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Digitalisation methodology for manufacturing SMEs, public authorities and academia

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Digitalisation methodology for manufacturing SMEs, public authorities and academia

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DIGITALISATION METHODOLOGY FOR MANUFACTURING SMES, PUBLIC AUTHORITIES AND ACADEMIA

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EXECUTIVE SUMMARY

This report, which is part of Work Package 1 of the Digi-B-Well project, details the methodology that will support the development of a digitalisation strategy. It elaborates on key pillars and considerations that organisations need to account for during the digitalisation process. In addition, the report explains a framework that organisations are recommended to adopt for the promotion of digital well-being in the workplace.

Structure and Content: The report is organised into 5 sections. The first section provides a general introduction on digitalisation, especially in the organisational context. The second section gives elaborate descriptions of the three pillars of digital transformation. The third section details and explains four important aspects that need to be considered in the digitalisation process of organisations. The fourth section expounds on the digitalisation methodology, which discusses the concept of digital well-being and the multilevel framework of interventions. The last section concludes with a summary of how the digitalisation strategy will build on the methodological framework presented in this report.

Methodology: In addition to the narrative literature review performed throughout this report, data was collected from project partners through a template that asked for their insights regarding four topics (i.e., digital maturity, readiness, age sensitivity, cybersecurity and data sensitivity) that are relevant to organisations' digitalisation process and employees' digital well-being. The template was distributed via e-mail, and an online meeting was also scheduled for project partners to raise any concerns or clarifications related to the template and the corresponding tasks. The responses gathered were analysed and summarised in the third section of this report.

Results: Given the four broad issues that need to be considered in the digitalisation process, SMEs, academic institutions, and public organisations are expected to address these considerations by aiming for high levels of digital maturity, building an organisational culture for readiness, promoting digital inclusion throughout age groups, and increasing awareness of cybersecurity.

Recommendations: The report recommends focusing on the digital well-being of employees by applying a multilevel framework that acknowledges the demands and resources that an organisation needs to work on different levels during its digitalisation process. SMEs, public entities, and academic institutions are suggested to concentrate on assessment, awareness, and action when prioritising the digital well-being of their employees in the context of digital transformation.

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ACRONYMS & ABBREVIATIONS

TERM	DESCRIPTION
DICT	Digital Information and Communication Technologies
DT	Digital Transformation
GTMI	GovTech Maturity Index
ICT	Information and Communication Technologies
OPSI	Observatory of Public Sector Innovation
OECD	Organisation for Economic Co-operation and Development
SMEs	Small and Medium Enterprises
WHO	World Health Organization

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DIGITALISATION METHODOLOGY FOR MANUFACTURING SMES, PUBLIC AUTHORITIES AND ACADEMIA

1. Introduction

The “new normal” is often described with reference to the impact of the COVID-19 pandemic in significantly increasing the use of digital technologies in the daily lives of individuals even in their work environment (Duarte et al., 2023). Indeed, a shift in norms has been observed within workplaces as an aftermath of the pandemic due to the adoption of digital technologies and the rise of hybrid or remote work arrangements (Amankwah-Amoah et al., 2021; Brynjolfsson et al., 2020). Given the prominence of digital technologies in the new normal, many aspects of work have been reconsidered or reevaluated post-pandemic such as flexible workplace/worktime practices, knowledge sharing, employee management, and digital communications (Vyas, 2022).

Even with the increased prominence of technology in individuals’ daily lives, the levels of digitalisation among organisations and countries can still vary between each other (e.g., Agostino et al., 2021). For instance, some organisations view technology as integral and fundamental in their respective long-term strategies (Gajendran & Harrison, 2007; Raghavan et al., 2021; Tremblay, 2002). Whereas other organisations adopt digital solutions only as response mechanisms during crises such as the COVID-19 pandemic (Smith & Elliot, 2007). In general, many factors can influence the degree of digital adoption in a workplace, especially among different sectors and countries.

Due to digitalisation, organisations are expected to adapt and improve their digital capabilities in order to survive and thrive in the “new normal” (Alsufyani & Gill, 2022). Digitalisation, in general, presents both advantages and disadvantages in workplaces (Scholze & Hecker, 2024). Among the benefits that employees and organisations can gain from digitalisation process are increased flexibility, job autonomy, work-life compatibility and support, facilitation of social networks, effective communication and collaboration, and opportunities for continuous learning and skills development (Ayyagari et al., 2011; Carlson et al., 2017; Leung, 2011; Rani & Furrer, 2021; Salanova et al., 2014; Soga et al., 2022; Ter Hoeven et al., 2016). At the same time, certain issues have been raised related to digitalisation such as excessive technology dependence, intensified workloads, technology-related challenges and interruptions, employee monitoring, constant availability, social disconnection, and work-life intrusions (Barley et al., 2011; Bauer & Hofmann, 2018; Becker et al., 2020; Day et al., 2012; Kaushik & Guleria, 2020; Mann & Holdsworth, 2003; Ninaus et al., 2015; Paškvan & Kubicek, 2017; Ruiner & Klumpp, 2022; Sardeshmukh et al., 2012; Stich, 2020; Ter Hoeven et al., 2016; Ter Hoeven & Van Zoonen, 2015; Vartiainen & Hyrkkänen, 2010). An important area of concern is the stress and anxiety generated by the increased utilisation of technology in the workplace (McClure, 2018). Issues related to the technology-related stress experienced by employees underscore the significance of giving attention to workers’ well-being in the digital context (Scholze & Hecker, 2023).

The Digi-B-Well Project intends to elaborate a methodology to maximise the advantages of digitalisation based on three pillars of digital transformation:

1. digital-era-fit management and business operation
2. change of digital and teleworking culture, enabling well-being of employees and prevention of their digital stress and burnout
3. adaptation to digital era with up-to-date technologies and infrastructures.

In the subsequent sections of the present deliverable, these three pillars will be discussed on the light of scientific literature. Next, some important factors that can influence digital transformation (i.e., digital maturity, individual and organisational readiness, age sensitivity, and cybersecurity) will be presented. Finally, the topic of digital well-being will be introduced on which the **Digital methodology for SMEs, public authorities and academia** will be developed.

2. Digitalisation Pillars

2.1. Pillar 1: Digital-Era-Fit Management & Business Operation

In the past, the terms digitisation, digitalisation, and digital transformation have been used interchangeably even though these three terminologies are distinct from each other (Bockshecker et al., 2018). Digitisation refers to the technological transformation of information by changing it from analogue to digital form (Freitas Junior et al., 2017). It mainly concerns technical elements such as the development of digital infrastructure. Whereas digitalisation and digital transformation take into account both social and technical elements in the process change (Bockshecker et al., 2018). Specifically, digitalisation refers to an organisation's digital development state of adopting and using digital technologies to make fundamental changes in their business model (e.g., organisational strategy, business processes, whole socio-technical organisational system; Bockshecker et al., 2018; Legner et al., 2017; Park & Saraf, 2016). As for digital transformation, it refers to the process of organisational changes driven by innovations and developments of information and communication technology (ICT; Bockshecker et al., 2018). In general, digital transformation not only serves as a catalysis for the adoption of digital tools and strategies, but it also concerns organisations using digital technologies' potential for innovation, agility, and resilience.

Considering digitalisation not only concerns technology adoption but also fundamental changes to different organisational aspects, the management and business model of an organisation should generally be aligned with the use of modern technologies to achieve their goals and improve performance (Aslanova & Kulichkina, 2020). The normalisation of telework has also prompted significant changes in business models and operational strategies. Many organisations have reduced their physical office space, cutting costs on rent and maintenance, while reallocating resources toward IT infrastructure, cybersecurity, and employee support systems to enhance technological resilience (Zhang et al., 2023). Management styles and organisational control are also affected by telework. Traditional physical oversight has given way to trust-based management and outcome-driven evaluations, and this change seems to foster collaboration and knowledge-sharing in remote teams (Mariotti et al., 2023). Strategic management now emphasizes decentralized decision-making and flexible task management, enhancing both productivity and employee engagement. HR strategies have also evolved to improve employee retention and

engagement. Research highlights the importance of strategic HR practices designed for virtual work environments, addressing challenges related to task supervision, performance assessment, and employee well-being (Amri, 2024; Haque, 2023). Additionally, the integration of digital tools and collaboration platforms has transformed knowledge management and skill distribution within organisations, requiring an alignment between digital competencies and job-specific tasks.

As described in Deliverable 1.1.1, the digitalisation process and digital transformation of SMEs, academic institutions, and public entities vary between each context. SMEs adopt a more gradual approach and are more concerned with the improvement of their operational efficiency, market reach, and customer engagement. Academic institutions focus on strengthening the digital competencies of its staff and aligning their current systems with digital innovations. And public institutions prioritise service delivery and transparency in their digital transformation for more accessible and streamlined interactions with citizens.

2.2. Pillar 2: Change of Digital & Telework Culture for Well-being of Employees and Digital Stress/Burnout Detection/Prevention

Telework, which has been synonymously referred to as remote work or telecommuting, is a flexible work arrangement that allows an employee to perform work away from their central workplace or usual office environment (e.g., at home, while mobile) using ICTs (Allen et al., 2015; Barsness et al., 2005; Charalampous et al., 2019). During the COVID-19 pandemic, telework became a necessity for majority of workers to protect them from infections (Raghavan et al., 2021). With the easing of COVID-19 restrictions, many employees returned to physical workplaces, resulting in a decline in fully remote work. However, hybrid work arrangements have gained significant traction, with 60% of European workers preferring to work from home several times a month rather than exclusively remotely (Eurofound, 2023). Similarly, in the U.S., 33% of employees in remote-capable jobs favour full-time remote work, 8% prefer entirely on-site work, and nearly 60% opt for a hybrid model (SuperSaas, 2024). Projections from Gallup (2024) suggest a continued growth in hybrid and remote work, signalling a lasting shift in workplace norms. The increasing practice of telework has transformed homes into virtual workspaces (Franken et al., 2021). The grown prominence of the digital and telework culture brings a challenging aspect on employees' well-being and work performance (Carnevale & Hatak, 2020).

Certain benefits from teleworking have been described in past research. For instance, organisations are suggested to benefit from telework due to improvements in employees' productivity, work engagement, work quality, and organisational commitment (Allen et al., 2015; Charalampous et al., 2019; Martin et al., 2012). Employees can also benefit from greater autonomy and flexibility in their working hours, as well as an inclusive work environment for workers with mobility issues (Raghavan et al., 2021). Rodriguez-Modrono (2023), using an ordinal measure of intensity, proposes that "several times a month for women and several times a week for men" represent reasonable intensity of work from home, which, in turn, may have more beneficial effects on health compared to when working fully home-based. In a meta-analysis, Gaiaendren et al. (2024) concluded that if autonomy may increase job satisfaction, social isolation may decrease the same job satisfaction and that an adequate amount of remote work intensity has small but beneficial effects on job satisfaction, organisational commitment, performance assessed by the supervisor and turnover intention. At the same time, the study showed that, although small, those effects are, anyway, higher than those observed in office-based colleagues of remote workers

(Gaiaendren et al., 2024). Similarly, a study showed that when working at home social isolation decreases performance, but concentration and work engagement increase performance, and that positive aspects outweigh the negative ones (Toscano et al., 2025).

