

# Technological Preferences of IT Professionals and Organizational Culture

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## Abstract

This position paper emphasizes the relation between technological preferences among IT professionals and organizational culture, recognizing their mutual influence and the potential impact on workplace dynamics, from a socio-technical and human resource management perspective. As technology continues to evolve rapidly, organizations strive to keep up with the ever-changing digital landscape by hiring skilled IT professionals who possess a wide range of technological preferences. Simultaneously, organizational culture, encompassing shared beliefs, values, and practices, significantly shapes the working environment and influences employees' behaviors and attitudes. The paper reviews existing literature and secondary research data to explore the various dimensions of organizational culture and technological preferences prevalent among IT professionals, including preferences for specific tools, programming languages, software development methodologies, and hardware platforms. Furthermore, this paper discusses the potential implications of a misalignment between technological preferences and organizational culture. It advocates for fostering an inclusive and adaptable organizational culture that encourages diversity of technological preferences and promotes knowledge sharing among IT professionals. Moreover, it suggests an establishment of suitable recruitment and retention strategies, effective communication channels, collaborative decision-making processes, and ongoing training and development programs to ensure a harmonious integration of technology and culture. To bridge the gap between technological preferences and organizational culture, this position paper proposes several research questions for future investigation. The paper highlights the need for organizations to create an environment that embraces diverse technological preferences while nurturing a positive and supportive culture.

## Keywords

Technological preferences, IT professionals, Organizational culture, Socio-technical approach, Human Resource Management (HRM).

## 1. Introduction

In today's fast-paced and technology-driven world, the role of IT professionals within organizations has become increasingly critical. These professionals possess a wide range of technological preferences, encompassing everything from programming languages and software tools to hardware platforms and development methodologies. Although technology is central to their work-life, an inadequate attention has been paid to technology as an antecedent of IT professionals' work outcomes [1]. Simultaneously, organizational culture plays a vital role in shaping the work environment, influencing employees' attitudes, behaviors, and overall performance. Understanding the intricate link between technological preferences among IT professionals and organizational culture [2] is crucial for organizations aiming to maximize collaboration, productivity, and innovation.

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The rapid advancement of technology has led to an exponential increase in the complexity and diversity of tools and platforms available to IT professionals. These individuals bring their unique backgrounds, experiences, and expertise to the workplace, resulting in a diverse landscape of technological preferences.

Organizational culture encompasses the shared beliefs, values, norms, and practices within an organization [3]. It sets the tone for employee interactions, decision-making processes, and overall work atmosphere. A strong and positive organizational culture fosters collaboration, creativity, and adaptability, while a weak or misaligned culture may hinder productivity, innovation, and employee satisfaction [4]. The culture of an organization influences not only how work is done but also how technology is embraced and integrated into everyday practices.

Recognizing the interplay between technological preferences among IT professionals and organizational culture is essential for organizations seeking to create a harmonious and productive work environment. A misalignment between these factors can lead to a range of challenges, including resistance to change, communication barriers, and decreased job satisfaction. On the other hand, a strong alignment can lead to improved teamwork, enhanced innovation, and increased employee engagement [5].

Understanding the relationship between IT and organizational culture has challenged scholars from a range of disciplines for nearly five decades. Beginning with some early field studies of IT implementation [6] researchers have identified problems with successfully leveraging IT – particularly systems that work “right” technically but are resisted by their users. This issue has been labeled a lack of system/culture fit, and explained in terms of technologies having questionable “organizational validity” [7] despite adequate “technical validity” [8].

Gordon [9] brought attention of the influence of the specific industry on the process of culture development and change: “Corporate cultures, consisting of widely shared assumptions and values, are, in part, molded by the requirements of the industry in which they operate”. According Chatman and Jehn [10], one of the most salient similarities among firms in the same industry is their technology. Also, organizational culture is not necessarily homogeneous across all areas of the organization. While some of the norms will permeate the entire organization, different groups within the organization might develop their own sub-cultures [11]. Being aware of existing occupational differences can help managing technology implementation more effectively. Different subcultures in IT and non-IT organizational departments should be expected. According Schein [12] ‘organizations will not learn effectively until they recognize and confront the implications of [their different] occupational cultures’.

