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**CONFIGURATIONS OF CRAFT:**  
**ALTERNATIVE MODELS FOR ORGANIZING WORK**

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## CONFIGURATIONS OF CRAFT: ALTERNATIVE MODELS FOR ORGANIZING WORK

### ABSTRACT

The concept of craft has long lived in the margins of organizational research and has typically been equated with a primitive form of manufacturing. Craft, however, seems to have had a resurgence as of late, and is now increasingly being associated with alternative approaches to work and organization in contemporary society. Yet, in spite of a growing stream of research on the phenomenon, insights have remained fragmented thus far due to a lack of common theoretical infrastructure. In an effort to synthesize the disparate threads of research on craft, we conducted an interpretive review of the use of the concept in management and organizational literature over the past century. Based on this review, we propose a reconceptualization of craft as a timeless approach to work that prioritizes human engagement over machine control. We identify the distinct work skills and attitudes that are typically associated with craft and illustrate how these appear across two conventional configurations (traditional and industrialized craft) and three contemporaneous configurations (technical, pure, and creative craft) that are visible in the literature. Finally, we suggest how our framework could be used as a general theory for understanding alternative approaches to work against the backdrop of growing affordances of machine technology and sketch future research avenues for exploring specific craft-related tensions and evolutionary processes.

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The last few decades have witnessed an extraordinary resurgence of interest in craft. Consider the U.S. beer industry: once dominated by a handful of multinational mass producers, it is now the hotbed of a global movement in craft brewing (Garavaglia & Swinnen, 2018). As a result, between 2008 and 2016, the number of breweries in the U.S. has exponentially grown by a factor of six while the number of workers employed in the industry has tripled (Thompson, 2018). Incredibly, this growth has occurred in a context where the overall consumption of beer is declining. With average beer prices also growing by almost 50 percent, it appears that beer drinkers are now consuming less while paying more for a superior product (Thompson, 2018).

A close look reveals that the beer brewing industry is not an exception. In fact, research has documented craft approaches to manufacturing in the making of bespoke vehicles (Irwin, Lahneman & Parmigiani, 2018; Kotha, 1995), musical instruments (Cattani, Dunbar, & Shapira, 2017), watches (Oertel & Thommes, 2018; Raffaelli, 2019), kitchen utensils (Rindova, Dalpiaz & Ravasi, 2011), and fashion (Djelic & Ainamo, 1999; Khaire, 2014; Korica & Bazin, 2019). Scholars have also used this notion to describe developments in non-manufacturing sectors such as urban services like barbering, bartending and butchering (Ocejo, 2017) or organic supermarket work (Endrissat, Islam, & Noppeney, 2015), car restoration (Bozkurt & Cohen, 2019), agriculture (Weber, Heinze, & DeSoucey, 2008), money management (Lounsbury & Crumley, 2007), police work (Bittner, 1967), software programming (Adler, 2015; Barley, 1996; McBreen, 2002), and even academic research (Baer & Shaw, 2017; Daft, 1983; Whitley, 1995). Indeed, even highly abstract domains such as thought or creativity have been illuminated by pointing to their craft aspects (Carruthers, 1998; Cronin & Loewenstein, 2018). Yet, although examples abound that point to craft being ubiquitous in and around organizations, we seem to lack a dedicated theory that helps us understand what distinguishes craft approaches to work. This – we argue – hampers

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3 our capacity to grasp these recent developments and, more generally, to explain the renewed  
4 relevance of craft in contemporary society.  
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8 Dominant theoretical perspectives in management and organization have long prioritized  
9 attention to modes of production and organization that optimize efficiency and consistency,  
10 through market mechanisms in combination with scientific or bureaucratic management (Coase,  
11 1937; Taylor, 1914; Weber, 1978; Williamson, 1985); the most recent manifestation of this  
12 tendency being the belief that artificial intelligence can be used to improve markets and impose  
13 algorithmic-forms of control (Kellogg, Valentine, & Christin, 2020; Schwab, 2017). This  
14 perspective also tends to imply a linear evolution towards increasingly efficient and rationalized  
15 modes (Davis, 2016; Thornton, Ocasio & Lounsbury, 2015; Weber, 1978). It is underpinned by  
16 the assumption that we live in a world of creative destruction where technological progress  
17 naturally drives the emergence of novel approaches to work and organization that are built on the  
18 ashes of the old (Schumpeter, 1942). Viewed from this perspective, craft is often described as a  
19 primitive or “traditionalistic” approach made largely extinct by industrialization (Adler, 2012;  
20 Bodrožić & Adler, 2018; McKelvey, 1978).  
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38 Yet, in contrast with this assumption, the concept of craft has been picked up again recently  
39 to describe alternative approaches to work and organization, and its use has been growing rapidly.  
40 This trend cannot easily be reconciled with the conventional view and suggests the need for a fresh  
41 perspective on the concept. This recognition encouraged us to revisit assumptions about craft in  
42 the literature, and to forward a novel theoretical understanding to better understand why and how  
43 advanced societies may be characterized by the revaluation and reinvention of craft approaches to  
44 work (cf. Kroezen & Heugens, 2019; Ocejo, 2017; Suddaby, Ganzin & Minkus, 2017).  
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To this end, we reviewed how the concept of craft has appeared in management and sociology research over the last century. Based on our reading of 453 relevant papers, found through a wide-ranging search, we inductively define craft as a humanist approach to work that prioritizes human engagement over machine control. In the literature, craft has typically been associated with distinct *skills* – mastery of technique, all-roundedness (that is, a holistic understanding of how different aspects of making interrelate), and embodied expertise (e.g. Becker, 1978; Sennett, 2008) – and *attitudes* – devotion to one’s work, a concern with communal interests, and an explorative mindset (e.g. Croidieu & Kim, 2018; Ranganathan, 2018) – that distinguish it from other approaches that subordinate workers to intelligent machines and standardized procedures, in the pursuit of efficiency and consistency.

Our review also reveals how manifestations of craft vary across time and space. It points to two sets of ideal-typical configurations of craft that appear in the literature and that illustrate the different ways in which craft, as a humanist approach to work, manifests in organizations and organizational fields. Two of these configurations, traditional vs. industrialized craft, reflect the conventional understanding of craft in the organizational literature. The second set, technical vs. pure vs. creative craft, points to an alternative, contemporaneous perspective that is increasingly visible in the literature, and associates craft with the pursuit of technical excellence, anti-industrial purity, or creative stimulation, respectively. Together, these configurations show how craft can be used to illuminate the human pole of the fundamental tension between human and machine in contemporary work organization and the different ways in which this tension can be resolved.

This paper proceeds as follows. First, we briefly review how craft has appeared in classic organizational theory, before pointing to observations that call for a fresh perspective. We then briefly describe our review method before presenting our first set of insights, showing how craft

has appeared as a humanist approach to work in the literature. Subsequently, we make use of classic coordination mechanisms to support the development of a typology of configurations of craft that capture different ways in which craft can be embedded in organizations and organizational fields. Finally, we discuss how our framework advances a theory for understanding human-engaged work and highlight specific implications for research on craft-related organizational tensions and evolutionary processes.

### **CRAFT AND THE ORGANIZATION OF WORK**

Based on our initial reading of the literature, we started with a working definition of craft as entailing a distinct approach to work and its organization. As such, we first examined how craft appeared in classic organizational theories of forms of organizing and associated coordination mechanisms (Coase, 1937; Ouchi, 1980; Williamson, 1985). Relating our emerging conceptualization of craft with these established notions also gives us the opportunity to illustrate how our perspective could be combined with central tenets of organizational theory to advance our understanding of work and its organization in contemporary society.

A core question in organization theory is how to structure work activities and coordinate collective action toward a common goal (Ouchi, 1980; Williamson, 1991). Building on the classic writings of Coase (1937) and Williamson (1985, 1991), organizational theorists have described three fundamentally distinct sets of coordination mechanisms. The most basic distinction separated market-based from hierarchy-based coordination (Williamson, 1985). While market-based coordination relies on mechanisms of competition and price, hierarchy-based coordination involves formal control and authority. Subsequent elaborations have pointed to community-based coordination as an alternative form that involves normative alignment and trust (Adler, 2001; McEvily, Perrone, & Zaheer, 2003; Ouchi, 1980). These different coordination mechanisms may

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be mixed in different ways resulting in different organizational forms that inherently impact the nature of work (Bradach & Eccles, 1989).

These classic concepts in organization theory have been employed to examine the empirical evolution of organizational forms and the nature of work. In this impactful line of research, craft is often mentioned briefly to refer to traditionalistic organizational forms and pre-industrial approaches to work. Classic organizational theories describe how traditional craft firms were replaced by industrial, mass-production firms that built on Taylorist principles of work division and associated managerial control (Bodrožić & Adler, 2018; Burris, 1989; Marsh & Mannari, 1980). Over time, these firms built up extensive bureaucratic hierarchies and control structures, developing into the well-known corporations of the 20<sup>th</sup> century. As advanced economies morphed from manufacturing- to knowledge-intensive economies, theoretical attention was drawn to novel community-forms of organizing – such as the modern professions or the open-source movement – that facilitated knowledge-sharing in and across firms (Adler, 2001; McEvily et al., 2003; Powell & Snellman, 2004). While initially, some scholars predicted a firm shift toward trust modes of coordinating (Adler, 2001), more recent accounts have argued that the vanishing of the 20<sup>th</sup>-century corporation has gone hand-in-hand with the birth of the platform economy, where market forces prevail supported by algorithmic control (Davis, 2016; Kellogg et al., 2020).

Though it appears that classic organizational theory does not account for the observed prevalence of craft approaches to work by keeping craft implicitly, and sometimes explicitly, outside of the diverse configurations of contemporary organizations (Bodrožić & Adler, 2018; Hull & Collins, 1987; McKelvey, 1978), there are some notable exceptions. For example, in some cases, craft has been used to describe a narrow set of contemporary organizations that rely on community-based coordination (Adler, 2001; Powell, 1990). More significantly, craft has also



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3 appeared in post-Fordist theories of manufacturing (Piore & Sabel, 1984; also see Deming, 1986)  
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5 where it is seen as a more fundamental feature of work and organization.  
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8 A brief glance beyond mainstream organizational theory, therefore, suggests that craft may  
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10 be more usefully approached as a fundamental and enduring feature of organizational life – based  
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12 on the recognition that humans are always more or less engaged with processes of making, and  
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14 that craft “is a part of all work life” (Fine, 1992: p. 1270). Indeed, the recent resurgence of craft  
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16 appears to suggest an increasing rather than decreasing relevance of the concept for organizational  
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18 theory. More than a century ago, Veblen (1914) used the broader term “workmanship” to describe  
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20 a fundamental instinct of the human species, and used this term interchangeably with  
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22 craftsmanship (also see Pye, 1995 for a nuanced discussion of these concepts).<sup>1</sup> In a recent  
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24 influential book, Sennett (2008) similarly defines craft as a basic human impulse to do “a job well  
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26 for its own sake.”  
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31 Fox Miller (2017:2) argues that “craft has always existed as the counterweight to  
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33 industrialized mass production” and points to “three waves of craft revival”, suggesting that the  
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35 value and saliency of craft evolved in tandem with industrial and technological progress. After the  
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37 traditional craft guilds of Medieval Europe were replaced by proto-forms of the profit-maximizing  
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39 formal organization (Kieser, 1989) – Fox Miller observes – craft enjoyed a first revival during the  
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41 Romantic era. This was most clearly seen in the English Arts and Crafts movement, which rejected  
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43 the mechanical work that was increasingly commonplace as a result of the Industrial Revolution,  
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45 and cherished, instead, human engagement with the material world and the natural imperfections  
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47 of human handwork (Morris, 1892; Ruskin, 1849). The second wave of craft revival originated in  
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54 <sup>1</sup> The language around the concept of craft has traditionally been gendered, prioritizing attention to the “men” that  
55 exercised masculine crafts. As such, we opted to use the label “craftsperson” instead of “craftsman” where possible.  
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the 1960s and 1970s with anti-capitalist movements that saw craft as a central part of the political and individualist pursuit of purpose, pleasure and dignity in work (Hodson, 2001; Luckman, 2012).

Technological advances, according to Fox Miller, seem to have enabled the third wave of craft revival where a resurgence of small-scale craft manufacturing follows from growing awareness of the limitations of mass production (Piore & Sabel, 1984), including the environmental and social costs of globalized industrial production (Fox Miller, 2017; Luckman, 2015). It now also appears that the rise of AI is triggering a new “industrial divide” (cf. Piore & Sabel, 1984) where craft approaches to work and organization can be seen as the alternative to algorithmically-controlled platform organizations. In contrast to relying on a craft approach, these organizations rely on centralization and robotization of work such that vocations, careers and jobs are ultimately reduced to “gigs” and workers follow efficiency-maximizing directives from an AI (cf. Barley, Bechky & Milliken, 2017; Davis, 2016; Kellogg et al., 2020).

In sum, a closer look suggests that craft is an enduring theme in the broader organizational literature, which reaches beyond the pre-industrial world and traditional modes of working and it may be infused or re-infused in modern work organizations. Our review of the literature helped us better articulate what distinguishes craft as a relevant approach to work, by (a) defining distinct *skills* and *attitudes* that differentiate craft from other approaches, (b) identifying and contrasting various manifestations of craft, based on how it has been embedded in organizations and organizational fields across time and space, and (c) highlighting fundamental tensions that arise in the organization of work based on the interaction between humans and machines in and around organizations. Together these elements provide a theoretical infrastructure that acknowledges the concept as a timeless feature of organizational life, and integrates prior work in a novel way, with

a view of promoting and supporting the intensification of research on craft across different areas of management studies.

## REVIEW METHOD

Since our concept of interest appeared across a wide variety of research, crossing disciplines and levels of analysis, and it frequently lacked explicit definition, we took an interpretivist approach, involving the use of inductive techniques to uncover common themes in a body of qualitative work (Noblit & Hare, 1988; Suddaby, Bitektine, & Haack, 2017). This enabled us to work toward a synthesis of dispersed insights by developing (a) an umbrella definition of craft that is based on both explicit and implicit understandings of the concept found in the literature and (b) a configurational typology that covers the diverse manifestations of the concept in organizational settings examined in previous research.

We casted our nets wide and searched 17 premier outlets of organization and management research.<sup>2</sup> We systematically applied keyword searching for “craft”, while also searching for articles that mentioned related terms of “artisan”, “handwork”, “guild”, “maker”, “master”, “skill”, “technique” and “workmanship”, which are strongly associated with craft in popular definitions. Our sample included 453 studies that interacted with craft in a relevant fashion. Figure 1 and Table 1 show how the included studies were distributed over time and outlets. They show not only that scholarly attention to craft stretches over a long period of time and a variety of outlets, but also that there has been a sharp increase in attention to the topic in recent decades. Although our main concern was with understanding how the concept of craft has been used across the premier peer-

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<sup>2</sup> Our journal list consisted of: *Academy of Management Journal*, *Academy of Management Review*, *Administrative Science Quarterly*, *Entrepreneurship Theory and Practice*, *Journal of Business Venturing*, *Journal of Management*, *Journal of Management Studies*, *Management Science*, *Organization Science*, *Organization Studies*, *Strategic Entrepreneurship Journal*, *Strategic Management Journal*, *American Journal of Sociology*, *American Sociological Review*, *Annual Review of Sociology*, *Socio-Economic Review*, *European Sociological Review*

reviewed organization and management outlets, we sharpened our interpretive lenses by reading broadly on the subject. To this end, we also engaged with books and other articles on craft that were cited by studies in our sample.

