

# **The use of digital communication tools and working from home arrangements across different industries: Implications for management**

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## **Keywords**

Digital communication tools, working from home, micro and small enterprises, MSE, digital transformation, technology adoption.

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### **Abstract**

Working from home (WFH) has become a standard working arrangement through the adoption of digital communication tools (DCTs) in many organisations across the globe. Using survey data from Switzerland, we explore the role of DCT in the WFH setting. Consistent with the theory of technology adoption, we find that organisations at the forefront of technological innovations are more likely to employ a more comprehensive range of DCTs. Amongst five key industries, we find that a significantly larger proportion of IT, media and financial services employed a comprehensive range of DCTs over the survey period to facilitate the adoption of WFH. Given the continuing trend of WFH, our work suggests that the WFH arrangement should be reassessed by senior management as part of the strategic decision-making process, particularly by late adopters of technologies. These organisations should consider investing in DCTs to enable employees to access a wider array of DCTs.

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## 1 Introduction

The COVID-19 pandemic accelerated the adoption of digital work environments (Nagel, 2020; Peter et al., 2024), with a particular focus on working from home (WFH). While recent research has explored the impact of digital transformation (DT) on the workplace, there is limited understanding of its influence on micro and small enterprises (MSEs) with fewer than 50 employees, particularly regarding their long-term adoption of digital technologies and WFH behaviour. MSEs constitute a significant portion of the global workforce and play a crucial role in developing a better understanding of the link between technology adoption and WFH. This study aims to better understand WFH practices in relation to technology adoption and the extent of Digital Communication Tool (DCT) adoption by Swiss MSEs during and after the COVID-19 pandemic.

Post-COVID-19 pandemic, WFH remains common practice across Europe, especially in London, Stockholm and Amsterdam (Sondh, 2025). The most prevalent arrangement, however, currently adopted by about 100 million employees in Europe and North America, is hybrid work, where individuals divide their time between WFH and working at the office each week (Bloom et al., 2024). Bloom et al. (2024) investigated in a six-month randomised controlled trial the impacts of hybrid WFH on 1,612 employees at a Chinese technology company during 2021–2022. They found that arrangements with WFH opportunities generally do not impact employee performance; however, they improve employee retention rates and increase employee job satisfaction. These are significant insights for managing directors in charge of workplace strategies and human resource managers responsible for recruitment and training design.

Generally, organisations can be categorised based on their technology adoption, being technological ‘pioneers’ (innovators or first movers), ‘early followers’, and ‘late followers’ (e.g., Gómez et al., 2021). Pioneers lead the way in adopting new technologies, gaining competitive advantages, accessing skilled workers, and having solid reputations (Daviy & Shakina, 2021). Pioneers are also perceived as flexible, especially in adapting to WFH or work-from-anywhere arrangements; however, they face high initial costs, low demand, and market uncertainty (Peter et al., 2024). Early followers quickly adopt technologies based on others’ experiences, while late adopters only embrace DCTs when they become essential (Pantano et al., 2022). Late followers benefit by economising on innovation costs, learning from pioneers’ mistakes, and leveraging economies of scale, although they face competition from pioneers who maintain their first-mover advantage (Suarez & Lanzolla, 2007).

Organisations use DCTs, such as emails and social media, to engage with both internal (employees) and external (clients, partners) audiences. These tools, which deliver messages through channels like email systems or phone networks, are key to achieving communication objectives (Mahoney, 2023). However, the functional tradition of communication, which emphasises message encoding and decoding, is criticised for ignoring the subjective interpretations of messages (Shockley-Zalabak, 2014). The socio-technical approach integrates both technical tools and social factors, emphasising trust-building and collaboration (Wuersch

et al., 2023). Digital communication tools, in turn, enhance employee engagement but require digital skills (Wuersch et al., 2024).

To better understand WFH practices and DCT adoption, this study uses survey data collected from Swiss MSEs, which contribute significantly to national employment and economic growth. This study examines how MSEs adapted to government-imposed lockdowns over the period of 2020-2022. It can be expected that early adopters of technologies, such as pioneers and early followers, are more likely to be found in the IT or media-related industries and are at the forefront of digital or technological advancements. Following this rationale, it is argued that such industries are expected to exhibit a relatively large proportion of employees *enabled* by a comprehensive range of DCTs to facilitate WFH during the pandemic. Therefore, we hypothesise that

The WFH arrangement is related to the extent of DCT usage and industry type. It is expected that IT-intensive firms are more likely to employ a more comprehensive range of DCT when the WFH arrangement is adopted.

