It is an advantage-seeking activity in which a categorising firm attempts to centrally position its knowledge resources to advance its desired category definition. The knowledge-led configuration is characterised by an exposed resource structure to explicitly showcase a firm's core knowledge resources. Given this,

cultural resources are peripheral and referential. Through technological positioning and performative considerations, structuration of the value space seeks to establish the centrality of firm's core knowledge resources by filling in incomplete understandings as well as influencing the preferences of a new target audience through rationalised accounts and casual argumentation. From this perspective, the ability to increase the relative value of a firm's core knowledge resources is tied to the efficacy by which it can address the problems of a target audience. This emphasises cognitive appeals to empirical validation and "proof." By so doing, the enables a firm to present claims as "objective truths" that are aligned with the goals and needs of the audience. The use of causal argumentation enables firms to provide audience with evaluative criteria that appear less socially constructed and thereby less open to negotiation (Pontikes and Kim, 2017).

The three supporting acts underpinning this dimension are necessary for the structuration of the category's value space. Technological positioning and differentiation, first, involves identifying competitive rivals likely to claim membership or be associated with the category. By grouping like members, a categorising firm can relationally define and start to empirically distinguish their core knowledge resources vis-à-vis competing alternatives. To create a favourable categorical structure, a categorising firm will likely leverage defining but quantifiable attributes of its core resource's superiority (e.g., speed) to shape the evaluative criteria provided to audiences. Technological differentiation is tied to observable physical characteristics which audiences can use to make sense of membership claims in the proposed category contributing to a status ordering effect among membership claims based on casually evidenced differences.

The second supporting act, performative validation, is theorised to occur concurrently with technological positioning and differentiation. As a complementing and reinforcing activity, it links a firm's core knowledge resource to the performative logics of a target audience. From this perspective, the construction and evaluation of value tied to a firm's core knowledge resources extends beyond technical capabilities and is grounded in rationalised accounts of economic optimisation. The centrality of a firm's core knowledge resource within a proposed category's social hierarchy is bolstered by empirical accounts of enhanced economic performance, which embolden the differences between membership claims.

The final supporting element, status claiming, is a logical symbolic extension of the technological and economic claims represented in the two previous acts. Status claiming seeks to

reinforce the centrality of a firm's core knowledge resource by invoking symbols of cultural significance to help sediment its position as the category's dominant referent. In this respect, status claiming strengthens the proposed social hierarchy advanced by the categorising firm. That said, the structuration of the value space contributes to the overall viability of the proposed categorisation by supporting internal coherence reflected in the stratification of membership claims based on amplified technological and performative differences.

*Reification of Material Space: Materialising Category Identity and Market Infrastructure*

The reification of material space refers to the use of settings and artefacts to shape meaning necessary to clarify and bolster understanding of the attributes, product design and the category's fit within an ecosystem. Unlike the two previous aggregate dimensions, this one is theorised to have a hybrid resource configuration, insofar as both firm and cultural resources are foregrounded. The hybrid configuration reflects a curated resource structure, illuminating the selective presentation of firm and cultural resources to materially embody and represent the category's identity and value structure. This is theorised to anchor the sense-making of audiences, such that a proposed category can be seen as real by providing tangible instantiations that ground audience evaluations in what they see and touch. In this respect, the reification of material space is driven by both advantage-seeking and meaning-making, in part to pragmatically address the need to generate empirical credibility and reduce causal ambiguity regarding the efficacy of a firm's core knowledge resources. But more broadly to create experiences of collective perspective that permit audiences and stakeholders to see the value in adopting a proposed category schema.

Objects of translation facilitate the substantiation of casual arguments and the illustration distinctive features of a category in relation to the knowledge resources of the firm. They are selective representations utilising recognisable forms and performative demonstrations to cultivate familiarity and to create cognitive impressions that support and enable audiences to update their cultural/knowledge schemas. In this respect, objects of translation can reduce the cognitive barriers regarding the commensurability of a firm's core knowledge resources in a new market category.

The reification of material space further helps a firm to create a new category within market ecosystems, where a market solution is not a standalone product but an amalgam of



different knowledge resources from various actors across the category ecosystem. A firm seeking to shape the definition of their proximate category, therefore, requires interactions with other actors in the field to address uncertainties regarding how sets of relationships are configured to create value. Considering this, the second supporting element of this dimension, *spaces of exemplification* is posited to materialise the entire value space at an ecosystem/market level. To this end, spaces of exemplification are not limited to providing audiences with a category exemplar but importantly presenting representative settings to show the “big picture” (Comi and Whyte, 2017) that extends beyond any one producer’s product. By materialising the entire value space, a categorising firm can trigger a process of collective meaning-making, where complementing stakeholders can interact to identify technological shortcomings, transactional misalignments and more generally reduce incomplete information that may potentially constrain the growth of a proposed category. Thereby also contributing to settling the meaning of the larger categorical system. For example, by clarifying the meaning of smart wireless manufacturing or cellular as the proposed referent for connectivity, the meaning of smart manufacturing more broadly becomes more stabilised.

## **4.5 Discussion**

This study explores how firms can make use of firm-specific resources and cultural resources to shape the categorisation of a new market to advance their competitive interests. Although elements of the findings are congruent with past examinations of strategic categorisation (Santos and Eisenhardt, 2009; Navis and Glynn, 2010; Kodeih et al., 2018; Ozcan and Gurses, 2018), they also differ illuminating the role distinct resource types and configurations that enable various acts of categorisation necessary to create and define a new market space. As such, the findings of this study have important implications for the literature on strategic categorisation. The discussion of the implications from this study are thematically organised as follows: *resourcing category shaping, material and visual resources of meaning-making, and the generation of resonance and social facticity.*

### *Resourcing Strategic Category Shaping*

This research addresses the limited attention in the literature concerning the ways firms shape the definitions of new categories (Pontikes, 2018; Delmestri et al., 2020) as well as the

role of firm resources in the processes of market categorisation (Durand and Boulongne, 2017). The findings this research contribute to reconceptualising strategic categorisation a resource laden undertaking reflecting the use of both firm and cultural resources. This reflects the idea that firms compete using their specific resource stock but require cultural resources to make their market offerings meaningful and appealing to target audiences. Prior research on market categorisation has drawn attention to importance of cultural resources as part an active symbolic management strategy to gain the attention of audiences and to make novel innovations comprehensible (Hargadon and Douglas, 2001; Navis and Glynn, 2010; Suarez et al., 2015). The presented findings add nuance to the use of cultural resources in processes of strategic categorisation insofar as not just communicating how a proposed category schema fits or is aligned with audience expectations but using the aspirational content from their cultural repertoire to displace existing schema. Thus, at the outset, cultural-led resource configurations are essential for establishing the category boundaries as well as creating the strategic space in which to define other distinguishing features of the category. From there, a firm can advance a knowledge-led resource configuration, which in turn influences the valuation criteria used by audiences. The findings indicated the structuration of the value space is aided by the mobilisation of intermediaries to validate the technological and performative claims associated with the proposed categorisation. Together, the aggregate dimensions of empathetic resonance and structuration of value space can be considered part of an “audience-centric strategy” while reification of material space can viewed a “product-centric strategy” (Kodeih et al., 2018). As such, the findings underpinning the model support the assumption that firms may pursue both strategies concurrently when engaging in strategic categorisation.

Additionally, the concept of strategically category shaping also contributes to understanding the link between the conceptual combinations exemplified in the category schema firm’s promote and their resource base (Durand and Boulongne, 2017). The findings indicate that firms are likely to advance conceptual combinations that maximise the value of their core knowledge resources. In part, this aligns with theorised considerations regarding why firms engage in category creation (Durand and Khaire, 2017). While a category may be defined around the knowledge core resources, evidence from examined case suggests the construction of it, symbolically and materially is likely to require deployment of secondary firm-specific resources. Resources that a firm may not compete on but are valuable in shaping meaning and garnering

legitimacy (Barney and Arkan, 2001). In this respect, the literature has highlighted that firms invoke secondary identities to claim membership in proximate categories (Vergne, 2012; Wry and Lounsbury, 2013). The findings suggest that identity is an important secondary resource in contributing to perceptions of plausibility and bolstering cultural credibility, however, it also grounded in tangible resources, such as an existing manufacturing plant. As such, the findings from the case extend theorising on category creation insofar as suggesting firms construct new categories to maximise the value core of their knowledges, while also maximising the contributions from their secondary tangible and intangible resources.

When strategic categorisation is approached through a resource lens broadens the emphasis from just considering the plausible fit between a category and a firm's core knowledge resources to the linkages between firm-specific resources (core and secondary) and a category. Thus, firms are likely to be better able to build and shape new market categories, when the perceived plausibility or fit is high, and the number of linkages across a firm's resource base is also high. In this ideal situation, firms benefit from a degree of social acceptance and the limited need to invest in developing or acquiring new resources and capabilities. As such, affords credibility need shape and define a new market space. By expanding the view of strategic categorisation with an eye to role of resources responds to calls for the "fuller integration" of strategic management and organisational theory into the study of market categorisation (Vergne and Wry, 2014; Durand and Boulongne, 2017).

#### *Material and Visual Resources of Categorisation*

The presented findings contribute to advancing the understanding the role of different meaning-making modes (linguistic, visual and material) in the construction and shaping of new categories (Jones et al., 2012; Delmestri and Greenwood, 2016; Blanchet, 2018; Slavich et al., 2020). Of relevance to category scholars are the use of material resources to overcome the challenge of perceptibility necessary to construct the meaning of an entity that is not fixed (Durand et al., 2017). Because smart wireless manufacturing is constructed around a technology resource that is only visible when combined with another object, it requires material mediation to make the distinguishing features manifest. This contrasts prior research where the defining features are typically tangible whether it be the building materials (Jones et al., 2012), the shape of a bottle (Delmestri and Greenwood, 2016) or rows of seats (Rosa et al., 1999). As such, this research affirms the important role of material artefacts in showing how defining aspects of a

category's identity are made identity visible, when the target of categorisation is intangible. Therefore, this study contributes theorising regarding materiality, identity and categories (Watkiss and Glynn, 2016).

In addition to emboldening the role of material artefacts, the findings importantly shed light on the role material settings in shaping the formation of new market categories. The construction of immersive environments emphasises how spaces can be used to create opportunities for “embodied engagement,” whereby audiences can physically interact with central elements of the category (McDonnell, 2010; Meyer et al., 2018). The critical element is being able to physically embed the target of categorisation into a representative environment, which imbues audience experiences with realism. Based on the case, the element of spatial scale is an important factor in generating perceptions of realism and empirical credibility, particularly, in shaping experiences of how audiences come “see” a category and its place within the ecosystem. The observed use of larger-scale demonstrators underscores the understanding of spaces as relational sites of meaning-making critical for enabling processes of institutional change (Kellogg, 2009; Hardy and Thomas, 2015). Thus, the strategic curation of a space reflects the “transformative intentions” of a firm (Pontikes and Rindova, 2020 p. 156). The examined case highlights the multi-faceted role of space in the contributing to the construction of a new market order, by providing a setting to materialise the category schema, illuminating interdependencies of value creation, and in doing so begin to influence to the resource allocations of other actors in the ecosystem. As such, this paper shows the how firms combine artefacts in settings to give the “multidimensional elements” of a category material form (Durand, Granqvist and Tyllstrom, 2017 p. 11). By doing so, this research answers calls for scholars to attend to the social material context in which processes of categorisation are taking place (Grodal and Kahl, 2017).

The paper also extends prior work combining symbolic management in strategic categorisation and market entrepreneurship (Santos and Eisenhardt, 2009; Granqvist et al., 2013; Suarez et al., 2015; Massa et al., 2017). The findings are consistent with the view of established literature that symbolic creation is critical in the early stages of categorisation in order introduce new meanings to help shape the interpretations of audiences and stakeholders regarding new category schemas and practices (Navis and Glynn, 2010; Grodal et al., 2015; Schnackenberg et al., 2019). Past research has typically approached the symbolic elements of categorisation in

terms of the vocabulary (Loewenstein et al., 2012), stories (Rosa et al., 1999) or the labels used (Granqvist et al., 2013; Suarez and Grodal, 2015), which privilege what actors say to gain beneficial positions. In complementing, “what is said” this research contributes by highlighting what actors do when constructing new symbolic boundaries and attempting to influence social evaluations during categorisation. Specifically, the presented case draws attention to the incorporation of symbols in performative acts of visual meaning-making. To this end, pairing the slogan of “cutting the cables” with the performative act, underlines the documented importance of gaining the attention of audiences (Santos and Eisenhardt, 2009; Navis and Glynn, 2010; Ozcan and Gurses, 2018), especially in the examined case, where the layered infrastructure of the market ecosystem can conceal the role of the focal firm or divert audience attention towards other layers (Dattee et al., 2018). Hence, strong, dramatic visual signalling was important to not only to embolden the defining attribute of the category but to convey Northern Telco’s expertise and its role in the ecosystem. This is relevant as previous research has shown the labels firms use do not always correspond with their capabilities (Granqvist et al., 2013). Therefore, building highly visible associations between a label and firm’s capabilities is relevant, if they are seeking to influence the definition of a market category. As such, this paper adds to the literature by attending to how the visual modes of symbolic delivery contribute to essential processes of categorisation (i.e., labelling, boundary formations).

#### *Generating Resonance and Social Facticity*

The present study adds further insights on resonance as a driver of strategic categorisation (Granqvist and Ritvala, 2016; Giorgi, 2017; Grodal and Kahl, 2017). In shifting the focus from nascent organisations, who rely on the generation of resonant narratives to acquire necessary resources (Lounsbury and Glynn, 2001; Martens et al., 2007; Navis and Glynn, 2011; Wry et al., 2013); the examined case highlights how an established firm can draw upon a range of existing firm resources in conjunction with available cultural resources to amplify the meanings of their category schema. Efforts to generate resonance can be considered a distinguishing feature of a proactive strategy of category shaping compared to reactive or hedging strategies (Granqvist et al., 2013; Suarez et al., 2015). While the latter is inherently opportunistic (e.g. access to new resources, regulatory shelter, stigma dilution) (Vergne, 2012; Granqvist et al., 2013; Kennedy and Fiss, 2013; Cornelissen and Cholakova, 2019), the intention,

however, is not to dominate, so much as to fit into a category. In such cases, the plausibility of a category claim is a minimum requirement, like prototypicality in mature categories reflected in acceptance through conformity (Glynn and Navis, 2013). Yet, when the goal is not to fit it but to define and dominate a category (Santos and Eisenhardt, 2009; Pontikes, 2018), firms will need to go beyond plausibility, which is likely to have implications for the resources they use and combine.

The findings indicate the ability to ‘hook’(Ozcan and Gurses, 2018) a new target audience at the outset may have related more to Northern Telco’s ability to communicate as a manufacturer and to reference experiences from their factories. This can be viewed as a critical element in cultivating the cultural credibility of smart wireless manufacturing. Especially, given their proposition of going fully wireless in a factory. As such, this research offers nuance to the understanding of resonance in specific strategies of market categorisation. In doing so, empathetic resonance is identified as a potent form “cognitive resonance” (Giorgi, 2017 p. 717) in proactive category strategies. From an advantage-seeking perspective, empathetic resonance strengthens “experiential commensurability” (Benford and Snow, 2000 p. 621) not just as a discursive outcome of narrative fidelity but the lived experiences that are materially rooted in the resource base of a firm. Empathetic resonance can be understood as a differentiating factor in strategic categorisation, separating firms who can leverage resources to create a material correspondence with the shared experiences of a target audience, from those, who can only discursively signal it. The identification of empathetic resonance extends recent theorising regarding types of resonance, and the need for greater illumination regarding the role of resources in contributing to resonance during market categorisation (Giorgi, 2017).

In examining the ways in which a firm attempts to structure the value space of a nascent category, this paper enhances the understanding of how strategic categorisation can be used to shape, even determine the “social facts” of a market domain (Pontikes and Kim, 2017 p. 105). The examined case affirms that categorisation is sensitive to technological change (Grodal et al., 2015) and that advancements in technological or scientific knowledge enable a firm to both challenge existing social facts as well as introduce new ones to construct an alternative market order. Because category systems appear as social facts, insofar as setting the rules and boundaries, and influencing perceptions and actions they are important to structure of markets (Hsu et al., 2009). However, in unsettled or equivocal contexts, a firm can proactively utilise

casual principles tied to the defining attributes of its core knowledge resources to imbue its desired category schema with “social facility” (Rao, 1994). The findings from the case, suggest social facility can be constructed through evidenced claims of ‘cause and effect’ that connect the distinguishing features of firm’s core knowledge resource to the performative repertoire (i.e., market logics or theory value) of a target audience. Strategically, constructing market claims with social facticity, for instance, expressed in accessible metrics (e.g. speed, efficiency, quality) is essential for appealing to an audience’s “faculty of knowing” (Arjaliès and Durand, 2019 p. 885) as well as guiding their sensemaking and analysis. This is consequential with respect to audiences learning and updating their casual models (Alexy and George, 2013; Durand and Paoletta, 2013), which has bearing on the viability of a nascent category (Lo et al., 2019). Therefore, social facticity is tied to generating a casual symbolic effect that creates a favourable order in nascent category by enabling audiences to approach comparisons of category members in an ‘objective’ manner.

#### **4.6 Conclusion, Limitations & Future Research**

In exploring how a firm strategically defines a new market drawing on available organisational and cultural resources, the findings contribute to the extant literature on market categorisation (inclusive of strategic categorisation), which has yet to holistically address the role of resources and how they are deployed and combined in the fashioning of new market domains. The theoretical framework articulates three dimensions, each with a corresponding resource configuration and specific function necessary to establish the boundaries, meaning and social order of a proposed category. As such, the presented research advances scholarly understanding of strategic categorisation, particularly in cases of market creation as a resource-intensive process.

Like all studies, this research has several limitations. The choice to focus on a single firm was informed by the level of access to the research context, however involved the trade-off of excluding rival actors (e.g. Nokia and Huawei) who are also seeking to introduce cellular into new markets. Accordingly, an inter-firm comparison presents an opportunity for future research, specifically considering to what extent do similar producers of cellular technology leverage to same configurations of resources to define new markets. This is particularly relevant given the mounting political contestation concerning Huawei’s involvement in developing 5G

infrastructure, thereby presenting the consideration of how national identity is enabling or constraining the of this resource in the construction of new markets around novel technologies. If it is a constraint, how does that influence resource deployments in category strategies? That said, Northern Telco is a global firm with a dominant market position, which makes their categorising efforts significant in terms of its ability to influence market definitions rendering the findings of this research less idiosyncratic (Gehman et al., 2018). The findings of this study are transferable beyond the immediate the context, especially in the prevailing context of digitalisation which is enabling established companies with expertise in digital technologies to pursuing new opportunities beyond their traditional markets. For example, Apple's entry into autonomous vehicles, Amazon's expansion from an online bookstore to web services including cloud computing and storage and even Facebook's entry into digital currencies are all instances where it is plausible to presume that firms will need a combine firm-specific and cultural resources to carry out key acts of categorisation.

An additional limitation pertains to the temporal scope of the study. The presented case is one that has followed the category creation process in real-time. While this minimises concerns of retrospective bias (Lee et al., 2018), nevertheless, the account provided is limited to the period of study, particularly as the case is still unfolding and is expected to do so for some time. Despite this, the period of observation was sufficient to identify distinct patterns able to explain how a firm attempts to create and define a new market at the front-end, prior to market take-off.

Since this research surfaced the important contribution of non-linguistic modes in the shaping and defining of a new category, however, this study did not embrace a "strong multimodal" approach (Zilber, 2017); subsequently, the literature on strategic categorisation would benefit from studies designed to account for the full contributions of different meaning modes in the construction of new market categories. Being able to account for this is germane in deepening the understanding, particularly of the market-shaping strategies employed by firms.

This paper sought to build on the idea that firms have the ability to shape new markets and are not limited to only reacting to their competitive environments. How firms approach doing so underlines that strategic categorisation is an interactive process as well as one tied to the resources firms own and the cultural resources they can access. The manner in which firms select and package available resources particularly reflects their ambitions as to whether they wish to fit in, or in fact be the driver of how audiences evaluate market spaces and the associated



offerings. In the present context of digitalisation, firms will be entering new markets where they were once not relevant but now have the potential to affect transformations. For scholars this means examining how firms construct new markets not just by the labels they apply and the stories they tell, but the resources they build with and combine to enable structures of exchange.

## **Chapter 5: Politics and lab rats in smart cities: A deliberative perspective on new market categorisation**

*“The technologist’s temptation may be to try to build a city from scratch, with none of that [bad] friction. And especially without the greatest friction of all, politics”*

– New York Times, 2017-10-18.