--- Insert Figure 1 and Table 1 about here ---

THE DEFINING FEATURES OF CRAFT

Our review shows that craft is commonly associated with a humanist approach to work that embraces human engagement in making.<sup>34</sup> When work is approached as craft – as we will describe in this section – it involves reliance on distinctly human *skills* (entailing mastery, all-roundedness and embodied expertise) and *attitudes* (entailing dedication, communality and exploration) that distinguish it from mechanical work resulting from the prioritization of machine control (see Table 2). Craft thus contrasts with approaches to work that effectively disengage humans from making through extensive use of automation and algorithmification, so that critical aspects of the process are performed by machines and remaining areas of human involvement are in the form of programmable and marketable tasks or “gigs” (Barley et al., 2017; Davis, 2016; Kellogg et al., 2020). The endgame of extreme mechanical approaches to work appears to entail as little human engagement with making as possible. In contradistinction, craft attaches importance to aspects, such as “human touch” and individual judgment, that cannot be replicated by machines or that are lost with purely mechanical approaches to work (cf. Raisch & Krakowski, 2020, p. 16).

<sup>3</sup> Please note that we are explicitly using the label of *humanism* to describe an approach to work that involves human freedom and progress, similar to Moore (2005) who equates craftsmanship with “humanizing business” and Sandberg (1995) who describes craft-based job enrichment as “human-centred production”. Whether or not an embrace of craft approaches to work results in human freedom and progress at the level of society is a related, but more complicated question.

<sup>4</sup> We use the term “making” in a broad sense to refer to both the manufacturing of products as well as the performance of services. Our terminology is thus deliberately flexible to indicate that craft is a fundamental approach that can be applied to any form of work.

Embracing human touch and engagement in making implies granting individuals – as “makers” – autonomy and control over all facets of a work process, from design to execution (cf. Fullan, 1970; Halaby & Weakliem, 1989; Hodson, 2010). Craft prioritizes a “workmanship of risk” where the quality of the work “depends on the judgment, dexterity and care” of the maker (Pye, 1995, p. 20) over a “workmanship of certainty, in which the quality of the result is predetermined and beyond the control” of the maker (p. 9). Organizations that embrace a craft approach to the manufacturing of products or the delivery of services tend to have comparatively more flexible work processes. They also tend to depend more on the individual worker than on the machine-mediated and faceless “collective worker” (Adler, 2007; Ingvaldsen, 2015) – understood as an interdependent system of indistinct workers performing highly specialized tasks (Marx, 1977) – or on the profit-maximizing manager (Smith & Miner, 1983; Thornton, 2002), who may render individual workers expendable.

Craft also reflects a particular concern with intrinsic work values over extrinsic market outcomes (e.g., Wilensky, 1964), as is evident in Sennett’s (2008) oft-cited definition of craft as an impulse to do a job well “for its own sake.” Relatedly, craft is commonly associated with a primary concern for aesthetic forms of quality (Becker, 1978; Ewenstein & Whyte, 2007; Fine, 1992; Rindova et al., 2011) rather than for mechanical qualities of efficiency and consistency across the work we reviewed. This applies to examples of early manufacturing, such as visible in Collons (1971) description of an ancient Chinese rice bowl that showed traces of meticulous application of human attention to delicate production tasks. It is also observable in cases of contemporary manufacturing, as in the case of recreational vehicle industry (Irwin et al., 2018), where craft producers prioritize “people” and “quality” over “costs” and “market.”

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3 Finally, craft appears just as frequently outside of manufacturing contexts. For example,  
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5 Thornton (2002) described how higher education publishing was traditionally a “craft industry”  
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7 where craft principles gradually made way for practices associated with a “market logic”.  
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9 Similarly, a substantial body of work finds craft in academia, and associates the concept with a  
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11 concern for individual engagement with process and quality in the production of research that  
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13 depends on supportive institutional conditions (Baer & Shaw, 2017; Daft, 1983; Rindova, 2008;  
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15 Van Maanen, 2011). Elsewhere, scholars have reported a revival of craft in urban service jobs,  
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17 such as supermarket work (Endrissat et al., 2015) or barbering (Ocejo, 2017). Another powerful  
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19 example of the relevance of craft to contemporary forms of work is the rising concern with  
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21 “software craftsmanship” among software developers (Martin, 2009; McBreen, 2002) that  
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23 promises to free human makers from the increasing rationalization and standardization that has  
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25 been prevalent across the sector (cf. Adler, 2015).  
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33 **Craft Skills.** Our review shows how a craft approach to making values mastery of  
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35 technique, all-roundedness, and embodied expertise, as opposed to a mechanical approach that  
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37 treats individual skills as commodities for highly specific, narrowly defined tasks, designed based  
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39 on formal and abstract expertise.  
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42 *Mastery of technique* refers to the exceptional competency of individuals in the making  
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44 process. This is clearly exemplified by the makers of Cremonese string instruments described by  
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46 Cattani, Dunbar, and Shapira (2013). The likes of Stradivari and del Gesù, who made high quality  
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48 violins 300 years ago, had such a high degree of mastery over particular techniques that it has been  
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50 difficult to reproduce the quality of their work ever since. The importance of mastery is also  
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52 apparent in haute-cuisine, where young chefs need years of dedicated practice to develop the  
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3 refined techniques required to become a master chef (Louisgrand & Islam, 2020; Slavich &  
4 Castellucci, 2016) or in the Indian apparel industry where there was reliance on “exclusive  
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6 handwork and craftsmanship” for the weaving, dyeing, printing, and embroidery of garments  
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8 (Khaire, 2014). Raffaelli (2019) also talked about the “level of mastery required to produce a  
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10 mechanical watch”, and Kotha (1995, p. 31) documented the important role of mastery in his study  
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12 of a Japanese bicycle manufacturer that relied on “highly skilled craftsmen [to] translate unique  
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14 customer specifications into finished products using prior experience and expertise” and to pay  
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16 attention to “the finest details” in the production process.  
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22 Work practices that emphasize mastery of technique contrast with those that merely rely  
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24 on basic skills that are treated as a commodity, such as typically the case with mass production or  
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26 rationalized service work (cf. Endrissat et al., 2015; Wrigley, 1982). In these instances, workers  
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28 are no longer master makers but have become “deskilled” (Braverman, 1974; Form, 1987; Roy,  
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30 1984) or are, at best, interchangeable “semi-skilled operators” (Anderson & Tushman, 1990;  
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32 Ezzamel, Willmott, & Worthington, 2001).  
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36 Craft, past research points out, also requires *all-roundedness* so that workers can have full  
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38 control over an entire making process. All-roundedness thus implies a mastery of multiple  
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40 interdependent techniques of making and a holistic understanding of how particular aspects of  
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42 making interrelate. Becker (1978, p. 865) illustrates this dimension clearly when he argues that  
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44 work that is organized as a craft usually requires not only “many years (...) to master the physical  
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46 skills and mental disciplines of a first-class practitioner” but also “mastering a wide variety of  
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48 techniques [as to] not only do things better than most others but also do more things.”  
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52 This all-roundedness would allow a craftsperson exceptional control over the “craft’s  
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54 materials, [and] ... do anything with them” (Becker, 1978, p. 865). It gives the individual  
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craftworker an exceptional ability to engage in problem-solving (Halaby & Weakliem, 1989), which is not only an asset for making but also for repair work (Bozkurt & Cohen, 2019; Strodbeck & Sussman, 1956). Similarly, Wallace and Kalleberg (1982, p. 309) observe how craft workers in the declining craft printing industry had a uniquely “integrated understanding of the relationships among different printing functions” that became a rare skill when the industry began to increasingly rely on routinization, specialization and automation after the Second World War.

This dimension of craft skill is also apparent in Sorge’s (1991, p. 167) comparative study of manufacturing systems in the UK, France and Germany, where he describes how British manufacturing became increasingly specialized due to the separation of technical and engineering professions from the “craft base” which led to “diluted skills in direct production”. This “vertical and lateral professional segmentation” had not taken place to the same degree in Germany that had maintained more artisanal and craft features where a “larger craft worker force [with] continuity of skills and knowledge from workers to technicians and engineers [was] more prevalent” (Sorge, 1991, p. 174). In other words, production work remained more all-round and complex in Germany where technical expertise was holistically integrated in, rather than separated from, traditional craft roles. Across the literature, craft work is indeed frequently associated with higher degrees of job complexity (Avolio, Waldman & McDaniel, 1990; Carter & Keon, 1989; Form, 1987; Holman & Rafferty, 2018). All-roundedness in skill thus contrasts with work practices that rely on fragmentation or “splintering” of skills for the purpose of task specialization and a narrow division of labor (Carter & Keon, 1989; Grimes, Klein & Shull, 1972; Wallace & Kalleberg, 1982). The latter is typically seen as another aspect of “deskilling” (Form, 1987).

Another important dimension of craft skill is the reliance on *embodied expertise*, requiring a balanced interaction between the senses and the mind in knowledge development. Sennett



(2008), for example, metaphorically described this as the interplay between the “hand and head” in craft approaches to making and referred to a “material consciousness” that is unique to craft work. Craft thus requires not only manual skill but also a practical and material form of knowledge that is, at least partially, embedded in context and tacit in nature (cf. McIver, Lengnick-Hall, Lengnick-Hall & Ramachandran, 2013; Perrow, 1967). Bell and Vachhani (2020) vividly depict this embodied dimension in their study of potters, shoemakers, and bicycle manufacturers, as they draw on Bennett (2010, p. 5) and Gibson (2016, p. 74) to argue that craft relies on “sensory engagements with matter” (p. 696) and thus has “embodied knowledge as the basis for practically and skillfully transforming lively and inconsistent materials into useful objects” (p. 682).

Based on a comparative ethnographic study of nine technicians’ occupations, Barley (1996) similarly describes the important role of “contextual knowledge.” The technicians he studied “valued experience over formal training” where experience “did not simply mean years of practice [but] a situated, rather than a principled knowledge of materials, technologies, and techniques” (Barley, 1996, p. 425). A particularly important form of contextual knowledge is what Barley (1996) describes as “semiotic knowledge.” This involved the technician’s ability to “recognize and interpret minute differences in sensation”, such as when “automotive technicians used both sight and smell to detect unusual patterns of scoring and decomposition of lubricating fluid that denote excessive wear of parts” (Barley, 1996, p. 425).

The embodied nature of craft expertise is also apparent in studies that focus less directly on the material aspects of craft, but still use the term to refer to a practical form of expertise that relies on “best practice” (Whitley, 1995), “empirical lore” (Stinchcombe, 1959) or “gut-level feel” (Westley & Mintzberg, 1989) with an “eye to production” (Tsoukas & Cummings, 1997, p. 665,

citing Reeve, 1992) that contrasts with “formal”, “abstract”, “static”, “intellectual” or purely “scientific” knowledge (Cook & Brown, 1999; Tsoukas & Cummings, 1997; Wrigley, 1982).

**Craft Attitudes.** Finally, craft also involves attitudes to work that may follow from a unique ethos (Becker, 1978) that values dedication, communality and exploration at work. On a theoretical continuum, this could be contrasted with the emphasis on detachment, individuality and planning that characterizes other forms of work organization as we illustrate below.

*Dedication* features in many of our reviewed papers as a central feature of craft work. When describing medieval craft guilds, for instance, Kieser (1989, p. 540) underscores that individual craftsmen could only participate by “investing all their resources, by bringing their personalities in toto into the guild” and accepting that “there was nothing like a private sphere outside the guild.” This also meant that these craftsmen did not just have to be committed to technical work practices but also to following “a strict religious life” (Kieser, 1989, p. 550) and adhere to trade-specific standards for clothing, ways of speaking and even music (p. 557). Dedication of a less religious sort was also apparent in the personal sacrifices that were required of members of the families that owned multi-centenary craft firms in Japan (Sasaki, Ravasi, & Micelotta, 2019) and among the handicraft artisans of Channapatna studied by Ranganathan (2018, p. 646) who made “sacrifices for the sake of their work, particularly when it came to personal health.” When Ranganathan (2018: p. 646) noticed that artisans were not wearing protective eyewear, one of the artisans explained: “when I work on the lathe, if I put on the shades [eyeglasses], I am unable to see the wood as carefully as I want to. So no one wears them”. The importance of dedication in craft work is such that it is often described as a “labor of love” (Croidieu & Kim, 2018; Kuhn & Galloway, 2015; Massa, Helms, Voronov & Wang, 2017). Again, Ranganathan (2018, p. 647) provides a vivid illustration when she notes how artisans in

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3 Channapatna “treated the products they made like their own babies, part of their embodied selves,  
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5 bestowing these products with love and showering them with attention.”  
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8         This attitude contrasts sharply with the detachment that appears to characterize opposing  
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10 approaches to work where workers are constantly driven to maximize the “exchange value” of  
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12 their efforts (Adler, 2007; Fitzmaurice et al., 2020), and more inclined to routinely change work  
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14 roles, organizations, and geographies, motivated by external success criteria (cf. Anteby, 2008;  
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16 Dobrev & Kim, 2019; Fitzmaurice et al., 2020). Whereas dedicated makers engage in work for its  
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18 own sake (Sennett, 2008) and craft forms of entrepreneurship are described as resting on  
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20 commitment “to long-standing practices and workmanship, not fixated on making money”  
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22 (Stinchfield, Nelson, & Wood, 2013: p. 899), “detached” workers or entrepreneurs are more  
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24 flexible in their commitments, driven primarily by career goals or monetary outcomes (Bracker,  
25  
26 Keats, & Pearson, 1998; Scott Morton & Podolny, 2002; Stinchfield et al., 2013). The attachment  
27  
28 to their work could be described as rather “utilitarian”, whereas craft workers would display a  
29  
30 deeper, “moral attachment” that may be reinforced through “symbols, myths and rituals” as found  
31  
32 in the case of the medieval guilds described by Kieser (1989: p. 558).  
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38         A second important attitude that appears typically as part of a craft ethos is *communality*.  
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40 Craft work tends to occur with a clear regard for some form of shared occupational identity and  
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42 purpose with others engaging in the same craft or trade (Anteby, 2008; Fine, 1992). A good  
43  
44 example of this is work under the medieval guild, described by Kieser (1989) and others, which  
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46 was approached as a “*gemeinschaft*” activity where good work meant valuing strong interpersonal  
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48 ties within particular locales (Adler, 2015). Similarly, Sasaki et al. (2019) describe how workers  
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50 in age-old Japanese craft firms were not just dedicated to the technical aspects of their work but  
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52 also had a sense of duty toward the family, the local community and their ancestors.  
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Communality is also found in contemporaneous examples of craft work, such as among amateur radio makers, craft brewers or other nascent maker entrepreneurs who formed clubs or “maker spaces” through which they learned from each other (Browder, Aldrich, & Bradley, 2019; Croidieu & Kim, 2018; Kroezen & Heugens, 2019), resulting in patterns of “coopetition” that persisted once activities transcended the amateur workshop into full-blown business (Mathias, Huyghe, Frid, & Galloway, 2018). Craft work thus appears to naturally involve the construction of “communities of practice” (Lave & Wenger, 1991) that maintain occupational identities, facilitate apprentice learning and enable distinct forms of coordination.<sup>5</sup>

The above is in contrast with mechanical work that is guided by individuality and characterized by self-interest, competition and more transactional interactions (cf. Weaver, 2006; Williamson, 1991). Fitzmaurice et al. (2020: 94), for example, speak of the “social intimacy” that workers in the sharing economy feel is “corroded” under conventional, more mechanical, market relations and labor conditions. As a result of this, general experiences in relation to making are experiences as more “alienated and impersonal” (*ibid.*).