This longitudinal study examined WFH practices and the use of DCTs among Swiss MSEs in 2020, 2021, and 2022. The findings are anticipated to provide insights into how MSEs can make well-informed decisions regarding technology investments and communication strategies, enhancing their competitive advantage.

## **2 Data and research design**

The sample comprises MSEs from various industries, including Commerce and Sales, Construction and Manufacturing, Financials and Services, Health, Education, IT, and Media. The classification of these industries is consistent with the Classification of Economic Activities (NOGA), which the Federal Statistical Office of Switzerland uses (FSO, 2008).

Over 1,500 MSE managing directors were interviewed using the CATI (Computer-Assisted Telephone Interviewing) method. The interview method is suitable for large-scale surveys (e.g., Kim & Couper, 2020; Peter et al., 2024) and is frequently used to conduct national surveys, such as the annual household survey by the Swiss Federal Statistical Office. A total of three surveys were conducted between 2020 and 2022. Each survey involved an initial target sample size of around 500 participants, who were then randomly selected to participate in the CATI interviews. The final sample consists of 1,513 records translated into English from German, French, and Italian for statistical analysis.

The contingency table approach was employed to analyse the categorical data (Sekaran & Bougie, 2016). This procedure examined whether a systematic association exists between the extent of digital communication tool usage and the WFH arrangements using the Pearson chi-squared ( $\chi^2$ ) test statistic. Furthermore, a two-tailed z-test statistic was used to determine if the difference between column proportions was statistically significant.

### 3 Results and discussion

To better understand the use of digital communication tools, participants are asked if they have employed the following tools in their workplace over the survey period: 1.) Email, 2.) Telephone, 3.) Social media, and 4.) Online communications. To measure the extent of digital tool usage by the MSEs, binary variables are employed to indicate the use of each digital communication tool (“1”=yes, otherwise “0”=no). The variables are combined to create an ordinal variable ranging from 1 to 5 (1=least comprehensive, use of only one type of DCT; 5=most comprehensive, use of all four types of DCT). The variable is termed Digital Communication Score (DCS) and can be interpreted as the level of comprehensiveness of DCT usage. Regressing the numerical data for technology group on the DCS, we find the coefficient for DCS is statistically significant after controlling for industry effect. This result suggests DCS has predictive validity.

*Figure 1: Counts of digital tool usage 2020-2022: Swiss MSEs (pioneers & early followers)*