*“Politics, not technology, may prove to be [Sidewalk Labs] biggest challenge to building its version of tomorrow”*

– New York Times, 2017-12-29

### **5.1 Introduction**

Smart cities straddle foundational questions of categorisation and politics. What kind of thing is a smart city? How ought it be governed? As a hybrid category blending urban modernisation and urban regeneration with the creation of new markets for digital products and services (Jong et al., 2015), smart cities reside precariously on the boundaries of the public and private (Lee et al., 2014). As a market category (Viitanen and Kingston, 2014), smart cities are unsettled and ambiguous (Morozov and Bria, 2018; Zuzul, 2019), exemplified by the absence of successful flagship examples (Snow et al., 2016). Compared with other market categories, smart cities are unique, insofar as not being defined by the features of any one product but by the places that are created (or envisioned). This has led many to ask who smart cities are for – companies reaping profits from the further marketisation of municipal services and digitalisation of urban systems, or citizens who live and work in such places (Hollands, 2008; Simmons et al., 2018)? Subsequently, how smart cities ought to be, draws attention to the political processes through which a smart city is created or becomes categorised as such.

Despite the acknowledgement and interest among category scholars in politics (Bowker and Star, 1999; Rao et al., 2000; Lounsbury et al., 2003; Durand et al., 2017), the literature has yet to explore market categorisation as a distinct political process. While politics is ever present in past examinations as contextual feature or analytical element (Garud et al., 2010; Rao et al., 2010; Lee et al., 2017), what scholars are often describing is a market process involving politics. Thus, politics is a feature or condition that is predominately viewed through the lens of power struggles and gamesmanship among markets actors (Lounsbury and Rao, 2004; Zhao, 2005;

Negro, Koçak, et al., 2010; Ozcan and Gurses, 2018). This perspective is well suited to capturing the competitive and contested nature of many market settings, however, such a view of politics is challenged by categorisations that do not reside squarely within the market realm. As a domain at the intersection of the public and private, the boundaries and distinctive features of a smart city are not shaped by producers and consumers but citizens, elected officials and other stakeholders, potentially in conjunction with a producer (Cardullo et al., 2018). The categorisation of new smart city markets, therefore, is fundamentally a political process about a market. This distinction is not inconsequential and illuminates the need to develop a better understanding of how market categorisation is embedded in political processes of democratic participation in economic development (Lounsbury et al., 2003). As such, this paper investigates, how does politics shape new market categorisation on the boundaries of the public and private?

In this paper, politics is understood as “collective conflict and its resolution” through dialogue and bargaining regarding the organisation of material resources and social power between the public and private actors (Bealey and Johnson, 1999 p. 261; Turner, 2006 pp. 445–446). As a category that resides on the boundaries of the public and private, smart cities have been shown to be politically contentious by scholars in disciplines such as urban studies and geography (Datta, 2015; Wiig, 2016; Cardullo et al., 2018). Issues of marketisation and privatisation of municipal services are accompanied by growing ethical concerns regarding the use and deployment of digital technologies in urban environments (Cardullo et al., 2018; Cugurullo, 2018). The challenges posed by smart cities are emblematic of the long standing concerns of management scholars regarding the growing influence of corporations in economic and social life (Stern and Barely, 1996; Barley, 2008). As such, the creation of smart cities represent an exemplary opportunity to look at the politics of market categorisation in an era of “data-opolies” (Stucke, 2018) and “surveillance capitalism” (Zuboff, 2015). This importantly directs attention to role of categorisation in larger societal discussions regarding how firms and the categories they use and operate in gain social license.

To enhance the literature’s understanding of politics in market categorisation, an inductive, qualitative case study is developed using the empirical case of Quayside, a smart city neighbour in Toronto, Canada. This case was purposefully selected for its theoretical relevance (Patton, 1990) because it featured the categorisation of a new market through a public-private venture between a public development agency, Waterfront Toronto and subsidiary of Alphabet,

Sidewalk Labs. As such, this made the politics of new market categorisation transparently observable. Based on a detailed analysis drawing upon diverse data sources, such as project documents, recorded public consultations and media articles the findings of this study multiple sources of contestation eliciting diverging political responses from public and private actors. The findings more broadly underscore the consequences of firms approaching the categorisation of markets that straddle the public and private as market process opposed to political processes.

The remainder of the paper is structured as follows. In the subsequent section, the literature on market categorisation is reviewed with an eye to connecting the existing treatment of politics to the shifting boundaries of where categorisation is occurring. By doing so, insights from literature of public private partnerships is used to illuminate the political changes of market categorisation on the boundaries of the public and private. To address these issues, an alternative political approach to categorisation is proposed based deliberative models in public administration and political science. Next, an overview of the research setting, and an explication of the data collection and analysis is provided highlighting three sources contestations and two political responses. The contestations and political responses are described in the finding section that followings providing both illustrative quotes and supporting visuals. In the final section, the theoretical model is presented, and implications for the literature is discussed.

## **5.2 Theoretical Background**

This section is comprised by four subsections, beginning first with an overview of the market categorisation literature, followed by a review of the role socio-political processes of categorisation. Next, the shifting context of market categorisation to the boundaries of the market and state is examined in relation to public-private partnerships. Based on the political implication of public-private partnerships, the review draws upon literatures from management as well as political science and public administration, to develop a deliberative political approach to conceptualising market categorisation.

### *Market Categorisation*

Market categories are “economic exchange structures constituted by shared meanings that define the identities of focal members and the offerings and practices (Navis and Glynn, 2010 p. 441). Categories provide the “cognitive infrastructure” that anchors evaluations of organisations,

the value or worth of products, and shape and define of rules, which enable material and symbolic exchanges (Durand and Paoletta, 2013 p. 1102; Vergne and Wry, 2014). Hence, categories act as interfaces of shared agreement about an entity (Durand and Thornton, 2018) and help to organise social and economic space. Past research has typically emphasised the effects of market categories on producers straddling multiple categories and deviating from established prototypes. (Zuckerman, 1999; Rao et al., 2005; Hsu et al., 2009). In recent years, the attention of scholarship has shifted, focusing on categories as socially constructed outcomes of the efforts of interested actors (Durand and Khaire, 2017). Current debates focus on processes of market categorisation (Durand et al., 2017), such as emergence (Rosa et al., 1999; Navis and Glynn, 2010), re-categorisation (Delmestri and Greenwood, 2016), and the limits of categorisation (Vergne and Swain, 2017).

Market categorisation in particular has been investigated as a process of formation, characterised by the introduction of a new typification (i.e. prototype or exemplar) or typificatory scheme (i.e. defining features, values codes, rules) which determine how a new category should be understood and judged (Negro et al., 2011; Suarez et al., 2015; Delmestri et al., 2020).<sup>8</sup> Yet, many market categorisations are initially “unstable, incomplete and disjointed conceptual systems” (Rosa et al., 1999 p. 64). Emergent or unsettled categories are subject to multiple and diverging meanings (e.g. frames, designs) (Santos and Eisenhardt, 2009; Granqvist and Laurila, 2011), which over time – if unresolved – can inhibit growth and viability (Lo et al., 2019), presenting the prospect of “losing favour and gradually disappearing [sic]” (Grodal et al., 2015, p. 432). This draws attention to the different ways involved actors seek to stabilise or configure the meanings, core features and boundaries of market categories. The configuring of a categorisation’s boundaries and features requires actors to develop shared understandings of an entity’s meaning, (i.e. what it is, how valuable it, it is socially acceptable). For instance, in the case of modern Indian art, Khaire and Wadhvani (2010) highlight how auction houses, art historians and collectors appropriated the criteria for evaluating modern European art in order to enable assessments of value and shift perceptions of Indian art away from associations of being

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<sup>8</sup> For the purposes of this paper, market categorisation is used in reference to both a proposed schema for a category as well as the process of rendering an entity more understandable through the meaning construction, labeling and boundary delineation (Glynn and Navis, 2013).

“provincial”. Others have shown how processes of categorisation involve the use of discursive devices, such as frames (Navis and Glynn, 2010; Hiatt and Carlos, 2019; Chliova et al., 2020), stories and narratives (Rosa et al., 1999; Delmestri and Greenwood, 2016) and material elements to transform a plurality of elements into a coherent entity (Blanchet, 2018; Delmestri et al., 2020).

As a social process, politics permeates market categorisation. Market categorisation is political because it is vested with the goals and interests of the actors, who create and use them (Glynn and Navis, 2013; Durand et al., 2017; Pontikes and Kim, 2017). For instance, Facebook’s self-categorisation as a ‘tech company’ opposed to ‘media company’ reflects an intent to minimise legal liabilities and to evade moral responsibility for the consequences of the content published on its platform (Dodson, 2018). This example highlights that categories can function as “political devices” that actors construct and manipulate to acquire resources as well as to shield themselves from scrutiny (Quinn and Munir, 2017 p. 115). It is for this reason, categories are often sites of “political and ethical work” (Bowker and Star, 1999 p. 196) characterised by actors advancing partisan visions for how a market and more generally a society should be organised, and according to which principles (Swyngedouw, 2011 p. 373; Kenis and Mathijs, 2014 pp. 1766–1767). Such instances are visible in the goal-based categorisations advanced by social movements that stand in opposition to the perceived failings of dominant industrial practices in agriculture, fashion and energy production (Weber et al., 2008; Sine and Lee, 2009; Lee et al., 2017; Blanchet, 2018). The social and economic transformations brought about through market categorisation illuminates not only the interest-based dimensions but the relations of authority and power that shape what becomes both recognised and legitimised (Espeland and Stevens, 1998; Delmestri et al., 2020). This underscores the growing calls for investigations of the political contestation in processes of market categorisation (Durand et al., 2017; Grodal and Kahl, 2017). But it also directs needed attention to the political process itself that determines the boundaries, guiding conventions and practises of a category.

### *Political Process of Market Creation*

The literature on market categorisation has generally advanced an instrumentalist view of politics premised on exercises of power within a competitive environment (Espeland and Stevens, 1998; Lounsbury et al., 2003; Lounsbury and Rao, 2004; Zhao, 2005; Negro et al.,

2010; Ozcan and Gurses, 2018). For example, the elite winemakers of Bordeaux, were able to construct a classification system in which they were able to claim high-ranked appellations securing their status, while also blocking the upward mobility of new winemakers. In this respect, the classification system of French wine emerged through a political process and once established, embodied with political power (Zhao, 2005 p. 193). Similarly, in their examination of the American mutual fund industry (1944-1985), Lounsbury and Rao (2004) reveal how agreements between incumbents and industry media were able to construct a categorical system that protected their market positions from the effects of performance variability and new entrants (p. 990). While not surprising, this approach presents a narrow view of politics emphasising a contest or battle, in which a strategic (often a dominant) actor mobilise resources (e.g. economic, and cultural) to manipulate processes of categorisation (Negro et al., 2010; Ozcan and Gurses, 2018). Yet, there is an alternative approach in the literature that views politics of categorisation through the lens of cooperative ventures (Glynn and Navis, 2013; Granqvist and Ritvala, 2016). For example the emergence of the recycling industry in the U.S. was possible albeit through an “unholy” alliance between recycling activists and solid waste conglomerates to establish the dominance of the resource recovery frame (Lounsbury et al., 2003 pp. 77, 94). Building on this perspective provides a relevant starting point for considering an alternative to the instrumentalist view, specifically by approaching categorisation as a deliberative political process.

The impetus for advancing an alternative reading of politics in processes of categorisation is tied to the fact that the literature has predominately focused on cases of categorisation within pure market contexts, exemplified by consumer products (e.g. cars, food and drink, movies). As a result, the literature has privileged the political dynamics between producers or between producers and consumers (Zhao, 2005; Weber et al., 2009; Slavich et al., 2020). A few notable examples have broadened the view to capture political dynamics among consumers, producers and regulators concerning the categorisation of nutritional supplements and financial products (Funk and Hirschman, 2014; Ozcan and Gurses, 2018). Common to these examples is creation and regulation of exchange within pure market contexts. However, the categorisation of new markets (e.g., smart cities) is not limited to the boundaries of the ‘private’, particularly as hybrid forms of organising have grown in prominence reflecting the evolving relationship between business and society (Kivleniece and Quélin, 2012; Wood and Wright, 2015; Scherer et al., 2016). This has led to situations where the locale of categorisation has shifted from the market to

the boundaries between the market and the state. This pattern is exemplified by the emergence of public-private partnerships, project-based organisations bringing together the public and private sectors to create new markets for public goods (Villani et al., 2017; Quélin et al., 2017; Quelin et al., 2019).

### *Market Categorisation via Public-Private Partnerships*

In recent years, public-private partnerships have been positioned to address societal agendas items like urban renewal (Hodge and Greve, 2007; Kort and Klijn, 2013), specifically, through the categorisation of new smart city markets (Deloitte, 2018; McKinsey & Company, 2018; Brown, 2019). Unlike pure market-based collaborations and exchanges, public-private partnerships are situated in the “intermediate space between private and public bureaucracies” (Kivleniece and Quélin, 2012 p. 272). Prior research has associated public-private partnerships with challenges and conflicts related to reconciling competing logics and interests (Caldwell et al., 2017; Quélin et al., 2017), managing interdependencies of value creation and capture (Mahoney et al., 2009), and the general tensions resulting from the blurring of the traditional boundaries between the state and market (Flinders, 2012; Kivleniece and Quélin, 2012; Wood and Wright, 2015). For instance, public-private partnerships have been used to create new markets for private prisons (Cabral et al., 2010), contract security and military operations (Wood and Wright, 2015), and health services (Rangan et al., 2006; Caldwell et al., 2017; Villani et al., 2017). Thus, new market categorisations advanced through public-private partnerships are important to the study of categorisation as it is an underexamined political context within the market categories literature, despite the wide use of such organisational forms to create and shape new markets. From a categorisation perspective, public-private partnerships challenge established organisational boundaries and roles often making them politically contentious, and consequently important social contexts of investigations. The blurring of categorical boundaries and corresponding tensions are best exemplified by the “politicisation of the corporation” (Palazzo and Scherer, 2006 p. 76).

The politicisation of market actors alters the political nature of market categorisation. As firms become increasingly involved in activities previously under the purview of the state, it alters the prototypical understanding of them as market actors. Management scholars have argued the shifting boundaries between the market and state has served to embed the concept of



firms as political and economic actors that “contributes to both private and public interests” (Scherer et al., 2014 p. 148 c.f. Scherer and Palazzo, 2007; Palazzo and Scherer, 2008). This is evidenced by their participation in rule-setting processes, influencing collective decisions, and the delivery of public goods with impacts beyond their contract partners (Pies et al., 2014 p. 227; Scherer et al., 2016 p. 276). The expanded conceptualisation of the firm as both a market and political has potential implications for the normative structure of the categorisation process as well as how firms act as skilled operators (Fligstein, 2001).

The expanded role of firms, exemplified by the growing use of public-private partnerships, have been challenged for the perceived democratic deficits reflected in the limited opportunity for the public to comment and weigh in on the terms of projects (Skelcher, 2007; Willems and Van Dooren, 2016; Boyer, 2019; Nederhand and Klijn, 2019). Skelcher, (2007) observes the establishment of public-private partnerships has been “generally opaque to public view and outside the realm of democratic discourse” requiring the need for public involvement to inform “democratic steering and societal accountability” in the delivery of public policy goals (p. 365). In this respect, as political actors, firms pursuing new market opportunities enabled by the evolving boundaries between the market and state have done so without necessarily being subject to processes of democratic legitimacy (Scherer and Palazzo, 2007 p. 1106). As a result, scholars from different disciplines (e.g., management, political science, and public administration) have proposed deliberative models as a means of circumscribing the actions of firms with more democratic processes (Scherer and Palazzo, 2011; Klijn and Edelenbos, 2013; Willems and Van Dooren, 2016). Thus, advancement of deliberative political models in contexts of the public-private partnerships brings forward an alternative to the instrumental view of politics within the market categorisation literature.

#### *Towards a deliberative political process of market categorisation*

By advancing a view of market categorisation as a deliberative political process, the intention is not to negate the likely contestations and potentially conflictual nature of categorisation but to offer an alternative to the instrumental approach premised upon domination (Santos and Eisenhardt, 2009) and power plays (Ozcan and Gurses, 2018). As a complement to the social approach to categorisation, a deliberative view provides a means to examine the contribution of democratic processes to categorisation of new markets. The emergence of the

medical cannabis industry in the U.S. stems from a ballot measure (Lashley and Pollock, 2020) is a small reminder regarding the role of people not just as consumers but as citizens in the creation of new markets. More broadly, considering the present controversies surrounding large tech companies, the deliberative approach affords a timely perspective to enhance the understanding in the literature regarding how proposed categorisations acquire social license (or not).

Deliberative political processes are not intended to be idealistic but to advance pragmatic solutions that are acceptable to involved stakeholders (Flinders, 2012). At the core of deliberative approaches is the resolution of conflict through open discussion of issues at stake (Miller, 1992). The aim is to arrive at decisions and solutions through a process in which they are exposed to the “scrutiny of open public debate, review and determination” (Fung, 2003 p. 52). It is through such processes that involved actors are able to share knowledge, explore possible solutions in an accessible manner and exchange value judgements (Klijn and Edelenbos, 2013 p. 635; Gutmann and Thompson, 2004 p. 7). The deliberative political view contrasts liberal economic assumptions, where firms are considered apolitical, and whose market decisions did not need to be exposed to public scrutiny, as long as they comply with law (Scherer and Palazzo, 2007 p. 1106). Through a deliberative lens firms are both market actors as well as political ones. Consequently, they are expected to participate in deliberative public processes, which subject their proposed categorisations to the argumentation of citizens, public officials and other actors. Based on a deliberative model, the acceptability or legitimacy of a proposed categorisation is tied to the accessibility and validity of the public deliberation process (Palazzo and Scherer, 2006; Scherer and Palazzo, 2007). This reflects recent findings in the public administration literature that in contexts of public-private partnerships, citizens want third party partners involved in public meetings because they want more direct accountability relationships with private partners. As such, private partners need to be able to demonstrate both their commitments and understandings of community needs (Boyer, 2019 p. 1477).

The articulation of the deliberative political view contrasts the instrumental depiction of politics that has predominated the market categorisation literature. Given the literature’s focus on market settings, the instrumental view of politics captures the advantage seeking behaviour of firms in competitive environments. However, as the location of categorisation shifts from the market to the boundaries of the market and state, the literature suggests a corresponding political shift from an instrumental to a deliberative orientation. As such, this creates expectations upon

firms to adopt less instrumental and more deliberative political strategies when categorising new markets through public-private partnerships. The case of Quayside described next provides empirical opportunity to examine the political processes of categorising new markets on the boundaries of the private and public.

## **5.3 Methods and Research Design**

This section describes the methodological approach of the study and the analytical steps taken to answer the identified research question. It begins with summary of the research setting, followed by the case selection justification. Next, the data collection process is described, and the final subsection details the steps in the analysis of the case.

### **5.3.1 Research Setting**

The proposed smart city project, Quayside, is located in Toronto, Canada on a 12-acre brownfield site along the city's eastern waterfront. The land is owned by a public development agency, Waterfront Toronto. Founded in 2001 by the three orders of Canadian government, Waterfront Toronto received \$1.5 billion in seed funding and a 25-year mandate to revitalise Toronto's post-industrial waterfront. In recent years, the organisation has faced capital shortfalls, which informed the design of the Quayside Request for Proposal (RFP), by emphasising an operating environment where "government funding is constrained" (RFP, 2017 p. 8). The development of Quayside, subsequently, represented a financial opportunity for Waterfront Toronto to leverage its ownership of the land (valued at \$590 million), and to establish an independent revenue stream through licencing of products and solutions developed in Quayside.

On October 17, 2017, Waterfront Toronto announced Sidewalk Labs, a subsidiary of Alphabet had been selected as its "Innovation and Funding partner" to create a plan for the redevelopment of Quayside. Quayside was envisioned to be a global exemplar for how to build "smarter, greener, more inclusive cities" while providing a "testbed for new technologies" to be scaled across the waterfront and exported elsewhere. As the innovation and funding partner, Sidewalk Labs, would be responsible for drafting the "master innovation and development plan" (MIDP) for Quayside and the development costs up to \$50 million.

Available evidence suggests, the of Sidewalk Labs rested heavily on its willingness to take on the financial risks of developing the MIDP (i.e. \$50 million) and its capabilities to

produce innovations for licensing (Auditor General Report, 2018). Importantly, at the time of issuing the RFP, Waterfront Toronto lacked sufficient experience concerning ‘smart city’ data collection, sensors, and digital economy policies as the organisation had principally overseen the construction of parks, streetscapes and condos (Flynn and Valverde, 2019). Comparatively, founded in 2015, Sidewalk Labs was a late entrant to the smart city field; consequently, Quayside afforded an opportunity to demonstrate to the market, its credibility as a smart city builder. Prior to being selected by Waterfront Toronto, the organisation had no comparable experience with respect to the scale and complexity of the Quayside project.

