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Citation:

Tkalac Verčič, A and Einwiller, S and Tench, R and Verčič, D (2025) Developing the Digital Communication Acceptance Scale (DICAS) for Measuring Employee Acceptance of Digital Communication Technologies in the Workplace. *International Journal of Business Communication*. pp. 1-27. ISSN 2329-4884 DOI: <https://doi.org/10.1177/23294884251322492>

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Document Version:

Article (Accepted Version)

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**Developing the Digital Communication Acceptance Scale (DICAS) for  
Measuring Employee Acceptance of Digital Communication Technologies in  
the Workplace<sup>a</sup>**

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<sup>a</sup> This work was supported by the Slovenian Research and Innovation Agency (project J5-4584) and Croatian Science Foundation (project IPS-2022-02-4542).

# **Developing the Digital Communication Acceptance Scale (DICAS) for Measuring Employee Acceptance of Digital Communication Technologies in the Workplace**

## **Abstract**

The study explores the impact of Digital Communication Technologies (DCT) on internal communication within organizations, focusing on employee acceptance. It introduces the Digital Communication Acceptance Scale (DICAS) to fill the gap in existing technology acceptance models, such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), which don't consider factors critical in the context of internal communication. The research was conducted in three phases: item creation and expert review, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA). Results showed a six-factor model—Interaction Facilitation, Apprehension, Effort Expectancy, Performance Expectancy, Facilitating Conditions, and Social Influence—explaining 79.5% of the variance. Reliability of the scale was confirmed with high internal consistency ( $\alpha = 0.918$ ). DICAS allows organizations to assess employee attitudes toward DCT, offering practical insights for improving communication strategies and facilitating smoother digital transformations. The scale also addresses privacy concerns, social dynamics, and organizational support, providing a comprehensive framework to guide future research and practice in digital workplace communication.

*Keywords: Digital Communication, Digitalization, Employees, Internal Communication, Technology Acceptance*

## **Introduction**

The rapid and ongoing digital transformation has fundamentally reshaped our economy and society, leading to significant changes in business models and their societal impacts (vom Brocke et al., 2016; Wilms et al., 2017). While scholarly research has extensively explored the macro-level impacts of digital transformation (Andal-Ancion et al., 2003; vom Brocke et al., 2016), there is a notable lack of emphasis on mid-level organizational structures and processes and even less on the micro-level, particularly the individual workplace environment and the array of new digital tools that support or hinder work. DCT in the workplace, encompassing tools from email systems to complex collaborative platforms, represents a critical area of study. These technologies are reshaping interactions, collaboration, and job performance, making it essential to understand how employees accept and utilize them, as this acceptance significantly influences remote work, innovation, and business strategies.

The current understanding of digital technology adoption in the workplace is primarily driven by two models, the TAM and the UTAUT. These foundational models focus heavily on perceived usefulness and ease of use, with limited attention to the unique dynamics of internal communication technologies. The DICAS challenges these traditional perspectives by shifting the focus toward a more employee-centered approach. This new scale acknowledges the complexity of DCT in workplace environments, incorporating critical factors such as privacy concerns, organizational support, and social dynamics. In doing so, it provides a more comprehensive framework that better reflects the realities of hybrid and digital-first workplaces.

## **Literature review**

The digital era, particularly highlighted during the COVID-19 pandemic, has significantly transformed internal communication, requiring more than just the addition of digital channels. This transformation calls for a holistic approach, integrating employee preferences and adapting to the merging of home and office work environments (Braun et al., 2019; Men, 2021; Tkalac Verčič & Špoljarić, 2020; Welch, 2012; Zerfass et al., 2022). However, internal corporate communication still lacks a comprehensive theoretical framework to address these changes. Current research suggests examining the sociotechnical and communication aspects of digital internal communication to understand this disparity in digital application within organizations (DeFilippis et al., 2022; Kreijns et al., 2021; Tkalac Verčič et al., 2023; Wuersch et al., 2022). Recognizing that overall feelings about technology can influence perceptions of specific technologies, there is a clear need for more research into employee attitudes towards technological change. This is particularly important when analyzing the significant shift in how employees interact and collaborate. As workplaces become increasingly reliant on DCT, understanding how these tools are perceived and utilized by employees is crucial.

### **Theoretical Frameworks on Technology Acceptance**

Research into technology acceptance has expanded with the rapid integration of technology in organizations. Models such as TAM, proposed by Davis in 1989, suggest that perceived usefulness (PU) and perceived ease of use (PEOU) drive technology adoption. TAM was later expanded to include additional factors like

subjective norms and specific technology usage (TAM2) (Venkatesh, 2000; Venkatesh & Davis, 2000). Building on this, Venkatesh et al. (2003) introduced the UTAUT, which integrates previous models and theories, including motivation (Davis et al., 1992; Vallerand, 1997), social cognitive theory (Bandura, 1986; Compeau & Higgins, 1995), and diffusion of innovations theory (Rogers, 1995). UTAUT identifies four primary factors—performance expectancy, effort expectancy, social influence, and facilitating conditions—and four moderating variables—age, gender, experience, and voluntariness—as determinants of technology adoption. The theory has been broadly validated, primarily using student and technology-focused groups, with common moderators like age and gender (Lee et al., 2003), and it was extended with UTAUT2 for the consumer context, including factors like price value, experience, habit, and hedonic motivation (Venkatesh et al., 2012).

A more recent framework by Kaasinen et al. (2018) supports the design, evaluation, and impact assessment of work systems with a consideration of employees' satisfaction and work-based well-being. Reviewing this framework, Molino et al. (2020) noted its potential to aid in the design and evaluation of new systems and tools, impacting both worker well-being and organizational outcomes. Their study of blue and white-collar workers found a positive relationship between technology acceptance and workplace engagement, highlighting the importance of acceptance for effective usage of new technology and promoting well-being.

Although TAM and UTAUT have provided valuable insights into technology acceptance, their application to workplace settings—particularly internal communication—remains limited (Chuttur, 2009; King and He, 2006; Venkatesh et

al., 2016), and with varying results. These models fail to address factors like privacy apprehension, organizational facilitation, and the social dynamics influencing technology adoption. This represents a critical blind spot in the literature, which the DICAS aims to fill by offering a more nuanced understanding of employee interaction with DCT.