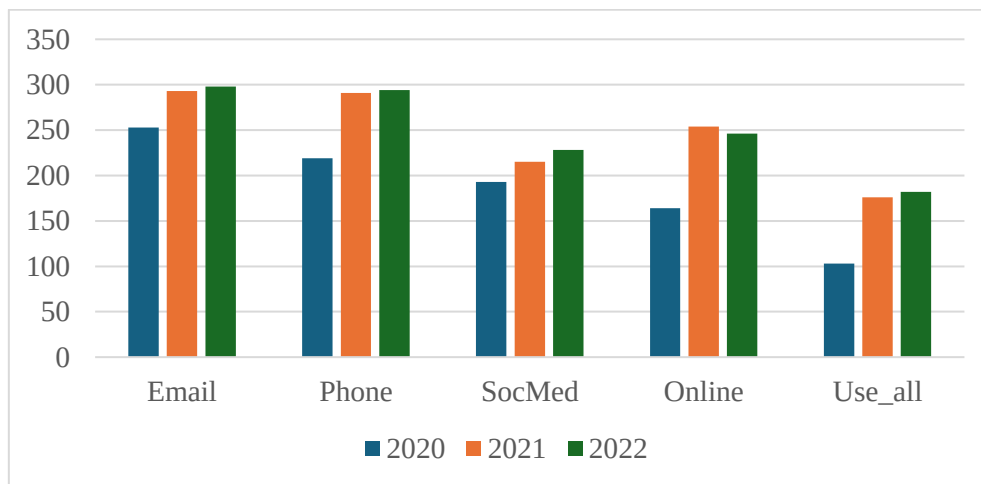


Figure 1 summarises the four categories of DCTs over the sample period for pioneers and early followers. The trend of DCT usage has been increasing over time since 2020. In particular, the use of all four types of DCTs increased by 76.7% in 2022 compared with the usage recorded in 2020. Except for social media, the Pearson chi-squared test statistic is statistically significant at the 5% level (not shown) for pioneers and early followers. This suggests evidence of a significant association between the pioneer/early adopters and the choice of DCT over time. In contrast, late followers in Figure 2 exhibit a smaller increase of 45.1% in the use-all category over the same period. For this technology group, the Pearson chi-squared test statistic (not shown) is only significant when telephone is selected as the tool for communication.

Table 1 provides an overview of DCS by industries and three different categories of DCT. Evidently, IT & Media (IM) has the highest DCS (median =5), while Health & Education (HE) has the lowest DCS, followed by Construction & Manufacturing (CM). More than half of the participants from the IM industry employed all four types of digital tools, whereas around 45% of CM and Financials & Services (FS) used three different types of DCT in their daily operations.

Figure 2: Counts of digital tool usage 2020-2022: Swiss MSEs (late followers)

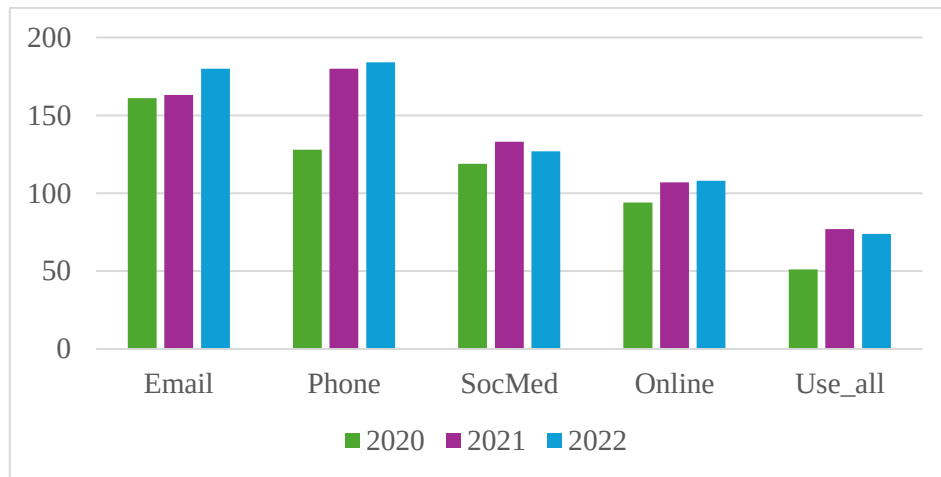


Table 2 provides the results for MSEs grouped by three main DCT categories, which aim to measure the comprehensiveness of DCT usage in the WFH setting. Group 1 (least comprehensive) uses between one to two DCTs in their daily business communications; Group 2 uses three DCTs, and Group 3 uses four DCTs (most comprehensive) in their operations. The data were further subcategorised by the working from home variable (WFH=0, where no employee opted for the WFH arrangement; WFH>0, where one or more employees opted for the WFH arrangement). The extent of DCT usage varies according to the industries and whether the MSEs opted for the WFH arrangement. For Group 3, the test for association between DCT by category is statistically significant at the 5% level, evidenced by the  $\chi^2$  of 23.89 ( $p<0.00$  with the Bonferroni correction). Although the  $\chi^2$  test statistics for Group 1 and Group 2 are above 8.0, they are not statistically significant at the 5% level. This evidence supports the notion that the extent of DCT usage is associated with industry type. Furthermore, in Group 3, the proportion of WFH>0 reported for HE and IM are 28.71% and 18.61%, respectively. Using the z-test statistic, these proportions are statistically larger than the corresponding results recorded under the subcategory WFH=0 in the rightmost column of Table 2. Interesting, the CM industry consists 24.92% of MSE employees that WFH over the sample period, but this contrasts with a significantly larger proportion of 44.07% of employees who did not WFH. This finding reinforces the need to differentiate between industries in our analysis, particularly in the CM industry, where employees can hardly WFH due to the inherent on-site nature of the industry. In this type of industry, productivity is expected to reduce substantially due to lockdowns.

