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# The impact of digital transformation on salespeople

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# The impact of digital transformation on salespeople: an empirical investigation using the JD-R model

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**ABSTRACT**

Many firms are engaging in the digital transformation (DT) of their sales forces, and this trend has accelerated during the COVID-19 pandemic. However, research on DT as a profound organizational change process, as well as salespeople's individual psychological reactions to such initiatives, is still limited. Although DT offers salespeople more and better resources for work-related goal attainment, it increases job demands and typically generates high uncertainty, which companies must then manage. We draw on job demands-resources (JD-R) theory to account for these bright and dark side effects simultaneously. We analyze the direct, mediated, and moderated effects of uncertainty reduction initiatives (resources) and excessive workload (demands) on the perceived usefulness of DT (i.e. salespeople's motivation to embrace it), the stress it generates, and the ultimate success of DT integration. In doing so, we shed light on the complex pattern of relationships that characterizes salespeople's psychological reactions to DT. Using DT context-specific constructs, we test our model and hypotheses on a sample of 144 salespeople of a firm engaged in DT. Our results fill several gaps in the technology in sales, DT, and JD-R literatures, and we provide managers with several guidelines to better manage DT in sales.

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Digital transformation; implementation; JD-R model; salespeople; psychological responses

Digital transformation (hereinafter, DT) is currently a top priority in 87% of companies, and 67% of executives say that to stay competitive, their firm must become significantly more digitalized (Connealy Weber and Hanrahan 2017). However, 70% of DT initiatives fail (Hatami et al. 2018). These trends hold true for sales organizations as well (Guenzi and Habel 2020).

Since the COVID-19 pandemic, we have witnessed an unprecedented acceleration in adoption of new technologies and digital channels for interacting with customers. According to McKinsey (Gavin et al. 2020), at the start of the pandemic, more than 90% of business-to-business (B2B) sales organizations almost immediately moved to remote selling, working via videoconferencing or phone. Interestingly, the majority (54%) of companies think that the virtual sales model is as effective as, or more so than, the traditional face-to-face selling model for reaching and serving customers. However, although these remote selling options were widely available before the COVID-19 crisis, many sales organizations did not use them to their full potential. The recent acceleration in DT use thus suggests that its slow pre-pandemic adoption was not caused by technological impediments, but rather by individual-level resistance.

Our understanding of salespeople's reactions to DT initiatives is still extremely limited and the literature on DT in sales shows several important limitations. First, although a vast literature on technologies in sales exists, these studies generally focus on a particular technology or application and mainly use a technology adoption perspective. Thus, this body of literature does not capture the essence of DT as a fundamental change management process and the profound uncertainty that sales employees must confront during the transition. Compared with the adoption of a single technology, DT is more encompassing, involving deeper individual psychological reactions (Schwarzmüller et al. 2018) and necessitating a broad set of managerial actions to respond to these reactions and, more specifically, to reduce salespeople's perceived uncertainty. However, most studies to date have not investigated such psychological reactions and have focused only on training and technical support as key organizational drivers of adoption. Second, extant literature tends to stress only the benefits of the technology, ignoring the fact that DT entails both a bright and a dark side for sales employees (Trittin-Ulbrich et al. 2021): on the one hand, it offers new goal achievement opportunities (e.g. better management of information, simplification of processes, more effective tools for customer engagement), but on the other, it is usually accompanied by greater job demands (e.g. the need to adopt new working methods, learn to use new technologies, develop new skills). This ambivalent nature of DT has positive and negative psychological consequences for salespeople that have been almost entirely overlooked in the extant literature (Romàn, Rodríguez, and Jaramillo 2018). Finally, the DT literature has mainly focused on the organizational, rather than individual, level (Hausberg et al. 2019; Vial 2019). As mentioned

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previously, to understand inhibitors to success, the individual level must be analyzed and included as well.

Therefore, the objective of our research is to study DT as an organizational change process that has a major influence on sales individuals, using job demands-resources (JD-R) theory to model the bright- and dark-side effects of DT in sales on individual-level DT integration. JD-R theory argues that perceived job demands and resources stemming from organizational change will have important psychological consequences for employees in terms of energy depletion and enhancement processes, which ultimately will affect employee performance. Thus, it is well suited to serve as a framework for analyzing both the motivational (positive) and stressful (negative) consequences of individual salespeople's perceptions of increased demands as well as an organization's provision of resources to introduce DT to its sales department.

Our study makes three important contributions to both sales and DT literatures. First, we extend prior technology and sales literature by viewing DT as a change process, moving beyond adoption of single technologies or tools (Hunter 2019). Our study thus extends the conceptualization of managerial actions from merely technical and organizational support for a unique technology or application to broader uncertainty reduction initiatives. Uncertainty typically accompanies change management (Bordia et al. 2004; Wisse and Sleebos 2016) such as DT. In particular, the multiplicity of potential technologies available and their rapid obsolescence fuel uncertainty about the change and its impact. Guenzi and Habel (2020) confirm that, in the sales context, DT projects typically involve perceived uncertainty on what should be transformed, why and how. Hence, we define uncertainty reduction initiatives as organizational interventions that act as facilitating conditions to overcome risk perceptions surrounding the introduction of a set of digital tools and the redesign of processes and procedures that accompany such systemic change. Examples of uncertainty reduction initiatives for DT projects are an in-depth analysis of the starting situation and involvement of salespeople in the design of the DT project, management's systematic listening to employees throughout the implementation process, a clear understanding of the drivers of salesperson performance before and after DT design and implementation, and the consistency between key performance indicators and the modifications in the activities requested to achieve goals (Chappuis et al. 2018) Second, we extend the literature on DT in sales by advancing the JD-R model as an integrative theoretical framework to simultaneously investigate both positive and negative psychological reactions to DT (Grewal et al. 2020). We view digitalization as not only an extension of organizational resources that can help salespeople achieve their goals, but also a driver of new job demands. Using the JD-R model helps extend the DT management literature, which has mainly focused on the organizational level and paid little attention to the individual. JD-R offers a comprehensive and more balanced perspective on the topic by accounting for both the DT-related benefits and new job demands for individual members of the sales force. Third, our study adds to the JD-R literature by contextualizing all JD-R constructs to the DT context and testing the JD-R model within a DT-related sales context. It provides further evidence of the model's applicability across research settings and thus its generalizability. We also contribute by addressing direct and mediating relationships in our model. By specifically focusing on moderating effects of DT hindrance demands and uncertainty reduction resources, we add to the debate on ambiguous results of prior studies.

This article is organized as follows. First, we provide theoretical background to investigate DT in sales by reviewing the literature and highlighting our focus on change management and the JD-R model. Second, we explain the choice of constructs in our model and their contextualization to DT in sales. Third, we present our model and develop our hypotheses. We continue with a discussion of our methods and then present and discuss our findings. We close with theoretical and managerial implications and point to limitations and suggestions for future research.

## Theoretical background

### *Literature review*

In their extensive review of the literature, Morakanyane, Grace, and O'Reilly (2017, 2) note that DT is a nascent area: 'There are indications of an immature literature landscape coupled with a limited understanding of the phenomenon'. The situation extends to the sales domain as well. Extant research has a strong focus on DT in the context of marketing strategies and managing relationships with end consumers or interorganizational partnerships, but studies investigating DT's impact on selling, sales force management, and salespeople are still limited (Hofacker et al. 2020; exceptions include Guenzi and Habel 2020; Singh et al. 2019).

Most studies on technology and sales focus on adoption or impact of a single, specific digital technology or application rather than DT as a process. This literature includes research focusing on technology impact on salespeople's jobs (e.g. artificial intelligence: Luo et al. 2021; Paschen, Wilson, and Ferreira 2020; social media: Agnihotri 2020; Bill, Feurer, and Klarmann 2020), salesperson–customer interaction (e.g. digitally enabled face-to-face interactions: Bharadwaj and Shipley 2020; e-negotiations: Singh, Marinova, and Singh 2020), and customers' reactions to digital technologies/tools (e.g. sales configurators and digital sales force automation tools: Mahlamäki et al. 2020). However, the literatures on sales enablement (Peterson and Dover 2021), omnichannel marketing (e.g. Hansen and Sia 2015), digital marketing capabilities and strategy (e.g. Herhausen et al. 2020), and digital transformation in general (e.g. Cennamo et al. 2020) clearly point out that such a piecemeal approach fails to recognize the fundamental nature and pervasive impact of digitalization as an overall organization-wide transformation. In contrast to a single digital technology, DT involves the redesign of roles, processes, working methods, and so on. Often accompanied by the simultaneous introduction of agile working methods (Edelman, Heller, and Spittaels 2016), which modify employees' working routines, DT

implementations substantially differ from the mere adoption of any single new technology (Kalaignanam et al. 2021).

Table 1 summarizes illustrative examples of studies focusing on three specific digital technologies: sales force automation (SFA), customer relationship management (CRM), and social media. In addition to focusing on a single technology, these studies have limitations that give rise to three important knowledge gaps.

First, they mainly analyze salesperson behaviors (adoption or use of the technology) and do not focus on employees' psychological reactions. In their recent extensive review of 129 articles published in the past 20 years, Herhausen et al. (2020) show that less than 3% of published papers about digital marketing capabilities focus on employees' relationship with these capabilities. Similarly, Morakanyane, Grace, and O'Reilly (2017) note that of all areas impacted by DT, employees are the most under-researched.

Second, extant studies analyze a limited set of managerial drivers of salespeople's adoption of such individual technologies, typically training and technical support (e.g. Schillewaert et al. 2005). In contrast, much less attention has been devoted to how managerial actions affect psychological reactions, particularly those reducing the uncertainty that typically accompanies change management initiatives like DT.