### **Digital Communication Technologies in the Workplace**

Historically, the relationship between technology and the workplace has been extensively explored across multiple academic disciplines, dating back to a foundational study in the late 20th century (Davis, 1989). This research spans fields such as information systems, psychology, sociology, organizational behavior, and management. Recent contributions from business and strategic information systems (Hess et al., 2016; Matt et al., 2015), human resources (Marler & Boudreau, 2017), and healthcare (Burton-Jones et al., 2020) have expanded the volume of research. However, there remains a gap in research focusing specifically on the intersection of technology and communication in the workplace. As organizations integrate digital technologies like social media, mobile devices, and analytics into their operations, they face significant challenges in internal communication due to the unique characteristics of these technologies and the development of digital platforms that shape systems within organizations.

Digital technologies include a variety of powerful and accessible tools such as social media, mobile devices, cloud computing, analytics, the Internet of Things, cognitive computing, and biometrics (Ross, 2017). Research has shown that these technologies have a profound and diverse impact on organizations (Kozanoglu & Abedin, 2020; Vial, 2019; Warner & Wäger, 2019). This impact is significant

because products and services are increasingly characterized by features like malleability, editability, openness, and transferability (Shao & Li, 2022). Digital transformation involves the ongoing integration of these digital technologies into daily organizational operations (Warner & Wäger, 2019). This transformation introduces several challenges for managers and decision-makers due to the unique characteristics of digital technologies (Abedin & Babar, 2018). Technology presents both opportunities and constraints, and these challenges are not confined to individual organizations but extend across multiple entities through the development of digital platforms (Teece, 2017).

The concrete effects of digitalization are evident across many job roles and industries, forcing organizations to adopt new technologies and update their business models to remain competitive (Sebastian et al., 2017). However, the broader implications of these changes on individual job tasks and entire occupational fields are less understood. There is a rising need to explore how employees and organizations can best adapt to these disruptions, with a focus on enhancing resilience.

The adoption and implementation of technology in workplace settings have been thoroughly investigated (Trenerry et al., 2021). This includes broad areas of information technology (Dutta & Borah, 2018; Liao & Landry, 2000) and specific tools such as email and word processing applications (Burton-Jones & Hubona, 2006; Venkatesh & Davis, 2000). Studies have shown that the type of technology—whether its use is optional or mandatory—affects how quickly it is adopted (Chuttur, 2009; Lee et al., 2003). The seminal work by Venkatesh and Davis (2000) suggests that subjective norms are crucial in environments where technology use is obligatory. However, in settings where use is voluntary, user perceptions and



social norms greatly influence their willingness to use technology. In situations where use is required, adoption may happen regardless of individual preferences, significantly affecting organizational attitudes and broader outcomes (Brown et al., 2002). Technologies seen as beneficial and easy to use are more readily adopted (Burton-Jones & Hubona, 2006; Wang et al., 2014), reinforcing the idea that perceived utility and ease of use are closely linked to user satisfaction and IT adoption (Kim et al., 2007; Liao & Landry, 2000).

Alongside research into technology adoption, studies on employee perceptions and attitudes towards technological changes are also expanding (Kim & Kim, 2018; Vieitez et al., 2001). With the rise of AI, robotics, and cloud computing, technological disruptions are impacting a wide range of industries (Trenerry et al., 2021). These studies often find that increased job insecurity due to new technologies is associated with lower organizational commitment and job satisfaction, as well as higher rates of cynicism, depression, and turnover intentions (Brougham and Haar, 2018; Vieitez et al., 2001). However, the effects vary across different organizational contexts and job roles. Notably, involving employees in decision-making processes that are related to technological changes tends to result in more positive adoption (Schraeder et al., 2006).

### **Digital Internal Communication**

Internal communication, broadly understood, encompasses all types of formal and informal communication that take place within an organization at all levels (Kalla, 2005; Men & Bowen, 2017; Tkalac Verčič et al., 2012). As an organizational function, it involves overseeing the interactions and relationships among the organization's members (Welch & Jackson, 2007) and facilitating the exchange of

information, ideas, and feedback between the organization and its members, with the goal of informing, motivating, engaging, and co-creating meaning to ultimately improve the organization's effectiveness (Tkalac Verčič, 2019; Tkalac Verčič et al., 2023). Internal communication satisfaction positively correlates with employee engagement and employer attractiveness, highlighting the need for effective communication strategies (Tkalac Verčič et al., 2021). Symmetrical internal communication enhances employees' perceptions of organizational support and positively influences their emotional responses during periods of change (Sun et al., 2021).

Depending on which internal groups or individuals communicate with each other, four dimensions of internal communication can be distinguished (Welch and Jackson, 2007): (1) line management communication between line managers and their employees, (2) internal team peer communication and (3) internal project peer communication, where employees communicate with each other, and (4) internal corporate communication, which is the communication between an organization's strategic managers and its internal stakeholders. While the first three dimensions mainly involve interpersonal two-way communication, internal corporate communication is often one-way, driven by leaders and carried out by professional communicators in the organization's communication department.

With workplaces becoming increasingly reliant on DCT, digital tools and platforms play an important role at all dimensions of internal communication. Digital internal communication (DIC) refers to the use of DCT (e.g., email, voice over IP, video conferencing, online chats) to facilitate communication, collaboration and relationship building at all levels within an organization to improve the flow of information and ideas, enhance collaboration and teamwork,

and to ultimately support the achievement of the organization's objectives (Tkalac Verčič et al., 2024). Wuersch et al. (2023) point out that DIC needs to emphasize social aspects and human factors as it includes how people interact in their day-to-day work, creating wealth and shared meaning. This is because "human factors, not technologies, are seen as the main obstacles to the digital transformation of organizations" (Wuersch et al., 2023, p. 628). In their socio-technical approach to DIC, Wuersch and colleagues include technical elements of internal communication, such as channels, strategies, structures, and systems as well as social elements, which include people, relationships and interactions between internal stakeholders. They distinguish three communication levels of DIC, intrapersonal, interpersonal and organizational, each of which includes social and technical elements, which they derived from an integrative literature review.

The intrapersonal DIC level in Wuersch et al.'s (2023) model includes cognitive, affective, and identity-based processes. Their analysis shows that social elements at this level primarily include a person's digital skills, which range from digital problem-solving to an individual's knowledge about privacy issues and cybersecurity, and digital soft skills such as an open attitude towards digital transformation, emotional competencies, teamwork, and leadership skills (Dobrowolska & Knop, 2020). It is at this intrapersonal level that employees' expectations, attitudes, and perceptions that underpin their acceptance of DCT manifest themselves. The technical elements at this level include personalized digital interfaces and individualized learning platforms where employees are trained in the use of DCT according to their strengths and potential improvements (Wuersch et al., 2023). Through personalization and training, employees' digital skills can be improved, which may also increase their acceptance of DCT.