Although the project had faced public criticism, particularly during the first year, it was not until February 2019, that a formal opposition emerged. Block Sidewalk, a loose collection of concerned citizens and community activists became the focal opposition group to the Quayside project. Sharing Block Sidewalk’s ambition to cancel or democratically reset the project were a broad assortment of advocacy groups (e.g. Canadian Civil Liberties Association, Good Jobs for All, Council of Canadian Innovators) and academics.

Despite couching the project in the rhetoric of innovation and progress, Quayside would become a focal point for a plethora of problems related to privacy in smart cities, and the role of ‘big tech’ in urban and civic affairs. Citing the project (amongst others), the Privacy Commissioner of Canada funded a survey finding 88 per cent of Canadians were concerned about privacy in smart cities (Bannerman and Orasch, 2019 p. 2). Additionally, polling conducted during the project indicated that most Torontonians did not trust Sidewalk Labs to collect data on residents and were wary about living in the proposed neighbourhood of Quayside (Forum Research, 2019-07-19). These findings reflect the shift in public sentiments during the project, which began with intrigue, even fanfare regarding the arrival Sidewalk Labs, epitomised by their proclamation to build Quayside “from the internet up”. But during the next two and half years, the project would be beset by governance controversies, project delays and polarised public opinion regarding the intentions of Sidewalk Labs, the competency of Waterfront Toronto and utility of the project. Despite the public contestation, the project had slowly progressed towards the approval stages of the MIDP. On May 7, 2020, Sidewalk Labs abruptly announced it was pulling out of the project citing the financial pressures of the COVID-19. Figure 10 provides a timeline of key events.

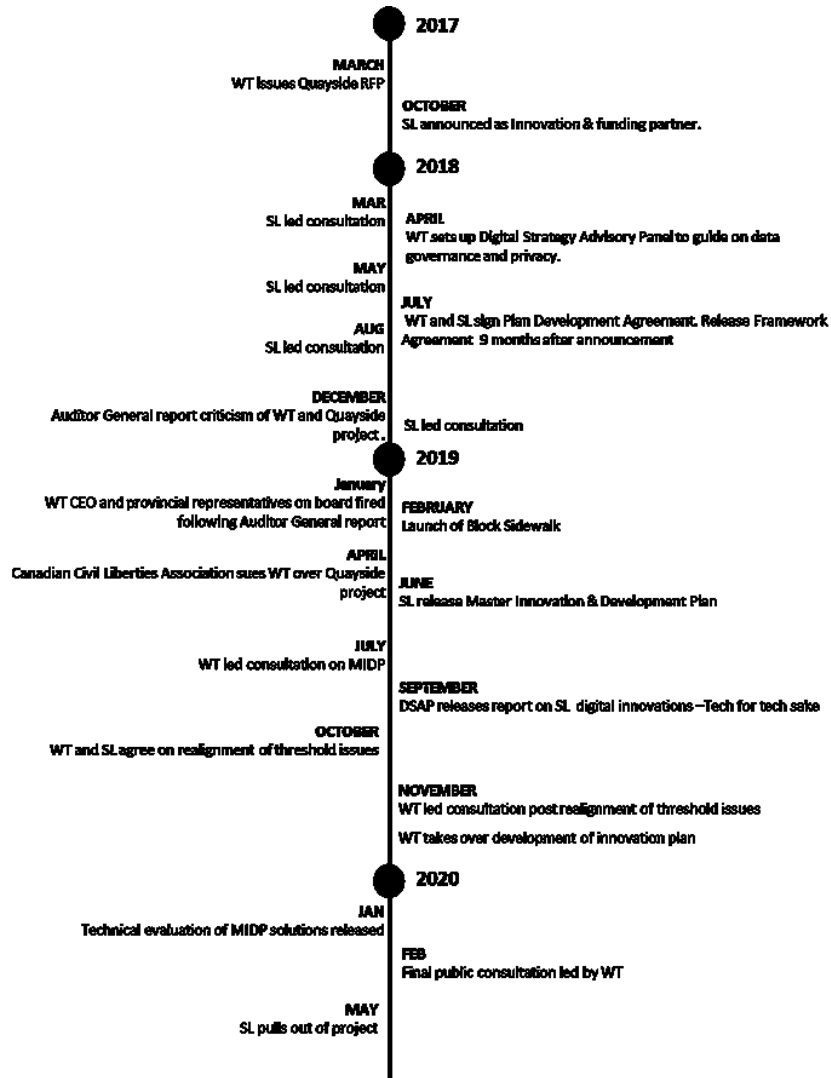


Figure 10. Quayside Project Timeline

### 5.3.2 Case Selection

Because the goal of this research is theory building, an inductive, holistic single case study design was adopted (Stake, 2000; Siggelkow, 2007; Ozcan et al., 2017). Given this interest, Quayside was purposefully selected to study the politics of categorisation because it provided an environment infused with politics (Patton, 1990). The project’s association with the concept of smart cities provoked concerns around privatisation of municipal services and data privacy, presenting conducive conditions for political contestation. The case was also selected because of the public-private partnership, which enabled the examination a market categorisation

process on the boundaries of the public and the private. In addition to the theoretical relevance, the case was compelling due to plethora of rich and diverse data reflected in recorded public consultations as well as presentations and other project planning documents. Together, the different sources of qualitative data sources enabled the development of a fine-grained understanding of the empirical case as well as the politics influencing the categorisation process (Ozcan et al., 2017).

### **5.3.3 Data Collection**

This research primarily draws upon a broad archival data supplemented by select interviews of individuals with direct knowledge of the case. The collection of data began days after the announcement of the project on October 17, 2017, and carried on throughout the duration of the project, up to and beyond Sidewalk Labs' decision to pull out on May 7, 2020. As such, the author was able to collect and analyse data in real-time as well as retrospectively (Granqvist et al., 2018), enabling the development of a strong contextual understanding of the case.

Following the case in real-time required three systematic and parallel streams of collection. The first stream focused on collecting and analysing project documents generated by Sidewalk Labs and Waterfront Toronto (including their Digital Strategy Advisory Panel (DSAP)). This included presentations, reports, meeting minutes, partnership agreements as they became available on their respective websites.<sup>9 10</sup> The second stream of data collection leveraged social media, specifically the YouTube channels of Waterfront Toronto and Sidewalk Labs as recordings of public consultations would be shared on this platform. YouTube was also a key source of archival interviews, panel discussions and conference keynotes from both Sidewalk Labs executives and prominent critics of the project. For all presentations and archival interviews, recordings were transcribed. Twitter was also important source data because it allowed for the collection of not only articles, reports, blog posts and images being shared by involved actors but the gathering of tweets containing comments and exchanges among actors on salient issues related to the project. Tweets were collected from prominent figures involved the

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<sup>9</sup> <https://www.sidewalktoronto.ca/documents>

<sup>10</sup> <https://waterfrontoronto.ca/nbe/portal/waterfront/Home/waterfronthome/projects/quayside>

public discourse like visible members of Block Sidewalk, academics and journalists writing editorials on the project as well as from both Waterfront Toronto and Sidewalk Labs.

The third stream of data collection focused on the news media using Nexis, a news database to search leading local, national and international newspapers (i.e. Financial Times, Globe and Mail, National/Financial Post, New York Times, Toronto Star, Washington Post). Terms such as “Quayside” and “Sidewalk Toronto” were used to identify relevant articles. Additional searches were conducted using Google to access publications not contained in Nexis (e.g. The Logic, Toronto Life, Toronto Now, Spacing Toronto, The Atlantic) as well as to ensure diversity in publications (i.e. size, editorial orientation, specialisation).

To gain a deeper understanding of the empirical context, the author conducted ten semi-structured interviews with eight key informants.<sup>11</sup> Two interviews were conducted with members of Block Sidewalk as well as five other prominent critics who participated in public meetings and panels regarding the project or whose op-eds were featured in local media (i.e. Toronto Star and Globe and Mail). While the majority of interview respondents were opposed to the project, a senior Waterfront Toronto executive, who was significantly involved in the drafting of the RFP and in the public consultations was interviewed on three occasions once during the project and twice following its conclusion. Three of the ten interviews were conducted face-to-face, while the remainder were conducted over Skype. Sidewalk Labs declined all requests for interviews. All interviews except one were recorded and transcribed. Complementing the interviews, the lead researcher also participated in a Waterfront Toronto-led public consultation attending two duplicate sessions in the morning and afternoon of February 29, 2020. During the same week, the author also attended a community meeting of Block Sidewalk and toured the Sidewalk Toronto showcase and headquarters. A full data inventory and description of use in the analysis is provided in Table 6.

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<sup>11</sup> A full summary of interviews provided in Appendix 4.

**Table 6 Data Inventory and Use**

Items	# of Pages	# of Hours	Use in Analysis
Archival Interviews: 48 <ul style="list-style-type: none"> <li>Sidewalk Labs (35)</li> <li>Waterfront Toronto (5)</li> <li>Project Opponents (8)</li> </ul>	251	6h 42min	<ul style="list-style-type: none"> <li>Used to identify different sources of political contestation arising from the project (i.e. privacy, public trust, anticipated benefits) and corresponding responses based on questions posed by journalists.</li> </ul>
	15	27 min	
	31	1 hr 7min	
Semi-Structured Interviews: 10 <ul style="list-style-type: none"> <li>Waterfront Toronto (3)</li> <li>Project Opponents (7)</li> </ul>	19	1hr 20min	<ul style="list-style-type: none"> <li>Used to build and reinforce contextual understanding project</li> <li>Used to capture reflections of on issues and events (i.e. consultations, MIDP, utility of proposed innovations.</li> <li>Informants with related subject matter expertise provided clarity of technical issues related to policy and regulatory frameworks</li> </ul>
	88	7hr 32min	
Media documents 349 <ul style="list-style-type: none"> <li>News paper articles</li> <li>Recording from local news shows</li> </ul>	846	1 hr 47 min	<ul style="list-style-type: none"> <li>Understands the public narratives associated with the project</li> <li>Used to construct case chronology</li> <li>Source quotes from relevant actors regarding events and issues at key junctures</li> </ul>
Sidewalk Labs Documents: 43 <ul style="list-style-type: none"> <li>Response to RFP</li> <li>Blog Posts</li> <li>MIDP and related texts</li> </ul>	2124		<ul style="list-style-type: none"> <li>Used to identify different sources of political contestation</li> <li>Used to examine their public communications re: purported value of proposed innovations, MIDP, defence of their engagement tactics.</li> <li>Used to understand strategic use of visuals used as well to representations of proposed innovations</li> </ul>
Waterfront Toronto Documents: 41 <ul style="list-style-type: none"> <li>RFP, Partnership docs</li> <li>Reports</li> <li>Press Releases/Communiques</li> <li>DSAP materials</li> </ul>	1794	9 hr 49min	<ul style="list-style-type: none"> <li>Used to identify the organizations motivations and objectives for the project</li> <li>Used to examine public communications, what issues are issues are identified how are they framed.</li> <li>Commentary and assessments related to issues of governance and innovation from expert panel contributed bridging insights between project proponent and opponents.</li> </ul>
Public Consultation Material: 24 <ul style="list-style-type: none"> <li>Transcripts of consultations</li> <li>Corporate presentations</li> <li>Feedback reports</li> </ul>	867	14 hr 15min	<ul style="list-style-type: none"> <li>Examined how both organizations described and articulated ambitions of the project, communicated their respective roles as well as the process of building Quayside to public.</li> <li>Observed how Sidewalk Labs and Waterfront Toronto framed the consultations and responded to citizen questions (or not)</li> </ul>
Project Opponents: 61 <ul style="list-style-type: none"> <li>Press releases</li> <li>Community meetings</li> <li>Blogs</li> <li>Keynote Presentations</li> </ul>	625	4 hr 41 min	<ul style="list-style-type: none"> <li>Illuminated governance issues and conflicts with the project contributing to identification of transgressions</li> <li>Used to capture counter narratives or challenges to frames disseminated by Sidewalk Labs and Waterfront Toronto informing identification of rendering tactics.</li> </ul>
Twitter: 165			<ul style="list-style-type: none"> <li>Used to capture public comments and conversations between actors relating to issues arising from the project and at pivotal periods like the release of the MIDP. For instance, informing identification of rendering tactics.</li> </ul>

### 5.3.4 Data Analysis

The analytical approach adopted was inductive and iterative alternating between the data the literature (Charmaz, 2006; Gioia et al., 2012) as part of an emergent multi-stage research design with five stages in total. All the collected data was uploaded to NVivo, which supported the organisation of data and the analytical process

*Stage one:* Prior to coding the data, a timeline was constructed and revised using a mix of project documents and news media articles to capture essential dates and events, as well as



pertinent decisions and actions taken by involved actors. In total, the case timeline was 15 pages (9100 words). This step heightened the author's sensitivity to and understanding of the various storylines that were emerging as the case evolved. In reflecting upon the data, frequent references to Quayside as a "laboratory", a "testbed" as well as a "neighbourhood" and "community" prompted the first the question of what this public-private partner sought to build? This provided an initial entry point into the data to tease out political elements shaping the market categorisation.

*Stage two:* To examine how Sidewalk Labs and Waterfront Toronto were talking about Quayside as a smart city, the author adopted a coding strategy using in vivo codes or codes that attempted to remain as close as possible to the text to retain the original meaning (Corbin and Strauss, 1990). The initial round of coding focused on the foundational documents of the project, specifically Waterfront Toronto's request for proposals and Sidewalk Labs' response, including press releases and other supporting material released during the announcement of the project. These materials importantly set the public framing and the scope of the project. Codes were separated by actor, specifically Waterfront Toronto, Sidewalk Labs and then opponents of the project as the analysis broadened and included more documents from the wider data set (i.e. archival interviews, tweets, media articles and wider project documentation). Codes generated at this stage, for instance, included "scaling technology", "place to experiment", "prototyping", "replicable solutions" which were tentatively clustered around a second-order theme of an innovation project. This step also generated contrasting codes such as "lived experience", "opting out and consent", "places for people" and "building community" which suggested a competing understanding of what Quayside should be. What emerged were two distinct understandings, one as a place for innovation and the other a place to live. These dual understandings would later be reflected in the aggregate dimension of conceptual contestation.

*Stage three:* As the research question concerned the role of politics, this stage sought to identify other issues or conflicts influencing the categorisation process. The coding processes was guided by the two additional sets of questions related to linking politics to the dimension of market categorisation. The first focused on value by asking, what are the benefits and who benefits from Quayside? The second focused on what are the rules and who is setting them relating to the need to establish parameters to guide the practices of market actors. These questions reflected that the Quayside project was publicly positioned to deliver public benefits,

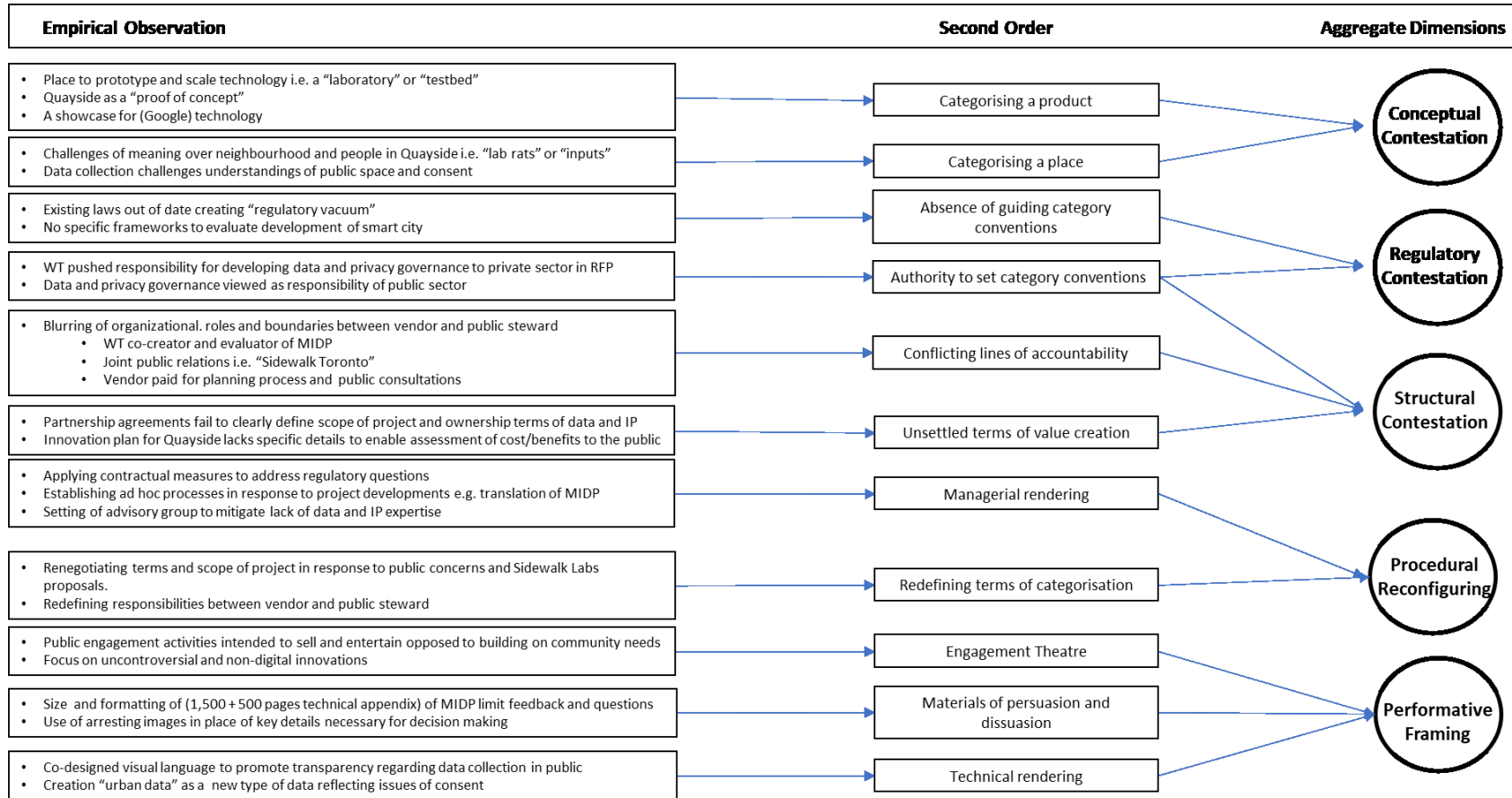
and the project's digital footprint prompted concerns about privacy and surveillance. Replicating the same steps as in stage one, a coding approach remained close to data, starting with foundational documents and then expanding to the wider data set. This process generated codes like, "policy vacuum", "outdated legislation" "democratically defined digital governance" relating to observed contestation concerning the planning of Quayside in the absence of appropriate regulation. Emerging from data were conflicts pertaining to who was setting the rules ("vendor-led policy"), which directed analytical focus to the roles being carried out by Waterfront and Toronto and Sidewalk Labs. As a result, the author also began coding for roles and responsibilities as well as instances of tension with respect to which organisation was doing what. This helped to generate codes like "financial capture", "organisational blurring", and "vendor-led consultations". At this stage, the author began to collapse and combine codes to enhance the analytical distinction of provisional second-order themes. The second-order themes were assigned to two aggregate dimensions, normative contestation and the structural contestation.

*Stage four:* Having identified three forms of political contestation, the next step was to examine how the Waterfront Toronto and Sidewalk Labs responded. At this stage, the decision was taken to focus coding on key events or incidents. As such, focused coding on the transcribed recordings of the public consultations first, followed by event reports and accompanying media news articles and social media posts. This focused analytical attention to what topics Waterfront Toronto and Sidewalk Labs presented at each consultation, how they addressed questions from the public, and the corresponding response from the public and media. This approach was applied to other important events like the (re)negotiation of partnership agreements as well as the release of Sidewalk Labs' innovation plan for Quayside. As a result, "winning approval", "consultation as marketing", "we are here to listen" were examples of first-order codes that were grouped under the second-order theme of "engagement theatre", and ultimately under the overarching dimensions of "performative framing". Comparatively, "renegotiating terms", "clarifying terms", "relational change" were examples of first-order codes which were used to induce the second-order theme of "redefining terms of categorisation". In turn, this would be grouped under the aggregate dimension of "procedural reconfiguring".

