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THE ADOPTION AND ROUTINIZATION OF DIGITAL PROCUREMENT IN THE GERMAN CONSTRUCTION INDUSTRY — AN EMPIRICAL STUDY

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Abstract:

In this study, we examine factors associated with the adoption and routinization of digital procurement in the German construction industry, building upon the technology-organization-environment framework. Analyzing survey data from 255 construction craftsmen, we conduct a logit and linear regression. We find that technological contextual factors and owner age are significantly associated with digital procurement adoption, while pressures to imitate successful competitors are associated with both adoption and routinization. This study contributes to existing research because it applies and validates an empirical framework to an industry that has not widely adopted and routinized electronic business practices, contrasting with other industries. Accordingly, this study provides researchers and practitioners with new insights to advance digital technologies in the construction industry in particular and small businesses in general.

Keywords: Electronic Procurement, Digital Sales, Adoption Factors, Survey

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1 Introduction

Economic lockdowns and the subsequent closing of non-essential stores due to the Covid-19 pandemic led to a boom in online purchasing among private households and businesses (McKinsey & Company, 2020b; The Wall Street Journal, 2020). Online business-to-business sales had been increasing since before the pandemic (Forrester Research, 2019), and similar to other trends accelerated by Covid-19, are growing at an even faster rate now (McKinsey & Company, 2020b). Interestingly, however, some industries and geographies have been laggards in adopting online purchasing. Businesses in the construction industry globally, and in Germany in particular, have been slow to digitalize their processes and overall activities, despite the measurable benefits (Deutsche Telekom, 2019a; McKinsey Global Institute, 2017). Small construction companies and individual craftsmen¹ rarely purchase the materials they process online (Statista, 2016, 2018). Prior empirical works investigate factors associated with the adoption and routinization of electronic business activities, such as digital procurement, in many different geographic regions and industries. The construction industry has not been the focus of any previous study. Therefore, understanding the relevant factors associated with digital procurement adoption and routinization for one of the least digitalized industries adds new knowledge to this observed puzzle.

There are approximately 235,000 construction craftsmanship firms in Germany, comprising the main construction craftsmanship such as bricklayers, roofers or scaffolders, and the finishing construction craftsmanship, such as painters, plumbers, electricians, and plasterers (Federal Statistical Office of Germany, 2017). In our study, only 69% of these firms state that they regularly purchase materials online even though

¹ Construction companies and construction craftsmen are also referred to as subcontractors or individual tradesmen. For consistency, we will continuously use the term construction craftsmen to describe applicators of building materials in this essay. Furthermore, we use the term "craftsman" in a gender-neutral and inclusive sense, describing male, female, and diverse craftspeople.

it can automate and streamline processes that are otherwise very manual and labor-intensive (Teo et al., 2009). Purchasing online, also called electronic or digital procurement, is one of many electronic business activities. It describes the process of procuring electronically by using online facilities to search and compare products or issue purchases, for example, in an online shop or through electronic data interchange (Hsiao & Teo, 2005; Teo et al., 2009).

Prior works often ground their empirical investigation of factors associated with adoption and routinization in innovation diffusion theory, primarily the technology-organization-environment framework (Sila, 2015). When analyzing contextual factors concerning technology, organization, and environment (Tornatzky & Fleischer, 1990), researchers find that technological factors especially, such as the IT endowment with equipment and IT expertise, are strongly and positively associated with the use of electronic procurement (Chang & Wong, 2010; Li, 2008; Soares-Aguiar & Palma-dos-Reis, 2008). Firm size as an organizational contextual factor is also often positively associated with the adoption of procuring digitally (Soares-Aguiar & Palma-dos-Reis, 2008; Teo et al., 2009). Environmental factors are oftentimes classified as isomorphic pressures following institutional theory (DiMaggio & Powell, 1983). Mimetic pressures to imitate competitors, coercive pressures to comply with laws or adhere to demands by business partners, and normative pressures to follow values are also repeatedly found to be associated with the adoption of electronic procurement (Li, 2008; Soares-Aguiar & Palma-dos-Reis, 2008; Teo et al., 2009; Wu, Mahajan, & Balasubramanian, 2003).

In the abundance of research on electronic business adoption in general (see **Error! Reference source not found.** for an overview), two gaps remain. First, only a few studies focus on routinization, in addition to adoption, of electronic commerce practices in general (Oliveira & Dhillon, 2015; Zhu, Kraemer, & Xu, 2006). To our knowledge, no studies look at the routinization of electronic procurement specifically. Second, few studies on adoption factors of electronic business practices take a closer look at small businesses (Kuan & Chau, 2001; Oliveira & Dhillon, 2015) or more

specifically, at construction craftsmen. The presented study helps to fill this gap and provides practitioners with valuable insights to improve understanding of adoption and routinization and to refine strategies to encourage digital procurement activities.

In this study, we ask what factors are associated with the adoption and routinization of digital procurement in the German construction craftsmanship industry. Our approach follows prior investigations that build upon the technology-organization-environment framework to form hypotheses and develop the conceptual model (Tornatzky & Fleischer, 1990). While other studies look at specific geographic regions, e.g., the U.S. (Hsu et al., 2006) or Singapore (Teo et al., 2009) or use cross-country and cross-industry samples (Oliveira & Dhillon, 2015), we focus and deep dive into a specific industry in one country. Moreover, we follow more recent approaches differentiating between initial adoption and continued routinization (Oliveira & Dhillon, 2015; Teo et al., 2009; Zhu, Kraemer, et al., 2006).

We analyze a dataset collected through an online survey among German construction companies and craftsmen, which we randomly contacted across various craftsmanship skills and geographic areas within Germany. Our dataset covers 255 valid answers, which we include in two empirical models. The first model, a logit regression, analyzes factors associated with digital procurement adoption, i.e., whether firms have used a digital channel at some point during the last five years. The second model, a linear regression, analyzes factors associated with digital procurement routinization, i.e., the share of digital orders as a percentage of total orders in an average month during the previous year.

We find that 26% of surveyed construction companies and craftsmen have not used a digital procurement channel during the last five years. We observe that routinized users order via all digital channels, namely manufacturer online shops, third-party online shops, and electronic data interchanges, more extensively. Furthermore, our analyses reveal that both adoption and routinization of digital procurement are positively associated with mimetic pressures, that is, observing successful competitors

using digital channels. IT infrastructure and IT competencies are positively associated with the initial adoption of digital procurement, while the founder's age is negatively associated with the initial adoption of digital procurement. Factors related to routinization include planning and demand uncertainty, coercive pressures by trading partners, supplier dependency, and switching costs to change suppliers.

This research makes contributions to both research and practice. For research, we take a closer look at the puzzle of the limited use of digital technologies in the construction industry, previously not researched in much detail. Moreover, we include not only the initial adoption, but also the routinization in our analysis and identify a different set of factors that are associated with adoption and with routinization (Hsu et al., 2006; Oliveira & Dhillon, 2015; Teo et al., 2009). Finally, we focus on small firms with an average of fewer than 20 employees, adding to prior works in this direction (Kuan & Chau, 2001; Oliveira & Dhillon, 2015). For practitioners and policy-makers, our study provides insights into what encourages and increases the use of electronic procurement among construction companies and craftsmen, such as the design of online shops or the targeting of subsidies.

This paper is structured as follows: In chapter 2, we provide a clear definition of electronic business, electronic commerce, and electronic procurement activities before reviewing the literature on factors associated with adoption and routinization. Chapter 3 introduces our proposed research model and hypotheses. In chapter 4, we present our empirical study, explaining the data collection and survey design, introducing the measures, and outlining the validity assessment and factor analysis. Chapter 5 reports the descriptive statistics and results of our empirical analyses. In chapter 6, we discuss our findings and conclusions.

2 Literature Review

2.1 Digital Procurement as a Form of Electronic Business

Digital or electronic procurement, and more broadly, electronic commerce, i.e., buying and selling, are forms of electronic business. Electronic business describes any business task and value chain activity between different parties that use digital technologies, such as procurement, sales, service, information sharing, or coordination (Wirtz, 2013; Zhu, Kraemer, et al., 2006). Researchers agree that electronic business is no longer only implemented by large and medium-sized firms, which have advantages of scale, but increasingly also by small firms, which tend to be more flexible (Soares-Aguiar & Palma-dos-Reis, 2008; Zhu, Dong, Xu, & Kraemer, 2006; Zhu, Kraemer, & Xu, 2003). Electronic commerce, as a part of electronic business, describes the transactions of goods and services, where the initiation, the purchase itself, and the handling are fully or partially conducted over the internet with the support of information and communication technologies (Deges, 2020; Fritz, 2004). Various closed technologies in the context of electronic commerce between businesses, such as electronic data interchange, digital funds transfer, vendor-managed-inventory, and continuous replenishment opportunities, have been developed and deployed (Kurnia, Karnali, & Rahim, 2015). Similarly, open, web-based alternatives like online and mobile shops have become pervasive for businesses. In summary, therefore, electronic commerce includes both selling and procuring through the internet.

In this study, we focus on the procurement part of electronic commerce between businesses, analyzing factors associated with the adoption and routinization of purchasing materials online. Following the definition employed by Hsiao & Teo (2005) and Teo, Lin, & Lai (2009), procuring electronically means using online facilities for purchasing and associated activities, e.g., searching for products and comparing prices. Additionally, electronic procurement helps businesses by "streamlining and automating the labor-intensive procurement routines" in organizations (Teo et al., 2009: 973). Therefore, our definition assigns ordering via social media messaging services to a

traditional procurement option, as it currently does not streamline procurement routines. Table 1 summarizes the traditional and digital options of procurement as defined for this study.

