SILESIAN UNIVERSITY OF TECHNOLOGY PUBLISHING HOUSE

SCIENTIFIC PAPERS OF SILESIAN UNIVERSITY OF TECHNOLOGY 2024
ORGANIZATION AND MANAGEMENT SERIES NO. 214

(IN)FORMAL COMMUNICATION SATISFACTION OF IT TOOLS AS AN ELEMENT OF ORGANIZATIONAL RESILIENCES

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Purpose: The aim of this study is to investigate whether IT tools influence the assessment of communication satisfaction during remote work to support organizational resilience after crisis.
Design/methodology/approach: The research tool was a CATI questionnaire carried out on 700 respondents, data were obtained in 2022 when the crisis was in the blooming phase. The questionnaire was expanded Communication satisfaction Questionnaire CSQ (Dawn and Hazen 1977) to include assessing satisfaction with the use of IT communication tools – synchronous (on-line) or asynchronous (off-line), in formal and informal organizational communication.
Findings: Respondents confirmed positive assessment of IT tools in communication during remote and hybrid work. Assessments of formal and informal communication in synchronous and asynchronous modes were above average. women better asses the IT tool in case of all types of communication while remote or hybrid work.
Research limitations/implications: More than 70% of respondents in our survey were young people born after 1980 it may have affected the level of satisfaction from IT communication. The tools themselves and how they were implemented were not studied here in order to asses if the user experience affected the results (the tool itself is satisfactory). These might be the suggestions for future research. The research is limited to respondents from Poland, which may affect the judgement because of high level of digital transformation of the country.
Practical implications: The communication while crisis facilitates and ensures business continuity and organization resilience. Employees satisfies with IT tools they use for communication support to overcome the crisis. Research findings can help managers identify key areas where organizational employees experience is valuable for the organization resilience in case of future crises.
Originality/value: The originality of the conducted research lies in presenting the new information about communication satisfaction from IT tools during remote work to support organizational resilience after crisis.
Keywords: communication satisfaction, IT tolls, hybrid work, remote work, resilience.
Category of the paper: Research paper.

1. Introduction

The management of crises has become a topic of concern for both academics and practitioners for some time, but interest in this field has grown significantly in recent years, and not without reason. Disruptions appear to be both inevitable and unpredictable. As a result, much of the literature suggests that investing in resilience may be a more effective strategy than allocating limited resources toward controlling the environment or defending against specific risks (Wildavsky, 1988). Resilience refers to an organization's preparedness to absorb shocks efficiently from an operational standpoint (Walker et al., 2004). From an individual perspective, it focuses on analyzing the cognitive and behavioral mechanisms that support adjustment to new situations (Biggs et al., 2010). Regardless of their origin, crises are often surprising, unpredictable, and demand a swift response, along with effective internal and external communication.

In this paper, resilience is understood as "the ability to repair old practices and develop new practices when the old ones are no longer possible" (Mark et al., 2009, p. 690). Therefore, organizational resilience can be viewed either as a response to crises or as a lesson learned over time, where new challenges serve as triggers for its application (Sutcliffe, Vogus, 2003). Communication during a crisis facilitates, and even ensures, business continuity, which in turn serves as the foundation for organizational resilience (Meechang, Watanabe, 2022; Steen et al., 2024).

Since the beginning of the 21st century, crisis management scholars have primarily focused on crisis communication, particularly its external aspects (Johansen et al., 2012). However, several studies have demonstrated that employee behavior during a crisis is crucial, and that internal communication and crisis management are the driving forces behind positive organizational outcomes (Ecklebe, Löffler, 2021; Frandsen, Johansen, 2011; Mazzei, Ravazzani, 2015; Taylor, 2010). The crisis management literature consistently highlights that employees are key to an organization's ability to recover after a crisis (Mohamad et al., 2023).

It can be argued that the quality and quantity of communication directly impact the level of employee trust and commitment (Adamu, Mohamad, 2019a). Despite this, there remains a gap in assessing employee satisfaction with communication, particularly across its different types and modes. Furthermore, the effectiveness of crisis communication strategies has received mixed support in research, calling for further investigation (Nöhammer et al., 2023; Tkalac Verčič et al., 2019). Additional research into communication satisfaction is essential, as its relationship to business continuity and effectiveness remains unclear.

Crisis communication is complex due to the speed, volume, sources, and channels of information exchanged, which can overwhelm individuals over time. Despite the confusion, signs of resilience often emerge, to which employees may refer. In the literature, entrepreneurial resilience is considered a multilevel concept (Doerfel et al., 2022), typically classified into three

levels: individual, team, and organizational (e.g., Raetze, 2021), or individual, organizational, and interorganizational resilience (e.g., Doerfel et al., 2022). This paper focuses on individuals within organizations, as emphasized in the aforementioned studies. These same levels can also be applied to communication.