Finally, based on our review, we find that when work is approached as a craft, it typically requires a mindset that embraces *exploration*. Sennett (2008: p. 273), for example, notes how the craftsperson likes to tinker or play around with something akin to how “children learn in play’s dialogue with physical materials.” Rather than seeking structure and a reduction of uncertainty, the craftsperson experiments and seeks complexity or ambiguity to advance his or her skills (Sennett, 2008). This exploration mindset is apparent among the “amateurs” that transformed radio

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<sup>5</sup> There is a rich literature on communities of practice and seminal examples have come from typical craft workers, such as tailors, butchers and midwives (Lave & Wenger, 1991). The subsequent extension of the concept to other contexts is another indication that elements of craft are more ubiquitous than is often recognized. However, whether or not an instance of community of practice involves a craft approach to work depends on the degree to which other features that we describe here are present.

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3 making (Croidieu & Kim, 2018) and beer brewing (Kroezen & Heugens, 2019). They gradually  
4 developed their making skills outside of formal organizational structures and through experiential  
5 learning (cf. Menger, 1999; Quinn & Bunderson, 2016) while aiming to derive intrinsic stimulation  
6 from exploratory activities. In the case of the radio makers, these “playful actions ... initially  
7 frustrated professional scientists” but ultimately caused an impactful transformation in radio  
8 technology from “point-to-point” to “point-to-many” transmission (Croidieu & Kim, 2018: p. 7).  
9  
10 Similarly, an exploration mindset is notable amongst chefs engaging in molecular gastronomy,  
11 constantly improving and extended their repertoire of cooking techniques (Slavich, Svejenova,  
12 Opazo & Patriotta, 2020), at the Italian manufacturer of household products, Alessi, where craft  
13 was deliberately reinfused in the organization to explore new forms of manufacturing (Rindova et  
14 al., 2011), and amongst 19<sup>th</sup> century violin makers who had to engage in exploration in attempts  
15 to rediscover the tacit knowledge needed to replicate the valued Cremonese instruments from the  
16 early 18<sup>th</sup> century (Cattani et al., 2013).  
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33 The exploration mindset that characterizes a craft approach to work contrasts with the  
34 planning mindset that characterizes a mechanical approach to work (cf. Fayol, 1949; Mintzberg,  
35 1994). Here, planning leads to a form of working that is controlled, highly structured and  
36 predictable to enhance efficiency and consistency. This is what David Pye (1995: p. 9) calls  
37 “workmanship of certainty.” The discipline of strategic management is a good illustration of an  
38 area where this contrast has been explicitly discussed. Mintzberg (1994) and Weick (1987), for  
39 example, have vividly argued that strategy is in practice often not the outcome of “a rational  
40 process of planning” as influential theory would suggest, but instead based on “whatever emerges  
41 from a process of creative, often ‘playful’, acting” (Tsoukas & Cummings, 1997). This again  
42 suggests that craft approaches tend to be more ubiquitous than is often acknowledged.  
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**A CONFIGURATIONAL TYPOLOGY OF CRAFT**

So far, we have built on commonalities in how prior literature has treated the subject, to define craft as a unique approach to work that relies on distinct skills and attitudes. However, past literature also displays important variations in how this concept is used, which point to distinct ways in which craft manifests in organizations and organizational fields. In this section, we analyze these varied manifestations through the lens of the framework developed in the previous section (i.e. craft skills and attitudes vs. mechanical skills and attitudes), and discuss their differential reliance on the coordination mechanisms that classic organization theory associates with fundamental forms of organization (Bradach & Eccles, 1989; McEvily et al., 2003; Williamson, 1991). The result is a configurational theory of craft that highlights the inherent tension between human and machine that characterizes the organization of work as well as the different ways in which it can be resolved. As this tension changes across time and space, and as actors attempt to strike a balance between machines and humans at work, craft appears to acquire different substantive manifestations and symbolic meanings.

Based on our review, we distinguish between two sets of configurations, summarized in Tables 3 and 4 and illustrated in their ideal-typical forms by Figures 2 to 6. We describe them in broadly chronological order as they appear in the literature, moving first across the conventional configurations of traditional and industrialized craft (Table 3), and then to the various manifestations of contemporaneous craft (Table 4). Our conceptualization of traditional and industrialized craft covers the perspective that has been dominant in the literature, where craft has been depicted as a primitive approach to making that became marginalized with industrialization as it was replaced by more efficient ways of working and modes of organizing that were deemed to have greater utility to organizations and society. Our conceptualization of technical, pure and creative craft covers an alternative perspective that is increasingly visible in the literature where

craft appears as a more timeless alternative to mechanical work. These configurations involve a more explicit concern for aesthetic forms of quality that relate to the pursuit of technical excellence, anti-industrial purity and creative stimulation.

--- Insert Table 3 and Table 4 about here ---

### **Traditional Craft**

The form of craft that is most common in the literature is what we term here as “traditional craft” (see Figure 2 and Table 3). It is visible in the pre-industrial forms of work organization that has been replaced or are persisting only in the margins with the prototypical example being found in the guild systems of Medieval Europe that Kieser (1989) describes as the “predecessor institutions” of formal organizations. This “traditional craft form of work organization” also features as pre-history in Bodrožić and Adler’s (2018) historical account of technological revolutions and associated management models and concepts. According to this account, with the advent of steam and then electrical power, the “traditionalistic” craft paradigm was replaced by the “professionally managed firm” involving the “rationalized management of a geographically dispersed enterprise” and then with the “factory” and its associated principles of scientific management. Similarly, Burris (1989) equates craft with a “pre-capitalist” control structure that relied on distinct characteristics compared to modern “technocratic control.”

--- Insert Figure 2 about here ---

In traditional craft, the purpose of human engagement with the making of a product or the delivery of a service is simply a prerequisite for performance; there is no mechanical alternative. The reliance on machines is thus low due to the state of technological development or the inherent nature of the work. As a result, work is largely manual and may be particularly hard, physically demanding and/or dangerous out of necessity. This was the case, for example, for the traditional weavers of Norwich (Bearman & Deane, 1992: p. 37-38). The coordination of traditional craft

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typically involves some form of master-apprenticeship system where, in order to enter the trade, one has to engage in an enduring and exclusive one-to-one training relationship with an established craftsman. This would involve a career ladder that takes many years to complete where an “apprentice” has to first qualify for some form of intermediate status (such as “journeyman”) before being eligible for the honorable rank of “master” (Aminzade & Hodson, 1982; Baer & Shaw, 2017; Kieser, 1989). Traditional crafts are also characterized by a concern with functional quality and thus external standards of performance (Becker, 1978). This means that mastery, all-roundedness and embodied expertise are balanced with at least some degree of commoditization, specification and codification of skills to ensure consistency in output quality and skill transfer. The medieval guilds are probably the clearest example of this balance and this is why Kieser (1989) refers to them as the “predecessor institutions” of the formal organizations that ultimately shifted this balance much further in the direction of mechanical work skills and attitudes enabled by technological and scientific advances.

The traditional craft configuration is associated with a unique mix of organizing mechanisms that relies on limited market-, but extensive hierarchy- and community-based coordination. In the first place, there is limited reliance on market mechanisms as there are powerful market-buffering institutions. Kieser (1989, p. 546), for instance, describes the guilds that typically structure traditional craft as “occupational monopolies... that protected their members from the threats to their existence engendered by markets... [as they] relieved the pressures of selection..., created security by standardizing expectations about the behavior of others, and thus allowed the monopolists to make forecasts on a longer-term basis.” In the absence of reliance on markets for “capital goods, labor, and property rights... only the end products of the



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3 guilds were traded in [extremely regulated] markets” (Kieser, 1989, p. 546; also see Bearman &  
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5 Deane, 1992; Carroll, Preisendoerfer, Swaminathan, & Wiedenmayer, 1993).

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8 In the absence of powerful collective regulatory bodies such as guilds or academies, Ruef  
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10 (2020) also observes how traditional craft production in the U.S. was also largely free from market  
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12 forces. Focusing specifically on labor, he describes how traditional craft involved “unfree” forms  
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14 of work that persisted until the mid-19<sup>th</sup> century when increasingly firms began to operate  
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16 according to a “factory system” that relied on “wage labor” and, thus, increasingly on the market  
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18 for coordinating work. This was not unique to the U.S., but also appears to be characteristic of  
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20 Europe before the emergence of the guilds (Wallis, 1902) or Southeast Asia before  
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22 industrialization (Koo, 1990). The modern heir of these traditional market-buffering institutions  
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24 around craft work is perhaps the “craft union” (Hannan & Freeman, 1987), which follows an  
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26 “occupational logic” by seeking “work control, often monopolizing the supply of labor ... [and]  
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28 enforcing craft standards as gate-keeping mechanisms” (Yu, 2013, p. 109). Though unions  
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30 emerged in response to industrialization, and in many cases indicated the loss of craft rather than  
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32 its persistence, in exceptional circumstances they gained enough power to resist technocratic  
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34 control and maintain traditional craft forms of organizing as was the case with AFL unions in the  
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36 beginning of the 20<sup>th</sup> century (Baron, Jennings, & Dobbin, 1988).  
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42 Secondly, traditional craft relies on strict, personal and normative hierarchies. The  
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44 craftsperson of lower rank is subjected to the will of higher-ranked “masters” and has no alternative  
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46 but to patiently follow the hierarchical structure of the social ladder if he or she wants to progress  
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48 (Clignet, 1979; Handman, 1938; Kieser, 1989). Relationships to hierarchy are highly personal, not  
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50 mediated by any form of bureaucracy (e.g., Burack, 1966; Stinchcombe, 1959) and involve  
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52 extensive cultural prescriptions for achieving and maintaining social status. For example, in Japan,  
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craft was traditionally organized according to rigid hierarchical relationships within a large household where the master acted as the head of the family and apprentices were considered part of the extended family (Takashina & Oonogi, 2006). Beyond consideration of craft skill levels, traditional craft hierarchies depended significantly on normative principles for determining social standing. For example, “honorableness” was a powerful norm among the Medieval guilds (Kieser, 1989) giving those higher up in the hierarchy explicit power to judge whether or not someone lower in the hierarchy was adhering to the traditional craft ethos. This meant that there was a constant threat of being expelled from the guild if one was found to have acted in a “dishonorable” manner (Kieser, 1989, p. 551).

Third, these hierarchical structures are socially embedded in inescapable networks of dense ties without separation of the public and private sphere that are characteristic of the “gemeinschaft” form of community (Adler, 2015; Adler, Kwon & Heckscher, 2008; Tönnies, 1957). Medieval guilds performed this function to the extreme (Kieser, 1989), though this communal dimension also characterizes other, non-guild examples of traditional craft where the family, the feudal lord or the geographic community serves a similar role (Ruef, 2020; Sasaki et al., 2019; Wallis, 1902). In traditional forms of craft, these community structures are so powerful that they function as near-total institutions that one cannot voluntarily enter or exit (Kieser, 1989; Ruef, 2020). This produces a strong sense of collective identity and a related, imposed responsibility for the protection of collective interest that is typically described as being “traditionalistic” in nature.

Compared to the contemporary configurations of craft discussed below, this mix of coordination mechanisms tends to prioritize dedication and communality over exploration, as workers have limited agency at work and appear more likely to see their work as a predefined duty to the community than as an “open space of play” (Sennett, 2008, p. 269). While some degree of

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2  
3 exploration is needed to acquire refined craft skills through experiential learning, strong social  
4 conventions also breed a planning mindset to ensure conformity that limits experimentation. The  
5  
6 medieval guilds of Europe, again, provide a powerful illustration as guilds typically had  
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8 constitutions that included words like: “no man should think of or invent something new or use it,  
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10 but everyman should follow his neighbour in brotherly love” (Braun, 1968, p. 257, as quoted in  
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15 Kieser, 1989 p. 553).

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17 As powerful as this mode of organizing once was, traditional craft has disappeared from a  
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19 large part of society. As the guilds, and similar social structures, declined due to a combination of  
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21 political, economic and technological circumstances, production gradually shifted toward more  
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23 “efficient” organizational forms that relied on modern principles of “line and staff” and “scientific  
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25 management” (Bodrožić & Adler, 2018; Robinson & Briggs, 1991). Yet our review points to  
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27 particular cases where the traditional craft form of organizing can still be observed. Stinchcombe  
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29 (1959, p. 170), for example, contrasts the organization of the US construction industry in the 1950s  
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31 with the dominant principles of “modern bureaucracy” and “mass production” and finds a  
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33 continued reliance on a “craft base” and “craft principles” instead of reliance on centralized  
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35 planning systems populated by clerks and professionals where “both the product and the work  
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37 process are planned in advance by persons not on the work crew.” Hodson (1996, 2010) points to  
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39 firefighting, police work, deep-sea fishing and factory maintenance as other fields where  
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41 traditional craft elements – such as, for instance, reliance on master-apprenticeship training – have  
42  
43 persisted (2010, p. 898). Bailey and Barley (2011) also noted the continued reliance on master-  
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45 apprenticeship in structural engineering relative to hardware engineering, and Maurice, Sorge, and  
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47 Warner (1980) point to Germany as a place where, in general, apprenticeship systems continued  
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49 to be “most strongly cultivated”. We also see the persistence of traditional craft structures  
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3 involving normative hierarchies embedded in gemeinschaft communities of place, such as in the  
4 case of Champagne grape growing (Ody-Brasier & Vermeulen, 2014) or mechanical engineering  
5 (Lazerson, 1988) and knitwear manufacturing (Lazerson, 1995) in Northern Italy. In such  
6 relatively rare cases of traditional craft persistence, authors have tended to point to exceptional  
7 conditions where it proved to be the most efficient system (Lazerson, 1988; Stinchcombe, 1959).  
8 However, our review also shows how even where traditional crafts became industrialized, craft  
9 continued to play an important role in organizational life.

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19 **Industrialized Craft**

20 We find that a substantial portion of the literature that has touched upon craft deals with instances  
21 where human engagement has been replaced by machine control and craft work has made way for  
22 mechanical work (see Figure 3 and Table 3). In these cases, the introduction of machine technology  
23 and associated bureaucratic personnel practices in accordance with the principles of scientific  
24 management, in essence, captured particular crafts and took away the craftworker’s control over  
25 their work in the process (Baron, et al., 1988; Blauner, 1964; Edwards, 1979).