Table 1: Traditional and digital options of procurement in the German construction industry

Traditional procurement activities	Electronic procurement activities
<ul style="list-style-type: none"> ▪ Retail or wholesale shop ▪ Mail ▪ Telephone ▪ Personal order from a sales representative ▪ Fax ▪ Email ▪ WhatsApp & other social media 	<ul style="list-style-type: none"> ▪ Closed, digital interface ▪ Open webshop ▪ Third-party online shop or sales platform ▪ Mobile shop or application

2.1.1 Different Theoretical Lenses to Explain Electronic Business Use

Researchers ground their works on adoption factors of electronic business technologies in different theoretical streams (Sila, 2015; Son & Benbasat, 2007). Most common are transaction cost theory and institutional theory (DiMaggio & Powell, 1983; Son & Benbasat, 2007), the diffusion of innovation (Rogers, 2003), the model of organizational readiness, perceived benefits, and external pressure (Iacovou et al., 1995), and frameworks like the technology-organization-environment framework², which build upon Roger's diffusion of innovation theory originally published in 1962 (Tornatzky & Fleischer, 1990). Most frequently, researchers use the lens of innovation diffusion theory and associated frameworks like the technology-organization-environment framework and institutional theory (Sila, 2015). Methodologically, when analyzing adoption factors of business-to-business electronic commerce in empirical works, research is often based on cross-sectional survey data collected in specific industries or countries.

² The technology-organization-environment framework is sometimes abbreviated to TOE framework.

Following prior empirical works, we build our study on the technology-organization-environment framework, which is widely applied and tested owing to its solid theoretical foundation and consistent empirical validity (Gibbs & Kraemer, 2004; Hsu et al., 2006; Oliveira & Martins, 2010; Teo, Ranganathan, & Dhaliwal, 2006). The framework identifies three aspects of an organization's context that determine the adoption of technology and innovation: the technological, organizational, and environmental context (Tornatzky & Fleischer, 1990). Often, studies combine the technology-organization-environment framework with institutional theory by classifying the environmental context into three types of legitimacy-oriented, institutional pressures: coercive, mimetic, normative (DiMaggio & Powell, 1983). Coercive pressures are exerted formally or informally by other organizations; mimetic pressures lead to companies imitating successful competitors; normative pressures are built by encompassing norms and values (DiMaggio & Powell, 1983). We follow this approach of combining the technology-organization-environment framework's environmental context with institutional pressures. The same approach has been used in prior research to investigate the adoption of both electronic procurement (Li, 2008; Soares-Aguiar & Palma-dos-Reis, 2008) and electronic commerce in general (Gibbs & Kraemer, 2004) and is illustrated in our conceptual model outlined in section 3.1.

2.1.2 Technological, Organizational, and Environmental Factors

According to the technology-organization-environment framework developed by Tornatzky & Fleischer (1990), three aspects of an organization's context influence the decision to adopt and routinely use a new technology initially. The technological context of a firm describes the relevant new technology and its characteristics, but also existing resources like the IT infrastructure and adequate capabilities (Soares-Aguiar & Palma-dos-Reis, 2008; Teo et al., 2009, 2006; Tornatzky & Fleischer, 1990; Zhu et al., 2003). Firm-specific characteristics like its size and scope, its management team's composition, and cultural traits constitute the organizational context (Hsu et al., 2006; Teo et al., 2009, 2006; Tornatzky & Fleischer, 1990). The environmental context

consists of a firm's industry and market, including the level of competition, technological support infrastructure, demand uncertainty, and legal regulations (Hsu et al., 2006; Teo et al., 2009; Tornatzky & Fleischer, 1990).

Prior studies find ample evidence highlighting the importance of technological factors related to the adoption and routinization of electronic commerce activities. The most researched aspects of technology resources are IT infrastructure, technological competencies, and the number of IT employees (Gibbs & Kraemer, 2004; Hsu et al., 2006; Oliveira & Dhillon, 2015; Teo et al., 2006; Zhu, Dong, et al., 2006; Zhu & Kraemer, 2005). These are sometimes referred to as "technology readiness" (Oliveira & Dhillon, 2015; Zhu, Kraemer, et al., 2006). Many researchers show that an insufficient IT infrastructure inhibits the adoption of electronic business technologies in general and electronic commerce and procurement technologies in particular (Hsu et al., 2006; Li, 2008; Soares-Aguiar & Palma-dos-Reis, 2008; Teo et al., 2006; Zhu et al., 2003). The adoption and usage of electronic business technologies increase when a firm expands its technology infrastructure (Zhu, Dong, et al., 2006; Zhu & Kraemer, 2005). With rising complexity and limited compatibility with existing systems, electronic procurement adoption tends to decrease (Li, 2008) while it increases with improved integration into different systems (Zhu, Kraemer, et al., 2006).

A firm's technological competence, i.e., adequate knowledge, expertise, and capabilities among employees, is similarly vital for the adoption and regular usage of electronic commerce activities (Chang & Wong, 2010; Soares-Aguiar & Palma-dos-Reis, 2008; Zhu, Dong, et al., 2006; Zhu & Kraemer, 2005; Zhu et al., 2003). Higher budgets directed towards IT functions are associated with higher use of electronic commerce (Gibbs & Kraemer, 2004). But even for small firms without dedicated IT employees, technological aspects, e.g., technical competence and IT expertise, are crucial factors associated with the adoption of electronic commerce technologies (Kuan & Chau, 2001).

Organizational aspects can also affect the adoption and usage of electronic business technologies. Firm size like the number of employees or average annual

revenue are among the most frequently identified factors associated with higher electronic business usage. Researchers find significant, positive associations between firm size and the extent and diversity of electronic business usage (Hsu et al., 2006). Many studies observe that firm size is not only positively correlated with the initial adoption of electronic procurement (Soares-Aguiar & Palma-dos-Reis, 2008; Teo et al., 2009; Zhu et al., 2003) but also with its continued and routinized usage (Zhu & Kraemer, 2005). Other organizational elements, such as managerial support, also positively relate to adopting electronic business technologies (Zhu, Kraemer, et al., 2006). The complexity of a firms' products and the asset specificity are found to negatively affect the level of routinization in digital procurement channels, like online marketplaces (Son & Benbasat, 2007).

Findings are inconsistent concerning the relative importance of technology-, organization- and environment-related aspects. In business-to-business settings, technological and organizational factors tend to be more potent electronic commerce adoption drivers than environmental factors (Teo et al., 2006). However, other studies, have found trading partners' exerted pressure to be the most crucial aspect of the adoption of electronic business technologies (Hsu et al., 2006). Coercive pressures, either through the readiness of business partners (Soares-Aguiar & Palma-dos-Reis, 2008) or business partners recommending or even requesting the use of electronic procurement, are found to be related to more electronic procurement adoption (Li, 2008; Teo et al., 2009). Conversely, the lack of readiness among trading partners is a significant inhibitor to electronic business adoption (Zhu et al., 2003). However, Zhu et al. (2003) find the importance of trading partner readiness to decrease as the intensity of electronic business usage increases. Similarly, government regulations requiring, for example, less paper-based work, also positively affect the adoption of electronic commerce technologies (Kuan & Chau, 2001). Regulatory support, i.e., adequate legal protection, sound data security, and privacy laws, is an essential antecedent of electronic business usage (Zhu & Kraemer, 2005; Zhu, Kraemer, et al., 2006).

Prior research also confirms the importance of mimetic and normative effects. There are mimetic effects across countries and industries, where higher competition and competitive pressures are associated with higher levels of adoption and routinization of electronic business activities (Oliveira & Dhillon, 2015; Zhu, Dong, et al., 2006; Zhu, Kraemer, et al., 2006). The perceived success of adopting competitors and the extent of their adoption positively relate to firms' own adoption of electronic procurement (Li, 2008; Soares-Aguiar & Palma-dos-Reis, 2008) and, more broadly, electronic business (Zhu & Kraemer, 2005). When taking a closer look at the routinized usage of digital procurement channels and not only adoption, mimetic effects are, however, not found to be strongly associated (Son & Benbasat, 2007). For small businesses, findings are ambiguous, as some studies find a negative relationship between mimetic pressures and electronic business adoption, which could be explained by adopters being early movers (Kuan & Chau, 2001). Normative pressures are also related to adopting and using electronic procurement options (Wu et al., 2003). When differentiating between initial adoption and routinized participation, normative pressures are only related to adoption, not participation levels (Son & Benbasat, 2007).