*Stage five:* The previous steps had generated five tentative aggregate dimensions with provisional second-order codes. As such, the focus of this stage was to refine the labels and the

analytical distinction of the second-order themes. This also included re-examining other codes that initially did not fit with the emerging structure. In certain cases, these codes were able to be incorporated into second-order themes. During this stage, the collected visual materials were connected to the relevant dimensions of the coding structure. Images were approached in a holistic manner. They were not coded, but contextualised based on the setting in which they were used or found by the researcher. In this respect, a hybrid “archaeological” and “strategic” approach (Meyer et al., 2013) was adopted in which images produced by field actors allowed the researcher to retrospectively reconstruct meaning about events. From this perspective, images provided direct evidence of an event or issue, enabling the assignment to a second-order theme. From a strategic perspective, images were also treated as evidence of marketing and claims-making in which an actor is using rhetoric to elicit a response from an audience. In such cases, images were assigned second-order themes based on triangulating references between data sources to the use of images. The final coding structure is presented in Figure 11.

Figure 11 Data structure for developing theoretical inferences from raw data.



## 5.4 Findings

This section is structured as follows; first, it begins by discussing the three forms of contestation (i.e. conceptual, normative and structural) shaping the politics of new market categorisation at the boundaries of the public and private. Then the remainder of the section will delve into the actions taken by Sidewalk Labs and Waterfront Toronto in response to the observed contestations. To support the discussion of the findings illustrative quotes pertaining to the sources of contestation as presented below in Table 7. Then following the discussion of the sources of contestation, illustrative quotes for the identified responses of Waterfront Toronto and Sidewalk Labs are presented at Table 8.

**Table 7 Sources Contestation - Supporting Evidence**

<b>Conceptual Contestation</b>	
Conflict resulting competing socio-cultural understandings and meaning of what the proposed smart city should be.	
<b>Second Order Codes</b>	<b>Illustrate Examples</b>
Smart city: as a product and site for innovation	<p>“...the best way we think to [...] actually demonstrate how it can be done in a place and ideally in our view, a place where there’s not a lot there to begin with because your capacity to innovate is inversely correlated with the number of people, infrastructure and other things that are there” (Sidewalk Labs CEO, Archival Interview 2018-01-17)</p> <p>“And our mission is to really help to redefine urban life in the 21st Century [...] And so we want to create a place, ultimately of large scale, that can be a laboratory for innovation” - Sidewalk Labs CEO, Freakonomics Podcast, 2018-06-06</p> <p>“a globally-significant community that will showcase advanced technologies...” - Quayside RFP, 2017, p. 6)</p>
Smart city: a place to live	<p>“One key Waterfront Toronto goal for Quayside was ‘places to live for people of all ages, abilities and incomes’. But what does an internet-advertising company really know about city building? It’s not an unreasonable question, if the goal is a great neighbourhood for people to live in, rather than a neighbourhood as tech experiment.” (Globe and Mail, June 26, 2019)</p> <p>“Participants also noted that a neighbourhood that is characterized as being surveilled would not be a popular place to live.” (Data Governance WG, Sidewalk Labs, 2019-05-27)</p> <p>“cities are places people live, not in themselves grounds for product-making. The question is, how do we think about how we want cities to work? [...] That’s what should be driving opportunities for business. Not the other way around.” (Block Sidewalk Founder, City Lab, 2018-12-21)</p>
<b>Regulatory Contestation</b>	
Conflict concerning what the rules should be and who should be setting them to guide behaviour in the smart city market category.	
<b>Second Order Codes</b>	<b>Illustrative Examples</b>
Absence of guiding categorical conventions	<p>“We all know that this issue with data – particularly data in public and semipublic spaces — is a big issue in society for which there are basically no rules. It’s the Wild West out there,” (CEO Sidewalk Labs, Financial Post, 2019-03-06)</p> <p>“The fact that our policies and laws are not up to speed, up to date in order manage some of the issues that might be coming out of these things [...]the status quo right now that we are in a legal and policy and regulatory vacuum regarding some of things related to data and technology” (Presenter, Block Sidewalk Community Meeting, 2019-04-17)</p> <p>“So far, Canada has no meaningful policies around smart cities” (Globe and Mail 2019-05-17)</p>
Authority to set categorical	<p>“The problem is less that Google and its siblings want the lab in the first place, the problem is that Waterfront Toronto and our governments let this happen [...] they [struck] a deal where they outsourced our privacy rights and the</p>

conventions	<p>supervision of our privacy rights and our surveillance to the very company that’s doing the surveillance.” (Executive Director, CCLA, Fast Company, 2019-04-18)</p> <p>“we are ceding the power to design Canadian data governance to a company. We are already seeing Sidewalk Labs step in to fill this void [...] What feels wrong is that this is a singular proposal [Civic Data Trust] coming from a private company, without leadership from public institutions or space for meaningful public debate” (Samantha Burton, Mozilla Foundation, Medium, 2019-03-07)</p> <p>“It’s not up to private corporations (esp vendors!) to tell us how we ought to be governed - these should be decisions left to residents + their elected representatives” (Saadia Muzaffar, former DSAP member, Twitter, 2019-07-07)</p>
<b>Structural Contestation</b>	
The lack of defined organization boundaries (i.e. roles and responsibilities) and terms of exchange, which embed conflict in a public and private partnership.	
<b>Second Order Codes</b>	<b>Illustrative Quotes</b>
Conflicting lines of accountability	<p>“Waterfront Toronto and Sidewalk Labs will: (i) work as an integrated team, with the key employees of Waterfront Toronto engaged in the creation of the MIDP (the “WT Team”) working together with the key employees of Sidewalk Labs working on the creation of the MIDP (the “Sidewalk Team”)” (PDA, 2018-07-31 p. 39)</p> <p>“How can it be, for example, that Waterfront Toronto set out as a co-creator of the MIDP only to distance itself from this role down the road to become the evaluator? This blurring of lines between our public agency and the Google subsidiary [...] continues on and has us highly concerned” (Letter to Waterfront Toronto Board, Block Sidewalk, 2019-07-31)</p> <p>“On November 19th, Waterfront Toronto held a public briefing to update community members on the Sidewalk Labs project, following the "realignment" of October 31st. Audience members, visibly frustrated, called for clarity over what, exactly, Sidewalk Labs currently proposed for Quayside, and whether Waterfront Toronto's role was to be co-author, advocate or evaluator of the plan (or a combination of all)” (Press Release, Blocksidewalk, 2019-12-01)</p>
Unsettled terms of value creation	<p>“In any deal I get something and you get something [...] What exactly are we getting from Sidewalk and what are we giving for it?” (Deputy Mayor Denzil Minnan-Wong, BBC, 2018-03-23)</p> <p>“Sidewalk had indicated [...] it wanted the opportunity to expand Quayside’s ‘scale’ but Diamond says no really understood what those words meant” (Toronto Star, 2019-11-01)</p> <p>“We can’t take any of the claims of economic development at face value. They are not transparent about the methods. This is a best-case scenario. What is the worst case?” (Public comment, Online Consultation Feedback, Waterfront Toronto, 2019-07-31)</p>

### *Conceptual Contestation*

Conceptual contestation refers to competing understandings of what the proposed smart city neighbourhood of Quayside should be. These are expressed in diverging meanings framing a smart city as a site for and target of innovation, and a smart city as a place to live.

This deeply rooted tension is already reflected in the Quayside RFP, where it envisions the site as a “testbed” and a “showcase for advanced technology” as well as a “highly sustainable mixed-use, mixed-income neighbourhood” (2017 p.7). Conceptual contestation is further exemplified by the repeated references by Sidewalk Labs to Quayside being a “laboratory” for innovation reflecting its vision of the site as one, where it can develop and test discrete proprietary solutions (e.g. dynamic curbs, building raincoats, Kola mounts) or present them together in the form of a “proof of concept” for new a type of smart city model. Approached

through the prism of product innovation, Sidewalk Labs conceives of Quayside as a “designated zone” defined by a digital layer enabling “ubiquitous sensing” for “real-time monitoring” generating “fine-grained data”, while guided by a “special set of regulatory and policy tools” that are “predisposed” to innovation (RFP Response, pp. 72, 120; MIDP, Vol 1 p. 424). Unsurprisingly, Quayside is presented as a technology first, people second type of place.

Comparatively, critics of the project viewed Quayside as a place where people live. For them technology may or may not have a role in meeting the needs of residents and visitors. They branded Sidewalk Labs’ depiction of Quayside as a “company town” or a “Disneyesque” world unto itself. Moreover, Sidewalk Labs’ categorisation of Quayside as laboratory further provoked images and questions among citizens as to whether they would be “lab rats”, “guinea pigs” or “inputs” for the company’s product development. Accordingly, the question of whether Quayside was to be a ‘laboratory’ or a place to live was emblematic of a larger issue concerning the shifting boundaries between public and private space in the proposed neighbourhood.

Specifically, if Quayside was to be a laboratory, how would citizens access and utilise public spaces in Quayside without being surveilled? Such a question underscored persistent concerns among citizens over how they opt-in/out of the neighbourhood, would it be a choice and even why they needed to (Roundtable Summary Reports, 2018-03-20, p. 20; 2018-05-03, p. 11; 2018-12-08, p. 26). The implications being, that without mechanisms to provide “meaningful consent” (undefined by Waterfront Toronto and Sidewalk Labs) citizens would face the choice of surrendering potentially personal data to access the neighbour or be forced to avoid the place entirely. Critics warned Quayside would be a “digital” or “virtual” gated community.

Conceptual contestation and related tensions caused by shifting boundaries of public and private space is exemplified in the following two excerpts. The first excerpt shows a Sidewalk Labs executive responding to the question of people being lab rats, and the second excerpt highlights a representative of Block Sidewalk the contesting the framing of accessing Quayside as a matter of personal choice.

Excerpt one:

*Journalist:* One of the things that a lot of smart city companies [...] they talk about how it is a testbed, a laboratory but that actually sometimes makes people feel uncomfortable. So, Block Sidewalk [...] has opposed the plans, one of the things they’ve said; we don’t want to be lab rats for Google. So, how do sort of answer that?

*Sidewalk Labs Executive:* Well, I think one of the ways we think about it is, nobody is ever going to be forced to live or visit this neighbourhood. And you know, I think it is one of the reasons that it makes sense to have the bulk of your innovation take place in a new built environment... (Smart City: Big Data's Watching You, BBC, 2019-12-24)

Excerpt two:

*Host:* Don't you ultimately have the power of choice that I don't have to live in a community like that. I don't want to set up a business in a community like that. I don't want to shop in a community like that. Don't you ultimately have the choice to boycott it?

*Block Sidewalk Representative:* No, because that is public space. Everybody is supposed to be able to access public space. You don't start privatising neighbourhoods like that (Danelle Smith Show, 2019-06-26).

These excerpts importantly illustrate how the categorisation of Quayside propagated conceptual contestation not just in terms of the applied labels (i.e. laboratory, testbed) but more fundamentally how public and private space is conceived in a context where consent to data collection may not be possible. The issues of consent segue way into the discussion in the next section concerning normative contestation.

### *Regulatory Contestation*

Regulatory contestation refers to conflicts concerning what the rules should be and who should be setting them to guide behaviour in a smart city. In turn, it is associated with the absence of categorical conventions related to data governance and privacy and which actors have the authority to establish categorical conventions or are expected to regulate data governance.

Regulatory contestation was politically significant as the proposed creation of a 'digital layer' premised on ubiquitous sensing stirred consternation among citizens. They were concerned about the policy voids in Canadian legislation at all levels (i.e. federal, provincial and municipal) when it comes to data governance. As one prominent critic noted:

when this project came up, I said, I don't think we are ready for this because our laws are already out of date [...] I am not sure we are prepared to manage what kind of issues might come out of this (Presentation, MyData Conference, 2018-09-24).

An observation substantiated by the Auditor General of Ontario, who noted in her audit report of Waterfront Toronto (including the Quayside project), the province of Ontario "lacks a policy framework to guide the development of a mixed-use smart city such as the one being contemplated for Quayside" (2018-12-18, p. 653). The CEO of Sidewalk Labs on several occasions referred to the state of the regulatory landscape as the "wild west". Accordingly, the



absence of appropriate regulation and policy prompted critiques regarding the perceived perils of planning a smart city prior to setting the rules. For instance, in an open letter to the three levels of Canadian government, advocating for a reset of the project, the Canadian Civil Liberties Association stated, “before bidding and procurement, you must first legislate protections for the people from the risks of surveillance capitalism on our streets” (CCLA 2019-03-05). For many observers, concerns over the inverted process were surpassed by their objections regarding who was developing and shaping the governance proposals for data and privacy.

In the Canadian context, government is responsible for creating and enforcing regulations and policy to ensure the protection of citizens and the public interest in market domains. By extension, as the public steward, Waterfront Toronto, has a mandated responsibility to advance the public interest. Thus, for opponents and supporters alike, regulatory contestations are rooted in the Quayside RFP, which shifted responsibility for developing governance frameworks from the public domain to the private. Below is the corresponding excerpt from the RFP requiring Sidewalk Labs to:

Create the required governance constructs to stimulate the growth of an urban innovation cluster, including legal frameworks (e.g. Intellectual Property, privacy, data sharing), financial considerations (including investment opportunities and revenue sharing expectations), deployment testbeds and project monitoring (KPI’s, reporting requirements and tools to capture data) (RFP 2017, p. 17).

Consequently, this was interpreted by many in the public as Waterfront Toronto asking Sidewalk Labs to define the rules on data governance. Waterfront Toronto would later contend the provision was not intended “to give them the keys to the kingdom” (Interview, 2020-05-06) but for them to propose governance ideas. For observers and critics, this provision was inappropriate because this policy discussion is one that should be between citizens and their elected representatives, not between citizens and a vendor. To this end, former Blackberry CEO, Jim Balsillie argued:

Here we have a vendor really taking responsibility to propose the frameworks. And really going directly to the population and directly to the governments [...] It’s not the way it’s supposed to work (Globe and Mail, 2019-06-26).

This also prompted the concern that Sidewalk Labs could have potentially undue influence over the rules they would be subject to. This issue was raised in the testimony during a federal parliamentary committee by one of the leaders of Block Sidewalk:

...what is happening in Toronto is problematic because you should not be making policy with the vendor [...] We are allowing someone who is going to be a vendor to influence

how the policy for said vendor's work will go (Standing Committee on Access to Information, Privacy and Ethics, 2018-10-04).

The role of Sidewalk Labs in proposing data governance arrangements fuelled sentiments that citizens were potentially ceding control to a private company to design how they are governed in cities. They argued that it was not “Google’s job” to decide “...how the new data economy ought to be regulated, so that it reflects our values and serves our interests” (Blog, Friends of Canadian Broadcasting, 2019-06-24).

Waterfront Toronto’s decision to entrust the issue of data governance to Sidewalk Labs was also politically contentious because it also enabled the company to frame the conversation, specifically by presenting the starting point as how, not if, data would be collected, creating the impression of inevitability (Our Approach to Data Privacy, Sidewalk Labs, 2017-10-06). The question of who sets the rules in a new and unsettled market category is arguably a regulatory as well as a structural issue as it relates to the division of responsibilities within the context of a public-private partnership. As such, this draws attention to sources of structural contestation which are the focus of the subsequent section.

### *Structural Contestation*

Structural contestation refers to the lack of defined organisational boundaries (i.e. roles and responsibilities) and terms of exchange, embedding conflict in the structure of a public and private partnership. As such, structural contestation is associated with conflicting lines of accountability and unsettled terms of value creation.

For the first nine months of the project, Waterfront Toronto refused to disclose its initial partnership agreement with Sidewalk Labs. Toronto’s citizens, as well as city officials, had no insight into details of the relationship. On July 31, 2018, Waterfront Toronto released an updated partnership agreement, the Plan Development Agreement (PDA), which sought to set the terms of the working relationship, particularly pertaining to the development of the Master Innovation and Development Plan for Quayside. Yet, the PDA failed to delineate clear roles and boundaries between the two organisations. Principally, the PDA contained multiple references to integrated and co-located Waterfront Toronto and Sidewalk Labs teams working to “co-create” the MIDP. The consistent use of the phrase “co-create” contributed to public confusion as Waterfront Toronto would also position itself as the evaluator of the MIDP. Waterfront Toronto would later

minimise its involvement in the creation of MIDP to “some initial research and to help set the objectives of what would be viable in terms of what a project might look like” (Public Consultation, 2019-07-22). The PDA contained additional provisions that blurred the organisational boundaries between the public steward and the private partner. Specifically, as part of the \$50million Sidewalk Labs committed to developing the MIDP, approximately \$5.8million was earmarked to paying for Waterfront Toronto staff (2018, p. 37). It is important to note, this financial transfer from Sidewalk Labs represented approximately 83 per cent of Waterfront Toronto’s operating budget for 2017/18 and was more than \$4.5million it received from the three levels of Canadian government combined. Given this, one critic wrote, “[i]t’s not a stretch to suggest that Sidewalk Labs is paying Waterfront Toronto to approve Google’s plans” (Friends of Canadian Broadcasting, 2020-02-24). This point of contention was posed to executives of Waterfront Toronto during a provincial parliamentary committee session:

*Member of Provincial Parliament:* Do you consider it good governance for Waterfront Toronto to accept funds from a vendor—in this case, almost \$5 million—to assist in development of a plan which, in turn, Waterfront Toronto will have to evaluate?

[...]

*Chair of Waterfront Toronto Board:* If \$4.5 million or \$5.5 million of public money is something that we can save, I think it’s incumbent on us to do that, as long as it doesn’t hurt the process (Standing Committee on Public Accounts, 2019-12-11, p. 299).

Other provisions of the PDA blurred the lines of accountability pertained to joint government and public relations between Waterfront Toronto and Sidewalk Labs, exemplified by the branding of Sidewalk Toronto, which obscured who was speaking to the public (i.e. the public steward or the vendor) (PDA pp. 51-53). This issue became particularly contentious during the initial public consultations, which were co-led and funded by Sidewalk Labs as part of their \$11million allocation for “communications, external affairs and engagement” (PDA, pp. 34-35). As such, the blurring of the boundaries between the two organisations emboldened concerns of who was looking after the public interest, leading to charges of process and regulatory capture by Sidewalk Labs.

The second source of structural contestation relates to the unsettled terms of value creation between Waterfront Toronto and Sidewalk Labs. As a smart city neighbourhood, Quayside was anticipated to generate opportunities for data monetisation as well as licensing opportunities from intellectual property. Despite these stated aims, the issue of data and IP ownership remained unresolved and provoked outcries from observers and critics. Both the

Framework Agreement and PDA between the two organisations did not address these issues in detail. For instance, one journalist noted that the PDA “barely grazed the question of who owns what data and how it could be monetised” (City Lab, 2018-09-07), while more broadly failing to “fully spell out who assumes what risks and who takes home what profits” (Valverde, 2018-12-03).

Data and IP exemplified the larger issue looming over the project, specifically what benefits would the public get and under what conditions. Facing mounting contestation over the opacity of its plan and business model for the Quayside project, Sidewalk Labs had sought to allay public concerns by suggesting the MIDP, once released would clear up the “confusion and debunk the myths” (Sidewalk Labs, City of Toronto Executive Committee, 2019-06-06). Yet, the release of the MIDP caused further confusion because the document was not a plan for the 12-acre site of Quayside but a proposal for a 190-acre site known as the Innovative Design and Economic Acceleration District. The document presented significant evaluative challenges for both the public and experts, as a Waterfront Toronto executive explained:

I think the biggest concern we probably had right up front was that it was very hard to decouple that plan for Quayside, a committed plan for Quayside from the desire to do something larger at scale (Interview, Waterfront Toronto, 2020-05-04).

As the primary planning document, the MIDP emphasised what Quayside could look like but did not specify details to enable an assessment of the costs and benefits to the public. Nor did Waterfront Toronto provide the public with detailed economic analysis to guide the public deliberations on the trade-offs. The contestation surrounding the unsettled terms of exchange are illustrated by a participant during the final public consultation shortly before the cancellation of the project:

I'm concerned that after two and a half years we're still talking about icing and not the cake. We're talking about whether building raincoats or trip hazards when the whole financial arrangements are completely vague [...] And that we also look at the finances of this particular deal, who finances what, who gets paid back and how who will end up owing money to whom, will the city end up owing money to Alphabet [...] all of that is still completely vague and undetermined. These questions, of course, should have been answered before any kind of agreement to go-ahead from the RFP ever happened. And it's outrageous that we still have to ask these questions (Participant, Public Consultation 2020-02-29).

Having identified the three sources of political contestation – *conceptual*, *regulatory* and *structural* – shaping the observed categorisation process, the focus now shifts to examining the

responses to the political contestation, which have been captured under the notions of *performative framing* and *procedural reconfiguring*. The former captures actions take by Sidewalk Labs, while the Waterfront Toronto. Supporting quotes are presented in Table 8.