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35 --- Insert Figure 3 about here ---  
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37 Wallace and Kalleberg (1982), for example, detail how craft was gradually captured after  
38 the World Wars in the US printing industry. This sector used to be considered the epitome of the  
39 persistence of traditional craft production in industrial society as “shop floor autonomy”, and a  
40 high level of all-roundedness in skills was maintained. This eventually changed dramatically after  
41 the “imposition of capitalist rationalization” and “automation” (Wallace & Kalleberg, 1982, pp.  
42 309-310). As a result of continued specialization, the craft became increasingly “splintered” with  
43 workers being increasingly forced onto narrow, specialized tracks that allowed them “less time  
44 developing an integrated understanding of the relationships among different printing functions”  
45 (*ibid.*). Wallace and Kalleberg (1982, p. 322) argue that this is a case of classic “deskilling”  
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(Braverman, 1974), where the “consequence ... of new technology was the gradual diminution of judgment and craftsmanship required of the individual worker and the transferal of control of the labor process to management”. Similar descriptions of craft decline due to industrialization can be found in other places, such as in the French aeronautic plant studied by Anteby (2008), in the US iron and steel industry (Conell & Voss, 1990) or across sectors in the UK more generally in comparison to Germany (Maurice et al., 1980; Sorge, 1991; Wrigley, 1982).

In the case of industrialized craft, the mechanical capabilities of machines are prioritized and the purpose of human engagement with making is reduced to only those aspects where robotic machines still lack capabilities. In many instances, this comprises highly specified roles for which limited skill is required. The conventional 20<sup>th</sup> century epitome of this is the assembly line worker (Blauner, 1964; Guest, 1954; Hodson, 1996), and the 21<sup>st</sup> century equivalent may be the gig worker controlled by digital platforms and algorithms (cf. Ravenelle, 2019; Scholz, 2017). Here workers see their autonomy and job complexity reduced and it may appear that they will be replaced as soon as there is a sufficiently capable and permissible robot. The “making” of the product or service has been detached from the “meaning” including the design and management (Dorner, 1997) as there is a shift toward valuing “mental work” over “manual work” (Barley & Orr, 1997; Sennett, 2008; Wrigley, 1982).

However, authors have also noted trends towards a potential skill “upgrading” under these conditions (Adler, 2007; Anderson & Tushman, 1990; Barley, 1996; Form, 1987). Barley (1996) argues that with the increased reliance on machines, we also witnessed the birth of a new occupational type: the technician. In the case of industrialized crafts, there is still a need for skilled technicians that operate and service robotic machines. These technician occupations may rely on capabilities that involve craft skills that depend on mastery, all-roundedness and embodied

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3 knowledge as well as on attitudes that correspond with a craft ethos, yet they are often seen as  
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5 “foreigners in the work site” (Barley, 1996, p. 422). Barley (1996, p. 422), for instance, describes  
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7 the work of technicians that “built, repaired and monitored complex technical systems” such as  
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9 computer technicians, programmers, network administrators and factory technicians. In the case  
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11 of industrialized craft, however, these technicians are not directly involved in making processes  
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13 and thus have limited engagement with end-products or services and the material world they are  
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15 ultimately made, consumed and used in. Instead, they are detached from making processes or have  
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17 marginal support roles in the organization such as the case in the British manufacturing system  
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19 described by Sorge (1991).  
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24 Increased reliance on efficient marketplaces combined with hierarchical and bureaucratic  
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26 forms of coordination has generally led to a reduced reliance on craft skills and attitudes in the  
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28 making process and thus shifted power away from makers (cf. Adler, 2007; Burawoy, 1982;  
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30 Edwards, 1979). When a craft gets captured in this way for efficiency purposes, skills become  
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32 rationalized through processes of commoditization, specialization and codification (Adler, 2012;  
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34 Griffin, Wallace, & Rubin, 1986; Weber, 1978). Similarly, there is institutional pressure for work-  
35  
36 related attitudes to shift toward detachment, individuality and planning that support the  
37  
38 rationalization and “atomization” of the work process (Adler, 2012; Burawoy, 1984; Griffin et al.,  
39  
40 1986).  
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44  
45 The industrialized form of craft can frequently be found in the “generalist” organizations  
46  
47 described in studies on the evolution of organizational populations (Sikavica & Pozner, 2013;  
48  
49 Swaminathan, 1998; Verhaal, Hoskins, & Lundmark, 2017). For example, the industrial revolution  
50  
51 led to the dominance of the mass-production beer brewery, which relied on the production of  
52  
53 highly standardized products with the widest possible appeal (Carroll & Swaminathan, 2000). In  
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3 this process of industrial transformation where scientific and technological advancements allowed  
4  
5 the capture of traditional craft aspects of beer brewing, the role of brewmaster, who used to be at  
6  
7 the center of the organization, evolved to that of brewing technician. He now operated the  
8  
9 machines but was removed from the material brewing process and had limited power over what  
10  
11 products were actually produced (Kroezen & Heugens, 2019).<sup>6</sup> The literature on craft unions  
12  
13 similarly describes how, with industrialized craft, the shift toward efficient marketplaces and  
14  
15 bureaucratic organization meant increasing competition among workers which ultimately led to  
16  
17 reduced control and autonomy at work and engagement with making across the entire craft base  
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19 (Conell & Voss, 1990; Streeck, Seglow, & Wallace, 1981; Wrigley, 1982).  
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24 The role of craft unions in the industrialized form of craft also points to detachment of craft  
25  
26 from community as an additional factor that contributes to a dilution of craft skill and attitudes.  
27  
28 The craft unions described in the literature, in most cases, struggle to preserve craft through formal  
29  
30 communities in the face of the declining influence of the *gemeinschaft* structures of traditional  
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32 craft organization and the growing influence of bureaucratic control. Though occupational  
33  
34 communities may still be maintained in places (Anteby, 2008; Barley, 1996), they are frequently  
35  
36 in tension with the need for control under rationalized bureaucratic organization. Anteby (2008)  
37  
38 observed how the diminished population of remaining craft workers in a French aeronautic planned  
39  
40 that had increasingly robotized craft production was given informal leeway from management to  
41  
42 produce “homers” (the formally prohibited making of factory artifacts with company tools for  
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44 personal use) to ensure their continued cooperation in the industrialized system. This is also an  
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52 <sup>6</sup> Note that this raises an important issue in relation to the deskilling / skill upgrading debate. One could argue that the  
53 role of brew master was upgraded as this now required more advanced, formalized training and skill levels. However,  
54 the codification of craft skills and the detachment from the material brewing process could also be interpreted as an  
55 instance of deskilling.  
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example of how remnants of craft may persist in the margins of or completely outside the organization of making in cases of industrialized craft.

**Technical Craft**

While a significant part of the literature has depicted instances where mechanical skills and attitudes associated with scientific management, bureaucracy and automation appear inherently oppositional to craft, there is also a substantial body of work that has observed instances in which these appear more compatible. Here, human and machine forces are not at odds but are balanced. While there is increased reliance on machines, makers continue to be autonomously involved in making and maintain control over machines during the process. In such technical craft, machines are used as tools to “augment” human senses, skills and their “capacity for productive expression” (Piore & Sabel, 1984, p. 19). Compared to other configurations of craft, this configuration depends on a prioritization of the value of technical excellence above all else, which may require more substantial reliance on mechanization (see Figure 4 and Table 4).

--- Insert Figure 4 about here ---

On the surface, there may be a resemblance with what we have described in the case of industrialized craft. However, while we find technicians in both, in the technical craft form, technicians are directly engaged with and in control of making through more extensive reliance on craft skill and attitudes. For example, Piore and Sabel (1984) notably described the unique “post-Fordist” production regimes found in industrialized Germany, Northern Italy and Japan as “flexible specialization” enabled by “the vestiges of craft tradition” in those countries. This regime lies at the “interface of product standardization and customization” (McKinlay & Starkey, 1988) such that there is semi-rationalization of work processes where rudimentary and peripheral aspects may be automated or otherwise efficiently outsourced in order to set makers free to focus on parts of the production process where quality is believed to be most dependent on mastery in the



1  
2  
3 application of refined skill and human touch (cf. Kotha, 1995; also see Best, 1990 and Cusumano,  
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5 1991).  
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8 This configuration of craft is also visible in the literature on “total quality management”  
9  
10 (Deming, 1986). Here, craft skills and attitudes are cherished or reinfused in industrial organization  
11  
12 to facilitate the pursuit of excellence in making through an attitude of continuous improvement  
13  
14 across all facets of the making process (Hackman & Wageman, 1995). This technical form of craft  
15  
16 can be observed in Raffaelli’s (2019) study of the mechanical watchmakers in Switzerland, in  
17  
18 Kotha’s (1995) study of a Japanese bicycle manufacturer as highlighted above, and in many others,  
19  
20 such as Darr and Talmud’s (2003) study of a small US micro-electronics company and Kelley’s  
21  
22 (1990) study of the introduction of programmable machines across US manufacturing sectors.  
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26 Across the board, this configuration relies on a fundamental balance between human and  
27  
28 machine forces, as is depicted in Figure 4, a visual illustration of how both craft and mechanical  
29  
30 skills and attitudes are present in this ideal-typical configuration. In organizations configured  
31  
32 according to technical, rather than industrialized, craft, roles are less specified or splintered and  
33  
34 come with more responsibility and thus all-roundedness (Grimes et al., 1972; McKinlay & Starkey,  
35  
36 1988; Perrow, 1967). Managers are supposed to get their hands dirty (Deming, 1986) and  
37  
38 “programmable automation tasks” are assigned to makers on the shop floor rather than housed in  
39  
40 “white collar” design, engineering or management functions (Kelley, 1990; Vallas, 2006) as  
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42 technology is used for the “upgrading” of skill rather than deskilling (cf. Adler, 2007; Perrow,  
43  
44 1983; Sorge, 1991).  
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49 The balance in skills and attitudes under technical craft appears to be associated with an  
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51 equivalent equilibrium between market, hierarchy and community coordination mechanisms (see  
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53 Figure 4). Compared to industrialized craft, there is less reliance on market and hierarchy, but  
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3 more reliance on the community in coordinating work. Technical craft is typically associated with  
4  
5 a niche or specialist strategy. Firms adopting this mode of organizing tend to be less affected by  
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7 direct competition than generalist firms (cf. Carroll & Swaminathan, 2000; Irwin et al., 2018;  
8  
9 Sorge, 1991). A concern for niche demand is typically associated with a “strategy of permanent  
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11 innovation” reliant on technical craft skills, potentially supported by “an industrial community that  
12  
13 restricts competition to those favoring innovation” such as originally observed in Northern Italy  
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15 and Germany (Piore & Sabel, 1984, p. 17; also see Doeringer & Crean, 2006 and Sorge, 1991).  
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17 The attitude of these firms toward upstream and downstream market relationships also tends to be  
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19 more “collaborative” (Irwin et al., 2018). For example, in their study of the US recreational vehicle  
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21 industry, Irwin et al. (2018, p. 282) distinguish “crafters” from “assemblers” and argue that the  
22  
23 former interpret their “industry identity as a mandate to emphasize personal, long-term  
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25 relationships” in contrast to the “transactional” and “competitive” relationships emphasized by the  
26  
27 more industrial “assembler” firms (Irwin et al., 2018, p. 285-286).  
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33 In the case of technical craft, a reduced reliance on hierarchy and bureaucracy for the  
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35 coordination of tasks typically goes hand in hand with models of “participative management” and  
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37 “semi-autonomous work groups” that function best when they are not just “management-initiated”  
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39 but instead build on a true craft mandate (Hodson, 1996, 2010). Here, elements of bureaucracy,  
40  
41 which are still necessary when dealing with complex technology and organization, are inherently  
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43 supportive and “enabling” rather than “coercive” (Adler & Borys, 1996). This alternative  
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45 organizational design is especially visible in the organizational restructuring efforts of large mass  
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47 producers, which had previously been configured as industrialized craft, that aim to infuse craft  
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49 elements into their production processes (McKinlay & Starkey, 1988).  
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3 In the case of technical craft, makers are embedded in a professional form of community  
4 that enables continued technical learning. This form of community is in sharp contrast with the  
5 more rigid, loyalty-based, *gemeinschaft* communities of traditional crafts. Instead, entry to the craft  
6 typically requires formal education combined with some form of apprenticeship and/or extensive  
7 on-the-job training (Adler et al., 2008; Barley, 1996; Vallas, 2006) and relies on “interdependent”  
8 rather than “dependent” or “independent self-construals” (Adler et al., 2008). This means makers  
9 experience a tension between the identification with the organization and with their occupational  
10 community of practice (Anteby, 2008; Barley, 1996), which in the case of technical craft is a  
11 productive tension that the organization of work capitalizes on. Beyond setting skill levels for  
12 entry, these communities provide sources for continued sharing of technical knowledge and  
13 expertise across organizational boundaries (Barley, 1996).  
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### 28 **Pure Craft**

29 Technical craft contrast with, what we have labeled as, *pure craft* (see Figure 5 and Table 4). In  
30 this instance, craft is associated with the radical prioritization of human skills and attitudes at the  
31 expense of all that is considered mechanical. This typically manifests itself as a consecration of  
32 manual dexterity and human touch in an effort to embrace anti-industrial purity in the process of  
33 making (Beverland, 2005; Sikavica & Pozner, 2013; Weber et al., 2008). Naturally, this  
34 configuration is also associated with an admiration for select properties of historic work forms and  
35 a rejection of modern technology. As such, this configuration resembles the traditional craft  
36 configuration but relies on a more idealist adherence to craft skills and attitudes, which now also  
37 includes a strong emphasis on exploration to (re)discover, and (re)construct “pure” making  
38 techniques in the face of industrialization. Pure craft thus often appears as a reconfiguration of  
39 traditional craft where select elements are restored and transformed through the use of history to  
40 give meaning to work in relation to mechanical alternatives (Kroezen & Heugens, 2019; Negro,  
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Hannan, & Rao, 2011; Weber et al., 2008). As such, this configuration is apparent in movements that strive to “re-enchant” manufacturing or service work in the face of industrialization and rationalization (Endrissat et al., 2015; Suddaby et al., 2017).

--- Insert Figure 5 about here ---

Historically, this form of craft can be traced back to movements from the Romantic era (e.g. Morris, 1892; Ruskin, 1849). As industrialization had led to a substantial transformation of work and society in the preceding era, there was an increasing nostalgic longing for more purely human forms of making. Indeed, an extreme example of pure craft is found in John Ruskin’s work, whose “radical... vision was to assert that modern society as a whole should and could return to a preindustrial past” (Sennett, 2008, p. 108). This “Ruskinism involved an appreciation of rough-hewn beauty, and more than a tinge of eroticism in hard physical labor” (Sennett, 2008, p. 109). Today, we can observe the pure craft configuration among “heritage crafts” that aim to revive, protect and preserve manual skills for making, such as illustrated by the Heritage Crafts Association in the UK, which produces a yearly “Red List of Endangered Crafts” (Carpenter, 2019). In our sample, this form of craft can also be found among organic farmers (Sikavicia & Pozner, 2013; Weber et al., 2008), Franconian beer breweries (Cruz, Beck, & Wezel, 2018), Italian wine and spirits producers (Delmestri & Greenwood, 2016; Negro et al., 2011), Japanese *shinise* (Sasaki et al., 2019) as well as in Bell and Vachhani’s (2020) study of bicycle, shoe and hand-decorated pottery makers.