By understanding the link between technological preferences and organizational culture, organizations can leverage the strengths of their IT professionals and cultivate an environment that supports continuous learning, collaboration, and innovation. By doing so, they can adapt to the ever-changing technological landscape and achieve sustainable growth in the digital age. As Bednar and Welch [13] have argued ‘it may be better to see managers not as architects of context, but as cultivators’.

This paper aims to highlight several perspectives to stimulate further academic and professional debate about the importance of this topic:

- The impact of organizational culture and technological preferences on recruitment and retention of IT professionals;
- The role of organizational culture in mediating knowledge distribution;
- Extent to which IT professionals prioritize data privacy and ethical considerations when choosing technologies [14] [15] [16] [17];
- The choice between open-source and proprietary software often comes down to both personal and organizational beliefs. Some argue that open-source solutions align better with a collaborative and open organizational culture, while others may claim that proprietary solutions offer better security and support, aligning with a more traditional and hierarchical culture [18] [19] [20];
- With the shift towards remote work, IT professionals' preferences for tools and technologies could be a source of debate. Some might argue that remote work

promotes greater autonomy, and IT professionals should have more freedom to choose their tools, while others may emphasize security and standardization to maintain control over the digital environment [21].

### 1.1. The role of socio-technical approach and human resource management

Systems for the effective use of tools by people, to bring about desired outcomes, require social and technical elements to be considered together. Thus, a contemporary, socio-technical approach does not pursue two separate (social and technical) strands for examination, but one, integrated whole [22]. To create a successful work environment, the socio-technical approach advocates for designing systems that promote effective communication, collaboration, job satisfaction, and work-life balance while utilizing appropriate technology, while some of the key HR competences are: ‘culture and change steward or champion’, ‘strategy architect’ and ‘technology and media integrator’ [23].

Sometimes managers fail to understand the links between technical and organizational issues and between the new technology and the strategic business goals and needs of their organizations. Aligning technology and culture is not an easy task, among other reasons because they both interact with other key organizational subsystems: the organization’s formal structure and procedures, its processes and its strategic intent [24]. Change initiatives must not necessarily come from the organization’s top management. New technological developments known to the technical staff can open up strategic opportunities that may have never been considered by the management. Therefore, HRM can adopt the principles of the socio-technical approach by emphasizing the importance of employee engagement, job design, team dynamics, and the integration of appropriate technology to create a harmonious and productive work environment. In this way, HRM can play a significant role in facilitating the application of the socio-technical approach within the organization.

The relationship between the variables considered in the paper is depicted in the figure below. It is obvious that a human-centered approach should be an imperative for a system that encompasses various internal and external organizational factors (employees/workers as individuals, socio-organizational context, socio-technical work system, uses of tools and technologies, organizational culture and climate, human resource management, technological innovations, industry standards...).

**Figure 1:** A generic model of socio-technical work system levels [25]



## **2. Secondary research data analysis**

DORA has surveyed over 30,000 technical professionals globally and has begun to understand, from a quantitative perspective, what high-performing technology organizations do and don't do to drive their dramatically better performance [26]. The DORA study has examined the role that culture plays on performance in the technology space and the results support the discussions that have taken place over the last few years. Culture, as measured using Ron Westrum's model of organizational culture [27], has been used as the culture measure component of the DORA study.

This research has identified several key cultural realities that help elicit best practice behaviors among technology teams that should be pointed out. The findings suggest that team dynamics are much more important to performance than the individual skills of the individual team members. Researchers at Google studied over 180 engineering teams and discovered that the most important factor in predicting high performing teams is psychological safety followed by dependability, structure, and clarity of work, meaning, and impact. For teams implementing DevOps principles in their organizations, this psychological safety creates a culture in which team members feel comfortable engaging in behaviors that drive performance including, but not limited to cooperation, surfacing problems with fear of reprisal, breaking down silos, conducting postmortems or after action reviews, and continually experimenting to drive improvement. Their findings suggest that leaders who give their teams the autonomy they need do to their work employee feelings of trust and having a voice increase. Trust and voice, in turn, help positively shape the culture of the organization.

