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Exploring regional industrial culture. Changing industrial culture and human agency in a Norwegian region

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ABSTRACT

This paper explores the role that industrial culture and human agency play in regional industrial development. It makes three contributions. First, it discusses and explores the concept of regional industrial culture and examines its relevance for regional industrial development. Second, it identifies and investigates two main forms of regional industrial culture: one self-interest dominated type and one community dominated type. Third, the paper discusses how firm – and system-level agencies can contribute to changing the dominant form of industrial culture at the regional level. The paper also provides a study of the regional industrial culture and change in the culture by key actors and agency in the Molde region in Western Norway since 2010. The empirical study demonstrates that the concepts of self-interest and community dominated culture and their link to firm - and system - level agency is relevant to capture and describe a regional industrial culture and potential changes within it. We found that the industrial cultural change in the Molde region could be regarded as mainly being the outcome of system level agency performed by both firm - and system - level actors.

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Regional industrial culture; human agency; regional industrial development; cluster project

1. Introduction

Studies of regional industrial development and restructuring have attracted new attention since the beginning of the 2000s, particularly among researchers inspired by economic geography. Their research has led to an increased understanding of mechanisms, such as various forms of knowledge exchange and spill over, that lead to different long-term regional industrial path development (Boschma 2017). Research on industrial path development has recently been extended by considering types of assets other than knowledge (Trippl et al. 2020) and a wider set of mechanisms and types of path development (Hassink, Isaksen, and Trippl 2019). This is in addition to awareness of the role of various types of change agency (Simmie 2012; Isaksen et al. 2019; Grillitsch and Sotarauta 2020), and the role of institutional quality (Cortinovis et al. 2017; Rodriguez-Pose 2020; Rekers and Stihl 2021) for regional industrial change.

While not ignoring the wide range of assets, actors, institutional arrangements and mechanisms that impact on regional industrial development, this article focuses on the

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role that regional industrial culture and human agency have on industrial development and restructuring. Regional industrial culture is a less applied, but potentially useful, concept in this context. While the importance of institutions for regional development has been on the research agenda for many years (Amin and Thrift 1994; Rodríguez-Pose 2013; Zukauskaite and 2013), there is still a knowledge gap considering 'how informal institutions impinge on urban and regional performance at a subnational level' (Rodriguez-Pose 2020, 378). We raise this challenge from Rodriguez-Pose and discuss whether the concept of regional industrial culture can help analyse and understand the important aspects of regional industrial performance at the subnational level. Based on this, the paper makes three specific contributions. First, we discuss the concept of regional industrial culture and how it affects human agency and vice versa. Second, building on work by Saxenian (1994) and Bjarnar, Gammelsæter, and Løseth (2004), we distinguish two main forms of regional industrial culture: a self-interest dominated culture and a community dominated culture. Third, we discuss how various types of actors and agencies can contribute in order to alter the dominant form of industrial culture in regions.

We further contribute by examining the regional industrial culture and changes in the culture by key actors and agencies in the Molde region in Western Norway since 2010. This study functions as a test of the relevance of our theoretical framework. The Molde region has approximately 65,000 inhabitants and has a relatively high degree of jobs in the manufacturing industry, demonstrated by a location quotient of 1.6.¹ Based on former studies of the industrial culture in the Molde region, as well as our investigation in 2020, we argue that the industrial culture in the region has developed towards becoming more community dominated in the last decade. This appears, in particular, through significantly increased formal and informal cooperation regarding innovation and development between firms and with the knowledge infrastructure in the region. Key firms in the manufacturing industry in the Molde region and knowledge organisations, as a university college and R&D institutes, participate in a publicly supported cluster project which has been essential for changing the industrial culture and development in Molde since the project's start in 2011.

The remaining part of this article is organised as follows. In the theory section, we highlight and explore the notion of regional industrial culture, distinguish between two forms of industrial culture and discuss how different types of agencies are affected by and influence the regional industrial culture. The third section presents the Molde region and describes our methods. This is followed by the empirical analysis which focuses on changes of the industrial culture in the Molde region over the last decade, and key agency influencing the change. In the final section, we present our conclusions and discuss theoretical lessons.