Whereas in the case of traditional, industrialized and technical craft there is (also) a utilitarian component to the purpose of human engagement with making, in the case of pure craft, the purpose of human engagement with making reflects primarily the pursuit of distinctive aesthetic qualities. Apart from relying on a romanticized version of the past and manual labor, this

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3 form of craft is also typically associated with a particular form of “anti-mass production sentiment”  
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5 (Carroll & Swaminathan, 2000; Sikavicia & Pozner, 2013; Verhaal et al., 2015) that cherishes  
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7 smallness and scarcity over “scale”, “material abundance” and “waste” (Sennett, 2008; Weber et  
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9 al., 2008). As such, there is an idealistic opposition to machines that are deemed to “disnature” the  
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11 production process by making it “artificial” or impure (Delmestri & Greenwood, 2016; Weber et  
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13 al., 2008; also see Form, 1987, p. 30-31).  
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17 Industrialization is often associated with the severing of the tie between making and  
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19 *gemeinschaft* communities such as those based on geographic place (Cruz et al., 2018; DeSoucey,  
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21 2010). In contrast, pure craft relies on movements that are typically tied to heritage communities  
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23 for the coordination of work and associated skills and attitudes (Beck, Swaminathan, Wade, &  
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25 Wezel, 2019; Khaire & Hall, 2016; Sasaki et al., 2019). Here, makers may present themselves as  
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27 custodians of cherished community traditions through explorative use of history (Dacin, Dacin, &  
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29 Kent, 2019). For example, the craft skill and ethos of organic farming were tied to the preservation  
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31 of “pastoral heritage”, “heritage breeds” and “heritage foods” by an emerging community of  
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33 producers of grass-fed meat and dairy products in the U.S. (Weber et al., 2008). The values upheld  
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35 and stories told by craftspersons that embrace this configuration tend to be alluring to outsiders  
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37 (Massa et al., 2017) and, in the absence of the powerful regulatory systems akin to traditional  
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39 crafts, there are lower barriers to entry for aspiring makers (Kroezen & Heugens, 2019; Weber et  
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41 al., 2008). This is in sharp contrast with technical craft, where craftsmanship requires a high degree  
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43 of technical proficiency and where external audiences are typically further removed from the  
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45 process of making.  
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51 Pure craft, in principle, is associated with little reliance on market modes of coordination.  
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53 The aim is to spread the pure craft skills and attitudes to the widest audience as authentically as  
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possible to realize an idealized end. Taken to its extreme, this perspective views the end-user of the crafted product no longer as consumer, but a potential partner that can be educated and “evangelized” (Massa et al., 2017) to participate in the protection of heritage or embrace “purer” forms of production and consumption. The same applies to peers in the sector who are not seen as competitors but as collaborators (Mathias et al., 2018; Weber et al., 2008). However, this is not to say that, in practice, the pure craft cannot have market value, as interesting tensions emerge when producers semi-authentically present themselves as pure craft firms for strategic reasons (Beverland, 2005). We will explore such tensions in the discussion.

Just like other forms of contemporary craft (technical craft described above and creative craft described below), there is typically limited reliance on hierarchy in the organization of pure craft. However, a moderate but distinct form of hierarchy could be observed in the authority positions that may be claimed by those makers that are especially well-versed in or able to construct a connection to a particular heritage upon which the pure craft skills rest. In addition, pure craft configurations may display some degree of hierarchy as the result of the vestiges of traditional craft coordination mechanisms. For example, work that has evolved from a traditional to a pure craft configuration may still be embedded in families that are committed to preserving or reviving their craft heritage (e.g., Delmestri & Greenwood, 2016; Erdogan, Rondi, & De Massis, 2020). Similarly, pure craft may be coordinated through a degree of formal authority as protectors of heritage may be able to maintain regulatory power positions, such as is observable in various forms of “gastronationalism” (DeSoucey, 2010), including champagne grape production in France (Ody-Brasier & Vermeulen, 2014).

Finally, as alluded to above, pure craft is associated more strongly with community coordination compared to industrialized and technical craft. Community has a distinct and more

powerful effect on production and performance as making is strongly influenced by constructed idealistic communities that are typically based on a sense of collective heritage (Cruz et al., 2018; DeSoucey, 2010; Sasaki et al., 2019; Weber et al., 2008). However, community boundaries are less rigid than with traditional and technical craft, and they are more permeable as the distinction between maker and consumer becomes blurred. Instead, both are engaged in a process of collective meaning making that is tied to the production and use of a craft product or service. Or as Bell and Vachhani (2020, p. 684) state: this aspect of craft “involves affective atmospheres [that] bring a specific feel to encounters and events as collective phenomena that cannot be reduced to individual bodies.”

### **Creative Craft**

A final contemporary configuration observed in the literature is what we call *creative craft* (see Figure 6 and Table 4). In this case, craft is associated with a pursuit of creativity in making and fueled by social movements promoting individual freedom and expression (Fitzmaurice et al., 2020; Kuhn & Galloway, 2015; Rao, Monin, & Durand, 2003). This is distinct from the technical craft configuration that hinges on machine-mediated technical perfection or the pure craft configuration that hinges on collective attachment to purist craft principles often steeped in nostalgia.

Critical is the distinctive importance of exploration as an attitude that takes more open and less ‘serious’ forms compared to pure craft as it is freed from communal expectations typically rooted in an idealized past. Instead, individual intrinsic value is found in the pursuit of personal interest in exploring and developing a technique as well as in the aim to make unique products or services that serve as an expression of individual identity. As such, there is typically some blurring of the domestic and the public spheres, as products and services may be created in and around the home – at an abstract level reminiscing of pre-industrial cottage industry and guild systems – and

playful individual hobby practices blur into commercial applications (Croidieu & Kim, 2018; Fitzmaurice et al., 2020; Kuhn & Galloway, 2015).

The multifaceted concept of authenticity could be used to further clarify the distinction between creative craft and other forms of craft (Lehman, O’Connor, Kovács, & Newman, 2019). Creative craft is concerned with a form of authenticity based on the consistency between one’s expressions and one’s values, so that work is practiced as a genuine expression of the self. This contrasts with forms of authenticity more typical of traditional or pure craft where there is a concern with the faithful conformity to collective standards or a purist connection to a constructed heritage. Similarly, there is a greater emphasis on innovation and uniqueness over consistency or constructed continuity in making. Creative craft is visible among chefs (Fine, 1992; Louisgrand & Islam, 2020; Rao et al., 2003; Slavich et al., 2020), the early 20<sup>th</sup> century amateur radio operators studied by Croidieu and Kim (2018), the community of Etsy.com artisan entrepreneurs depicted in Kuhn and Galloway (2015) and also appears to be a dominant force in the craft brewing movement (Kroezen & Heugens, 2019; Mathias et al., 2018).

--- Insert Figure 6 about here ---

In the case of creative craft, the purpose of human engagement with making is to facilitate individual, creative expression. The attitude toward machines is probably most ambivalent under this form, where machines are supportive tools as long as they contribute to processes of creative discovery and expression. Empirically, creative craft can thus either be reliant on more traditional handicraft techniques, such as in the case of the handicraft artisans who balanced their “craft heritage ... traditional knowledge and designs with individual creative expression” (Ranganathan, 2018) or on modern machine technology, such as in the case of maker spaces where costly cutting-



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3 edge technology is shared by a community of independent makers (Browder et al., 2019;  
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5 Fitzmaurice et al., 2020).

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8 What characterizes these examples, in contrast with other configurations of craft, is a more  
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10 individualist attitude, so that individual craft workers have “relative freedom ... from outside  
11  
12 interference with his[/her] work” (Becker, 1978, p. 866; also see Fine, 1992). Rather than the  
13  
14 “apprenticed know-how” that is typical of other configurations of craft, creative craft relies more  
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16 on individualized “talent and intuitive know-how” for the “creation of ingenious, innovative,  
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18 exceptional outcomes” (McIver et al., 2013, p. 606). The coordination of creative craft typically  
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20 occurs through learning and practicing in supportive, informal creative communities. As such,  
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22 compared to technical crafts, “initial training is an imperfect filtering device” for distinguishing  
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24 the skilled from the non-skilled (Menger, 1999, p. 541).  
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29 Informal creative communities can take the form of hobby clubs such as in the case of  
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31 amateur radio making (Croidieu & Kim, 2018) or craft brewing (Kroezen & Heugens, 2019;  
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33 Mathias et al., 2018) where makers of varying levels come together to share their creative interests,  
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35 practice together and learn from each other through trial and error. These communities are  
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37 sometimes taking a machine-mediated or online form so that inspiration, knowledge and advice  
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39 flow more freely across geographies (Kuhn & Galloway, 2015). Rather than imposing algorithmic  
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41 control on gig workers, when configured as a creative craft, platforms may liberate individual  
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43 makers (Fitzmaurice et al., 2020) through online-mediated communities allowing independent  
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45 makers to freely and creatively learn, practice and express their passion for their trade (cf. Kuhn  
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47 & Galloway, 2015).  
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52 Compared to pure craft, creative craft tends to be more open to market mechanisms of  
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54 coordination as makers become more directly associated with work outcomes and, as such, more  
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3 directly concerned with the external aesthetic valuation of their work (Fine, 1992; Khaire, 2014).  
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5 Though this may not lead to outright competitive behaviors among makers, creative crafts tend to  
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7 be characterized by contests for beauty and uniqueness (Becker, 1978; Cattani et al., 2013; Mathias  
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9 et al., 2018). These are structured by formal or informal “selection systems” (Wijnberg & Gemser,  
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11 2000), such as awards or rankings for individual makers and products that could be regarded as a  
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13 form of competition that is relatively “friendly in nature” (Mathias et al., 2018) yet with a  
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15 significant impact on market outcomes. Illustrative are well-known cases from creative industries  
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17 such as the Academy Awards for creators in the Hollywood motion picture and animation industry  
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19 (Cattani, Ferriani, & Allison, 2014; Gemser, Leenders, & Wijnberg, 2008; Mannucci & Yong,  
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21 2018) or the Michelin awards in gastronomy (Rao, Monin, & Durand, 2005; Slavich & Castellucci,  
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23 2016). Yet, such “art worlds” may develop in any maker context (Becker, 1978), as is seen in the  
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25 importance of awards and ranking in craft spirit distilling (Pedeliento, Andreini, & Dalli, 2020)  
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27 and beer brewing (Mathias et al., 2018; Verhaal, Khessina, & Dobrev, 2015).  
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33 When craft takes its creative form, some hierarchical power structures may develop directly  
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35 from market forces that provide intermediaries with the capability to constrain “the artist’s  
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37 expressive freedom” (Becker, 1978, p. 866). Yet, compared to other configurations of craft, what  
38  
39 is most striking is the absence of conventional mechanisms of hierarchical coordination. In fact,  
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41 there is typically reduced reliance on formal organization or bureaucratic control structures as  
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43 individual makers become entrepreneurs that strive to pursue their creative interests independently  
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45 (Fitzmaurice et al., 2020; Kuhn & Galloway, 2018; Menger, 1999; Rao et al., 2003). For example,  
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47 chefs that embraced the “nouvelle cuisine” movement in France resisted the “hierarchy of the  
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49 ancient régime ... [where] the chef was virtually owned by patrons and nobles ... [and supplanted  
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51 it with] a more egalitarian order” (Rao et al., 2003, p. 799).  
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Though creative craft typically rests on liberal and individualist movements for artistic or creative expression, these are naturally balanced by community coordination mechanisms. In contrast to the more exclusive semi-formal communities that structure technical crafts, creative crafts typically rely on more inclusive informal communities to enable egalitarian forms of knowledge sharing (Browder et al., 2019; Kuhn & Galloway, 2015; Quinn & Bunderson, 2016) with often relatively low barriers to entry and engagement (Croidieu & Kim, 2018; Kroezen & Heugens, 2019; Menger, 1999) to allow any member of these communities to improve their individual skills for creative expression. For example, the “maker movement ... emphasizes community and inclusiveness” among makers sharing a physical space and creative tools for which willingness to help others is a necessary condition for participation (Browder et al., 2019, p. 470).

In sum, by taking a configurational approach, we have connected and compared conventional (i.e., traditional and industrialized) and more contemporary (i.e., pure, technical, and creative) perspectives on craft to illustrate the different ways in which craft manifests in and around organizations. These differences, as our tables and figures succinctly show, depend in part on the different ways in which craft skills and attitudes are interpreted, combined, and applied to work. They can be informative for understanding how different organizational actors approach the same work domain through very different lenses and pursue different types of qualities. For example, the idealization of uniquely human skills and attitudes that rely on the construction of shared heritage that characterizes pure craft, contrasts sharply with the emphasis on technical skills to augment human capabilities and more ‘professional’ attitudes that characterize technical craft.

In addition, the different combinations of coordination mechanisms that appear across our configurational typology indicate what kind of organizational forms are typically associated with each instantiation of craft. They show how craft appears strongly associated with community-

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based coordination, but that the types of communities that form around it can vary substantially, in ways that reflect the influence of other modes of coordination. For example, the role of community-based coordination in the traditional craft configuration is substantially different from the role of community-based coordination in the creative craft configuration. Where the former typically depends on *gemeinschaft* communities as dense geographically-bounded networks that support embedded social hierarchies and rigid adherence to standards, the latter depends on much looser, informal networks that facilitate potentially borderless sharing of skills and attitudes.

Together, we believe that these configurations can provide the building blocks for a theoretical framework that can help synthesize the rich, but largely implicit and fragmented, insights on craft and inspire multiple avenues for future research. We discuss this framework and future research directions in the final section.

**DISCUSSION**

To illustrate how we see our framework contributing to the literature, we first discuss how it provides a general theory for understanding alternative models of work that continue to rely on human engagement in contrast to more mechanical forms of work. We subsequently discuss two implications of this theory for future research: (1) how it illuminates specific tensions that relate to the human-machine duality in work organization and (2) how it can help improve our understanding of evolutionary processes in and around organizations.

**Toward a Theory for Understanding Human-Engaged Work**

Our framework advances a holistic understanding of how making (of products, services, or ultimately even decisions) is approached and organized. Based on our review, we show how the concept of craft can be used to describe and synthesize insights about humanist models for organizing work – those that continue to rely on distinctively human skills and attitudes for making purposes – that contrast with the mechanical models that have become dominant with the industrial

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3 revolutions. Viewed in this way, craft reflects a fundamental and timeless approach to work and  
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5 brings to the fore an essential tension between human and machine in processes of making.  
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8         The different configurations we describe here point to the different ways in which this  
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10 tension can be resolved by capturing the conditions under which humans are more or less engaged  
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12 with making in relation to technological affordances. While the notion of craft appears to bring  
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14 human and machine in full opposition at first sight, it is important to recognize how they are also  
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16 mutually enabling. This is most evident in how we conceptualize technical craft, where advanced  
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18 machine technology and mechanical processes are used to empower makers and augment their  
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20 capabilities to focus on aspects of their work where human touch can add most value. However,  
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22 arguably this also applies to pure and creative craft. While these forms tend to appear in direct  
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24 opposition to mechanical work and machine control, they are also enabled by them, to the extent  
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26 that mechanized alternatives provide a semiotic contrast that gives contemporary craft  
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28 configurations their social meaning. Indeed, our review suggests how craft approaches to work  
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30 often become more recognizable and meaningful after mechanization changes the nature of work  
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32 in a given domain. For example, pure and creative craft forms of beer brewing only emerged after  
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34 the significant industrialization of the field (Kroezen & Heugens, 2019).  
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40         This observation suggests that the resolution of the duality between human and machine is  
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42 not just an organization-level issue but also a field- and even a societal-level one, as increasing  
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44 advances in artificial intelligence keep challenging us to reconsider what is uniquely human (cf.  
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46 Harari, 2014; Hayes, 1999). Even if the boundary between human and machine keeps moving, as  
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48 machines increasingly gain capabilities that were previously thought to be exclusively human, our  
49  
50 review suggests that craft will remain an enduring part of production systems. We see this shifting  
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52 duality that underlies our definition of craft work as an important area for future research. For  
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instance, we need to ask more fundamental questions about how intelligent machines (in lieu of capable humans) are used in organizations (cf. Murray, Rhymer, & Sirmon, 2020; Raisch & Krakowski, 2020), and the extent to which they constrain or enable human capabilities and with what consequences. To this end, future research may investigate how the digital technology and artificial intelligence used by contemporary platform organizations hinder or inspire craft approaches to work (e.g., Fitzmaurice et al., 2020; Kuhn & Galloway, 2015; Scholz, 2017); this may also reveal more vividly the social construction of different craft configurations, as experiences of platform work seem to vary dramatically across individuals and contexts (Fitzmaurice et al., 2020; Ravenelle, 2019).