At the individual level (Doerfel et al., 2010), people connect and assist one another, often coordinating through social media and other channels. These actions underscore the importance of communication in fostering resilience. Moreover, resilient employees are able to accept adverse situations and make efforts to adapt to changing environments through effective communication (Agarwal, Buzzanell, 2015). They cultivate resilience through storytelling, routines, and networking, which help legitimize negative experiences (Buzzanell, 2018). Employees can further build resilience by activating organizational connections and developing social support networks across various levels (Lee et al., 2020).

Organizational resilience is not merely the sum of individual-level resilience (Kantabutra, Ketprapakorn, 2021); rather, it is built upon processes that promote competence, restore efficacy, and encourage growth (Raetze et al., 2021). Organizational resilience is a capacity that emerges across multiple levels (Tasic et al., 2020). Recognizing employees as key stakeholders is a critical first step toward successful crisis management. In this context, Mazzei and Ravazzani (2013) view internal communication as a vital component, acting as a lever to either prevent crises or support appropriate responses, thus minimizing damage and producing positive outcomes. Effective communication can mitigate the impact of crises on organizations and their workforce—for example, by enabling employees to work independently (Kim, 2020; Lengnick-Hall et al., 2011).

In critical situations—whether due to a hurricane, pandemic, or flood—communication becomes the foundation for the survival and functioning of the organization. With significant employee participation, organizations can develop the communication mechanisms necessary to navigate through such cataclysms. If these mechanisms prove satisfactory for the participants involved, they can serve as a model for future crisis communication and be applied to unforeseen events.

Both formal and informal communication channels must meet the needs of employees to be effective. Formal communication enables the efficient and rapid management of the organization during a crisis, supporting its core operations and facilitating the exchange of messages with external stakeholders, such as clients and suppliers. Informal communication, on the other hand, plays a key role in fostering relationships among employees during crises. The pandemic, for instance, highlighted the importance of human connection within organizations. The disruption of pre-existing informal networks hindered the organization's basic functioning, emphasizing the need to maintain strong interpersonal relationships, even during a crisis.

In today's world, intra-organizational crisis communication is largely facilitated by IT tools. Employees use the tools available within the organization for formal communication, while often shifting informal communication to platforms outside of the company's systems. Since the value of a technology lies in how it is used rather than the technology itself (Orlikowski, 2000), new or adapted routines may be created by employees to meet their own satisfaction needs. In response to crises, employees often alter both communication and technology structures, using available tools to gain access to the necessary resources and contacts for survival and recovery (Sutton et al., 2008). They may also adapt one or more ICT technologies (Katz, Rice, 2002) that they have access to and use these technologies to facilitate recovery. This research, therefore, focuses on communication satisfaction via IT tools.

The communication tools were categorized based on the time dimension in which the communication process occurs—either synchronous or asynchronous (Zalewska-Turzyńska, Miklaszewska, 2019). At both the individual and organizational levels, ongoing crisis communication is also intertwined with issues such as exertion, overload, and fatigue (Lu, Jin, 2022). Communication overload is one of the identified challenges associated with the increased workload from remote work (Nadler, 2020; Lee et al., 2021). Therefore, the issue of satisfaction with organizational communication re-emerges in this paper, now considered in the context of avoiding communication overload.

IT communication tools enable remote work, and the level of satisfaction with these tools can help prevent overload, thus supporting the recovery process. Given the constant evolution of IT tools and the recurrence of crisis situations, ongoing research on communication satisfaction is both relevant and necessary.

The aim of this study is to investigate whether IT tools influence the assessment of communication satisfaction during remote work. To evaluate communication satisfaction, the Communication Satisfaction Questionnaire (CSQ) developed by Downs and Hazen (1977) was utilized. The original CSQ was developed in two phases: initially, 7 dimensions were identified, but the final version of the questionnaire was refined to 40 items, with five items for each of the 8 factors. These items are measured on a 7-point Likert-type scale, ranging from "extremely satisfied" to "extremely dissatisfied." The test-retest reliability of Downs and Hazen’s questionnaire was reported to be 0.94, demonstrating the strong consistency and stability of its factor structure (Tkalac Verčič et al., 2007).

Additionally, Gray and Laidlaw (2004) confirmed that the CSQ has gained widespread use in scholarly research, and it has been analyzed by various other researchers (a comprehensive list of studies and comparisons can be found in Meintjes, Steyn, 2006).

However, there have been some criticisms of the CSQ, particularly regarding the validity of its original 8-factor structure. Tkalac Verčič et al. (2021) questioned the validity of the factor structure, and Deconinck et al. (2008) also raised concerns. In response to these concerns, alternative factor solutions have been suggested by researchers: a 5-factor solution has been proposed as more valid than the original 8-factor model (Deconinck et al., 2008), while others

have suggested a 6-factor solution (Greenbaum et al., 1988) or even a 9-factor solution (Pincus, 1986).

