

## Framework for addressing the challenges of digitalization in organizations

### Marco para afrontar los desafíos de la digitalización en las organizaciones

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#### Abstract

Many organizations are currently making efforts to achieve digital transformation, but a high percentage do not achieve the expected results. The aim of this article is to outline the actions that, according to existing literature, should be implemented in organizations to face the challenge of digitalization. A classification of barriers to digitalization is proposed and a conceptual framework that covers four categories, each of which comprises five phases. Each phase describes the actions that could be undertaken within organizations. The suggested actions are discretionary, which means that there is the freedom to choose among them depending on the nature and requirements of each organization. The contribution of this work consists in the integration of elements from various perspectives, models and frameworks into a logical and coherent structure to address the challenges of digitalization in organizations.

**Digitalization in organizations, Barriers to digitalization, Conceptual framework for digitalization**

#### Resumen

Muchas organizaciones realizan actualmente esfuerzos para lograr la transformación digital, pero un alto porcentaje no obtiene los resultados esperados. El objetivo de este artículo es delinear las acciones que, según la literatura existente, deben implementarse en las organizaciones para enfrentar el desafío de la digitalización. Se propone una clasificación de barreras a la digitalización y un marco conceptual que abarca cuatro categorías, cada una de las cuales comprende cinco fases. Cada fase describe las acciones que podrían emprenderse dentro de las organizaciones. Las acciones sugeridas son discrecionales, lo que significa que se tiene la libertad de elegir entre ellas en función de la naturaleza y los requisitos de cada organización. La contribución de este trabajo consiste en la integración de elementos de diversas perspectivas, modelos y marcos en una estructura lógica y coherente para abordar los retos de la digitalización en las organizaciones.

**Digitalización en las organizaciones, Barreras para la digitalización, Marco conceptual para la digitalización**

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## Introduction

Businesses are undergoing a digital transformation driven by mega trends, from the initial digitisation of physical information to today's end-to-end digitisation. The new wave of digitisation impacts all organisational aspects and business networks, requiring their reinvention to remain competitive. This involves the transition to digital platforms, data-driven improvement based on customer feedback and the establishment of diverse communication channels (Halpern and Valderrama, 2018). However, although companies invest in digital transformation initiatives, a high percentage of them do not achieve the expected results (Tabrizi et al., 2019). Recent studies suggest that the main problems of digitisation in organisations are related to four relevant categories:

- 1) Employee and customer resistance to change (Blyukov, 2021; Enders et al., 2020; Frick et al., 2021; Liakhovych, 2020; Minakov and Suglobov, 2021; Parviainen et al., 2017; Talwar et al., 2020; Wang, 2022).
- 2) Lack of digital skills and training affecting leadership, management, creativity and IT competence; and generating difficulties such as: service disruptions and staff burnout (Drydak, 2022; Hulla and Ramsauer, 2020; Lebedeva and Federation, 2019; Ollerenshaw et al., 2021; Parida et al., 2021; Sousa and Rocha, 2019).
- 3) Data protection, IT security, system integration and compatibility represent major risks in the digitisation of organisations (Agarwal et al., 2019; Bouncken et al., 2019; Cordoba et al., 2019; Draper and Raymond, 2020; Edu et al., 2021; Kannadhasan, et al., 2022; Khadam et al., 2019; Nieves et al., 2019; Pavlykivska et al., 2021; Shibl et al., 2021; Yang and Zhang, 2022).
- 4) Investment in technology, resources and human capital is a major challenge in business digitalisation (Almeida et al., 2020; Björkdahl, 2020; Camisón-Haba et al., 2022; Charochkina et al., 2021; Faruk et al., 2022; Grahn et al., 2021; Kvasha et al., 2021; Parida et al., 2019; Sergeev and Shirobokova, 2020).

This paper proposes a framework consisting of a classification of barriers and a phased framework that aims to help organisations overcome the various challenges they face during their digitisation process.

## Theoretical framework

According to studies by Caputo et al. (2021), Cybovskiy (2022), Lertpiromsuk and Ueasangkomsate (2022), Parida et al. (2021) Sotnyk et al. (2020), Moss et al. (2021) and Karimi and Walter (2015), theories on technological innovation, strategic management, digital transformation and digital business models, as well as interdisciplinary approaches combining economics, law and business theory, are the basis for research on solutions for business digitisation.