Third, these studies exhibit a substantial lack of consideration of both positive and negative aspects of DT on individual salespeople's psychological reactions to DT and the related consequences. As in the DT management literature, scholars' view on this topic has been overly positive. However, as Grewal et al. (2020) note, adoption of new technologies has both benefits and costs. These authors stress the importance of accounting for the influence of new technologies on employees' well-being in future research, thus calling for using a more balanced perspective to develop models that better account for these positive and negative dimensions.

## Change management and JD-R theory

To fill these knowledge gaps, we draw on the change management perspective and JD-R theory. This perspective involves viewing DT as a holistic phenomenon that, in introducing a multitude of new tools and procedures, substantially modifies salespersons' everyday tasks and routines, as exemplified by the fact that 74% of employees report that DT has modified their life (Salesforce 2018) and even offers potential for disintermediation (Ahearne and Rapp 2010). DT modifies roles, structures, procedures, and systems, which calls for a better understanding of how individual sales force members respond to it, as well as the consequences of these reactions for the individual (Morakanyane, Grace, and O'Reilly 2017). Considering DT as a form of technology-centered change management in an organization is useful for two main reasons. First, it draws attention to the fact that change can have both positive and negative consequences (i.e. a bright and a dark side, in our terminology) for employees, depending on their subjective perceptions and related psychological reactions (Oreg et al. 2018). This is important, because extant studies in the literature on technology in sales usually investigate either positive or negative reactions (e.g. the literature on technostress such as Ragu-Nathan et al. 2008), but not both effects simultaneously. Second, the change management perspective stresses that such individual responses largely depend on employees' perceptions about organizational interventions that support and facilitate the transition (e.g. Claret, Mauger, and Roegner 2006). This research highlights the importance of uncertainty reduction initiatives for any successful implementation or change (Bordia et al. 2004). In fact, employees' limited adoption of digital technologies is the most relevant barrier to the success of DT initiatives (Blazejewski and Walker 2018; InformationAge.com 2020), and among the most relevant concerns deterring employees are uncertainty-related variables like fear of change, unclear communication and uncertainty about required digital skills, fear of losing flexibility in performing tasks, and concerns about job elimination (Salesforce 2018). So, at the employee level, 'the new digital technologies provide possibilities to improve working conditions on the one hand but also evoke new forms of stress on the other hand' (Blazejewski and Walker 2018, 79). The managerial literature suggests that companies should not only focus on digital technologies per se, but rather create several facilitating conditions to support the successful adoption of DT by their employees (InformationAge.com 2020; Westerman, Bonnet, and McAfee 2014) and help mitigate potential downturns that can result from employees' perceptions of workplace effort–reward imbalance. DT incorporates a dark side, for example in terms of technostress, defined as a 'modern disease of adaptation caused by an inability to cope with the new computer technologies in a healthy manner' (Brod 1984, 16). Technostress occurs especially in response to information and communication technology (ICT)–driven work changes (Ragu-Nathan et al. 2008), like those caused by DT. Several managerial interventions can be designed to counterbalance the impact of these stressors on ICT users (Ragu-Nathan et al. 2008). Using the lens of person–environment fit theory (Edwards 1996), it can be argued that the outcomes of a DT project will be the result of how individuals react to such managerial interventions. Such perceptions and responses, including individual differences, can be holistically and parsimoniously investigated using the JD-R model.

The JD-R model is consistent with and complements the aforementioned aspects of change management. It helps account for positive and negative psychological responses of salespeople to DT projects in their company, while also facilitating discovery of DT's drivers and consequences. JD-R theory incorporates four broad categories of constructs that predict employee job outcomes: demands, resources, strain, and engagement (e.g. Bakker, Van Veldhoven, and Xanthopoulou 2010). The theory posits that demands are the main drivers of strain, with resources operating to reduce strain and serving as a buffer of the negative effects of demands. At the same time, appropriate resources are the most important influencers of engagement, with demands acting to reduce engagement while also enhancing the positive effects of resources (Bakker and Demerouti 2007). Strain and engagement, in turn, exert negative and positive effects on job outcomes, respectively.

**Table 1.** Review of key studies on digital technologies in sales.

| Focal technology | Source | Focal construct (B = Behavioral; P = Psychological) | Focal psychological construct (+ = Positive; − = Negative) | Managerial/ organizational drivers | Consequences: positive / negative |
|---|---|---|---|---|---|
| CRM | Ahearne, Hughes, and Schillewaert (2007)* | IT acceptance (P) | IT acceptance (+) | None | Positive only (e.g. call productivity, job performance) |
| | Avlonitis and Panagopoulos (2005)* | CRM acceptance (P) | CRM perceived usefulness, ease of use, acceptance (+) | Training, User participation in decision making, Clear communication of expectations | Positive only (CRM user satisfaction, sales performance) |
| | Raman, Wittman, and Rauseo (2006)* | CRM implementation (B) | None | Business process orientation, Organizational learning, Customer centricity, Task-technology fit | None |
| | Rodriguez, Peterson, and Krishnan (2018)* | CRM effectiveness (P) | CRM effectiveness (+) | None | Positive only (opportunity creation, opportunity management, relationship management) |
| | Suoniemi et al. (2021)* | CRM system quality (P) | None | Firm-level IT capability (e.g. IT infrastructure) and CRM system capability (e.g. training resources, user involvement) | Positive only (e.g. organizational productivity gains) |
| Social media | Agnihotri et al. (2016)* | Social media use (B) | None | None | Positive only (e.g. adaptive selling, Sales performance) |
| | Bill, Feurer, and Klarmann (2020) | Social media use (B) | Perceived usefulness and ease of use (+) | Training and Support | Positive only (customer loyalty) |
| | Guenzi and Nijssen (2020) | Social media use (B) | Perceived social media usefulness (+) | Organizational support (technical support and training) | Positive (sales performance) and negative (distraction) |
| | Itani et al. (2017)* | Social media use (B) | Attitude toward social media usefulness (+) | None | Positive only (e.g. responsiveness, sales performance) |
| | Moore et al. (2015)* | Social media use (B) | None | None | None |
| | Ogilvie et al. (2018)* | Social media use (B) | None | None | Positive only (e.g. adaptability, relationship performance, goal achievement) |
| | Rodriguez et al. (2016)* | Social media use (B) | None | Upper management support | Positive only (e.g. relationship performance) |
| | Trainor et al. (2014)* | Social media use (B) | None | None | Positive only (e.g. relationship performance, sales performance) |
| SFA | Ahearne, Jelinek, and Rapp (2005)* | SFA usage (B) | None | Technical Support, training | Positive only (effectiveness, efficiency) |
| | Baker and Delpechitre (2013) | SFA use (B) | Performance expectation (+) | Facilitating conditions (resources, knowledge, assistance) | None |
| | Buehrer, Senecal and Bolman Pullins (2005)* | SFA usage (B) | Perceived usefulness (+), Reluctance to change (−) | Technical support, training, management support | Positive only (e.g. productivity, time saving, better communication with customers) |
| | Cascio, Mariadoss, and Mouri (2010)* | SFA adoption (B) | None | Management commitment, Technical support, Training | None |
| | Cho and Chung (2008)* | SFA innovation resistance (P) | SFA innovation resistance (−) | Peer usage | None |
| | Holloway, Deitz, and Hansen (2013)* | SFA usage (B) | SFA ease of use (+) | None | Positive only (e.g. relationship performance, sales performance) |
| | Mariadoss et al. (2014)* | SFA use (B) | None | Technical support, training | Positive only (e.g. competitive intelligence behaviors, sales performance) |
| | Park et al. (2010)* | SFA usage (B) | None | None | Positive only (e.g. adaptive selling, relationship quality, Sales performance) |
| | Rangarajan, Jones, and Chin (2005) | SFA infusion (B) | Perceived usefulness (+), Role stress (−) | None | None |
| **Conclusions** | | | | | |
| All studies focus on a single technology/ application | | Most studies focus on behavioral rather than psychological constructs | Almost no study investigates both positive and negative psychological constructs | Most studies do not investigate any managerial aspect at all. The few studies doing so mainly analyze technical support and training, with no focus on uncertainty reduction | Almost no study investigates both positive and negative aspects of DT |

*Note: The full list of articles included in this review of literature is not reported in the References of this article but can be provided by the authors upon request.

**Table 2.** Review of key JD-R studies in sales.

| Study | Resources | Demands | Strain | Engagement | Job Performance | Notes |
|---|---|---|---|---|---|---|
| Allison et al. (2016) | Brand attachment | Job codification and hierarchy of authority | Job stress | Brand selling effort | Job satisfaction | No testing of relationship between resources and demands; no testing of partial mediation effects; challenge demands not included |
| Beeler et al. (2020)* | Organizational identification, Friend-selling Network size | Friend-selling frequency | Friend-selling role conflict and role ambiguity | Absent | Sales performance, turnover intentions, customer acquisition, trustworthiness | No testing of relationship between resources and demands; engagement not included, hence no testing of crossover effects; no testing of partial mediation effects |
| Christ Brendemuhl, and Scaarschmidt (2020)* | Optimism toward technology | Technology-induced role overload and role ambiguity | Technostress | Absent | Customer satisfaction, Customer delight, WOM intention | No testing of relationship between resources and demands; engagement not included, hence no testing of crossover effects; no testing of partial mediation effects |
| Kuester and Rauch (2016) | Absent | Assigned and self-set market intelligence activities goals | Role ambiguity and role conflict | Market intelligence generation and dissemination | Market intelligence use, innovation performance | No testing of crossover effects; no testing of interaction effects; no testing of partial mediation effects; resources not included; demands conceptualized as simultaneously hindrance and challenge |
| Matthews et al. (2018)* | Autonomy to create value, Experience, Selling Time, Customer Orientation | Autonomy to appropriate value | Emotional exhaustion, depersonalization, personal accomplishment) | Absent | Absent | No testing of relationship between resources and demands; engagement not included, hence no testing of crossover effects; no testing of partial mediation effects |
| Miao and Evans (2013) | Capability control | Outcome control, activity control | Role ambiguity, role conflict | Adaptive selling behavior, Selling effort | Salesperson performance | No testing of relationship between resources and demands; no testing of impact of resources on strain and engagement; no testing of crossover effects; no testing of partial mediation effects; hindrance demands not included |

*Note: The full list of articles included in this review of literature is not reported in the References of this article but can be provided by the authors upon request.