In this study, the revised questionnaire structure proposed by Deconinck et al. (2008) has been adopted, focusing on the following dimensions:

- Co-worker Communication: This dimension assesses the extent to which horizontal and informal communication among employees is accurate, open, and free-flowing.
- Supervisor Communication: This factor measures two-way communication with supervisors, focusing on consultative and participative communication styles.
- Media Quality: This dimension evaluates the quality of meetings, organizational directives, and other formal communication channels.
- Corporate Information: This covers broad organizational information, such as updates on the company's financial health and changes within the organization.
- Organizational Integration: This factor examines the degree to which employees receive feedback about their immediate work environment and their role within it.
- Communication Climate: This dimension looks at the overall communication environment, both at personal and organizational levels. It assesses how well the communication climate encourages employees to meet organizational goals and shapes their attitudes toward the company.
- Personal Feedback: This refers to how employees are evaluated, particularly in terms of performance appraisal and constructive feedback.
- Subordinate Communication: This dimension focuses on two-way communication between supervisors and their subordinates. Only supervisors respond to this category, as it evaluates their communication with those they manage.

Media is usually distilled down to a categorization of “traditional” versus “advanced” technologies (Carr, Kaynak, 2007). Therefore we have broaden the questionnaire by the purpose of the tools – for formal and for informal communication.

2. Method

The research method was designed with 5 consecutive steps:

1. CSQ questionnaire analysis.
2. Expanding the CSQ questionnaire to include a general construct related to assessing satisfaction with the use of IT tools – synchronous, that is simultaneously (on-line) or asynchronous with a delay (off-line), tools for communication and tools supporting the exchanging information for the formal or informal purposes.
3. Data collection.

4. Examining the relationship of the impact of the new construct on communication satisfaction.
5. Exploring perceptions of different forms and types of communication.

Critical review of CSQ questionnaire analysis literature

The study was conducted to evaluate the technical aspect of communication, specifically focusing on satisfaction with IT tools used during the pandemic for remote and hybrid work. **The research aimed** to assess how these tools impacted communication satisfaction, which, in turn, is believed to contribute to organizational resilience. The assumption, supported by literature (discussed in the introduction), is that effective communication during a crisis lays the foundation for organizational resilience.

The first stage of the research consisted of a mapping review (Lönngren, Van Poeck, 2021) of the relevant literature. The choice of this review method was dictated by the research questions, theoretical assumptions, and the scope of the investigation. The literature surrounding the Communication Satisfaction Questionnaire (CSQ) was analyzed across three main areas:

- Evaluation of the Questionnaire's Quality: This group of studies examined the reliability and validity of the CSQ (e.g., Deconinck et al., 2008; Tkalac Verčič et al., 2007).
- Context-Specific Implementations: These studies focused on how the CSQ has been applied in specific contexts, countries, or sectors. Examples include its use in the Indian context (Verghese, 2017; Tewari, Saraswat, 2017), in Palestine (Alsayed et al., 2012), and in the Turkish postal service (Okay, Okay, 2009). The CSQ has also been used in sector-specific studies, such as in the nursing profession (Wagner et al., 2015).
- Interdependence of Communication Satisfaction and Other Organizational Factors: This field examined the relationship between communication satisfaction and various organizational outcomes. Examples include job satisfaction among intensive care unit nurses (Vermeir et al., 2018), employee engagement (Iyer, Israel, 2012), organizational identification (Nakra, 2006), communication satisfaction in virtual workplaces (Akkirman, Harris, 2005), and the relationship between job satisfaction and job performance (Pincus, 1986).

Additionally, we encountered some critical evaluations of the CSQ itself, pointing out limitations. For instance, some studies were restricted to a single organization (e.g., a private higher education institution in South Africa, Meintjes, Steyn, 2006) or focused on a specific aspect of the communication process, such as communication audit techniques (Zwijze-Koning, de Jong, 2007).

To clarify the scope of extending the questionnaire with the construct we prepared, it is necessary to refer to the essence of mediated communication – IT tools allow for online communication, when the sender and receiver connect through IT tools and communicate simultaneously, and offline, when the sender issues a message in the absence of the receiver's

presence, and the receiver responds at another time, comfortable for him. The alternation of formal and informal communication stems from the nature of communication in an organization. These were the reasons behind the use of the 4 questions to explore each of the possibilities.

Data collection and research sample analysis

For the next step of the study, data collection was required using quantitative research methods. A verified and reliable questionnaire was adopted for this purpose, specifically the Communication Satisfaction Questionnaire (CSQ) developed by Downs and Hazen (1977). The data collection process was outsourced to a professional market research agency. The questionnaires were integrated into a single electronic form, and the data were collected via the Computer-Assisted Telephone Interviewing (CATI) method. The respondents were employees based in Poland. A filter question was used to ensure that only individuals who worked online were eligible to participate in the survey. The research was conducted during the pandemic, in the first quarter of 2022, during a time of crisis. The extended CSQ questionnaire was used for the survey. A total of 700 complete responses were collected.

Table 1 outlines the structure of the study group. More than 70% of the respondents were young people born after 1980. Female respondents comprised 49.29% of the sample, while male respondents represented 50.71%. Most of the respondents had extensive professional experience with a single employer. Approximately 52.29% had been employed for more than three years, 27.14% had been with their employer for 1 to 3 years, and 12.57% had worked for the same employer for half a year. Furthermore, 42% of the respondents had more than one year of experience working remotely. At the time of the study, most respondents were already well-versed in remote work, with over 90% working remotely more than one day a week. Notably, 28% of respondents worked remotely five days a week or more, meaning they worked entirely from home.