Meanwhile, studies by Bazan and Estevez (2021), Felli et al. (2022), Kocbek et al. (2019), Yulianto et al. (2021), Veitaitė and Lopata (2020), Snihur and Wiklund (2019) and, Argyropoulos et al. (2019), suggest that important models in researching solutions to business process challenges can be categorised into: process modelling (e.g., Industry 4.0, DDSA, CMMN, BPMN), infrastructure and alignment (e.g., remote resources, infrastructure alignment, EM) and, context-aware and knowledge-based approaches (e.g., unstructured processes, complex event processing, strategic management theory, knowledge-based information systems engineering).

Furthermore, other authors suggest that various frameworks, focusing on business model innovation, portfolio considerations and multilevel factors, can guide the overcoming of important problems in business digitisation (Bican and Brem, 2020; Bouncken et al., 2019; Broekhuizen et al., 2021; Linde et al., 2020; North et al., 2019; Olsson and Bosch, 2020; Parida, 2019; Parviainen et al., 2022; Trenerry et al., 2021; Verhoef et al., 2021; Volberda et al., 2021; Zimmermann et al., 2021), as shown in Table 1.

Autor	Proposal
Bican y Brem, 2020	A conceptual framework on digital readiness, digital technology and digital business models to address change in a sustainable way through digitisation.
Bouncken et al., 2019	A conceptual matrix for portfolio considerations of enterprise business model digitisation.
Broekhuizen et al., 2021	A multi-disciplinary and multi-stakeholder perspective to create collaborative solutions for digital transformation.
Linde et al., 2020	A three-phase framework to help companies assess digital business model opportunities and make informed decisions about business prospects.
North et al., 2019	A framework to help SMEs assess their level of digital maturity and the capabilities associated with each level to enhance digital growth.
Olsson y Bosch, 2020	A strategic decision framework to successfully navigate digital transformation by evolving existing ecosystems and creating new ecosystems around new technologies.
Parida, 2019	A framework that links digitalisation, business model innovation and sustainability in industrial environments.
Parviainen et al., 2022	A four-step Digital Transformation Model: positioning, definition of objectives, analysis of the current state and implementation of a roadmap to achieve the objectives.
Trenerry et al., 2021	A multi-level framework involving individual, group and organisational factors can help guide a successful digital transformation in organisations.
Verhoef et al., 2021	It proposes to create specific organisational structures and performance metrics to successfully overcome the challenges of business digitalisation.
Volberda et al., 2021	A framework for strategising in the new digital competitive landscape that emphasises the interplay between cognitive barriers, digital routines and organisational changes.

**Table 1** Frameworks and models that propose different tools to face the challenges of digitalisation in organisations

Source: Own elaboration with information from the authors

**Methodology**

To determine which tools organisations can use to address the challenges of digitalisation, a conceptual framework was constructed for this particular case based on Adom et al., 2018; Collins and Stockton, 2018; and, Sui and Chua, 2019; following five steps:

- 1) Identify the main problems (already defined in the introduction)

- 2) Identify the relevant models or frameworks to address those problems (already listed in the theoretical framework).
- 3) Identify the key concepts (Barriers)
- 4) Relate the solutions to the corresponding challenges.
- 5) Design a visual representation to form the conceptual framework.

**Results and discussion**

Based on a literature review of selected authors different barriers were identified for each category as shown in table 2.