Our result reinforces the idea that ITC-intensive industries are more inclined to utilise a broad array of DCTs, aligning with the perspective that these industries are largely at the cutting edge of technological innovation. Overall, this finding is consistent with the work of Peter et al. (2024) regarding the WFH behaviour of pioneers and early followers.

Table 1: Digital Communication Score classified by industry and the level of comprehensiveness

| Industries                        | DCS<br>Mean | Number of DCT used grouped by category |        |         |        |         |        |
|-----------------------------------|-------------|----------------------------------------|--------|---------|--------|---------|--------|
|                                   |             | Group 1                                |        | Group 2 |        | Group 3 |        |
|                                   |             | N                                      | Row %  | N       | Row %  | N       | Row %  |
| Commerce, Sales, & Others (CS)    | 3.67        | 55                                     | 16.80% | 130     | 39.80% | 142     | 43.40% |
| Construction & Manufacturing (CM) | 3.58        | 75                                     | 16.50% | 205     | 45.10% | 175     | 38.50% |
| Financials & Services (FS)        | 3.61        | 51                                     | 15.20% | 152     | 45.40% | 132     | 39.40% |
| Health & Education (HE)           | 3.41        | 37                                     | 21.90% | 75      | 44.40% | 57      | 33.70% |
| IT & Media (IM)                   | 3.91        | 16                                     | 11.30% | 51      | 36.20% | 74      | 52.50% |

Notes: Group 1 uses 1-2 DCTs; Group 2 uses 3 DCTs, and Group 3 uses 4 DCTs (all).

Table 2: Comparison of Digital Communication Score grouped by the level of comprehensiveness

| Industries                                       | Number of DCT used by category |       |           |       |           |           |           |           |           |          |           |          |
|--------------------------------------------------|--------------------------------|-------|-----------|-------|-----------|-----------|-----------|-----------|-----------|----------|-----------|----------|
|                                                  | Group 1                        |       |           |       | Group 2   |           |           |           | Group 3   |          |           |          |
|                                                  | WFH>0 (A)                      |       | WFH=0 (B) |       | WFH>0 (C) |           | WFH=0 (D) |           | WFH>0 (E) |          | WFH=0 (F) |          |
|                                                  | N                              | Col % | N         | Col % | N         | Col %     | N         | Col %     | N         | Col %    | N         | Col %    |
| Commerce, Sales, & Others (CS)                   | 12                             | 17.65 | 8         | 24.24 | 45        | 15.79     | 26        | 25.74 (C) | 66        | 20.82    | 30        | 25.42    |
| Construction & Manufacturing (CM)                | 19                             | 27.94 | 13        | 39.39 | 94        | 32.98     | 36        | 35.64     | 79        | 24.92    | 52        | 44.07(E) |
| Financials & Services (FS)                       | 20                             | 29.41 | 7         | 21.21 | 88        | 30.88     | 27        | 26.73     | 91        | 28.71(F) | 22        | 18.64    |
| Health & Education (HE)                          | 6                              | 8.82  | 5         | 15.15 | 18        | 6.32      | 6         | 5.94      | 22        | 6.94     | 7         | 5.93     |
| IT & Media (IM)                                  | 11                             | 16.18 | 0         | 0.00  | 40        | 14.04 (D) | 6         | 5.94      | 59        | 18.61(F) | 7         | 5.93     |
| Chi-squared ( $\chi^2$ ) test statistic (df = 4) |                                |       |           | 8.12  |           |           |           | 8.72      |           |          |           | 23.89*   |

Note: The table above presents the test results of the Pearson Chi-Squared Test statistic,  $\chi^2$ , for the presence of a significant association between the variables of interest. When a pair is found to exhibit a significant difference in proportion (at the 5% level using z-test statistic), the column number that corresponds with the smaller proportion is placed in the column that corresponds with the larger proportion. Group 1 uses (least comprehensive) one to two DCTs; Group 2 uses three DCTs, and Group 3 uses four DCTs (most comprehensive). \*  $\chi^2$  test statistic significant at the 5% level.