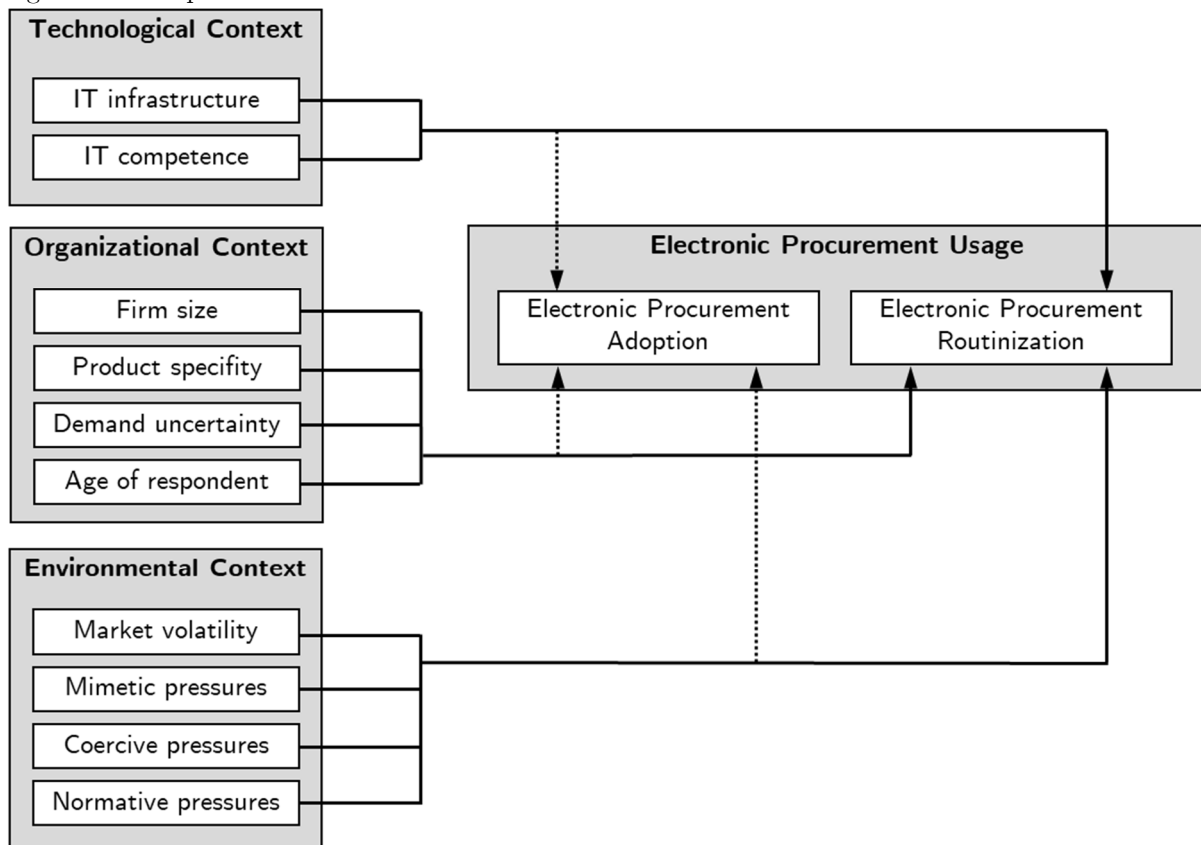
3 Research Model and Hypotheses

3.1 The Conceptual Model

This study examines technological, organizational, and environmental factors associated with the adoption and routinization of digital procurement technologies. We develop the conceptual framework, as shown in Figure 1. The conceptual model is built upon the technology-organization-environment framework by Tornatzky & Fleischer (1990) and integrates institutional theory by DiMaggio & Powell (1983) in the environmental context. We hypothesize that the factors fall into the three categories of the technology-organization-environment framework. For the technological context, we analyze IT infrastructure and competence. For the organizational context, we look at the firm size, product specificity, demand uncertainty, and respondents' age. The

environmental context is clustered following institutional theory by looking at mimetic, coercive, and normative factors. Additionally, we include market volatility. As dependent variables, we use both adoption and routinization, as illustrated in Figure 1.

Figure 1: Conceptual model



The factors we examine are informed by existing theories, earlier empirical findings as well as formal and informal expert interviews with executives in the construction sector. Similar previous studies mention the difficulty of considering all potential factors associated with digital procurement (e.g., Teo et al., 2009). Therefore, we use two complementary methods to triangulate the most relevant factors. On the one hand, we performed an extensive literature review, summarizing previous studies looking into the adoption and routinization factors of businesses' electronic procurement technologies. The key findings are outlined in **Error! Reference source**

not found.. On the other hand, we conducted multiple interviews with leading executives at applicators, i.e., the purchasers of building materials and distributors at manufacturers, and with the director of the German Confederation of Skilled Crafts. These interviews yield interesting additional factors, for example, the respondent's – in most instances, the owner's – age or private online shopping behavior. Taken together, we develop the conceptual model, as shown in Figure 1. In the following section, we propose formal hypotheses and provide additional explanations and justifications for the hypothesized factors, which we summarize in Table 2.

3.2 Hypotheses

Technological Factors. To assess the technological context of a firm, we focus on two factors: IT infrastructure and competence. Prior works distinguish various items to describe the technological context. Most frequently researched are a firm's IT infrastructure, its technological competencies, and the number of IT employees, which are all positively associated with the adoption of electronic procurement (Gibbs & Kraemer, 2004; Hsu et al., 2006; Teo et al., 2006; Zhu, Dong, et al., 2006; Zhu & Kraemer, 2005). Following our expert interviews, we assume that most of the targeted firms are too small to have dedicated IT employees. Therefore, we focus on IT infrastructure and IT competence. Aligned with previous research on IT infrastructure and the adoption and routinization of electronic procurement, we hypothesize:

H1a: Better IT infrastructure is positively associated with the adoption of electronic procurement.

H1b: Better IT infrastructure is positively associated with the routinization of electronic procurement.

In addition to sufficient IT infrastructure, technological expertise and IT competence are associated with the adoption and regular use of digital procurement. Market-based research reveals that these are lower in small and medium-sized

companies (KfW, 2020). Therefore, our hypotheses regarding IT competence are as follows:

H2a: Higher IT competence is positively associated with the adoption of electronic procurement.

H2b: Higher IT competence is positively associated with the routinization of electronic procurement.

Organizational Factors. We look at four firm-related factors describing the organizational context: firm size, product specificity, demand uncertainty, and the age of firm owners. Firm size is repeatedly found to be positively associated with both the adoption and routinization of digital procurement options (Soares-Aguiar & Palmados-Reis, 2008; Teo et al., 2009; Zhu & Kraemer, 2005; Zhu et al., 2003). It is most often measured by the number of employees (Lee & Xia, 2006). Some studies suggest that large firms tend to have higher bureaucracy levels, ultimately slowing down the adoption of new technologies owing to slower decision-making processes (Lee & Xia, 2006). For our survey targeted at construction companies and craftsmen in Germany, however, we assume that these potential tipping points of large firms are not reached, as the average craftsmen firm in Germany employs less than ten people on average (Federal Statistical Office of Germany, 2019). Hence, we hypothesize:

H3a: Organizational size is positively associated with the adoption of electronic procurement.

H3b: Organizational size is positively associated with the routinization of electronic procurement.

Characteristics of the purchased products can also be related to the adoption of digital procurement. Prior works have found that product specificity is negatively associated with the use of digital procurement (Son & Benbasat, 2007). Our expert

interviews confirm that products are often complex, customized, and specific in the construction industry. Concerning product specificity, we make the following hypotheses:

H4a: Product specificity is negatively associated with the adoption of electronic procurement.

H4b: Product specificity is negatively associated with the routinization of electronic procurement.

Demand uncertainty can be negatively related to electronic procurement (Son & Benbasat, 2007). This can be due to a volatile, external environment, which we cover in the next section. But insufficient internal, hence firm-specific planning processes can also cause demand uncertainty. Therefore, we hypothesize:

H5a: Demand uncertainty is negatively associated with the adoption of electronic procurement.

H5b: Demand uncertainty is negatively associated with the routinization of electronic procurement.

Our expert interviews reveal the presumption that there is a correlation between a firm owner's age and digital procurement. Interview partners observed that younger generations of craftsmen were more inclined to use electronic procurement. While we do not find any prior evidence concerning age, we include the following hypotheses on the age of respondent, who were primarily the firms' owners:

H6a: Age of the respondent is negatively associated with the adoption of electronic procurement.

H6b: Age of the respondent is negatively associated with the routinization of electronic procurement.

Environmental Factors. In addition to market volatility, we look at the three factors proposed by institutional theory: mimetic, coercive, and normative effects (DiMaggio & Powell, 1983). Confronted with an unstable market environment, firms might either strengthen ties with existing suppliers or continuously change suppliers, searching for lower prices (Son & Benbasat, 2007). Previous works on market volatility and uncertainty show that a more volatile environment may hamper stable business relationships (Son, Narasimhan, & Riggins, 2005). Following this reasoning, we expect digital procurement options to facilitate switching and comparing suppliers due to reduced search costs (Bakos, 1991). Therefore, in a more volatile market environment, in terms of uncertainty, instability, or change dynamics, we expect increased use of digital procurement options and hypothesize:

H7a: Market volatility is positively associated with the adoption of electronic procurement.

H7b: Market volatility is positively associated with the routinization of electronic procurement.

As proposed by institutional theory, pressures exerted by a firm's environment can be legitimacy-oriented or isomorphic, i.e., making firms feel peer pressure and thus assimilating over time (DiMaggio & Powell, 1983). Competitors, suppliers, but also governments or trade associations, can contribute to this pressure and previous studies confirm the effects of institutional factors associated with the adoption of inter-organizational technologies (Teo et al., 2003). First, mimetic effects from monitoring competitors or from fearing to be left behind are repeatedly found to be associated with the adoption of electronic business and electronic procurement technologies in prior works (Li, 2008; Soares-Aguiar & Palma-dos-Reis, 2008; Zhu & Kraemer, 2005; Zhu et al., 2003). Following previous research, we break mimetic effects down into the perceived adoption and perceived success of electronic procurement among competitors (Son & Benbasat, 2007; Teo et al., 2003) and hypothesize:

H8a: Mimetic pressures are positively associated with the adoption of electronic procurement.

H8b: Mimetic pressures are positively associated with the routinization of electronic procurement.

Second, coercive effects follow external parties forcing, convincing, or advising firms to adopt a particular technology (DiMaggio & Powell, 1983). Prior works find that trading partners adopting certain technologies are positively related to focal firms' adoption (Soares-Aguiar & Palma-dos-Reis, 2008; Teo et al., 2003), which is especially true for small firms (Iacovou et al., 1995). Similar to these studies, we define coercive pressure as the perceived dependence and readiness of suppliers and hypothesize:

H9a: Coercive pressures are positively associated with the adoption of electronic procurement.

H9b: Coercive pressures are positively associated with the routinization of electronic procurement.

Third, normative effects pertain to rules and norms that firms share with their external environment (DiMaggio & Powell, 1983; Soares-Aguiar & Palma-dos-Reis, 2008; Son & Benbasat, 2007). Research and expert interviews confirm that trade associations could play an important role in exerting normative pressure (DiMaggio & Powell, 1983). Several previous studies find evidence for the positive correlation between normative pressure and technology adoption (Gibbs & Kraemer, 2004; Hsu et al., 2006; Kuan & Chau, 2001; Wu et al., 2003; Zhu & Kraemer, 2005; Zhu, Kraemer, et al., 2006). Hence, we make the following hypotheses:

H10a: Normative pressures are positively associated with the adoption of electronic procurement.

H10b: Normative pressures are positively associated with the routinization of electronic procurement.