However, remote work has also clear disadvantages and risks. In particular, technostress, work-life conflicts, and social isolation are causes of concern in the digital and telework culture, considering these issues can induce psychological strain and negatively impact employees' well-being (Bentley et al., 2016). Productivity hinges on knowledge-sharing and digital tools (Nwankpa & Roumani, 2024), while digital well-being remains critical as employees navigate virtual workspaces (Singh et al., 2022). Working remotely for long hours requires often a heavy reliance on digital technologies, which may result in technostress, defined as the stress experienced because of the use of ICT systems and technologies (Salazar-Concha et al., 2021) or, in relation to telework, the stress experienced by teleworkers due to the lack of adaptation to ICT (Fernandez-Fernandez et al., 2023). Studies show that components of technostress, namely techno-overload, techno-complexity and techno-invasion, significantly impacted Indian employees during the pandemic (Dutta and Mishra (2023), and that higher technostress correlated with lower job satisfaction and job performance (Fernandez-Fernandez et al. (2023). Furthermore, public employees reported that overwhelming technostress increased job demands and decreased work engagement (Harunavamwe & Kanengoni, 2023)

Among the recommendations to help employees adapt to teleworking and digital working conditions is the provision of managerial and technological support (Franken et al., 2021). For instance, leadership plays a crucial role in maintaining morale and productivity, with transformational leadership being linked to higher job satisfaction and motivation in remote settings (Jones & Schöning, 2021). In addition to their key role in the continuity and productivity of businesses in telework arrangements, managers are also fundamental in supporting employees to effectively handle work-to-life and life-to-work conflicts (French et al., 2018). Past research has also recommended the establishment of policies and incentives among organisations that will make telework integral in their work processes (e.g., Raghavan et al., 2021). Such policies can demonstrate the organisational and individual support that will be provided to employees as they transition to this new flexible work arrangement (Bentley et al., 2016). Furthermore, it can motivate employees to support the transition and learn new but necessary technological skills for teleworking (Kim et al., 2021). In general, successful remote work relies on effective leadership, employee engagement, and an adaptable organisational culture (Bravo-Duarte et al., 2025). Indeed, continuous adaptation is important for sustaining productivity while addressing remote work challenges. As firms adapt to remote and hybrid work, fostering a culture of trust and support is essential to sustaining employee commitment, particularly in distributed teams that lack the cohesion of face-to-face interactions.

Telework culture also poses challenges on employees' well-being and performance in light of the interconnectedness and blurred lines between employees' work and home lives (Carnevale & Hatak, 2020). On the one hand, telework can help employees maximise the advantages of being proximal to their family and avoiding commute to achieve better work-life balance, well-being, and quality of life (Gajendran & Harrison, 2007). On the other hand, employees who are unable to cope with the competing demands of work and home may suffer the negative consequences of increased frequency and intensity of telework arrangements (Fonner & Roloff, 2010; Oakman et al., 2020; Teng-Calleja et al., 2020).

Social isolation from colleagues is also related to stress and decreased telework productivity (Toscano & Zappalà, 2020). Lack of support from colleagues and supervisor, which represents in itself forms of social isolation, were associated to increased job demands, burnout and reduced job satisfaction and performance (Costin et al. 2023; Schmitt, 2024), lost comradery (Babapour et al., 2022), and lower work-life wellness (Como et al., 2020). The lack of supervisor's support was associated with working despite feeling ill (Schmitz et al., 2023), whereas the support of the supervisor acts as a protective factor against techno-complexity (Capone et al., 2024).

Telework in Sectors

Despite the grown prominence of telework culture in current society, some organisations still hesitate to adopt it in their working model due to various reasons such as lack of organisational preparedness and technological/resource limitations (Green et al., 2020; Metwally et al., 2021). The context and nature of an organisation can also play a factor in the adoption of telework in their working processes. Of interest in the Digi-B-Well project are the organisational contexts of academic institutions, SMEs, and public entities. The current knowledge on the telework culture and arrangements in each of these sectors are described below.

- **Academia**: Telework options can be common among knowledge and information organisations (e.g., education, science). Among which, academic teaching and research staff are considered frequent teleworkers in view of the nature of their work (i.e., autonomous, flexible) and the increasing demands in teaching and research (García-González et al., 2020; Charalampous et al., 2019; Currie & Eveline, 2011; Widar et al., 2022). Because of their self-regulated work, academic employees are considered to benefit from telework when they are performing tasks that require deep concentration (e.g., research; Widar et al., 2022). But among employees with minimal ICT experience, tasks related to teaching, administrative work, and managerial responsibilities may be more difficult to implement through telework (Widar et al., 2022).
- **SMEs**: Large enterprises and SMEs can starkly differ regarding their implementation of telework in their workplaces. Particularly, SMEs lack more formalised processes on work procedures and outcomes that can support telework arrangements among their employees (Bajzikova et al., 2016). In addition to ICT availability issues, factors such as strong hierarchies, management styles, and trust issues can influence SMEs' adoption of telework (Clear & Dickson, 2005). For some countries (e.g., Czech Republic; Vrchota et al., 2020), more than half of their SMEs are observed to have implemented telework in their respective organisations.
- **Public Sector**: For some public institutions, telework can be considered unsuitable for certain technical or infrastructural services (e.g., public space, public transport, road maintenance; Kam, 2023). But for public employees engaged in knowledge work and digital citizen services, telework is considered compatible even with the traditionally bureaucratic nature of their work (Taskin & Edwards, 2007; Varotsis, 2022). Telework arrangements among public employees must generally be coherent with the bureaucratic structure and principles of public organisations (Taskin & Edwards, 2007). Furthermore, government recommendations or legislations can play a role in the work design changes in public organisations that adopt telework arrangements (e.g., Barbieri et al., 2025; Jämsen et al., 2022).

2.3. Pillar 3: Digital Adaptation with Up-To-Date Technologies and Infrastructure

The vital role of an organisation's technology infrastructure was highlighted during the period of the COVID-19 pandemic (Green et al., 2020). It continues to gain in value with the rapid advent of artificial intelligence and new technologies that are changing the world of work and life in general. The organisations that adopted digital solutions even before the pandemic were more effective in integrating new technologies, which helped them adapt their working model to the circumstances of the pandemic (Andersen et al., 2020).

In general, digital adoption needs to be considered as a fundamental element for organisational transformation (Raghavan et al., 2021). Efforts should be made to upgrade technological infrastructure at an organisational level and provide adequate technological support for employees to enable the wider adoption of digital solutions in organisations (Monaco et al., 2021). Organisations are also expected to adopt a digital mindset and evolve their processes, so they can truly maximise the proficiency of their new technology (Raghavan et al., 2021). In the context of telework, the transition to flexible work arrangements has necessitated not only robust IT solutions but also enhanced transportation infrastructures, enabling work in previously underserved areas. Previous studies have highlighted the role of digital innovation in sustaining remote work, with companies investing in high-bandwidth networks, VPNs, and cloud storage to accommodate a geographically dispersed workforce (Gökhan & Ozmen, 2023; Saraiva et al., 2021).

However, digital adaptation does not only require infrastructural investment. Digital divide understood as disparities in access, use, and digital skills persists across different populations within organisations and communities more generally. The reason lies in the fact that beyond material access, cognitive, motivational, and socio-emotional factors influence digital inclusion (van Deursen & Helsper, 2015).

To bridge the gap, upskilling (enhancing existing digital skills) and reskilling (learning new digital competencies) are essential strategies. According to learning theories (Bandura, 1986), self-efficacy and motivation play a crucial role in acquiring digital skills. Individuals with lower self-efficacy in technology usage may experience higher digital exclusion, reinforcing socioeconomic inequalities. Growth mindset (Dweck, 2006) and lifelong learning attitudes facilitate successful upskilling and reskilling processes. Moreover, workplace training programs that incorporate experiential learning and social support have been shown to improve digital skill acquisition and adaptation (Kolb, 1984; Eraut, 2004).

From an organisational psychology perspective, companies that invest in digital skills development benefit from higher employee engagement and adaptability to technological change (Tannenbaum & Yukl, 1992). However, psychological barriers such as fear of obsolescence and resistance to change may hinder upskilling efforts, requiring tailored interventions to foster a digital learning culture (Kanfer & Ackerman, 2004). Policymakers and educators must consider not only access to technology but also psychosocial factors influencing digital skill development. Interventions promoting digital confidence, adaptive learning strategies, and inclusive training environments are crucial for mitigating the digital divide and preparing individuals for the evolving labour market.

3. IMPORTANT CONSIDERATIONS IN THE DIGITALISATION PROCESS

In order to develop the methodology through which the Digi-B-Well project intends to support the digital transformation of SMEs, public authorities and academia, four important factors were considered: (1) digital maturity; (2) readiness; (3) age sensitivity; (4) cybersecurity and data sensitivity.

The analysis of these factors and their impact on the outcome of digital transformation was conducted both through the review of scientific literature and through the active involvement of project partners. A template was distributed via e-mail to the project partners. Through these templates, the partners of the Digi-B-Well project provided contextualised definitions of the four topics based on their organisational, sectoral, and country experiences. In addition, they listed relevant materials to provide further information on each topic (see Appendix for the completed templates of each project partner).

3.1. Digital Maturity

The concept of digital maturity and digital transformation often go hand in hand, considering digital maturity encompasses a gradual process of organisations integrating and implementing their processes, human capital, and other resources into digital processes (Aslanova & Kulichkina, 2020). Digital maturity is defined as "the status of a company's digital transformation" and describes "what a company has already achieved with regard to transformation efforts" (Chanias and Hess, 2016a, p. 2). It is a key pillar of digital transformation, as it refers to an organisation's ability to effectively integrate and leverage digital technologies to enhance efficiency, innovation, and competitiveness. It involves aligning digital tools and strategies with business goals while fostering a digital culture among employees.

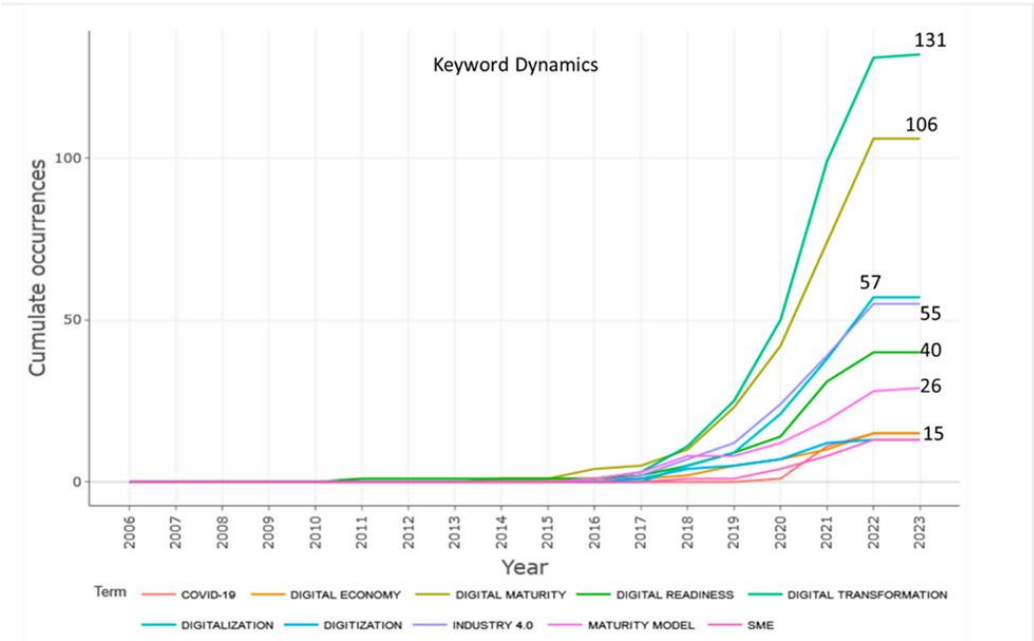

Figure 1. Dynamic of frequently used keywords (Sources: Aras & Büyüközkan, 2023)

There has been an increasing interest in digital maturity in scientific literature over the last decades. Figure 1 reports the number of times "digital maturity" appears among the keywords of the documents reviewed by Aras and Büyüközkan (2023). At both academic and business levels, many conceptual models have been developed. Most of them include different dimensions that help to define the digital maturity of an organisation, namely:

- **Strategy:** how corporate vision, strategic direction, and goals drive digital transformation (DT) to create value.
- **Product:** the impact of DT on customer value, product offerings, and differentiation.
- **Process:** the extent of DT implementation in organisational processes, i.e., business management processes.
- **Technology:** the use of technology and data for sustainable digital transformation.
- **People:** the impact of DT on work patterns and the digital skills required for employees.
- **Governance:** how managerial and cultural issues are handled to ensure the successful implementation and sustainability of DT.

Generally, digital maturity requires awareness of both the benefits and risks of digital tools while ensuring continuous capacity-building through advanced ICT implementation.