At the interpersonal DIC level, social elements identified by Wuersch et al. (2023) include interpersonal skills such as the capacity to learn, empowering others, collaborating, building relationships, and trust. The technical elements at this level support these social elements, including digital collaboration tools such as digital apps, specialized software that fosters teamwork, and social media platforms. Internal social media and social networks have been studied extensively (Tkalac Verčič et al., 2024). These platforms are characterized by their media richness, which Daft and Lengel (1984) define as the ability of communication channels to convey information effectively. This includes reducing uncertainty and fostering deeper understanding through immediate feedback, multiple cues, and personalization. As a result, they encourage dialogue, knowledge exchange, and collaboration among organizational members. This process helps to facilitate relationship building, as noted by Ewing et al. (2019) and Madsen (2020).

Rich media at this interpersonal level, such as videoconferencing tools, can bring physically dispersed employees together and simulate face-to-face encounters to some extent (Men & Bowen, 2017). Moderately rich media that support DIC at this interpersonal level include email, instant messaging, and chats, while lean media include telephone and voicemail.

Social elements at the organizational DIC level include digital leadership, digital values and culture, and knowledge building (Wuersch et al., 2023). At this level, the strategy of the organization's senior management plays an essential role in making the digital transformation work (Kiron et al., 2016). The technical elements of communication at this level comprise several DIC channels, including intranets, which are formal online communication tools often used for strategic purposes like reinforcing corporate values, policies, strategies, and culture (Men &

Bowen, 2017). Today, intranets are often enriched with interactive elements, becoming more like social intranets or social media. Social collaboration tools can significantly impact internal communication processes by fostering social exchange and adherence to group norms (Uysal, 2016). Mobile employee apps with information and interactive elements are used to reach employees. Top managers, such as the CEO, can use the interactive elements of social media and apps to put a human face on the organization and provide direct opportunities to interact with the organization's top leaders (Men & Bowen, 2017). Leadership communication on internal digital platforms plays a crucial role in shaping organizational culture and enhancing employee morale (Cardon et al., 2019; Krishna, 2022). Aside from such comprehensive digital platforms, the organizational DIC level also includes lean media like digital screens and newsletters. It is at this level that internal training systems are planned and implemented to make employees more tech-savvy.

To advance the research and practice of DIC, it is essential to measure how employees perceive and accept DCT in their work-related communication. To this end, we developed and validated the DICAS to assess this acceptance. While models such as TAM and UTAUT offer valuable frameworks for understanding general technology adoption, they do not account for the specific dynamics of digital communication tools within organizational contexts. DICAS addresses this gap by focusing on how employees accept and utilize DCT in internal communication and by incorporating dimensions that reflect the realities of workplace communication technologies.

Existing literature on technology acceptance has primarily centered on perceived usefulness and ease of use. However, this emphasis overlooks critical

factors that are especially relevant to the acceptance of DCT. For example, while TAM and UTAUT consider general technology adoption, they do not account for the apprehension employees may feel about privacy and data security in the context of digital communication. Additionally, these models do not fully capture the degree to which digital communication tools facilitate productive interaction and collaboration—an essential component of internal communication dynamics. Social influence, though included in UTAUT, is not explored in depth in relation to how organizational culture, leadership, and peer behaviors specifically affect the adoption of DCT within the workplace.

The DICAS broadens the scope of previous models by adding the factors apprehension, interaction facilitation, and social influence, which are highly relevant in the context of internal communication. Apprehension about privacy and security is a significant concern that is not addressed in traditional models but is critical to understanding the acceptance of digital tools in the workplace. Similarly, interaction facilitation—the extent to which digital tools enable effective communication and collaboration—provides a more holistic view of how these technologies are integrated into everyday organizational practices. Moreover, DICAS offers a refined perspective on social influence, tailoring it to the specific dynamics of internal communication, where peer behaviors and leadership expectations play a pivotal role in shaping employee adoption of digital tools. By incorporating these dimensions, DICAS extends the capabilities of existing models, providing a more complete framework for understanding and improving the use of DCT in the workplace. This allows organizations to better understand how employees perceive and engage with digital communication tools, offering valuable

insights that can inform the design and implementation of more effective digital communication strategies. The procedure and results are presented next.

## **Method and Results**

The development and validation of DICAS were conducted in multiple phases, involving the creation of assessment items, expert evaluations, and analysis of reliability and multidimensionality. This process was divided into three distinct phases: item creation based on a comprehensive literature review and systematic feedback from experts (Phase 1), exploratory factor analysis (EFA) using principal component analysis (PCA) with Varimax rotation (Phase 2), and confirmatory factor analysis (CFA) (Phase 3). This resulted in a robust and reliable scale comprising six-factors—interaction facilitation, apprehension, effort expectancy, performance expectancy, facilitating conditions, and social influence. The whole research design process went through Leeds Beckett University's Research Ethics Committee (an equivalent process to the IRB according to the UKRI (UK Research and Innovation) national research body. Research ethics was approved on the 10<sup>th</sup> July 2023. The methodology and findings for each phase are detailed next.

### **Phase 1: Scale development**

The initial phase of developing the DICAS involved clarifying the concept and its scope. Establishing theoretically and practically robust definitions was crucial to ensure that the construct's psychometric attributes were accurately representative. Careful attention in this phase reduces the risk of construct variance. Therefore, the preliminary step in articulating the concept of employee acceptance of DCT involved an extensive examination of existing literature.

The creation of DICAS measurement items was conducted through a thorough review of scholarly articles in strategic communication, public relations, and computer-mediated communication domains. This comprehensive literature search was conducted using databases such as Web of Science and Google Scholar. We focused on identifying key literature related to the acceptance and use of DCT in organizational contexts. The aim was to gather comprehensive insights into both existing technology acceptance models, such as TAM and UTAUT, and more specific studies on internal communication and employee attitudes toward digital tools. This search was essential to ensure that the development of DICAS was grounded in a thorough understanding of current theoretical and empirical research on technology acceptance and DCT. Keywords used in the search included combinations of terms like DCT, technology acceptance, internal communication, privacy concerns, social influence, and collaboration tools. This approach allowed us to identify relevant factors that could be adapted or extended in the context of workplace communication, such as the inclusion of apprehension and interaction facilitation. The goal was to ensure that the DICAS scale reflected both well-established concepts and emerging trends in the adoption of DCT within organizations. After gathering all relevant sources about digital communication in workplace settings, we undertook open coding to identify key concepts within the collected literature. Next, we performed a comparative analysis to group conceptually similar codes into broader categories.