As Table 2 shows, the JD-R perspective has been applied to sales settings to a limited extent, and has never been applied to DT in sales. Most studies only partially test the JD-R model, that is, some studies leave out constructs while others omit for example crossover, interaction, and/or mediation effects. Our aim is to apply JD-R to DT and account for all the model's relationships.

We use the JD-R model to study the impact of salespeople's perceptions of DT on the degree to which they integrate the DT-related digital tools in their sales jobs. DT can provide salespeople more and better resources for work-related goals attainment (and their related positive, motivational consequences), on the one hand, but may increase their job demands (and the related negative, stressful consequences), on the other. The JD-R framework thus highlights both positive and negative individual-level psychological reactions to the DT and the role of subjective interpretations of job-related benefits and demands stemming from the DT (Demerouti et al. 2001). Like previous studies, we select and use context-specific constructs.

## Conceptualization of JD-R constructs in the DT context

While the key advantages of the JD-R theory are its flexibility and parsimony, the lack of specificity is its biggest weakness (Crawford, LePine, and Rich 2010). To select the variables for our JD-R constructs in the context of DT, we follow three guiding principles: The constructs should be (1) specific to the DT context and focused on the individual salesperson's perceptions about the resources and demands offered to and placed on them by their organization, as recommended by Crawford, LePine, and Rich (2010); (2) rooted in literature; and (3) consistent with their general definition in the JD-R literature.

*Perceived DT-related resources.*[1] In our context, we conceptualize perceived DT-related resources as uncertainty reduction initiatives, which we define as salespeople's perceptions of organizational factors that act as facilitating conditions to support DT implementation at the salesperson level and therefore help reduce the perceived risks associated with DT initiatives. The theoretical foundation for this construct is the literature on the motivational role of uncertainty reduction (e.g. Sullivan 1988; Zorn and Ruccio 1998). Uncertainty can be reduced, for example, by organizational practices that support employee participation in decision making and systems to encourage employee feedback (Subramony 2009). These DT-related practices are consistent with those suggested by uncertainty management theory (Lind and van den Boos 2002) and the academic literature on change management in general (e.g. Neves, Almeida, and Velez 2018). Sales literature also generally recognizes these practices as effective ways to reduce employee uncertainty, albeit not specifically for DT projects (see, e.g. Claret, Mauger, and Roegner 2006; Hurley 1998). According to the literature

on organizational change (Whelan-Berry and Somerville, 2010), several change drivers enable the individual employee's psychological acceptance and behavioral adoption of change throughout the entire change process. Such drivers include an accepted change vision (change is seen as positive by employees as long as they perceive that it is made in their interest), change related employee participation (employees perceive that they are allowed to exert some influence on change), aligned performance appraisal and reward systems (signaling management understanding of the impact of change on individuals' behaviors and outcomes), aligned planning and control processes (which increase perceptions that the implementation of change will be facilitated), and change-related ongoing two-way communication (to regularly address employees' questions and concerns, ensuring that any obstacles are properly identified and removed).

All these drivers help reduce the employees' perceived DT-related uncertainty and risk. To exemplify, change related employee participation can be fostered by involving salespeople in the design of the DT and then continuously stimulating their feedback throughout the DT implementation. This will reduce salespeople's perceptions of the risk that the company will omit aspects of DT design and implementation that may be relevant for them, as well as that DT will be designed based on a limited or wrong understanding of its impact on the everyday job routines of the sales force. Similarly, aligning performance appraisal and reward systems to the DT will reduce uncertainty, since it will reduce salespeople's perceived risk of inconsistencies between the impact of DT on their work (including some unintended negative impacts) and the (re) design of sales force control systems and performance evaluation criteria.

*DT-related demands*. We conceptualize DT-related demands as excessive workload, which we define as an individual salesperson's subjective assessment of the specific extra job requirements imposed by the introduction of DT in the organization. These stressful demands can thwart personal goal attainment (Crawford, LePine, and Rich 2010) and thus represent 'hindrance demands'[2] (Cavanaugh et al. 2000). This interpretation is consistent with the growing stream of work on DT and technostress (e.g. Salanova, Llorens, and Cifre 2013; Schwarzmüller et al. 2018; Tarafdar et al. 2011) that suggests that excessive workload characterizes DT initiatives. Guenzi and Habel (2020) also note that DT projects in sales usually increase salespeople's workload, as members of the sales force are asked to do new things (e.g. extra data collection and analysis), must take more time to satisfy needs for higher personalization to customer needs, and provide enhanced services to customers. In addition to performing new tasks, salespeople must spend extra time and energy to learn new procedures and technologies, as well as how to integrate these new and old activities.

*DT-related stress.*The DT-related stress construct refers to the individual salesperson's perceptions and feelings about stressful implications of DT projects, including the physical, cognitive, and emotional exhaustion (e.g. Demerouti et al. 2001) associated with specific job demands/tasks. Related to this, many studies that apply the JD-R model to salespeople (see, e.g. Kuester and Rauch 2016; Miao and Evans 2013; Rangarajan, Jones, and Chin 2005; Zablah et al. 2012) conceptualize this strain as a combination of a person's perceptions of role conflict, defined as the degree of incongruity or incompatibility of expectations communicated to salespeople from various organization members (Michaels, Day, and Joachimsthaler 1987), and lack of self-efficacy (i.e. perceived gaps in knowledge and ability) about how to properly use new technologies (Tarafdar et al. 2011). However, we also include fear of being replaced by the technology as part of this stress construct. Unlike the simple adoption of salesperson-centric/focused technologies (Ahearne and Rapp 2010) such as social media, CRM, and SFA, DT offers the potential for disintermediation. Hence, stress for salespeople involved in DT initiatives stems from fear of potentially losing one's job and not possessing adequate knowledge to work with the new technology, as well as from the new plethora of customer-facing and internal (cross-functional) processes –modified with different goals in mind—that increases perceive role conflict (Guenzi and Habel 2020). Salespeople must not only learn how to use these new technologies but also develop new routines and procedures and do extra activities.

*DT-related motivation*. Whereas in general motivation refers to a salesperson's level of investment in a specific task or set of tasks (Demerouti et al. 2001), in our context, it refers to how useful the salesperson perceives the related digital technology for achieving work-related goals. Thus, we conceptualize DT-related motivation as DT usefulness, which we define as an individual salesperson's perceived benefits of DT and its technology for job-related purposes. Guenzi and Habel (2020) identify four key benefits of DT in sales: the extent to which the DT (1) increases the knowledge available to salespeople, (2) facilitates their ability to reach customers and colleagues, (3) better creates and communicates value to customers, and (4) increases speed of decision making and action thereby reducing response time. Salespeople with more perceived benefits will be more motivated to embrace and integrate DT in their job.

*DT integration*. Through integration, DT impacts sales processes (i.e. what salespeople do and how they perform these things; Guenzi and Habel 2020). This integration will depend on individual perceptions and efforts of the salesperson to make the complex set of tools of the DT work. The technology comes with functions that sales individuals interpret depending on their organizational and personal context and which users integrate in their work by ascribing meaning to it and making changes to their work routines (Blazejewski and Walker 2018). Hence, DT integration refers to the extent to which the salesperson follows the procedures, performs the tasks, and uses the proposed set of technologies as intended by the company to meet expectations regarding his or her DT-related new work role.

## Model and hypotheses

Figure 1 shows the model that we developed using JD-R for understanding individual salespeople's response to DT,

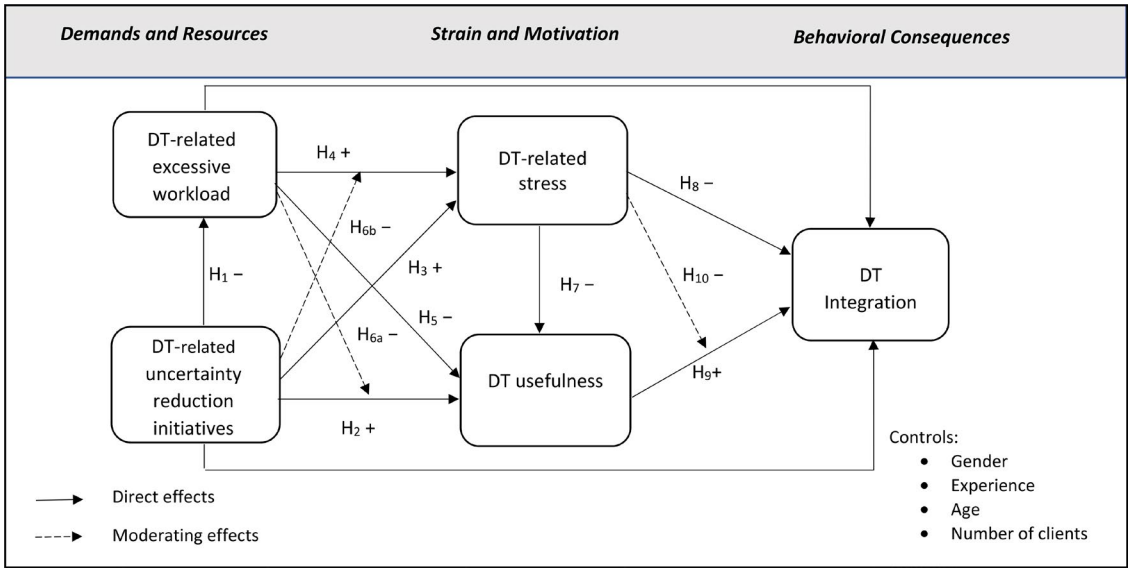


**Figure 1.** JD-R model of digital transformation in sales.

using the identified constructs. We expect DT-related uncertainty reduction initiatives to create conditions for salespeople to better achieve their work goals and thus fuel perceived DT usefulness, which in turn motivates individuals to embrace and thus integrate DT in their job. However, DT-related excessive workload leads to perceptions of DT-related stress, which acts as a barrier to integration and thus implementation of DT. Consistent with the JD-R perspective, we also posit that DT-related uncertainty reduction initiatives are negatively associated with DT-related excessive workload, and we account for the interaction between DT-related resources and DT-related demands (i.e. DT uncertainty reduction initiatives and DT-excessive workload) and its impact on the two mediating variables as well. In the following subsections, we develop our hypotheses. Because the main effects are intuitive, we particularly focus on the mediation and moderation effects.