According to the Digi-B-Well project partners, digital maturity is crucial for supporting SMEs in Industry 4.0 adoption, AI-driven decision-making, and digital transformation strategies. High digital maturity helps SMEs enhance efficiency, remain competitive, and reduce employee digital stress. On an individual level, continuous digital skills development is essential for innovation and knowledge transfer.

Similarly, at the national and local levels, public authorities' priority digitalisation efforts are aimed to improve public services, enhance cyber and data security, and optimize IT efficiency. More specifically, the OECD Observatory of Public Sector Innovation (OPSI) developed the Innovation Facets framework to identify four key drivers of innovation in public services:

1. Enhancement-Oriented Innovation focuses on improving existing practices for greater efficiency without drastically changing the system. It is driven by resource constraints, market-driven public administration (New Public Management), and technological advancements.
2. Mission-Oriented Innovation aims to tackle complex societal challenges by coordinating cross-sectoral efforts. It introduces new technological, social, or organisational solutions to address grand missions such as climate change, clean oceans, and sustainable economic growth.
3. Adaptive Innovation responds to dynamic environments by adjusting public sector strategies at multiple levels—external (environmental drivers), institutional (organisational capacity), and individual (public officials' initiatives).
4. Anticipatory Innovation prepares governments for future uncertainties by exploring scenarios, testing solutions, and strengthening resilience to leverage opportunities while mitigating risks.

In brief, this framework helps public institutions navigate challenges and foster innovation for effective governance.

Different indexes have also been developed to measure the maturity of digital government around the world. For instance, the OECD published in October 2020 the *Digital Government Index (DGI)*

to measure the maturity of digital government in 33 countries, including 29 OECD member countries and 4 non-member countries, namely, Argentina, Brazil, Panama, and Uruguay. This index focuses on six key aspects: digital by design; data-driven public sector; government as a platform; open by default; user-driven approach; proactiveness. *The GovTech Maturity Index (GTMI)* was launched by the World Bank in 2020 to introduce a measure of GovTech maturity in four focus areas: core government systems; service delivery; citizen engagement; GovTech enablers. Constructed for 198 economies using consistent data sources, the GTMI is the most comprehensive measure of digital transformation in the public sector. According to the GTMI, five of the eight partner countries in the Digi-B-Well project (i.e., Croatia, Italy, Germany, Hungary, Slovenia) have a very high level of digital government maturity (>0.75), while two (i.e., Poland, Slovakia) have a high level of digital government maturity (0.65 < GTMI < 0.75; World Bank Group, 2022). Among the Digi-B-Well project partners, PGKC has made significant progress in digital transformation by implementing web-based services, SharePoint, and social media platforms, as well as offering digital submission of requests via eForms. However, municipalities like Lučenec face challenges in digital transformation due to budget constraints and limited staff training in new technologies.

3.2. Readiness

Readiness and maturity are often used indifferently in literature to represent the same set of concepts. However, while maturity consists of the proven ability to integrate digital technologies effectively and sustainably to improve processes and achieve objectives, the concept of readiness refers to “the state of being both psychologically and behaviourally prepared to take action (i.e., willing and able)” (Weiner, 2009). Readiness is a key element when managing organisational change mainly because the people who form the organisation (i.e., employees) are the contended true source or vehicle for change to succeed or successfully happen in an organisation (Smith, 2005). In other words, change readiness can spell the difference between people embracing or resisting the change. In the context of digitalisation, resistance to change has been observed, for example, among organisations adopting telework arrangements, even among their managerial levels (Raghavan et al., 2021). In the succeeding paragraphs, readiness is further defined among three concepts: digital readiness; organisational readiness; individual readiness.

The Digital Maturity Assessment Tool promoted by the European AI Office (https://european-digital-innovation-hubs.ec.europa.eu/news/digital-maturity-assessment-tool-vital-resource-digital-transformation) considers digital readiness as a dimension of digital maturity. Similarly, Chirumalla et al. (2025) included readiness among the critical factors affecting digital transformation in manufacturing companies. Specifically, they developed the ARTO model, a structured framework comprising four distinct success factors:

1. Awareness: Building knowledge and fostering a culture of innovation throughout the organisation, ensuring that all stakeholders understand the purpose, challenges, and benefits of the transformation
2. Readiness: Establishing the necessary infrastructure, leadership capabilities, and strategic roadmaps, while aligning organisational structure and culture to support digital initiatives
3. Technology: Systematically adopting, integrating, and optimising digital technologies to improve production processes, enhance collaboration, and maintain robust data security and governance

4. Operations: Continuously evolving operational systems to harness real-time data, optimise factory designs, and achieve long-term productivity and sustainability goals.

Organisational readiness refers to the collective preparedness of an organisation to implement change, encompassing factors such as leadership support, resource availability, and a culture conducive to change. It encompasses two main facets:

- Change Commitment: The shared resolve or determination among organisational members to implement the change
- Change Efficacy: The collective confidence in their capabilities to implement the change.

Individual readiness for change reflects an individual's preparedness to embrace organisational change. It is influenced by:

- Normative-Educational Change Strategies: These strategies focus on changing norms and values through education and persuasion, which can increase individual readiness
- Perceived Organisational Support: Supportive environments and positive communication from management can enhance individual readiness.

With regard to public institutions, the eGovernment Benchmark assesses the progress of public service digitalisation across the EU27 based on four key dimensions:

- User-Centricity: Evaluates the accessibility, usability, and responsiveness of digital public services
- Transparency: Measures the clarity of information on service delivery, policy-making, digital service design, and personal data processing
- Key Enablers: Examines the technological infrastructure supporting eGovernment services
- Cross-Border Services: Assesses the accessibility of online services for foreign citizens and the availability of support and feedback mechanisms.

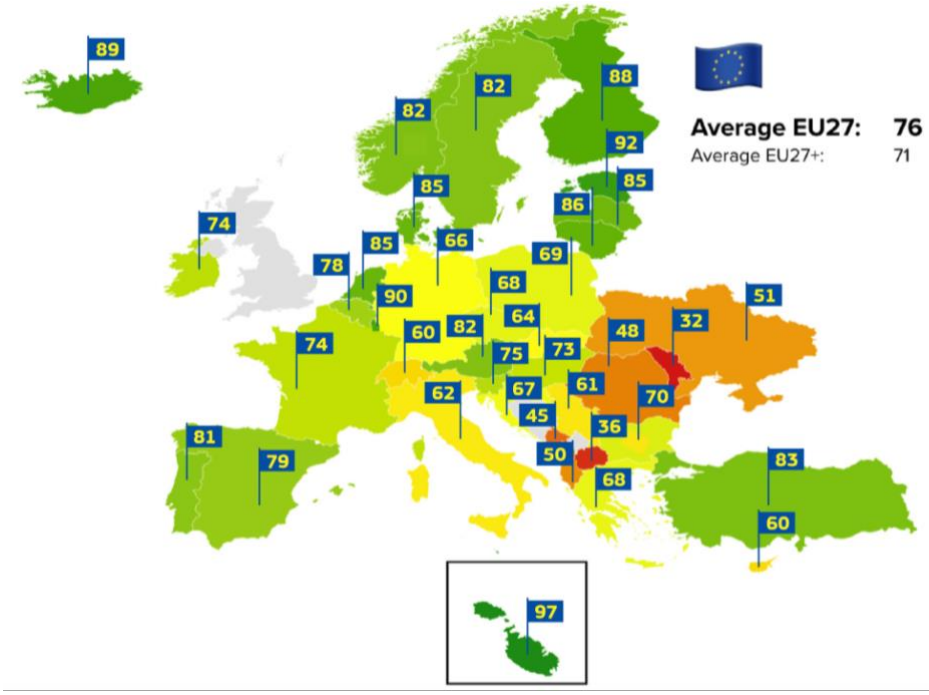

Figure 2. Country overall performance, biennial average 2022/2023 (source: eGovernment Benchmark 2024)

Based on the four dimensions, countries receive an overall eGovernment performance score, ranging from 0 to 100 points. Higher scores suggest stronger performance, while lower scores suggest areas for improvement. According to the eGovernment Benchmark 2024, the countries participating in the Digi-B-Well project seem to have a medium to low performance score, including 62 (Italy) and 75 (Slovenia; see Figure 2).

The perception of some partners is that organisational readiness in the municipalities is still at a minimal level. There are plans and proposals, but so far, real activities have been implemented rather sporadically. The higher average age of staff may be an individual barrier to the rapid and effective implementation of change. Established practices and rejection of new ICT based on little experience and mistrust are some of the significant individual factors in implementing change.

Concerning the private sector, many SMEs hesitate to invest in digitalisation due to concerns about costs, lack of expertise, and uncertainty about the benefits. Facilitating knowledge transfer, coordinating pilot projects, and engaging decision-makers in strategy development can enhance SMEs readiness.

3.3. Age Sensitivity

Digital transformation and demographic change are two metaprocesses that have influenced age and aging. The World Health Organization (WHO; 2022) forecasts that the proportion of the global population aged 60 and over will double between 2015 and 2050. Digitalisation is expected to enhance the availability of public and private services and ensure equal access to them. Digital technologies and media have entered the workplace and, in some fields, have even become ubiquitous. In addition, citizens increasingly communicate through digital media such as the internet and social media in their everyday lives. According to Eurostat's 2024 survey on ICT usage, 93% of the surveyed European population reported using the internet within the last three months. This figure varies from country to country as shown in Figure 3.

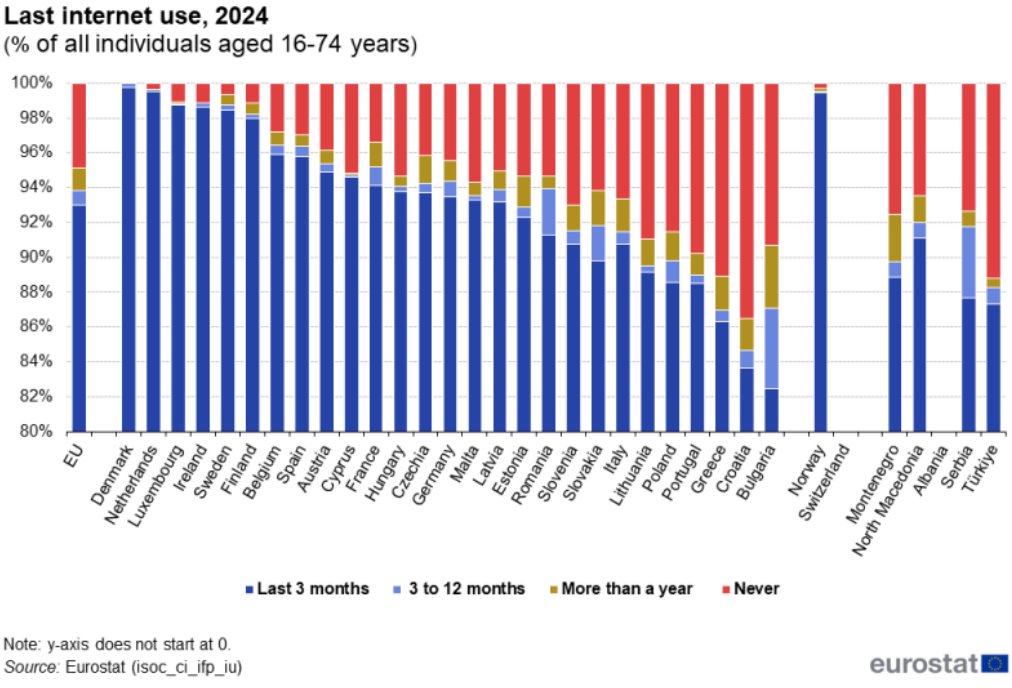

Figure 3. Last internet use 2024 (Source: Eurostat)

Many older adults, however, struggle to adapt to new technologies. Consequently, the aging population and the rapid pace of technological evolution have intensified the digital divide, which is an inequality in access to and use of ICT that disproportionately affects older adults. The term "digital divide" refers to the gap between individuals, households, companies, and geographic areas at different socioeconomic levels in terms of access to and use of ICT. Previous research has highlighted the complex and dynamic nature of the digital divide, which can be understood across at least three levels (Helsper, 2021; Scheerder et al., 2019). The first-level digital divide concerns access to the internet; the second-level digital divide relates to differences in internet usage, skills, and digital literacy; while the third-level digital divide pertains to disparities in individuals' ability to use the internet in ways that enhance their participation in society.