The initial factors identified as related to the construct included Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Interaction Facilitation, and Apprehension (adapted from Venkatesh et al., 2003; and Nimrod, 2018). The definitions and indicators utilized in these



studies shaped the understanding of each dimension within employees' acceptance of DCT. The initial definition we started from referred to DCT for internal communication as specific forms for internal communication, such as email, voice over IP, video conferencing, online chats, etc., used when communicating within their organization.

Considering the detailed and context-specific definitions of each dimension in the scholarly work, measures were implemented to ensure the construct and its dimensions were clearly understood. For each of these categories, we formulated multiple assessment items. These DICAS items were phrased as specific statements reflecting attitudes towards DCT in workplace scenarios. For example, one of the items was "Using DCT makes it easy to engage in productive discussions." These items featured Likert-type scale response options ranging from 1 (strongly disagree) to 7 (strongly agree). Initially, we developed a set of 64 assessment items.

The second stage of Phase 1 involved expert reviewers providing quantitative evaluations of the conceptual framework and the DICAS measurement items. This expert review took place in May 2023. The reviewers assessed the representativeness and clarity of the concepts related to DCT for internal use and the definitions of specific dimensions. They also evaluated the relevance, clarity, and specificity of the DICAS items proposed. All dimensions were evaluated using two questions: "Is this item understandable and answerable?" and "How effectively does this indicator represent the dimension?" These questions were rated on a 5-point scale from 1 (not at all) to 5 (completely). The reviewers also provided open-ended feedback for potential new items and suggested refinements for existing items.

We invited 26 experts to review the DICAS components through an online survey. Out of those invited, 23 participated in the review process. These scholars were chosen based on their expertise in the field of strategic communication. We computed descriptive statistics for the ratings given by the panel reviewers to the proposed DICAS items. Items that had below-average means might indicate issues with the phrasing or content related to the domain of digital internal communication. Items that scored low or received specific comments from the open-ended feedback were revised or removed based on our analysis. This step is essential to determine if an indicator should be retained as a representative of the factor. Following specific suggestions from the reviewers, the response format was adjusted. The expert reviewers also had the opportunity to answer open-ended questions about whether any assessment items should be modified, clarified, or included. Based on this feedback, 6 items were either removed or merged with others. In total, the quantitative and qualitative findings from Phase 1 led to a refined set of 58 items.

## **Phase 2: Exploratory Factor Analysis (EFA)**

The primary objective of Phase 2 was to assess the dimensionality of the DICAS through the use of *EFA*. Data collection for this phase occurred in July 2023. Participants accessed the online survey via a provided link. Participants were asked to respond to items using Likert-type scale options ranging from 1 (strongly disagree) to 7 (strongly agree).

Participants were sourced from Prolific, an online platform that facilitates paid research participation. All participants joined voluntarily and received a small remuneration from the platform, not by the research team. They were informed of

their right to withdraw at any time, and this information was included in the survey instrument along with contact details for an academic independent of the research team for any ethical concerns. Thus, their participation was entirely voluntary and facilitated solely through the data-providing platform. The final sample consisted of 294 respondents, all of whom were employees in organizations with over 250 staff members. The sample was evenly split between male ( $n = 147$ ; 50%) and female ( $n = 147$ ; 50%) participants. The average age of participants was 39.92 years ( $SD = 10.991$ ). Most participants were of white ethnicity ( $n = 263$ ; 89.5%), followed by Asian ( $n = 16$ ; 5.4%), black ( $n = 6$ ; 2.0%), mixed ( $n = 4$ ; 1.4%), and other ( $n = 5$ ; 1.7%). A majority of the participants resided in the United Kingdom ( $n = 260$ ; 88.4%), with the remainder from Australia ( $n = 11$ ; 3.7%), Canada ( $n = 9$ ; 3.1%), Ireland ( $n = 7$ ; 2.4%), and the United States ( $n = 6$ ; 2.0%). Of the 294 participants, 243 worked full-time (82.7%), and 51 worked part-time (17.3%).

Phase 2 aimed to identify the dimensionality of DICAS through exploratory factor analysis (EFA) using principal component analysis. *EFA* is a suitable statistical method to determine the number of common factors for a specific construct (Fabrigar et al., 1999). The factors were retained based on the following criteria: (a) eigenvalues exceeding 1.00 (Henson & Roberts, 2006; Thompson & Daniel, 1996), and (b) appearing as points above the elbow in the scree plot (DeVellis, 2012; Henson & Roberts, 2006). We applied an orthogonal rotation with the Varimax method (Kaiser, 1958) to clarify the underlying structure of the DICAS items. The criterion for coefficient interpretation was set at .60/.40, meaning items needed a primary loading of .60 or higher and no secondary loading above .40 to be included in a factor (McCroskey & Young, 1979).

The *EFA* was iteratively run, adjusting items each time until all had acceptable loadings. Initially, an *EFA* with all 58 items was conducted. After three iterations of *EFA*, a final factor structure emerged. The results indicated a 24-item scale ( $\alpha = .918$ ) with a six-factor solution that explained 79.532% of the total variance (refer to Table 1). After finalizing the overall factor structure, we named the factors based on the common themes among the items in each factor.

The first factor, named "Interaction Facilitation" ( $\alpha = .913$ ), consisted of 4 items including "Through DCT, it becomes effortless to engage in productive discussions" and "Through DCT, it becomes effortless to exchange information with colleagues." The second factor, termed "Apprehension" ( $\alpha = .903$ ), also comprised 4 items such as "It concerns me that the data generated by using DCT could be traceable even years later" and "I feel that my use of DCT makes it easier for my privacy to be invaded." The third factor, called "Effort Expectancy" ( $\alpha = .913$ ), included 4 items like "It is easy for me to become proficient in using DCT" and "I find DCT user-friendly." The fourth factor, labelled "Performance Expectancy" ( $\alpha = .929$ ), contained 4 items such as "Using DCT helps me complete work tasks more quickly" and "Using DCT enhances my work productivity." The fifth factor, named "Facilitating Conditions" ( $\alpha = .927$ ), included 4 items including "A specific person or group is available to help with any difficulties I encounter using DCT" and "My organization provides the needed support for using DCT." The final, sixth factor, called "Social Influence" ( $\alpha = .845$ ), consisted of 4 items such as "People who influence my behavior (colleagues and superiors) believe that I should use DCT" and "People at work who are important to me think that I should use DCT."