## Main effects of demands and resources

We include the generally ignored negative relationship between resources and demands (Bakker and Demerouti 2007) in our model. Salespeople's perceptions of uncertainty reduction initiatives adopted by their organization should help mitigate perceptions of the same company imposing excessive workload, such that they may perceive the extra workload but are less likely to consider it excessive. In fact, the extra demands stemming from DT are likely to be perceived as reasonable if they are based on in-depth analysis and understanding of DT impact on salespeople's work, their involvement in change design, and consequently a proper process of goal setting and a consistent performance evaluation. Such organizational change-related practices signal procedural justice, in that they increase transparency and communicate fairness in key decision making processes regarding DT (e.g. balanced distribution of resources or work load) and quality of treatment (e.g. being listened to) (Blader and Tyler 2003), which potentially lead to perceived distributive justice as well (Rouziou 2019). Support for this hypothesis comes from work on perceived fairness in performance evaluation in high-uncertainty contexts (De Cremer and Sedikides 2004); because DT initiatives cause uncertainty, we posit that these findings apply to our context as well. Hence:

H1: Perceived DT-related uncertainty reduction initiatives reduce salespeople's perceived DT-related excessive workload.

According to JD-R theory, resources can be motivating because they are instrumental to the achievement of work goals (Bakker and Demerouti 2007). Various meta-analytic analyses (Crawford, LePine, and Rich 2010; Nahrgang, Morgeson, and Hofmann 2011) support the positive effects of organizational resources on employee engagement. During organizational change, uncertainty can undermine motivation (Bordia et al. 2004). Hence, to keep employees' motivation high, companies involved in DT should reduce uncertainty—for example, by investing in strong internal communication processes aimed at acquiring feedback from salespeople, analyzing the situation, understanding the impact of DT on salespeople, involving them to set more realistic goals and action plans, and using fair goal setting and performance evaluation. Conceptually, all such practices can help reduce uncertainty by offering transparency about how goals are set (goal-setting theory), about securing consistency between goals and resources (path-goal theory), and about fairness of performance evaluation (equity theory) (Sullivan 1988). Consistent with this perspective, we posit the company's provision of DT-related uncertainty reduction initiatives, particularly investments in internal communication processes, as a motivational driver because it reduces uncertainty surrounding DT and increases perceived DT

usefulness. We thus focus on instrumental motivation rather than, for example, meaning making or bonding actions, which may be more appropriate for other forms of motivation not investigated here (Zorn and Ruccio 1998). We hypothesize that uncertainty reduction initiatives increase a salesperson's perceptions and thus belief that DT is worthwhile and useful for achieving work-related benefits and goals. Formally:

H2: Perceived DT-related uncertainty reduction initiatives increase salespeople's perceived DT usefulness.

The JD-R literature generally supports the negative effect of resources on strain, specifically Van den Broeck et al. (2010) and Crawford, LePine, and Rich (2010) meta-analysis, which shows a significant direct effect of resources on burnout. In our specific case, we posit that the perceived provision of DT uncertainty reduction initiatives (e.g. involving salespeople, systematic analysis of the situation, gathering feedback) will increase salespeople's clarity about expected changes and responsibilities, thereby reducing role conflict (Malhotra and Ackfeldt 2016). At the same time, stress can be diminished by reducing uncertainty through the design of a new measurement, control, and performance management systems in accordance with the transformation process and its objectives, and accounting for the extra activities salespeople must engage in as a result of the DT (Colletti and Chonko 1997). Together, these DT uncertainty reduction initiatives (including increasing salesperson perception that the intention behind the DT project is to support them) signal the company's intention to invest in its sales force, thereby reducing fear of being replaced by technology. Consistent with this, we propose the following:

H3: Perceived DT-related uncertainty reduction initiatives reduce salespeople's perceived DT-related stress.

The JD-R literature in general suggests that job demands require serious psychological efforts on the part of the individual employee, which can result in negative consequences and cause strain (Bakker and Demerouti 2007). DT as a change process implies important job demands, such as greater workload, more complex tasks stemming from the availability of much more data, and the need to learn how to work with new technologies (Guenzi and Habel 2020), which have been shown to increase stress among salespeople. As several technostress studies (e.g. Ragu-Nathan et al. 2008; Salanova, Llorens, and Cifre 2013; Tarafdar et al. 2011) show, such demands fuel role conflict and thus add to job stress (Delpechitre, Black, and Farrish 2019). This is particularly the case for DT, which involves a comprehensive change process introducing digital technology that modifies cross-functional processes and working methods, thus significantly changing work relations (Blazejewski and Walker 2018). Therefore, we propose:

H4: Perceived DT-related excessive workload increases perceived DT-related stress.

Demands that are perceived as hindrances can frustrate and obscure personal goal attainment (Crawford, LePine, and Rich 2010). Focusing on DT-related demands as excessive workload characterized by an increased number, type, and complexity of tasks (e.g. Salanova, et al. 2013; Tarafdar et al. 2011), we thus anticipate a negative influence on motivation, that is, the perceived usefulness of the DT technology, again supported by Crawford, LePine, and Rich (2010) meta-analysis, among others. Therefore, we propose:

H5: Perceived DT-related excessive workload decreases perceived DT usefulness.

### *Moderating effects of DT-related demands and resources*

In addition to these main effects, JD-R theory posits that resources are most valuable when workers face demanding job conditions because they can help buffer the impact of demands on strain (Bakker and Demerouti 2007). This directly follows from the definition of job resources as a means to achieve goals and/or reduce job demands and the associated exhaustion. Particularly in the presence of higher levels of DT resources aimed at uncertainty reduction, salespeople should be better able to deal with potential feelings of stress. Some empirical support comes from Xanthopoulou et al. (2007), who observe that the effect of job demands on exhaustion is strongest for employees with limited job resources and that the effect of job resources on cynicism is particularly strong if employees experience high job demands. Some studies also show evidence of a positive interaction effect of job resources and job demands on work engagement (e.g. Bakker, Van Veldhoven, and Xanthopoulou 2010). We conclude that when confronted with high job demands, employees appreciate the presence of job resources more and thus are more motivated to use them.

However, Lesener et al. (2020) recent meta-analysis does not find support for the interaction effect of resources and demands in the JD-R model across studies, and Brough et al. (2013) find support for only 1 of 16 interactions that they tested. Ambivalent results regarding the negative moderating effect job demands on the resources–motivation relationship have been attributed to lack of attention to differentiate and account for hindering versus challenging demands: Whereas the former trigger negative emotions, the latter tend to stimulate, resulting in an increasing rather than diminishing main effect. However, because we exclusively focus on hindrance demands stemming from DT, we expect the negative moderation to hold. Using a similar logic, we anticipate uncertainty reduction initiatives will weaken the relationship between hindrance demands and strain. Hence, we posit:

H6a: The positive influence of perceived DT-related uncertainty reduction initiatives on DT perceived usefulness is stronger (weaker) when perceived DT-related excessive workload is high (low).

H6b: The positive influence of perceived DT-related excessive workload on perceived DT-related stress is weaker (stronger) when perceived DT-related uncertainty reduction initiatives are high (low).

### Main effects of DT stress and usefulness

Research confirms that stress generally decreases task performance and ultimately results in poor job performance (Nahrgang, Morgeson, and Hofmann 2011). Therefore, we anticipate that salespeople who consider DT stressful will perceive lower levels of DT usefulness and thus less motivation to adopt it compared with counterparts who consider DT less stressful. Moreover, highly stressed individuals are often cynical and thus also more likely to refrain from adoption. This stress prevents these individuals from integrating the new tools in their job in accordance with guidelines provided because it is often exactly these prescribed routines that cause the increased emotions and strain. Thus,

H7: Perceived DT-related stress decreases perceived DT usefulness.

H8: Perceived DT-related stress decreases DT integration.

Finally, and consistent with JD-R theory, we expect that engaged employees use all their physical, cognitive, and emotional energies for goal attainment and consequently perform better than their less engaged counterparts (Bakker and Demerouti 2007; Crawford, LePine, and Rich 2010). The technology adoption literature largely supports a positive pattern between perceived usefulness and use, too (Davis 1989). This means that perceived DT usefulness will lead to better DT integration because motivation provides these salespeople the energy levels necessary to deliver the desired outcome of the DT strategy and the change process management it is advocating. These motivated employees are thus more likely to integrate the new tools in accordance with proposed guidelines. Therefore, we propose:

H9: Perceived DT usefulness increases DT integration.