Several socio-demographic variables, including education, income, age, and gender, were found to be associated with non-use or lack of access to the Internet. Older adults' difficulties in adapting to the digital environment not only limit their access to essential services but also negatively affect their mental health and well-being. The growing interest in digital inclusion and the well-being of older adults reflects an increasing recognition of the importance of digital skills for this demographic. This topic explores the role of digital technologies in promoting active aging, social participation, and overall well-being among older adults.

Workplace digitalisation is often associated with the risk of excluding older workers. In particular, workers over 55 tend to adopt new technologies more cautiously—a behaviour that may initially reduce technostress but can lead to increased stress over time as digital tools become more widespread in the workplace (Marchiori et al., 2019). Additionally, older workers often experience a higher cognitive load when multitasking with digital tools, making adaptation more challenging (Tams et al., 2014). Several studies indicate that workplace digitalisation can render the skills of older workers obsolete, increasing the likelihood of early retirement (e.g., Behaghel et al., 2014; Greenan & Messe, 2018; Hudomiet & Willis, 2021). This risk is particularly pronounced when older employees are excluded from workplace training programs (Lee et al., 2008; Magnani, 2006; Staufer, 1992; Van Dalen et al., 2015).

At the same time, digital technologies have the potential to counteract age-related productivity declines, enabling older workers to remain in the workforce longer. Digital solutions can reduce the physical demands of work, for example, by eliminating the need to carry paper files and folders or by using sensors to detect and mitigate workplace hazards (Sheng et al., 2022). These advancements can help prevent health issues and make tasks more accessible for workers with existing health conditions (Hudomiet & Willis, 2021). Similarly, remote work technologies offer older employees greater flexibility, allowing those with health concerns to manage their workload more effectively from home (Damman, 2016).

These general findings suggest that older workers can be supported in embracing digital transformation. For instance, mentoring programs have proven effective in reducing technostress by providing guidance and fostering digital confidence (Wang et al., 2020). Addressing the digital divide among older workers through such initiatives can help ensure their continued engagement and productivity in an increasingly technology-driven work environment. At PGKC, one of the Digi-B-Well project partners, all employees have access to a series of instructions through the intranet that simplify the performance of everyday actions and tasks related to digital knowledge and skills.

Employees also have access to an external digital service provider, which, based on the individual's request and needs, directs and simplifies certain technological challenges.

At another Digi-B-Well project partner, PBN's projects often observe that older employees struggle more with adapting to new digital tools, while younger generations are more agile in adopting emerging technologies. This gap can slow down innovation if not addressed through targeted training programs and intergenerational knowledge-sharing initiatives. PBN actively supports lifelong learning and mentoring systems to ensure that all employees, regardless of age, can benefit from digital transformation efforts and contribute to innovation. Besides this, PBN has a dedicated unit for the assistance of elderly people in the use of new digital technologies, especially in healthy living.

To conclude, **age sensitivity** refers to the recognition and accommodation of the unique needs, preferences, and challenges associated with different age groups. In the context of digitalisation, it involves understanding how various age demographics, particularly older adults, interact with and are affected by digital technologies. This encompasses acknowledging disparities in digital skills, access to technology, and the potential for digital exclusion among older populations. Addressing age sensitivity ensures that digital initiatives are inclusive, enabling all age groups to benefit from technological advancements without facing usability barriers or inequities.

3.4. Cybersecurity and Data Sensitivity

Digital transformation involves integrating digital technology into all aspects of a business, fundamentally changing how organisations operate and deliver value to customers. While this shift enhances efficiency and productivity, it also introduces significant cybersecurity and data sensitivity challenges, particularly regarding privacy and data integrity. The adoption of emerging technologies—such as artificial intelligence, big data, blockchain, and cloud computing—offers numerous advantages but also exposes organisations to new cyber threats, including:

- Data breaches and unauthorized access: Insecure devices and systems can compromise sensitive business information and intellectual property, leading to revenue loss and reputational damage.
- Cyber-attacks and malware threats: Ransomware, phishing attacks, and other malicious activities can undermine trust among customers and stakeholders.

While advanced technologies provide opportunities to enhance security, they also introduce complexities that require organisations to strengthen data protection measures and improve employees' cybersecurity awareness and skills. Cybersecurity refers to the practices and technologies designed to protect networks, devices, programs, and data from attack, damage, or unauthorized access. It ensures the confidentiality, integrity, and availability of information. Data sensitivity involves classifying data based on its importance and the potential impact of unauthorized access or modification. Recognizing which data requires heightened protection is essential for effective security strategies.

Several factors contribute to the cybersecurity challenges faced by organisations, including:

- Low technological maturity: Some authorities and organisations lack the infrastructure to defend against cyber threats.

- Limited IT knowledge among employees: Many workers hold misconceptions that digital data is less vulnerable than paper records. A lack of training prevents them from effectively securing their devices and information.
- Weak data protection policies in SMEs: Many small and medium enterprises (SMEs) lack structured cybersecurity measures, making them highly vulnerable to cyber threats. GDPR compliance is particularly crucial in cross-border collaborations.

Recognizing the importance of cybersecurity, the Government of the Republic of Croatia has established a National Cybersecurity Strategy and an accompanying Action Plan. These frameworks guide efforts to protect users of digital services across public, private, and individual sectors. The goal is to create a regulated, accessible, open, and secure Croatian cyberspace through coordinated actions among various institutions.

Among the Digi-B-Well project partners, the PGKC has implemented an Information Security Management System (ISMS) based on international security standards. This system, along with internal regulations and legal norms, ensures the proper use and protection of data handled by PGKC employees.

In general, employees with the right competencies (coupled with the right organisational design) can better anticipate and respond to potential cybersecurity threats. Research (e.g., Wong et al., 2022) suggests that **cybersecurity awareness** affects employees' threat appraisals (i.e., perceived threat severity and perceived threat vulnerability). Therefore, organisations need to actively promote cybersecurity rules to their staff and stakeholders by encouraging a cybersecure mindset. Training and educating staff to understand the forms of a potential attack can help them avoid falling for cybersecurity threats, improve their ability to assess the severity of the threat, and understand their own vulnerabilities. Some possible activities, such as organising regular campaigns to engage and inform employees on how to minimise their online footprint, promote staff safety, and recognise insider threats, are essential and should be encouraged. As an employee's perception of response efficacy increases, their tendency to adopt an appropriate coping strategy also increases. Therefore, organisations must provide both training and support to help employees use the technology correctly and increase their response efficacy. Implementation guidelines need to be communicated to employees during the adoption phase. Guidelines must be clear, structured, and easy to follow to encourage awareness and compliance. This would enable employees to continually strive to manage and minimise risk by prioritising actions that maximise protection.

4. DIGI-B-WELL DIGITALISATION METHODOLOGY

Deliverable 1.1.2 offered several methodological recommendations in the implementation of interventions during the digitalisation process of organisations. It highlighted the importance of accounting for employees' digital well-being, the organisational context, and the impact of leadership and organisational culture when adopting and maximising the benefits of digital technologies in workplace settings. This past deliverable placed emphasis, however, on the need to focus on digital well-being given the absence of a framework that considers employees' health and well-being when managing the challenges of digitalisation. In alignment with these previous recommendations, the methodology elaborated in this section centres its discussion on digital

well-being and provides a comprehensive framework by examining different organisational and contextual levels to assess it.

4.1. Digital Well-being

Considering digital technologies have become ingrained in individuals' everyday lives including the professional environment, more discussions and debates have occurred regarding the benefits and drawbacks of their use (Duarte & Dias, 2023). In particular, the concept of digital well-being, which concerns the impact of digital technologies on individuals' well-being (Floridi, 2014), has developed into an important issue and focus of recent studies, especially after the COVID-19 pandemic (Duarte & Dias, 2023; Burr et al., 2020). Research in the fields of communication sciences and human-computer interaction have provided varying insights on the conceptualization and definitions of digital well-being. For instance, Vanden Abeele (2021) defined digital well-being as the "subjective individual experience of optimal balance between the benefits and drawbacks obtained from mobile connectivity" (p. 938). An alternative description of digital well-being considers it as "a state where subjective well-being is maintained in an environment characterized by digital communication overabundance" (Galanxhi & Nah, 2021, p. 349). Whereas these two example definitions consider individuals' subjective evaluations of the relationship and role of digital technology in their lives, other studies have simply equated digital well-being to technology overuse and screen time (Lyngs et al., 2019; Parry et al., 2023; Vanden Abeele, 2021). In general, researchers have approached digital well-being from various viewpoints, which resulted to the emergence of multiple definitions about the concept in the present literature (Al-Mansoori et al., 2023).

More pertinent to the Digi-B-Well project, digital well-being can be approached from a psychological perspective on well-being in the workplace context. A prominent theory in work and organisational psychology regarding employee well-being is the Job Demands-Resources model (Bakker & Demerouti, 2007). This theory contends that specific aspects of the work environment (i.e., physical, psychological, social, or organisational aspects of a job) can be categorised as either job demands or job resources (Bakker & Demerouti, 2017; Schaufeli, 2017). Job demands refer to job aspects that require sustained physical and psychological efforts, whereas job resources refer to job aspects that can motivate individuals and mitigate the negative consequences of job demands (Demerouti et al., 2001). In line with the perspectives of the Job Demands-Resources model, an individual's well-being is assessed based on the resources that they possess to balance the demands or challenges of the workplace (Duarte & Dias, 2023).

Recently, researchers have extended the propositions of the Job Demands-Resources model to acknowledge the impact of digitalisation in workplaces. Specifically, Scholze and Hecker (2024) contended the importance of distinguishing and identifying digital job demands and digital job resources in the work environment. Digital job demands concern job aspects that require physical or psychological exertion for prolonged periods due to utilisation of DICT, whereas digital job resources concern work, organisational and development resources that come from DICT (Scholze & Hecker, 2024).

Integrating the various perspectives from work and organisational psychology, communication sciences, and human computer interaction, a definition of digital well-being is established that is relevant to the context of the Digi-B-Well project and its specific sectors of interest (i.e., SMEs,

academia, public institutions). In brief, **digital well-being is defined as an individual's subjective experience of optimal balance between the benefits (i.e., digital job resources) and drawbacks (i.e., digital job demands) of digitalisation (e.g., adoption of new technologies and digital capabilities) in the workplace** (Scholze & Hecker, 2024; Vanden Abeele, 2021). In this definition, subjective experience is related to the subjective component of well-being based on individuals' cognitive (i.e., thoughts) and affective (i.e., emotions) evaluations of their lives that can be further clustered to different dimensions (e.g., mental well-being, social well-being, physical well-being; Linton et al., 2016). Furthermore, by considering both digital job resources and digital job demands in its definition, digital well-being is better differentiated from technostress, which is another relevant concept that mainly focuses on the negative impact of technology use on well-being (e.g., stress and anxiety; Bondanini et al., 2020)

4.2. Multilevel Framework of Interventions

In addressing the digital well-being of employees, the multifaceted and mixed impact of digitalisation on working conditions needs to be acknowledged (Scholze & Hecker, 2024). In particular, the effects of digital job demands (e.g., availability, work intensification, technology dependence) and digital job resources (e.g., collaboration, autonomy, efficiency) can vary depending on the work context (Scholze & Hecker, 2024). To maximise the positive implications of digitalisation and mitigate the technostress of employees, the perspectives of psychologically healthy workplaces (Day & Nielsen, 2017) can be adopted in the Digi-B-Well project. In lieu of the notion that a healthy workforce is related to good organisational performance, psychologically healthy workplaces have two concurrent aims: (1) to foster the health and well-being of their employees; (2) to incorporate business practices that maintain organisational efficiency, productivity, and positive impact toward clients and community (Day & Nielsen, 2017; Day & Randell, 2014). To create a psychologically health workplace, each organisation will need to understand their own unique problems (e.g., challenges/demands) and solutions (e.g., resources; Day & Nielsen, 2017). In the context of digitalisation, organisations would need to decrease negative workplace factors that create technostress (i.e., reduce digital job demands) and increase positive workplace factors that enhance the digital well-being of employees (i.e., promote digital job resources).