Table 1.
The structure of the surveyed respondents

Gender	**Work experience for current employer**	**Remote work experience for current employer**	**Days of remote work per week**	**Age group**
Male	Up to 6 months	Up to 6 months	1	1946-1964 (baby boomers)
355 records/ 50,71%	*56 records/ 8%*	*180 records/ 25,71%*	*59 records/ 8,43%*	*36 records/ 5,14%*
Female	6 to 12 month	6 to 12 month	2	1965-1979
345 records/ 49.29%	*88 records/ 12,57%*	*226 records/ 32,29%*	*150 records/ 21,43%*	*161 records/ 23%*
	1 to 3 years	>1 year	3	1980-2000
	190 records/ 27,14%	*294 records/ 42%*	*229 records/ 32,71%*	*496 records/ 70,863%*
	More than 3 years		4	2001-
	366 records/ 52,29%		*66 records/ 9,43%*	*7 records/ 1%*

Cont. table 1.

			5	
			171 records/ 24,43%	
			more than 5	
			25 records/ 3,57%	

Source: own compilation.

3. Findings and analyses

The original (CSQ) instrument used for thus study was divided into eight dimensions. To determine the degree of communication satisfaction, mean value and basic statistics were calculated for each dimension creating eight composite scores showing statistically significant correlation (table 2).

Table 2.
The descriptive statistics and test of normality (Kolmogorov-Smirnov) for original CSQ dimensions

				Kolmogorov-Smirnov with Lilliefors significance corrections		
CSQ Dimension/Variable	**Sum**	**Mean**	**Stand. dev.**	**Statistics**	**df**	**Sig.**
1.Co-Worker Communication (horizontal communication)/**CW**	3524,60	5,04	0,979	0,094	700	<,001
2. Supervisory Communication/**SC**	3494,00	5,00	1,084	0,092	700	<,001
3. Media Quality/**MQ**	3488,60	4,99	0,967	0,079	700	<,001
4. Corporate Information/**CI**	3379,00	4,83	1,032	0,078	700	<,001
5.Organizational Integration/**OI**	3517,60	5,03	1,044	0,098	700	<,001
6.Communication Climate/**CC**	3434,80	4,90	1,057	0,095	700	<,001
7.Personal Feedback/**PF**	3405,20	4,86	1,104	0,087	700	<,001
8.Subordinate Communication/**CS**	3448,60	4,92	0,974	,0066	700	<,001

Source: own compilation.

To examine the relationship of the IT tools on communication satisfaction an additional composite score for IT tools was calculated based on the mean value of four variables that measured satisfaction with formal/informal and online/offline communication. To assess the overall level of communication satisfaction via IT tools, the mean value and basic statistics were calculated for this composite score. The reliability of the composite variables was tested using Cronbach's Alpha, which indicated a high level of internal consistency among the items ($\alpha = 0.834$).

The original and transformed variable (logit transformation) were evaluated using the Kolmogorov-Smirnov test to assess the normality of the distribution. In all cases, the significance level was less than alpha 0.001, leading to the conclusion that the variables deviated from a normal distribution.

In the next step the statistical relationship between the composite IT tools score and the original 8 dimensions of communication satisfaction was examined using Spearman's correlation showing statistically significant correlations for all dimensions (table 3). Therefore, we can conclude that the perception of IT tools used in formal/informal communication has a measurable impact on overall communication satisfaction.

Table 3.
IT tools and communication dimensions of communication relationship – the results of Spearman's correlation

	CW. Mean	SC. Mean	MQ. Mean	CI. Mean	OI. Mean	CC. Mean	PF. Mean	CS. Mean
Correlation Coefficient	0,750	0,668	0,707	0,599	0,651	0,661	0,611	0,685
Sig.	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	0,006

Source: own compilation.

In the next step of the research perceptions of different forms and types of communication (formal/fnformal, synchronous(online)/asynchronous(offline)), was examined due to gain more insight into the relationship between the IT tools and communication satisfaction during remote and hybrid work reflecting tools used to exchange information. The impact of variables such as gender, remote working experience, number of days working online and age group of the respondent on were examined. Mainly non-parametric tests were applied as the data included both nominal and ordinal variables (Likert scale perceptions).

Gender impact

The Mann-Whitney U test showed a statistically significant relationship (p = 0.02) between the variable representing the dimension of the IT tool and gender. To further explore these findings, a t-test was performed to identify specific differences in IT tool assessments across 4 types of communication. The results showed that women rated IT tools more favorably in all types of communication during remote or hybrid work. This difference in assessment was particularly notable in online communication. The differences were statistically significant, as the p-values were below the 0.05 threshold for formal offline, formal online, and informal online communication types (table 4).