Category 1 Barriers	Identified by
Lack of trust in management, fear of job loss and work-life balance.	Blyukov, 2021
Preference for routine, cognitive rigidity, emotional response and short-term focus of employees.	Enders et al., 2020 Frick et al., 2021
Lack of competence, interest, motivation, lack of understanding of change and uncertainty.	Liakhovych, 2020
Insufficient knowledge, fears of low ROI, lack of funding and infrastructure, and cybercrime.	Minakov y Suglobov, 2021
The socio-cultural challenge of new technology and the technical challenge of mastering it.	Parviainen et al., 2017
Functional (use, value, risk, characteristics, age) and psychological (tradition, image, education, religiosity).	Talwar et al., 2020
Behaviour protective of the effects of change, due to fear or misunderstanding of its benefits.	Wang, 2022
Category 2 Barriers	Identified by
Lack of awareness of digital services and outcomes and their benefits.	Drydakis, 2022
Lack of qualification and competence requirements for employees.	Hulla y Ramsauer, 2020
Lack of digital skills and competences, skills gap between recent graduates and those in demand.	Lebedeva y Federation, 2019
Insufficient understanding of digital technologies, lack of skills needed for digital adoption, lack of skills and knowledge to upgrade and implement technologies and identify their value.	Ollershaw et al., 2021
Lack of understanding of how digitalisation can create, deliver and capture value for the organisation.	Parida et al., 2021
Lack of innovation, leadership and management skills.	Sousa y Rocha, 2019
Category 3 barriers	Identified by
Attacks due to lack of security in systems and data leakage or modification by unauthorised parties in the network.	Agarwal et al., 2019
Lack of integration of digital technologies into organisational structures and senior management.	Bouncken et al., 2019
The need for systems to safeguard assets from IT security threats and for secure data storage and transmission.	Cordoba et al., 2019

Risks of employees sharing their access data, disabling security measures or mishandling classified information.	Draper y Raymond, 2020
Insufficient backup power, firewall protection and security audits.	Edu et al., 2021
Client-side Trojan programmes, as they can bypass or subvert the authentication and authorisation protocols used in a transaction.	Kannadhasan, et al., 2022
The challenges of secure and efficient management of large amounts of data.	Khadam et al., 2019
Weak data protection on platforms, lagging IT security developments, the challenges of cloud data storage, encryption methods and the impact of data protection regulation.	Nieves et al., 2019
The challenge of reconverting the organisation, collection, processing, storage and use of data and administrative and accounting policies to adapt them to digitisation.	Pavlykivska et al., 2021
Current use of incompatible data models and legacy systems; few resources for the development of global projects to handle continuous integration.	Shibl et al., 2021
Lack of effective data security protection leading to data leakage.	Yang y Zhang, 2022
<b>Category 4 barriers Identified by</b>	
Unmet demand for talent and lack of implementation of new ways of working; lack of flexibility of digital products and services, and; cybersecurity and privacy vulnerabilities for new products, services and ways of working.	Almeida et al., 2020
Imbalance between the pursuit of greater efficiency through digitisation and the pursuit of organisational growth, leading to misidentification of skills, assets and data.	Björkdahl, 2020
Inability to access or insufficient funding to standardise corporate information to comply with regulations, which affects the organisation's reputation and competitiveness.	Camisón-Haba et al., 2022
Delays in technological transformation due to digital disparities by size of organisations, low digital adoption, poor infrastructure, insufficient government support and inter-sectoral technology gap.	Charochkina et al., 2021
SMEs' difficulty in mobilising substantial resources, which limits their effective digitisation.	Faruk et al., 2022
Organisations find it difficult to use resources efficiently and effectively to cope with digitisation, and allocate limited resources to identify and assess value creation from digitisation.	Grahn et al., 2021
Limited innovative potential in organisations, scarcity of resources to innovate and difficulty in accumulating and applying innovative potential for digitisation.	Kvasha et al., 2021
Inequitable distribution of activities and functions, cost and revenue sharing models, procurement, value creation and value capture by and for digitisation.	Parida et al., 2019
Incompetence and low interest of many employees in digitalisation, the high investment risks required, the low level of technology and the predominance of medium-sized and low-skilled labour in company processes.	Sergeev y Shirobokova, 2020

**Table 2** Categorization and relationship between the challenges and the tools to face them proposed by the authors reviewed

Source: Authors' own elaboration with information from the authors

Table 3 below breaks down the elements that can be used to address the challenges related to resistance to change (which have been synthesised into more general barriers to facilitate the analysis), in accordance with the scope of the frameworks and models indicated by the authors in table 1.