2. Regional industrial culture and agency

Studies of regional economic development have received increased attention at a time of considerable technological changes and worldwide crises. In addition to explaining the economic development of regions with historically developed structural conditions, researchers have increasingly turned to the role of actors and agencies (Grillitsch and Sotarauta 2020). In this article, we explore and discuss the less-studied concept of regional industrial culture and consider how different types of human agency support self-interest and community dominated industrial culture. The significance of industrial

culture for regional industrial development and economic restructuring has, until recently, received little attention, notwithstanding pioneering works by Saxenian (1994) and Gertler (2004). This section resumes these works for the subsequent theoretical discussion.

2.1. The notion of regional industrial culture

James (2005, 1197) maintains that 'the precise impact of regional "culture" on firms' competitive performance remains unspecified'. In a recent, comprehensive review of the literature, Bole (2021, 2) concludes likewise that industrial culture is an understudied and 'low-key concept in geographical research'. The concept is, according to Bole (2021), used inconsistently and lacks a precise definition. 'The intangible aspects of culture and its impact on the economy and development' (Bole 2021, 2) is particularly little understood. Based on a rich literature review, Bole (2021, 10) defines industrial culture 'as a dynamic phenomenon where former and present industrial production is embedded in the physical environment, social structures, cognitive abilities, and institutions that can influence future development choices of (post)industrial communities'.

Our point of departure is to develop a conceptual framework for an empirical study of changes in industrial culture and industrial development in a small Norwegian region. Our framework suggests distinguishing between (i) conditions and processes that create and change a regional industrial culture; (ii) regional industrial culture as common conventions, interpretations and so on among actors in a regional industry; and (iii) different expressions and outcomes of the culture in terms of institutionalised practices by actors and their influence on regional industrial change and material conditions (Figure 1). Based on this, we propose that the particular industrial culture in a region can be detected and understood by combining key actors' perceptions of the joint conventions, interpretations and visions that guide business conduct behaviour and visible patterns of behaviour seen in joint routines, practises, etc.

The approach in Figure 1 is in line with some related theoretical frameworks. This includes the approach in evolutionary economic geography that current actions and developments in a regional economy are largely conditioned by former practices and decisions (and visions of the future) (Hassink, Isaksen, and Trippl 2019). By focusing on lessons learned from the past, it also addresses a recent point that Martin and Sunley (2022, 76) make, 'that historical modes of causal investigation involving appreciative theorising and narrative deserve greater attention'. Further, it mirrors the view that 'industrial cultures - whether at the level of the workplace, the region or the nation - are themselves constructed by social practices' (Gertler 1997, 47), and where social practices mirror former industrial activities and traditions. Thus, we propose that individuals and organisations, due to large networks and certain standing in a community, hold positive options for influencing the development of a regional culture. Regarding cultural expressions and outcome, the approach in Figure 1 resembles a main argument in institutional theory (Fuenfschilling 2019), finding that institutions guide the behaviour of actors, and that agency is seen as being embedded within institutional contexts. It is also in line with James (2005), who saw regional industrial culture as norms, values and attitudes, and distinguishes this from concrete, visible and measurable impacts of the embedded actors' behaviours.



Figure 1 . Delineation of regional industrial culture.

Further, some empirical studies support and illustrate the arguments in Figure 1. Thus, the arguments correspond, to some extent, with how Grabher (1993) describes cognitive lock-in of the steel, iron and coal industries in Ruhr in the 1970s and '80s. A groupthink interpretation developed among actors within the industry as the result of long-term personal ties. The groupthink included a specific world view that determined how phenomena were interpreted. In the Ruhr case, groupthink prevented a reorganisation of the regional economy, which led to stagnation and decline. However, the general argument was that at a social praxis, as a long-standing personal tie, results in common orientations and interpretations among actors, which again lead to specific regional industrial changes.

Another related case includes the disappearance of the Arendal boat building industry in the wake of the financial crisis in 2008 (Isaksen 2018). A long history of boat building, in particular, the downsizing and closure of a mass-producing firm during the 1970s, created a common interpretation (i.e. industrial culture) among boat builders in the region that building high quality boats in this area should be craftwork. This led to the practice of artisan craft production, which contributed to the disappearance (regional industrial change) of the boat building industry in Arendal while leaving an industrial heritage of production premises and equipment.