By foregrounding the tension between human and machine, the configurational theory of craft we advance has some resemblance with prior theories of organizing that have described alternatives to rational and mechanical approaches, including “organic” management systems (Burns & Stalker, 1961) or normative forms of control (Barley & Kunda, 1992). However, our theory is distinct in taking the nature of work as a starting point (cf. Barley & Kunda, 2001), and seeing organizations, in the first place, as sites of making. Although established perspectives of adaptive management, organizational systems, environmental selection or class struggle are clearly relevant for understanding the role of craft in organizations and society, our perspective starts by considering the nature of work in terms of how products and services are made, what meanings are constructed out of that, and how such making is organized in and around organizations.

In this sense, the craft perspective we develop here is distinct by conceptualizing the uniquely human capabilities that craft work relies on. While there is extensive work on the tacit nature of capabilities and its relationship with different configurations of coordination mechanisms

(e.g., Lam, 2000; Zander & Kogut, 1995), a craft perspective on capabilities calls explicit attention to the role of the body and the interaction with the material world in such tacit forms of knowing (Bell & Vachhani, 2020; Barley, 1996). This recognition is in line with a growing interest in the role of bodily experience in learning and sensemaking more broadly (e.g., Beane, 2019; de Rond, Holeman, & Howard-Grenville, 2020). There is an opportunity to extend this line of work by considering how the role of embodiment and materiality varies across the different forms of craft work identified here and how it is intertwined with the other dimensions of craft skill identified here (mastery and all-roundedness).

Another key distinguishing feature of a craft perspective is the emphasis it places on distinct forms of meaning that are pursued through work and, relatedly, through the consumption of its outputs. The perspective we advance here draws attention to the different ways in which human engagement with making is valued in a world that seems increasingly “posthuman” (cf. Hayles, 1999). This resonates with recent micro-level research that has started to explore how individuals derive meaning from work when it is socially constructed as a craft (Fetzer & Pratt, 2020; Pratt, Pradies, & Lepisto, 2013). It also resonates with macro-level research on the role of craft-based authenticity in processes of social evaluation (e.g., Carroll & Swaminathan, 2000; Lehman et al., 2019). As such, it appears to us that the theory of craft we advance here can shed new light on ongoing research on these subjects as well.

To advance this perspective more generally, future research could examine craft in what could be regarded as more unexpected contexts. In the past, most research has unsurprisingly studied craft in the theoretically extreme and naturally alluring contexts of artisan manufacturing (e.g., Bell & Vachhani, 2020; Kroezen & Heugens, 2019; Ranganathan, 2018). However, our review shows how the concept of craft can also be used to understand how people approach their

work in professional settings, such as health care (Beane, 2019; Dornan & Nestel, 2013) or higher education (Baer & Shaw, 2017; Daft, 1983; Rindova, 2008). Indeed, how science is “crafted” has been recognized as an important but underappreciated issue (cf. Latour & Woolgar, 1979; Lamont, 2009). It would be interesting to explore to what extent the fine-grained, multi-faceted representation of craft we forward here can account for the dynamics of work organization in these contexts where we would naturally expect to find a more “mechanical” approach, based on procedural or scientific rationality.

**The Human-Machine Duality and Experienced Tensions in Contemporary Organizations**

Our review suggests how the fundamental tension between human and machine may manifest itself in more concrete, experienced tensions in and around contemporary organizations. Contrasts between the various configurations of craft we identified based on our review point to at least three such tensions (the past vs. the future, the imaginary vs. the ordinary, and the aesthetic vs. the utilitarian).

*The past vs. the future.* A craft perspective on work draws attention to how work practices are constructed by grappling with tensions between collectively imagined pasts and futures. Conventionally, craft has been associated with practices that are rooted in the past and a related humanist concern with the preservation of traditional skills and techniques in the face of industrialization (cf. Morris, 1892; Ruskin, 1849). Conversely, futuristic images that embrace the promise of artificial intelligence (e.g., Schwab, 2017) can engender a sense of technological determinism among organizational actors that appears to justify the erosion of craft approaches in favor of mechanization. How organizational actors deal with the human-machine duality thus importantly depends on how they experience and resolve the tension between the past and the future and balance concerns for tradition with those for innovation (cf. Blundel & Smith, 2013; Erdogan, et al., 2020; Khaire, 2014).



Our framework not only draws attention to this specific tension but also adds important nuance by moving beyond the stereotypical views of craft as the stuff of the past and machine technology as the stuff of the future. While the pure craft configuration we describe here is often fueled by nostalgia and an enchanted vision of the past that opposes constructed dystopian images of the future, the technical and creative craft configurations capture substantially different positions related to the past and the future. Here, the practices from the past are not sanctified but seen as flexible inputs that can be adapted to, blended with or even augmented by the machine technology of the future for the purposes of technical and creative innovation. Future research could explore this in more detail by using our framework to add nuance to the conventional associations between human and past, on the one side, vs. machine and future, on the other side, and considering potentially contrasting instances where mechanical approaches to work are associated with the past, and humanist approaches with imagined futures.

***The imaginary vs. the ordinary.*** Beyond the construction of pasts and futures, collective imagination also relates more fundamentally to another specific tension that is notable across the literature we reviewed: the imaginary and the ordinary. This tension could be illuminated by considering how creative and purist forms of craft, on the one hand, contrast with more technical and industrialized forms on the other hand. While, in practice, much work is relatively ordinary, mundane, and anonymous, craft affords the opportunity to make work more meaningful as we acknowledged above. In part, this appears to be because of the concept's capacity to provoke various culturally-desirable images (cf. Bell, Mangia, Taylor, & Toraldo, 2018; Suddaby et al., 2017). The contemporary configurations of craft we have described here capture different images of this sort, ranging from the romanticized past to the distinguished artist-maker that is involved in every step of the process.

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As such, while actual work practices may resemble those of an industrialized craft, the projected images of such work practices may resemble more those of a pure or creative craft to benefit from positive evaluations that follow from a desire for authenticity and human touch in making and consuming (Peterson, 1999). This phenomenon could be described as “craft washing” (Kuijpers, Popa, & Kroezen, 2019). Beverland (2005), for example, describes how wine makers often present themselves as pure craft firms, while the ordinary reality of work resembles much more that of a technical or even industrialized craft. This tension may also manifest itself in the context of job design, where ordinary work may be craft-washed to enhance job satisfaction and performance. This has historically been illustrated, for example, by the frequent mismatch between managerial rhetoric about total quality management or lean production and the reality of work (Alcadipani, Hassard, & Islam, 2018; Zbaracki, 1998) or the related struggles with management-initiated teamwork (Hodson, 2010). As management concepts are notorious for becoming fad-like and are regularly used rhetorically in ways that may actually reinforce rather than change established orders (Abrahamson, 1996; Alcadipani et al., 2018), similar dynamics should be expected for the notion of craft.

Future research on the social construction of craft imaginaries seems crucial to further examine the extent to which craft is associated with the alluring kinds of change it promises, or the causes and implications of using craft as a rhetorical device, masking more sober realities of work (cf. Bell et al., 2018; Fischer, 2019). Interestingly, the reverse dynamic also appears worthy of exploration, as concepts of “fauxtimation” (Taylor, 2018) or “math-washing” (Woods, 2016) have been used to describe the practice of hiding the ordinary craft realities of work behind the imaginaries of ‘objective’ machines.

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3       ***The aesthetic vs. the utilitarian.*** Finally, our review also indicates how the human-machine  
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5 duality may manifest itself as an experienced tension between aesthetic and utilitarian dimensions  
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7 of work that could be illuminated from a craft perspective. Our framework suggests how work  
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9 naturally is more craft-like when there is an appreciation for aesthetic qualities that tend to require  
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11 reliance on human skills and attitudes and distinctively less craft-like when there is a primary  
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13 concern for utilitarian qualities that rely on mechanical skills and attitudes. However, in practice,  
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15 any form of work, even those that resemble the contemporary craft forms that we describe, requires  
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17 ultimately some consideration for external standards of utility (Becker, 1978). The configurational  
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19 framework can be interpreted as different organizational solutions to this tension, where  
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21 industrialized craft strongly emphasizes utility over aesthetics, while creative and pure craft clearly  
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23 prioritize distinct aesthetic qualities and technical craft involves a more equal balance.  
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25 Organizational actors that grapple with this tension may encounter it in particularly salient form,  
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27 for example, when pursuing market growth for art-infused products (Patichol, Wongsurawat &  
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29 Johri, 2014; Rindova et al., 2011; Sasaki, Nummela & Ravasi, 2020). During such moments of  
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31 organizational expansion or change, the duality between human and machine is likely to become  
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33 salient as decisions may triggers shifts between the different craft configurations described here.  
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35 There is an opportunity for future research to explore these moments more deeply from a craft  
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37 perspective.  
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44       Inside organizations, this tension between aesthetics and utility can also be related to the  
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46 reproduction of valued skills and attitudes. When work becomes too art-like, it may become  
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48 exceptionally difficult to reproduce or sustain the underlying capabilities, as cases of lost skills in  
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50 violin making (Cattani et al., 2013) and painting practice teach us (Dalí & Chevalier, 1992). In  
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52 such instances, refined skills were attributed to the virtuosity of individual artisans in a manner  
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that appeared to inhibit skill transmission. Yet, when a utilitarian view of reproduction prevails and efforts are made to capture craft skills and attitudes in formal rules and procedures to facilitate “socialization” or commoditization (Adler, 2007), there is a risk of losing particular organizational capabilities or meanings that do not lend themselves to formalization. While the codification of skill for knowledge transfer has been associated with a strategic trade-off between effective growth and the risk of imitation (Zander & Kogut, 1995), from a craft perspective, there thus appears a more fundamental risk of transforming core capabilities if aesthetic forms of knowing and practicing are lost (cf. Ewenstein & Whyte, 2007). Another interesting area for future research, hence, is to explore how the various configurations of craft involve different “teaching-learning ecologies” (Bailey & Barley, 2011; Quinn & Bunderson, 2016) and how these relate to the resolution of this tension.

**Evolutionary Trajectories of Craft Decline, Persistence and Resurgence**

While there is a long tradition of research that shows the decline of craft approaches to work and organization in the wake of the industrial revolution (e.g., Braverman, 1974; Form, 1987; Wallace & Kalleberg, 1982), more recent research has highlighted trajectories of craft persistence or resurgence (e.g., Kroezen & Heugens, 2019; Ocejo, 2017; Sasaki et al., 2019). The theory we advance based on our review of such research has implications for our understanding of evolutionary processes in and around organizations.

The variety of manifestations of craft encountered in the literature suggests that the nature of craft work and the value attached to it is subject to constant change as a result of societal and technological progress (cf. Fox Miller, 2017). As the development of machines provides new and expanding affordances, craft work changes from being a necessity to becoming a choice – and, at times, a comparatively expensive one. As craft work embraces values that contrast with efficiency, however, social factors, not only technological or economic ones, determine trajectories of craft

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3 persistence, decline, or resurgence (cf. Piore & Sabel, 1984). Macro-level research has a long  
4 history of engaging with these types of questions. The framework proposed here, we argue, may  
5 advance this research by offering an opportunity to reframe long-standing debates, such as those  
6 around deskilling (e.g., Form, 1987) or technological determinism (e.g., Leonardi & Barley, 2008).  
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12 A rich tradition of research in economic sociology examined the impact of machine  
13 technologies on craft. Most of this work has appeared as a Marxist discussion around the questions  
14 of whether or not industrialization and the rationalization of production processes has had a  
15 measurable deskilling or a skill upgrading effect (e.g., Braverman, 1974; Form, 1987; Adler,  
16 2007), and to what degree technological advancements were captured by the capitalist class in  
17 order to control the craft worker. Our framework offers an alternative perspective on this issue, as  
18 it highlights how craft may acquire different forms and meanings as society progresses and the  
19 tension between human and machine evolves. With the issue of skill remaining an important topic  
20 in the age of AI, we believe it may be prudent to reignite this research and explore to what extent  
21 the craft perspective we develop here can guide new insights.  
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36 Our review suggests that the value placed on craft in society is not shaped exclusively by  
37 industrial revolutions and technological innovations, but by other social forces, reflecting the  
38 pursuit of glocalization (e.g., DeSoucey, 2010; Fischer, 2019), environmental sustainability (e.g.  
39 Sikavica & Pozner, 2013; Voronov, De Clercq, & Hinings, 2013; Weber et al., 2008), individual  
40 expression (e.g. Rao et al., 2003; Kuhn & Galloway, 2015), social equality (Haydu, 2002; Moore  
41 & Beadle, 2006) and historical re-enchantment (Beverland, 2005; Suddaby et al., 2017). Such  
42 forces seem to be pulling work organizations more toward creative or pure craft configurations in  
43 contrast to the industrialized or even technical craft configurations that are often implicitly treated  
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as the most “advanced” form of making by accounts that rely to a greater degree on technological determinism (e.g., Bodrožić & Adler, 2018).

The COVID-19 pandemic has also highlighted the societal value of craft during times of disruption and social upheaval. Engaging in forms of craft work appears to be therapeutic when coping with hardship, such as is perhaps illustrated by the sudden popularity of baking homemade bread during lockdown (Oppenheimer, 2020). At the same time, it also appears to provide concrete economic value, such as affording resiliency in the supply of facemasks during peak demand (Lee, 2020) or the creative, localized production of emergency ventilators (OperationAIR, 2020). Turning to craft – in the making of goods for self-sufficiency or collective benefits – helped people address the disruption of industrial production and global supply chains, and the existential anxiety caused by lockdowns and isolation.

As the value and form of craft may thus evolve with industrial and societal advancement and take different forms in response to various movements, it may be hard to capture by consistent quantitative measures. As the Fourth Industrial Revolution provides greater affordances to replace, augment or liberate the role of humans in production (cf. Browder et al., 2019; Fitzmaurice et al., 2020; Murray et al., 2020; Raisch & Krakowski, 2020), and advanced societies are simultaneously becoming increasingly concerned with providing meaning to work life (Suddaby et al., 2017), how configurations of craft will evolve, and whether new configurations will appear – possibly in relations to health crises, social inequality, and environmental sustainability – becomes an important question for future research.