**Table 8 Responses to Political Contestation - Supporting Evidence**

<b>Performative Framing</b>	
An activity utilizing rhetoric, visual and artefacts to direct audience attention towards uncontroversial things as a means of depoliticizing contestation	
<b>Second Order Codes</b>	<b>Illustrative Quotes</b>
Engagement Theater	<p>You know these drop-in clinic's right where they show you weird bits of plywood and cameras these are this isn't true consultation, it's theater but it's meant to dazzle, it's meant to entertain, it's meant to buy votes or buy appreciation.” (Interview, 2019-02-24)</p> <p>“Those earlier on consultations were very heavily scripted. The presentations were you know done collectively there was a lot of time spent on aesthetic kind of presentations [...] There was a real information out sense probably in round tables one through three for sure. That didn't do justice to the level of information that the citizens of Toronto could have actually given to this project.” (Interview, Waterfront Toronto, 2020-05-21)</p>
Materials of persuasion and dissuasion	<p>“And Sidewalk Labs communications are very much de rigueur marketing for a for-profit corporation [...] So, the communication formats to me have been quite striking and I think people get quite suckered by that. A lot people think, wow how exciting then you realize they are being subliminally effected by the beautiful pictures of the sunny lake or something” (Interview, 2020-03-12)</p> <p>“The Draft MIDP is difficult to get through and contains both too much, and too little, information. Many considered the 1,500-page document to be inaccessible, characterized as either a poorly conceived communications plan or an effort to overwhelm. Many said that a shorter, simplified version is required, while at the same time saying that more information is needed in key areas” (Facilitator Report, Pubic Consultation Feedback, 2019-09-19, p. 7)</p> <p>“MIDP “draft” a new chapter in Sidewalk Labs’ quest to take over Toronto’s waterfront. Plan designed to drown the public in detail, while deflecting attention from a corrupt process” (Press Release, Block Sidewalk 2019-06-24)</p>
Technical Rendering	<p>“Because it's not possible to actually get meaningful consent in a public space — you can’t turn it off, it applies to everybody [...] there’s responsibility to be really clear with the pubic about what’s going on who’s doing it, why and how they can find out more. Those are the four components of this DTPR visual language [...] it's not a product, we're not selling this, it's just a visual language we think ought to exist ... We clearly realize that both the tech industry and the city governments have got to get people comfortable with what’s going on and find the right set of rules for what should be acceptable and what shouldn’t be” (Executive, Sidewalk Labs, Archival Interview. 2019-11-29)</p> <p>“it’s difficult to see how relying upon people to notice and understand signage in public spaces constitutes consent, especially when it involves requiring people to learn what different symbols mean and remember their relationship to each other” (Tusikov, The Conversation, 2019-07-30).</p>
<b>Procedural Reconfiguring</b>	
An activity utilizing legal and/or managerial tools and processes as a means of addressing political contestation	
<b>Second Order Codes</b>	<b>Illustrative Quotes</b>
Managerial Rendering	<p>“Just from a technical perspective, we're going to evaluate only those components of the MIDP that was provided to us that made it through the threshold issues. And then after that we will come forward with an innovation plan to the public that looks different than the MIDP” (Waterfront Toronto, Public Consultation, 2019-11-19)</p> <p>Since last November, Waterfront Toronto, assisted by local and international subject matter experts, has distilled the over 1,500 pages of Sidewalk Labs’ Master Innovation and Development Plan into 160 solutions and evaluated those solutions for their effectiveness in addressing critical urban challenges faced by growing cities like Toronto. The committee overseeing the analysis of the MIDP confirmed that the work done by Waterfront Toronto [...] merit consultation with the public as well as further refinement and negotiation with Sidewalk Labs” (Statement from Board Chair, Waterfront Toronto, 2020-01-23)</p> <p>“Waterfront Toronto has developed Draft Digital Principles and is creating Intelligent Community Guidelines to ensure ethical standards are upheld as the project progresses. These measures strive to raise the bar on the ethical integration of technology into city-building, in the same manner as Waterfront Toronto has done in the past with its Minimum Green Building Standards that raised the bar on sustainability” (Response to DSAP on DIA, Waterfront Toronto, 2020-02-26)</p>

Redefining terms of partnership	<p>“As a result of the October 31, 2019 resolution of threshold issues, in addition to Waterfront Toronto acting as project lead for privacy and digital governance aspects of the project, we are also responsible for the planning, design and delivery of municipal infrastructure” (Response to DSAP, Waterfront Toronto, 2020-02-26)</p> <p>“I think our former, former CEO who had really thought there was a way of doing a new type of partnership, where the public and private sector could work side-by-side. But as that became very obvious that the public wouldn't trust that, you know our interim CEO Michael Nybrega really helped to reset the roles and responsibilities and let us get back to where we were comfortable” (Interview, Waterfront Toronto, 2020-05-21)</p>
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### *Performative Framing*

Performative framing is an activity utilising rhetoric, visual and artefacts to direct audience attention towards uncontroversial things as a means of depoliticising contestation. It is manifested in three forms, 1) *engagement theatre*, 2) *materials of persuasion and dissuasion*, and 3) *technical rendering*.

Engagement theatre reflects Sidewalk Labs’ use of public engagement processes (e.g. roundtables, reference panels, design jams, open houses, speaker series, summer camps for kids) to present the front of “listening”, using the language of “co-creation” and “participatory design” to steer discussions with the public away from contentious issues. Although Sidewalk Labs proclaimed its engagement process to be “robust” and “unprecedented” resulting in the engagement of 21,000 people (Public Engagement Process, Sidewalk Labs, 2019-06-24), however, these efforts were often viewed as “shallow” and “inauthentic”. The Financial Times characterised the consultations hosted by Sidewalk Labs as evenings of “puffery” (Financial Times, 2018-03-22) intended to side-line questions concerning the company’s business model and plans for data governance. This is further illustrated by a headline in the Toronto Star following the third public consultation, “Sidewalk Labs unveils plans for timber towers, raincoats for buildings in Quayside, but Torontonians must wait for data details” (Toronto Star, 2018-08-14). As such, the public engagement events emphasised “general urban themes” and featured technology demonstrations, as opposed to providing fora to address the fears, concerns and questions from citizens. Instead, Sidewalk Labs’ sought to create the impression of listening to the community, while at concurrently avoiding difficult conversations. This contradiction is expressed by a member Sidewalk Labs’ Resident Panel:

Our panel did not address the data-related questions raised here. This is mostly because Sidewalk Labs consistently chose safer examples to frame the conversation. Let’s talk about potholes, they said, or how to make sure an older woman can have extra time to cross the street. Who would object to that? (Toronto Now, 2019-05-22).

This concern was echoed in an open resignation letter submitted to Waterfront Toronto by a former member of its Digital Strategy Advisory Panel, who wrote:

The most recent public roundtable in August displayed a blatant disregard for resident concerns about data and digital infrastructure. Time was spent instead talking about buildings made out of wood and the width of one-way streets, things no one has contested or expressed material concern for in this entire process (Resignation Letter, 2018-10-06).

Engagement theatre, therefore, is a public relations exercise creating the “illusion” of consultation while attempting to exert control over the narrative by avoiding contentious issues necessary to garner support. The visuals and artefacts (technical prototypes) in this activity also form the basis of the second element of performative framing, materials of persuasion and dissuasion.

This theme captures *materials of persuasion and dissuasion* in the use of visuals and artefacts to both sell and to silence or limit the opposition to a proposed categorical account. From the outset of the project, Sidewalk Labs employed the use of fun and arresting images to not only communicate its vision for Quayside but also to establish a dominant visual narrative. As visual representations of proposed categorisation, the images appeared in news casts about the project as well in media articles both favourable and opposed to the project. The media’s unconscious dissemination of these images in their stories without seriously or meaningfully challenging Sidewalk’s visual narrative, thereby enabling its categorical account to be pervasive (Champagne, 2019). Instead of explanations, Sidewalk Labs used images not just to sell the project but to “soothe Torontonians, to convince them of the value, utility, and excitement” of this venture (Sauter, 2019). Yet, as a tool to depoliticise contestation, the visual narrative constructed by Sidewalk Labs, importantly served to:

direct [sic] collective attention to artsy pictures of imaginary buildings and gadgets – and away from anything financial. And anything legal (Blog, Centre for Freedom of Expression, 2019-01-14).

As eluded to above, the use of arresting images was not limited to only selling a categorisation but to discouraging public engagement with it. Illustrative examples of the images used by Sidewalk Labs are presented in Figure 12.

Evidence suggests, to contain potential contestation resulting from the proposals in the MIDP, Sidewalk Labs employed a deliberate design strategy intended to stymy examination. On an aesthetic level, it invoked a “facade of beautiful design” (Twitter 2019-09-05) characterised by attention-grabbing images while spreading details of the plan across four volumes. Despite

Sidewalk Labs being the subsidiary of a digital giant, the MIDP was designed to be physically read rather than digitally consumed on smartphones or tablets, evidenced by the page layouts, absence of hyperlinks and overarching table of contents. In this respect, the document is best understood as a “coffee table book to be marvelled at [...] rather than a planning document that enables the critical scrutiny necessary for public decision-making” (Preliminary Commentary on MIDP, DSAP, 2019, p. 49). Further dissuading scrutiny is the document’s physical size, weighing 18-pounds and totalling 1,524 pages. During the public consultation on the MIDP, the facilitator joked, “if you were reading 20 pages a day, it would take you three months to get through it” (Public Consultation, 2019-07-22). Viewed in this light, Sidewalk Labs packaged the MIDP in such a way to elicit affective responses while dissuading closer examinations given the onerous size of the document. Images of the MIDP are presented in Figure 13.



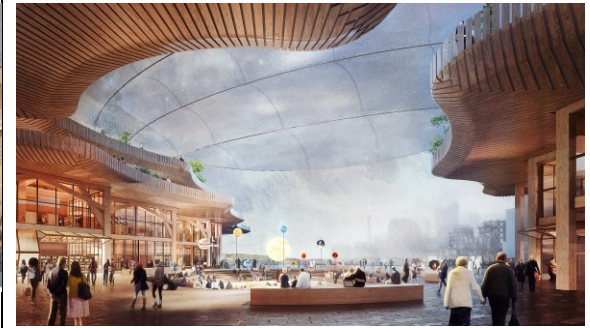
*Figure 12 Materials of Persuasion - Quayside Renderings*



Sidewalk Labs, 2017-10-17



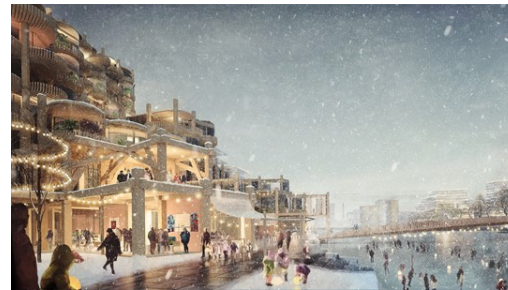
Sidewalk Labs, 2018-08-14



Sidewalk Labs, 2019-02-14



Sidewalk Labs, 2017-10-17



Sidewalk Labs, 2019-02-14



Quayside, MIDP Vol 1, 2019 p. 59



Sidewalk Labs, 2018-08-14



Sidewalk Labs, 2019-02-14

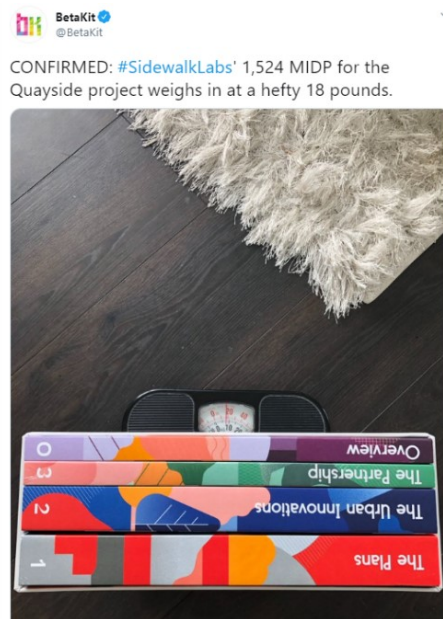


MIDP, Vol 0 2019, pp.118-119

Figure 13 The MIDP



Sidewalk Labs, Twitter 2019-06-29



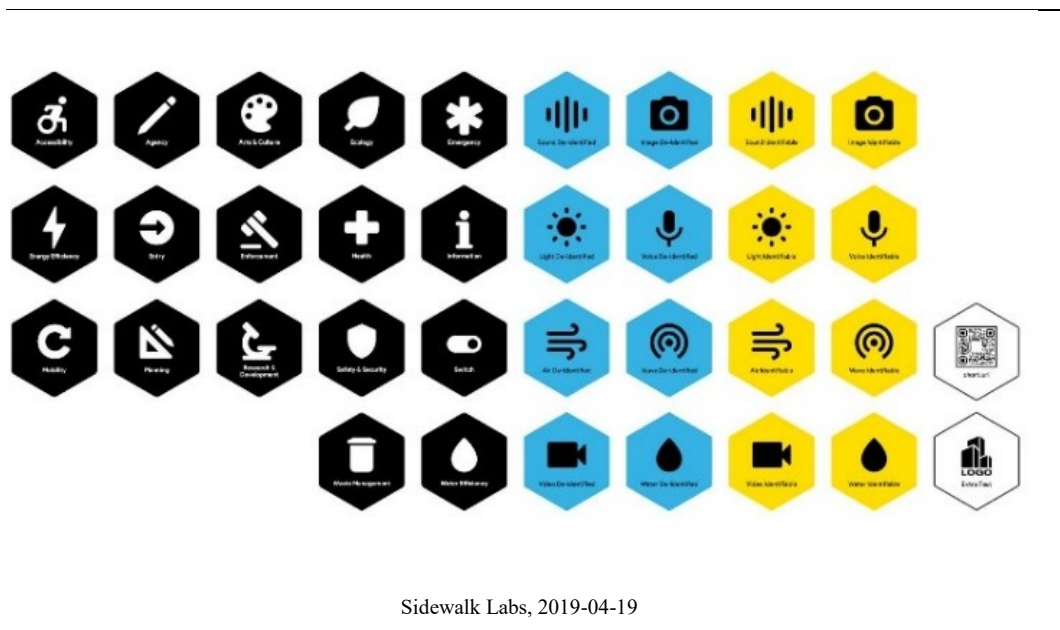
Beta Kit, Twitter 2019-06-25

The third element of performative framing is *technical rendering*, which involves reducing a complex social problem to an easy technical solution. In the general, the Quayside project itself is an example of technical rendering given the emphasis of the RFP on realising the benefits of emerging technologies (e.g. the Industrial Internet of Things, analytics, and artificial intelligence) and urban innovation to address challenges of sustainability and economic development (RFP 2017 p. 8). More specifically, technical rendering was exemplified in Sidewalk Labs efforts to mitigate growing public contestation regarding consent and data collection in public space. In order, to depoliticise the issue of data collection in Quayside, Sidewalk Labs developed a set of icons providing “a visual language for signage” to inform people to the presence of digital technology in public spaces. The signage attempted to address what Sidewalk Labs argued is a lack of transparency regarding “how and why data is being collected and used in the public realm” (Blog, Sidewalk Labs, 2019-04-19). The coloured hexagon icons indicate the type of technology (e.g. video, image, audio), whether identifiable information is being collected or not, and if so, how it is used. The signage utilises QR codes with a smartphone app. The visual signage is presented in Figure 14. Importantly, the rationale advanced by Sidewalk Labs for the signage conflates

transparency with consent. In so doing, it places the onus on the individual to be able to see, recognise and understand the icons. This point is explained by an interview respondent below:

I'll be informed about the signs if I pay close attention as a good consumer [...] I'll know. If I'm a careless, preliterate consumer or I don't you know understand what the symbols are, I'm a bad consumer, and that's on me right. Because if you have individual consent, you have individual responsibility. If you don't understand that you're being surveilled, then you should really pay more attention to your surroundings (Interview, 2020-02-24).

This technical solution is consistent with the “privacy commitments” made by Sidewalk Labs during the consultations to “always inform individuals of how and why their personal information is being collected and used” and to “honour their choices” (Presentation Consultation, 2018-05-03). However, in creating a solution premised on transparency, it avoids providing a mechanism for obtaining consent and exercising a meaningful choice for data collection in public spaces. Although this reflects an effort to help address an outstanding problem in smart cities, the icons and the visual language (unique to Sidewalk Labs), however, present issue of privacy and consent as an individual choice, which can be mediated through a fun or cool app. As such, this directed attention away from the underlying issue that transparency of data collection does not equate to consent for nor guard against the privatisation of public space in the absence of opt-out mechanisms.



*Figure 14 Technical Rendering - Visual Language*

### *Procedural Reconfiguring*

Procedural reconfiguring is an activity utilising legal and/or managerial tools and processes as a means of addressing political contestation. Based on the analysis, procedural reconfiguring is expressed in two forms, 1) *managerial rendering*, and 2) *redefining terms of categorisation*.

*Managerial rendering* involves treating contestation as a managerial problem that can be addressed through bureaucratic instruments. The digital footprint of the Quayside project combined with Waterfront Toronto's admission that "we are an urban revitalisation organisation [...] we are not experts on data governance" (DSAP Meeting Minutes, 2018-12-13), exacerbated concerns over the knowledge asymmetries between it and Sidewalk Labs. When facing public criticism and contestation over issues of data governance and the plans for Quayside, Waterfront Toronto would employ managerial rendering. A prime example is Waterfront Toronto's creation of a 15-member Digital Strategy Advisory Panel with the mandate to provide "objective, expert advice to ensure that principles of ethical use of technology, accountability, transparency, protection of personal privacy, data governance and cybersecurity are upheld" (Press Release, Waterfront Toronto, 2018-04-27). The Digital Strategy Advisory Panel, as a Waterfront Toronto executive testified, was necessary a "stopgap" to inform how to move the project forward (Federal Standing Committee on Access to Information, Privacy and Ethics, 2019-02-21). It also provided Waterfront Toronto with a tool to deflect charges from critics that it was "over its head" reflecting the perceived mishandling the initial treatment of data in RFP (Interview 9).

On the wider issue of Quayside being planned in the context of a policy void, an assessment shared by both Sidewalk Labs and project opponents, Waterfront Toronto, comparatively characterised it as an "evolving policy frontier". In doing so, Waterfront Toronto proposed to employ contractual measures in order to quell concerns regarding the perceived absence of appropriate regulation. This position is illustrated in the following quote from a Waterfront Toronto executive:

...there isn't necessarily a policy void [...] but a bit of a policy frontier [...] we feel we can address—similar to how we did in our minimum green building requirements around sustainability—by having a contractual level of obligation, as well, for any vendor to provide a greater degree of privacy protection here on the waterfront than you would have in any other smart city deployment throughout the world (Standing Committee on Public Accounts, 2019-12-11p. 312).

This managerial response aligns with the understanding that Waterfront Toronto has no regulatory authorities; consequently, it had to address contestation concerning data

governance and privacy “through the vehicles that we have available to us” (Waterfront Toronto CEO, Public Briefing, 2019-11-19).

Another instance where Waterfront Toronto is observed to be engaging in managerial rendering was in their response to the release of the MIDP by Sidewalk Labs. Because the MIDP was a long, difficult document for the public to engage with Waterfront Toronto was observed to take several managerial actions. First, it issued a 68 page “Note to Reader” outlining the proposals in the MIDP and highlighting their concerns related to oversight over data collection, governance and privacy and project scope. This action aimed to MIDP more comprehensible for the public:

how the MIDP was packaged [...], it became too hard to tease that apart, and that became a major piece of work for us to do. And that's where we tried to do very quickly, the Note to Reader and some of the other work Waterfront Toronto created. But, also for the public to try to digest what was the aspiration. What could be achieved and who would need to be involved (Interview, Waterfront Toronto, 2020-05-04).

Second, Waterfront Toronto created an ad hoc process to “translate” the MIDP into a set of 160 solutions, which would permit a technical evaluation of ideas proposed in the MIDP. For opponents, this activity was merely “stripping the MIDP for parts” to save face and to get a plan approved (Interview, 2020-03-24). As such a more digestible list of prospective solutions; did not provide the public with any additional information to determine whether “the solutions proposed raise the bar on meeting urban challenges” (Presentation, Waterfront Toronto, 2020-02-29). Managerial rendering, while it addressed some the contentious issues, it did not resolve them. This was complemented by a second activity associated with procedural reconfiguring, *redefining the terms of categorisation*.