2.2. Two forms of industrial culture

Our conceptualisation further distinguishes between two main forms of regional industrial culture: a self-interest dominated culture and a community dominated culture. This distinction is inspired by AnnaLee Saxenian, who put the role of industrial culture for

regional economic performance high on the agenda in her book *Regional advantage* (Saxenian 1994). The book studies two local industrial systems: Silicon Valley with industrial growth in the 1980s, and Boston Route 128 which experienced stagnation. One argument was that the two regions had similar dominant industries in electronics, computers and data communication, and mainly had similar 'hard' location factors (as research universities), but had different industrial cultures, which, in Saxenian's view, explains much of the different industrial development during the 1980s in the two regions.²

The cultural characteristics of the Silicon Valley industry include egalitarian attitudes and resistance towards social hierarchies, willingness to share knowledge, a will to experiment and take risks and acceptance of trial and error (Saxenian 1994). The creators and carriers of these cultural characteristics are mostly start-up entrepreneurs and technological nerds, often coming from the region's universities and familiar with an (almost) free flow of ideas and knowledge in academic circles.

The industry along Boston Route 128 had very different cultural characteristics, according to Saxenian (1994). Contrary to Silicon Valley, Boston had stable social hierarchies and loyalty toward employers. Carriers of such cultural traits were managers and officials in the large corporations in Route 128. The industrial culture in Boston coincides with less knowledge flow and spill over than in Silicon Valley. This is due to there being fewer firm collaborations and less labour mobility. Thus, the firm structure in Boston generally consisted of large, vertical integrated firms (Best 2001), while Silicon Valley had more entrepreneurial and collaborative firms.

More generally, self-interest dominated and community dominated industrial cultures are ideal types, and both will be found to a different degree in specific industries in a region. Nevertheless, drawing on Saxenian's description of different industrial cultures, the Boston Route 128 in the 1980s - with its structure of vertically integrated and independent firms - may exemplify a self-interest dominated industrial culture. Such a culture is characterised by an ethic of individualism and strong competitions which does not support cooperation and may portray Anglo-American industry (Gertler 1997, 47). However, a resurgence occurred in Boston Route 128 during the 1990s. 'The short answer to why the resurgence is that the region made a rapid transition from a closed to the new open systems business model' (Best 2001, 127), which was already developed in Silicon Valley. Best (2001) did not refer to changes in industrial culture in that context, but it may be part of the resurgence of Boston Route 128. At least does Silicon Valley remind us, with a structure consisting of several smaller, collaborating firms, of a community dominated industrial culture. We acknowledge that firms follow their own interest, but nevertheless, Silicon Valley in the 1980s seemed to hold a regional industrial culture that could be characterised by the sense of community that Piore and Sabel (1984) argue favours cooperation among firms in regional conglomerations. Piore and Sabel (1984, 275) argue then that 'it is hard to tell where society [...] ends, and where economic organisation begins'.

2.3. How various forms of agency shape various industrial cultures

The two forms of regional industrial culture differ as self-interest dominated culture favours competition and individual success while community dominated industrial culture promotes cooperation and joint solutions. Figure 1 contends that existing

industrial culture emerges from historically formed conditions and processes. In line with this, we argue that different embedded actors and agencies will promote the two ideal forms of industry culture.

A distinction can be made between firm-level and system-level actors (Isaksen et al. 2019). The actors can be (groups of) individuals and organisations. Firm-level actors focus mainly on their own success and the possibility to explore opportunities for profit (Asheim, Isaksen, and Trippl 2019), while system-level actors aim to create collective value for firms in a local area. Both types of actors can perform change agency (Grillitsch et al. 2021), which is understood as actions or interventions that produce a particular effect (Sotarauta and Suvinen 2018, 5). Change agency includes innovative entrepreneurship, institutional entrepreneurship, and lastly, place-based leadership, which consists of coordinating and mobilising a set of regional initiatives (Grillitsch and Sotarauta 2020).