### Moderating effects of DT-related stress

Few JD-R studies have tested the interaction of strain and motivation variables. An exception is Kuester and Rauch (2016), who argue that salesperson strain (experiencing stress due to role ambiguity and conflict) weakens the relationship between the motivated efforts put into data collection and dissemination and the job outcome of (contribution to) innovation performance. Similarly, Obal and Morgan (2018) show that the impact of salespeople's goal-oriented motivation on their acceptance of new technologies is reduced when technological change is perceived as substantial—and thus stressful. These studies suggest that even if a salesperson thinks DT can lead to better goal achievement and thus is motivated to embrace it, this effect may be reduced by perceptions of cost such as required behavioral change, the need to learn new skills (Lyytinen and Rose 2003), and risk or fear of losing one's job (Morgan and Inks 2001). Therefore, we explore potential negative interaction between perceived DT-related stress and perceived DT usefulness on DT integration at the back end of our model. We expect perceived DT-related stress to erode the impact of perceived DT usefulness on performance. Thus:

H10: The positive effects of perceived DT usefulness on DT integration are weaker (stronger) when perceived DT-related stress is high (low).

## Research method

To operationalize our DT-contextualized JD-R constructs, we adapted existing measures wherever possible and developed new measures when necessary. The approach adopted is similar to that used in several previous studies (see, e.g. Skiba, Saini, and Friend 2019). Consistent with established scale development standards, we started from the definition and conceptualization of key constructs based on conceptual and empirical research (both academic and managerial), as well as from existing scales, when possible. We then discussed and refined items with practitioners in two separate focus groups (involving six sales managers and six salespeople from companies planning and implementing DT in sales)[3] and subsequently validated the result with four expert academics. In a final step, we performed an empirical validation. With the support of a specialized market research company, we collected data from a sample of 206 salespeople from firms engaged in DT in sales (net response rate 41.2%) and performed a confirmatory factor analysis (CFA). The CFA resulted in deletion of some items; while the measurement model fit of the model including all items was moderate (particularly high residual index; i.e. root mean square error of approximation (RMSEA) = .079), the final measurement model fit was acceptable ($\chi^2$ = 146.11, d.f. = 96; $p$ < .001, comparative fit index = .98, RMSEA = .050). Appendix B provides an overview of the study constructs and their measures, including deleted items.

The measure for DT-related excessive workload is based on Ragu-Nathan et al. (2008) and Ayyagari, Grover, and Purvis (2011). In choosing the items for DT-related uncertainty reduction initiatives, we built on Hartmann and Slapničar (2012) work by including employee voice and evaluation of the effort–outcome relationship. The items focus on management's efforts to reduce uncertainty for salespeople (i.e. involving salespeople, listening to feedback, equity, and fairness of goal setting). The measure for DT-related stress is built on Guenzi and Habel (2020) study, combining three items referring to stress related to perceived lack of knowledge, role conflict, and fear of replacement due to DT. The construct of DT usefulness is also based on Guenzi and Habel (2020). Finally, to measure integration of DT by an individual in his/her work tasks, we used three items based on Guenzi and Nijssen (2020) that focus on adopting working routines in accordance with managerial guidelines.

### Data collection procedure

To test our framework and hypotheses, we collected data from the salespeople of a leading European firm in electrical tools using an online survey with a personal invitation. The firm is a global leader in its B2B market and is very active in digitalization of its sales units worldwide. Respondents

**Table 3.** Demographics of the sample.

| Gender | (%) | Experience (years) | (%) | Age (years) | (%) | Nr. clients | (%) |
|---|---|---|---|---|---|---|---|
| Male | 88.9 | <5 | 32.6 | <30 | 15.3 | <50 | 19.4 |
| Female | 11.1 | 6–10 | 13.2 | 31–40 | 29.8 | 51–150 | 32.8 |
| | | 11–15 | 15.3 | 41–50 | 34.8 | 151–300 | 23.7 |
| | | 16–20 | 13.2 | >51 | 20.1 | >300 | 28.7 |
| | | >20 | 25.7 | | | | |

were invited and promised anonymity, and we offered a summary of the results as an incentive. Before sending out the survey, we administered the questionnaire to five sales managers to verify its wording, response formats, and clarity of instructions. Based on their feedback, we made appropriate changes to the instrument. In total, 344 salespeople were invited to participate in the study, and 147 surveys were returned. After deleting cases with missing values, we were left with 144 complete surveys for the analysis (net response rate 41.8%). Table 3 shows some descriptive characteristics of our sample. Most salespeople in our sample are male, 54.2% have 10 or more years of sales experience, and 54.9% are 41 years of age or older.

We included several control variables in the questionnaire and analyses to help ensure correct model estimation: gender, number of customers managed, experience, and age. Meta-analytic results show that age is generally negatively correlated with the adoption of innovations (Arts, Frambach, and Bijmolt 2011) and new technologies (e.g. Guenzi and Nijssen 2020). Further, experienced salespeople have more ingrained routines than less experienced counterparts and thus may be more affected by DT and its new tools. We included gender because men tend to be more engaged in technical innovations and actively try to improve their functionality (Von Hippel, Ogawa, and de Jong 2011). Finally, we controlled for the number of customers to account for the fact that some DT solutions may be geared toward better managing smaller customer portfolios and others toward managing larger ones.

## Measure validation and common method bias

To test our model, we analyzed the data in two steps. First, we validated the measurement properties of our multi-item constructs using CFA and explored the possibility of common method bias. The factor loadings of the CFA are shown in Appendix A. Each item loaded well on its respective construct with minimal cross loading (<.35). We also explored internal consistency of the constructs using average variance extracted (AVE) and composite reliabilities (CRs). The AVE for the constructs exceeded .50, and the CRs ranged from .83 for perceived DT-related stress to .93 for perceived DT-related excessive workload, indicating acceptable levels of internal consistency. We also conducted Fornell and Larcker (1981) test for discriminant validity and confirmed the discriminatory powers of the model constructs. The AVE of all constructs exceeds shared variance with other study constructs (see Table 4).

To address common method bias concerns, we used several remedies as suggested by Podsakoff et al. (2003)—for example, ensuring anonymity. To examine whether post hoc common method bias may have augmented relationships in the perceptual data collected, we examined the smallest correlation between core study constructs (Lindell and Brandt 2000). The smallest observed correlation among the model variables, which is a proxy for potential common method bias, is not significantly different from zero (−.02, n.s., between perceived DT-related excessive workload and DT integration; see Table 4). This finding further suggests little evidence that potential common method bias is a major concern.

Second, we used SmartPLS (Ringle, Wende, and Will 2005) to estimate our structural equation model. PLS requires fewer assumptions about data distribution than other covariance matrix techniques, which makes findings less sensitive to data skewness and kurtosis. It also renders stable results for small samples (Willaby et al. 2015). To test the effects and statistical significance of the hypothesized pathways in the structural model, we used the bootstrapping option with 500 samples, as generally recommended to obtain stable results. We estimated two models: one with the controls and main effects and one with the interaction effects included. We evaluated the increase in adjusted $R^2$ using F-tests and found it to be significant.

We also tested for full and partial mediation using Hayes PROCESS (2013). We tested two separate mediating pathways for the positive and negative psychological mechanisms, using all other variables as covariates, a bootstrap of 5,000 samples, and significance level of $p < .05$. The results (see Appendix B) confirm that the effect of DT excessive workload on DT integration is partially mediated. The indirect

**Table 4.** Correlations and descriptives of study constructs.

| | Mean | Std. Dev. | Composite Reliability | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.DT-related excessive workload | 5.67 | 1.94 | .90 | *.83* | | | | | | | |
| 2.DT-related uncertainty reduction initiatives | 6.03 | 1.65 | .89 | −.20** | *.78* | | | | | | |
| 3.DT-related stress | 3.78 | 1.78 | .82 | .39** | −.20** | *.78* | | | | | |
| 4.DT usefulness | 6.73 | 1.33 | .90 | −.25** | .43** | −.27** | *.83* | | | | |
| 5.DT integration | 7.46 | 1.04 | .90 | −.02 | .21** | −.24** | .33** | *.87* | | | |
| 6.Gender | 1.11 | .32 | NA | −.08 | −.04 | −.14* | −.04 | .08** | *NA* | | |
| 7.Age | 42.23 | 9.19 | NA | .09 | −.04 | .25** | −.03 | −.14* | −.27** | *NA* | |
| 7.Experience | 13.72 | 10.10 | NA | .11 | −.08 | .24** | −.04 | −.14* | −.31** | .61** | *NA* |
| 9. Ln_# clients | 4.99 | 1.13 | NA | −.12* | .12* | −.15** | .13* | .16** | .02 | .36 | −.10 |

Kendall's tau-b correlations. Numbers on the diagonal represent the square root of the AVE. NA = not applicable.
**$p < .01$; *$p < .05$ (2-tailed).

effect is via DT-related stress, and DT-related stress → DT usefulness. The direct and indirect effects cancel each other out. The impact of DT-related uncertainty reduction initiatives on DT integration is fully mediated by DT usefulness and DT-related stress, such that its total effect on DT integration is positive.

## Results

Table 5 shows the results of the PLS estimations of our JD-R-based framework. The results of Model 1 show that our model explains a fair amount of variance in our dependent variables: perceived DT-related excessive workload (18.0%), perceived DT-related stress (40.0%), DT usefulness (39.4%), and DT integration (34.6%).

Perceived DT-related uncertainty reduction initiatives are negatively related to DT-related demands (β = −.27, $p$ < .01), increase perceptions of DT usefulness (β = .52, $p$ < .01), and negatively affect perceived DT-related stress (β = −.15, $p$ < .05), in support of H1, H2, and H3. Perceived DT-related excessive workload significantly and positively impacts perceived DT-related stress, as anticipated in H4 (β = .49, $p$ < .01), and is negatively correlated with perceptions of DT usefulness. While the effect is not significant in Model 1, it is significant in Model 2 (β= −.14, n.s. and −15, $p$ < .01, respectively). We thus observe partial support for H5.