## 4 Discussion and Conclusion

### 4.1 Contributions to the literature

Our research examined the WFH behaviours and DCT usage among MSEs in Switzerland during three distinct phases of the COVID-19 pandemic. This study extends previous research by analysing the prevalence of WFH across three technology adoption groups—pioneers, early followers, and late followers—and their use of DCT.

The findings show that adopting digital technology significantly influences MSEs' ability to implement WFH arrangements. Pioneer MSEs, at the forefront of technology adoption, integrate WFH arrangements more extensively than early adopters and laggards. Early adopters demonstrate adaptability, while laggards, like those in education, rely heavily on face-to-face interactions. However, the pandemic catalysed DT in education, with late followers increasing online learning and WFH options.

Comparing surveys from 2020 and 2022, the study suggests that DT changes made during the pandemic persist to some extent, offering more WFH opportunities than before the pandemic. This aligns with Nagel's (2020) and Peter et al.'s (2024) findings that COVID-19 accelerated DT.

The study validates existing research and expands the literature with a unique dataset focused on MSEs. Using the CATI method, the research provides a significant methodological contribution by collecting responses from over 1,500 managing directors of MSEs across Switzerland's major language regions. Unlike prior studies focusing on large organisations, this study targets MSEs, which constitute the majority of businesses in Switzerland and globally, making a substantial economic contribution.

### 4.2 Recommendations to practice

The study offers several practical recommendations. First, the discussion on technology typologies highlights differences between pioneers, early adopters, and laggards in digital technology use. While pioneers are more technologically advanced, this does not imply superiority. Variations in industries exist, with ITC-intensive industries (such as IT and Media) being pioneers, while those driven by human interaction (like Health and Education) tend to be laggards. However, late followers, like Education, adapted to online teaching during the pandemic but still valued classroom interactions. Hence, MSEs should evaluate their DT possibilities and consider WFH within their environment. Strategic technological investments are crucial for digital competitiveness and future preparedness. MSE managing directors should discuss with stakeholders to identify beneficial digital technologies and develop a strategic digital roadmap.

Second, pioneers and early followers used video conferencing platforms like Zoom and Teams more than late followers during the pandemic. Late followers increased their use of these tools and social media to facilitate WFH, suggesting reactive technology investments. MSE managers should continue using online communication tools, exploring new features, and

testing their applications in various tasks. Collecting feedback on these tools' effectiveness can help evaluate the most suitable application within MSEs and avoid potential technostress.

Third, increased use of DCT requires digital policies to ensure appropriate usage and content communication. These policies contribute to trust-building and mitigate reputational, ethical, legal, and security risks. Hence, on the one hand, MSEs should define conduct, etiquette, and quality standards for internal and external communication. On the other hand, they should implement digital policies, with HR management leading the effort, acknowledging that resources may be scarce, particularly for micro-enterprises. Therefore, policymakers can support enterprises by providing standardised policy templates and training programs.

Finally, leaders with a clear digital vision and strategy are likely to succeed. Investing in communication technologies is a strategic decision for MSEs to facilitate WFH. Concurrently, developing digital capabilities at all levels of the organisation is crucial. Thus, digital skills within their organisation should be evaluated, and future capability development initiatives should be outlined.

#### 4.3 Limitations and avenues for further research

The study focuses solely on Swiss MSEs. Expanding the dataset to include SMEs could provide deeper insights and increase comparability both within Switzerland and internationally. A larger sample size would further help reduce potential measurement biases that might arise from a small sample or a lack of industry diversity. Therefore, this foundational study presents an opportunity to broaden the dataset internationally, facilitating geographical and cultural comparisons. Future research could also investigate employees' perspectives on WFH, consider external stakeholders, and assess the DT in the MSE sector during the pandemic. Methodologically, while our study does not address causality, future research could employ causal modelling to explore the complex relationships between variables. Despite its limitations, our work contributes to a better understanding of MSEs' adoption of WFH, technological typologies, and the use of DCT.

#### 4.4 Conclusion

In conclusion, our research offers valuable insights into the strategic implications of DT in WFH settings and the use of DCT within MSEs. By integrating DCTs, DT aims to enhance economic value and redefine organisational structures and work dynamics. It influences business processes, efficiencies, and interpersonal interactions, contributing to organisational growth.

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