Table 2: Overview of hypotheses

		Hypothesis
Technological Context	H1	Better IT infrastructure is positively associated with ...
	a	the adoption of electronic procurement.
	b	the routinization of electronic procurement.
	H2	Higher IT competence is positively associated with ...
	a	the adoption of electronic procurement.
	b	the routinization of electronic procurement.
Organizational Context	H3	Organizational size is positively associated ...
	a	the adoption of electronic procurement.
	b	the routinization of electronic procurement.
	H4	Product specificity is negatively associated ...
	a	the adoption of electronic procurement.
	b	the routinization of electronic procurement.
	H5	Demand uncertainty is negatively associated ...
	a	the adoption of electronic procurement.
	b	the routinization of electronic procurement.
	H6	Age of the respondent is negatively associated ...
	a	the adoption of electronic procurement.
	b	the routinization of electronic procurement.
Environmental Context	H7	Market volatility is positively associated ...
	a	the adoption of electronic procurement.
	b	the routinization of electronic procurement.
	H8	Mimetic pressures are positively associated ...
	a	the adoption of electronic procurement.
	b	the routinization of electronic procurement.
	H9	Coercive pressures are positively associated ...
	a	the adoption of electronic procurement.
	b	the routinization of electronic procurement.
	H10	Normative pressures are positively associated ...
	a	the adoption of electronic procurement.
	b	the routinization of electronic procurement.

4 Empirical Study

4.1 Data Collection and Survey Design

We use an online questionnaire to test the conceptual model and hypotheses. The survey was conducted via Qualtrics between March and June 2020 and distributed to companies from the construction craftsmanship industry all over Germany. A detailed list of included crafts can be found in Table 3, as proposed by the German Confederation of Skilled Crafts. We had 271 participants, of which 16 responses were unusable and invalid because either respondents were unfamiliar with the procurement process, because the time used to fill in the survey was below a reasonable threshold or because they were not part of the construction craftsmanship industry. Excluding invalid responses yields a total of 255 valid responses.

Table 3: Skilled crafts of survey participants by main and finishing construction craftsmanship industry in Germany

Main construction craftsmanship	Finishing construction craftsmanship
▪ Bricklayers & concrete builder	▪ Painter
▪ Joiner	▪ Plumber
▪ Roofer	▪ Installer
▪ Road builder	▪ Electrician
▪ Scaffolder	▪ Carpenter
	▪ Interior decorator
	▪ Glazier
	▪ Tiles layer
	▪ Plasterer

Before administering the final survey, we conducted several rounds of pretests as recommended by research (Hulland, Baumgartner, & Smith, 2018). Pretests allow improving the understandability and clarity of question and question-answer fit, checking for technical smoothness and the time required to fill out the survey, and examining the collected data (Brace, 2004). We performed two rounds of pretests. First, we discussed the survey design with two experts, one with a robust industry-specific background and one with a deep survey-specific, methodological background. The

questionnaire was refined to improve question-answer fit, eliminate ambiguity, and increase matching between questions and respondents' knowledge. Second, we performed a respondent debrief, i.e., running the survey on a small subsample of three firms, and identified and resolved usability issues.

We took various ex-ante measures to avoid common method bias in the survey design. Beyond conforming to general recommendations for survey design, such as low grammatical complexity, active voice, and reverse coded questions, we took four ex-ante measures. First, we separated questions regarding the dependent and independent variables in the survey by placing them on different pages and different scales to reduce single-source bias (Hulland et al., 2018; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Second, to alleviate the effects of implicit theories, context-induced mood, and item ambiguity, we did not ask explicitly for the use of electronic procurement channels. Instead, we asked about the adoption and routinization of every potential electronic procurement channel separately (Podsakoff et al., 2003). Third, instead of highlighting the supposed lack of digitalization in the construction industry, we framed our survey in a more neutral context inquiring about procurement options. Potentially priming questions about technology use were placed at the end. These two measures mitigate single-source bias, and item characteristics bias coming from social desirability (Podsakoff et al., 2003). Furthermore, we reduce informant bias by talking as much as possible to the most senior executives of respondent firms, i.e., owners or CEOs, which constitute 80% of the respondents, and we eliminate all answers by respondents unfamiliar with the procurement process (Teo et al., 2009). Finally, emphasizing respondents' anonymity and the importance of their expertise increased and encouraged participation, as outlined before, and helped reduce common method bias (Podsakoff et al., 2003).

We contacted survey participants through various online and offline channels, with a response rate of 18.9%, and used randomization techniques to mitigate selection bias. Gathering responses in person on trade fairs, as initially planned, was restricted

by pandemic-related lockdowns. Therefore, we focused on contacting construction companies and craftsmen via email and telephone, randomizing the selection by location and skilled craft. This mode of contact represents over 80% of respondents. Additionally, we reached out to multiple construction craftsmanship magazines and social media groups, where we advertised and posted our survey. Finally, we used snowball sampling to spread the questionnaire in several different private and professional networks. These two modes of contact might introduce some selection bias, as more digitally affine firms may get attracted to social media postings, but this channel makes up less than 20% of our sample. Moreover, we control for the mode of contact in our subsequent analyses to alleviate non-response bias. To encourage participation, we highlighted respondents' valuable industry and business expertise, ensured and emphasized anonymity, and offered to share a summary of results if desired. The full survey is included in Appendix C.

4.2 Measures

Dependent Variables. The measure of our dependent variable is two-fold, assessing the adoption and routinization of electronic procurement. Previous research uses and combines different measures, either asking whether participants have adopted or plan to adopt (Son & Benbasat, 2007; Teo et al., 2003) or by differentiating adoption levels, e.g., in exploration, trial, and commitment (Son & Benbasat, 2007). Our approach follows Oliveira & Dhillon (2015) and Zhu, Kraemer, et al. (2006) and measures two aspects. For adoption, we use a binary variable to measure whether a firm has used electronic procurement technologies within the last five years, differentiating between traditional and digital channels, as stated in Table 1. These channels were selected and refined with the help of an industry expert. For routinization, we use a discrete variable to determine the average, monthly share of digital orders as a fraction of total orders.

Independent Variables. Our independent variables' measures are primarily based on prior research that also develops hypotheses based on the technology-organization-environment framework. The technological context is measured by the number of IT

instruments used, like corporate email addresses or digital processes, and online shopping affinity from private online shopping (Oliveira & Martins, 2008). For the organizational context, firm size is assessed through the number of employees (Hsu et al., 2006). Additionally, respondents evaluate several aspects of product specificity and demand uncertainty on a 7-point Likert scale (Son & Benbasat, 2007) and indicate their age. Some of the measures are inverted to create variety and maintain respondents' focus throughout the survey. For the environmental context, we break market volatility down into the aspects of market insecurity, market instability, and the speed of changes in the industry (Bello & Gilliland, 1997). Mimetic pressures are measured by perceived use and success of electronic procurement by competitors; coercive pressures are measured by various characteristics of the relationship with suppliers; normative pressures are measured through the influence of trade associations (Teo et al., 2003). All measurement items, the respective scale and source in prior empirical works are summarized in

Table 44.

Control Variables. We include several control variables on the level of individual respondents and the firm they represent. On a respondent level, we control for gender. Furthermore, we check how the respondent was recruited to participate in the survey. On a firm level, we control for the skilled craft in which the respondent's firm specializes. We do this by clustering firms as part of either main construction craftsmanship, i.e., constructing the building shell, or finishing construction craftsmanship, i.e., conducting the finishing, as outlined in Table 3. Additionally, we control for the distance to the closest physical retailer or wholesaler and the location by ZIP code to determine whether firms are located in a more rural or urban area of Germany.

Table 4: Overview of independent variable measures by hypothesis

		Hypothesis and Measure	Scale	Source
Technological Context	H1	IT infrastructure		
		Number of different IT instruments in company	Choose from given ones or indicate other	Oliveira & Martins (2008)
	H2	IT competence		
		Number of private online purchases	Select from given intervals	Own measure
Organizational Context	H3	Organizational size		
		Number of employees	Select from given intervals	Hsu et al. (2006)
	H4	Product specificity		
		Customization of products	7-point Likert	Son & Benbasat (2007)
	H5	Demand uncertainty		
		Demand uncertainty in terms of regularity	7-point Likert	Son & Benbasat (2007)
		Demand uncertainty in terms of time	7-point Likert	Son & Benbasat (2007)
		Demand uncertainty in terms of volume	7-point Likert	Son & Benbasat (2007)
Environmental Context		Demand uncertainty in terms of volume volatility	7-point Likert	Son & Benbasat (2007)
	H6	Age of the respondent		
		Age	Select from given intervals	Own measure
	H7	Market volatility		
		Stable or volatile market	Semantic scale	Bello & Gilliland (1997)
		Secure or insecure market	Semantic scale	Bello & Gilliland (1997)
		Market changes quickly or slowly	Semantic scale	Bello & Gilliland (1997)
	H8	Mimetic pressures		
		Perceived competitor use of electronic procurement	7-point Likert	Teo et al. (2003)
		Perceived competitor success of electronic procurement	7-point Likert	Teo et al. (2003)
	H9	Coercive pressures		
		Dependency on supplier	7-point Likert	Teo et al. (2003)
		Effort to change supplier	7-point Likert	Teo et al. (2003)
		Suppliers offering electronic procurement channels today	7-point Likert	Teo et al. (2003)
		Suppliers offering electronic procurement channels in the future	7-point Likert	Teo et al. (2003)
		Legal influence	7-point Likert	Teo et al. (2003)
	H10	Normative pressures		
		Association influence	7-point Likert	Teo et al. (2003)

4.3 Validity Assessment and Factor Analysis

Before testing our hypotheses, we assess the content and construct validity of the measurement items in the survey. To ensure content validity, we conduct an extensive literature analysis and base almost all measured items on prior empirical findings, as evidenced by

Table 44. To ensure construct validity and reduce the number of variables, we conduct an exploratory principal factor analysis with orthogonal varimax rotation. Before the factor analysis, the Bartlett's test of sphericity confirms a significant, sufficient correlation between measurement items to conduct a factor analysis. The Kaiser-Meyer-Olkin test for sampling adequacy is above 0.5, indicating the dataset's suitability for factor analysis. As becomes clear from Table 5, we develop five factors that all have Eigenvalues larger than 1, including items with factor loadings equal to or larger than 0.6 for all but one factor. Cronbach's Alpha is high enough to ensure adequate reliability of the constructed factors. To refute potential multicollinearity, we check correlation coefficients and conduct a variance inflation analysis, with a mean variance inflation factor of 1.24.