Firm-level actors engage in innovative entrepreneurship through start-ups and innovation activity in existing firms. Focusing on start-ups, regional start-up rates depend, to some extent, on 'place-based characteristics influencing the individual entrepreneurial decisions' (Bosma, Schutjens, and Stam 2011, 482), which is in line with the arguments in Figure 1. The place-based characteristics include many self-employed and young and small firms. Potential entrepreneurs will then find local role models, they can achieve entrepreneurial knowledge from varied experiences in jobs in small firms, and competence, resources and mindsets can be transferred between generations. The idea is that these place-based characteristics further support what Højrup and Rahbek Christensen (1989) define as the 'independent life form,' whereby the local culture, including the industrial culture, highlights entrepreneurship and the running of a small firm as a preferred form of life. Thus, many firm-level actors may contribute to a self-interest dominated culture that further supports innovative entrepreneurship, and through the large role of entrepreneurs in a local community, they can also influence place-based leader-ship towards, for example, support for start-ups and small firms.

System-level actors perform innovative entrepreneurship by, amongst others, establishing and running organisations that aim to provide joint benefits for local industries. Silicon Valley in the 1980s, for example, had several business associations that provided collective services and fostered the exchange of information and technology (Saxenian 1992, 316). The associations played an integrative and coordinating role for the firms by developing a common technical language and standards and providing joint services (op. cit.). Such associations contributed to creating and maintaining two principal beliefs underlying the dynamism of Silicon Valley: 'a belief in entrepreneurship and a belief that technical knowledge is a common property and should be shared, subject to certain ethical standards' (Lorenz 1992, 201). Some business associations also lobby for supportive regional and national policy for specific industries. Thus, we argue that system-level actors often support community dominated industrial culture among members within specific regional industries.

To briefly summarize the theoretical argument, we contend that different types of actors support self-interest and community dominated industrial culture. From this it follows that a change of industrial culture builds on agency by different actors. For example, system-level actors can contribute to a development towards more community dominated industrial culture, while firm-level actors can spread norms that support more self-interest dominated industrial culture.

3. Context and method

We aim to illustrate and examine the relevance of our conceptual framework through a case study of the changing industrial culture in the Molde region on the west coast of southern Norway. The industrial structure in the Molde region is varied and mainly represented by the manufacturing industry, technical and trade services and the public sector. Molde city is the administrative centre in Møre & Romsdal County, and is home to an applied research institute and Molde University College.

At the time of their study, Bjarnar, Gammelsæter, and Løseth (2004) characterised the industrial culture in the Molde region as being dominated by self-interest when compared with the neighbouring southern region, where industry leaders had a higher degree of community based culture. However, in 2016, one of the researchers of the aforementioned study indicated (when he was president at Molde University College) that the industrial culture in the Molde region had changed. More specifically, he argued the region had developed a higher degree of community based culture than before, and that the iKuben cluster project contributed to that cultural change (Gammelsæter 2016). These observations provide an important background for why Molde was chosen as an empirical test bed for the relevance of our conceptualisation of regional industrial culture. Based on the distinction between the two types of regional industrial culture and the two main types of actors, our study of industrial culture and industrial development in the Molde region addresses the following questions:

- 1. What type of industrial culture characterises the Molde region in 2020?
- 2. How has the industrial culture in the Molde region changed over the last decade?
- 3. Who have been the key actors in developing and altering the industrial culture in the region?

We seek to answer these questions by analysing the findings from 23 informant interviews held between December 2019 and June 2020. Among these, 19 interviews were held with leaders in member firms of the iKuben cluster project, three with leaders in two municipalities, one with leaders in the Møre og Romsdal county council, and one with the leader (from 2012 to 2021) of the iKuben cluster organisation. According to Statistics Norway,³ a major part of the working population in Molde is employed within the manufacturing industry, technical services and trade, in addition to the public sector. As firms within these sectors are heavily represented in the iKuben cluster organisation, we contacted iKuben to gain access to these firms. As a result, there is a relatively high degree of member firms in the cluster organisation among our interviewees. Still our results can be argued to be valid for the development of the industrial culture in the Molde region as a whole as iKuben is a large cluster in a small region and as its member firms include the large dominating firms which have a high influence on the region.

