

# Designing digital workplaces for employee engagement: Practical guidelines from a systematic literature review

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## Abstract

*Technological advancements have enabled a new perspective on the future of work, by bringing about job creation, job destruction, and different ways of work. In the meantime, new generations are becoming the majority of the global workforce. In this context, we performed a Systematic Literature Review (SLR) to understand how employees experience the digital workplace. We focused on generations Y (Millennials) and Z. We identified the need for the companies to consider process, people, and technology to provide a workplace where employees can perform their jobs seamlessly wherever they are. The SLR also provided the necessary input to propose a systematization of a set of guidelines across four phases to support organizations in the implementation of an engaging digital workplace.*

## 1. Introduction

According to Marsh [1], the digital workplace provides a comprehensive set of connected technologies used by employees in daily tasks over the last two decades [1], enabling them to work from any location, without depending on a physical office [2]. However, successful deployment of technological tools relies on the employees' acceptance and adoption [1]. Accordingly, organizations need to understand their points-of-view on the digital workplace, especially for Millennials, aka Gen Y (individuals born between 1980-1994) and Gen Z (individuals born between 1995-2010) [3], who represent about half of the global workforce, with this number set to rise to 75% by 2030 [4]. For example, these generations consider flexibility and work-life balance as two of the most relevant motivators, so a successful implementation of a digital workplace needs to address those requirements [3, 5]. However, our literature review shows that the design of an engaging digital workplace that accounts for the traits of the new generations is understudied, even as companies invested

\$1.7 trillion in digital transformation projects over 2019 [6]. A better understanding of how to create a fulfilling digital workplace will contribute to increased organizational performance and workers' well-being [6]. According to Perry [7], "[e]ngaged individuals fully invest themselves and their resources in their work and the workplace, whereas disengaged employees are detached, withdrawn, and avoid significant investments in work". Further, employees not engaged can negatively impact organizational performance [8]. Other authors estimate that about 70% of the employees are not engaged, resulting in companies losing up to \$355 billion of their revenue per year [9]. Hence our research question:

**RQ:** *How can organizations implement engaging digital workplaces for employees, with an emphasis on generations Y and Z?*

Based on our systematic literature review, we propose a more complete definition of a digital workplace, clarify the differences between different workplace arrangements (physical, remote, virtual, and digital), and develop a systematization of guidelines to support organizations in implementing an engaging digital workplace, considering the values and needs of the different generations.

The remainder of this paper is structured as follows. First, we present the research context and our methodology. Next, we analyze the data from the SLR. Section 5 details the contribution: a systematization of a set of guidelines to design engaging digital workplaces. Section 6 concludes with the results, key contributions, research implications, and limitations of our study.

## 2. Research Context

Successful digital workplace implementation relies on the chosen strategy and the ability to adapt to new digital methods of work [10, 4], while also caring about the employees' experience [4]. Organizations need to consider a human-centered approach to design this new work environment [4, 11]. Culture and engagement

are cited by 87% of organizations as two of their major challenges [4]. A study from Deloitte with 383 employees showed that more than half were not engaged in their jobs [4]. Considering that millennials and Gen Z will encompass the majority of the global workforce in the next decade [4], it is necessary to understand what motivates them to design an engaging digital workplaces.

Almost 70% of operating costs of US companies (an average of \$ 41.3 million per year) reside in attracting and retaining employees [12]. Millennials and Generation Z are more likely to leave their jobs when they are not satisfied, disagree with companies' business practices, values, or political leanings [3]. Organizations face a challenge to effectively engage employees from different generations.

### 3. Methodology

We performed a systematic literature review (SLR) on digital workplace, engagement, and generational characteristics to confirm the relevance of our work and identify the gaps and limitations in the body of knowledge. We followed Webster and Watson, 2002 [13], taking into consideration the research question above. First, we selected six scientific databases, aiming for comprehensive coverage of publications (EBSCO, AISel, ScienceDirect, IEEE, ACM, and Web of Science). We performed the search from the last week of June 2020 until the first week of July 2020. The search expression originally chosen was ("digital workplace" OR "remote work" OR "future of work" OR "virtual teams") AND ("engagement" OR "motivation" OR "satisfaction" OR "organization" OR "organisation"). However, preliminary searches in Google Scholar indicated that "effectiveness" and "millennial" or "individual" or "employee" were also relevant. Since preliminary searches identified very few papers that accounted for generational characteristics, we decided to use "OR" combinations of keywords for wider coverage. This strategy enabled us to cover the different workplace arrangements (virtual teams, remote work, or digital workplace) and different constructs related to engagement (motivation, job satisfaction, or effectiveness). Figure 1 indicates the final search expression. The inclusion criteria were conference and journal papers, in English, in PDF format, and published since 2000, the date of the influential article by Jeffrey Beir, that used for the first time the expression digital workplace [14].