Table 5: Factor loadings and Cronbach's Alpha for constructed factors

Factor	Integrated variables	Factor loadings	Cronbach's Alpha
Market volatility	Market instability	0.84	0.78
	Market insecurity	0.84	
	Market changing speed	0.53	
Suppliers' digital channels	Supplier digital channels today	0.71	0.76
	Supplier digital channels in future	0.71	
Coercive pressures	Legal requirements	0.68	0.74
	Association effects	0.68	
Mimetic pressure	Competitor use of digital channels	0.73	0.79
	Competitor success with digital channels	0.73	
Demand uncertainty in terms of time & volume	Demand uncertainty in terms of time	0.60	0.65
	Demand uncertainty in terms of volume	0.60	

Coercive pressure combines items from normative and coercive constructs loading on the same factor. Cronbach's Alpha was standardized for reversed-scale items.

5 Data Analysis and Results



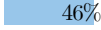
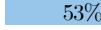




















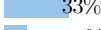
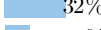

























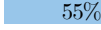
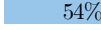








5.1 Sample Characteristics and Descriptive Statistics

For all subsequent analyses, we use two samples. The full sample includes all 255 valid responses of firms, while the partial sample only includes the subset of 177 firms that have used digital procurement options in an average month during the past 12 months. Table 6 and Table 7 summarize demographic profiles and digital procurement activities, respectively. Of the 255 respondent firms, 189 (74%) state that they have used some type of digital procurement during the last five years. 177 (69%) of respondent firms have used digital procurement options in an average month over the previous 12 months. Therefore, they are considered routinized digital procurement users, similar to previous studies, and make up the partial sample (Oliveira & Dhillon, 2015).

As summarized in Table 6, our sample of 255 responses covers a wide array of construction craftsmen on the level of represented firms and participants and sufficiently represents the underlying population. On a firm level, with an almost equal split, we include answers from the main and finishing craftsmanship segment. According to the German Confederation of Skilled Crafts, there are almost 500,000 construction outlets in Germany, of which almost 80% are from the finishing and 20% are from the main construction craftsmanship sector (ZDH Zentralverband des Handwerks, 2021). The majority of our sample firms have 5 to 19 employees, similar to the German average of 9 employees for construction craftsmen (Federal Statistical Office of Germany, 2019). Our respondent firms' annual purchasing volumes are distributed between less than €50,000 to € 5,000,000, with 33% of firms purchasing goods valued at €100,001 to €500,000. The firms conduct 78 orders in an average month, with over 70% of firms placing 100 or fewer orders. Classifying firms based on their indicated ZIP code location into urban, rural, or intermediate, we sufficiently cover all types of areas. This is reinforced by the distance to firms' closest physical purchasing location, which is predominantly less than 10 km. On a respondent level, we observe that most

respondents are male and are age 46 to 65. The large majority (>80%) of respondents are the owner or CEO of the company.

Table 6: Respondent summary

	Full sample for adoption phase		Partial sample for routinization phase	
	Participants	%	Participants	%
Total	255		177	
Firm-level characteristics				
Construction craftsmanship sector				
Main construction craftsmanship sector	124	 49%	78	 44%
Finishing construction craftsmanship sector	118	 46%	93	 53%
Other	13	 5%	6	 3%
Number of employees				
1	20	 8%	12	 7%
2 – 4	40	 16%	33	 19%
5 – 9	73	 29%	46	 26%
10 – 19	52	 20%	35	 20%
20 – 49	43	 17%	32	 18%
> 50	25	 10%	18	 10%
n/a	2	 1%	1	 1%
Annual purchasing volume				
€ 0 – € 50,000	34	 13%	24	 14%
€ 50,001 – € 100,000	43	 17%	31	 18%
€ 100,001 – € 500,000	85	 33%	56	 32%
€ 500,001 – € 1,000,000	30	 12%	22	 12%
€ 1,000,001 – € 5,000,000	39	 15%	26	 15%
> € 5,000,000	14	 5%	10	 6%
n/a	10	 4%	8	 5%
Number of monthly orders				
1 – 50	91	 36%	55	 31%
51 – 100	95	 37%	71	 40%
101 – 150	41	 16%	32	 18%
> 150	24	 9%	19	 11%
n/a	4	 2%	0	0%
Location based on ZIP code				
Predominantly urban	72	 28%	56	 32%
Intermediate	106	 42%	71	 40%
Predominantly rural	48	 19%	32	 18%
n/a	29	 11%	18	 10%
Distance to closest physical purchasing location				
0 – 10km	140	 55%	95	 54%
10 – 20km	63	 25%	48	 27%
20 – 50km	30	 12%	20	 11%
> 50km	17	 7%	11	 6%
n/a	5	 2%	3	 2%

	Full sample for adoption phase		Partial sample for routinization phase	
	Participants	%	Participants	%
Total	255		177	
Respondent-level characteristics				
Age				
18 – 25	3	1%	3	2%
26 – 35	33	13%	28	16%
36 – 45	44	17%	33	19%
46 – 65	156	61%	105	59%
> 65	14	5%	5	3%
n/a	5	2%	3	2%
Gender				
Male	202	79%	141	80%
Female	50	20%	34	19%
Not indicated	3	1%	2	1%
Role <i>(multiple choices possible)</i>				
CEO/Owner	206	81%	141	80%
Master craftsman	92	36%	64	36%
Journeyman	5	2%	4	2%
Apprentice	2	1%	2	1%
Administration	40	16%	28	16%
Other	2	1%	2	1%
n/a	3	1%	1	1%

The full sample contains adopters of electronic procurement channels within the last five years. The partial sample contains only participants who used electronic procurement in an average month over the previous 12 months.

Some similarities and differences stand out when comparing the full sample with the partial sample, which includes only firms that have used a digital procurement channel in an average month over the last 12 months. On a firm level, we see a slightly higher share of finishing construction craftsmen than main construction craftsmen. Both samples are relatively similar regarding the number of employees, annual purchasing volumes, monthly orders, and location-related characteristics. On a respondent-level, we observe that in the partial routinization sample, there are more respondents aged 26 to 45 and fewer respondents aged 65 and older than in the full sample. With regard to gender and roles, both samples have similarly distributed characteristics.

Table 7: Frequency of procurement channels used by adoption and routinization phase

	Full sample		Partial sample		Difference
	#	%	#	%	
	255	100%	177	69%	
Traditional procurement options used	253	99%	175	99%	-0%
Retail or wholesale shop	218	85%	154	87%	+2%
Mail	68	27%	55	31%	+4%
Telephone	227	89%	162	92%	+3%
Personal order from sales representative	191	75%	138	78%	+3%
Fax	126	49%	89	50%	+1%
E-Mail	227	89%	165	93%	+4%
WhatsApp & other social media	44	17%	33	19%	+1%
Digital procurement options used	189	74%	177	100%	+26%
Digital interface	50	20%	48	27%	+8%
Online shop of supplier or manufacturer	175	69%	166	94%	+25%
Third-party online shop	93	36%	88	50%	+13%

The table reports what percentage of participants use the respective procurement activities within each sample. Multiple answers are possible.

In Table 7, we take a closer look at the different traditional and digital procurement channels used by firms in our two samples. For the entire sample, we observe that the most commonly used procurement options are retail or wholesale shops, telephone, and orders issued via email. Over 80% of respondents state that they have used either procurement options at some point during the past five years. Seventy-four percent of firms in our sample have used a digital procurement option at some point during the last five years. Sixty-nine percent of our sample firms can be considered routinized users of digital procurement channels because they have ordered digitally in an average month within the last 12 months. We observe that routinized users of digital procurement channels use not only digital options more frequently but also traditional ones. Among routinized users, ordering digitally is more extensive for

all channels, especially for online shops and third-party online shops. This observation suggests that routinized users of digital procurement channels employ multiple channels in parallel and switch between them more flexibly. It also indicates that most craftsmen and construction companies prefer open online shops to closed, often more expensive digital interfaces such as electronic data interchanges.

5.2 Factors Associated with the Adoption and Routinization of Digital Procurement

We run two separate analyses to identify the factors associated with the adoption and routinization of digital procurement. To identify factors associated with adoption, we run a logit regression. The dependent variable is binary and describes whether or not a firm has used a digital procurement channel at some point during the last five years. In column (a) of Table 8, we report the estimated odds ratio. This approach is similar to many previous studies investigating the adoption of electronic procurement to analyze the binary decision of adoption (Oliveira & Dhillon, 2015; Soares-Aguiar & Palma-dos-Reis, 2008; Teo et al., 2009). To identify factors associated with routinization, we conduct an ordinary least squares linear regression. The dependent variable is the share of digital orders as a percentage of overall orders in an average month during the last 12 months. In column (b) of Table 8, we report the estimated coefficients, where independent variables are summarized by hypothesis. Previous works have used ordered logistic regressions (Oliveira & Dhillon, 2015), hierarchical regressions (Zhu, Kraemer, et al., 2006), and partial least squares linear regressions (Teo et al., 2009). While these prior studies collect data on a less granular level to conduct supplementary data analysis or to group respondent firms into clusters, in this study, we construct a continuous, more nuanced variable to measure the share of digital orders in more detail.