Table 4.
Gender influence on the evaluation of communication via IT tools

Communication type		Gender	N	Mean	Std. Dev.	Std.Error Mean	Sig.(2-tailed)/df
Formal	Online	Female	345	5,19	1,142	0,061	(0,017)/698
		Male	355	4,95	1,411	0,075	(0,016)/675
	Offline	Female	345	5,30	1,059	0,057	(0,009)/698
		Male	355	5,06	1,298	0,069	(0,009)/677
Informal	Online	Female	345	5,16	1,094	0,059	(0,035)/698
		Male	355	4,96	1,348	0,072	(0,035)/677
	Offline	Female	345	5,18	1,086	0,058	(0,332)/698
		Male	355	5,09	1,409	0,075	(0,330)/663

Source: own compilation.

Remote/hybrid work experience impact

The statistical relationship between the WorkExperience variable (representing remote working experience of the respondent) and the transformed composite variable representing IT tool dimensions of communication satisfaction was examined. No statistically significant difference ($p = 0.12$) was found after applying the Kruskal-Wallis test, so no further detailed analysis was conducted for this variable.

Number of days working online impact

The statistical relationship between the DaysOnline variable representing (number of days working online) and the transformed composite variable for IT tools dimensions of communication satisfaction was examined. A statistically significant difference ($p = 0.003$) was found after applying the Kruskal-Wallis test. In particular, pairwise comparisons showed a significant difference between respondents working 3-5 days ($p = 0.036$) and those working 3-and more than 5 days remotely ($p = 0.038$), but no significant differences were observed for other comparisons.

The median values for each number of remote workdays were also calculated giving the results from 5 for those working 1 and 3 days remotely, and 5.75 for those working more than 5 days remotely (all results are included in table 5 part a).

The Kruskal-Wallis test was applied to analyze individual variables in more detail, as shown in table 5 part b. A statistically significant difference ($p = 0.002$) was found for the Formal/Online communication type. Pairwise comparisons revealed a significant difference between respondents working 2–5 days ($p = 0.044$) and those working 3-6 days remotely ($p = 0.018$).

For Formal/Offline communication, a statistically significant difference ($p = 0.035$) was also observed. Pairwise comparisons showed a significant difference only between respondents working 3 and more than 5 days remotely ($p = 0.025$).

In the case of formal communication, the mean satisfaction ratings were higher for online communication across all workdays.

For informal/online communication, there was no statistically significant difference in satisfaction based on the number of remote workdays ($p = 0.319$), so these results can only be interpreted within the research group.

However, for informal/offline communication, a statistically significant difference ($p = 0.033$) was found for satisfaction based on the number of remote workdays, but no statistically significant differences were observed in any pairwise comparisons.

In the case of informal communication, respondents working more than one day remotely rated offline communication slightly better, although these differences were minor when considering the mean values.

Table 5.
Remote work experience influence on the evaluation of communication via IT tools

a

Days Online	N	Mean	Std.Dev.	Median
1	59	5,025	1,052	5,000
2	150	5,078	0,972	5,125
3	229	4,973	0,982	5,000
4	66	5,178	1,159	5,250
5	171	5,250	1,020	5,250
>5	25	5,620	0,866	5,750

b

Communication type	Days Online	N	Mean	Std. Dev.	Median	Communication type	Mean	Std. Dev.
Formal Online	1	59	4,95	1,224	5,00	Formal Offline	5,15	1,172
	2	150	4,93	1,257	5,00		5,16	1,188
	3	229	4,91	1,349	5,00		5,05	1,209
	4	66	5,17	1,421	5,00		5,24	1,096
	5	171	5,33	1,197	5,00		5,25	1,208
	>5	25	5,64	0,952	6,00		5,80	1,080
InFormal Online	1	59	5,03	1,217	5,00	InFormal Offline	4,97	1,313
	2	150	5,05	1,128	5,00		5,17	1,201
	3	229	4,93	1,292	5,00		5,00	1,196
	4	66	5,05	1,440	5,00		5,26	1,512
	5	171	5,20	1,176	5,00		5,22	1,287
	>5	25	5,36	1,036	6,00		5,68	0,988

Source: own compilation.

Age group impact

The statistical relationship between the AgeGroup variable and the transformed composite variable representing communication satisfaction with IT tools was examine. No statistically significant difference ($p = 0.767$) was found after applying the Kruskal-Wallis test, so no further detailed analysis was conducted for this variable.

4. Discussion and limitations

Respondents provided a positive evaluation of IT tools used for communication during remote and hybrid work. The assessments of both formal and informal communication, in both synchronous and asynchronous modes, were above average. Although not all detailed results reached the required level of statistical significance, the findings suggest that employees are generally satisfied with the use of IT tools as instruments and mediums for communication.

Thus, it can be assumed that, in the event of future situations requiring remote work, communication via IT tools is unlikely to pose a high risk to the continuity of the organization's operations.

The pandemic, as a time of crisis, has served as both a cause and catalyst for various events within organizations. It provided a unique research opportunity to study how individuals and organizations respond to sudden, unforeseen conditions that threaten survival, and it also highlighted methods for rebuilding and adapting companies in the face of such challenges.