Waterfront Toronto made multiple attempts to the reduce political contestation surrounding the Quayside project by altering the terms of its partnership with Sidewalk Labs through the negotiation of new agreements and the renegotiations of existing ones. In the face of public consternation, Waterfront Toronto used the negotiation of the Plan Development Agreement (July 2018) and its subsequent renegotiation (October 2019) as opportunities to reassert its role as the public steward, thereby countering accusations of it being too “weak”, and that its partner was calling the shots (Toronto Star, 2019-11-01). At the time, Waterfront Toronto officials positioned the PDA as “reinforce[ing] the public interest” (Waterfront Toronto, Spacing, 2018-07-31). The PDA sought to rectify what had many considered overly favourable terms for Sidewalk Labs in the initial Framework Agreement (October 2017). The negotiated PDA was viewed as “walking back a really bad deal” (Washington Post, 2018-08-

08). The revised the agreement was more restrictive with respect to the geographic scope and identified Waterfront Toronto as “the steward of the public interest [and] the revitalisation lead”. Language identifying Sidewalk Labs as a co-master developer, was removed and replaced with ‘innovation and funding partner’ (PDA vs FA Comparison Table, Waterfront Toronto, 2018-07-31).

The negotiation of the PDA had marked the beginning of a shift in the relationship between the two organisations. The CEO of Sidewalk Labs observed that “[Waterfront Toronto] has become much more of a counterparty than a partner” (Business Insider, 2019-06-27). This shift became more pronounced when Waterfront Toronto and Sidewalk Labs entered negotiations to resolve a set of “threshold issues”. The outcome saw many of the proposals and demands Sidewalk Labs had articulated in the MIDP rejected, such as the 190-acre site (returning to the original 12 specified in the RFP), funding of public transit as a precondition, and the limited profit-sharing offer. The revised agreement was viewed as a significant climbdown for Sidewalk Labs, exemplified by a headline in the New York Times, “How Toronto reined in Big Tech” (New York Times, 2019-11-01). Perhaps most notable, was the amended terms that all matters regarding digital governance and privacy would be led by Waterfront Toronto (Overview of Realignment of MIDP Threshold Issues, Waterfront Toronto, 2019-10-31) as illustrated in the quote below:

The terms of the agreement make it clear that the public sector, not Sidewalk, will determine the approvals timetable, the legislative and regulatory framework, and the procurement process (Spacing, 2019-11-01).

The presented findings in this section showed how the proposed categorisation of Quayside, as a smart city, was marked by political contestation, rooted in conflicting meanings and unsatisfied expectations with respect to how new market categorisations on the boundaries between the public and private should be undertaken. Ultimately, the inability of Sidewalk Labs and Waterfront Toronto to sufficiently resolve these political contestations via their respective strategies of performative framing and procedural reconfiguring contributed to the categorisation of Quayside being abandoned. The findings presented in this section are discussed below with a view to the contribution they make to the categorisation literature and with a view to presenting a model categorisation abandonment.

## 5.5 Discussion

This research set out to explain how politics shapes new market categorisations on the boundaries of the public and private. The findings show the efforts to create a smart city market triggered sources of contestation reflecting the proposed introduction a new schema and actor roles that challenged taken-for-granted understandings. Yet, the diverging responses observed by Waterfront Toronto and Sidewalk Labs prevented the construction of meaningful democratic process to resolve the contestations arising from the categorisation of Quayside. To this end, the outcome of abandonment reflects the failure of politics to resolve conflicts stemming from the categorisation process. This argument will be developed further through the elaboration of the theoretical model of *categorisation abandonment*. Following this, contributions to the literature on market categorisation will be presented.

### 5.5.1 New market categorisation: A deliberative political process

The categorisation of new markets is not just a struggle between market actors and instrumental uses of power. When categorisation is occurring on the boundaries of the public and private or has public interest implications highlights the need to understand the wider politics of meaning which can be examined through a deliberative process. Accordingly, this paper argues that new market categorisation can be viewed as a deliberative political process. As a deliberative political process, categorisation is underpinned by the conceptualisation of market actors as also political actors, who are expected to participate in and be subject to deliberative practices premised on accessible rationales, open debate and scrutiny of proposed categorisations (Gutmann and Thompson, 2004). Thus, the attainment of public legitimacy for a categorisation is contingent upon the resolution of political contestations. From this perspective, the legitimisation of a categorisation is endogenous to the political process, thereby reflecting the negotiations and interactions among stakeholders (Uzunca et al., 2018). The deliberative process, therefore, is essential to achieving shared agreements upon the meaning and defining features of a proposed categorisation among stakeholders (i.e. citizens, local government and central governments, focal firms). Incomplete categorisations, subsequently, are attributable to the breakdown of the political process and the persistence of unresolved contestations, which increases the likelihood of a categorisation being abandoned due to diminished viability.

Based on this understanding, the theoretical model of *categorisation abandonment* is presented in Figure 15. The model has two main components: (1) sources of political contestation, and (2) responses to contestation, which consist of *performative framing* and

*procedural reconfiguring*. At the centre of the model are three identified sources of political contestation –*conceptual, regulatory and structural* – which correspond to categorical dimensions requiring configuring for a proposed categorisation to settle (or progress to the next developmental stage). Along the sides of the model are the political responses to the identified contestations. As the model indicates both performative framing and procedural reconfiguring are unable to sufficiently resolve the contestations at the centre of model (albeit for different reasons), which ultimately contribute to the abandonment of the proposed categorisation.

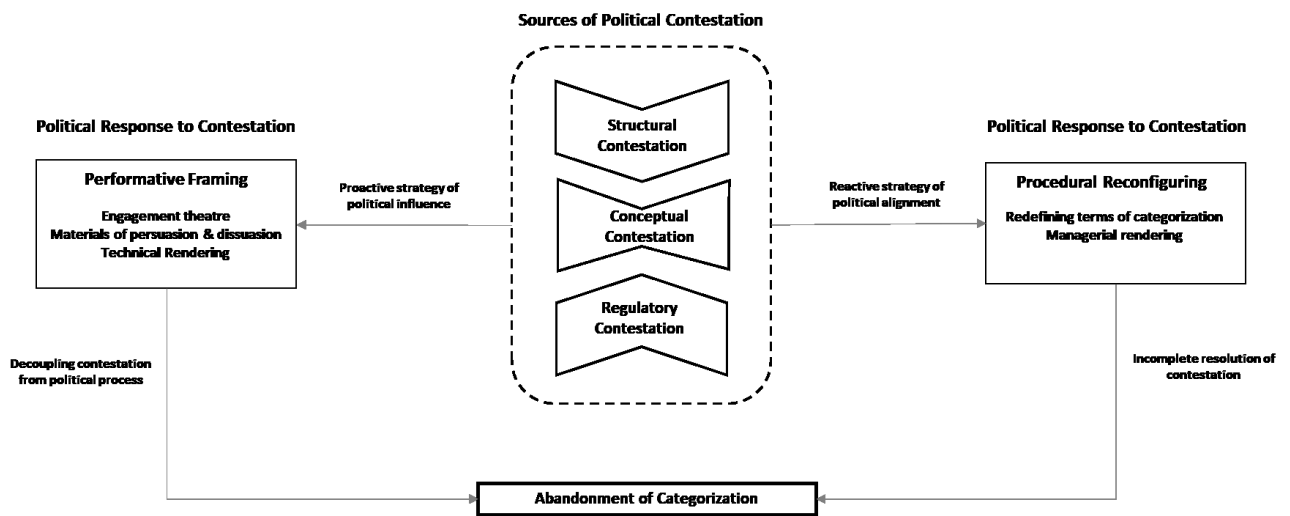


Figure 15. Theoretical Model of Categorisation Abandonment

*Sources of political contestation*

The existing literature suggests that all new categorisations can be expected to face varying degrees of uncertainty and contestation stemming from unsettled meanings and competing interpretations. Given this understanding, structural, conceptual and regulatory contestations are presented as general sources of contestation likely to shape a political process of new market categorisation. Each source of contestation corresponds with a key categorical dimension that requires configuring for a proposed categorisation to progress. The contestations, therefore, touch upon a range of salient questions related to market categorisation, i.e. what it is, what is the value, what are the rules (and who sets them), what are the roles of involved actors? Further, all three sources of political contestation are treated as occurring concurrently and interconnected. For instance, competing representations underpinning conceptual contestation may be exacerbated by the absence of guiding



categorical conventions or clear terms of exchange, reflected in regulatory and structural contestations, respectively. The guiding assumption is that all three sources of contestation will need to be resolved through the political process, and the inability to do so is likely to contribute to the abandonment of the categorisation. The reason being the persistence of contestation induces instability placing constraints on the settlement of meaning and attainment of social acceptance.

The presence of political contestation is expected to trigger responses from public and private actors, which are likely to differ in form and function, based on the actor's sector of origin. This position reflects the understanding that actors are likely to adopt courses of action in line with established societal responsibilities and expectations (i.e. sectoral identity/competency/logic) associated with their sector (i.e. state and market). Additionally, actors involved in political processes of categorisation have differing levels of authority, which enables or constrains their ability to resolve contestations and to settle categorical meanings (Rhee et al., 2017). With these background assumptions in mind, performative framing is posited as a political response to contestation adopted by a market actor characterised by high social standing but low category authority. This builds on the understanding that market actors with high social standing are likely to have the resources (e.g. economic, cultural, political) to pursue proactive political strategies of influence (Suarez et al., 2015; Kodeih et al., 2018). Additionally, prominent market actors are typically subject to fewer conformity pressures and when combined with a record of market success or even a history of industry dominance are likely to hold beliefs inflating their bargaining power (Phillips and Zuckerman, 2001; Ozcan and Santos, 2015). Consequently, this may reduce the perceived utility of participating in deliberative activities of categorisation (e.g. co-creation). In this respect, they are likely to view categorisation as a political contest to win as opposed to a deliberative political process rooted in cooperation. Conversely, market actors with low social standing and low category authority are presumed to be less likely to engage in performative framing, owing to higher conformity pressures, and a dearth of resources necessary to pursue strategies of influence.

In comparison, procedural reconfiguring is posited as a political response to be adopted by a public actor. By virtue of being entrusted with advancing the public interest, a public actor is vested with a degree of category authority, which may not be absolute but relative to the market actor is higher. This reflects the understanding within the public sector category authorities may be shared across different organisations (e.g., legislators, regulatory

bodies, judiciary). It is assumed that during political processes of categorisation, a public actor will act as a ‘gatekeeper’ (Coslor et al., 2020) reflecting their civic responsibilities and duties. As such, they are likely to advance strategies that are organisational and structural in nature. The aim of these strategies is to align and modify the boundaries of a new market categorisation with stated policy goals as well as voiced interests and/or expectations of stakeholders (Klijn and Edelenbos, 2013; Boyer, 2019).

*A proactive strategy of political influence: Performative framing*

Performative framing refers to the use of rhetoric, visuals and artefacts to exert control over the public discourse and to focus attention towards uncontroversial issues as a means of depoliticising contestation. As a proactive political strategy, performative framing emphasises depoliticisation, which involves “redrawing boundaries, limiting the scope of contestation” and restricting the way issues can surface and become a matter of public action and deliberation (Beveridge and Koch, 2016 p. 41). In a simple sense, performative framing “selects some aspect of a perceived reality and makes them more salient [sic]” to mobilise support and minimise resistance to a proposed categorisation (Entman, 1993 p. 52; Cornelissen and Werner, 2014). That said, performative framing is not merely emphasising one aspect at the exclusion of another but pursuing a strategy of influence that is exogenous to the political process. This is manifested in constraining deliberation as a means of eliciting public support for a proposed categorisation without subjecting it to public scrutiny.

The adoption of performative framing as a political strategy exemplifies a market actor thinking only as a market actor. In so doing, a market actor is seeking to retain a degree of control over their proposed categorisation, while at the same time attempting to insulate it from competing alternatives. As a result, this may create the space necessary for the market actor to position their proposed categorisation as the dominant account. While potentially attractive if successful, performative framing is a high stakes gamble, which if unsuccessful comes at the expense of fulfilling the normative expectations of a firm as a political actor. From this perspective, performative framing is not only antithetical to processes of deliberation, but strategically, it can represent a fundamental misreading of the political context. Firms adopting strategies of performative framing are consequently not acting as skilled social actors but political “dopes” reflecting their inability to recognise and understand particular situations and to frame courses of action commensurate with voiced public concerns and expectations of the political process (Fligstein, 2001).

By approaching market categorisation as an exogenous political process to be manipulated, performative framing decouples political contestations from discussions of a proposed categorisation. This presents significant hurdles to the settlement of the categorisation. First, the contestations underlying a proposed categorisation are not resolved because they are not integrated into the political process. As a result, this limits the opportunities for stakeholders to address contestations collaboratively and to co-create solutions necessary to legitimise as proposed categorisation. Second, the persistence of unresolved contestations may amplify tensions among stakeholders, potentially entrenching opposition or at least constraining social acceptance necessary for the categorisation to progress to next the stage of development. In such circumstances, a proposed categorisation is likely to remain incomplete, which increases the chances of abandonment. This may be due to the unwillingness of a market actor to subject their proposed account to the political process, in which they would have to forfeit a degree of control. Loss of control may be seen as leading to shifts in the value proposition of a proposed categorisation away from their interests. On the other hand, the performative framing may also contribute to a fixed view of a proposed categorisation as illegitimate among stakeholders.

*A reactive strategy of political alignment: Procedural Reconfiguring*

In comparison, procedural configuring is a strategy deployed to reduce political contestation using legal and/or managerial tools and processes. Because procedural reconfiguring is a reactive strategy to political contestation, it is a direct response to voiced concerns from stakeholders pertaining to overlooked needs or unmet expectations, which are in turn reflected in changes to the terms of categorisation. The need to do so can also pertain to the absence of appropriate coordination mechanisms that structure and align goals, interests and resources between public and market actors (Caldwell et al., 2017). Generally, procedural reconfiguring represents an effort by a public actor to bring contestations back inside the political process indirectly and directly such that issues can be potentially resolved in a manner reflecting the will of stakeholders. Thus, it is posited that when market actors engage in performative framing, public actors will pursue procedural reconfiguring as an endogenising counterweight. As a reactive strategy, the tactics of procedural reconfiguring aim to restore and/or bolster the legitimacy of the categorisation process. Additionally, procedural reconfiguring offers a means for public actors to (re)build or maintain their legitimacy as a political actor.

As procedural reconfiguring aims to ensure both the political process and the proposed categorisation is socially acceptable, the associated tactics, i.e., managerial rendering or redefining terms of categorisation are undertaken to challenge the depoliticisation of contestation pursued through performative framing. The underlying assumption is that procedural reconfiguring as a reactive strategy is informed by a degree of prior engagement with stakeholders, which enables the actions taken by the public actor be representative of the expressed interests of stakeholders. However, as a political strategy, the efficacy of procedural reconfiguring is contingent upon the degree of categorical authority of a public actor, which can result in contestations being in varying states of (un)resolution. The implication being, when issues of political contestation are equal to or within a public actor's authority, it is likely to be resolved. Conversely, when issues of political contestation exceed a public actor's category authority, it can only be reduced. Consequently, this allows for a political contestation to persist. This is exemplified by contractual measures proposed to address issues of privacy and consent by Waterfront Toronto to compensate for their inability to enact regulatory remedies. Because procedural reconfiguring may only partially mitigate a source of political contestation, it is likely to provoke residual questions of efficacy and appropriateness. This reflects the fact that a proposed measure is aligned with the authority of the public actor and not necessary with what is required to resolve the contestation. In turn, creating a potential gap in which residual contestations may fester. From this perspective, procedural rendering can contribute to the categorisation process remaining open and consequently, unsettled.

Procedural reconfiguring also contributes to the incomplete resolution of contestation by shifting the conditions under which a proposed categorisation would create value. New market categorisations involving the public and private seek to generate value for both actors. Redefining terms of categorisation, however, can inject additional uncertainty, depending on how far the categorisation has progressed and what the extent of the change in terms is. As such, when redefining of terms of categorisation is delayed and/or occurs beyond the initial stages of categorisation, it is likely to result in more significant alterations to the proposed categorisation. A potential consequence is a shift in the perceived market benefits of participation. Accordingly, changes in the anticipated value generation of a proposed categorisation combined with the ability of procedural reconfiguring to reduce but not eliminate contestation drives the abandonment of a proposed categorisation.

Having described the theoretical model, the contributions to extant theory are discussed next.

### **5.5.2 Theoretical Contributions**

The theoretical contributions of this research are organised as follows, 1) market categorisation and deliberative politics, and 2) materials of depoliticisation in market categorisation.

#### *Market categorisation and deliberative politics*

Overall, this study contributes to the social perspective on market categorisation (Durand et al., 2017) by advancing an alternative reading of market categorisation, specifically, as a deliberative political process. As such, this study contributes to the categorisation literature by not only affirming politics as an inescapable factor in the social dynamics of categorisation (Bowker and Star, 1999; Quinn and Munir, 2017; Slavich et al., 2020) but counterbalancing the typical framing of politics as a strategic game of advantage seeking, in which socially dominant actors are able to impose or influence the adoption of their desired schema (Lounsbury and Rao, 2004; Zhao, 2005; Negro et al., 2010; Ozcan and Gurses, 2018). Instead, building from the complementing view, this paper highlights the utility of viewing new market categorisation at the boundaries of the public and private as a cooperative venture (Navis and Glynn, 2010; Granqvist and Ritvala, 2016), in which political actors are expected to participate in deliberative activities necessary to shape a proposed categorisation collectively.

Approaching politics through a deliberative lens in which firms are more accountable to citizens may be taken as overly normative, even naïve. The findings from this case, however, suggest those market actors who fail to fulfil the expectations of them as political actors are likely to face sustained opposition to their proposed categorisation. Recent scholarship by Uzunca et al., (2018) examining how sharing economy companies, specifically Uber and Airbnb, shape their institutional environments lends credence to the position advanced herein. The authors found Uber's transformative strategy, corresponding with the instrumental view of politics, premised on exercises of power and aggression was less effective in positively shaping stable institutional environments. In comparison, the deliberative orientation of Airbnb's relational and additive strategy was found to "allow for more opportunities to codevelop (new) regulations that provide more sustainable legitimacy gains" (p. 267). Importantly, the above example underlines how approaching the

categorisation process as a show of “political agency” (Negro et al., 2010), fundamentally contributed to Sidewalk Labs’ ineffectiveness as a political actor. Their failure as a political actor is exemplified in their advancement of performative framing in response to contestations that arose during the project. Sidewalk Labs approached the categorisation of Quayside as a smart city through an instrumental lens, in which they were exogenous to the political process. In this respect, this study responds to recent critiques of the market categorisation literature as being apolitical (Cornelissen and Cholakova, 2019) by conceptualising categorisation as a deliberative political process, in which market actors participate as political actors as well, and where the configuration and acceptance (or not) of a categorisation is an outcome of the political process.

Additionally, viewing categorisation through the deliberative lens offers a complementing explanation for when categorisations fail or are abandoned. As categories and categorisation is an outcome to be explained (Kennedy and Fiss, 2013), the literature has typically privileged successful cases, however with a few exceptions (Navis et al., 2012; Kuilman and Driel, 2013). As such, the findings of this study contribute to an under-researched area in the market categorisation literature. In complementing explanations of abandonment, such as inchoate and conflicting identity frames (Navis et al., 2012) or more generally the inability of a categorisation to balance coherence and distinctiveness (Lo et al., 2019), the examined case directs attention to the conditions and normative political expectations under which the defining features, practices of a proposed categorisation are negotiated. This underlines the extent to which actors seek to engage in the political negotiation of shared interests, or merely attempt to affect the process, has consequences for the viability of a proposed categorisation.

#### *Materials of depoliticisation in market categorisation*

The second contribution of research pertains to the role material and visuals in political processes of categorisation. Sidewalk Labs used material and visual artefacts to cultivate excitement and mobilise support for their categorisation of Quayside, as a smart city. This was a defining feature of their political strategy that was heavily mediated by material prototypes and visual renderings. Past research has highlighted the role of visuals and material artefacts in shaping and settling the meaning and boundaries during market categorisation (Jones et al., 2012; Delmestri and Greenwood, 2016; Blanchet, 2018). The findings of this study, while confirming the vital role of material and visual artefacts in

market categorisation, however, offer a point of departure by illuminating the role of material and visual artefacts as tools of depoliticisation contributing to the abandonment of a categorisation. By doing so, this paper connects political processes of categorisation to the growing attention of material and visual artefacts in institutional processes (Meyer et al., 2013; Meyer et al., 2018; Jones et al., 2019).