The direct effects of perceived DT-related stress and DT usefulness on DT integration are negative and positive, respectively, as we anticipated (β= −.17, β= .41, respectively, both $p$s < .01), which lends support to H7 and H8. Further, we observed a positive impact of perceived DT usefulness on DT integration (β = .48, $p$ < .01), in support of H9. Some elaboration on these effects is helpful: The direct effect from perceived DT-related excessive workload on DT integration is significant (β = .41, $p$ < .01), whereas the impact of perceived DT-related uncertainty reduction initiatives on DT integration is not (β= −.03, n.s.); hence, consistent with our PROCESS results, we can conclude that perceived DT-related stress partially mediates the impact of demands, whereas perceived DT usefulness fully mediates the effect of resources on DT integration.

To test the moderating effects, we turn to Model 2. First, adding the moderating effects contributes to significant increases in adjusted $R^2$ (see bottom of Table 5). Adding the interactions thus significantly adds to the explanation of variance in our dependent variables and is useful. Second, we can now interpret the detailed interaction effects. H6a predicted that perceived DT-related uncertainty reduction initiatives should weaken the relationship between perceived DT-related excessive workload and perceived DT-related stress; however, we find a significant positive moderating effect (β = .13, $p$ < .10) instead, rejecting H6a. A simple slope analysis (Figure 2, Panel A) shows how the relationship behaves one standard deviation above and below the mean of the predictor: Under high perceived DT-related resources, the slope of the relationship of perceived DT-related excessive workload on perceived DT stress steepens. In other words, people who perceive more DT-related uncertainty reduction initiatives experience *more*, not less, DT stress. We return to this unexpected finding in our discussion.

**Table 5.** Results of model estimates of PLS.

| | Coef. | SE | t-Value | Coef. | SE | t-Value |
|---|---|---|---|---|---|---|
| **Hypothesized effects:** | | | | | | |
| H1: DT-related uncertainty red. in's → DT-excessive workload | −.27 | (.08) | 3.29** | −.27 | (.08) | 3.28** |
| H2: DT-related uncertainty red. in's → DT usefulness | .52 | (.07) | 7.43** | .48 | (.08) | 6.29** |
| H3: DT-related uncertainty reduction in's → DT-related stress | −.15 | (.06) | 2.26* | −.15 | (.06) | 2.27* |
| H4: DT-related excessive workload → DT-related stress | .49 | (.07) | 6.96** | .46 | (.07) | 6.18** |
| H5: DT-related excessive workload → DT usefulness | −.14 | (.09) | 1.58 | −.15 | (.08) | 1.83† |
| H7: DT-related stress → DT usefulness | −.17 | (.08) | 2.12* | −.18 | (.08) | 2.33* |
| H8: DT-related stress → DT integration | −.41 | (.10) | 4.02** | −.39 | (.10) | 3.82** |
| H9: DT usefulness → DT integration | .48 | (.10) | 4.57** | .53 | (.11) | 4.90** |
| H6a: DT-related exc. workload *DT-related unc. red. in's → DT-related stress | | | | .13 | (.07) | 1.82† |
| H6b: DT-related exc. workload *DT-related unc. red. in's → DT usefulness | | | | .14 | (.07) | 1.96* |
| H10: DT usefulness * DT-related stress → DT integration | | | | −.30 | (.10) | 2.90** |
| **Control paths and variables:** | | | | | | |
| DT-related excessive workload → DT integration | .41 | (.09) | 4.57** | .39 | (.09) | 4.16** |
| DT-related uncertainty reduction in's → DT integration | −.03 | (.06) | .48 | .02 | (.06) | .26 |
| Gender → DT-related excessive workload | −.09 | (.07) | 1.34 | −.09 | (.07) | 1.37 |
| Gender → DT-related stress | −.01 | (.04) | .30 | −.02 | (.04) | .40 |
| Gender → DT usefulness | −.02 | (.04) | .57 | −.03 | (.04) | .67 |
| Gender → DT integration | .04 | (.05) | .91 | .05 | (.05) | 1.07 |
| Age → DT-related excessive workload | .17 | (.11) | 1.59 | .17 | (.11) | 1.59 |
| Age → DT-related stress | .20 | (.11) | 1.87† | .20 | (.11) | 1.86† |
| Age → DT usefulness | .05 | (.06) | .79 | .04 | (.07) | .62 |
| Age → DT integration | −.07 | (.08) | .87 | −.05 | (.07) | .72 |
| Experience → DT-related excessive workload | −.10 | (.09) | 1.03 | −.10 | (.09) | 1.03 |
| Experience → DT-related stress | .09 | (.09) | 1.01 | .07 | (.08) | .88 |
| Experience → DT usefulness | −.00 | (.07) | .03 | .03 | (.06) | .41 |
| Experience → DT integration | .02 | (.07) | .34 | −.04 | (.07) | .52 |
| #clients → DT-related excessive workload | −.31 | (.08) | 4.17** | −.31 | (.07) | 4.45** |
| #clients → DT-related stress | −.01 | (.03) | .21 | −.01 | (.04) | .32 |
| #clients → DT usefulness | −.04 | (.04) | .82 | −.04 | (.04) | .92 |
| #clients → DT integration | −.03 | (.04) | .68 | −.01 | (.04) | .25 |

$p$-values: **<.01; *<.05; †<.10 (two-tailed).

Adj $R^2$s = Model 1; Model 2 [ΔR2, F-value change, $p$-value] – DT-related excessive workload =.18, DT-related stress =.400; .413 [.016; 4.00; $p$ < .05], DT usefulness =.394; .408 [.017; 4.09; $p$ < .05] and DT integration =.346; .426 [.080; 20.00; $p$ < .01].

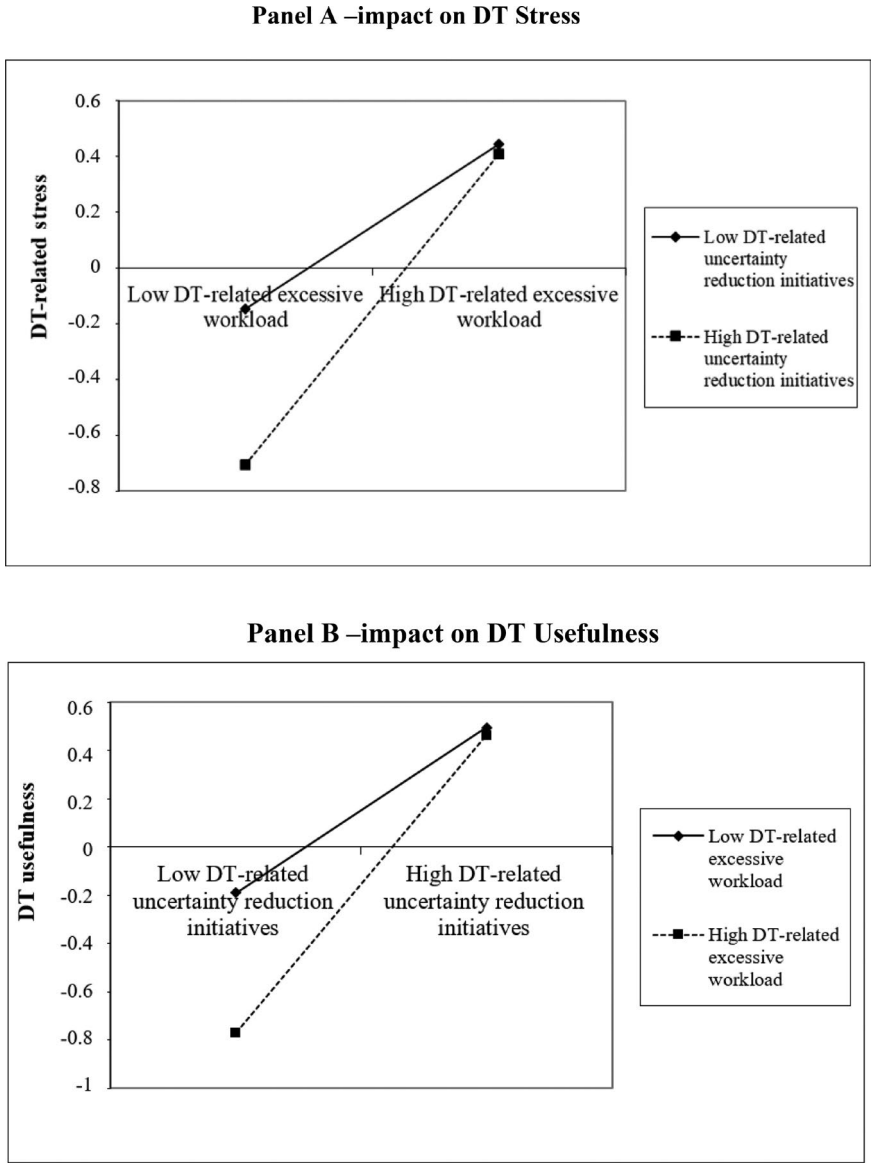


**Figure 2.** Simple slope analysis of the interaction between perceived DT-related excessive workload and DT-related uncertainty reduction initiatives.

H6b predicted that perceived DT-related excessive workload would increase the relationship between perceived DT-related uncertainty reduction initiatives and DT usefulness. Consistent with this, the results of Table 5 show a positive interaction effect ($\beta = .14$, $p < .05$). The simple slope analysis (see Figure 2, Panel B) confirms that if perceived DT-related excessive workload is high, the impact of perceived DT uncertainty reduction initiatives on perceived DT usefulness is positive and stronger than when perceived DT excessive workload is low. Therefore, the data support H6b.

Finally, H10 predicted that perceived DT-related stress would moderate the perceived DT usefulness–DT integration relationship. The results confirm this effect ($\beta = -.30$, $p < .01$). A simple slope analysis (see Figure 3) again facilitates interpretation: It confirms a modest positive effect of perceived DT usefulness on DT integration when perceived DT-related stress is high, but a very strong positive effect if perceived DT-related stress is low. Therefore, high perceived DT-related stress weakens the impact of perceived DT usefulness on DT integration.