Table 1. Factor Loadings, Cronbach's Alpha, and Percentage of Variance Explained for DICAS Survey Items

Item	Factor loading	Cronbach's alpha	% of variance explained
<b>FACTOR 1: Interaction Facilitation</b>		.913	36.680
Through DCT, it becomes effortless to engage in productive discussions.	0.784		
Through DCT, it becomes effortless to exchange information with colleagues.	0.794		
DCT promotes effective communication.	0.808		
DCT promotes efficient communication.	0.769		
<b>FACTOR 2: Apprehension</b>		.903	12.720
It bothers me that the data created by using DCT could be traced even years from now. (r)	0.844		
I feel that my use of DCT makes it easier to invade my privacy. (r)	0.830		
Using DCT makes me feel anxious about the potential threats to my privacy. (r)	0.903		
The potential risks to my privacy make me hesitant when using DCT. (r)	0.814		
<b>FACTOR 3: Effort Expectancy</b>		.913	8.487
It is easy for me to become skilful at using DCT.	0.716		
I find DCT easy to use.	0.816		
Learning to use DCT is easy for me.	0.841		
My interaction with DCT is smooth and easy.	0.759		
<b>FACTOR 4: Performance Expectancy</b>		.929	7.447
Using DCT enables me to accomplish work tasks more quickly.	0.812		
Using DCT increases my work productivity.	0.839		
I believe that DCT can help me save time at work.	0.817		
DCT helps me to do my job better.	0.741		
<b>FACTOR 5: Facilitating Conditions</b>		.927	7.021
A specific person (or group) is available for assistance with any difficulties I have using DCT.	0.776		

My organization provides the necessary support for using DCT.	0.827		
I feel supported by the organization to use DCT.	0.726		
My organization provides the technical resources required for using DCT.	0.743		
<b>FACTOR 6: Social Influence</b>		.845	5.176
People who influence my behavior (colleagues and superiors) think that I should use DCT.	0.807		
People at work who are important to me think that I should use DCT.	0.755		
I believe using DCT aligns with the organizational expectations.	0.667		
Management expects me to use DCT.	0.683		

### Phase 3: Confirmatory Factor Analysis (CFA)

Phase 3 involved a *CFA* to confirm the DICAS factor structure previously established in Phase 2. A key consideration for the research was to access independent respondents working in organizations of a minimum size (as in Phase 2), ensuring they had personal experience of both communication between employees/employee groups and between the employer and employees. Anonymity and voluntary participation were emphasized throughout the data collection process.

To achieve this, we again used Prolific. All participants joined the study voluntarily and received a small remuneration provided by Prolific, not by the research team. Participants had the right to withdraw at any point, which was detailed on the survey instrument. Contact information for an academic independent of the research team was provided for any ethical concerns. The participation was, therefore, voluntary and accessed exclusively through the data-supplying organization. The survey instrument was electronically distributed via

Prolific in December 2023. The final sample included 249 respondents, all employed in organizations with more than 250 employees.

To confirm the proposed DICAS factor structure, *CFAs* were conducted using IBM SPSS AMOS 23. Hot deck imputation was used to replace a minimal number of missing values before conducting *CFAs* (Myers, 2011). Given the sensitivity of the chi-square statistic to sample sizes larger than 100, significant chi-square tests for larger samples are not indicative of poor model fit (Allen et al., 2009). Instead, model fit was assessed through indices such as the comparative fit index (*CFI*), root mean square error of approximation (*RMSEA*), and the Tucker-Lewis index (*TLI*). According to Little's (2013) criteria for acceptable fit, *CFI* values between .90 and .99, *RMSEA* values between .05 and .08, and *TLI* values between .90 and .99 were used.

The initial model had an unacceptable fit:  $\chi^2(237, N = 294) = 699.670, p < .001; CFI = .920; RMSEA = .082, 90\% CI = [.075, .089]; TLI = .899$ . Although the *CFI* statistic was acceptable, adjustments were needed to achieve acceptable *RMSEA* and *TLI* statistics. The following covariance paths were added based on modification indices: a. Two covariance paths among residual terms for indicators on the Interaction Facilitation factor. b. One covariance path between residual terms for indicators on the Effort Expectancy factor. c. One covariance path between residual terms for indicators on the Facilitating Conditions factor. 5. Two covariance paths among residual terms for indicators on the Social Influence factor. The respecified model indicated good model fit for the DICAS scale:  $\chi^2(199, n = 294) = 1041.682, p < .001; CFI = .931; RMSEA = .077, 90\% CI = [.068, .085]; TLI = .912$  (Figure 1).