The initial search considered the title, abstract, and keywords, resulting in a total of 560 entries. We discarded twenty-eight duplicated papers. Two

researchers analyzed separately the title and abstract of the 532 resulting articles and classified their relevance for our work using (Yes/No/Maybe). We considered research papers as relevant if they covered one of the constructs in a digital workplace arrangement (such as motivation or engagement) or if they considered individual characteristics in a digital workplace context (such as individual values or personality traits). After the triangulation of the results [15], including discussions on the "Maybes", 470 non-relevant articles were discarded and the full text of the remaining 62 articles was analyzed in detail. Figure 1 represents the search process.

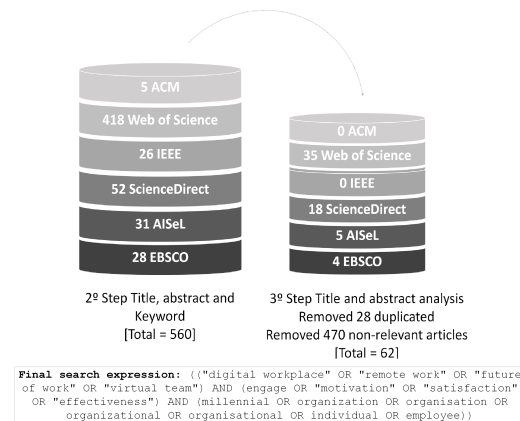


Figure 1. Steps of the search process

In the SLR, we identified eleven other papers that are also literature reviews [16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26]. However, none of them considers the generational impacts in a digital workplace. Some authors state that this "remain[s] a topic not well presented in research" [22]. Further, the majority focus on one main aspect of the digital workplace, such as trust [23], leadership [18], or virtuality [24, 16]. We choose to have a comprehensive view of the digital workplace to analyze how it can respond effectively to generational differences in employee engagement, with the purpose to contribute to this gap in the literature.

Building on the outcomes of the SLR, we propose a systematization of a set of guidelines into four phases to support organizations in implementing an engaging digital workplace.

### 4. Literature Analysis

Table 1 shows the selected papers, classified in terms of the year, workplace arrangement (e.g., physical workplace, remote work, virtual workplace, digital workplace), whether the generational differences are addressed (Yes or No), and main outcome (e.g.,

performance, effectiveness, engagement, satisfaction, motivation, well-being). We provide a brief context for each article.

The vast majority of the selected papers (79%), consider the virtual workplace arrangement. Nine studies focused on remote working. Only one article studied the digital workplace context. Regarding the generational differences, only six of the sixty-two papers consider the individual characteristics of the generations. Most of the papers (63%) focus primarily on performance or effectiveness. Nine articles analyze the engagement. We also identified satisfaction, motivation, and well-being as main objects of study.

#### 4.1. Digital Workplace

The existing studies in the literature consider physical workplace, virtual workplace, remote work, or digital workplace as models of work arrangements. The physical workplace represents the traditional office environment, where employees share the physical space [59]. The remote work accounts for when employees perform their job away from their primary office, at any other location [7]. The virtual workplace is defined as an environment where a “group of individuals that are geographically dispersed and collaborate via electronic technologies to accomplish a specific goal.” [33]. On the other hand, the digital workplace encompasses all the information, technologies, tools, and processes used by the employees in a work environment [73]. It enables a personal, real-time, mobile-enabled, and collaborative digitally-driven work experience [73].