Work and organisational psychology researchers have discussed the importance of identifying job demands and job resources at multiple levels of an organisation to create a healthy workplace (Nielsen et al., 2018). The IGLO model is a suggested framework that can help determine the digital job demands and digital job resources that need to be addressed at four levels in the work context: individual, group, leader, organisation (Day & Nielsen, 2017; Nielsen & Miraglia, 2017). In using this model, all areas of an organisation can be considered when detecting problems or issues related to employees' digital well-being. Furthermore, different levels of an organisation would require different types of interventions to address a specific digital job demand or digital job resource (Day & Nielsen, 2017). Thus, the IGLO model can help pinpoint and better clarify the focus and level an intervention and initiative should be to foster digital well-being.

Generally, healthy workplaces implement multilevel interventions that are balanced among individuals, groups, leaders, and the overall organisation to achieve a synergistic effect (Day & Nielsen, 2017). The following paragraphs provide further descriptions of the interventions or

initiatives that can be implemented in each organisational level to improve the digital well-being of employees.

- **Organisational Level**: This level of interventions mainly targets the way work is organised, designed and managed (Nielsen, 2013). Such interventions have implications of changing the organisation itself by addressing psychosocial factors in the workplace and other organisational elements (e.g., policies, workflows, workplace culture; Day & Nielsen, 2017). Organisational level interventions are recommended to employ participatory approaches in its implementation (Day & Nielsen, 2017). Such approach would ideally involve employees and managers from all levels of an organisation to define the actions and methods related to the implementation of the intervention (Nielsen et al., 2010). From collaboratively planning on how work processes will be changed to evaluating the effects of the intervention, the participatory approach can empower both employees and managers through self-direction and self-management. Additionally, organisational participatory interventions can promote supportive and respective work cultures as managers and employees collectively reflect on their digital well-being and gain insights regarding each other's specific situations and wider organisational issues (Day & Nielsen, 2017).
- **Leader Level**: This level of interventions considers the important role of leaders or managers in organisations and the influence of their behaviours (e.g., effectiveness, decision-making, organisational goal alignment) on the digital well-being of employees (Skakon et al., 2010). These interventions have two complementary aims, which are to foster the health and well-being of both leaders and their employees (Kelloway & Barling, 2010). These aims can be achieved directly by providing leaders with the resources or information to improve their own digital well-being, as well as their employees' digital well-being. Alternatively, these aims can be achieved indirectly by focusing the intervention or training on the improvement of the leadership styles or management skills of leaders. Through such initiatives, managers can become better leaders and supplementary resources for their subordinates' health and digital well-being (Day & Nielsen, 2017).
- **Group Level**: This level of interventions focuses on the social relationships of work groups, teams, or units. In lieu of how teams and groups function within an organisation, these interventions can involve the improvement of group-level processes and quality of workplace interactions and relationships (e.g., team cohesion, communication, collaboration, conflict resolution; Day & Nielsen, 2017). Furthermore, initiatives can be implemented to promote social resources that are especially relevant in social interactions with colleagues and leaders (Nielsen et al., 2018). For example, trainings can be encouraged to improve team members' interpersonal skills, and initiatives can be promoted to create workplace cultures of respect and dignity among people (Day & Nielsen, 2017).
- **Individual Level**: This level of interventions concerns the direct provision of resources to individual employees for the improvement of their digital well-being and productivity (Day & Nielsen, 2017). These interventions can directly target the employee's health and digital well-being. Or it can focus on the development of personal resources (e.g., characteristics, skills, knowledge, motivations), so employees can sufficiently deal with digital work

demands, as well as nonwork demands (Day & Nielsen, 2017). Some examples of these initiatives include job-related training (e.g., to increase employees' effective work performance), recovery activities, positive coping strategies, and individual resilience development.

In extension of the IGLO model, two more additional levels can be examined when identifying digital job demands and digital resources beyond the organisational level. These are detailed below.

- **Technological Level**: In reference to the results reported in Deliverable 1.1.1, the technological level considers the state (or absence) of an organisation's digital infrastructure. An organisation's reliance on DICT can affect their working conditions and work processes, including individual job requirements (Scholze & Hecker, 2023). In workplaces that have high dependence on DICT, employees' performance and digital well-being can be significantly impacted when technical issues arise.
- **Overarching Context**: The contextual level or the overarching context considers expansive environmental factors (e.g., national context, national culture; Nielsen et al., 2018) that is relevant to the digitalisation of organisations. For instance, the national context can influence the operation of organisational policies and practices related to digitalisation. Certain digital job resources and digital job demands can also be derived from the societal context, culture, and national legislations that are unique to a country (Rubino et al., 2020; Sirovátka et al., 2023). Thus, variations between country or overarching contexts need to be acknowledged when addressing employees' digital well-being from a transnational perspective.

In summary, the extended version of the IGLO model presents a multilevel framework of interventions that can be implemented to foster digital well-being in the workplace. This framework does not only aim for the absence of negative factors (i.e., digital job demands) but also for the presence of positive factors (i.e., digital job resources) in the workplace (Day & Nielsen, 2017). Table 1 provides examples of digital job demands and digital job resources previously identified by researchers that can be addressed using different levels of interventions.

Table 1. Examples of digital job demands and digital job resources that can be considered at each organisational and contextual level

Level of Intervention	Decrease Digital Job Demand	Increase Digital Job Resource
Technological (Raghavan et al., 2021; Scholze & Hecker, 2023)	Technology malfunctions can cause work interruptions	Existing technology infrastructure can facilitate telework adoption
Individual (Scholze & Hecker, 2023)	Continuous availability can increase employee pressure	Improved efficiency can enhance job performance and satisfaction
Group (Scholze & Hecker, 2023)	Communication can be perceived as cyberaggression or ineffective	Streamlined work can enhance collaboration

Leader (Mikołajczyk, 2024)	Overstimulation of employee notifications can reduce manager productivity	Ease of communication can improve employee management
Organisational (Scholze & Hecker, 2023)	Implementation of new technology can form an insecure work environment	More support can be provided to employees during the work process
Overarching context (Rubino et al., 2020; Sirovátka et al., 2023)	National legislations can deviate the regular working hours of remote work	Cultural values can influence an organisation's level of digitalisation

Healthy workplaces are built by multilevel interventions, and the collaboration between employees and managers is important for the continuous improvement process of promoting digital well-being within organisations (Day & Nielsen, 2017). Through collaborative discussions from each organisational level, sustainably healthy workplaces can be created where resources from different levels can augment the impact of other resources to enhance the digital well-being of individuals (Nielsen et al., 2018; Scholze & Hecker, 2024).

5. CONCLUSION

In summary, this report expounded on the significance of digitalisation in today's workplace with an emphasis on the three key pillars of digital transformation. Integrating the insights collected from project partners with reports from previous research, the relevance of digital maturity, readiness, age sensitivity, and cybersecurity and data sensitivity were highlighted as issues that organisations should account for in the digitalisation process, especially considering the nuanced contexts of sectors and countries. Considering digital maturity and digital transformation are complementary subjects, many reporting tools have been previously developed to assess the digital maturity of organisations. The Digi-B-Well project expands from the existing tools that measure digital maturity by considering the well-being experiences of individuals involved in the digitalisation process. Specifically, the methodology of the Digi-B-Well project intends to bridge the lack of attention towards well-being observed in previous digital transformation support projects. To achieve this, the methodology described in this report is based on two key points. Firstly, digital well-being is defined as a subjective experience of optimal balance between the benefits (i.e., digital job resources) and drawbacks (i.e., digital job demands) of digitalisation (e.g., adoption of new technologies and digital capabilities) in the workplace. Secondly, the assessment of digital well-being should be viewed from multiple levels, i.e., technological, individual, group, leader, organisational, and overarching (country) context.

Thus, the Digi-B-Well Project intends to promote a three-step methodology as follows:

- **Assessment** of the gap between demands and resources: starting from the definition of job demands and resources, the methodology intends to develop a toolkit that helps evaluate the level of digital well-being in public authorities, SMEs, and academia.
- **Awareness** of the level of digital well-being: subjectivity is a determinant of well-being. Through the promotion of a transnational strategy, the aim is to increase awareness about

digital well-being in work contexts, involving different levels: individual, team, leadership, organisational, and territorial.

- **Action** to improve the level of digital well-being: through the analysis and awareness of needs, it is possible to identify targeted action plans to promote digital well-being in different countries and with respect to the specific needs of the target population.

Lastly, there are many current and foreseen broader trends that can affect the digital transformation of organisations in the present and the future. These trends can be technological or societal in nature. Thus, it is important for organisations to also anticipate these trends when addressing digital well-being in the workplace.

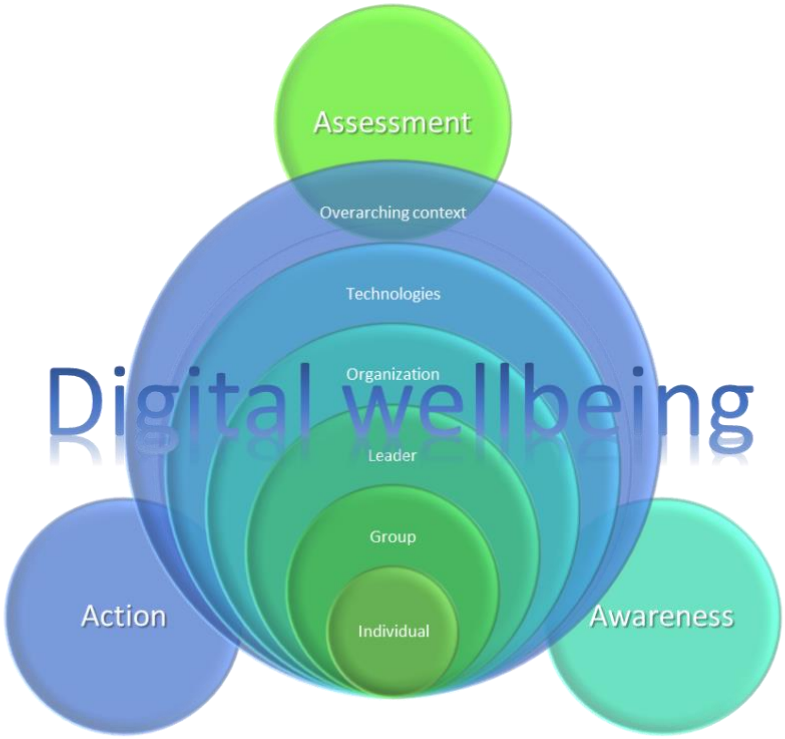

Figure 4. The 3A Digi-B-Well Methodology

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7. APPENDIX

7.1. Template Instructions

Introduction

The current template aims to facilitate the data collection for WP1 Deliverable 1.2.1 **'Digitalisation methodology for manufacturing SMEs, public authorities and academia'**. Specifically, we would like to gather knowledge from project partners regarding four topics that need to be considered during the digitalisation process and how it impacts the digital well-being of employees.

As a working definition, **digital well-being** refers to an individual's subjective experience of optimal balance between the benefits (i.e., digital job resources) and drawbacks (i.e., digital job demands) of digitalisation (e.g., adoption new technologies and digital capabilities) in the workplace.

This template focuses on collecting reference materials and definitions that can provide comprehensive descriptions about these four topics related to digitalisation and digital well-being:

- Digital Maturity
- Organisational and Individual Readiness
- Age Sensitivity
- Cybersecurity and Data Sensitivity

For each topic, you can find minor details that can serve as a guide to complete the task.

If you have any questions or clarifications about this template, please send an email to rita.chiesa@unibo.it and audreyansay.antonio@unibo.it

Thank you very much for your contributions in the Digi-B-Well project. We look forward to receiving your input.