This period has led to a significant amount of research and publications, including those utilizing the CSQ questionnaire. After conducting the research described in this paper, we performed another targeted mapping review. This second review focused on the period from 2019 to 2024 (chosen due to the typical inertia in the publishing process), and it revealed that many studies were published during this time comparing communication satisfaction with other organizational factors. However, we did not find any studies in which IT tools were the second factor of comparison.

In the context of achieving the aim of this work, the study by Ali Akkirman and Drew Harris (2005) is particularly relevant. Nearly 20 years ago, they stated in their research: "the virtual workplace does not have a categorically negative impact on organizational communication" (Akkirman, Harris, 2005, p. 404). Their study was based on a single organization, with all workers coming from one company, which contrasts with our research that included a broader range of participants.

According to our findings, women rated IT tools more favorably for all types of communication during remote or hybrid work. This difference in assessment was particularly noticeable in the case of online communication. This finding aligns with other studies showing that women are more likely to work from home than men (Astroza et al., 2020) and that women are more inclined to maintain relationships through text messaging (Arakawa et al., 2023).

More than 70% of the respondents in our survey were young people born after 1980. This can be considered a limitation of the study, as the sample predominantly consisted of younger individuals. However, it is important to note that in the event of future crises or threats to organizations, these young employees are likely to be the ones leading efforts to renew and rebuild the organization. They represent the workforce that will remain in organizations over the coming years and, looking more broadly at the labor market, they are a resource that organizations will continue to rely on. Moreover, they carry with them the experiences gained from the recent crisis.

Another limitation of the study relates to the questionnaire itself. In order to be distributed to Polish respondents, the CSQ had to be translated into Polish by the authors of this paper. The reliability of the translation was verified, similar to previous work by Tkalac Verčič et al. (2021).

The tools themselves and their implementation methods were not investigated, they may have an impact on the perception of satisfaction with communication through them (according to the *user experience* concept). There is a possibility that the tools themselves carry the satisfaction of using them. Additionally, since the research was conducted in Poland, we might assume that, as in other European countries, the IT infrastructure in Poland is well-developed

(Michałkiewicz, Mierzejewska, 2020). It is possible that the overall level of digitalization in the country influenced the respondents' positive assessments of communication satisfaction with IT tools. However, our research did not examine the overall level of digital transformation in the country, nor did it investigate the potential interdependence between digital transformation and communication satisfaction with IT tools.

Moreover, referring to the definition of resilience presented here in the text of introductory section, after conducting the research we would venture to say that the new practices are being developed. And further, based on the results of our research, we can assume that good practices with IT communication tools are emerging, and in the future directions of research it will be possible to exploit the detailed types of practices new or adapted routines may be created by employees to meet their own satisfaction needs.

In this study, the constructs were researched, so in the future we can focus on the detailed content of each construct. In addition, good communication practices using IT tools for organizational resilience in detail – which exact tools support organizational resilience to the highest degree – deserve attention in further research.

References

1. Adamu, A., Mohamad, B. (2019). Developing a strategic model of internal crisis communication: Empirical evidence from Nigeria. *International Journal of Strategic Communication*, *13(3),* 233-254. https://doi.org/10.1080/1553118X.2019.1629935
2. Adamu, A., Mohamad, B. (2019a). A reliable and valid measurement scale for assessing internal crisis communication. *Journal of Communication Management*, *23*(2), 90-108. DOI 10.1108/JCOM-07-2018-0068
3. Akkirman, A.D., Harris, D.L. (2005). Organizational communication satisfaction in the virtual workplace. *Journal of management development*, *24*(5), 397-409. DOI 10.1108/02621710510598427
4. Alsayed, A.K., Motaghi, M.H., Osman, I.B. (2012). The use of the multifactor leadership questionnaire and communication satisfaction questionnaire in Palestine: A research note. *International Journal of Scientific and Research Publications*, *2*(11), 340-348. ISSN 2250-3153
5. Arakawa, Y., Inoue, K., Nishioka, D., Nakagomi, A., Tabuchi, T., Kondo, N. (2023). Remote communication and loneliness during the COVID-19 pandemic: Cross-sectional study. *Journal of Medical Internet Research*, *25*(1), e45338. doi: 10.2196/45338
6. Astroza, S., Tirachini, A., Hurtubia, R., Carrasco, J.A., Guevara, A., Munizaga, M., Figueroa, M., Torres, V. (2020). Mobility changes, teleworking, and remote communication during the COVID-19 pandemic in Chile. *Findings*. https://doi.org/10.32866/001c.13489.