The four models have virtuality as a common dimension. Scholars identified virtuality as a characteristic that differs from virtual to face-to-face teams [24]. Virtuality is a multidimensional construct composed of two to six dimensions: (1) geographic or spatial distance; (2) temporal or time differences; (3) organizational differences; (4) cultural distance, (5) proportion of face-to-face interactions; and (6) technology usage, [24]. To focus on the scope of our research question, we will leave out the temporal, organizational, and cultural dimensions. In this study, we will consider three dimensions: the first, the proportion of time that team members work face-to-face vs. virtually. The second is the geographic or spatial distance, the proportion of team members that work apart [72, 61]. The third is the relative degree of the use of technology [25]. The first dimension highlights the relevance of promoting face-to-face interactions in some moments [68, 55, 48]. Many studies discuss the need of maintaining at least some face-to-face interactions to build trust and manage conflicts, especially during the

formation of a team [60, 48, 52]. To be consistent with previous studies, since these were the most used in the literature [25], and to be aligned with the scope of work, we also considered the second (geographic distance) and third (use of technology) dimensions.

Drawing from the various contributions in the extant literature we propose the following consolidated working definition of Digital Workplace [74, 73]:

*A setting supported on a holistic strategy that encompasses the process, people, and technology to provide a digitally-driven work experience.*

We choose to consider a comprehensive view of the digital workplace in our study because, over time, mere virtual teams can become inert due to the dilution of the knowledge structures [60]. Teams tend to use technological tools to engage in social processes [66]. A more holistic view of the digital workplace supports a broader perspective, by looking at the whole environment, not only one the part, related to communication.

#### 4.2. Employee Engagement

We found in the literature different constructs for engagement. Organizational engagement focuses on how the worker is committed to the enterprise role [75]. Social and intellectual engagement is the extent to which the employee is intellectually involved with his/her job role, and socially connected with the team members [75]. Work engagement is characterized by the employee’s vigor, dedication, and absorption with his/her tasks [76]. Job engagement is related to the effort and energy dedicated by workers to perform their tasks [75]. Employee engagement is a work-related positive psychological state constructed by cognitive, emotional, and behavioral energy [75, 46, 50]. The job engagement focuses on the individual tasks, while employee engagement seeks to understand the latter’s broad experience [75]. Our study covered employee engagement to catch the whole experience of the individual in the workplace.

Engagement is a multidisciplinary phenomenon studied over the last 35 years [77]. Kahn [78] first conceptualized engagement with these three dimensions: affective, cognitive, and physical. He used Goffman’s [79] role theory, motivation, and group theories to envisage engagement as an independent construct. Some authors [9], state that engagement is a unique construct “due to psychometric problems exploiting the same measure to assess both burnout and engagement”. During two decades, researchers considered engagement as the positive antipode of burnout. Burnout is associated with a state of mental