Table 8: Results for logit and linear regression

			(a)	(b)
			Adoption of Digital Procurement	Routinization of Digital Procurement
			Odds ratio of logit regression	Coefficients of linear regression
Technological Context	H1	Technological infrastructure	1.493* (0.306)	0.020 (0.016)
	H2	Technological competence	1.647** (0.324)	0.015 (0.015)
Organizational Context	H3	Firm size	1.157 (0.182)	-0.005 (0.013)
	H4	Product specificity	0.911 (0.083)	-0.012 (0.007)
	H5	Demand uncertainty in terms of regularity	0.785 (0.196)	0.012 (0.022)
		Demand uncertainty in terms of time & volume	0.904 (0.171)	-0.040** (0.019)
		Demand uncertainty in terms of volume volatility	1.110 (0.177)	-0.002 (0.013)
	H6	Age	0.604* (0.158)	0.004 (0.017)
	H7	Market volatility	1.150 (0.239)	-0.012 (0.016)
Environmental Context	H8	Mimetic pressure	1.544* (0.387)	0.057*** (0.021)
	H9	Coercive pressures by suppliers' digital channels	1.194 (0.284)	0.086*** (0.019)
		Coercive pressure in terms of feasibility to switch suppliers	1.127 (0.131)	0.019** (0.009)
		Coercive pressures in terms of supplier dependency	1.003 (0.131)	-0.043*** (0.012)
	H10	Normative pressures	1.311 (0.318)	-0.014 (0.020)
Sector Controls			Yes	Yes
Respondent Controls			Yes	Yes
Firm Controls			Yes	Yes
Survey Channel Controls			Yes	Yes
Observations			255	177
R ²			-	0.39
McKelvey and Zavoina's R ²			0.34	-

Odds ratio (a) and coefficients (b) of the multivariate regressions. Standard errors in parentheses. Dependent variable is whether digital channels were used in the last five years for the adoption of digital procurement channels (a) and the share of electronic procurement orders within an average month in

the last 12 months for routinization of digital procurement (b). Legal requirements and association influence load on the same factor and are summarized as normative pressures. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Several measures report the goodness of fit of our model. As there is no equivalently interpretable R^2 for the logit regression, we report the McKelvey and Zavoina's R^2 , which most closely approximates R^2 for linear regressions. For our logit regression, the McKelvey and Zavoina's R^2 is 0.34, meaning that approximately 34% of the variance are explained by the independent variables. Overall, 79.61% of adopters and non-adopters are correctly classified by our model, at a positive outcome threshold of 0.5 as the cutoff value. We report further measures of fit in **Error! Reference source not found..** For the linear regression, we report an R^2 of 0.39. This indicates that 39% of the variance in the dependent variable are explained by the independent variables.

Our logit regression identifies four factors significantly associated with the adoption of digital procurement by a firm during the last five years. Based on our results, we find supporting evidence for hypotheses H1a and H2a for the technological context. The estimates indicate that with more extensive technological infrastructure and technological competence, digital procurement adoption is significantly higher in our sample. For the organizational context, we find supporting evidence for H6a regarding respondent age with an estimated odds ratio of below 1. This finding suggests that the older the owner of a construction company is, the less likely the adoption of digital procurement is. Lastly, for the environmental context, we find significant evidence of mimetic pressures that supports H8a. When more observed competitor firms successfully use digital procurement, adoption among observing firms is more widespread.

Our results on adoption are in line with comparable studies, as summarized in **Error! Reference source not found..** Like our results, the large majority of studies find a positive relationship between technological contextual factors, i.e., infrastructure and competence, and the adoption of electronic business, commerce and procurement

activities (Chang & Wong, 2010; Li, 2008; Soares-Aguiar & Palma-dos-Reis, 2008). For organizational contextual factors, previous findings on firm size are inconclusive, and our study finds a positive but insignificant result. This might well be because all firms in our sample are small and display insufficient variation to exhibit a sizeable effect. Product specificity may be negatively associated with the adoption and routinization of electronic procurement activities, but the results are insignificant in our analysis. This is to some extent in line with Son & Benbasat (2007), who find that with rising product specificity or complexity, electronic procurement adoption increases. They do not observe that effect for the routinization of electronic procurement. For demand uncertainty, i.e., the internal planning capability of demand in terms of regularity, time, and volume as well as volume volatility, our findings are insignificant and directionally mixed. Prior studies observe a negative relationship between demand uncertainty and the adoption of digital procurement (Son & Benbasat, 2007).

Our findings on adoption are also directionally in line with most other studies incorporating market volatility and isomorphic pressures even though some of our estimates are insignificant. From prior studies, market volatility appears to be positively associated with digital procurement adoption (Son & Benbasat, 2007; Wu et al., 2003). Our estimate, while directionally similar, is not significant. Many prior studies include isomorphic pressures and find mostly positive associations between mimetic, coercive, and normative pressures, and the adoption of electronic business in general and procurement in particular. For mimetic pressures, we find a positive and significant relationship, similar to prior studies especially focusing on the adoption of electronic procurement (Li, 2008; Soares-Aguiar & Palma-dos-Reis, 2008). Our estimates on coercive and normative pressures all imply positive relationships but are not significant. Previous works observe positive and significant relationships between coercive and normative pressures and the adoption of electronic procurement (Li, 2008; Soares-Aguiar & Palma-dos-Reis, 2008; Teo et al., 2009; Wu et al., 2003).

For the routinization of digital procurement, the linear regression yields five different, significantly associated factors. For the organizational context, we can find support for hypothesis H5b, observing that internal demand uncertainty regarding the timing and volume of needed materials is negatively associated with digital procurement routinization. For the environmental context, we identify several significantly associated factors. We find supporting evidence for hypothesis H8b regarding mimetic pressures to imitate successful competitors. This implies that the more competitors routinely and successfully use digital procurement, the more likely sample firms are to routinize digital procurement channels themselves. Finally, we can partially confirm H9b regarding coercive pressures. Our estimates indicate that suppliers' pressure and the ease and feasibility to switch suppliers are positively associated with the routinization of digital procurement channels. Firms' dependency on suppliers, however, is significantly and negatively associated with routinization.

The estimated coefficients on routinization are similar to other studies focusing on routinization in addition to adoption. First of all, it is noteworthy that similar to previous studies (Oliveira & Dhillon, 2015; Teo et al., 2009), we also identify different sets of factors associated with routinization on the one hand and adoption on the other. Technological contextual factors are repeatedly found to be positively related to the routinization of electronic business and commerce activities (Oliveira & Dhillon, 2015; Zhu, Kraemer, et al., 2006). Our results, though directionally similar, are insignificant. Our firm size estimate is also directionally similar to other studies (Oliveira & Dhillon, 2015; Zhu, Kraemer, et al., 2006) suggesting that firm size is negatively associated with digital procurement routinization. Again, potentially due to the limited variation in firm size in our sample, our estimate is not significant. We find some significant evidence suggesting that less demand uncertainty is associated with a higher share of digitally procured orders. No previous studies include these items in their analysis, which is also true for product specificity and age, where our findings are insignificant.

There are also no prior findings on the relationship between market volatility and digital procurement routinization, and our findings are not significant.

Lastly, on isomorphic pressures, we add to the literature by investigating more environmental factors. No previous study investigates the effect of mimetic pressure on routinization, for which we find a highly significant and positive relationship with digital procurement routinization. Oliveira & Dhillon (2015) observe that collaboration with trading partners is positively associated with digital procurement routinization, which is in line with our positive and significant findings on coercive pressures exerted by suppliers to encourage digital procurement. Unlike prior studies, we analyze coercive pressures in more depth and find a significant positive relationship between routinization and the feasibility to switch suppliers and a significant negative relationship between routinization and the dependency of suppliers. For normative pressures, which are also not part of any prior studies, we do not find a significant effect.

This study generates valuable insights. The results of our analyses linked to respective hypotheses on adoption and routinization are summarized in

Table 99. Most notably, we find that very different sets of factors are associated with adoption on the one hand and routinization on the other, similar to other studies (Teo et al., 2009). Innovation diffusion theory explains this by positing that technology diffuses in distinct stages and that different factors are relevant and associated with these different stages (Zhu, Kraemer, et al., 2006).

For the technological context, we observe that IT infrastructure and competence are highly relevant for the initial digital procurement adoption but not for its routinized usage. This could be explained by the relative ease of ordering products online, both in terms of equipment and expertise. Once mastered by businesses, the quantity of digital ordering is no longer significantly affected. For the organizational context, the owner's or CEO's age only appears to be associated with the initial adoption. Once firms have routinized the usage of digital procurement options, the owner's age no longer seems to have a strong association with the amount of digital orders. As internal demand uncertainties decrease, the share of digital orders tends to increase. One possible explanation is that online ordering requires more forward-looking planning to be superior to a drive to a physical retail location. As construction craftsmen improve their planning, they also manage to increase the share of digital orders.

For the environmental context, we observe interesting effects for both mimetic and coercive pressures. Mimetic pressures based on competitors' perceived use and success of digital channels are positively associated with both the adoption and routinization of digital procurement. One possible explanation is that firms adopt and continue to use digital procurement when benchmarking against their successful competitors. We observe that the effect of coercive pressures is multi-faceted and is only associated with digital procurement routinization, not with adoption. When suppliers offer, plan, or encourage digital procurement, the share of digital orders tends to be higher. Incentive schemes as offered by some suppliers may help to increase digital orders. Easier switching between suppliers is also associated with increased routinized use of digital procurement, which can be explained by the opportunity to compare

prices or delivery terms conveniently online, for example. This would also explain why when dependency on suppliers is high, shares of digital orders tend to decrease, as these advantages of ordering online may disappear.