Elements for tackling barriers	Author of the framework or model
<b>Barriers: Employment factors</b>	
Organisational solutions for change management	Bouncken et al., 2019
Categorise dimensions of digital transformation in the organisational framework.	Broekhuizen et al., 2021
Interpret market signals to anticipate required changes in the way of working and address sources of resistance early on.	North et al., 2019
Focus on the potential benefits and competitive advantages of new technologies when moving towards digitalisation.	Parida et al., 2019
Implement strategies and continuously monitor and adjust based on feedback.	Parviainen et al., 2022
<b>Barriers: Cognitive and Emotional Factors</b>	
Engage diverse disciplines.	Broekhuizen et al., 2021
Understand and address resistance factors by deploying resources and capabilities before implementing change.	North et al., 2019
Understand the benefits of digitalisation and communicate them to all stakeholders.	Parviainen et al., 2022
Reframe cognitive frameworks to help people imagine new models of digital work and business.	Volberda et al., 2021
<b>Barriers: Competitive factors and uncertainty</b>	
Enhance knowledge sharing.	Bican y Brem, 2020
Strategically build core capacities, essential to facilitate the transition to digitisation and seize opportunities.	Olsson y Bosch, 2020
Identify areas where resistance is greatest and understand the reasons behind it.	Parviainen et al., 2022
<b>Barriers: Economic and infrastructure factors</b>	
An integrative perspective can help to overcome barriers of this type.	Broekhuizen et al., 2021
Assessing Risks in the Business Model, Modelling Finance by analysing new scenarios and formalising control mechanisms.	Linde et al., 2020
<b>Barriers: Technological and socio-cultural challenges</b>	
Integrate digital technologies into business models and processes.	Bouncken et al., 2019
Incorporate the perspectives of various stakeholders	Broekhuizen et al., 2021
Develop training programmes, communication strategies and change management initiatives.	Parviainen et al., 2022
Develop new digital assets and capabilities to demonstrate the value of digitisation.	Verhoef et al., 2021

<b>Barriers: Functional and psychological factors</b>	
Adapt activities to business models	Bican y Brem, 2020
Adapt the digital business model to manage risks.	Linde et al., 2020
Barriers: Protective behaviour.	
Promoting sustainable digitalisation.	Bican y Brem, 2020
Assessing the Value of the Digital Opportunity Identifying perceived needs of employees and customers.	Linde et al., 2020
Fostering a culture of adaptability and innovation to mitigate resistance through a continuous and proactive approach to transformation.	North et al., 2019

**Table 3** Proposals for addressing the challenges of digitalisation in organisations  
 Source: Prepared by authors

Table 4 shows a breakdown of the elements that can be used to address the challenges related to the lack of digital skills and training (which have been synthesised into more general barriers to facilitate the analysis), in accordance with the scope of the frameworks and models indicated by the authors in table 1.

<b>Elements for tackling barriers</b>	<b>Author of the framework or model</b>
<b>Barrier: Lack of awareness of digitisation</b>	
Promote knowledge sharing	Bican y Brem, 2020
Promote collaboration across disciplines.	Broekhuizen et al., 2021
Assess the digital opportunity, its risks and Refine the Value Proposition to guide workforce readiness.	Linde et al., 2020
Recognise the importance of digital skills and make them a key part of the company's digitalisation strategy.	Parviainen et al., 2022
<b>Barrier: Lack of labour skills</b>	
Strategic implementation of digital technologies	Bouncken et al., 2019
An aligned organisational framework can guide training appropriately.	Broekhuizen et al., 2021
Plan training based on financial analysis and formalise training mechanisms.	Linde et al., 2020
Develop a conceptual framework to identify skills required for digitisation and develop a training programme.	Parida et al., 2021
Develop a training programme to improve the skills of the workforce.	Parviainen et al., 2022
<b>Barrier: Digital skills gap</b>	
Embrace continuous learning and adaptation.	Bouncken et al., 2019
Identify digital skills needs early by monitoring technology trends to align and implement training and development programmes.	North et al., 2019
Develop a conceptual framework to identify skills required for digitisation and develop a development programme.	Parida et al., 2021