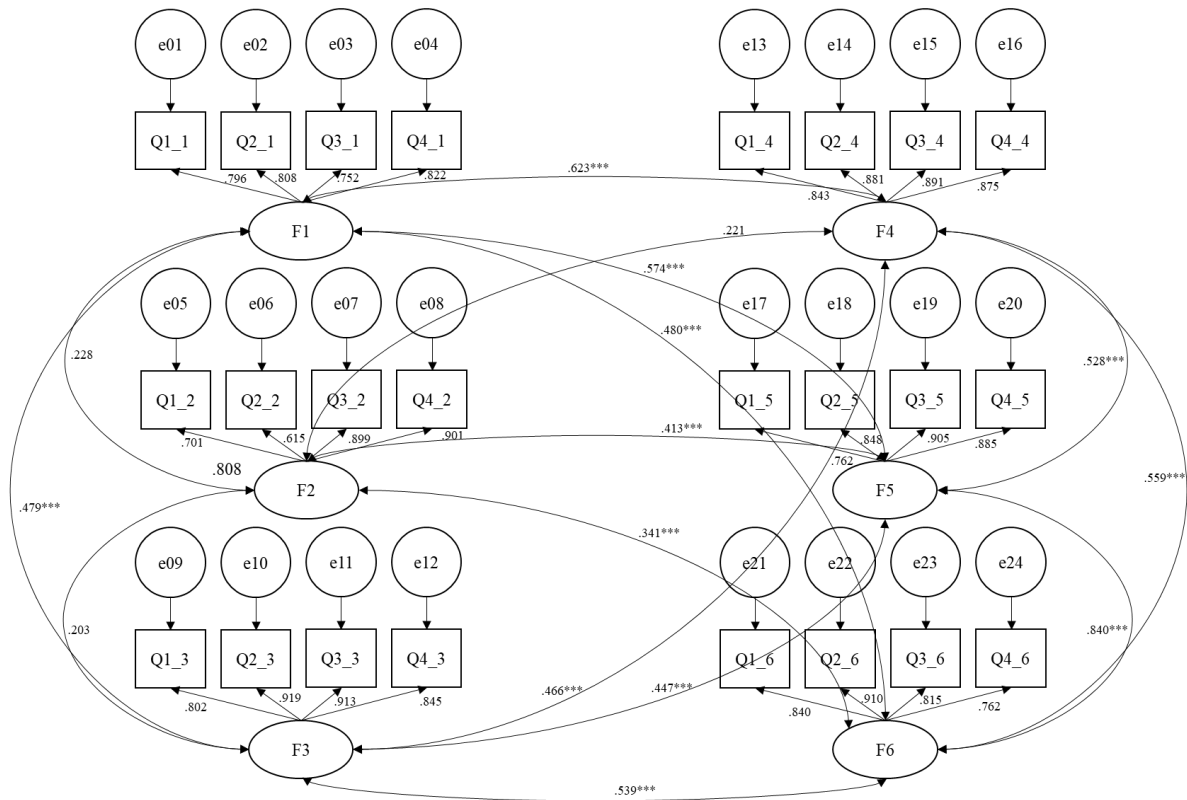


Figure 1: Model of employee acceptance of digital communication technologies in the workplace construct with six-factor 24-item solution.

At this point, items exhibiting significant cross-loadings were eliminated, and the entire analytical process was repeated. In the subsequent iteration, five indicators displaying cross-loadings exceeding .50, as well as those not aligning with operational definitions, were excluded. The EFA results confirmed the importance of factors such as Apprehension and Social Influence in shaping employee acceptance of DCT. The final exploratory phase concluded with 24 items being selected for further examination. Before proceeding to confirmatory analysis, an analysis imposing six factors was conducted. The coefficient alpha for all factors exceeded .80, and the interitem correlations were substantial, suggesting that the items are suitable representations of each factor's domain and demonstrate internal consistency. Dimensionality was evaluated by examining



corrected item-to-total correlations. All correlations were moderate and centered around the mean, fulfilling criteria for dimensionality. Adopting a conservative approach, all items were retained for the subsequent confirmatory factor analysis to reduce the risk of creating a scale overly specific to a particular situation.

The final questionnaire demonstrated strong measurement invariance across gender, age, company size, student and employment status, ethnicity, country of birth, country of residence, nationality, and language. Sociodemographic variables were not statistically significantly related to either the total instrument or its six dimensions, except for age, which significantly correlated only with one dimension (Effort Expectancy,  $r = .201$ ,  $p < 0.01$ ). Consequently, sociodemographic variables were omitted from the construct validity analysis.

## **Discussion**

In this study, we have successfully developed and validated the Digital Communication Assessment Scale (DICAS), which measures employee acceptance of digital communication technology (DCT) in the workplace. This section discusses the implications of our findings, potential applications of the DICAS, limitations of the study, and future research directions.

Our findings challenge the traditional reliance on models like TAM and UTAUT, which focus narrowly on perceived usefulness and ease of use, for evaluating the acceptance of DCT in internal communication. By validating factors such as Apprehension, Social Influence, and Interaction Facilitation, this research highlights the complexity of employee acceptance of DCT. The DICAS offers a new, more comprehensive framework for understanding these dynamics, providing

organizations with actionable insights to improve their digital communication strategies. Unlike UTAUT2, which is designed for general technology adoption with a focus on factors like price value and hedonic motivation in consumer contexts, DICAS is specifically tailored for workplace DCT. UTAUT2 expands upon the original UTAUT by introducing dimensions such as habit, price value, and hedonic motivation, which are particularly relevant for personal and consumer technology adoption. These factors, while valuable in certain contexts, are less relevant for understanding how employees adopt and use digital communication tools within organizations. Unlike UTAUT2, DICAS includes Apprehension, addressing concerns around data security and privacy, which are paramount in organizational settings. Furthermore, it emphasizes Interaction Facilitation, a dimension that directly addresses how well digital tools support collaboration and communication in the workplace—factors that are not captured by UTAUT2. While UTAUT2 includes Social Influence, DICAS refines this dimension by focusing on the role of organizational culture and leadership in driving technology adoption, recognizing the specific pressures employees face in adopting workplace technologies. This context-specific refinement ensures a more accurate representation of internal communication technology adoption within organizations than can be provided by UTAUT2.

The creation of the DICAS addresses a notable gap in the literature by providing a robust tool specifically designed to evaluate how employees perceive and accept DCT used for internal communication within organizations. The identification of six distinct factors—Interaction Facilitation, Apprehension, Effort Expectancy, Performance Expectancy, Facilitating Conditions, and Social

Influence—highlights the multifaceted nature of technology acceptance in professional settings.

Interaction Facilitation emphasizes the significance of ease and efficiency in communication facilitated by digital tools. Organizations should prioritize enhancing the usability and effectiveness of these tools to improve employee interaction and collaboration. By making communication tools more intuitive and seamless, employees can engage more readily in productive discussions and information exchange, thus fostering a more collaborative work environment. The positive impact of well-designed digital communication tools on employee interaction cannot be overstated. Efficient tools can bridge communication gaps, reduce misunderstandings, and enhance the overall workflow within teams.

Apprehension focuses on concerns related to privacy and data security, which are prominent among employees. Implementing transparent policies and robust security measures can mitigate these concerns, fostering a more trusting environment for the use of DCT. Open communication about the regulatory contexts and the specific use of DCT in internal communication can further alleviate these apprehensions, ensuring that employees feel more secure and confident in using these technologies. Addressing privacy concerns is crucial for gaining employee trust and encouraging the adoption of new technologies. By actively involving employees in discussions about data security and demonstrating a commitment to protecting their information, organizations can create a safer digital environment.

Effort Expectancy aligns with existing technology acceptance models, underscoring that perceived ease of use is crucial for the acceptance of new technologies. Organizations can significantly enhance this perception by

implementing comprehensive training programs and developing user-friendly interfaces. Ensuring that digital tools are easy to learn, and use will encourage employees to adopt and utilize these technologies more effectively. Training programs should be tailored to different skill levels and should emphasize hands-on practice. Additionally, feedback mechanisms should be in place to continuously improve the usability of these tools based on user experiences.