Table 9: Overview of hypotheses and results

		Hypothesis	Status	Significance Level
Technological Context	H1	Better IT infrastructure is positively associated with ...		
	a	the adoption of electronic procurement.	✓	*
	b	the routinization of electronic procurement.	✓	
	H2	Higher IT competence is positively associated with ...		
	a	the adoption of electronic procurement.	✓	**
	b	the routinization of electronic procurement.	✓	
Organizational Context	H3	Organizational size is positively associated ...		
	a	the adoption of electronic procurement.	✓	
	b	the routinization of electronic procurement.	✗	
	H4	Product complexity is negatively associated ...		
	a	the adoption of electronic procurement.	✓	
	b	the routinization of electronic procurement.	✓	
	H5	Demand uncertainty is negatively associated ...		
	a	the adoption of electronic procurement.	✓	
	b	the routinization of electronic procurement.	✗	
	H6	Age of the respondent is negatively associated ...		
	a	the adoption of electronic procurement.	✓	*
	b	the routinization of electronic procurement.	✓	
Environmental Context	H7	Market volatility is positively associated ...		
	a	the adoption of electronic procurement.	✓	
	b	the routinization of electronic procurement.	✗	
	H8	Mimetic pressures are positively associated ...		
	a	the adoption of electronic procurement.	✓	*
	b	the routinization of electronic procurement.	✓	***
	H9	Coercive pressures are positively associated ...		
	a	the adoption of electronic procurement.	✓	
	b	the routinization of electronic procurement.	✓/✗	***
	H10	Normative pressures are positively associated ...		
	a	the adoption of electronic procurement.	✓	
	b	the routinization of electronic procurement.	✗	

6 Discussion and Conclusion

6.1 Findings and Limitations

This study generates novel insights on factors associated with the adoption and routinization of digital procurement channels among the German construction craftsmanship industry. For an industry that has traditionally lagged in adopting digitalization initiatives in general, we find that 26% of surveyed firms have not used any digital means such as online shops or electronic data interchanges to purchase materials. Sixty-nine percent of surveyed craftsmen can be considered routinized users of digital procurement options, suggesting that most firms who try online purchasing – 74% of our sample – become routinized users – 69% of our sample. Furthermore, we observe that routinized users most commonly use suppliers' or manufacturers online shops rather than third-party wholesalers' online shops. Routinized users purchase more frequently through all channels, even traditional ones, suggesting that they are more flexible in their purchasing processes.

Our regression analysis yields further insightful findings. The developed hypotheses are grounded in the technology-organization-environment framework, resembling multiple prior works in other geographies and industries. We find increased initial adoption when a firm's IT infrastructure and competence are higher, and when a firm's owner is younger. The routinization of digital procurement is higher when firms have little internal uncertainty regarding the timing and volume of necessary orders. With higher coercive pressures exerted by trading partners, the share of digital orders is also higher. Higher dependency on suppliers, however, is associated with a decreased share of digital orders. Lastly, mimetic pressures imitating successful competitors are positively associated with both adoption and routinization of digital procurement.

This study has several limitations, which can be addressed by future research. First, we follow prior studies and choose the technology-organization-environment framework as the theoretical foundation. Other theoretical lenses, such as the model of

organizational readiness, perceived benefits, and external pressure (Iacovou et al., 1995) and other potentially overlooked factors, e.g., brand or manufacturer affiliation or industry idiosyncrasies, could also be examined. Second, our results suggest association rather than causation between various contextual factors of the technology-organization-environment framework and the adoption and routinization of digital procurement. As suggested by other researchers, longitudinal studies could address this limitation (Teo et al., 2009). Third, we have to make some simplifying assumptions. We limit our dependent variable to digital purchases. However, this, neglects the possibility that some firms seek product information or compare prices online before placing an order via phone, for example. Therefore, we can only focus on digital purchases, not the use of digital marketing channels overall. Finally, there are methodological limitations to our study. Common method bias is a concern for surveys like this one. We try to mitigate these concerns as much as possible, as outlined in section 4.1. The generalizability of our results is limited. Even though other cross-industry studies have not found significant differences between firms from different industries, arguing that digital procurement options and electronic business activities in general have proliferated throughout all industries (Teo et al., 2009), we think that the presented study applies primarily to the German construction craftsmanship industry, which was the focus and objective of this study.

6.2 Contributions to Research and Practice

We contribute to existing research in three ways. Similar prior research in cross-industry settings finds that industry affiliation is not associated with any difference in the adoption and use of electronic business (Teo et al., 2009). Other studies observe that manufacturing sectors lag in electronic business use, compared to industries that deal directly with end consumers like financial services (Hsu et al., 2006). Thus, empirical research on differences between industries and sectors is mixed. Simultaneously, the German construction industry is puzzling owing to its low levels of digital procurement usage. Taking a closer look at contextual factors in this puzzle

is this study's main contribution and we add upon existing research by looking at this previously unresearched industry. Additionally, only a few recent works analyze both adoption and routinization in one comprehensive study (e.g., Hsu et al., 2006; Oliveira & Dhillon, 2015; Teo et al., 2009). Like prior studies, we demonstrate that different factors are associated with the initial adoption on the one hand and continued routinization on the other (Teo et al., 2009). Lastly, only a few studies have included or focused primarily on small businesses in their analyses of adoption factors (Kuan & Chau, 2001; Oliveira & Dhillon, 2015). Our study adds new insights to that stream of literature, looking primarily at businesses with 5 to 19 employees.

For practitioners affiliated with the construction craftsmanship industry, this study provides a better understanding of factors associated with digital procurement adoption and routinization. Understanding these factors can help tailor appropriate digital sales strategies on the side of suppliers and encourage more widespread usage of digital procurement on the side of construction craftsmen. We find technological infrastructure and competence, the owner's age, and mimetic pressures to be associated with the adoption of digital procurement. For manufacturers and resellers, such as wholesalers and retailers, this implies that technological infrastructure and competence are crucial to enable digital procurement in the first place. Easy-to-use online shops and inexpensive online ordering options, e.g., without requiring costly additional software, may increase online purchases. As more craftsmen successfully adopt these options and as younger generations of owners replace older ones, digital procurement may become more predominant.

Demand uncertainty and supplier dependency are negatively associated, while mimetic pressures and coercive pressures by trading partners are positively associated with routinization of digital procurement. To increase the share of digital orders, manufacturers and resellers should provide additional demand planning tools to reduce demand uncertainty for craftsmen. Trading partners incentivizing the use of digital procurement may increase the share of digital orders as well. The feasibility of switching

suppliers also encourages the use of digital procurement, so especially multi-brand resellers could leverage this by offering alternative brands and products in their webshops. Lastly, our study does not find significant, immediate associations between the use of digital procurement and legal requirements. Nonetheless, public decision-makers requiring wider use of building information modeling software in construction will facilitate and streamline planning and coordination, and may ultimately also encourage more digital procurement.

Appendix

Appendix 1: Summary of key findings in previous studies

Year	Authors	Title	Innovation context	Technology context	Organizational context			Environmental context			
				Technological infrastructure & competence	Firm size	Product complexity	Demand uncertainty	Market volatility	Mimetic pressures	Coercive pressures	Normative pressures
2001	Kuan & Chan	A perception-based model for EDI adoption in small businesses using a technology-organization-environment framework	Electronic Business	+					-	+	+
2003	Zhu et al.	Electronic Business Adoption by European Firms: A Cross-country Assessment of the Facilitators and Inhibitors	Electronic Business	+	+					+	
2005	Zhu & Kraemer	Post-Adoption Variations in Usage and Value of E-Business by Organizations: Cross-Country Evidence from the Retail Industry	Electronic Business	+	-				+		+
2006	Hsu et al.	Determinants of E-Business Use in U.S. Firms	Electronic Business	+	-				-	+	+
2006	Zhu, Dong, et al.	Innovation diffusion in global contexts: determinants of post-adoption digital transformation of European companies	Electronic Business	+							
2006	Zhu, Kraemer, et al.	The Process of Innovation Assimilation by Firms in Different Countries: A Technology Diffusion Perspective on E-Business	Electronic Business	+	-				+		+
2008	Oliveira & Martins	A Comparison of web site adoption in small and large portuguese firms	Electronic Business	+					+		
2008	Lin & Lin	Determinants of e-business diffusion: A test of the technology diffusion perspective	Electronic Business	+					+	+	
2010	Oliveira & Martins	Firms Patterns of e-Business Adoption: Evidence for the European Union-27	Electronic Business	+	+				+		
2010	Oliveira & Martins	Understanding e-Business Adoption Across Industries in European Countries	Electronic Business	+	+				+	+	
2001	Grewal et al.	An Investigation into the Antecedents of Organizational Participation in Business-to-Business Electronic Markets	Electronic Commerce	+							
2004	Gibbs & Kraemer	A Cross-Country Investigation of the Determinants of Scope of E-commerce Use: An Institutional Approach	Electronic Commerce	+	-				+		+
2006	T. S. H. Teo et al.	Key Dimensions of Inhibitors for the Deployment of Web-Based Business-to-Business Electronic Commerce	Electronic Commerce	+							
2007	Son & Bousset	Organizational Buyer's Adoption and Use of B2B Electronic Marketplaces: Efficiency- and Legitimacy-Oriented Perspectives	Electronic Commerce	±	±	±	-		+	±	+
2008	Liu	Determinants of e-commerce development: An empirical study by firms in Shanghai, China	Electronic Commerce	+							
2009	Oliveira & Martins	Determinants of Information Technology Adoption in Portugal	Electronic Commerce	±					+		
2015	Oliveira & Dhillon	From Adoption to Routinization of B2B e-Commerce: Understanding Patterns Across Europe	Electronic Commerce	+	-				+	+	
2003	Wu et al.	An Analysis of E-Business Adoption and its Impact on Business Performance	Electronic Procurement		+				+		+
2008	Li	An Empirical Investigation on the Determinants of E-procurement Adoption in Chinese Manufacturing Enterprises	Electronic Procurement	+					+		+
2008	Sources-Aguilar & Palma-dos-Palmeiras	Why Do Firms Adopt E-Procurement Systems? Using Logistic Regression to Empirically Test a Conceptual Model	Electronic Procurement	+	+				+	+	
2009	T. S. H. Teo et al.	Adopters and non-adopters of e-procurement in Singapore: An empirical study	Electronic Procurement	+	+					+	+
2010	Chung & Wong	Adoption of e-procurement and participation of e-marketplace on firm performance: Trust as a moderator	Electronic Procurement	+							

A "+" indicates a positive, "++" a mixed, and "-" a negative association found in the respective empirical research.