Assess the current digital skills of the workforce and identify where training is needed.	Parviainen et al., 2022
Fostering Digital Agility can promote a culture of continuous learning and adaptation, addressing the skills gap.	Verhoef et al., 2021
<b>Barrier: Lack of understanding of digital technologies</b>	
Enhance knowledge sharing	Bican y Brem, 2020
Introduce employees to success stories from other organisations to highlight the importance of digital technologies and skills and their benefits for staff.	Parida et al., 2021
Integrate new digital technologies alongside training and education programmes with an emphasis on the benefits for employees and the business.	Olsson y Bosch, 2020
The creation of new routines can foster a culture of continuous learning and adaptation.	Volberda et al., 2021
<b>Barrier: Misunderstanding of the value of digitisation</b>	
Support individualised approaches to training, capacity building and role and function allocation to emphasise the benefits of digitisation..	Bican y Brem, 2020
<b>Barrier: Lack of leadership and innovation skills</b>	
Implement the training programme and continuously update it in line with the evolving digital landscape.	Parviainen et al., 2022
Train different organisational levels in: New business opportunities, Project management, Risk management, Efficiency and effectiveness, Networking, Talent management, Motivation and satisfaction, Communication, Career management, Multicultural employee leadership, Emerging technologies, Decision-making tools, Big data analysis, Organisational change, Strategic management, Social and relational knowledge, according to their roles and responsibilities.	Sousa y Rocha, 2019

**Table 4** Proposals to address the challenges of lack of digital skills and training in organisations  
 Source: Own elaboration based on authors

Table 5 below breaks down the elements with which the challenges related to data protection, IT security and systems integration and compatibility can be addressed (which have been synthesised into more general barriers to facilitate the analysis), in accordance with the scope of the frameworks and models indicated by the authors in table 1.

Elements for tackling barriers	Author of the framework or model
<b>Barrier: System security and data protection</b>	
Align activities with business models.	Bican y Brem, 2020
Integrate digital technologies into business models.	Bouncken et al., 2019
Multi-stakeholder perspectives, helping to identify data protection solutions.	Broekhuizen et al., 2021
Understand customer operations and value proposition orientation to assess system and data security implications.	Linde et al., 2020
Detect potential data protection, security and compliance issues in market signals to take action.	North et al., 2019
Develop a conceptual framework to guide secure practices in systems and data.	Parida et al., 2021
Identify the current state of data protection measures and systems integration.	Parviainen et al., 2022
<b>Barrier: Competence and behavioural management of employees</b>	
Promote sustainable digitalisation.	Bican y Brem, 2020
Identify risks, adapt business model operations and formalise mitigation and control mechanisms.	Linde et al., 2020
Prioritise the integration of robust data protection and IT security measures during organisational transformation.	North et al., 2019
Develop a conceptual framework for employees to understand the importance and place of the competencies and behaviours required for digitisation.	Parida et al., 2021
<b>Barrier: Understanding and integrating digitisation</b>	
Integrating digital technologies into business models	Bouncken et al., 2019
Engage non-business stakeholders, such as consumers and society.	Broekhuizen et al., 2021
Introduce employees to success stories from other organisations to help them understand the benefits of digitalisation and how it should be integrated into the business.	Parida et al., 2021
Understand the importance of data protection and systems integration in the digitalisation process.	Parviainen et al., 2022
The implementation of new Organisational Forms can ensure effective coordination and management of digital operations.	Volberda et al., 2021
<b>Barrier: Incompatibility of systems and resources</b>	
Aligning activities with business models	Bican y Brem, 2020
Integrating digital technologies into business models	Bouncken et al., 2019
An aligned integration perspective and organisational framework considers security and compatibility as integral components.	Broekhuizen et al., 2021

Evolve systems together with the internal and external ecosystem to progressively resolve incompatibilities.	Olsson y Bosch, 2020
Develop a conceptual framework to guide a smooth integration and transition of systems and resources.	Parida et al., 2021
Big Data analytics capabilities can help manage and protect data while ensuring compatibility and integration of systems.	Verhoef et al., 2021
<b>Barrier: Infrastructure requirements</b>	
An aligned integrative perspective and organisational framework considers security and compatibility as integral components.	Broekhuizen et al., 2021
Model the finances of the digital operation based on sensitivity analysis and scenarios to implement infrastructure and guide the required contractual operations.	Linde et al., 2020
Develop a plan to enhance data protection measures and improve systems integration.	Parviainen et al., 2022
<b>Barrier: Regulatory compliance</b>	
Perspectives from various stakeholders, help identify relevant regulatory requirements.	Broekhuizen et al., 2021
Identify success stories to guide compliance, create a conceptual framework for your own case and identify obstacles to address them comprehensively.	Parida et al., 2021
Implement the plan and continuously monitor and adjust based on changes in legislation and regulations.	Verhoef et al., 2021

**Table 5** Proposals to address the challenges of data protection, IT security and systems integration and compatibility in organisations

Source: Own elaboration based on authors

Finally, table 6 breaks down the elements that can be used to address the challenges related to investment in technology, resources and human capital (which have been synthesised into more general barriers to facilitate the analysis), in accordance with the scope of the frameworks and models indicated by the authors in table 1.