Performance Expectancy highlights that perceived usefulness is a critical determinant of acceptance, again consistent with established technology acceptance models. Training programs that demonstrate the tangible benefits of DCT, along with interfaces designed for optimal functionality, can enhance employees' perceptions of these tools' utility in improving their work performance and productivity. It is important for organizations to provide real-world examples and case studies showing how digital tools have successfully improved workflow efficiency and employee productivity. This can help in reinforcing the value of these technologies.

Facilitating Conditions emphasize the importance of organizational support in technology adoption. Providing employees with the necessary resources, assistance, and technical support is vital for the successful implementation of DCT. Organizations must ensure that support structures are in place to help employees navigate any difficulties they may encounter when using digital communication tools.

Social Influence underscores the impact of colleagues and superiors on an individual's decision to use DCT, highlighting the social dynamics within the workplace. Encouraging influential employees to advocate for the use of technology can positively affect overall acceptance rates. When respected peers

and leaders endorse and utilize these tools, it can create a positive ripple effect throughout the organization, leading to broader adoption and integration. Peer-led training sessions and testimonials from early adopters can be particularly effective in promoting new technologies. Additionally, creating a culture that celebrates innovation and technological adoption can further reinforce positive social influence.

The DICAS serves as a comprehensive tool to capture, reveal, and address concerns encapsulated within these six factors, thus enabling effective management of the digital transformation of internal communication in organizations. By systematically evaluating employee perceptions and acceptance levels, organizations can identify areas needing improvement and tailor their strategies to enhance overall technology adoption. Our findings indicate that employee acceptance of DCT is not only a matter of usability and efficiency but also a crucial factor in creating more inclusive and equitable workplaces. By using DICAS, organizations can better understand and support employees with diverse backgrounds and varying levels of technological proficiency, ensuring that all employees can engage effectively with digital communication tools. This shift in perspective changes the way the field views digital technology adoption, moving toward an employee-centered approach that prioritizes inclusivity and accessibility. Ultimately, by addressing barriers such as privacy concerns and lack of organizational support, DICAS contributes to creating a more just and equitable workplace, where all employees can thrive in a digitally transformed environment.

### **Potential Applications of the DICAS**

Organizations can leverage the DICAS in several ways to enhance their digital communication strategies. Regularly measuring employee acceptance of DCT allows organizations to identify areas of resistance or discomfort and address them proactively. The DICAS can be used as a formative, process, or summative research instrument. It can be applied before a major change initiative to improve its success probability, during the transformation to fine-tune the process, and after the implementation to assess its overall impact and effectiveness.

*Formative Assessment:* Utilizing the DICAS before implementing new digital communication tools can help organizations gauge initial employee perceptions and readiness for change. By identifying potential barriers to acceptance early, organizations can develop targeted strategies to address these issues, such as tailored communication plans, training sessions, and support mechanisms. This proactive approach increases the likelihood of a smooth transition and higher acceptance rates.

*Process Monitoring:* During the implementation phase, the DICAS can serve as a process monitoring tool. By regularly measuring employee acceptance, organizations can track the effectiveness of their communication strategies and support initiatives in real-time. This ongoing assessment allows for timely adjustments to be made, ensuring that any emerging issues are promptly addressed. Such real-time feedback is invaluable for maintaining momentum and keeping the implementation on track.

*Summative Evaluation:* After the implementation of new digital communication tools, the DICAS can be used to evaluate the overall impact and effectiveness of the initiative. By comparing pre- and post-implementation data, organizations can assess the success of their strategies and identify areas for

further improvement. This summative evaluation provides a comprehensive understanding of the initiative's outcomes and informs future digital transformation efforts.

Developing customized training and support programs based on specific areas where employees feel less confident or apprehensive can also benefit from the insights provided by the DICAS. These programs can be complemented with pre-developed or simultaneously developed on- and offline resources. Leveraging artificial intelligence can significantly enhance the speed and customization of these training programs, ensuring they are tailored to meet the specific needs of different employee groups. For example, AI-driven platforms can offer personalized learning paths, interactive simulations, and real-time feedback, making the training more engaging and effective.

Enhancing internal communication strategies based on the insights gained from the DICAS ensures that they are better aligned with employee needs and preferences. Improved communication strategies can directly or indirectly affect productivity, work satisfaction, and overall organizational effectiveness. By addressing the specific concerns and preferences of employees, organizations can create a more supportive and effective communication environment. For instance, if the DICAS reveals that employees prefer more visual and interactive communication formats, organizations can incorporate more video content, infographics, and interactive tools into their communication channels.

Facilitating smoother transitions during the implementation of new digital tools is another crucial application of the DICAS. Understanding and addressing employee concerns and expectations can ease the adoption process and reduce resistance to change. Recognizing that employee perceptions and acceptance of

change may evolve over time due to various factors, organizations can remain agile and responsive to these dynamics. Continuous engagement with employees through feedback loops and iterative improvements can foster a culture of adaptability and openness to new technologies.

Establishing benchmarks for DCT acceptance and tracking changes over time allows organizations to continuously improve their digital communication strategies. As digital transformation is an ongoing process, this approach helps ensure that strategies remain relevant, effective, and aligned with the evolving needs of the workforce. By setting clear benchmarks and regularly measuring progress against them, organizations can maintain a forward-looking approach to digital communication. This long-term perspective enables organizations to anticipate future trends, prepare for upcoming challenges, and stay ahead in the competitive landscape.

The DICAS provides a versatile and comprehensive tool for organizations to enhance their digital communication strategies. By systematically measuring and addressing employee acceptance of DCT, organizations can foster a more supportive, efficient, and adaptable communication environment. This proactive approach not only improves immediate outcomes but also contributes to the long-term success of digital transformation initiatives.

Yet, DICAS is not only applicable for organizational practice but also in research. For researchers, the scale offers a validated instrument to study employee acceptance of DCT in various organizational contexts. It provides insights into the key factors that underly and influence employee acceptance of digital tools for internal communication, thereby helping to conduct research that



leads to a better understanding of the complexities of internal communication in digital environments.

### **Limitations and Future Research**

Despite the significant contributions of the DICAS, several limitations should be acknowledged. While the dimensions of the scale were derived from the literature and thus represent the current knowledge on technology acceptance and internal communication in the international academic literature, the 23 experts reviewing the item pool were predominantly from countries in the western world, which may have led to a tool that is understood best by western participants. Similarly, although the sample was diverse in terms of gender and ethnicity, it only included individuals living in western English-speaking countries (UK, US, and Australia) predominantly working in large organizations. This is because the DICAS was developed as an English-language scale. In future research, the scale should be validated in different languages with samples from different geographic and cultural regions.