Ref	Brief Description	Year	Workplace Arrangement	Gen	Outcome
[27]	The influence of knowledge sharing and trust on virtual team effectiveness.	2017	Virtual	No	Effectiveness
[16]	The complexity of mental models on virtual teams.	2017	Virtual	No	Effectiveness
[17]	The of social, technological, political, and economical aspects of the future of work.	2020	Digital	Yes	Satisfaction
[28]	The best practices to influence positively the effectiveness of virtual teams.	2001	Virtual	No	Effectiveness
[29]	A model to support how to achieve effectiveness in virtual teams.	2010	Virtual	No	Effectiveness
[30]	The influence of cultural aspects and communication technology in virtual teams.	2008	Virtual	No	Effectiveness
[31]	The influence of heterogeneity and conflict management on virtual teams' performance.	2004	Virtual	No	Performance
[32]	A framework to support organizations with diversity, mutual trust, and knowledge sharing in virtual teams.	2013	Virtual	No	Effectiveness
[18]	A guide with principles to improve leadership communication in virtual teams.	2008	Virtual	No	Effectiveness
[33]	A framework to identify the individual qualities needed to work virtually.	2004	Virtual	No	Effectiveness
[34]	The influence of conflict, communication frequency, and knowledge sharing on virtual teams' performance and satisfaction.	2012	Virtual	No	Performance and satisfaction
[19]	The impact of gamification in software engineering teams.	2015	Do not specify	No	Engagement and performance
[35]	The concept and challenges of the future of work in Europe.	2012	Remote	No	
[20]	The development of the Ushahidi platform using a Rapid Prototype Model.	2013	Virtual	No	Satisfaction
[36]	The relevance of effective communication on virtual team' interactions.	2017	Virtual	No	Performance and satisfaction
[37]	The workers' locus of control attitudes and their implications on virtual teams' satisfaction.	2006	Virtual	No	Performance and satisfaction
[38]	The relationship of personality with cyberslacking and its impact on satisfaction and performance.	2014	Remote	No	Performance and satisfaction
[39]	The relationship of personality with cyberslacking and its impact on work engagement.	2014	Remote	No	Engagement
[40]	The media theories and its impacts on virtual team's communication.	2016	Virtual	No	Performance
[41]	The influence of effective information systems uses on virtual teams' satisfaction.	2015	Virtual	No	Satisfaction
[42]	An analysis of collaborative remote work using agile methodologies.	2016	Remote	No	Engagement
[43]	The implementation of agile methods in a virtual team.	2017	Virtual	No	Performance
[11]	The relevance of the theories for designing and developing collaboration systems.	2019	Do not specify	No	Motivation
[44]	The influence of leadership, trust, and autonomy on virtual teams' satisfaction.	2018	Virtual	No	Satisfaction
[45]	The differences of gender-based communication styles and their impact in virtual teams.	2007	Virtual	No	Satisfaction
[46]	A process-oriented model to support virtual teams to achieve engagement and effectiveness.	2008	Virtual	No	Engagement and effectiveness
[47]	The influence of leadership style on communication effectiveness and leader performance.	2010	Remote	No	Performance and effectiveness
[26]	The benefits of working in virtual teams.	2019	Virtual	No	Performance
[48]	The differences between the virtual and traditional teams.	2019	Virtual	No	Effectiveness
[49]	An analysis of the communication features in the workplace that impacts the employees' well-being.	2019	Remote	No	Well-being and performance
[8]	The influence of cultural intelligence, communication, technology, trust, and individual maturity on employee engagement in virtual teams.	2019	Virtual	Yes	Engagement
[50]	A comparison between virtual and face-to-face teams (advantages and limitations).	2019	Virtual/Physical	No	Motivation
[51]	The influence of asynchronous communication on engagement in virtual teams.	2019	Virtual	No	Engagement
[44]	The influence of shared leadership, individual trust, and autonomy in virtual teams.	2018	Virtual	No	Satisfaction
[52]	An employee-focused human resource management to improve well-being in virtual teams.	2018	Virtual	No	Well-being
[7]	The influence of emotional stability influences and autonomy for remote workers.	2018	Remote	No	Satisfaction and engagement
[53]	The relative importance of the constructs of performance in virtual teams.	2018	Virtual	No	Performance
[21]	The requirements and challenges for virtual collaboration.	2017	Virtual	No	Performance and motivation
[22]	The influence of virtuality and shared mental models on virtual teams' performance.	2017	Virtual	Yes	Performance
[23]	The influence of trust on virtual team effectiveness.	2016	Virtual	No	Effectiveness
[54]	The influence of technical proficiency on virtual team' effectiveness.	2016	Virtual	Yes	Effectiveness
[55]	A framework based on process, purpose, and people to support virtual teams effectiveness.	2016	Virtual	No	Effectiveness
[56]	The use of Action Research to conflict resolution in virtual teams.	2016	Virtual	No	Do not specify
[24]	A comparison between different definitions of virtual teams to understand virtuality.	2016	Virtual	No	Do not specify
[25]	A review of the inputs, mediators, moderators, and opportunities in virtual teams.	2015	Virtual	Yes	Performance
[57]	The aspects that influence the choices of communication media in a virtual team.	2013	Virtual	No	Performance and satisfaction
[58]	The relationship between trust, task interdependence, information sharing, conflicts, and cultural values in a virtual team.	2012	Virtual	No	Do not specify
[59]	The development of organizational identification and the role of cultural aspects.	2012	Virtual	No	Do not specify
[60]	The effective use of systems to improve knowledge sharing and learning in virtual teams.	2011	Virtual	No	Performance
[61]	The construct and measurement of the virtuality on teams.	2010	Virtual	No	Effectiveness
[62]	The influence of technology-assisted supplemental work (TASW) on perceived usefulness, psychological climate, and work-family conflicts.	2010	Remote Work	No	Performance
[63]	The advantages and challenges, and success factors to manage virtual teams.	2010	Virtual	No	Performance
[64]	The organizational knowledge creation processes in virtual teams.	2009	Virtual	No	Do not specify
[65]	The perspectives of media use in virtual teams and its influence on teams' performance.	2009	Virtual	No	Performance
[5]	The work styles, human resource policy, workplace design, and the effective use of technology.	2008	Do not specify	Yes	Performance
[66]	The influence of conflict and leadership on virtual teams performance.	2008	Virtual	No	Performance
[67]	The influence of leadership on successful virtual teams.	2007	Virtual	No	Engagement
[68]	A guide with practical recommendations for leaders and members of virtual teams.	2007	Virtual	No	Do not specify
[69]	A comparison between virtual and traditional teams (inputs, process, and outputs).	2006	Virtual/Physical	No	Effectiveness
[70]	A virtuality index to measure geography, time zone, organization, national culture, work practices, and technology aspects of a team.	2005	Virtual	No	Performance
[71]	The critical success factors on benchmarking the remote work arrangement.	2005	Remote	No	Performance and satisfaction
[72]	The challenges and lessons learned from the implementation of a virtual team.	2002	Virtual	No	Performance