Elements to address barriers	Author of the frame or model
<b>Barrier: Lack of investment in new ways of working.</b>	
Align activities with business models	Bican y Brem, 2020
Focus on value creation and proposition, organisational solutions for change management.	Bouncken et al., 2019
Strategically transform ways of working to capture opportunities and gain competitiveness.	North et al., 2019

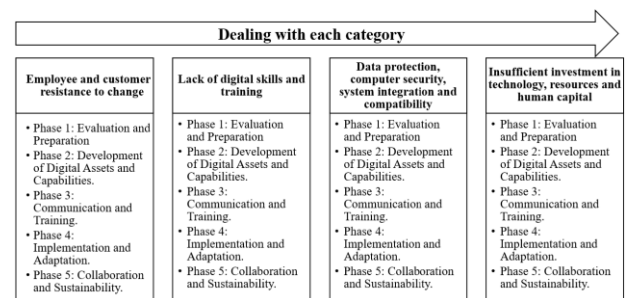
Recognise the need for investment in new ways of working, identify the gaps between the current state and the required state, plan a roadmap and implement it.	Parviainen et al., 2022
Investment can be guided by the need to rethink Cognitive Frameworks, build new Routines and implement new Organisational Forms for digitalisation.	Volberda et al., 2021
<b>Barrier: Lack of investment in security of digital products and services</b>	
Supporting individualised approaches	Bican y Brem, 2020
An integrative perspective supports strategic investment by considering the wider impact on business models.	Broekhuizen et al., 2021
Recognise the need for investment in digital product and service security, identify gaps between current state and required state, plan a roadmap and implement it.	Parviainen et al., 2022
<b>Barrier: Lack of investment in digital infrastructure</b>	
Strategic implementation of digital technologies	Bouncken et al., 2019
Strategically move from mechanical, electrical and electronic to the use of software, data and AI for improved process efficiency and development of new products and services.	Olsson y Bosch, 2020
Recognise the need for investment in digital infrastructure, identify the gaps between the current state and the required state, plan a roadmap and implement it.	Parviainen et al., 2022
<b>Barrier: Lack of investment in resources for digitalisation</b>	
Applying digital to sustainable practices	Bican y Brem, 2020
Involving various stakeholders ensures that investment decisions consider the interests of different parties.	Broekhuizen et al., 2021
Identify early strategic investment areas in technology trends to align resources with emerging opportunities.	North et al., 2019
Recognise the need for investment in digitisation, identify gaps between the current state and what is required, plan a roadmap and implement it.	Parviainen et al., 2022
Investment can be guided by the need to develop Digital Networking Capacity, enabling collaboration and sharing of resources in the digital ecosystem.	Verhoef et al., 2021
<b>Barrier: Lack of investment in human capital for digitisation</b>	
Align activities with business models	Bican y Brem, 2020
Assess the training needs required by the digital opportunity and the new business model and refine their implementation.	Linde et al., 2020
Develop early human capital to capture value in digital growth opportunities.	North et al., 2019
Recognise the need for investment in human capital, identify gaps between current and required state, plan a roadmap and implement it.	Parviainen et al., 2022

<b>Barrier: Lack of investment in technology for business processes</b>	
Align activities with business models, Apply digital to sustainable practices.	Bican y Brem, 2020
Organisational solutions for change management	Bouncken et al., 2019
The organisational framework provides a structured way to plan investments by categorising dimensions such as digital transformation.	Broekhuizen et al., 2021
Assess risks on required investments in technology, resources and human capital, modelling finances based on analysis, scenarios and impact of investments.	Linde et al., 2020
Recognise the need for technology investment in processes, identify gaps between the current state and the required state, plan a roadmap and implement it.	Parviainen et al., 2022

**Table 6** Proposals to address the challenges of investment in technology, resources and human capital in organisations