Only two controls are significant. As expected, older salespeople seem to experience more DT stress than their younger counterparts ($\beta = .20$, $p < .10$). Further, the number of clients has a negative relationship with perceived DT-related excessive workload ($\beta = -.30$, $p < .01$). It may be that sales employees with larger numbers of customers are more accustomed to dealing with the challenges of work overload in general.

## Discussion

The purpose of this study was to use the JD-R lens to examine the individual salespeople's psychological responses to firms' DT as a technology-centered change process in sales. We focused particularly on how salespeople's perceptions of DT-related excessive workload and DT-related

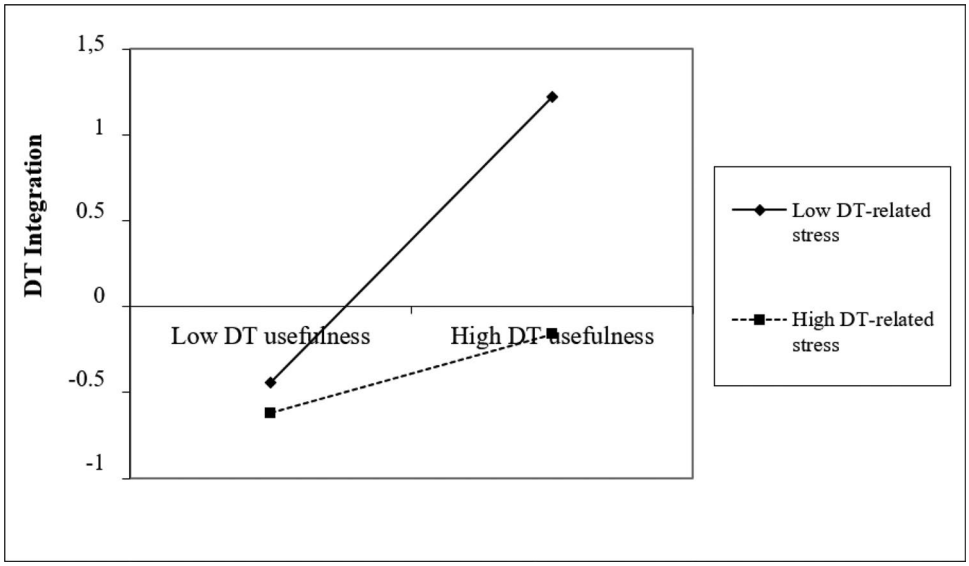


**Figure 3.** Simple slope analysis of the interaction between perceived DT-related stress and DT usefulness on DT integration.

uncertainty reduction initiatives affected their perceived DT usefulness and feelings of DT-related stress, and how these two variables, in turn, together affected the integration of DT at the individual level in accordance with firm guidelines. As predicted by the energy depletion process of the JD-R model, our empirical results confirm that perceived DT-related excessive workload is a strong predictor of perceived DT stress, which clearly and negatively impacts a sales employee's integration of DT tools in work routines and tasks. So, in contrast to the largely prevailing managerial view of DT a 'holy grail' to improve performance (Chappuis et al. 2018), we find that for employees, it is not a panacea: DT significantly fuels sales employees' work stress by creating additional job-related demands.

To reduce perceived DT-related demands, sales managers should provide their salespeople with adequate DT-related resources, in the form of DT-related uncertainty reduction initiatives. These resources can also stimulate individual sales employees' motivation to embrace (i.e. increase perceptions of usefulness, in our case) DT.

In addition to these main paths, we also found evidence for crossover effects posited by JD-R theory: Perceptions of excessive demands harm motivation, whereas DT-related perceived uncertainty reduction initiatives reduce perceived DT-related stress. Regarding the interaction effects, in keeping with JD-R theory, we found that the positive impact of perceived resources (i.e. perceived DT-related uncertainty reduction initiatives) on motivation (i.e. perceived DT usefulness) is amplified when perceived demands (i.e. perceived DT-related excessive workload) are high.

Contrary to the traditional JD-R perspective, we found a positive rather than negative moderating effect of DT-related resources on the demands–stress relationship. Although the total effect of DT job resources on DT stress is negative ($\beta = -.27$, $t = 3.71$, $p < .01$), this intriguing finding suggests that ready availability of resources (at least in the form of perceived DT-related uncertainty reduction initiatives) triggers respondents to be more involved and concerned about the stressful consequences of an excessive DT-related workload. A potential explanation based on literature of psychological reactions of employees to change management initiatives (Oreg et al. 2018) is that a high investment in DT resources may signal a strong organizational commitment to DT, which may increase employees' concerns about possible negative consequences of DT-related demands for the individual. Paradoxically, the more a company invests in reducing employees' uncertainty about the DT (and organizational change in general), the more employees may feel affected and thus activated by the change. Particularly if this high activation is coupled with high hindrance demands induced by DT (in our study, excessive workload), stress levels stemming from such demands will increase.

As expected, perceived DT-related stress reduces the likelihood of successful adoption and thus integration of DT by the salesperson, whereas perceived DT usefulness promotes DT's integration and usage. However, the latter positive impact disappears in the presence of high perceived DT-related stress. Although this aspect is rarely included in empirical investigations of the JD-R model, this result is consistent with overall JD-R theory.

Finally, although the impact of perceived DT-related uncertainty reduction initiatives on DT adoption is fully mediated by perceived DT usefulness, the impact of perceived DT-related excessive workload on individual DT adoption is more complex. In addition to the negative influence exerted via the psychological energy depletion process, our hindrance demands also directly and positively affect salespeople's behavioral response (i.e. a stronger integration of DT in their daily routines).

## Contributions to theory

Using insights from the change management and the technology literature, our study contributes to filling several important gaps in the DT in sales literature, on the one hand, and the JD-R literature, on the other. Regarding the

first aspect, as highlighted in Table 1, we contribute to the literature on technology in sales by investigating the bright and dark sides of salespeople's psychological reactions to DT initiatives. Prior research focuses exclusively on either positive or negative reactions, whereas our study examines both. In analyzing the drivers of such responses, we investigate the role of a novel construct rooted in strong conceptual foundations: uncertainty reduction initiatives. Our findings add to extant research, which explores only a relatively limited subset of the organizational drivers of such reactions to technology infusion (e.g. activities monitoring: Onyemah, Swain, and Hanna 2010; training: Sarin et al. 2010; infrastructure: Clark, Abela, and Ambler 2005; support: Schillewaert et al. 2005). Notably, most existing studies focus on the impact of a single technology (e.g. CRM, SFA, social media) on salespeople's work, whereas our study develops a comprehensive analysis of the organization-wide effects of technologies that typically stem from DT processes. This difference is important, because DT goes beyond the simple use of technological tools on the job; it further involves redesigning with strategic intent a broad set of processes through a number of tools (Guenzi and Habel 2020). As Hunter (2019) highlights, such a 'holistic use' of technology by salespeople is particularly challenging and useful, and therefore calls for more comprehensive investigations. This is especially true when analyzing salespeople's psychological reactions to technologies, a research area quite overlooked to date. In contrast with previous studies in the technology literature, using the JD-R model our study contributes to the development of an overarching conceptual framework capturing both positive and negative psychological reactions to organization-wide, complex, and comprehensive DT processes that may cause salespeople to fear being replaced by technology and feel stronger role conflict and job uncertainty, as witnessed in the adoption of multichannel strategies as well (Thaichon et al. 2018). Hence, by adopting the JD-R model and considering both the strain and the engagement processes, we contribute to a more balanced understanding of salespeople's psychological reactions to DT (and, in a broader perspective, to technology). In this perspective, our study extends prior work on technology adoption literature (which typically focuses on the bright side only) and technostress (which focuses on the dark side only).

In addition to filling gaps in the DT in sales literature, our study contributes to JD-R theory in several important ways. First, it extends JD-R's generalizability and usefulness to the context of DT and salespeople. This unique context is interesting because DT represents an extremely relevant form of organizational change and sales an important organization function. Second, our research offers evidence of the JD-R's effectiveness using a comprehensive framework and test of direct, mediated, crossover, and moderating relationships among variables in the model. Hence, our study extends prior JD-R based work applied to sales contexts (see Table 2) mainly because we offer a complete and thus better test of the JD-R theory (Brough et al. 2013). A particularly important contribution is our investigation of the interaction effects in the model because prior studies have found controversial results (Brough et al. 2013). This is also true for sales-oriented studies such as Miao and Evans (2013) who found support for only three of their six interaction hypotheses concerning capability control (i.e. resource) and outcome or activity control (i.e. demands), and Allison et al. (2016) who found support for only two of their four hypothesized interaction effects.

### Implications for managers

Our study has several implications for managers. First, companies and managers should be aware that DT initiatives imply both bright and dark sides for their salespeople, and therefore, they should carefully analyze and understand the psychological consequences and related drivers of these initiatives and act accordingly. Of particular importance, they should invest in uncertainty reduction initiatives, being aware that they might have not only positive but also some 'dark side' effects, like amplifying the impact of DT-related demands (extra workload) on stress, because they communicate a sense of urgency and 'proximity' to change. Adequate training and support are particularly important to counterbalance these effects.

Additionally, considering that DT-related stress harms DT integration, its sources should be carefully analyzed. For example, companies should analyze actual workloads and invest in carefully (re)designing jobs and DT-related activities. From this perspective, an in-depth analysis of sales processes before and after DT initiatives would be extremely beneficial. Clarifying roles, responsibilities, and expectations (Guenzi and Habel 2020) and redesigning and harmonizing cross-functional goals and processes are also important to reduce role conflict. This can be especially relevant when adopting agile ways of working, which is common in DT initiatives (e.g. Heller and Robinson 2017). Furthermore, management may consider turning perceptions of hindrance demands into perceptions of challenge demands, for example through coaching. Providing training and support is also important to reduce stressful perceptions of inadequate possession of the knowledge needed to successfully tackle DT.