Only 56% of responding organizations in PwC's 2022 Digital IQ survey [28] expanded their training on tools and new processes. This gap between adopting new technologies by organizations and employees can be plugged by focusing on organizational culture and making concerted efforts to maintain it during transformation. Reluctance to let go of existing procedures stops them from setting and achieving new goals that contribute to the growth of their employees and organization. According the same report, promoting collaboration is another hallmark of digital culture. It encourages employees across departments and functions to come together as a team and optimize processes, which leads to an increase in efficiency. Championing transparency allows an employee in a digitally empowered culture to reach out for help as soon as they hit a snag instead of worrying about the reactions of their seniors and team members. It also fosters trust and helps employees share their opinions, suggestions and criticisms freely.

### **2.1. Mapping of the Macedonian IT industry**

The Macedonian IT industry has experienced significant growth and transformation over the past few years so in order to gain a comprehensive understanding of its current state; two Macedonian IT companies collaborated on a mapping project in 2022. Their study constitutes the second assessment of the industry [29] following the initial analysis conducted in 2019 [30]. The primary objective of this endeavor was to provide valuable insights into the industry's dynamics and address various questions pertaining to income, technology adoption, and professional practices.

The mapping of the Macedonian IT industry was accomplished through an extensive survey conducted during the summer months in 2022. Through a well- structured questionnaire, the survey aimed to acquire vital information regarding income levels, technology usage patterns, and work- related habits.

The survey garnered responses from a diverse pool of over 2000 individuals working across the IT, marketing, and design sectors in Macedonia. The participants hailed from various professional backgrounds, including software developers, marketers, designers, project managers, and other related roles. This diverse representation enabled the study to offer a holistic view of the industry's landscape.

According to the mapping study, among IT professionals in the country, JavaScript emerges as the predominant technology, boasting the highest adoption rate. C# and Java secure the second and third positions, respectively, indicating their significant presence in the industry. Additionally, PHP, Python and .NET make up the remaining spots in the top five technologies preferred by IT experts.

The prevailing trend among developers in the country aligns with global patterns, as most aspire to enhance their expertise in Python [31]. In addition to Python, Macedonian developers also express a keen interest in acquiring knowledge in JavaScript, TypeScript, Go, Java, and Node.js, showcasing their enthusiasm for diverse programming languages. According to the survey findings, a significant majority of developers, accounting for 67.64%, favor Windows as their primary operating system. Mac is the preferred choice for 19.36% of developers, closely followed by Linux, which is utilized by 10.37% of the developer community. Interestingly, only a small minority of developers, merely 2.32%, opt for the Dual Boot option to manage their operating systems.

When it comes to databases, Macedonian programmers and developers exhibit a preference for MySQL, accounting for 30.64% of the choices, followed by SQL Server at 24.59%, and PostgreSQL at 18.15%. These databases find widespread use in a diverse range of projects.

Regarding the obstacles and decisions, developers consistently find themselves troubled by the recruitment processes in IT companies mostly by two primary factors: a lack of comprehensive information about specific position (52.6%) and salary (51.3%), and the lengthy, slow-paced interviewing procedures (54.9%). Surprisingly, their paramount consideration when selecting an employer is not centered around salary but rather the potential for personal growth, skill development, and continuous learning opportunities. In the workplace, developers' experiences are significantly influenced by the effectiveness of internal organization. They tend to express their dissatisfaction through direct conversations with their superiors, highlighting the importance of addressing these concerns promptly and constructively. As they explore job opportunities, developers predominantly turn to social media platforms to seek information about available positions, making it crucial for employers to establish a strong and engaging online presence to attract potential candidates.

High rate or 38.9% of the respondents have changed their working organization during the pandemic. More than half (54.38%) prefer a hybrid work schedule – working from office or home, by an own choice, while 20% prefer remote work. For half or 49.8% of the developers, the organizational culture is one of the most important aspects when they choose which companies to join.