The interviews with firms' representatives centred on the type of innovation activity within each firm. Further, we sought to find answers regarding the firms' collaborative partners in innovation processes, the firms' changes in innovation activity over time, their views on the regional industrial culture and possible changes in that culture. As it has been pointed out that the cluster organisation is playing an important role for change in the industrial culture, we also asked about the firms' use of different activities organised by iKuben, and iKuben's possible contribution to the firms' innovation activities and collaboration patterns. The interviews that were held with representatives of the municipalities and the county council targeted some particular collaboration projects, in general, and projects with iKuben, in particular. They also addressed the cluster organisation's role in the regional industrial development. In addition to the interviews, two workshops held with, respectively, three and five employees in the cluster organisation discussed iKuben's activities and our initial findings. One workshop held with three researchers at Molde University College generally discussed the regional industrial development. Additionally, the analysis draws on secondary data material, including annual reports from the iKuben project from 2012 to 2019 and iKuben's application to become an 'Arena cluster' in the Norwegian cluster programme in 2012.

Throughout our analyses, we systematically compared the results from our interviews with what we observed in terms of collaboration activity and contact between firms in the region. This is important, as we argue (in line with Figure 1) that regional industrial culture may be detected by carving out the overlaps between how individuals themselves describe regional culture – which informs about conventions and interpretations based on shared experiences, visions and personal ties – and visible patterns of behaviour (joint routines, practises, etc.).

4. Changing industrial culture in the Molde region

Based on the data material, this section discusses the type of industrial culture that characterised the Molde region in 2020, how the industrial culture has changed since around 2010, and, lastly, which actors have been key in altering the region's industrial culture.

4.1. The industrial culture characterising the Molde region in 2020

Throughout our interviews, we found several indications pointing to characterising Molde (in 2020) as a community-based industrial culture. This was demonstrated by much collaboration on innovation projects and a high degree of knowledge exchange, both among firms and between firms and R&D organisations. It became evident that cooperation was regarded as an important and integrated part of a joint business behaviour in the Molde region. This was clear through quotes from firm leaders, such as 'We have to rely on more than just our own firm in order to develop the whole region'. Further, many interviewees affirmed that local firms had little knowledge of and cooperation with each other before the iKuben project began. This situation changed as firms came to know each other through arrangements leading up to, and later organised by, the iKuben cluster organisation. Firms have since built more trust for each other. Expressions such as, 'We're applauding each other here' and 'We participate in each other's development' were repeated in similar ways by many firms' representatives. In our view, these expressions can be regarded as support of a community dominated industrial culture because they point to common experiences that have led to shared conventions, norms and values among industrial actors in the Molde region.

Further indications of a community based industrial culture can be founded on the fact that entrepreneurs and firm managers are concerned about the region's labour market and industrial development, and make thereby decisions with the aim of strengthening the region's industrial attractiveness. This finding is supported by interviewees' expressions, such as, 'The industry is good at engaging with concerns outside their own firms'. In one case, one local firm bought another local firm that was about to go bankrupt. The latter firm is a large customer for several local firms, indicating that the acquisition would reduce uncertainty for the buying firm and for some other local firms by protecting parts of a joint regional value chain. Still, our interviewees tell us that the acquisition was also about 'holding each other's backs' and retaining jobs in the region. Other firms reported that they actively employed and cooperated with the local research institute (Møreforskning) and with Molde University College on innovation projects. Such activities benefit individual firms; however, the rationale is also to contribute to a local, relevant research milieu and organisations from which to recruit employees.

4.2. Change of industrial culture

Møre og Romsdal County consists of three subregions that, according to Bjarnar, Gammelsæter, and Løseth (2004), had developed two distinct types of industrial culture. While the two cultural types were present in all of the regions, the southern region (Sunnmøre) was dominated by a community based industrial culture in the early 2000s, while the central (the Molde region) and the northern region were dominated by an industrial culture that was based more on self-interest. The industrial culture in Molde has been characterised by suspicion between actors, and by entrepreneurial and business activities based on competition, according to Bjarnar, Gammelsæter, and Løseth (2004). Several informants in our study (e.g. from the county council) maintained that the industrial culture in the Molde region carries a history of being competitive and introverted. According to our interviewees, this cultural feature of self-interest was further strengthened by a lack of available engineers for regional firms, which led firms to compete over labour resources.