Table 1. Classification of identified papers

exhaustion. Both burnout and engagement used to be measured together as two dependent and opposite poles. However, around 2000, researchers concluded that engagement and burnout have independent dimensions. Therefore, researchers should measure them independently and with different instruments [80]. Employee engagement can be measured using the EES-Employee Engagement Scale.

EES differs from others engagement measurements due to its conceptualization of personal engagement [81]. Shuck et al. (2017) argued “EES is [...] inclusive of the full spectrum of the immediate work experience (i.e. work, job, team, and the active experience of working)” (p. 4). It is also a more comprehensive scale when taking into consideration the experience of employees’ active roles within their work, job, team, and organization.”. This instrument is composed of 12 questions, 4 questions for each dimension (cognitive, emotional, and behavioral) [75]. In 2017, Gallup proposed a different scale. It considers the basic needs, individual needs, teamwork needs, and personal growth to measure employee engagement [82]. Instead of the focus on cognitive, emotional, and behavioral aspects of EES, Gallup classifies employees as follows [82]:

- Engaged: workers involved in and enthusiastic about their job and workplace. They boost company’ performance and innovation.
- Not engaged: workers are psychologically unattached to their work and company. They dedicate time, but not energy into their job.
- Actively disengaged: workers unhappy and resentful at their job. These employees can affect negatively engaged coworkers.

Studies cited positive outcomes from engaged employees, such as work quality (efficiency and efficacy), individual performance [76], reduced absenteeism, increased organizational commitment, and reduced turnover [83, 76]. Also, organizational commitment helps to achieve the company goals [76]. A fulfilling work experience positively impacts employee engagement. Developing adequate management processes, mitigating employee stress, promoting employee well-being, and self-management are some of the enablers of employee engagement [76]. They can be grouped by job resources, job demands, leadership, job characteristics, individual differences, and personal resources [84]. Job Resources include autonomy, supportive coworkers, coaching, feedback, opportunities for development, social support, positive workplace climate, recovery, rewards and recognition, support, job variety, and work

role fit [84]. Challenging demands have a positive impact on employee engagement, while physical and hindrance demands decrease employee engagement [84]. Task variety, task significance, feedback, problem-solving processes, job complexity, and social support are job characteristics with a positive impact on employee engagement [84]. A core self-evaluation, conscientiousness, positive affect, and proactive personality are examples of individual characteristics that influence positively the employee engagement [84]. Also, self-efficacy, organization-based self-esteem, and optimism are personal resources with a positive influence on employee engagement [84]. Hambley et al., 2007 state that “leaders cannot simply lead the virtual team exactly the same as if it were [face-to-face]” [68]. Transformational and empowering leadership is necessary to engage employees [84, 47]. Transformational leadership is a behavior that goes “beyond exchanging inducements for desired performance by developing, intellectually stimulating, and inspiring followers to transcend their own self-interests for a higher collective purpose, mission, or vision” [47]. A multi-generational workforce demands strong leadership, to manage appropriately according to each generation’s needs [85].

The engagement is perceived differently by each generation, due to their different needs, interests, and values [86]. In 2011, a study conducted in North America cited the Millennials as one of the generations less engaged with work, at only 16% (we could not identify a similar study for generation Z). Organizations need to understand what engages the employees to increase net revenue, product quality, avoid turnover, among other factors [86].