Source: Own elaboration based on authors

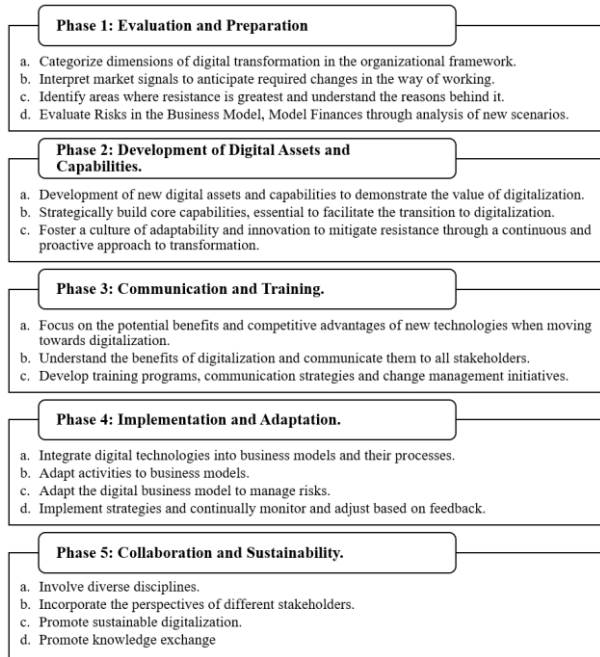
Based on the analysis of elements to address the barriers to digitalisation in each category, the model shown in figure 1 was developed, which involves the different elements proposed by the authors of the frameworks and models reviewed. These elements have been related, synthesised and included in a five-phase process to address the challenges of digitisation in organisations for each category, which constitute tools for this purpose.



**Figure 1** Model for addressing the challenges of digitalisation for each category

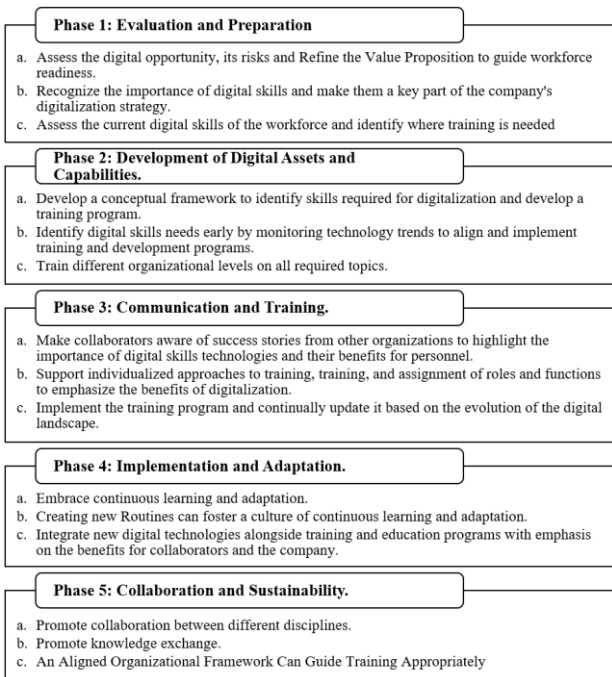
Source: Prepared by the company

Figure 2 shows the activities to be carried out in each phase to address the challenges of category 1: Resistance of employees and customers to change..



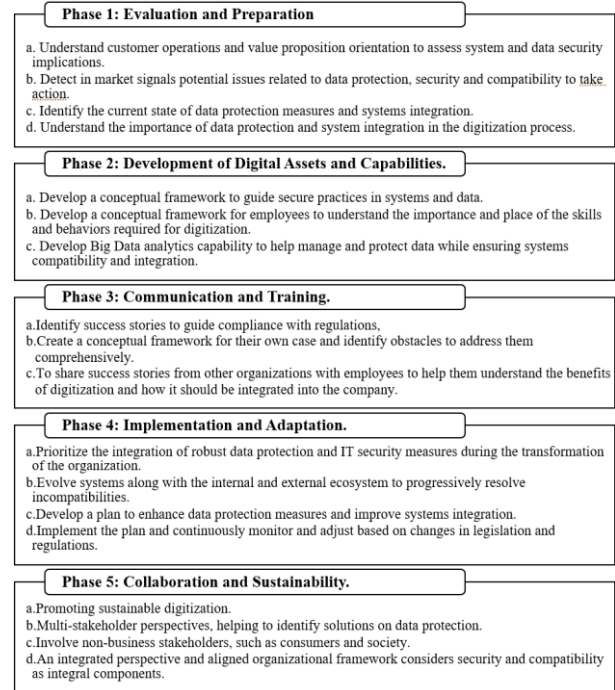
**Figure 2** Activities for each phase to address the challenges of category 1: Resistance of employees and customers to change  
*Source: Own elaboration*