This description stands as a contrast to the current community dominated industrial culture that we uncovered in the Molde region in 2020. Evidence of enhanced collaboration in the region is found within two specific innovation programmes, both indicating increased collaboration on innovation projects in the Molde region when compared to a decade ago. The policy support tool, 'Innovation contract' (Industrielle forsknings - og utviklingskontrakter) by Innovation Norway, funds small - and medium-sized companies that develop products and services to pre-commercial prototypes in collaboration with private or public pilot customers. The Molde region firms had six innovation contracts amounting to NOK 2.3 million in support during the four-year period of 2010-2013. This increased to fifteen contracts and NOK 13.3 million in support from 2014 to 2017, and resulted in eight contracts amounting to NOK 11.8 million from 2018 to mid-2020.³ Similar trends are seen in the Research Council of Norway's programme, BIA - User-driven Research-based Innovation. This programme is the primary instrument used to support R&D-based innovation in the Norwegian industry. It promotes collaboration among firms and between firms and research institutes, both nationally and internationally. The programme started in 2005 and, until 2013, it supported three projects in Molde region firms amounting to NOK 18.3 million. Nine projects (NOK 37.0 million) in Molde region firms were funded by the programme from 2014 to 2017, and nine projects have been funded (NOK 38.5 million) from 2018 to 2021.^{4.}

In line with this increased use of specific support tools, firms' representatives reported a significant rise in firm collaborations and knowledge-sharing activities. They also identify several technological innovations, product and service innovations, and new market areas stemming from cross-firm partnerships. One example is a firm that has managed to develop automated engineering in which algorithms retrieve data from previous projects. As a result, tasks that previously required 480 h can now be completed within minutes. This technology is shared locally and can raise the competitiveness of local engineering firms.

Firms' representatives also reported what they referred to as 'unexpected collaborations,' in the sense that cooperation occurs between companies that are not technologically related, but rather have completely different products and technology. These firms, nevertheless, have common challenges and have realised they can learn from each other. Firms cooperate with other local firms of which they have little prior knowledge on matters such as big data, logistics, material technology and business models. One example is a firm that needed information about ways to implement the practise of 'engineering to order' in a project. The interviewee said, 'We called a woman in firm X as we were certain she had worked with similar questions'. According to the same interviewee, the person in firm X then shared experiences that were of great help.

Based on this, we conclude that our interviewees have developed stronger personal ties to other local actors based on common experiences in collaboration projects, among others. Over time, this collaboration has become a part of 'business as usual,' resulting in an institutionalised practice, as referred to in Figure 1. This visible, yet immaterial, behavioural pattern can be seen as a reflection of norms, values and ethics coinciding with a community dominated type of industrial culture.

4.3. Agency for changing industrial culture

In retrospect, regional actors point to the initiative that one local business owner and entrepreneur raised when asked to pinpoint key agencies that initiated more regional firm collaboration. The business owner was the owner and leader of a large family firm. He was also the chairman of the Molde Industry Forum (Molde Næringsforum), which is an independent member organisation for business firms across industries in the Molde region. The organisation works to achieve a competitive local industrial policy and infrastructure, and to strengthen and draw attention to the industry, competence and attractiveness of the region.⁴ Molde Industry Forum initiated a trainee scheme for engineers, whereby newly educated engineers work for some time in various local firms, thereby helping to recruit engineers to Molde.

In 2002, the local entrepreneur mentioned above participated in a network project including 12–14 firms. Sintef, a large national R&D organisation based in Trondheim, organised it. The project planned meetings that led to knowledge sharing among firms. Inspired by this program, the local business owner invited fellow local entrepreneurs to meet and discuss common challenges and opportunities. The participants soon began to value the initiative to explore new opportunities. One of the interviewed firm leaders explained the importance of the initiative by highlighting that 'it is a long way to the nearest resource I can talk to. [...]'. In other words, the firms' location in a fairly small region made it difficult for many of them to find similar local firms with which to exchange knowledge and ideas. Rather, firms gradually saw the benefits of

investigating options for knowledge sharing and collaboration within the array of firms operating in various types of industries.