Appendix 2: Goodness of fit measures for logit regression

	Adoption of Digital Procurement
Chi-Square ($p < 0.0001$)	54.63
Adjusted Count R^2	0.21
Correctly classified adopters	94.18%
Correctly classified non-adopters	37.88%
Correctly classified overall	79.61%

Appendix 3: Questionnaire (as conducted in German)



Vielen Dank, dass Sie an dieser Umfrage teilnehmen.
Ihre Geschäftserfahrung und Ihr Expertenwissen ist für diese Studie von besonderer Bedeutung. Die Durchführung der Umfrage dauert circa 10 Minuten. Es gibt keine richtigen oder falschen Antworten.

Meine Abschlussarbeit ist Teil eines Forschungsprojekts der TU München zur Untersuchung der Einkaufskanäle im Bauhandwerk. Ihre Antworten werden als Teil eines großen Datensatzes analysiert. Alle Informationen werden streng vertraulich und anonym behandelt und können nicht auf einzelne Befragte zurückgeführt werden.

Wenn Sie an den Ergebnissen der Umfrage Interesse haben, senden Sie mir eine E-Mail mit dem Betreff "Umfrageergebnisse" an andrea.haubner@tum.de

Herzlichen Dank für Ihre Unterstützung!
Andrea Haubner

WICHTIG: Alle Fragen beziehen sich auf die Situation vor dem Ausbruch der Corona Epidemie (falls diese zu Veränderungen in Ihrem Geschäftsablauf geführt hat).

Wie sind Sie auf die Umfrage aufmerksam geworden?

E-Mail	<input type="radio"/>
Telefonat	<input type="radio"/>
Postalisch	<input type="radio"/>
Soziale Medien (z.B. Whatsapp, Facebook)	<input type="radio"/>
Anzeige auf Website	<input type="radio"/>
Sonstiges (bitte angeben):	<input type="radio"/>
<input type="text"/>	

Welchem Geschlecht fühlen Sie sich zugehörig?

männlich	<input type="radio"/>
weiblich	<input type="radio"/>
keine Angabe	<input type="radio"/>

Wie alt sind Sie?

18 - 25

☐

26 - 35

☐

36 - 45

☐

46 - 65

☐

>65

☐

keine Angabe

☐

Zu welchem Gewerk zählt Ihr Betrieb?

Maurer & Betonbauer

☐

Zimmerer

☐

Dachdecker

☐

Straßenbauer

☐

Gerüstbauer

☐

Maler & Lackierer

☐

Klempner

☐

Installateur & Heizungsbauer (SHK)

☐

Elektrotechniker (Elektroinstallateure, Elektromechaniker...)

☐

Tischler

☐

Raumausstatter

☐

Glaser

☐

Fliesen-, Platten und Mosaikleger

☐

Stuckateure

☐

Sonstige (bitte angeben):

☐

Wie viele Vollzeitbeschäftigte arbeiten in Ihrem Betrieb (inklusive Ihnen selbst)?

1	<input type="radio"/>
2 - 4	<input type="radio"/>
5 - 9	<input type="radio"/>
10 - 19	<input type="radio"/>
20 - 49	<input type="radio"/>
50 und mehr	<input type="radio"/>
keine Angabe	<input type="radio"/>

Welche der folgenden Bezeichnungen beschreiben Ihre Rolle im Betrieb am besten? (Mehrfachauswahl möglich)

Geschäftsführer/Firmeninhaber	<input type="checkbox"/>
Meister	<input type="checkbox"/>
Geselle	<input type="checkbox"/>
Lehrling	<input type="checkbox"/>
Mitarbeiter in der Verwaltung	<input type="checkbox"/>
keine Angabe	<input type="checkbox"/>
Sonstiges (bitte angeben):	<input type="checkbox"/>

Sind Sie in Ihrer Position mit dem Einkauf von Gebrauchs- & Verbrauchsmaterialien (=alles was Sie auf der Baustelle verbauen und alles was Sie dazu benötigen) betraut?

ja

☐

nein, nicht direkt. Ich weiß aber über die Einkaufsabläufe im Betrieb Bescheid

☐

nein, gar nicht

☐

Gibt es den Fall, dass Ihre Kunden das Material selbst beschaffen?

ja, oft

☐

ja, manchmal

☐

ja, selten

☐

nein

☐

keine Angabe

☐

Welches Einkaufsvolumen für Gebrauchs- & Verbrauchsmaterialien hat Ihr Betrieb jährlich?

0 - 50.000 €

☐

50.001 - 100.000 €

☐

100.001 - 500.000 €

☐

500.001 - 1.000.000 €

☐

1.000.001 - 5.000.000 €

☐

5.000.000 € und mehr

☐

keine Angabe

☐

Welche der folgenden Einkaufswege haben Sie für Gebrauchs- & Verbrauchsgüter **innerhalb der letzten 5 Jahre mindestens einmal** benutzt? (Bitte alle zutreffenden ankreuzen)

Fahrt zum Händler/Hersteller ins Geschäft vor Ort	<input type="checkbox"/>
Bestellformular (postalisch/als Brief)	<input type="checkbox"/>
Telefon (z.B. Innendienstmitarbeiter)	<input type="checkbox"/>
Außendienstmitarbeiter	<input type="checkbox"/>
Fax	<input type="checkbox"/>
E-Mail	<input type="checkbox"/>
Whatsapp und andere soziale Medien	<input type="checkbox"/>
Digitale Schnittstelle zum Händler/Hersteller	<input type="checkbox"/>
Onlineshop von Händler/Hersteller	<input type="checkbox"/>
Onlineshop Dritter (z.B. ebay, Bausep etc.)	<input type="checkbox"/>
Sonstige:	<input type="checkbox"/>

Wie viele Bestellungen für Gebrauchs- & Verbrauchsgüter tätigen Sie **in einem durchschnittlichen Monat des letzten Jahres** über die jeweiligen Einkaufswege? (Bitte Anzahl je Monat über Schieberegler anwählen)

0

60

Fahrt zum Händler/Hersteller ins Geschäft vor Ort

0



Bestellformular (postalisch/als Brief)



Telefon (z.B. Innendienstmitarbeiter)



Außendienstmitarbeiter



Fax



E-Mail



Whatsapp und andere soziale Medien

A horizontal scale bar consisting of a light gray line with a solid blue circle at the left end, representing a starting point or zero value.

Digitale Schnittstelle zum Händler/Hersteller

A horizontal scale bar consisting of a light gray line with a solid blue circle at the left end, representing a starting point or zero value.

Onlineshop von Händler/Hersteller

A horizontal scale bar consisting of a light gray line with a solid blue circle at the left end, representing a starting point or zero value.

Onlineshop Dritter (z.B. ebay, Bausep etc.)

A horizontal scale bar consisting of a light gray line with a solid blue circle at the left end, representing a starting point or zero value.

Sonstige:

A rectangular text input field with a thin gray border, intended for additional information.A horizontal scale bar consisting of a light gray line with a solid blue circle at the left end, representing a starting point or zero value.

Wie viele Bestellungen für Gebrauchs- & Verbrauchsgüter tätigen Sie **in einem durchschnittlichen Monat des letzten Jahres** über die jeweiligen Einkaufswege? (Bitte Anzahl je Monat über Schieberegler anwählen)

0

60

In einem durchschnittlichen Monat: Wie viele Bestellungen von Gebrauchs- & Verbrauchsgütern tätigen Sie über die jeweiligen Kanäle? (Bitte über Schieberegler anwählen)

0

60

Hersteller



Großhändler



Einzelhändler



Sonstige (bitte angeben):



Wie viele km ist ihr nächstgelegener Fachhändler (den Sie nutzen könnten) entfernt?

0 - 10 km

☐

10 - 20 km

☐

20 - 50 km

☐

mehr als 50 km

☐

keine Angabe

☐

Ihr Marktumfeld (Wettbewerber, Lieferanten...)

ist stabil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	volatil
ist sicher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	unsicher
ändert sich schnell	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	langsam

Privat: Wie viele Online Einkäufe tätigen Sie durchschnittlich im Monat?

keine	<input type="radio"/>
1 - 2	<input type="radio"/>
3 - 5	<input type="radio"/>
mehr als 5	<input type="radio"/>
keine Angabe	<input type="radio"/>

Welche der folgenden IT Instrumente nutzen Sie in Ihrem Betrieb?
(Mehrfachauswahl möglich)

Betrieb hat eine Website	<input type="checkbox"/>
Jeder Mitarbeiter hat eine eigene E-Mail Adresse	<input type="checkbox"/>
Betriebliche Prozesse (z.B. Digitale Abrechnungssysteme)	<input type="checkbox"/>
Sonstige (bitte angeben):	<input type="checkbox"/>
<input type="text"/>	
keine der hier angegebenen	<input type="checkbox"/>

Welche Schwierigkeiten haben oder sehen Sie bei der Online
Bestellung/Systemschnittstelle zum Händler?
(Bitte alle zutreffenden ankreuzen)

Bestellung falscher Artikel

☐

Zu teure Preise

☐

Keine (zusätzlichen Rabatte) von Außen-/Innendienstmitarbeitern

☐

Die Bestellung kann verloren gehen

☐

Ich erhalte die Lieferung später als bei anderen Bestellwegen

☐

Mir ist der persönliche Kontakt wichtig

☐

Sonstiges (bitte angeben):

☐

Was müsste passieren, damit Sie Gebrauchs- & Verbrauchsgüter online bestellen?

(Bitte alle zutreffenden ankreuzen)

Mein Händler müsste eine Online-Bestellung anbieten

☐

Einfachere Bedienbarkeit

☐

Volle Integration von Bauplanungs- und Materialbeschaffungsprozessen (z.B. in einem integrierten Online- oder Softwaretool)

☐

Vollständiges Sortiment müsste verfügbar sein

☐

Erweiterte Funktionalitäten (z.B. elektronische Rechnungen, Status von Bestellungen und Lieferungen, Echtzeittransparenz von Lieferungen etc.)

☐

Günstigere Preise als Bestellung auf traditionelle Weise

☐

Sonstiges (bitte angeben):

☐

In welchem Gebiet liegt Ihr Betrieb? (Postleitzahl oder Landkreis)

Bitte klicken Sie auf den Pfeil unten um die Umfrage zu beenden.



Vielen Dank, dass Sie an der Umfrage teilgenommen haben!

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