Next, our findings suggest some organizational actions for facilitating DT adoption (mainly through an increase in salespeople's motivation), like listening to employees and collecting feedback from them; involving them in decision making; and redesigning the measurement, monitoring, performance management and reward systems in accordance with the new activities salespeople must perform and the different ways of working they must follow when embracing DT.

Furthermore, sales organizations may look to hire salespeople who already have experience in facing a DT or those who possess personal resources (e.g. technological knowledge, ability to deal with uncertainty and role conflict, trust in technologies, optimism) to successfully manage the psychological challenges that DT entails. Our research also suggests that companies need to increase salespeople's motivation to embrace DT by ensuring that their DT initiatives contribute to goal achievement in terms of actually filling gaps of knowledge, speed, contact, and value creation and communication.

Finally, the psychological reactions of salespeople affected by the DT can also be influenced by appropriate

interventions in corporate culture and leadership styles. For example, shaping a psychological climate inspired by high transparency and adopting a participative leadership style can help reduce perceived uncertainty. Similarly, guidance from transformational leaders can support the motivation to embrace the challenge of DT.

### *Limitations and directions for future research*

Our study has several limitations that provide opportunities for future research on DT in sales. First, we study perceptions of employees from a single company and its DT. Although this approach has several advantages, investigating a broad set of firms would certainly add to the generalizability of our current results. Second, our study is cross-sectional, which means caution should be used in interpreting casual effects. A longitudinal research method would help in this regard. Third, our study did not include the impact of DT integration on performance. Although a positive relationship is generally anticipated, this outcome is not guaranteed and has not been established. The relationship may be investigated in different ways, at individual or team/organizational levels, focusing on short- and long-term effects, and accounting for efficiency versus effectiveness gains. Fourth, future studies could investigate other constructs related to the JD-R framework. For example, in addition to the hindrance aspect of DT-related demands, the challenge dimension could be explored. Similarly, extra-organizational resources (e.g. training, support, technology quality, leadership style) and individual resources (e.g. optimism) could be examined. Fifth, our development of new, contextualized measures makes comparability with prior work difficult. Therefore, we encourage scholars to replicate and extend our findings using our DT context-specific measures. More fine-grained and even multi-dimensional scales could be used to operationalize our constructs, thereby allowing a more in-depth investigation. Finally, our respondents were from a single country (hence, multi-country research would be useful: Brough et al. 2013) and women are under-represented in our sample, therefore in future studies we recommend to use a more balanced mix in terms of gender. Considering the nature of selling process and the related tasks (e.g. mainly hunting versus mainly farming) could be particularly fruitful, too, since it may affect the perceived impact and benefits of DT, and more precisely its related psychological consequences for salespeople, too. Finally, it would be interesting to use more nuanced scales for some constructs (e.g. adopting multi-dimensional operationalizations for uncertainty reduction initiatives and DT-related stress and perceived benefits).

DT is an interesting phenomenon with major impact on sales organizations. We hope our study contributes to stimulate further investigations on this relevant topic.

## Notes

1. When we chose variables specifically for the context of DT initiatives in sales, we deliberately decided not to focus on already well-known and established constructs; for example, the literature on sales force technology adoption has established that training and technical support play a key role (see, e.g. Clark, Abela, and Ambler 2005; Sarin et al. 2010) and basically represent 'hygiene factors' or 'must-haves' for positive adoption. Therefore, salespeople certainly view these resources as important in DT initiatives, but investigating their impact would bring few new insights.
2. In our study, we investigate the dual process characterizing both positive and negative salesperson reactions to DT. From this perspective, positive (motivational) consequences are activated by resources, whereas negative (energy depletion) consequences (and the related psychological costs) are caused by hindrance demands. Note that we do not investigate the potential role of challenge demands, focusing on hindrance demands only. Doing so is important because meta-analytical research (Crawford, LePine, and Rich 2010) demonstrates that in past JD-R studies, failure to differentiate types of demands (i.e., hindrance from challenge) can mask or confuse significant relationships with psychological consequences.
3. For example, for the construct perceived DT-related usefulness, we started with the four items indicated by Guenzi and Habel (2020). However, in addition to these four items, our focus groups suggested that the perceived usefulness of DT also resides in the motivational power of investing in innovative digital technologies and business practices, as highlighted in the following quotes: 'We pursue Digital Transformation because we want to be innovative, to do innovative things, to use innovative tools … we believe this is very motivating for all of our employees' (sales manager, electrical tools & machinery company). 'Our company has a systematic tension towards leadership… this is true for digitalization, too. Using cutting-edge technologies is a way of stimulating pride in our sales force. It positively impress our customers, too … making salespeople more self-confident in everything they do and facilitating their acceptance of DT' (key account manager, fast-moving consumer goods company). Furthermore, some of the academics we interviewed highlighted that this fifth aspect is consistent with the JD-R literature, which underscores that engagement is typically related to innovativeness, learning, and personal growth (e.g. Kwon and Kim 2020; Xanthopoulou et al. 2007). Therefore, our final scale incorporates four items that correspond to the aforementioned benefits, as well as this additional fifth one.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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## Appendix A: Measures of study constructs

| **DT-related uncertainty reduction initiatives** (new, based on Hartmann and Slapničar 2012)<br>*Regarding digital transformation and its technologies, your company…* | loading |
|---|---|
| Knows and understands how much and how digital technologies have changed your daily work | .85 |
| Measures and evaluates the back-office activities of salespeople in an appropriate manner with respect to the changes induced by digital transformation | .88 |
| Consulted or involved salespeople to design its digital transformation plan | .83 |
| Measures and evaluates salespeople not only on results, but also on how much and how they follow certain processes | .56 |
| Introduced and uses digital technologies to support salespeople rather than to control them | .77 |
| Listens to employees and gets useful feedback and instructions to improve the implementation of digital transformation† | |
| Has an adequate understanding of how your activities should be carried out as a result of the digital transformation† | |
| **DT-related stress** (new, based on Guenzi and Habel 2020)<br>*As a result of digital transformation in your company…* | |
| You lack the knowledge to deal with the changes driven by digital technologies to your work | .71 |
| You struggle to meet contradictory demands from different people in your company | .82 |
| You fear that many of those who work in the commercial function will be replaced by technological tools | .81 |
| **DT integration** (adapted from Guenzi and Nijssen 2020) | |
| You use the digital technologies made available by the company in your daily job | .88 |
| You implement processes consistently with the requirements of the digital transformation | .90 |
| You perform the activities required by the digital transformation | .81 |

| **DT-related excessive workload** (adapted from Ragu-Nathan et al. 2008 and Ayyagari, Grover, and Purvis 2011)<br>*Digital transformation and the related new technologies used in the business processes of your company…* | loading |
|---|---|
| Require you to work even during off-hours so as not to lose information or requests | .76 |
| Increased the complexity of the tasks you have to perform | .82 |
| Increase the number of requests you have to meet, making you lose focus on priorities | .87 |
| Expanded the number of activities you have to do forcing you to do too many things | .88 |
| Take time and energy away from carrying out activities that are important for achieving your sales targets† | |
| Made your work rhythms unbearable† | |
| **DT usefulness** (new, based on Guenzi and Habel 2020)<br>*Digital transformation and its new technologies in the business processes of your company…* | |
| Allow you to have more information and tools that help the relationship with the customer† | |
| Help you doing things faster, simplifying processes and speeding up tasks | .81 |
| Are stimulating because they induce you to do new things and learn new ways of doing things | .87 |
| Support you in creating value for the customer | .86 |
| Allow you to have better contacts with customers and colleagues | .77 |

All items measures use nine-point Likert scale from 1 = 'totally disagree' to 9 = 'completely agree'.
†items deleted based on test measurement model in pretest.

## Appendix B: Results of Mediation Test (Hayes PROCESS Analysis, Model 6)

| Effect of DT excessive workload on DT integration | Effect | SE | t | *p* | LLCI | ULCI |
|---|---|---|---|---|---|---|
| Total effect | .1090 | .0908 | 1.2007 | .2319 | −.0705 | .2886 |
| Direct effect | .4137 | .0888 | 4.6575 | .0000 | .2380 | .5893 |
| | | **BootSE** | | | **BootLLCI** | **BootULCI** |
| Total Indirect effect(s). | −.3046 | .0742 | | | -.4572 | −.1698 |
| *Disaggregated indirect effects* | | | | | | |
| DT excessive workload → DT related stress → DT integration | −.1991 | .0586 | | | -.3277 | −.0947 |
| DT excessive workload → DT usefulness → DT integration | −.0665 | .0483 | | | -.1709 | .0194 |
| DT excessive workload → DT related stress → DT usefulness → DT integration | −.0390 | .0226 | | | -.0898 | −.0015 |

Level of confidence for all confidence intervals in output: 95%. Number of bootstrap samples for confidence intervals: 5,000

| Effect of DT-related uncertainty reduction initiatives on DT integration | Effect | SE | t | *p* | LLCI | ULCI |
|---|---|---|---|---|---|---|
| Total effect | .2912 | .0854 | 3.4100 | .0009 | .1223 | .4600 |
| Direct effect | −.0288 | .0865 | −.3327 | .7398 | −.1998 | .1422 |
| | | **BootSE** | | | **BootLLCI** | **BootULCI** |
| Total Indirect effect(s) | .3200 | .0820 | | | .1650 | .4856 |
| *Disaggregated indirect effects* | | | | | | |
| DT-related unc. red.in's → DT related stress → DT integration | .0596 | .0307 | | | .0077 | .1271 |
| DT-related unc. red.in's → DT usefulness → DT integration | .2486 | .0650 | | | .1233 | .3800 |
| DT-related unc. red.in's → DT related stress → DT usefulness → DT integration | .0117 | .0093 | | | −.0006 | .0345 |

Level of confidence for all confidence intervals in output: 95%. Number of bootstrap samples for confidence intervals: 5,000.