As mentioned, the early initiative to increase regional cross-firm and – industry collaboration proved successful for the firms involved. Inspired by positive results, the firms formed the first formal cluster initiative in 2009, under the name Teknopark Molde. In 2010, the cluster project changed its name to iKuben, and the formal iKuben cluster organisation was registered in 2011. The cluster project aimed to provide a platform where innovative international manufacturing firms could collaborate and share generic knowledge. However, according to the leader of the iKuben cluster organisation, it was initially quite difficult to facilitate collaboration, as member firms were rather restrictive about sharing ideas and knowledge and somewhat suspicious and reticent, not the least about cooperation with R&D institutes, thereby pointing towards a selfinterest dominated industrial culture.

In 2012, the cluster organisation applied for and received ARENA status in the Norwegian cluster program run by the three main public policy support organisations, Innovation Norway, the Research Council of Norway and SIVA. The ARENA status is a policy instrument that supports undeveloped and emerging clusters by offering economic and knowledge support for three years. This support proved important to the iKuben cluster project. It fuelled and directed a wide range of cluster initiatives to back cross-firm and industry collaboration and to attract more firms to participate in the cluster project. The formal cluster project had some advantages over keeping the firm collaboration as an informal and community-based network. Formal cluster status includes funding from the national cluster programme to, among other things, employing facilitators who work to stimulate knowledge exchange, trust, and cooperation between cluster members. In addition, some core member companies must commit to working together to achieve specific goals as a prerequisite for public support through the cluster programme. As a consequence of the ARENA support, the cluster introduced several new arenas and forums that aimed to upgrade knowledge and competence in areas like material technology, logistics and innovation processes. Thus, the iKuben case demonstrates that policy support can be an important instrument in supporting industrial cultural change, in this case, towards a more community dominated culture, which may have been more difficult to achieve through an informal network.

Local firms received the initiatives that the cluster administration offered during 2012 and onward, and the positive effects attracted more firms to join the cluster. From 2012 to 2017, the iKuben cluster grew from 19 to 45 members. An important milestone for the iKuben cluster project was the introduction of the ProtoMore innovation lab in 2016. At the time, ProtoMore was the first industrial innovation lab in Norway. According to their website,⁵ the lab has since facilitated design thinking, cross-industrial innovation processes for several thousand participants.

The continuation of the iKuben cluster project's activity to facilitate innovation collaboration amongst regional firms was strengthened when Innovation Norway, the Research Council of Norway and SIVA collectively awarded the cluster the Norwegian Centres of Expertise (NCE) cluster status in 2017. The NCE status is awarded to dynamic and mature industry clusters that held a national position, and the status released considerable economic funding and knowledge transfer which also underlines the importance of iKuben being a formal constellation rather than only an informal network. Thus, the 12 👄 E. L. ERIKSEN ET AL.

NCE support has continued to fuel the cluster organisation's promotion of knowledgecreating projects and knowledge-sharing processes. Since 2017, the cluster has, among other things, initiated many R&D&I (research, development and innovation) projects, applied for EU funding, launched a range of new programs and opened an Industry 4.0 laboratory and a new innovation lab. In 2021, the cluster project consisted of 55 member firms, the cluster organisation had five employees, and it offered a more comprehensive program and activities to member organisations.

Even if the system-level agency performed by entrepreneurs from around 2010 and a few years ahead and also by the iKuben cluster project were important contributions to nudge the industry culture towards becoming more community-oriented, these agencies are not sufficient to explain the process of change. As Kyllingstad and Rypestøl (2019) and Isaksen et al. (2019) pointed out, successful change processes require firm-level actors to respond to system-level agencies. In this case, firms engaged in new collaboration constellations, and by doing so, they also established institutional entrepreneurship as they challenged the existing dominant industrial culture. Thus, both system level agency and firm-level activity contributed to cultural change. The interviewees also highlight that firms were not only acting on opportunities to gain profit when involving in more local collaboration. In addition, they also executed system-level agency themselves. Such initiatives span from the first trainee arrangements in the early 2000s aiming to increase the number of qualified engineers in the local community, to later examples where local firms gave courses and lectures to other local firms on relevant topics, like how to exploit opportunities from new, generic technology or how to upgrade certain production processes by use of lean principles.