### 4.3. Generational Characteristics

Companies usually attract employees whose personal values are similar to the organizational values [59]. While Millennials value teamwork, Gen Z’s prefer independent work, especially in a virtual environment [3]. The work experiences, work-life balance, and feedback are relevant to Millennials [3]. They also care about positive feedback, attention, and assistance at their home [3]. Millennials and Gen Z do not expect “just a job”, they want work that adds value and purpose to their lives [87]. These new generations of employees need continuous personal growth through mentoring and adequate leadership to promote employee commitment [17]. Flexible working conditions is one of the most relevant motivations for both generations [3]. A recent study shows work itself, recognition, responsibility, alignment with organization

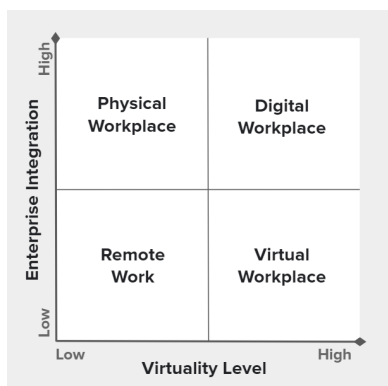
purpose (meaning), development opportunities, and flexibility as the relevant values for generations Y and Z [3].

Little is known about the generational impacts in a digital workplace environment [22]. However, the younger generations may view working in a digital environment as natural and working in a traditional office (face-to-face) as the exception [25].

## 5. Discussion and contribution

In creating our socio-technical process to support the implementation of an engaging digital workplace, we rest on three pillars: (1) people; (2) process; and (3) technology [88]. The first pillar focuses on understanding employees' motivators and needs in a digital workplace. The second pillar defines and standardizes how employees perform their work. The third pillar represents the technological tools and infrastructure available in an organization (such as communication tools) and how employees interact with it. Effective communication supports the information evaluation and the process to achieve an optimal solution [36]. The choice of the tool to perform each task can influence employee satisfaction [40].

Virtuality is a common multi-dimension concept present in the literature to distinguish face-to-face from the virtual workplace. We propose a second concept to study an organizational environment comprehensively: the level of enterprise integration. M. Attaran, et al. [73], state that "[c]ompanies that are not adopting an integrated approach [...] are failing to capitalize on a significant opportunities digital workplace could deliver". The enterprise integration concept connects the three pillars: process, people, and technology. Figure 2 shows how we view different workplace arrangements, according to the level of virtuality and the level of enterprise integration.



**Figure 2. Workplace arrangements as a function of virtuality and enterprise integration**

The physical workplace quadrant current known concept of an office, where employees share a common physical space [59]. The physical workplace has a low level of virtuality and a high level of enterprise integration. The remote work has a low level of virtuality and a low level of enterprise integration. Usually, there are no adapted processes or tools to integrate the remote worker with the co-located office team. The remote worker usually performs independent tasks, has limited access to information and participation with the co-located office team [42]. The virtual workplace quadrant encompasses IT-mediated communication to allow the work between employees in different geographic locations [41]. In a virtual workplace, the employees usually rely on technological platforms to share information and perform their interdependent tasks [34]. The virtual workplace has a high level of virtuality and a low level of enterprise integration. The digital workplace seeks to bring enterprise integration that provides socialization between team members, knowledge sharing, improved trust and collaboration, and connect people, processes, and technology in an organization. In a digital workplace, the default is for employees to be able to work from anywhere without compromise. Using the same physical space is not required for workers to perform individual or collaborative tasks. The employees tend to be immersed in a highly digital work environment, so they have a digitally-driven experience. The digital workplace has a high level of virtuality and a high level of enterprise integration.

We claim to be relevant to build an effective digitally-driven work experience. The digital workplace offers an integrated and complete experience to employees, with no fall back compared to physical workplace arrangement. The connection of people, process, and technology allow teams to build trust, share knowledge, manage conflicts, and collaborate with each other. It is important to identify the type of workplace arrangement to define a strategy to move forward to the digital workplace arrangement.