Please, send the completed form to rita.chiesa@unibo.it and audreyansay.antonio@unibo.it by Wednesday 5th March 2025

Interreg CENTRAL EUROPE
Co-funded by the European Union
Digi-B-Well

The UNIBO Team

SOURCE MATERIALS ABOUT IMPORTANT TOPICS / CONSIDERATIONS RELATED TO DIGITALISATION AND DIGITAL WELL-BEING

Each topic has two sections that you need to complete.

In the first section, provide a definition or description of the topic, referring specifically to your organisational context or sector. You may also include personal reflections on how the topic impacts employees' digital well-being. Please ensure your response adheres to the specified word limit.

In the second section, list references or links to relevant sources that provide further information on the topic. These may include peer-reviewed scholarly articles, public reports from national or international organisations, or other expert materials. Where possible, prioritise sources that discuss digitalisation and its effects on employee well-being.
If the topic is outside the scope of your expertise, you can skip it and move forward to the next.

7.2. Project Partner: Chamber of Commerce and Industry of Slovenia

Organisational and Individual Digital Maturity

It can be related to the integration of digital processes into organisations or the digital capacities of an individual

Meaning / Definition (Max. 100 words):

Organizational and individual digital maturity refers to the capacity of organizations and individuals to effectively integrate and leverage digital technologies to enhance processes, decision-making, and overall performance. For organizations, this encompasses the adoption of digital tools, fostering a culture that supports digital innovation, and aligning digital initiatives with strategic objectives. For individuals, it involves possessing the necessary digital skills, adaptability, and mindset to utilize digital technologies proficiently in their roles.

Source materials list (1-5 references):

- **Digital Slovenia 2030:** Digital_Slovenia_2030.docx
- **State and Trends of Digital Transformation in Slovenia**: https://scispace.com/pdf/stanje-in-trendi-digitalne-preobrazbe-v-sloveniji-3o980etsfc.pdf
- **Slovenia on the Path to Digital Transformation:** https://zalozba.fri.uni-lj.si/bavec2019.pdf
- **A Multi-Criteria Model for Assessing the Digital Maturity of Small and Medium-Sized Enterprises**: (PDF) Večkriterijski model za ocenjevanje digitalne zrelosti malih in srednje velikih podjetij

II. Organisational and Individual Readiness

It can be related to the organisational- and individual-level of preparedness for change to manage resistance

Meaning / Definition (Max. 100 words):

Organizational readiness refers to the collective preparedness of an organization to implement change, encompassing factors such as leadership support, resource availability, and a culture conducive to change. Individual readiness pertains to employees' attitudes, beliefs, and intentions

regarding the adoption of change, influenced by their understanding of the change, perceived benefits, and personal adaptability.
Source materials list (1-5 references): • **Comparative Analysis of the Organisational Learning Process in Slovenia, Croatia, and Malaysia**: (PDF) Comparative analysis of the organisational learning process in Slovenia, Croatia, and Malaysia • **Organizational Readiness for Co-Creation of Public Services in the Central and Eastern European Administrative Tradition: Development of the Conceptual Multi-Attribute Decision Support Model**: (PDF) Organizational Readiness for Co-Creation of Public Services in the Central and Eastern European Administrative Tradition: Development of the Conceptual Multi-Attribute Decision Support Model • **Self-Organization in Slovenian Public Spending**: Self-organization in Slovenian public spending | Royal Society Open Science

III. Age Sensitivity

It can be related to the digital skills and access of different age groups

Meaning / Definition (Max. 100 words): Age sensitivity refers to the recognition and accommodation of the unique needs, preferences, and challenges associated with different age groups. In the context of digitalization, it involves understanding how various age demographics, particularly older adults, interact with and are affected by digital technologies. This encompasses acknowledging disparities in digital skills, access to technology, and the potential for digital exclusion among older populations. Addressing age sensitivity ensures that digital initiatives are inclusive, enabling all age groups to benefit from technological advancements without facing usability barriers or inequities.
Source materials list (1-5 references): • **Digital Inequalities and Older Adults in Slovenia: An Evaluation of the Measures Implemented Under the Digital Inclusion Promotion Act:** https://www.fdv.uni-lj.si/en/research/institute-of-social-science/research-projects/P7588?utm • **Digital Skills and Inclusion for Older Adults in Rural Slovenia:** Digital skills and inclusion for older adults in rural Slovenia | Shaping Europe's digital future • **Digital Inequalities Among Internet Users Before and During the COVID-19 Pandemic: A Comparison from Two Cross-Sectional Surveys in Slovenia**: (PDF) Digital inequalities among internet users before and during the COVID-19 pandemic: A comparison from two cross-sectional surveys in Slovenia

IV. Cybersecurity and Data Sensitivity

It can be related to perceived issues of privacy and integrity

Meaning / Definition (Max. 100 words): Cybersecurity refers to the practices and technologies designed to protect networks, devices, programs, and data from attack, damage, or unauthorized access. It encompasses measures to safeguard the confidentiality, integrity, and availability of information. Data sensitivity pertains to the classification of data based on its level of importance and the potential impact that its unauthorized disclosure, modification, or destruction could have on an organization or individual.

Recognizing data sensitivity is crucial for implementing appropriate security measures to protect information from threats.
Source materials list (1-5 references): • **Comprehension of Cyber Threats and Their Consequences in Slovenia:** https://www.researchgate.net/publication/295395527_Comprehension_of_cyber_threats_and_their_consequences_in_Slovenia • **Digital Data Encryption – Aspects of Criminal Law and Dilemmas in Slovenia:** https://www.researchgate.net/publication/287561717_Digital_data_encryption_-_aspects_of_criminal_law_and_dilemmas_in_Slovenia • **National Cybersecurity Organisation: Slovenia:** https://ccdcoe.org/library/publications/national-cybersecurity-organisation-slovenia/

7.3. Project Partner: City of Lučenec

I. Organisational and Individual Digital Maturity

It can be related to the integration of digital processes into organisations or the digital capacities of an individual

Meaning / Definition (Max. 100 words): Priority digitalization locally and nationally should bring: 1. Better services for the public, 2. Digital and data transformation, 3. Cyber and information security, 4. Efficient IT. All of these practices are intended to reduce the time to implement projects and actions, increase the value of deployed systems, and optimize the cost of operating systems. The City Municipality of Lučenec has its own budget. The systems are subject to state and EU legislation. Technological equipment and training for employees, despite the need to adapt to modern technologies due to the low budget, is usually not adequate. Staff are inexperienced with very new technologies.
Source materials list (1-5 references): **https://www.mirri.gov.sk/wp-content/uploads/2019/10/SDT-English-Version-FINAL.pdf**

II. Organisational and Individual Readiness

It can be related to the organisational- and individual-level of preparedness for change to manage resistance

Meaning / Definition (Max. 100 words): Organizational readiness is still at a minimal level. There are plans and proposals, but so far real activities have been implemented rather sporadically. The higher average age of staff may be an individual barrier to the rapid and effective implementation of change. EU funding opportunities can improve the concrete actions of municipalities. Established practices and rejection of new IT based on little experience and mistrust are some of the significant individual factors in implementing change.
Source materials list (1-5 references): **chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.mfsr.sk/files/sk/financie/institut-financnej-politiky/strategicke-materialy/narodny-program-reforiem/national-reform-programme-2024_eng.pdf** **chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://mirri.gov.sk/wp-content/uploads/2019/10/AP-DT-English-Version-FINAL.pdf**

III. Age Sensitivity

It can be related to the digital skills and access of different age groups

Meaning / Definition (Max. 100 words):
The Slovak Republic is ageing, and a large majority of employees are aged 50+. These factors, as well as the slow national roll-out of a functioning system interconnection, cause digital lag and digital stress for some employees. This also applies to our Municipality. Younger employees are already coming in with more advanced digital skills. Lack of technology skills, increasingly newer IT and minimal training cause stress in direct proportion to advancing age.
Source materials list (1-5 references): **chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.jois.eu/files/21_970_Stachova%20et%20al.pdf** **chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://mirri.gov.sk/wp-content/uploads/2024/03/National-Digital-Decade-Strategic-Roadmap-of-the-Slovak-Republic.pdf** **chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://fra.europa.eu/sites/default/files/fra_uploads/sk-ageing_in_digital_societies-country_report.pdf**

IV. Cybersecurity and Data Sensitivity

It can be related to perceived issues of privacy and integrity

Meaning / Definition (Max. 100 words):
Despite EU and Slovak legislation and the implementation of many measures, the fear of data leakage prevails. In particular, the hacking attacks that have recently rendered a Slovak state office (the Catastre) inoperable and the attacks on schools deepen mistrust. One important factor is the low technological maturity of the authority, which makes it vulnerable. The lack of IT knowledge among employees deepens the prejudice that imaginary data that is not on paper can easily get lost. They also lack the knowledge to skillfully set up protection for their devices.
Source materials list (1-5 references): **chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.nbu.gov.sk/data/att/1344.pdf**

7.4. Project Partner: Pannon Business Network Association

I. Organisational and Individual Digital Maturity

It can be related to the integration of digital processes into organisations or the digital capacities of an individual

Meaning / Definition (Max. 100 words):
Digital maturity is in my understanding is how well digital tools, processes, and strategies are embedded within an organization, influencing efficiency, innovation, and competitiveness. Digital maturity is a critical aspect for PBN, as the organization facilitates international projects that enhance SME development and regional resilience. This involves supporting the adoption of Industry 4.0 solutions, AI-driven decision-making, and digital transformation strategies among SMEs and policymakers. High digital maturity enables SMEs to increase efficiency, remain competitive, and reduce digital stress among employees.

On an individual level, PBN's colleagues must continuously develop digital competencies to implement innovative solutions effectively and transfer knowledge to stakeholders.
Source materials list (1-5 references): ***Example for supporting SMEs in digital technologies:*** Digi-Twin Green Project (PBN was partner) Digital twinning to business replication to support digital and green transition based on simulation model • Digital educational materials for SMEs – digital learning 'nuggets' • https://digitwingreen.eu/ ***McKinsey & PwC reports on Industry 4.0 and SME digitalisation***

II. Organisational and Individual Readiness

It can be related to the organisational- and individual-level of preparedness for change to manage resistance

Meaning / Definition (Max. 100 words): **In my understanding, digital readiness refers to the extent to which an organization or employee is prepared to adopt and effectively use new digital solutions to enhance their work and operate at a more advanced level.** PBN plays a crucial role in helping SMEs and policymakers overcome barriers to digital adoption through international projects. Many SMEs hesitate to invest in digitalisation due to concerns about costs, lack of expertise, and uncertainty about the benefits. PBN addresses this by facilitating knowledge transfer, coordinating pilot projects, and engaging decision-makers in strategy development. By doing so, the organization ensures that SMEs and public institutions can successfully integrate digital solutions and boost regional innovation. On the individual level PBN colleagues are mainly open towards digital preparedness due to the nature of the development focuses of the projects.
Source materials list (1-5 references): **Bringing Artificial Intelligence towards SMEs – PBN Project** **https://interreg-danube.eu/projects/brain**

III. Age Sensitivity

It can be related to the digital skills and access of different age groups

Meaning / Definition (Max. 100 words): **On my opinion different generations within SMEs and public institutions show varying levels of digital literacy, which impacts digital transformation success.** PBN's projects often observe that older employees struggle more with adapting to new digital tools, while younger generations are more agile in adopting emerging technologies. This gap can slow down innovation if not addressed through targeted training programs and intergenerational knowledge-sharing initiatives. PBN actively supports lifelong learning and mentoring systems to ensure that all employees, regardless of age, can benefit from digital transformation efforts and contribute to innovation. Besides this PBN has a dedicated unit for the assistance of elderly people in the use of new digital technologies, especially in healthy living.
Source materials list (1-5 references): Mrs. Ágnes Csiszárik-Kocsir: The Background Motives of Different Generations' Digital Presence.