The implicit assumption in the market categorisation literature is that actors will utilise material and visual artefacts in a progressive fashion to reify and instantiate the meaning of a proposed categorisation (Blanchet, 2018). The findings of this research suggest how material and visual artefacts are used will differ depending on the political strategy of categorisation employed. Aligning with recent theorising concerning the affordances of visual texts (Meyer et al., 2013; Meyer et al., 2018), instrumental political strategies, characterised by performative framing, specifically rely on visuals because of the capacity to limit or avoid deliberation. To this end, visuals communicate meaning in a way that can “elicit attitudes that precede awareness” by affectively and aesthetically engaging audiences, which can enable a market actor to mobilise support and appeal based on “feeling” rather than “deliberation” (Meyer et al., 2018 pp. 399, 404). Because visual artefacts are memorable, they importantly allow for the communication of information without argumentation, which can serve to depoliticise a proposed categorisation that challenges established meanings of a social milieu (Meyer et al., 2013 p. 496; Meyer et al., 2018 p. 402). For instance, the labelling of the Quayside neighbourhood as a “laboratory” was supplanted by artistic images of everyday life creating cognitive distance between the contested label and the dominant referents, i.e. the iconic renderings of wooden buildings. As such, the use of visuals in strategies of depoliticisation extends the understanding of the ability of visuals to “mask” or to “purify” undesired elements of a proposed categorisation (Blanchet, 2018; Boxenbaum et al., 2018).

Briefly, in comparison, procedural reconfiguring as a counterweight to visually heavy performative framing emphasised a verbal discourse, exemplified in contracts, evaluations, and project reports. As a more deliberative political strategy, it was characterised by argumentation and specificity tied to more concrete outcomes. This suggests that when political strategies of categorisation are deliberative, they are likely to be verbally laden with visual texts supporting arguments and specified details necessary for discussion, debate and scrutinizing. Conversely, when political strategies are instrumental, they are likely to be visually laden with supporting verbal texts. The reason being, instrumental strategies use

visuals to attract and focus audience attention on noncontroversial elements as means of “surpassing cognitive processes” necessary to avoid deliberation (Meyer et al., 2018 p. 399). This may present advantages in market settings when competing for the limited attention of audiences; however, when employed in politically contentious situations, it may permit underlying tensions to persist, increasing the likelihood of a categorisation being abandoned.

Having presented the theoretical model and the contributions of this study to the literature on market categorisation, the remainder of the paper is devoted to discussing future research and concluding remarks.

## **5.6 Conclusion, Limitations & Future Research**

This research sought to understand how politics influenced new market categorisations at the between the boundaries of the public and private. In exploring this question, an alternative view of politics was advanced, conceptualising categorisation as a deliberative political process. Applying this interpretation to the case of Quayside, it was shown that market actors are not exogenous to the political processes of categorisation but endogenous political actors, whereby the legitimacy of their proposed categorisations is tied to satisfying the normative expectations of the political process. Consequently, the inability to act as a skilled social actor contributed to unresolved political contestations and ultimately, the abandonment of the categorisation. With that said, the findings of this paper should be understood in light of its limitations.

The primary limitation of this study is the decision of Sidewalk Labs to pull out from the project due to the COVID-19 pandemic. As a result, it is impossible to know if the project would have succeeded or failed under normal conditions. Despite this, the findings and the theoretical concepts generated from data are reflective of the conditions up to the point of cancellation. Given this, the proposed theoretical concepts and model do offer a plausible explanation regarding the response to and persistence of political contestations. The second limitation is the research design, a single case involving two relative unique actors, specifically, Waterfront Toronto, a public redevelopment corporation with a limited corporate charter when compared with other analogous organisations like the New York Port Authority (Dutton and Dukerich, 1991); and Sidewalk Labs, a subsidiary of one of the largest and wealthiest companies. Although single case studies typically face challenges of generalizability, however, the findings of this study hold relevance for market categorisation involving novel interactions between the public and private. Specifically, this study draws



attention to the categorisation of new markets that will require regulation but where it is not clear what regulations should be, or even is should be setting them. As such, this case surfaced important regulatory issues and questions regarding the role of digital technologies in society and what are the appropriate boundaries. The commonly cited examples of Facebook, Google and Uber, and the growing discomfort with their business models underscores the importance of more deliberative approach to market categorisation because labels used to classify products and people are often linked to underlying complex social issues. The resolution of those issues, particularly where they intersect with the market require negotiation not just between market actors. Therefore, future research should seek examine how deliberative approaches are being applied in other contexts where markets are being categorised involving digital technologies.

This research also directed attention to an understudied context for market categorisation, public-private partnerships. Given the continued fiscal challenges facing governments, public-private partnerships are likely to remain an attractive option for establishing new markets on boundaries of the public and private. Future research could investigate how the politics of public-partnerships differ when categorising new markets tied digital technologies versus conventional services and products.

The findings of this study underscored the importance of visuals in strategies of depoliticisation. Future research should examine how firms seek establish dominant visuals narratives or frames to drive the categorisation process toward their desired schema. The unsettled boundaries and meaning of smart city, creates the leeway strategic envisioning, therefore future research could examine to what extent ambiguity of market space influences the discursive and visual strategies of firms. Additionally, for markets that are perceived to be politically contentious how firms use visuals to resolve tensions necessary to advance process of categorisation.

The findings of this study offer a cautionary tale for public organisations as well as companies engaging in market categorisation where the absence of guiding regulations make it difficult to define what is appropriate in the market. This takes on greater significance in period of time where market categorisation build around digital technologies can have sources contestations ingrained in them. The ability of certain categories to challenge traditional notions of the public realm or privacy embolden the need to bring market categorisations back into political processes, to guardrails for market categorisation.

## Chapter 6: Synthesising Discussion and Conclusion

The research presented in this dissertation investigated the strategies and the politics of categorising new markets in the present era of digitalisation. On the theme of strategy, the literature in recent years has come to adopt a more agentic view of category formation, whereby firms have a direct hand in shaping the definition of the market spaces they inhabit (Kennedy, 2008; Pontikes, 2018; Pontikes and Rindova, 2020). Despite the increased recognition of market categories as strategic creations or outcomes, the literature has tended to focus on the use of cultural resources which help to make a category resonant and socially congruent. As a result, the question of what firm-specific resources are required to both construct and shape a new category has been underexplored. To fill this gap, the first study included in this dissertation examines Northern Telco's efforts to construct the category of "smart wireless manufacturing". The research was guided by the following research question:

- How does a firm make strategic use of firm-specific and cultural resources to shape and define a new market category?

The findings of this study show how a firm seeks to create (and favourably define) a new market around its specific knowledge resources. Specifically, the study introduces a theoretical model of *strategic category shaping*. Strategic category shaping is enabled by three distinct configurations of firm-specific and cultural resources (cultural-led, knowledge-led, and hybrid-led) supporting three dimensions of category shaping (empathetic resonance, structuration of value space, reification of material space). The identified resource configurations and dimensions of category shaping contribute to a better understanding of strategic categorisation as a resource-laden process. By doing so, it shows that firms need to align not only their specific knowledge resources with the cultural ones of a target audience but their secondary resources as well.

The second study in this dissertation draws upon the case of a proposed smart city neighbourhood to examine the role of politics in categorising new markets on the boundaries of the public and private. Politics has long been recognised in the literature as going hand-in-hand with market categorisation given the potential for conflicting interests, ideologies and normative expectations, and a need for regulation and government oversight (Bowker and Star, 1999; Lounsbury and Rao, 2004; Durand and Khaire, 2017). The market categorisation literature has fostered an instrumental view of politics where actors of status and means attempt to dominate or assert their influence over a market space. Consequently, the literature

has yet to fulsomely investigate market categorisation through the lens of a political process rooted in public deliberation and cooperation. As such, this study was guided by the following research question:

- How does politics shape new market categorisation on the boundaries of the public and the private?

The findings of this research show that a failure of a firm to approach the categorisation of a new market as a distinct political process can trigger persistent contestation preventing a proposed categorisation from stabilising. Based on the examined case a theoretical model of *categorisation abandonment* is developed. The model shows that when confronted political contestation the public and private partners pursued diverging strategies, specifically procedural reconfiguring and performative framing, respectively, which permitted contestations to go unresolved.

This final chapter of the dissertation discusses the principal findings of the two studies around two themes: categorisation as an interest-based endeavour, and a multimodal inquiry of categorisation. This is followed by a reflection on the limitations of the dissertation (6.3) and a summary of the contributions made to the literature on market categorisation (6.4). The penultimate section discusses implications for practitioners and provides recommendations for those working in industry and government (6.5), and then subsection 6.6 concludes.

## **6.1. Synthesising of Theoretical Themes**

This subsection discusses two overarching sub-themes that connect elements from the two studies: 1) *categorisation as an interest-based endeavour*; and 2) *a multimodal inquiry of categorisation*.

### **6.1.1 Categorisation as an interest-based endeavour**

Although the studies presented in Chapters 4 and 5 examine different empirical contexts, together, they embolden the “interest-based” dimension of categorising new markets (Durand et al., 2017; Pontikes and Kim, 2017; Delmestri et al., 2020). When viewed holistically, they paint a contrasting picture of how the underlying economic objectives, beliefs or motivators influence the agency of market actors as they engage in market categorisation. Thus, for discussion here, it is possible to distinguish between the process of market categorisation characterised by *converging interest-based strategies* and *diverging interest-based strategies*. These strategies, in turn, reflect how market actors approach

audiences, what resources and tactics they employ in the pursuit of their competitive interests.

A *converging interest-based strategy* is rooted in a more consensual, cooperative orientation to the categorisation of a new market. Producers are likely to advance category definitions built around the symbols and concepts from an audience's cultural repertoire. The intention is to bolster feelings of familiarity and commensurability with the goals and aspirations of an audience through the provisioning of causal information and demonstrations of how a proposed category schema can address their problems and needs (Giorgi, 2017; McDonnell et al., 2017). For instance, the vision for smart wireless manufacturing was grounded in the cultural repertoire of the manufacturing industry, insofar as the narratives and concepts of 'flexibility' and 'mass customisation' were used to give meaning and value to cellular in the new context. It is important to note, the notion of convergence extends beyond evocative storytelling, underscoring the necessity of demonstrating knowledge about an audience, and showing how they benefit from the categorisation of a new market. In this respect, the convergence of interests implies clarity of mutual benefit, which drives the formation of relationships of exchange.

Comparatively, a *diverging interest-based strategy* is likely to be advanced in situations where there are power asymmetries that afford certain actors greater influence over the categorisation process. The relative imbalance underscores a less cooperative orientation. Unlike the convergent strategies that seek to align interests through actions that build the resonance of category definitions and features, divergent strategies approach the alignment of interests more rhetorically and superficially. This strategy is reflected in producers advancing category definitions built around the symbols and concepts from their cultural repertoire as opposed to that of the audiences'. For instance, Sidewalk Labs' slogans of "building a neighbourhood from the internet up" and neighbourhood as a "laboratory for innovation" are symbols and concepts rooted in the cultural repertoire of the tech industry. As such, this points to a situation where producers in privileged positions are selling a proposed categorisation but where the links to addressing the goals and aspirations of an audience are not explicitly evident. While this does not preclude diverging interest-based strategies from being successful, it presents a cultural credibility gap for producers.

The differences between the interest-based strategies premised on converging with the needs of an audience versus diverging, where the needs of the producer are more emphasised are exemplified in the different use of material and visual artefacts between the cases. For

instance, Northern Telco actively sought to empathise and propose a culturally resonant category definition, whereby conference demos and large-scale demonstrators were geared to showing how cellular works and how the adoption could make manufactures more efficient. Thus, the element of convergence involved visual and materials artefacts showing how the problems of today could be addressed with future technology. Conversely, Sidewalk Labs used material and visual artefacts to persuade audiences they fit into the categorical vision created by Sidewalk Labs. Consequently, the depictions used to define the features of the proposed categorisation were *detached from addressing the problems of today*. Audiences were presented with a category schema defined through the prism of an Alphabet product portfolio. Therefore, how firms balance the advancement of their competitive interests with the needs of a target audience has implications concerning potential contestation that may be encountered and the overall viability of a proposed categorisation.

Given the known outcome of the Quayside project, it is perhaps easy to attribute a diverging interest-based strategy to the abandonment of the categorisation of a new smart city. Having said this, there are noticeable differences between how Northern Telco is attempting to shape the market for smart wireless manufacturing and the previous efforts of Sidewalk Labs. All things being equal, Northern Telco has sought to align its interests with a new target audience, and to an extent, that is reflected in their use of cultural and material resources. The same could not be said for Sidewalk Labs. A possible explanation is Northern Telco has to be more cooperative as a new entrant into an industry, where it does not have an established identity. Therefore, it needs to build a position in the market before exerting any soft power it may come to have. Comparatively, the nature of Sidewalk Labs' selection and partnership with Waterfront Toronto afforded it a certain degree of power and influence on the categorisation process. This was evidenced in the top-down approach the company adopted to build support among the public for its vision for Quayside (and the Waterfront). Considering this, perhaps when firms perceive they have a relative advantage in terms of credibility, positioning and influence, they may be less inclined to adopt a strategy of convergence. As such, this may present an avenue for future research regarding how the differences in relative power influence the orientation of interest-based strategies during market categorisation.

Another explanation for the differing strategies of Northern Telco and Sidewalk Labs pertains to the degree of conceptual ambiguity associated smart manufacturing and smart cities, and their roles within these domains. Although, smart manufacturing is still emerging,

it builds on existing notions of efficiency and automation. Additionally, the identified need for connectivity (as per the Industry 4.0 Maturity Index) aligned with Northern Telco's narrow focus on establishing a new niche for cellular technology. Thus, what they are offering and where they fit in the ecosystem is clear. Comparatively, the concept of smart cities has been politically problematic, characterised by polarising associations ranging from environmental sustainability to mass surveillance. The conceptual ambiguities were amplified by the sweeping role Sidewalk Labs proposed for itself, specifically, as a provider of digital infrastructure and products, urban planning consultant, and venture capitalist. Consequently, what Sidewalk Labs is and what it does was unclear. This was reflected in its explorative approach to market making, which constrained its ability to empathise with the needs of users and mobilise support for its category schema. The challenges Sidewalk Labs confronted, and the corresponding political contestation are partially the consequence of lacking specialism in an ambiguous domain. These factors reinforced each other creating confusion among citizens.

### **6.1.2 A Multimodal Inquiry of Categorisation**

The prolific use of visual and material artefacts observed in both studies brings into sight the growing recognition that “institutions are multimodal achievements” (Meyer et al., 2018 p. 408). By extension, the creation of new market categories are too (Meyer et al., 2013). Yet, the dominant linguistic approach to studying categorisation “[marginalises] the non-discursive” (Alvesson and Kärreman, 2011 p. 1124) and focusses on textual data only. The standing critiques of the literature highlighting the tendency to emphasise the effects of categories (Durand and Paoletta, 2013; Kennedy and Fiss, 2013; Durand et al., 2017; Delmestri et al., 2020) is not only a matter theoretical consequence but also implies a methodological challenge. As scholarship shifts the focus of inquiry to processes of categorical formation and change, the predominate emphasis upon language as the principal modality of meaning-making is being accelerated, particularly as algorithmic methods like topic modelling come into vogue (Kaplan and Vakili, 2015; Hannigan et al., 2019). The existing literature on market categorisation offers several examples of quantitative approaches to analysing the linguistic construction of meaning and category dynamics (Kennedy, 2008; Kennedy et al., 2010; Bajpai and Weber, 2017). The attraction of scholars to large “big data” studies aided by computational text analytics to track categories, including labels and firms paints a clear path towards quantitative theory testing (Suarez et al., 2015 p. 445; Pontikes, 2018 p. 228). While such approaches are undoubtedly able to generate relevant

insights capable of advancing the literature, the issue is not efficacy per se but the continued primacy a singular, textual, mode of meaning making that shapes categorisation of markets.

If understanding the complexities of socially constructing market categories requires theoretical pluralism (Negro, Koçak, et al., 2010; Durand and Thornton, 2018; Pedeliento et al., 2020), then the same can likely be said of the modalities of meaning that are examined. Although the studies in this dissertation adopted what some may consider a “weak” approach to multimodality (Zilber, 2017), the chosen approach is in part a reflection of the dearth of multimodal studies within the categorisation literature and more broadly in management as a field (Bell and Davison, 2013; Meyer et al., 2013). Scholars are working to normalise the adoption of multimodal inquiries, exemplified in foundational theorising (Meyer et al., 2018) as well as a dedicated journal issue in *Organizational Studies* (Boxenbaum et al., 2018) and book volume (Höllner et al., 2018). However, at present the role of visual and material objects in examinations of category processes remains at the periphery with few notable exceptions (Jones et al., 2012; Delmestri and Greenwood, 2016; Blanchet, 2018). Subsequently, the lacking guiding exemplars in the literature both inspired and tempered the author’s ambitions as a PhD student to put a stronger emphasis on multimodality with a view to the phenomenon (market categorisation) and research strategy (single case study). This caution was due to the confines of the dissertation as well as considerations as to where such research could be published. That said, the decision to engage with the visual materials was driven by the type of data being collected (e.g., PowerPoint) as well as references by informants to specific material artefacts.

The decision to integrate visual data into the wider analysis of the two case studies reflects the present period of digitalisation, where objects of categorisation are shifting forms and becoming increasingly immaterial (e.g. blockchain, Bitcoin). As a result, digital objects require an element of material mediation (e.g. social media, apps) to become socially recognisable and meaningful. The conceptualisation of categorisation as a social process of communication (Cornelissen et al., 2015; Durand et al., 2017) makes it subject to the shifting media in which the meanings of market categories are shared and diffused. For instance, social media platforms blend visuals (video, images) and text. Understanding visual representations of categories and how they emerge, and change is just as important as tracking the labels or analogies that actors may use. It directs attention to how visuals are strategically used and to what end (e.g. clarifying meaning or obstructing scrutiny). Thus, the

use of visuals in processes of market categorisations remains an intriguing and necessary line of investigation.

## **6.2 Reflections on Limitations**

While some of the limitations of this research have already been addressed in the preceding chapters, this section discusses some key limitations relating to the study's overarching research design and challenges encountered in the field.

The merits and challenges of single-case study designs remain a source an ongoing debate and methodological investigation among management scholars (Eisenhardt, 1989; Dyer and Wilkins, 1991; Welch et al., 2011; Gehman et al., 2018). The principal trade-off of deep contextual understanding of a research phenomenon at the expense of generalisability is also a Limitation of this study. That said, the focus on market creation around digital communications technologies, particularly involving large established companies suggests a certain degree of transferability of the insights generated. The extent to which some of the insights can be transferred to other contexts remains of course an empirical question. However, the rich contextual understanding provided allows the reader to come to some judgement as to how the insights and models provided could be useful to understand similar phenomena in similar settings.

Overall, this dissertation has attempted to follow and implement identified best practices that inform the development of rigorous qualitative case studies (Gibbert and Ruigrok, 2010; Piekkari et al., 2010). Both studies employed purposeful sampling, relying on the collection of robust data sets triangulating diverse and complementary sources of data. Additionally, in both research projects, the phenomena of inquiry were examined for a prolonged period of time, enabling the author to develop refined contextual understanding, particularly, in the case of Northern Telco where the author was embedded within the company for 18 months. The author has sought to be transparent in reporting how the analysis process was conducted and seeking validation from individuals who participated in the study as interviewees.

That said, no study is without limitations, and the two studies presented in this dissertation are no different. Each presented different challenges and limitations related to positionality and access. Often the challenge for researchers is gaining inside access to an organisation. In reference to the case study presented in Chapter 4, access to the research setting was negotiated as part of a larger research project. Yet, at times during the



secondment to the company, the difference between being on the inside and being an insider was evident. While this did not limit the ability of the researcher to gather pertinent documents, at times it did present barriers to getting the ‘unofficial story’ from interviewees or employees during small talk in the tea kitchen, for example. In some respects, this was attributable to being identified as a “researcher” from a university but also due to the cultural context, foreign to the author, and a local language that was not spoken by the author. This limited access to perhaps more privileged discussions. At the same time, the degree of distance was beneficial in maintaining a balanced perspective in the research process.

A second limitation worth noting relates the nascency of Northern Telco’s market building effort. Because the market for smart wireless manufacturing is a few years away, a large share of the data collected captures what the firm wants to do, and is currently doing. As of now, it is impossible to know if this will turn into a success story or not. As the case continues to progress the theorising of strategic category shaping may be bolstered by additional corroborating evidence or may require changes in the face of it.

In reference to the case study presented in Chapter 5, regarding Sidewalk Labs and Waterfront Toronto two limitations are worth reflecting on. First, the amount of publicly accessible data made reduced the barriers to collecting diverse dataset, ranging from recorded public consultations, project presentations and plans, blogs. The amount of data collectable data was buoyed by the amount of media attention the project received. As such, this was an advantage given the geographic distance between the location and setting of the research phenomenon and location of the researcher (i.e. Canada and Europe). This geographic distance limited the ability of the researcher to attend the various public engagements associated with the project (e.g. public consultations, community panel discussions, open houses). Although many of the events were video recorded and as such accessible to the researcher, being able to attend events in person provides a different perspective on events that are not necessarily evident when viewed after the fact.