Figure 3 shows the activities to be carried out in each phase to address the challenges of category 2: Lack of digital skills and training in organisations.



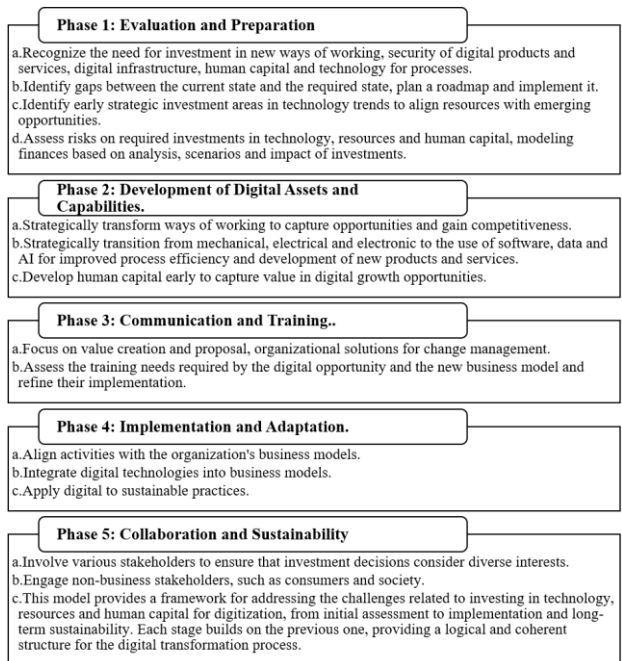
**Figure 3** Actividades por cada fase para afrontar los desafíos de la Category 2: Lack of digital skills and training in organisations  
*Source: Own elaboration*

Figure 4 shows the activities to be carried out in each phase to address the challenges of category 3: Data protection, IT security, system integration and compatibility.



**Figure 4** Activities for each phase to address the challenges of category 2: Lack of digital skills and training in organisations  
*Source: Prepared by the authors*

Figure 5 shows the activities to be carried out in each phase to address the challenges of category 4: Challenges related to investment in technology, resources and human capital.



**Figure 5** Activities for each phase to address the challenges of category 4: Challenges related to investment in technology, resources and human capital in organisations  
*Source: Own elaboration*



As a result, an integrated model is presented that discerns and classifies various barriers to digitisation within organisations into four distinct categories. Also, a five-phase framework, based on the various perspectives, models and frameworks suggested by the chosen authors, is proposed to address the challenges faced by organisations in the digitisation process for each category, these are the tools that organisations can use to address their challenges to digitisation. This framework aims to provide a rational and coherent structure for addressing the challenges within each category, thus helping organisations to streamline their own process. In addition, organisations can prioritise the relevant category of challenges on a case-by-case basis and build on the progress they have already made, making it easier for them to implement their efforts to remove barriers to digitisation based on the tools proposed.

## Conclusions

Different studies have identified a large number of barriers, challenges and problems that are found around the digitisation processes of organisations, and all this variety needs to be synthesised and classified for the attention of different stakeholders in the field. This paper integrates a model that identifies and classifies the different challenges posed by digitisation in organisations into four categories.

This model is complemented by a framework composed of five phases for each category and is based on the different proposals of the selected authors, thus providing a logical and coherent structure to address the different challenges in each of these categories.

The proposed framework is flexible and allows to choose the most relevant category of challenges for each organisation and to build on the progress they have already made to facilitate the implementation of their process of removing barriers to digitisation.

As future work, an empirical study involving different types of organisations at different stages of progress towards digitisation is proposed in order to validate the relevance and usefulness of the proposed framework, receive feedback and make any necessary corrections to make it a useful and easily applicable tool to facilitate the digitisation of organisations.

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