7. Baksi, A.K., Aich, A. (2018). Developing a communication satisfaction scale for internal marketing. *Asian Journal of Management*, *9*(1), 643-648. DOI: 10.5958/2321-5763.2018.00101.4
8. Carr, A.S., Kaynak, H. (2007). Communication methods, information sharing, supplier development and performance: an empirical study of their relationships. *International, Journal of Operations & Production Management, Vol. 27 No. 4,* pp. 346-70. DOI 10.1108/01443570710736958
9. Deconinck, J., Johnson, J., Busbin, J., Lockwood, F. (2008). An examination of the validity of the Downs and Hazen communication satisfaction questionnaire. *Marketing management Journal*, *18*(2), 145-153. ISSN 1534-973X.
10. Doerfel, M., Kim, M., Kwestel, M., Yoon, H., Quow, J. (2022). Resilience organizing: a multilevel communication framework. *Journal of Communication*, *72*(6), 605-618. https://doi.org/10.1093/joc/jqac027.
11. Ecklebe, S., Löffler, N. (2021). A question of quality: Perceptions of internal communication during the COVID-19 pandemic in Germany. *Journal of Communication Management, 25(3),* 214-232. DOI 10.1108/JCOM-09-2020-0101.
12. Frandsen, F., Johansen, W. (2011). The study of internal crisis communication: Towards an integrative framework. *Corporate Communications: An International Journal, 16(4),* 347-361. DOI 10.1108/13563281111186977
13. Iyer, S., Israel, D. (2012). for Testing the Impact of Organization Communication Satisfaction on Employee Engagement. *South Asian Journal of Management*, *19*(1), 51-81. ISSN: 0971-5428
14. Kantabutra, S., Ketprapakorn, N. (2021). Toward an organizational theory of resilience: an interim struggle. *Sustainability*, *13*(23), 13137. https://doi.org/10.3390/su132313137
15. Katz, J., Rice, R. (2002). The telephone as a medium of faith, hope, terror, and redemption: America, September 11. *Prometheus, 20(3),* 247-253. DOI: 10.1080/08109020210144882
16. Kim, Y. (2020). Organizational resilience and employee work-role performance after a crisis situation: Exploring the effects of organizational resilience on internal crisis communication. *Journal of Public Relations Research, 32(1-2),* 47-75. https://doi.org/10.1080/1062726X.2020.1765368
17. Lee, S., Zhou, Z., Xie, J., Guo, H. (2021) Work-related use of information and communication technologies after hours and employee fatigue: the exacerbating effect of affective commitment. *Journal of Managerial Psychology*. DOI 10.1108/JMP-12-2019-0677
18. Lengnick-Hall, C., Beck, T., Lengnick-Hall, M. (2011). Developing a capacity for organizational resilience through strategic human resource management. *Human Resource Management Review, 21,* 243-255. doi:10.1016/j.hrmr.2010.07.001

19. Lönngren, J., Van Poeck, K. (2021). Wicked problems: A mapping review of the literature. *International Journal of Sustainable Development & World Ecology*, *28*(6), 481-502. https://doi.org/10.1080/13504509.2020.1859415
20. Lu, X., Jin, Y. (2022). Integrating strategy and dosage: A new conceptual formula for overcoming unintended effects in public health crisis communication (PHCC). In: W.T. Coombs, S.J. Holladay (Eds.), *The Handbook of Crisis Communication (2nd ed.)* (pp. 263-284). Wiley. https://doi.org/10.1002/9781119678953.ch18
21. Mark, G., Al-Ani, B., Semaan, B. (2009). *Resilience through technology adoption: Merging the old and the new in Iraq.* Proceedings of the 27th international conference on Human factors in computing systems. New York: ACM Press, pp. 689-698.
22. Mazzei A., Ravazzani S. (2015). Internal crisis communication strategies to protect trust relationships: A study of Italian companies. *International Journal of Business Communication*, *52(3),* 319-337. DOI: 10.1177/2329488414525447
23. Mazzei, A., Ravazzani, S. (2013). *Responsible communication with employees to mitigate the negative effects of crises: A study of Italian companies*. International Conference on Corporate and Marketing Communication: Responsible Communication. IT, pp. 2-11.
24. Meechang, K., Watanabe, K. (2022). The critical success factors of area-business continuity management: A systematic review and outlooks from the public and private sectors. *Journal of Disaster Research*, *17*(6), 923-932. https://doi.org/10.20965/jdr.2022.p0923
25. Meintjes, C., Steyn, B. (2006). *A critical evaluation of the Downs-Hazen instrument (CSQ) by measuring employee communication satisfaction at a private higher education institution in South Africa.* https://doi.org/10.1080/02500160608537968
26. Michałkiewicz A., Mierzejewska W. (eds.) (2020). *Contemporary organisation and management. Challenges and trends.* Wydawnictwo Uniwersytetu Łódzkiego.
27. Mohamad, B., Abbas Adamu, A., Akanmu, M.D. (2022). Structural model for the antecedents and consequences of internal crisis communication (ICC) in Malaysia oil and gas high risk industry. *Sage Open*, *12*(1). DOI: 10.1177/21582440221079887
28. Mohamad, B., Adamu, A., Akanmu, M. (2023). Internal crisis communication (ICC) framework in high risk industry: A qualitative study from key informants' perspectives. *Cogent Business & Management*, *10*(3), 2281699. https://doi.org/10.1080/23311975.2023.2281699
29. Nadler, R. (2020) Understanding "Zoom fatigue": Theorizing spatial dynamics as third skins in computer-mediated communication. *Computers and Composition*, *58*. https://doi.org/10.1016/j.compcom.2020.102613
30. Nakra, R. (2006). Relationship between communication satisfaction and organizational identification: An empirical study. *Vision*, *10*(2), 41-51.
31. Nöhammer, E., Schorn, R., Becker, N. (2023). Optimizing the Organizational Crisis Communication Portfolio. *Corporate Reputation Review*, *26*(4), 304-319. https://doi.org/10.1057/s41299-022-00156-6