Respondents in the surveys were asked to answer the statements representing the indicators of the scale with respect to their acceptance to DCT in internal communication in general. They were provided examples for DCT like email, voice over IP, video conferencing, online chats, but stated their attitudes with regards to DCT in general. Thus, the data gathered represent an overall acceptance level. Applying the DICAS to individual tools will provide insights into the acceptance of specific tools instead. Additionally, the study relied on self-reported data, which may introduce biases caused by social desirability or self-

selection. Combining self-report measures with objective data, such as usage logs, could provide a more comprehensive understanding of DCT acceptance.

The study was designed to develop a scale and to provide insights into its dimensionality. Therefore, a cross-sectional design of the study was viable. However, it can only provide a snapshot of the current state of DCT acceptance. By applying a longitudinal study design insights can be gained into how acceptance evolves over time and in response to changes in the digital landscape.

Future research can expand on this study by exploring the application of the DICAS in different regions, organizational contexts, such as small and medium-sized enterprises (SMEs) and non-profits, as well as various industries. This would help examine contextual variations in DCT acceptance. Conducting longitudinal research to understand how employee acceptance of DCT evolves over time and in response to specific interventions or organizational changes would also be valuable.

Integrating the DICAS with other models of technology acceptance and organizational behavior could develop a more holistic understanding of digital transformation in the workplace. Additionally, investigating other potential factors influencing DCT acceptance, such as organizational culture, individual personality traits, and external environmental influences, could provide further insights.

## **Conclusion**

The DICAS offers a valuable tool for organizations to assess and enhance their digital communication strategies. By addressing employee concerns and aligning digital tools with user needs, organizations can foster a more supportive and effective communication environment. This, in turn, can drive innovation,

productivity, and job satisfaction. Future research should continue to explore the dynamic interplay between technology and human factors to support the successful digital transformation of modern workplaces.

The development of the DICAS provides a valuable tool for organizations to assess and enhance their digital communication strategies. By addressing employee concerns and aligning digital tools with user needs, organizations can foster a more supportive and effective communication environment, ultimately driving innovation, productivity, and job satisfaction. Future research should continue to explore the dynamic interplay between technology and human factors to support the successful digital transformation of modern workplaces.

By addressing critical gaps in existing technology acceptance models, this study presents a transformational vision for understanding employee engagement with DCT. The DICAS provides a more nuanced, employee-centered approach, positioning it as a critical tool for guiding organizations through successful digital transformations. As the workplace continues to evolve, understanding these complexities will be essential for fostering effective internal communication and employee satisfaction.

### **Final Thoughts**

The ongoing digital transformation may be one of the most significant societal innovations since the invention of the movable printing press half a millennium ago. The printing press was a blueprint for the modern mass society, influencing everything from mass production of goods and services to mass media and communication. Modern communication technology, starting with the mass print press, enabled the growth of large organizations, from corporations to empires. Similarly, the digital transformation is reshaping our societies into network

societies, diverging from mass societies much as those early formations diverged from feudal ones. Digital technology has enabled the emergence of new types of global corporations based on trading with immaterial data, creating realities that span both the material and virtual worlds with mutual influences.

While the use of DCT has become an integral part of life and work, humans are often expected to adjust to technology without sufficient attention to how they accept DCT and the consequences of this acceptance. Understanding employee acceptance of DCT is crucial for the successful implementation of digital transformation and communication in contemporary organizations. It is essential for fostering innovation, enhancing productivity, and improving job and life satisfaction among employees. Moreover, it is vital to measure how employees perceive and use different DCTs, such as email, intranet, internal social media, Google Meet, Teams, Webex, WhatsApp, and Zoom. This understanding helps plan and organize various communication structures based on different modes of interpersonal and mediated, particularly computer-mediated, communication.

The digital transformation of organizations and communication, considering the limited empirical evidence on the acceptance of DCT in general and its specific solutions, is spreading spontaneously and through social osmosis. Our development of a scale for measuring employee acceptance of DCT in the workplace aims to impose some order on this seemingly chaotic process.

Our scale is founded on a robust theoretical background based on a literature review of studies dealing with human acceptance of new technology, which we adapted to cover the field of internal communication. Creating validated tools to measure employee perceptions of digitalization is a crucial task. This approach facilitates informed decision-making, essential for tailoring digital

solutions to employee needs and enhancing overall adoption rates. Additionally, understanding employee perspectives through these instruments can significantly impact satisfaction and retention, as employees are more likely to embrace changes that consider their feedback and needs.

Furthermore, these instruments serve as benchmarks for continuous improvement, allowing organizations to track and adapt to evolving employee attitudes towards digitalization. Lastly, they act as proactive measures in risk mitigation, identifying potential resistance and issues early in the digital transformation process. Thus, in this paper, we underscore the importance of developing and utilizing validated instruments to gauge employee perceptions of digitalization, a step that is not only strategic but also essential for the successful digital transformation of modern organizations.

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## Appendix 1:

### Digital Communication Acceptance Scale (DICAS)

Item	Question
1	Through DCT, it becomes effortless to engage in productive discussions.
2	Through DCT, it becomes effortless to exchange information with colleagues.
3	DCT promotes effective communication.
4	DCT promotes efficient communication.
5	It bothers me that the data created by using DCT could be traced even years from now. (r)
6	I feel that my use of DCT makes it easier to invade my privacy. (r)
7	Using DCT makes me feel anxious about the potential threats to my privacy. (r)
8	The potential risks to my privacy make me hesitant when using DCT. (r)

<b>9</b>	It is easy for me to become skilful at using DCT.
<b>10</b>	I find DCT easy to use.
<b>11</b>	Learning to use DCT is easy for me.
<b>12</b>	My interaction with DCT is smooth and easy.
<b>13</b>	Using DCT enables me to accomplish work tasks more quickly.
<b>14</b>	Using DCT increases my work productivity.
<b>15</b>	I believe that DCT can help me save time at work.
<b>16</b>	DCT helps me to do my job better.
<b>17</b>	A specific person (or group) is available for assistance with any difficulties I have using DCT.
<b>18</b>	My organization provides the necessary support for using DCT.
<b>19</b>	I feel supported by the organization to use DCT.
<b>20</b>	My organization provides the technical resources required for using DCT.
<b>21</b>	People who influence my behavior (colleagues and superiors) think that I should use DCT.
<b>22</b>	People at work who are important to me think that I should use DCT.
<b>23</b>	I believe using DCT aligns with the organizational expectations.
<b>24</b>	Management expects me to use DCT.