We also see an opportunity for our framework to enhance evolutionary models of organization and organizational fields. Research has often depicted craft as an elementary form of technology and organization that is indicative of the early stages of evolution with natural forces

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3 ultimately leading to rationalization or industrialization of craft. For example, Adler (2015) uses  
4 such a lifecycle model to describe the evolution of the software industry. During its infancy, the  
5 field functioned like a craft, dependent on software developers who mastered the craft of coding,  
6 relying largely on tacit expertise; later stages of rationalization, however, appeared to tame the  
7 chaos and particularism of prior stages and afforded “the collective worker” much greater  
8 capabilities (Adler, 2015). Analyzing this case through the lens of our framework, however,  
9 suggests that craft does not necessarily disappear as fields develop. Instead, fields may experience  
10 a transition from one configuration to another, as, for example, initial emphasis on creative craft  
11 may shift toward a more technical or industrialized configuration, possibly to give way, as industry  
12 enters a late stage of development, to manifestations closer to pure craft.  
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26 Indeed, in this industry, we can see a craft resurgence, in response to the practices of the  
27 mainstream software industry, in the Agile Manifesto that cherishes an approach that prioritizes  
28 “individuals and interactions over processes and tools” and challenges the assumptions underlying  
29 the “scientific” and “engineering” approaches of the mainstream industry (Beck et al., 2001;  
30 McBreen, 2002; Martin, 2009). This movement explicitly draws an analogy between modern  
31 software development and the guild craft of Medieval Europe. This example points to a different  
32 role of craft in evolutionary models of organizations and organizational fields, showing that craft  
33 may be more common in these cycles than is often acknowledged. It also exposes distinct types of  
34 tensions that add more nuance to established categories used in common models such as those of  
35 generalist vs. specialist strategies (Carroll & Swaminathan, 2000) or rational vs. normative  
36 ideologies (Barley & Kunda, 1992). Rather than associating craft with niche strategies in  
37 industrialized fields or normative corrections to technology determining the evolution of forms of  
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work organization, our framework shows how craft, in its various forms, plays a more fundamental part in models of evolution.

Among new organizations and organizational fields, we may indeed see an initial prevalence of a particular type of craft configuration, but once they evolve, we are likely to observe varied patterns of craft decline, persistence and resurgence. Akin to s-curve models of innovation, craft may in fact, evolve in tandem with mechanical approaches to work. Recent studies of contemporary forms of craft suggest that craft is associated with value creation that is then captured through increasing mechanical approaches until there is a wider need for new sources of value (cf. Raffaelli, 2019). Where mechanical forms of work organization are associated with the maximization of exchange value through efficiency and satisfying extrinsic demands, craft forms of work organization are associated with the maximization of use-value through embracing more intrinsic values of technical excellence, nostalgic purity and creative stimulation. However, more macro-level research is needed to better understand the configurations and trajectories of craft across organizations and organizational fields. For example, how can our framework illuminate the different trajectories that work organization follows after the introduction of artificial intelligence (cf. Glaser, 2017; Waardenburg, Sergeeva, & Huysman, 2018)? How will emerging tensions ultimately be settled in cases where traditional craft skills and those possessing them may now be replaced by mechanical processes? Will settlements naturally resemble one of the configurations described here or is there an alternative? How are the concept of craft and its various forms described here harnessed to fuel resistance or support for algorithmically mediated work?

Most of these questions have received little attention in contemporary macro-level research as it has long neglected the role of craft in modern society and instead painted a picture of increasing rationalization. However, scholars have recently started to become attuned to processes



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3 of craft reemergence and re-enchantment (e.g., Bell et al., 2018; Kroezen & Heugens, 2018; Ocejó,  
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5 2017; Suddaby et al., 2017). Moreover, the turn to work, practice and now personhood in  
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7 institutional theory is allowing us to better see the “humanity of institutions” and providing the  
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9 ontological and epistemological toolkit to observe configurations and trajectories of craft anew  
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11 (Voronov & Weber, 2020).  
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## 14 15 **CONCLUSION**

16 In this review, we have strived to integrate the rich but highly fragmented literature on craft in  
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18 organization and management theory. The conceptual apparatus we have proposed synthesizes a  
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20 vast body of work that touched upon craft, in sociology and organization studies, in a way that a)  
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22 encourages a more explicit theoretical recognition of craft as a humanist and timeless approach to  
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24 work and its organization, (b) brings together a fragmented research landscape, tracing connections  
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26 and highlighting differences and similarities among prior studies, and (c) inspires cross-  
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28 fertilization across different theoretical domains.  
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32 More research is needed to advance this new perspective on craft to improve our  
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34 understanding of how actors grapple with the evolving tensions between human and machine in  
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36 the age of artificial intelligence. Somewhat counterintuitively, craft, as a humanist approach to  
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38 work, appears increasingly relevant to any form of work in this context. We encourage future  
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40 research to explore more deeply the implications of our framework for our understanding of skill  
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42 development, use and transfer, as well as the construction of meaning in and around work. Future  
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44 research may also consider how craft can be part of novel approaches to tackle grand challenges  
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46 related to climate change and social inequality but should also attend to the potentially more  
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48 problematic impact of the growing allure of craft imaginaries in society, such as in cases of craft-  
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50 washing.  
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Figure 1.  
Yearly Number of Published Articles in Premier Journals in Management and Organization Theory Featuring Craft (1900-2019)

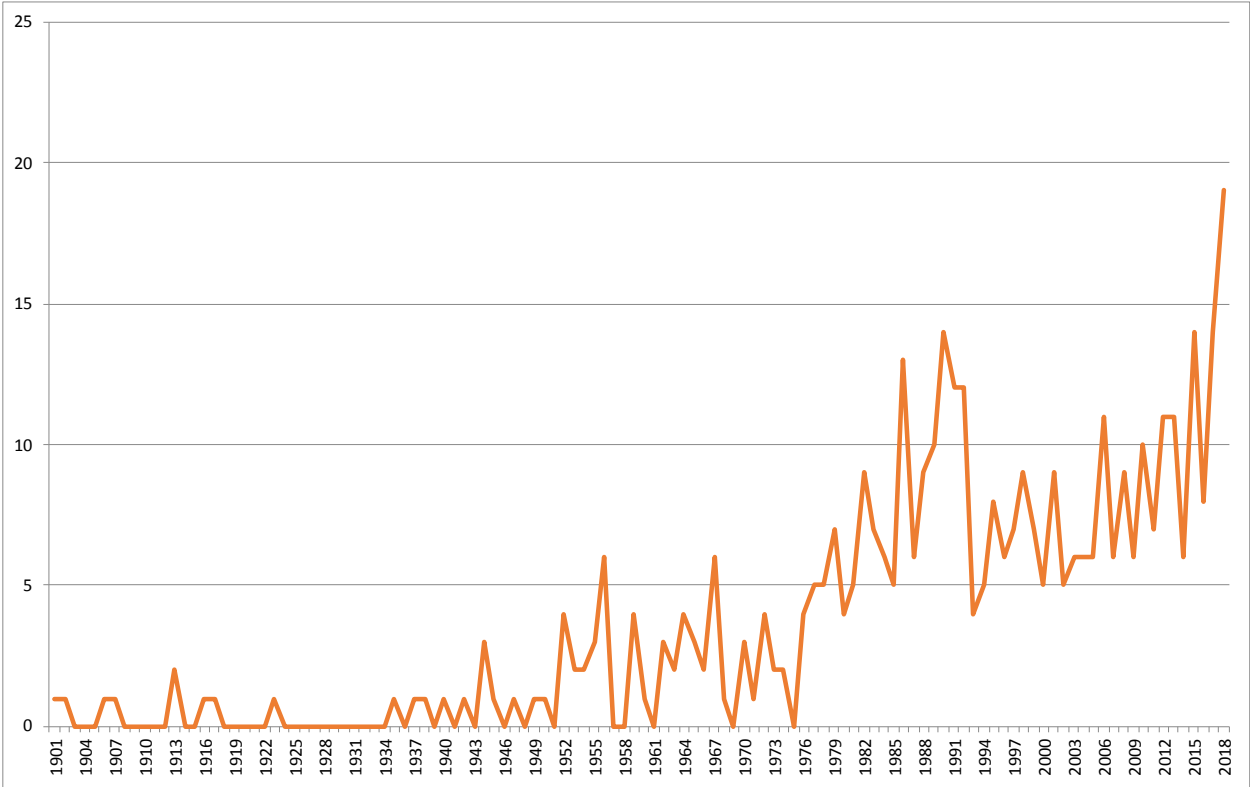
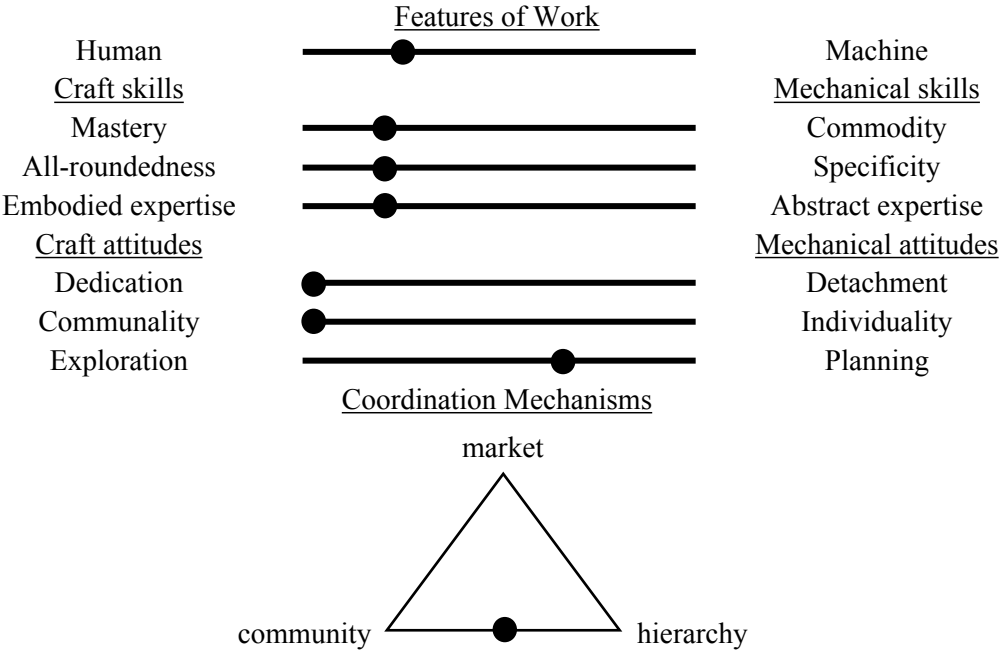


Figure 2: The Traditional Craft Work Configuration



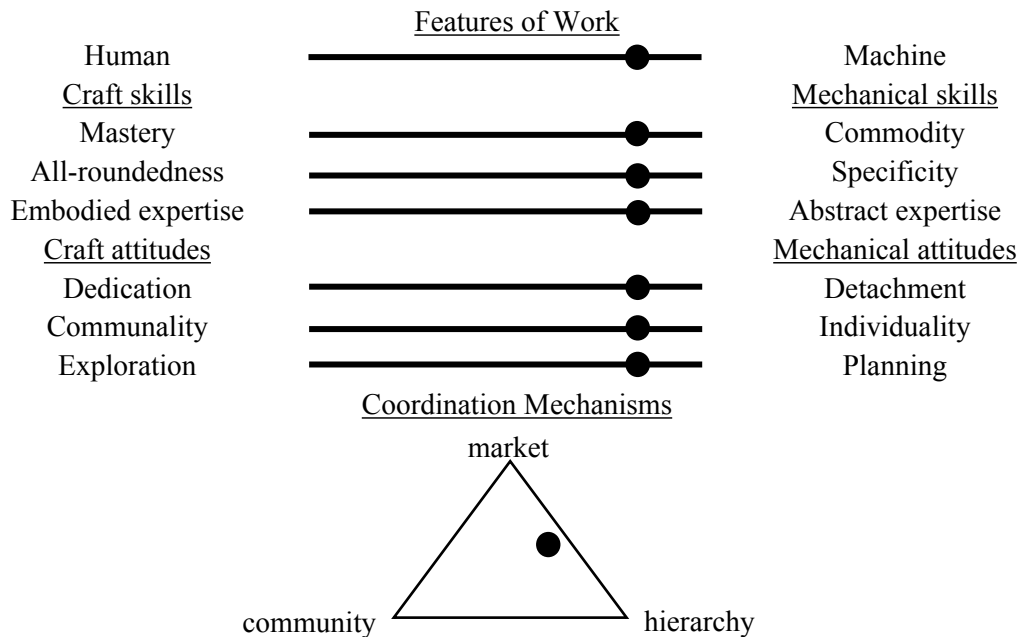
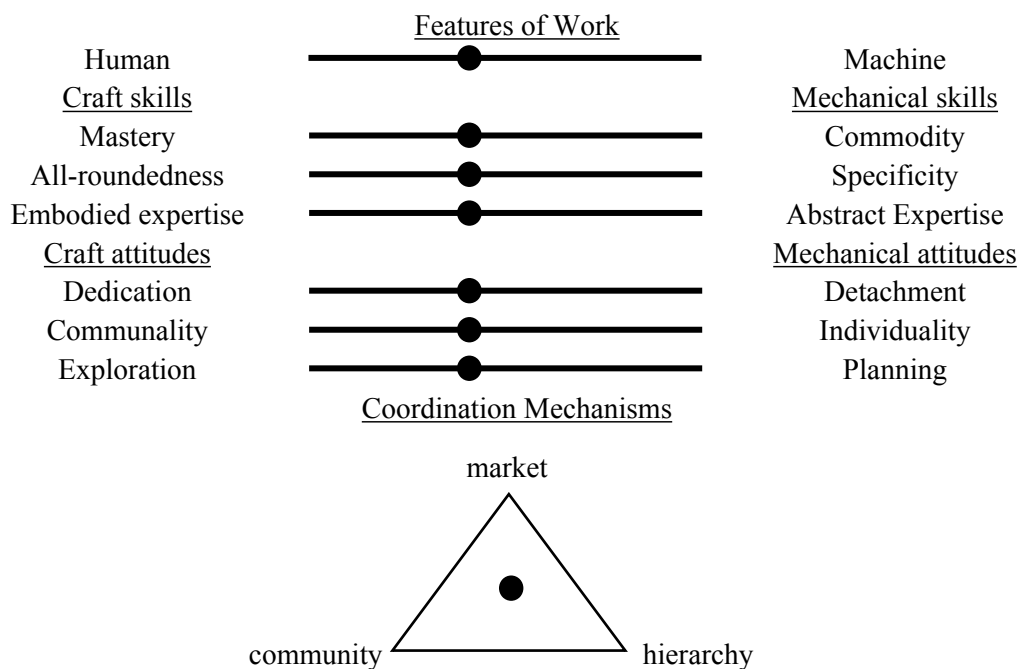
**Figure 3: The Industrialized Craft Work Configuration****Figure 4: The Technical Craft Work Configuration**