We adapted the 3 phases suggested by M. Attaran, et al. [73], and propose a cyclical and iterative model with 4 phases to implement a digital workplace. Our four steps represent the continuous maintenance and enhancement process of the digital workplace. The first is the Awareness phase, which maps individual, team, and organizational characteristics. Also, where we understand the present situation of technology use, employees' relationships, and processes. The second is the Design phase, which defines the strategies and possible solutions to improve the current workplace and move forward towards a digital workplace. The third

is the Build phase, which is dedicated to developing and implementing the previously defined solution. We included the fourth phase, the Evaluation, to measure and analyze the improvements implemented previously.

For each proposed phase we have identified actionable guidelines in our SLR. Table 2 shows a short description and references for the practical guidelines proposed. The systematization of the set of guidelines into four phases supports the implementation of an engaging digital workplace in the organization. Responding effectively to employee engagement may decrease the turnover and provide a better workplace climate, also impact leadership performance [75].

According to Panteli et al., 2019, the process of building engagement involves the following strategies: (1) developing engagement - clarity (project nature, roles, and tasks), and face-to-face meetings when possible; (2) supporting engagement - open communication about the state of the project, updates on members' status, and peer to peer support; (3) nourishing engagement - reflect the lessons learned, celebrate the achievements, and develop connections.

## 6. Conclusion

We performed an SLR on the digital workplace, engagement, and generational characteristics (with an emphasis on Gens Y and Z). Building on the outcomes of the SLR, we propose a systematization of a set of guidelines into four phases capable of supporting the implementation of an engaging digital workplace, considering the different generations. Most of the existing studies focus on the communication tools to provide a virtual workplace. We argue the relevance of studying the comprehensive aspects of the work environment, considering not only the perspective of the tasks to be done, but also a holistic view on how process, people, and technology are integrated into the enterprise to provide an efficient and effective digital workplace.

### 6.1. Key Contributions

Our systematic literature review consolidates the extant knowledge about implementing engaging digital workplaces. Based on our findings, we propose a more complete definition of a digital workplace, clarify the differences between workplace arrangements (physical, remote, virtual, and digital), and systematize guidelines to support organizations in tailoring digital workplaces to engage different generations, with distinct values and needs.

Step	Guideline	Reference
<b>Awareness</b>	Identify actors, networks, and conflicts	[89, 90, 91, 92, 93]
	Identify level of virtuality	[25, 22, 24]
	Confirm Gens Y and Z characteristics of employees	[3, 86]
	Identify employees, job, and organizational characteristics	[70, 52, 28, 31, 32, 25]
	Identify technologies, tools, and processes used by the teams	[32, 41, 18, 27, 52, 42]
	Map the information flows	[73]
	Map the physical workplace (distrations, ergonomic workspace, Internet connection)	[7]
<b>Design</b>	Define common procedures to establish teams' stability	[91, 90, 92, 93, 89]
	Define governance model with roles and responsibilities	[52]
	Identify the tools that best suit for each task performed in a digital workplace	[27, 18, 52]
	Establish a balance between work and personal life	[35, 17, 3]
	Establish face-to-face meetings when necessary	[72, 60, 48, 52, 68]
	<b>Build and Adopt</b>	Enrollment and mobilization
<b>Build and Adopt</b>	Plan and manage activities	[94]
	Develop employee engagement	[76, 75]
	Manage conflicts	[8, 21]
	Align strategy and organizational culture	[25]
<b>Evaluation</b>	Measure effective use of IS	[32]
	Measure employee engagement level	[75, 82]
	Measure changes in trust, knowledge sharing, and leadership	[71, 34, 23, 27, 21, 52, 44, 8, 51, 30, 48, 68, 29, 45, 53, 54, 58, 63]

**Table 2. Guideline references for implementing an engaging digital workplace**

### 6.2. Limitations and Future Research

The SLR focused mainly on technology studies, even if this is a multi-disciplinary subject. We did not analyze how demographic, social, and cultural aspects may influence employee engagement in a digital workplace. Also, we did not yet validate the proposed guidelines in an organizational environment.

Future research should use the proposed definition of digital workplace to clarify the type of workplace arrangement. Further, the generational different needs are still a gap in the literature, less than 10% of the selected papers considered that. This paper

is part of an ongoing study, where we plan to perform a Design Science Research (DSR) project in at least one organization to build and validate the proposed framework based on the suggested phases and guidelines. Future research related to digital workplace implementation should also experiment with this systematization to contribute with further guidelines and validate their applicability. As argued by Großer et al. [22], this topic is not well explored in the literature.

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