This study takes a comparative approach to examine the digital presence and awareness of different generations based on a questionnaire survey conducted in Hungary. https://kgk.uni-obuda.hu/wp-content/uploads/2024/06/VF_TK_24_1_A-kulonbozo-generaciok-digitalis-jelenletenek.pdf

IV. Cybersecurity and Data Sensitivity

It can be related to perceived issues of privacy and integrity

Meaning / Definition (Max. 100 words): **For me cyber security is the method, measures of the protection of e.g. workplaces internal systems, the protection of data, which can be personal or organisational data as well.** Data sensitivity shows that some data requires more protection than others. As PBN manages international projects and supports SME digitalisation, cybersecurity and data sensitivity are fundamental concerns. Many SMEs lack structured data protection policies, making them vulnerable to cyber threats. Moreover, GDPR compliance is crucial in cross-border collaborations.
Source materials list (1-5 references): **N/A**

7.5. Project Partner: Primorje-Gorski Kotar County

It can be related to the integration of digital processes into organisations or the digital capacities of an individual

I. Organisational and Individual Digital Maturity

It can be related to the integration of digital processes into organisations or the digital capacities of an individual

Meaning / Definition (Max. 100 words): Public sector organizations in the Republic of Croatia face numerous challenges related to the quality of their services due to the traditional bureaucratic model of business organization. The most extensive measure of digital transformation in the public sector, which includes 198 world economies, and which also includes Croatia - The GovTech Maturity Index (GTMI), was launched by the World Bank Group (WBG). In 2020, Croatia was ranked among the top 20% of GovTech leaders. Primorje-Gorski Kotar County is a public sector organization (regional self-government unit). The digital maturity of the PGKC refers to the ability to successfully integrate modern digital technologies at the organizational level, which will consequently affect simpler and more efficient operations and management. Digital support for the employees of the organization is regulated through an external service provider, while a number of technological solutions such as WEB pages (internet), SharePoint (intranet), and Facebook have been implemented in daily operations. PGKC for certain services it offers to citizens enables the digital submission of Requests using the eForms software application, which can be accessed from the official PGKC website.
Source materials list (1-5 references): 1. Internal document: **PGKC, County office: "Instructions for working with digital media of PGKC"** 2. Internal document: **Instructions on electronic communication with parties and other persons participating in administrative proceedings before administrative bodies of the Primorje - Gorski Kotar County**

3. **GovTech Maturity Index, The World Bank (2021)**; (Available at: https://documents1.worldbank.org/curated/en/298661631773566870/pdf/GovTech-Maturity-Index-The-State-of-Public-Sector-Digital-Transformation.pdf)
4. **Digital Croatia Strategy for the period until 2032**; Republic of Croatia - Central State Office for the Development of the Digital Society (2022) (Available at: https://mpudt.gov.hr/UserDocsImages//RDD/SDURDD-dokumenti//Strategija_Digitalne_Hrvatske_final_v1_EN.pdf)

II. Organisational and Individual Readiness

It can be related to the organisational- and individual-level of preparedness for change to manage resistance

Meaning / Definition (Max. 100 words):

A study by the European Commission (Entering a new digital government era) states that the Republic of Croatia makes insufficient use of its ICT potential to provide public e-services and other public services. The study emphasizes that Croatia still needs to provide important preconditions for improving the overall system of public e-services. According to the same study, digital quality indicators services in Croatia, are subject to further improvement and development. In particular, this applies to quality indicators of digital services provided in Croatia, increasing the number of online services, providing digital services to a larger extent, as well as increasing the availability of information and services integrated with eIDs and eDocuments for users from other European countries.

When it comes to the readiness to implement new digital technologies and introduce changes into the area of new technologies, there is still an evident difference between the private and public sector. Likewise, it can be assumed that stakeholders, primarily citizens, today expect more accessible and transparent services from the public sector, including Primorje - Gorski Kotar County as a public sector organization, in a similar way to services they receive from the private sector.

Source materials list (1-5 references):

1. **Doctoral thesis: The relationship of technological, organizational and environmental factors with the adoption of e-participation in local self-governments;** (Available at: https://repozitorij.efst.unist.hr/islandora/object/efst:5348)
2. **European Commission - eGovernment benchmark 2021: Entering a new digital government era**; (Available at: https://op.europa.eu/en/publication-detail/-/publication/d30dcae1-436f-11ec-89db-01aa75ed71a1)
3. **Digital Croatia Strategy for the period until 2032**; Republic of Croatia - Central State Office for the Development of the Digital Society (2022); (Available at: https://mpudt.gov.hr/UserDocsImages//RDD/SDURDD-dokumenti//Strategija_Digitalne_Hrvatske_final_v1_EN.pdf)

III. Age Sensitivity

It can be related to the digital skills and access of different age groups

Meaning / Definition (Max. 100 words):

The resistance of older people to new technologies is a phenomenon that represents the first and one of the biggest challenges to the adoption of basic digital skills. The discomfort is mainly caused by the fear of making a mistake or even the fear of damaging the device by wrong handling. At

the PGKC level, all employees have access to a series of instructions through the intranet that simplify the performance of everyday actions and tasks related to digital knowledge and skills. Employees also have access to an external digital service provider, which, based on the individual's request and needs, directs and simplifies certain technological challenges.
Source materials list (1-5 references): 1. **Digital literacy of people of the third age**; (Available at: https://zir.nsk.hr/islandora/object/ffos%3A6985/datastream/PDF/view) 2. Internal document: **Instructions on how to save the form** 3. Internal document: **PGKC, County office: "Instructions for working with digital media of PGKC"** 4. Internal document: **Instructions on electronic communication with parties and other persons participating in administrative proceedings before administrative bodies of the Primorje - Gorski Kotar County** 5. Internal document: **Instructions for using the wireless network of the Primorje-Gorski Kotar County**

IV. Cybersecurity and Data Sensitivity

It can be related to perceived issues of privacy and integrity

Meaning / Definition (Max. 100 words): Cyber security includes the practice of protecting systems, networks and programs from digital attacks. The Government of the Republic of Croatia has set a strategic framework for cybersecurity through the National Cybersecurity Strategy and the Action Plan for its implementation. The aforementioned documents are the basis for the implementation of all activities aimed at protecting all users of modern electronic services, both in the public and economic sectors, and the citizens as a whole. The ultimate goal is a regulated, accessible, open and secure Croatian cyberspace through a coordinated and balanced response by a number of institutions representing all sectors of society. The use and protection of data to which PGKC employees have access during their work are regulated by a series of internal regulations and decisions, as well as legal norms. In order to protect all information stored in digital form, the PGKC has implemented an ISMS (Information Security Management System) based on the international standard for information security management systems, ISO 27001:2005. The organization also employs an Information Security Advisor who performs information security tasks, is a member of the Information Security Authorization Team, and is included in the e-crypt system for protected communication. The organization also has a personal data protection officer who takes care of the legality of personal data processing and the exercise of the right to personal data protection.
Source materials list (1-5 references): 1. Internal document: **Decision on the appointment of an officer for the protection of personal data** 2. Internal document: **Decision on the appointment of an information security advisor** 3. Internal document: **Decision on amending the Decision on the appointment of an officer for the protection of personal data** 4. Internal document: **Decision on the designation of the Information Officer in the PGKC** 5. Internal document: **Rules on the use and protection of computer records of the Primorsko-Goranska County**

6. **"Cyber security" - website of the Ministry of Justice, Public Administration and Digital Transformation** (Available at: https://mpudt.gov.hr/kiberneticka-sigurnost/28695)

7.6. Project Partner: Regional Development in Agency in Bielsko-Biała

I. Organisational and Individual Digital Maturity

It can be related to the integration of digital processes into organisations or the digital capacities of an individual

Meaning / Definition (Max. 100 words):

ORGANISATIONAL DIGITAL MATURITY

a) Aleksandra's own definitions based on the knowledge and literature:

Organisational Digital Maturity – the proven capacity to employ digital technologies to improve the processes in the organisation in an effective and sustainable way to support the achievement of its objectives.

The awareness and understanding of the benefits and risks of digital technologies while using them to improve the processes (in the organisation or by an individual) in an effective and sustainable way to support the achievement of organisational or individual (respectively) objectives based on the experience.

b) The state when the organisation increases its capacity thanks to implemented complex ICTs. (Piotr Adamczewski, see below)

INDIVIDUAL DIGITAL MATURITY

Individual digital maturity refers to a person's ability to effectively use digital tools and technologies to achieve personal and professional goals.

IMPO it should be accompanied by the awareness of the threats and risks related to the digital activities.

Source materials list (1-5 references):

a)

https://repozytorium.uni.lodz.pl/bitstream/handle/11089/34452/315-337-cieslinski.pdf

Dr hab. Wojciech Cieśliński, prof. AWF Wrocław; Digital maturity of an organisation; accessed 07 March 2025

b)

https://econjournals.sgh.waw.pl/SiP/article/download/861/763/

„Towards the digital maturity of smart organisations" by Piotr Adamczewski, WSB University, Institute of Management, Poznan, Poland. An articile in **"Studia i Prace Kolegium Zarządzania i Finansów SGH"** no. 161/2018

accessed 07 March 2025

https://www.academia.edu/56951638/Intelligent_Organizations_in_Digital_Age_Case_Study_of_SMEs_in_Poland by Piotr Adamczewski, WSB University, Institute of Management, Poznan, Poland; accessed 07 March 2025

https://digitalmaturity.org/definitions/

https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Technology-Media-Telecommunications/deloitte-digital-maturity-model.pdf

II. Organisational and Individual Readiness

It can be related to the organisational- and individual-level of preparedness for change to manage resistance

Meaning / Definition (Max. 100 words): The organisational capacity to introduce ICTs to the processes of the organisation to increase its efficiency in terms of the knowledge and human and organisational sources (e.g. skills and competencies of HR, processes and structure, analysed information flow, vision, strategy and/or action plan).
Source materials list (1-5 references): e.g. ILO, McKensey provide in nat. language AND translation of the abstract, rel. paragraphs https://european-digital-innovation-hubs.ec.europa.eu/news/digital-maturity-assessment-tool-vital-resource-digital-transformation https://blog.isa.org/readiness-and-maturity-walking-the-path-of-digital-transformation **all accessed 07th March 2025**

III. Age Sensitivity

It can be related to the digital skills and access of different age groups

Meaning / Definition (Max. 100 words):
Source materials list (1-5 references):

IV. Cybersecurity and Data Sensitivity

It can be related to perceived issues of privacy and integrity

Meaning / Definition (Max. 100 words):
Source materials list (1-5 references):

7.7. Project Partner: Technical University Ilmenau

I. Organisational and Individual Digital Maturity

It can be related to the integration of digital processes into organisations or the digital capacities of an individual

Meaning / Definition (Max. 100 words):

Digital maturity in the workplace refers to an organization's ability to effectively leverage digital technologies to adapt to changing environments and maintain competitiveness. It encompasses various dimensions, including the integration of digital tools, the alignment of digital strategies with business goals, and the development of a digital culture. Individual digital maturity encompasses the skills and attitudes necessary for individuals to thrive in a digital environment also learning growth.
Source materials list (1-5 references): Alrub, Y. A., & Sánchez-Cañizares, S. M. (2025). Dynamic Capabilities and Digital Transformation: Toward Strategic Planning in the Digital Age—Evidence from Palestine. *Administrative Sciences*, *15*(1), 21. https://doi.org/10.3390/admsci15010021 De Carolis, A., Sassanelli, C., Acerbi, F., Macchi, M., Terzi, S., & Taisch, M. (2025). The Digital REadiness Assessment MaturitY (DREAMY) framework to guide manufacturing companies towards a digitalisation roadmap. *International Journal of Production Research*, 1–27. https://doi.org/10.1080/00207543.2025.2455476 Kaszás, N., Ernszt, I., & Jakab, B. (2023). Pojava organizacijskih i ljudskih čimbenika u modelima digitalne zrelosti. *Management*, *28*(1), 123–135. https://doi.org/10.30924/mjcmi.28.1.8 Nerima, M., & Ralyté, J. (2021). Towards a digital maturity balance model for public organizations. In *Lecture notes in business information processing* (pp. 295–310). https://doi.org/10.1007/978-3-030-75018-3_20 Laaber, F., Florack, A., Koch, T., & Hubert, M. (2023). Digital maturity: Development and validation of the Digital Maturity Inventory (DIMI). *Computers in Human Behavior*, *143*, 107709. https://doi.org/10.1016/j.chb.2023.107709