Figure 5: The Pure Craft Work Configuration

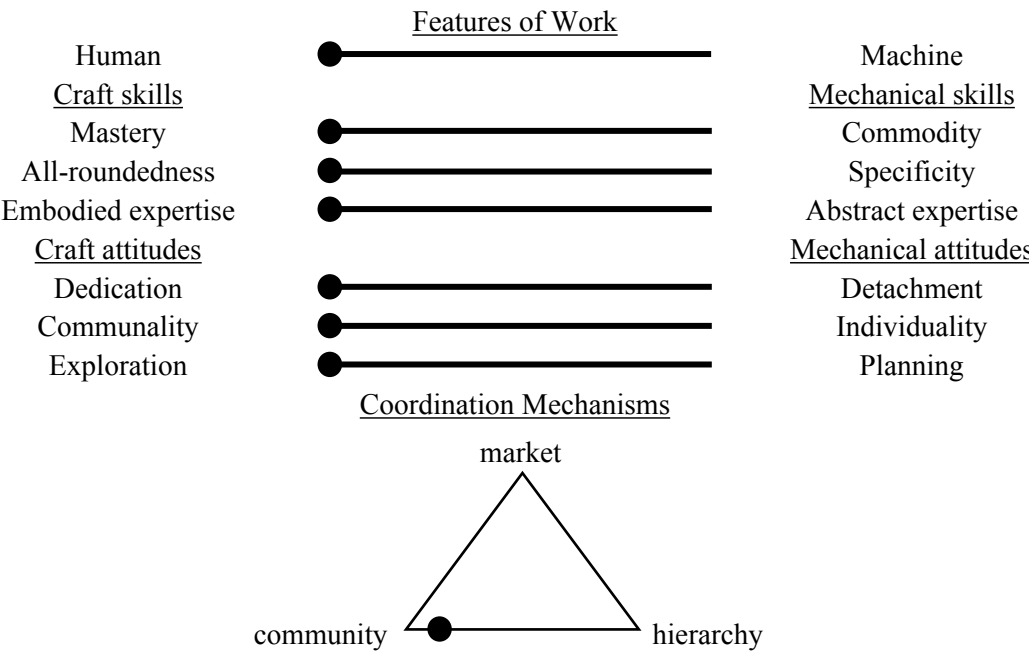
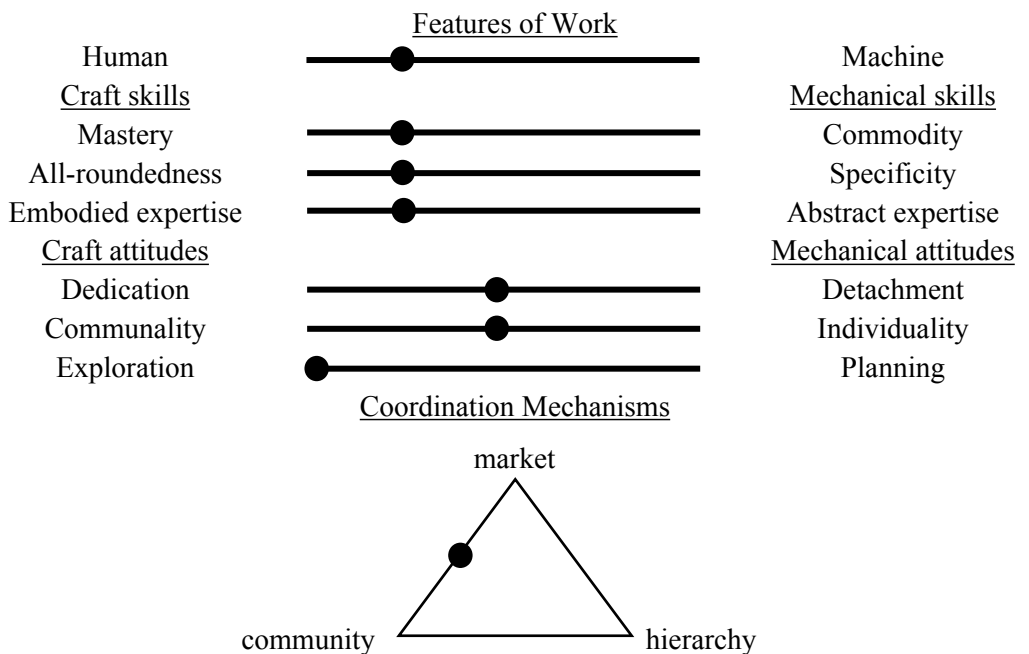


Figure 6: The Creative Craft Work Configuration





**Table 1: Number of Published Articles in which Craft has Featured per Premier Organization and Management Outlet (1900-2020)**

Outlet	Nr. of Articles
American Journal of Sociology (AJS)	84
Organization Studies	75
American Sociological Review (ASR)	74
Administrative Science Quarterly (ASQ)	31
Journal of Management Studies (JMS)	28
Academy of Management Journal (AMJ)	27
Organization Science	27
Strategic Management Journal (SMJ)	25
Entrepreneurship: Theory & Practice (ETP)	15
Academy of Management Review (AMR)	13
Annual Review of Sociology (ARS)	10
Journal of Business Venturing (JBV)	9
Management Science	9
European Sociological Review (ESR)	8
Journal of Management (JoM)	8
Socio-Economic Review (SER)	8
Strategic Entrepreneurship Journal (SEJ)	2
<b>TOTAL</b>	<b>453</b>

**Table 2: Craft Work vs. Mechanical Work**

	Craft Work	Mechanical Work
<b>Approach to making</b>	Human engagement with the material aspects of making is extensive, direct and real-time as the work process is relatively unstructured and underdetermined; individual judgments are key in the search for aesthetic quality.	Human engagement is significantly mediated or replaced by mechanization and/or algorithmic control as the work process is highly structured and overdetermined; standardization is key in the search for efficiency and consistency.
<b>Skills</b>	<p><u>Mastery</u></p> <p>Reliance on polished, refined, and difficult to obtain technical skills.</p> <p><u>All-roundedness</u></p> <p>Reliance on possession of a range of techniques within a defined trade to achieve holistic understanding of the making process.</p> <p><u>Embodied expertise</u></p> <p>Valued skills are based on bodily and aesthetic ways of knowing that are inherently tacit.</p>	<p><u>Commodity</u></p> <p>Reliance on widely available, relatively undifferentiated, and easy to obtain technical skills.</p> <p><u>Specificity</u></p> <p>Reliance on narrow, task-specialized skills to support extreme division of labor.</p> <p><u>Abstract expertise</u></p> <p>Valued skills are based on formal and intellectual ways of knowing that are inherently codifiable.</p>
<b>Attitudes</b>	<p><u>Dedication</u></p> <p>Profound and personal commitment to one's work; efforts are independent of expected economic rewards.</p> <p><u>Communality</u></p> <p>Assumption of inter-dependent interests; occupational identity and felt connection to other workers in the trade is salient to personal identity and fosters social interactions.</p> <p><u>Exploration</u></p> <p>Openness to experimentation, improvisation and real-time variation, supported by experiential learning.</p>	<p><u>Detachment</u></p> <p>Dispassionate and utilitarian involvement with one's work; efforts are commensurate to expected economic rewards.</p> <p><u>Individuality</u></p> <p>Assumption of independent interests; absence of occupational identity and lack of felt connection to other workers in the trade leads to fragmentation of identity and social isolation.</p> <p><u>Planning</u></p> <p>Pursuit of structure and uncertainty reduction through careful programming of activities, supported by evidence-based learning.</p>

Table 3: Traditional and Industrialized Craft Work Configurations

	Traditional Craft	Industrialized Craft
Meaning of Craft	A pre-industrial approach to making	A human skill that can be captured and controlled
Human vs. Machine	Primitive form of making, based on direct human engagement and relying on manual skills and relatively simple tools; pre-dating reliance on machines for making purposes.	Pockets of human engagement in a system that otherwise relies extensively on machines to increase efficiency; limited to fringe activities that cannot be mechanized or automated.
Skills (mastery, all-roundedness, embodied expertise)	Superior dexterity, mastery of broad range of techniques, and embodied expertise are essential to the making process and define social position. At least some degree of formalization to ensure functional quality and facilitate skill transfer.	Decomposition of craft skills in the service of industrialized production; mastery circumscribed to specialized techniques requiring embodied expertise that cannot be replicated by a machine.
Attitudes (dedication, communality, exploration)	Expectation of profound devotion to one’s trade and respect of communal norms and ethos and common interests; social identity defined by trade; adherence to conventions typically more important than experimental variation for the refinement of skills and techniques.	Subordination of craft work to industrialized, mechanized production processes dilutes dedication and restricts opportunities for variation; possible vestigial pride in the possession of rare skills that distinguish craftspeople from deskilled, despecialized workers, and commitment to their maintenance.
Configuration of coordination mechanisms	Coordination achieved through a combination of hierarchy and community, regulating the transfer and the practice of skills through master-apprenticeship systems and/or <i>gemeinschaft</i> communities attached to place and family.	Coordination achieved within a broader context characterized by rationalization of work processes, market-based incentives, and bureaucratic control.
Market	Low – market-buffering institutions (e.g. guilds) protect the integrity and economic value of craft skills, by regulating competition and exchanges.	High – incentive system based on labour market conditions and individual performance metrics.
Hierarchy	High – strict, personal and normative hierarchies shape vertical (master-apprentice) and horizontal (among peers, e.g. guilds) relationships among craftspeople.	High – bureaucratic (formal and rational) control system that subjects the execution of tasks to hierarchical oversight.
Community	High – exchanges framed by interpersonal bonds (master-apprentice, guilds, households) characterized by web of loyalties and obligations that underpin mutual trust.	Low – limited opportunities for trust-based interactions; lack of collective action structures
Examples	Medieval guilds of Europe (Kieser, 1989) Domestic production systems of pre-war Japan (Sasaki et al., 2019) or pre-industrial US (Ruef, 2020) Visual art academies of Italy (Wijnberg & Gemser, 2000) U.S. construction (Stinchcombe, 1959) Deep sea fishery (Hodson, 1996) Structural engineering (Bailey & Barley, 2011)	U.S. printing (Wallace & Kalleberg, 1982) U.S. iron and steel (Conell & Voss, 1990) British and French manufacturing (Maurice, Sorge, & Warner, 1980; Sorge, 1991; Wrigley, 1982) Railway industry of Britan (Streeck et al., 1981) French aeronautic plant (Anteby, 2008) U.S. apparel industry (Doeringer & Crean, 2006)

**Table 4: Technical, Pure and Creative Craft Work Configurations**

	Technical Craft	Pure Craft	Creative Craft
<b>Meaning of Craft</b>	Technical excellence in making	Anti-industrial purity in making	Creative stimulation through making
<b>Human vs. Machine</b>	Mechanization used as a tool to augment human senses, skills and capacity while humans remain continuously engaged in design, and refinement of aspects of making to achieve a technical form of perfection.	Human touch is consecrated and technology is rejected to achieve a socially constructed form of purity that is anti-industrial in nature.	Human engagement is prioritized to liberate human creativity and ingenuity for intrinsic stimulation and fulfilment; mechanization is used where it can facilitate unique creative expressions.
<b>Skills (mastery, all-roundedness, embodied expertise)</b>	Mastery defined by intimate knowledge of flexible, advanced mechanized tools, and awareness of the potentialities they offer, that is balanced with the commoditization, specification and codification of skills through use of formal qualifications, manuals and technical specialization.	Idealized emphasis on purely human skills that require extreme mastery, all-roundedness and embodied expertise. Often manifested as the tacit and tactile ability to apply historic manual making techniques that are embodied in heritage artefacts.	Mastery defined by aesthetic prowess (not necessarily confined to visual); possible trade-off between acquiring a broad skill-base and refining a unique style.
<b>Attitudes (dedication, communality, exploration)</b>	Dedication to a trade and context is balanced by pursuit of career advancement through mobility based on formal qualifications; communality within narrow technical expert groups but tension and competition with other experts; reliance on direct and vicarious experiential learning within a formally prescribed domain.	Driven by a passionate commitment to preserve, construct or revive a romanticized form of purity in making; identification with anti-industrial movements and/or cross-temporal collectives of craftspeople; high degree of exploration needed to (re)construct pure making skills often through rediscovery and reimagination of forgotten techniques from the past.	Driven and powered (also) by intellectual curiosity and stimulation; playful exploration and experimentation to develop distinctive style; identification and intense interaction with community of creatives.
<b>Configuration of coordination mechanisms</b>	Coordination achieved through semi-formal technical communities, characterized by status hierarchies based on expertise.	Coordination occurs through norms, interpretations, and collective imaginaries within anti-industrial communities that claim custodianship of pure techniques.	Coordination through “friendly” markets and supportive, informal, non-hierarchical creative communities (hobby clubs, online fora, creative huddles, maker spaces)
<b>Market</b>	Moderate – focus on niches, flexibility and customization lowers market pressures for efficiency and places market value on superior skills.	Low – considerations for demand and competition are secondary to the aim of protecting pure skills and associated meanings.	Moderate – individual identification with aesthetic valuation of outcome may lead to friendly competitive structures (“beauty contests”); opportunities to monetize one’s craft may induce market-based, competitive behaviour among the most skilled.
<b>Hierarchy</b>	Moderate – task coordination through participative management and semi-autonomous work groups.	Moderate – authoritative positions in the community may be claimed by (and conferred to) those that are most versed in	Low – largely practiced individually; if execution requires support activities (i.e. fine dining), tasks may be organized hierarchically, based on skills and creative

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		pure skills especially when those build on a constructed sense of heritage.	vision; informal hierarchies in creative communities based on advice and feedback giving.
<b>Community</b>	Moderate – professional forms of collaborative, partly inter-organizational community protect and refine craft skills.	High – craft skills are acquired and deployed within anti-industrial social movements and/or attached to long-standing and partly reinvented traditions, typically maintained by geographically concentrated communities.	Moderate – craftspeople’s capacity for individual expression is augmented by participation in informal communities though advice, feedback, inspiration, and knowledge-sharing.
<b>Examples</b>	“Flexible specialization” in German and Japanese manufacturing (Maurice, Sorge, & Warner, 1980; Sorge, 1991; Kotha, 1995) Swiss watchmaking (Raffaelli, 2019) Autonomous work groups at Pilkingtons, Rank Xerox and Ford UK (McKinlay & Starkey, 1988) Blue-collar workers with machine programming responsibilities in US manufacturing (Kelley, 1990; Vallas, 2006)	Organic food production (Weber et al., 2008) Franconian beer brewing (Cruz et al., 2018) Italian grappa making (Delmestri & Greenwood, 2016) Italian Barolo/Barbaresco winemaking (Negro et al., 2011) Japanese <i>shinise</i> (Sasaki et al., 2019) Hand-decorated pottery (Bell & Vachhani, 2020)	Amateur radio broadcasting (Croidieu & Kim, 2018) Handicraft artisans on etsy.com (Kuhn & Galloway, 2015) French cuisine (Rao et al. 2003) Professional cooks in US (Fine, 1992) Craft brewing (Kroezen & Heugens, 2019; Mathias et al., 2018) Newspaper journalism (Quinn & Bunderson, 2016)