The second limitation of the study presented in Chapter 5 pertained to access to respondents, specifically, representatives from Sidewalk Labs and Waterfront Toronto’s Digital Strategy Advisory Panel. Repeated efforts were made to speak with employees of Sidewalk Labs (direct email, private messaging on Twitter, and formal requests submitted through the company’s public relations channels). Although the author was able to collect numerous archival interviews, recorded keynotes and other “soundbites” of representatives from the company speaking about the project, the data in that respect was limited to public

relations narratives. This placed limitations on being able to move beyond knowing what they did or what they said to why did it and said it. Interviews with representatives from Sidewalk Labs would have provided complementary insights and allowing more of a balance in terms of the viewpoints captured in the interviews conducted.

Similarly, given the critical role that Waterfront Toronto's Digital Strategy Advisory Panel played in the context of the project, it would have been beneficial to have interviewed members of the panel. Since non-disclosure agreements bound panellists, this limited their willingness and ability to speak. Again, recordings and meeting minutes from the Digital Strategy Advisory Panel meetings were obtained, providing access to opinions and expressed viewpoints on issues that emerged during the project, nevertheless, this group of stakeholders remain unrepresented in the sample of interview participants.

### **6.3 Contributions to the Literature**

Overall, this dissertation contributes to the literature on social categorisation. The main contributions are thematically organised around categorisation as strategy, the politics of categorisation and categorisation as material and visual meaning-making. Collectively they respond to several gaps in the literature regarding the strategic interests of actors, the influence of social and material context and the nature of the object being categorised (Durand et al., 2017; Grodal and Kahl, 2017; Pontikes, 2018).

#### *Categorisation as Strategy*

The findings from Chapter contribute to the literature by enhancing our understanding of the ways in which firms attempt to strategically shape the categorisation of new markets (Pontikes, 2018; Delmestri et al., 2020). A model of *strategic category shaping* is developed explicating how firms can make strategic use of firm-specific resources and cultural ones in order to favourably define a category around their specific knowledge resources. In doing so, this study fills a gap in the literature regarding the role of firm resources in supporting the strategic categorisation of new markets (Durand and Boulongne, 2017). By bringing together the literatures on the resource-based view (Barney, 2001; Peteraf, 1993), cultural view of resources (Weber and Dacin, 2011; Ravasi et al., 2012) and strategic categorisation (Vergne and Wry, 2014; Pontikes and Kim, 2017) this study further responds to calls for the greater integration of strategic management and organisation theory in the study of market categories (Durand, 2012; Vergne and Wry, 2014; Zhao et al., 2018).

### *The Politics of Categorisation*

Findings from the second study contribute to the literature on market categorisation by advancing an alternative reading of market categorisation as a deliberative political process. The research affirms politics as an inescapable factor in the social dynamics of categorisation (Bowker and Star, 1999; Quinn and Munir, 2017; Slavich et al., 2020) while at the same time counterbalancing the typical framing of politics as a strategic game in which socially dominant actors are able to impose or influence the adoption of their desired schema (Lounsbury and Rao, 2004; Zhao, 2005; Negro et al., 2010; Ozcan and Gurses, 2018). Instead, this paper examines the categorisation of a new market at the boundaries of the public and private as a cooperative venture (Navis and Glynn, 2013; Granqvist and Ritvala, 2016), in which political actors are expected to participate in deliberative activities necessary to shape a proposed categorisation. A theoretical model of *categorisation abandonment* is developed showing how the failure of firms to approach the categorisation of a new market as a political process can trigger persistent contestation that ultimately prevents a proposed categorisation from stabilising.

### *Categorisation as material and visual meaning-making*

The research presented in this dissertation connects an understanding of categorisation as a social and political process to the growing attention of material and visual artefacts in processes of institutionalisation (Meyer et al., 2013; Meyer et al., 2018; Jones et al., 2019) and strategic meaning-making (Knight and Paroutis, 2018). The two presented studies affirm the importance of material and visual artefacts in processes of market categorisation (Jones et al., 2012; Delmestri and Greenwood, 2016; Blanchet, 2018; Delmestri et al., 2020), contributing contrasting perspectives regarding the strategic use of these non-linguistic modalities in shaping category meanings. The findings of the first study contribute to the literature regarding the use of material artefacts: 1) in the context of performances of symbolic boundary demarcation by highlighting the role of visual signalling as a complementing act of categorisation (Delmestri and Greenwood, 2016; Durand et al., 2017); 2) in situations where the target of categorisation is imperceptible, the study demonstrates how combinations of material artefacts are used to make an entity's "multidimensional features" observable and in turn evaluable by audiences; and 3) the study shows how the material context of large-scale demonstrators create immersive spaces providing

audiences with realistic representations of the proposed market category allowing the ecosystem to be displayed.

The findings from Chapter 5 specifically connect material and visual artefacts to political processes of market categorisation. This study offers a point of departure from the literature by illuminating the role of such artefacts as tools of de-politicisation used to manage contestation as opposed to clarifying meanings, thereby ultimately contributing to the abandonment of a categorisation.

## **6.4 Future Research**

Both case studies included in this dissertation point to opportunities for future research. With regard to the first study, future research could continue longitudinally to understand the efficacy of the observed acts of category shaping as well as to see if other resource configurations are added over time, and to what end. In parallel, it would be beneficial to expand the sample size to not only to include similar firms but also some operating in other markets to better understand what resources are being configured and whether they follow a similar pattern. Building on the contrasting outcomes of the two studies to date, it would also be interesting to know why certain firms are able to integrate firm and cultural resources more effectively than others in attempting create and shape categorisation of new markets.

Future research opportunities arising from the second study would be to examine other instances where markets have been or are being categorised through a deliberative political process. This could open avenues for historical case studies enabling scholars to gain a deeper understanding of how deliberative political processes influence the outcomes of categorisation. It would also be beneficial to know under what conditions strategies of de-politicisation work, as well as to identify alternative strategies that firms may deploy to manage the political dynamics of categorising on the boundaries of the public and private. Given the expectations of a deliberative process, it would be interesting to understand if that influences the type and maturity of markets firms attempt to categorise. Is a deliberative process perceived as barrier to entry or potentially a boon to establishing to the legitimacy of a new market and an advantageous position within it.

## 6.5 Implications for Managers and Policy Makers

In addition to contributing to the academic literature, the findings of this dissertation have implications for both managers in industry and the public sector who engage the categorisation of new markets.

### *Implications for practitioners in industry*

The creation and categorisation of new markets can be a contentious process, marked by diverging interests and goals, communication matters. This even more so when the categorisation is taking place on the borders between industries or sectors, where incommensurate analogies or conflicting views can derail the process. This places importance on the appropriate selection of narratives and symbols not only to attract the attention of a new audience but also to build support and credibility for a proposed categorisation. To avoid rhetorical sloppiness, firms should build narratives around what is culturally salient for a target audience, specifically focusing on aspirational features and references that can make a proposed category appealing. Invoking symbols and features from an audience's historical and cultural traditions is one way to create new associations and support the positioning of the category.

Additionally, for managers engaging the categorisation of new markets, it is important to be aware that this requires a plurality of resources beyond just financial. Managers should first select prospective markets that allow a given firm to maximise potential contributions from its existing resource base. For instance, a proposed market could connect to different aspects of the firm's identity, which may not necessarily be the first answer to "who we are and what we do" (Watkiss and Glynn, 2016) but perhaps "what we use to do" or "what we also do". The aim is to establish multiple resource linkages between the firm and the proposed market category to build the perceptions of plausibility with the target audience. How managers can build perceptions of plausibility is partially determined by what is said but also by what can be *shown*. The notion of seeing is believing is especially germane during the early stages of market formation when audiences are still making sense of new category. Given this, consideration should be given where audiences are engaged as much as what they are being shown. The findings from this dissertation also suggest the benefit of constructing representations of a proposed category at scale. The goal is to create sensory experiences for an audience that activate certain cognitive processes as well as create memorable

impressions. This underscores the importance of *realism*, which can amplify the defining features or boundaries of a new category.

Accordingly, notions of scale and realism are also essential considerations for market categorisations structured around ecosystems. Managers should seek to place their market offering within a realistic facsimile ecosystem to show audiences and stakeholders the big picture, and the linkages between them and existing products and systems that contribute to the ecosystem. Overall, for managers engaging in the categorisation of new markets, consideration should be given to what is said, how its shown, and where it fits.

### *Implications for policymakers*

The findings from Chapter 5 present several implications for policy makers involved in the categorisation of new markets, particularly in the digital realm. First and foremost, the examined case highlights the political necessity of maintaining clear and unambiguous boundaries between public and private entities. It is critical for the public to be able to see who is representing their interests and on what terms the negotiations are conducted. In the context of public-private partnerships, the terms of market creation need to be set out in advance to ensure clarity with respect to roles, conditions of value creation and capture, and articulated benefits.

Second, the negotiation of category boundaries and rules is not just a matter of who is on what side, but the ability of the involved actors to achieve a degree of shared understanding about the nature of a proposed market. The examined case is one of likely many where the target of categorisation requires specialised knowledge to be able to participate in a collective discussion about what something is and how it should be regulated. For instance, citizens generally understand what it means when a public agency partners with a firm to build a hospital. But it is less clear if that is the case regarding the construction of a smart city or other aspects of digital infrastructure and services. Things brings forward a larger issue associated with the categorisation of digital market spaces, specifically the issue of “digital literacy” of public officials and citizens, and their abilities to effectively engage in governance processes. Policy markers should pursue public education initiatives alongside market categorisation activities as means of enabling citizens to be better able to participate in public governance processes and to give *informed consent*. Such measures are important with respect bolstering the credibility and public legitimacy of market creation processes.

Third, while public organisations are typically concerned with whom they partner to create new markets, the examined case highlights the challenges of forming partnerships with large tech companies. Large tech firms have cultivated images of innovativeness and the ability to mobilise significant resources, which makes them potentially attractive partners for often resource constrained public organisations. At the same time, major tech companies (e.g., Alphabet, Facebook, Amazon, Microsoft, Apple) are increasingly seen as “irregular” actors given their knowledge asymmetries compared with local governments as well as their ability to shape public discourse, and to navigate political and legal systems. This can create political challenges for public organisations regarding their ability to discourage malfeasance and to both protect the rights of citizens as well as the public interest (see Google Fibre in Louisville, Kentucky). Given the current regulatory challenges, it could be advisable to limit the scope and scale of partnerships with large tech companies until the digital rules of the game are set.

On a related note, the impetus of using Quayside as a catalyst for innovation and economic development highlights questions for policy makers as to whether not such policy goals should be pursued through partnerships with large tech companies. While this consideration is outside the scope of this dissertation, it is important to note that the categorisation of new markets is driven by the aim of capturing value. Thus, it requires policy makers to understand how value is created and appropriated in new digital economies premised on data, intellectual property and proprietary platform infrastructure. This is particularly important if the public policy goal is to foster the development of local technology ecosystems.

## **6.6 Conclusion**

Together, the cases in this dissertation show the categorisation of new markets is filled with strategic promises as well as political perils. Despite the differing contexts and outcomes to date, the two case studies offer complementary insights into market categorisation during a time of digital transformation, and the opportunities and challenges that come with it. Specifically, the study of ‘smart wireless manufacturing’ shows how firms make use of both firm-specific resources as well as cultural ones to strategically influence the definition of a new market category. Complementing this organisational view, the study of the politics of a smart city in the case of Quayside, opens up the socio-political dynamics of categorising new markets on the boundaries of the public and private. By illuminating the

politics of market categorisation, the research reaffirms that while firms may use categories to strategically communicate and advance their interests, such categories are not a given nor should they go unquestioned by audiences like citizens, public officials, and the media. The categories firms come to use draws attention to the processes through which they obtain social license to operate (if at all). By drawing out the strategic and political dimensions of market categorisation reinforces the pertinence of the literature and the value of scholarly endeavors that help to challenge and unpack the categorisations advanced by powerful actors in society.



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## Appendix 1

### Ethical Clearance – Chapter 4 – Case Study Northern Telecom

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**From:** John Hardy <J.E.Hardy@leeds.ac.uk> on behalf of ResearchEthics <researchethics@leeds.ac.uk>  
**Sent:** 16 June 2020 11:06  
**To:** David Larkin <bndl@leeds.ac.uk>  
**Cc:** ResearchEthics <researchethics@leeds.ac.uk>  
**Subject:** RE: Reference Number

Thanks David – my apologies. We have two separate databases for Light Touch and “full” ethical reviews, I was looking at the database for the full applications.

I can see you had a project called *Categorization in an Emergent Ecosystem: Case Study of the IoT* that was approved on 18/08/2017, with the reference LTLUBS-181. The title and dates seem similar to the ones suggested by you – could this be the project? I couldn't find one with the title that you suggested.



Best wishes,

John Hardy  
Research Ethics & Governance Administrator  
The Secretariat,  
University of Leeds, LS2 9LT

## Appendix 2

### Ethical Clearance – Chapter 5 – Case Study Quayside

To: David Larkin  
Cc: ResearchEthics

Hi David,

**LTLUBS-328 - The categorization of place and the politics of new market new creation**

***NB: All approvals/comments are subject to compliance with current University of Leeds and UK Government advice regarding the Covid-19 pandemic, as well as any local restrictions where the study is being carried out regarding in-person data collection and travel.***

I am pleased to inform you that the above research ethics application has been reviewed by the Business, Environment and Social Sciences (AREA) Faculty Research Ethics Committee and on behalf of the Chair, I can confirm a favourable ethical opinion based on the documentation received at date of this email.

***Please retain this email as evidence of approval in your study file.***

Please notify the committee if you intend to make any further amendments to the original research as submitted and approved to date. This includes recruitment methodology; all changes must receive ethical approval prior to implementation. Please see <https://leeds365.sharepoint.com/sites/ResearchandInnovationService/SitePages/Amendments.aspx> or contact the Research Ethics Administrator for further information ([researchethics@leeds.ac.uk](mailto:researchethics@leeds.ac.uk)) if required.

Ethics approval does not infer you have the right of access to any member of staff or student or documents and the premises of the University of Leeds. Nor does it imply any right of access to the premises of any other organisation, including clinical areas. The committee takes no responsibility for you gaining access to staff, students and/or premises prior to, during or following your research activities.

***Please note:*** You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, risk assessments and other documents relating to the study. This should be kept in your study file, which should be readily available for audit purposes. You will be given a two week notice period if your project is to be audited.

It is our policy to remind everyone that it is your responsibility to comply with Health and Safety, Data Protection and any other legal and/or professional guidelines there may be.

I hope the study goes well.

## **Appendix 3 Information Sheet -Chapter 5**

### **The categorization of place and the politics of market creation**

#### **Information Sheet**

##### **What is the study about?**

This doctoral research project seeks to explore the creation of smart cities and markets for smart city technologies. As such, the intention is to examine the role of private, public and community actors and how they respectively construct and navigate the political challenges and issues (e.g. privacy, data governance, public-private boundaries) associated with the deployment of digital technologies under the banner of smart city developments.

##### **Why have you been invited to participate?**

You are invited to participate in this research because you have been identified as having relevant subject matter expertise (i.e. technical, legal, political, environmental, etc.) concerning issues and challenges associated with smart city projects; and/or personal experience with smart city projects (i.e. professional, member of local community), who can offer contextual insights and reflections. We believe this project would benefit greatly from your involvement.

It is up to you to decide whether you would like to participate or not. If you decide to take part, you are free to withdraw at any time and without giving a reason. All you need to do is contact David Larkin's either by email or telephone using contact information provided.

##### **What will happen if you take part?**

As a participant in this study, you will be asked to take part in a qualitative interview lasting approximately 30 minutes or of an agreed upon duration.

##### **Will your taking part in this study be kept confidential?**

Upon obtaining your consent, interviews will be recorded. All your personal data will be confidential and will be kept separately from your responses. No private names will be linked with the research material or any publications. Anonymised quotations from your interview(s) may be used in the reports/publications from the study but you will be consulted prior to publication if there is any concern regarding anonymization or confidentiality. Data submitted will be evaluated and catalogued but not shared with third parties without explicit consent to do so.

##### **What are the possible benefits of taking part?**

Whilst there are no immediate benefits for those people participating in this research, it is hoped this work will support and contribute to the increased political and ethical sensitivity of management scholars concerning the social implications of how digital technologies are commercialized. By doing so, the intention is to further contribute to a broader society discussion about responsible innovation in the digital era.

##### **What will happen to the results of the research study?**

It is expected the results of this research will contribute to the completion of the researcher's doctoral dissertation with the future potential to contribute to scholarly articles, lecture material, public policy recommendations, and articles for the wider public.

**Who is supervising the research?**

This doctoral research is being supervised by Professor Krsto Pandza and Dr Lena Jaspersen, University of Leeds Business School.

**Who has reviewed the study?**

The research project is being reviewed by the University Research Ethics Committee, University of Leeds.

**Contact for Further Information**

For further information please contact the researcher David Larkin (contact details above).

Thank you for taking the time to read this information sheet.

David Larkin  
Leeds, 20.02.2020

## Appendix 3 Summary of Conducted Interviews

### A3.1 Interview Summary Chapter 4

Interview Respondent	Date	Role	Interview Method (face-to-face, skype, no recording)	Time (HR:M:S)
Interview 1	2017-11-09	Director IoT	Skype	36:11
Interview 2	2017-11-13	Sr. Researcher	Face-to-face	43:58
Interview 3	2017-11-14	Manager	Skype	33:23
Interview 4a	2017-12-08	Partner Manager	Face-to-face	38:15
Interview 4b	2017-12-13	Ecosystems		35:25
Interview 5a	2018-05-18	Technology Ecosystem Manager	Skype	45:00
Interview 6	2018-05-23	Business Developer 5G	Face-to-face	24:14
Interview 7a	2018-10-18	Business Development Manager	Face-to-face, no recording	~ 20:00
Interview 7b	2019-12-30		Skype	49:35
Interview 7c	2020-03-09		Face-to-face	42:06
Interview 7d	2020-06-19		Skype	29:16
Interview 8	2018-10-23	Technology Ecosystem Manager		34:10
Interview 9	2018-11-02	Business Operations Manager	Face-to-face, no recording	25:00
Interview 10	2018-11-02	Research Manager	Skype	50:58
Interview 11	2018-11-02	Senior Researcher	Skype	50:58
Interview 12	2018-11-09	Product Manager	Face-to-face	53:27
Interview 13	2018-11-20	Ecosystem Manager	Face-to-face	47:08
Interview 14a	2018-11-21	Portfolio Manager	Face-to-face	1:11:05
Interview 15a	2018-11-23	Business Architect	Skype	60:00
Interview 15b	2018-12-07			27:07
Interview 16	2018-11-28	Marketing Advanced Industries	Skype	22:58
Interview 17	2018-12-03	Customer Consultant	Skype	53:51
Interview 18	2018-12-17	Head of Advanced Industries	Skype	22:58
Interview 19a	2019-01-10	Sr. Architect Business Innovation	Face-to-face	53:27
Interview 19b	2019-02-07		Face-to-face	36:16
Interview 20	2019-01-19	Master Researcher	Face-to-face	34:14
Interview 21a	2019-01-31	Portfolio Manager	Face-to-face	60:00
Interview 21b	2020-06-26		Skype	20:32
Interview 22	2019-02-11	Research Manager, 5G for Industries	Skype	42:54
Interview 23a	2019-02-15	Program Manager, 5G for Industries	Face-to-face	51:45
Interview 23b	2020-03-09		Face-to-face	25:34



### A3.2 Interview Summary – Chapter 5

<b>Interview Respondent</b>	<b>Date</b>	<b>Role</b>	<b>Interview Method</b> (face-to-face, skype, no recording)	<b>Time</b> (HR:M:S)
Interview 1	2020-02-25	Academic/Public Commentator	Face-to-face	1:10:50
Interview 2	2020-02-28	Co-leader Block Sidewalk	Face-to-face. No recording	~ 45:00
Interview 3	2020-03-01	Member Block Sidewalk	Face-to-face	46:48
Interview 4a	2020-03-04	Executive Waterfront Toronto	Skype	53:21
Interview 5	2020-03-04	Community Activist	Skype	1:07:15
Interview 6	2020-03-05	Academic/Public Commentator	Skype	54:30
Interview 7	2020-03-12	Academic/Public Commentator	Skype	59:44
Interview 8	2020-03-16	Academic/Public Commentator	Skype. No recording	~ 20:00
Interview 9	2020-03-24	Academic/Public Commentator	Skype	1:09:02
Interview 4b	2020-05-06	Executive Waterfront Toronto	Skype	37:47
Interview 4c	2020-05-21			33:21
Interview 10	2020-09-09	Member Block Sidewalk	Skype	42:58
Interview 11a	2020-09-10	Co-leader Block Sidewalk	Skype	41:07
Interview 11b	2020-09-11			2:02:45