32. Okay Aydemir, Okay Ayla (2009). An analytic study of communication satisfaction in the Turkish postal service. *Selçuk İletişim*, *6*(1), 51-66.
33. Orlikowski, W. (2000). Using technology and constituting structures: A practice lens for studying technology in organizations. *Organization Science, 11,* 404-428. https://www.jstor.org/stable/2640412
34. Pincus, J.D. (1986). Communication satisfaction, job satisfaction, and job performance. *Human Communication Research*, *12*(3), 395-419. https://doi.org/10.1111/j.1468-2958.1986.tb00084.x
35. Raetze, S., Duchek, S., Maynard, M., Kirkman, B.L. (2021). Resilience in organizations: An integrative multilevel review and editorial introduction. *Group & Organization Management*, *46*(4), 607-656. DOI: 10.1177/10596011211032129
36. Steen, R., Haug, O.J., Patriarca, R. (2024). Business continuity and resilience management: A conceptual framework. *Journal of Contingencies and Crisis Management*, *32*(1), e12501. https://doi.org/10.1111/1468-5973.12501
37. Sutcliffe, K., Vogus, T. (2003). Organizing for resilience. In: K. Cameron, J. Dutton, R. Quinn (Eds.), *Positive organizational scholarship: Foundations of a new discipline* (pp. 94-110). San Francisco, CA: Berrett-Koehler.
38. Sutton, J., Palen, L., Shklovski, I. (2008). *Backchannels on the front lines: Emergent uses of social media in the 2007 Southern California Wildfires*. Proceedings of the 5th International ISCRAM Conference. Washington, DC.
39. Tasic, J., Amir, S., Tan, J., Khader, M. (2020). A multilevel framework to enhance organizational resilience. *Journal of Risk Research*, *23*(6), 713-738. https://doi.org/10.1080/13669877.2019.1617340
40. Taylor, M. (2010). Toward a holistic organizational approach to understanding crisis. In: W.T. Coombs, S.J. Holladay, *The Handbook of Crisis Communication* (pp. 698-704). Blackwell Publishing Ltd.
41. Tewari, R., Saraswat, A. (2017). *Understanding Communication satisfaction in the Indian context.* Working Paper. Ahmedabad University.
42. Tkalac Verčič, A., Sinčić Ćorić, D., Pološki Vokić, N. (2021). Measuring internal communication satisfaction: validating the internal communication satisfaction questionnaire. *Corporate Communications: An International Journal*, *26*(3), 589-604. DOI 10.1108/CCIJ-01-2021-0006
43. Tkalac Verčič, A., Verčič, D., Coombs, W.T. (2019). Convergence of crisis response strategy and source credibility: Who can you trust? *Journal of Contingencies and Crisis Management, 27(1),* 28-37. DOI: 10.1111/1468-5973.12229
44. Verghese, A.K., Verma, P., Mohapatra, S. (2017). *Communication Satisfaction Questionnaire (CSQ) in Indian Context.* 6th International Conference on Managing Human Resources at the Workplace, Mysuru. ISBN 978-93-83302-27-7

45. Vermeir, P., Blot, S., Degroote, S., Vandijck, D., Mariman, A., Vanacker, T., Peleman, R., Verhaeghe, R., Vogelaers, D. (2018). Communication satisfaction and job satisfaction among critical care nurses and their impact on burnout and intention to leave: A questionnaire study. *Intensive and Critical Care Nursing*, *48*, 21-27. https://doi.org/10.1016/j.iccn.2018.07.001
46. Wagner, J.D., Bezuidenhout, M.C., Roos, J.H. (2015). Communication satisfaction of professional nurses working in public hospitals. *Journal of nursing management*, *23*(8), 974-982. DOI: 10.1111/jonm.12243
47. Wildavsky, A. (1988) *Searching for Safety*. New Brunswick, NJ: Transaction Books.
48. Zalewska-Turzyńska, M., Miklaszewska, A. (2019). Communication Process Between Real Estate Brokers and their Customers in the Era of the Information Society. *Przedsiębiorczość i Zarządzanie*, *20*(10), 387-404. https://www.ceeol.com/search/article-detail?id=830059
49. Zwijze-Koning, K., de Jong, M. (2007). Evaluating the communication satisfaction questionnaire as a communication audit tool. *Management communication quarterly*, *20*(3), 261-282. DOI: 10.1177/0893318906295680.