According the ICT export report [32] 96% of the companies in the country have invested in learning new technologies and skills, while 76% have invested in developing new or enchasing existing software.

### **3. Discussion about next steps and further challenges**

Hence, this position paper raises the following questions for future research actions, which are considered as very significant from the perspective of Socio-Technical Systems and Human Resource Management theory/literature and practice development:

1. What are the implications of the link between technological preferences and organizational culture on talent attraction/recruitment, retention, and turnover rates of IT professionals?
2. How can organizations adapt their HRM practices to align with the technological preferences of IT professionals and promote a positive organizational culture?
3. What are the predominant reasons behind the choice of open-source or proprietary software by IT professionals, and how do these choices relate to organizational culture?
4. How do the values and backgrounds of IT professionals impact their technology choices/preferences, and does this affect the overall culture of the organization?

5. How can organizations foster a culture of innovation that integrates IT professionals' technological preferences to drive technological advancements and organizational performance?
6. What role does leadership play in shaping the link between IT professionals' technological preferences and organizational culture?
7. How do IT professionals' technology preferences influence remote work practices, and what are the perceived advantages and disadvantages of allowing them greater autonomy in selecting their tools and technologies?
8. Can the development of personalized career paths and skill development programs cater to the diverse technological preferences of IT professionals while maintaining a cohesive organizational culture?

These research questions aim to investigate the complex relationship between IT professionals' technological preferences and organizational culture, considering various aspects such as individual differences, leadership influence and societal factors. Addressing these questions can lead to significant advancements in Socio-Technical Systems and Human Resource Management theory and practice, ultimately helping organizations to create an environment where IT professionals thrive and contribute effectively to their organizations' success.

Both, scholars and HR managers must have in mind the integration of human and technological factors in organizational settings, especially in the rapidly developing IT industry. While the socio-technical approach is a broader perspective that encompasses the interaction between people and technology in various systems, including organizations, HRM can be seen as one of the components that contribute to the effective implementation of the socio-technical approach within an organization. In summary, the socio-technical approach and human resource management are two distinct concepts, but they can be integrated and mutually supportive in organizations seeking to optimize both human and technological aspects of their operations.

## References

- [1] Tomer, G., Mishra, S.K. and Qureshi, I., 2022. Features of technology and its linkages with turnover intention and work exhaustion among IT professionals: A multi-study investigation. *International Journal of Information Management*, 66, p.102518.
- [2] Olson, M.H., 1982. New information technology and organizational culture. *MIS quarterly*, pp.71-92.
- [3] Schein, E.H., 1990. *Organizational culture* (Vol. 45, No. 2, p. 109). American Psychological Association.
- [4] Kotter, J.P., 2008. *Corporate culture and performance*. Simon and Schuster.
- [5] Martins, E.C. and Terblanche, F., 2003. Building organisational culture that stimulates creativity and innovation. *European journal of innovation management*, 6(1), pp.64-74.
- [6] Markus ML. Power, politics, and MIS implementation. *Communications of the ACM*. 1983, Jun 1;26(6):430-44.J. Cohen (Ed.), Special issue: Digital Libraries, volume 39, 1996.
- [7] Markus, M. Lynne, and Daniel Robey. "The organizational validity of management information systems." *Human relations* 36, no. 3. 1983: 203-225
- [8] Gallivan M, Srite M. Information technology and culture: Identifying fragmentary and holistic perspectives of culture. *Information and organization*, 2005, Oct 1;15(4):295-338.I. Editor (Ed.), The title of book one, volume 9 of The name of the series one, 1st. ed., University of Chicago Press, Chicago, 2007. DOI:10.1007 3-540-09237-4.
- [9] Gordon, G.G., 1991. Industry determinants of organizational culture. *Academy of management review*, 16(2), pp.396-415.