5. Conclusion

A main aim of this study has been to highlight and discuss the concept of regional industrial culture as an important factor for understanding and analysing regional industrial development. Based on our discussion, we propose an analytical framework (illustrated in Figure 1) where we distinguish between processes that contribute to developing a regional industrial culture, the features of the culture itself, and material and immaterial results of such culture. To further explore the meaning of regional industrial culture, we distinguish between two main forms of culture: a culture dominated by self-interest and a community dominated industrial culture. Ultimately, we connect the two types of industrial culture to different types of actors and agency in order to grasp how the culture is developed and altered through human actions. Applying the analytical framework, the paper uses a case study design to examine the relevance of the framework on an empirical case and to investigate the changing industrial culture in the Molde region and the key actors and agencies that contributed to the cultural change.

Our empirical study clearly indicates that the industrial culture in the Molde region has shifted from being dominated by self interest in the early 2000s to becoming more community based in 2020. The evidence of this cultural shift is partly found by analysing our interviewees' stories,' in which several of them pointed out that there was little or no cooperation between firms at the beginning of the 2000s, but that they in 2020 are taking part in some of each other's development and innovation activities. Further, several interviewees' statements not only underpin an enhanced amount of collaboration, but suggest a 'more community' based focus. For example, 'We have to rely on more than just our own firm in order to develop the whole region,' can be interpreted as expressing a joint vision of a positive future development among actors in the Molde region. These findings are backed by information from national policy support instruments that finance collaborative innovation projects where the number of contracts and the amount of funding by firms in the Molde region have increased significantly from 2005 to 2021.

The empirical study demonstrates that the concepts of self-interest and community dominated culture and their link to combinations of firm-level and system-level agency are relevant when trying to capture and describe a regional industrial culture and changes within it. Analyses of such culture demand careful and detailed studies of how individuals regard themselves as being integrated in shared conventions, interpretations, norms and values among regional industrial actors. This contributes to our understanding of how regional industrial development is influenced by 'soft' institutional factors affecting (and being affected by) human agency. This complexity seems more manageable to comprehend with precise analytical concepts.

Although distinguishing between two types of regional industrial culture and two main types of change agency proved useful for identifying and characterising the industrial culture in the Molde region, the framework lacks the ability to integrate the dynamics regarding how agencies more precisely affect and are affected by cultural change. The framework can capture how the regional industrial culture is maintained through consistent institutionalised practices, amongst others, based on common experiences, visions of future development and long-standing personal ties. Our case study also highlights the significance of bringing human agency into the analyses of (the change of) regional industrial culture, where both firm – and system-level actors and agencies were relevant. We found that the change of industrial culture in the Molde region resulted both from the community engagement of local company owners and leaders and from activities by a publicly-supported cluster project. Thus, the industrial cultural change in the Molde region can be regarded as mainly being the outcome of system-level agency performed by both firm – and system-level actors, but also that individual firms benefitted from activities organised by the public supported cluster organisation.

This study is an attempt to advance and review a conceptual framework to uncover the meaning of regional industrial culture and its role for regional industrial development. Our empirical analysis draws from a single case study which does not allow for comparison outside this specific case. Thus, we think that future studies in this field of research could (i) open for further conceptual discussions of how regional industrial culture can be comprehended and identified in empirical studies; (ii) critically review and extend the proposed conceptual framework by exploring how regional industrial culture changes, e.g. enquiring into what type of events may trigger cultural change, and the key actors and agency behind such changes; and (iii) test, refine and possibly alter the conceptual proposed framework in further empirical studies.

Notes

- 1. Source: Table 07984 in the Statistical bank, Statistics Norway
- 2. This argument was contested by Kenney and von Burg (1999), who argued that the different industrial development in the two regions results from their industrial specialities, the

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semiconductor industry in Silicon Valley and the minicomputer industry in Route 128. The technological trajectories in these industries were different and led to the differential success of the two regions. Saxenian (1999) again claimed that a key point is to understand the mechanisms by which technological trajectories are established, and the culture and institutional environments that support collective learning and innovation within the trajectories.

- 3. Table 07984 in the Statistical Bank of Statistics Norway.
- 4. https://www.moldenf.no/om-molde-naeringsforum
- 5. See, https://www.protomore.no/ for more information

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