II. Organisational and Individual Readiness

It can be related to the organisational- and individual-level of preparedness for change to manage resistance

Meaning / Definition (Max. 100 words): Organisational readiness for change is defined as the psychological and behavioural preparedness of organisational members to implement change. It encompasses two main facets: • **Change Commitment**: The shared resolve or determination among organisational members to implement the change. • **Change Efficacy**: The collective confidence in their capabilities to implement the change Individual readiness for change reflects an individual's preparedness to embrace organisational change. It is influenced by: • **Normative-Reeducative Change Strategies**: These strategies focus on changing norms and values through education and persuasion, which can increase individual readiness 3. • **Perceived Organisational Support**: Supportive environments and positive communication from management can enhance individual readiness 5 6.
Source materials list (1-5 references):

Weiner, B. J. (2020). A theory of organizational readiness for change. In *Edward Elgar Publishing eBooks*. https://doi.org/10.4337/9781788975995.00015

Choi, M., & Ruona, W. E. A. (2010). Individual readiness for organizational change and its implications for human resource and organization development. *Human Resource Development Review*, *10*(1), 46–73. https://doi.org/10.1177/1534484310384957

Mathur, M., Kapoor, T., & Swami, S. (2023). Readiness for organizational change: the effects of individual and organizational factors. *Journal of Advances in Management Research*, *20*(4), 730–757. https://doi.org/10.1108/jamr-02-2023-0032

III. Age Sensitivity

It can be related to the digital skills and access of different age groups

Meaning / Definition (Max. 100 words):

The relationship between age and digital skills/access is multifaceted, influenced by various socio-demographic factors and life experiences. Here are some key insights

Digital Divide

- **Persistent Gaps**: Despite improvements, digital divides persist, particularly among older adults and those with lower socioeconomic status. These divides are evident in access, usage, and the perceived importance of the internet

Digital Literacy and Inclusion Among Older Adults

The rising interest in the digital inclusion and well-being of older adults reflects a growing recognition of the importance of digital skills for this demographic. This theme examines the role of digital technologies in promoting active aging, social participation, and overall well-being among older adults.

Source materials list (1-5 references):

Yin, J., Zitkus, E., & Maguire, M. (2024). Towards an understanding of how computer skills relate to online safety across older adults. In *Communications in computer and information science* (pp. 324–334). https://doi.org/10.1007/978-3-031-61947-2_34

Park, Y. R., & Youm, Y. (2024). Digital literacy and health of older people in a Korean rural village. *Gerontechnology*, *23*(s), 1. https://doi.org/10.4017/gt.2024.23.s.1157.opp

Jena, B., & Paltasingh, T. (2024). Digital literacy among older adults: a systematic review in Indian context. *Educational Gerontology*, 1–16. https://doi.org/10.1080/03601277.2024.2397428

IV. Cybersecurity and Data Sensitivity

It can be related to perceived issues of privacy and integrity

Meaning / Definition (Max. 100 words):

Digital transformation (DT) involves the integration of digital technology into all areas of a business, fundamentally changing how organizations operate and deliver value to customers. However, this shift brings significant cybersecurity and data sensitivity challenges, particularly concerning privacy and integrity.

Increased Cybersecurity Risks:

○ The adoption of emerging technologies such as artificial intelligence, big data, blockchain, and cloud computing, while enhancing efficiency and productivity, also introduces new cybersecurity risks. These risks include data breaches, cyber-attacks, and unauthorized access to sensitive information. ○ Insecure devices and systems can lead to security breaches and malware attacks, endangering sensitive business information and intellectual property, which can result in revenue loss and damage to reputation
Source materials list (1-5 references): Taherdoost, H., Madanchian, M., & Ebrahimi, M. (2021). Advancement of cybersecurity and information security awareness to facilitate digital transformation. In *Advances in information security, privacy, and ethics book series* (pp. 99–117). https://doi.org/10.4018/978-1-7998-6975-7.ch006 Swain, A., Swain, K. P., Pattnaik, S. K., Samal, S. R., & Das, J. K. (2022). Cybersecurity in digital transformations. In *Lecture notes in networks and systems* (pp. 247–252). https://doi.org/10.1007/978-981-19-0825-5_26 Saeed, S., Altamimi, S. A., Alkayyal, N. A., Alshehri, E., & Alabbad, D. A. (2023). Digital Transformation and Cybersecurity Challenges for businesses Resilience: Issues and recommendations. *Sensors*, *23*(15), 6666. https://doi.org/10.3390/s23156666

7.8. Project Partner: University of Economics in Bratislava

I. Organisational and Individual Digital Maturity

It can be related to the integration of digital processes into organisations or the digital capacities of an individual

Meaning / Definition (Max. 100 words): We consider digital maturity (public/private organisation) as the extent to which an organisation has integrated digital technologies into its operations, working culture, and development strategies with the aim to enable it to effectively valorise such technologies for the improved performance, higher competitiveness and sustainability but also to influence the organisation's ability to deliver efficient and effective services to customers/ clients but also its employees.
Source materials list (1-5 references): Development of methods for assessing the digital maturity of business, Iryna Denchik: **https://www.researchgate.net/publication/385614830_Development_of_methods_for_assessing_the_digital_maturity_of_business** Business Digital Maturity and Organizational Performance: An Empirical Analysis of Service Sector Firms in a Developing Context, Gampine Ibrahim Tanko https://www.researchgate.net/publication/373650077_Business_Digital_Maturity_and_Organizational_Performance_An_Empirical_Analysis_of_Service_Sector_Firms_in_a_Developing_Context Digital Maturity Assessment Model for the Organizational and Process Dimensions, Agnieszka A. Tubis: https://www.mdpi.com/2071-1050/15/20/15122

Towards a Model for Assessing the Maturity of Organizations' Work on Universally Designed Digital Solutions, Halbach, Fuglerud, Simon-Liedke
https://www.researchgate.net/publication/385932885_Towards_a_Model_for_Assessing_the_Maturity_of_Organizations'_Work_on_Universally_Designed_Digital_Solutions

Technology of Digital Maturity Estimation for an Educational Organization. Part II, Shevtsova, Monastirskaya, Poletaikin, Danilova.
https://www.researchgate.net/publication/377346107_Technology_of_Digital_Maturity_Estimation_for_an_Educational_Organization_Part_II

II. Organisational and Individual Readiness

It can be related to the organisational- and individual-level of preparedness for change to manage resistance

Meaning / Definition (Max. 100 words):

Under organisational / individual digital maturity we understand the level of proficiency and readiness an organisation / individual has in effectively utilising digital technologies within the daily practise / professional environment. It encompasses several dimensions, including skill proficiency, adaptability to new technologies, critical thinking in evaluating digital information, collaboration in digital settings, and a commitment to continuous learning.
Resistance to any type change (incl. to digital transformation) is a natural response, often stemming from fear of the unknown or discomfort with the use of new technologies.

Source materials list (1-5 references):

Perceptions of Organizational Change Readiness for Sustainable Digital Transformation: Insights from Learning Management System Projects in Higher Education Institutions
Artan Veseli
https://www.mdpi.com/2071-1050/17/2/619

Principles of responsible digital implementation: Developing operational business resilience to reduce resistance to digital innovations
Zixuan Mia Cheng, Francesca Bonetti, Anouk de Regt, Joel Lo Ribeiro, Kirk Plangger
https://www.sciencedirect.com/science/article/pii/S0090261624000160

Employee Role Transformation and Adaptation in Digital Transformation: Barriers, Misalignments, and Solutions in Digital Tool Application
Huilian Xiao
https://www.ewadirect.com/journal/jaeps/article/view/17866/pdf

Technology-Induced Stress and Employee Resistance in the Context of Digital Transformation and Identification of Countermeasures
David Bausch, Tobias Kraemer, Oliver Mauroner
https://www.researchgate.net/publication/377374465_Technology-induced_Stress_and_Employee_Resistance_in_the_Context_of_Digital_Transformation_and_Identification_of_Countermeasures

Role of Readiness to Change in the Relationship Between Workforce Agility and Digital Transformation Kritika Sharma, Namrata Nigam, Jatinder Kumar Jha https://www.researchgate.net/publication/381021906_Role_of_Readiness_to_Change_in_the_Relationship_Between_Workforce_Agility_and_Digital_Transformation

III. Age Sensitivity

It can be related to the digital skills and access of different age groups

Meaning / Definition (Max. 100 words): The level of digital skills and access to up-to-date digital technologies vary across different age groups. Such skills might be considerably influenced by diverse factors such as socioeconomic status, educational background but also regional disparities, limiting the access to technologies (i.e., the gap between technological "centres/hubs" and remote areas). While younger generations are generally more digitally literate, older adults face significant challenges in accessing and utilizing digital technologies. Understanding these variations is crucial for addressing digital inequality and fostering inclusive digital environments, allowing equitable access to digital resources across all age groups.
Source materials list (1-5 references): Investigating Factors Associated with Digital Inclusion Among Older Adults in China: A Latent Profile Analysis Le Thi Ngan, Yuqian Sheng, Weichao Chen https://www.researchgate.net/publication/387557399_Investigating_Factors_Associated_with_Digital_Inclusion_Among_Older_Adults_in_China_A_Latent_Profile_Analysis Differential digital divides: Age gaps across existing and emerging technologies Edie Sanders, George Mois, Wendy Anne Rogers https://www.researchgate.net/publication/387645480_DIFFERENTIAL_DIGITAL_DIVIDES_AGE_GAPS_ACROSS_EXISTING_AND_EMERGING_TECHNOLOGIES Addressing the Digital Divide: Access and Use of Technology in Education Arfa Afzal, … https://ojs.jssr.org.pk/index.php/jssr/article/view/326 Involvement of Elderly People in the Processes of Modern Digital Transformations G A Barysheva, E I Klemasheva, O P Nedospasova https://www.researchgate.net/publication/360448406_Involvement_of_older_people_in_the_processes_of_modern_digital_transformations The Effect of Training on an Ageing Workforce's Attitude to Digital Transformation of a Communications Company Sunil Piyarlall, Willem Bester https://bit.fsv.cvut.cz/issues/01-24/full_01-24_03.pdf

IV. Cybersecurity and Data Sensitivity

It can be related to perceived issues of privacy and integrity

Meaning / Definition (Max. 100 words):
Digital transformation has a significant impact on cybersecurity and data sensitivity of both SMEs but also public institutions. During the process of adoption of digital technologies, they face increasing cyber threats, including ransomware, phishing, and data breaches, which can affect the trust of their customers but also their reputation. While the integration of advanced technologies presents opportunities for enhanced security, it also introduces complexities and challenges that organizations must address to ensure effective data protection in the digital age and enhance the knowledge and skills of their employees.
Source materials list (1-5 references): Cybersecurity challenges in the era of digital transformation Ritesh Verma https://www.researchgate.net/publication/377625512_CYBERSECURITY_CHALLENGES_IN_THE_ERA_OF_DIGITAL_TRANSFORMATION Enhancing Data Security and Data Sensitivity: Leveraging the Synergy of Blockchain Artificial Intelligence Vikas Jain https://www.researchgate.net/publication/379093381_Enhancing_Data_Security_and_Data_Sensitivity_Leveraging_the_Synergy_of_Blockchain_Artificial_Intelligence Cybersecurity Challenges in the Context of Digital Transformation Elena Angelova https://ideas.repec.org/a/nwe/iisabg/y2024i3p123-135.html Digital transformation and data protection C.Lakshmi Raja https://www.researchgate.net/publication/385663937_DIGITAL_TRANSFORMATION_AND_DATA_PROTECTION_UMA_MAHESWARI_S_Student_MBA-Sathyabama_Institute_of_Science_and_Technology_SABINA_DEVI_N_Student_MBA-Sathyabama_Institute_of_Science_and_Technology