- [10] Chatman, J.A. and Jehn, K.A., 1994. Assessing the relationship between industry characteristics and organizational culture: how different can you be?. *Academy of management journal*, 37(3), pp.522-553.
- [11] Kotter, J.P., 2008. *Corporate culture and performance*. Simon and Schuster.
- [12] Schein, E.H., 1990. *Organizational culture* (Vol. 45, No. 2, p. 109). American Psychological Association.
- [13] Bednar, P.M., Welch, C. Socio-Technical Perspectives on Smart Working: Creating Meaningful and Sustainable Systems. *Inf Syst Front* 22, 281–298, 2020, <https://doi.org/10.1007/s10796-019-09921-1>
- [14] <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/tech-forward/ethical-data-usage-in-an-era-of-digital-technology-and-regulation>
- [15] Moor, J.H. Why We Need Better Ethics for Emerging Technologies. *Ethics Inf Technol* 7, 111–119, 2005. <https://doi.org/10.1007/s10676-006-0008-0>
- [16] Calluzzo, V.J. and Cante, C.J., 2004. Ethics in information technology and software use. *Journal of Business Ethics*, 51, pp.301-312.
- [17] Martin, K., Shilton, K. & Smith, J. Business and the Ethical Implications of Technology: Introduction to the Symposium. *J Bus Ethics* 160, 307–317, 2019. <https://doi.org/10.1007/s10551-019-04213-9>
- [18] Weber, S., 2000. The political economy of open source software.
- [19] Morgan, L. and Finnegan, P., 2014. Beyond free software: An exploration of the business value of strategic open source. *The Journal of Strategic Information Systems*, 23(3), pp.226-238.
- [20] Rolandsson, B., Bergquist, M. and Ljungberg, J., 2011. Open source in the firm: Opening up professional practices of software development. *Research Policy*, 40(4), pp.576-587.
- [21] Parker, S.K. and Grote, G., 2022. Automation, algorithms, and beyond: Why work design matters more than ever in a digital world. *Applied Psychology*, 71(4), pp.1171-1204.
- [22] Bednar, P.M., Welch, C. Socio-Technical Perspectives on Smart Working: Creating Meaningful and Sustainable Systems. *Inf Syst Front* 22, 281–298, 2020, <https://doi.org/10.1007/s10796-019-09921-1>
- [23] Ulrich, D., Brockbank, W., Ulrich, M. and Kryscynski, D., 2015. Toward a synthesis of HR competency models: The Common HR" Food Groups".
- [24] Cabrera Á, Cabrera EF, Barajas S. The key role of organizational culture in a multi-system view of technology-driven change. In *Global Information Systems 2008 Sep 10* (pp. 178-199). Routledge.
- [25] Vorraber W, Neubacher D, Moesl B, Brugger J, Stadlmeier S, Voessner S. UCTM—An Ambidextrous Service Innovation Framework—A Bottom-Up Approach to Combine Human and Technology-Centered Service Design. *Systems*. 2019; 7(2):23. <https://doi.org/10.3390/systems7020023>
- [26] <https://www.forbes.com/sites/chrisancialosi/2018/11/06/the-critical-role-of-culture-in-technology-transformation/>
- [27] Westrum R. A typology of organisational cultures. *Qual Saf Health Care*. 2004, Dec;13 Suppl 2(Suppl 2):ii22-7. doi: 10.1136/qhc.13.suppl\_2.ii22. PMID: 15576687; PMCID: PMC1765804
- [28] Digital Transformation And Its Impact On Organizational Culture <https://www.forbes.com/sites/forbeshumanresourcescouncil/2022/07/22/digital-transformation-and-its-impact-on-organizational-culture/?sh=f17742429a2e>
- [29] Mapping of the MK IT industry, 2022, <https://it.mk/mapiranje-na-it-industrijata-vo-mk-2022/>
- [30] Mapping of the MK IT industry 2019, <https://it.mk/mapiranje-na-it-industrijata-vo-mk/>
- [31] Stack Overflow. Developer Survey Results 2019, <https://insights.stackoverflow.com/survey/2019>
- [32] ICT Export Report: Current Situation And Potentials. 2020, Skopje, [https://masit.org.mk/wp-content/uploads/2020/09/export\\_report\\_masit\\_v1.00.pdf](https://masit.org.mk/wp-content/uploads/2020/09/export_report_masit_v1.00.pdf)