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Article

Managing Organisational Performance in the Digital Age: A Case Study of a Construction Company

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Summary: Organisational performance is a major concern for any company wishing to remain competitive in today's market. This is why many companies have begun to integrate digital technologies into their management systems. The aim of this article is to determine the contribution of digitisation to organisational performance management, through observations and analysis of a single case study of a company that has adopted a digital transformation project. It emerged that digital transformation makes a significant contribution to organisational performance management. However, this transformation requires significant support and adaptation of skills and organisational structures.

Abstract: Organisational performance is a major concern for any company hoping to remain competitive in today's market, which, in turn, is the reason why many companies started to integrate digital technologies into their management systems. The purpose of this article is to determine the contribution of digitization to organizational performance management. This analysis will be done through observations and analysis of a unique case of a company that has adopted a digital transformation project. After the analysis, it was found that the digital transformation contributes to the management of organizational performance. However, this transformation requires significant support and adaptation of skills and organizational structures.

Keywords: digital transformation; organisational performance; management control; adaptation; data

Introduction

Francis Blanche said many years ago: "In a changing world, it's better to think about change than to change the bandage". Today, it resonates even more strongly with the advent of the digital revolution and the remarkable advances in artificial intelligence. Digital transformation has become an unavoidable element in all areas of society, and particularly in the business world. For all the world's major companies, it has become clear that the key to success lies in digital transformation.

However, the integration of digital tools within the company can be beneficial and a source of performance, just as much as it can be a factor in slowing things down. It is clear that simply installing digital tools is not enough to improve organisational performance; a more profound organisational transformation is required. Indeed, the adoption of this new process can lead to a renewal not only of working methods but also of organisational culture. This is referred to as combining business strategies with information systems, with organisations that integrate their business strategies with their information systems performing better than those that do not (Chan & Reich, 2007).

Adopting a digital transformation project therefore requires us to examine its impact on organisational performance management. Our research question is: "How can digital transformation contribute to organisational performance management? To answer this question, we conducted an exploratory study within a large organisation that had adopted a digital transformation project.

To achieve this objective, we will begin with a literature review of the conceptual and theoretical framework of the key concepts of our research. We will then describe the methodology of the

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empirical study. Finally, we will discuss the results obtained and conclude by addressing the limitations and prospects of this study.

Literature Review

"In the state of the art, we find a variety of definitions concerning the concept of digital transformation as well as that of performance, which constitute the two pillars of our research. However, it is crucial to point out that, until now, researchers have not been able to establish a unified definition, due to the complexity and multidimensionality inherent in these two concepts."

The Concept of Performance

The concept of performance is essential in the evaluation of companies and organisations. Indeed, understanding performance requires us to consider the specific context in which it is used, which may vary according to organisational culture, strategic objectives and stakeholder expectations. Performance, by its complex nature, integrates various dimensions such as human, financial, strategic, innovative and internal process aspects, among others (Ali et al., 2015).

Table 1. Summary of some definitions of performance.

Defining performance	Indicators used	Authors
Performance is reflected in the organisation's ability to produce and control costs (the industrial era).	Financial indicators such as profitabilitý, profitabilitý, return on tangible assets. Etc	(Jacques brasseul, 1997)
Performance is a multidimensional construct that cannot be assessed on the basis of financial indicators alone.	Financial and non-financial indicators	(Iltner et al.1998)
Performance is reflected in the achievement of objectives and the pursuit of efficiency in carrying out activities.	Financial and non-financial indicators	(Franck et al.2010)
Performance is reflected in the achievement of a minimum or acceptable result or the reduction of undesirable elements.	Financial and non-financial indicators	(Ndao, 2011)

Source: (Ndao, 2011).

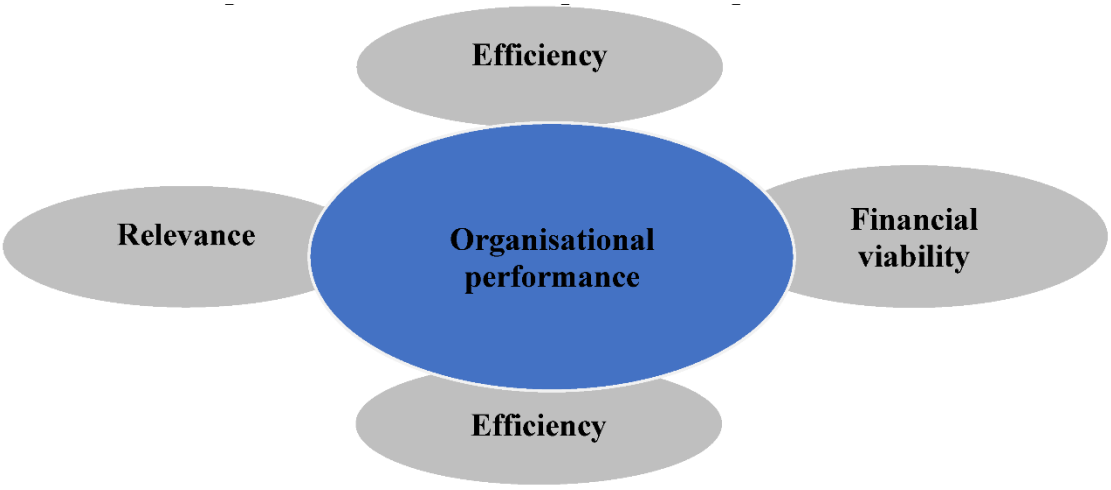
Organisational performance, the subject of our study, relates to the effectiveness of the organisational structure, i.e. the way in which the company is organised to achieve its objectives and the way in which it succeeds in achieving them. It incorporates various indicators such as product and service quality, employee motivation, work climate, productivity and customer satisfaction, among others (Salgado, 2013). Organisational performance focuses on the effectiveness of the organisational structure itself, rather than on its social or economic consequences. Factors for assessing this effectiveness include compliance with the formal structure, the relationships between the organisation's components, the quality of the flow of information, the flexibility of the structure and the power of the leader (Bocco, 2010).

To further clarify the concept of organisational performance, we will examine its main components, as identified in the literature:

- Organisational effectiveness: this is measured by an organisation's ability to fulfil its mission and achieve its objectives (Lusthaus et al., 1998). Audigier (2008) specifies that this corresponds to the extent to which an organisation can achieve its goals.
- Organisational efficiency: this reflects an organisation's ability to deliver outstanding services while maintaining an appropriate cost structure (Lusthaus et al., 1998).
- Organisational relevance: defined as an organisation's ability to meet the needs of its priority stakeholders and secure their support, now and in the future (Audigier, 2008).

 doi:10.20944/preprints202405.1671.v1

- The organisation's financial viability: this requires the inflow of financial resources to exceed expenditure, thereby ensuring the organisation's survival through a diversity of funding sources and positive cash flow (Lusthaus et al., 1998).



Source: DJIMTA.F et all (2022) adapted from Gibert (1980)

Figure 1. Dimensions of organisational performance.

The Concept of Digital Transformation

A review of the literature on the current state of digital transformation revealed the definitions proposed in the following table:

Table 2. Summary of some definitions of digitisation.

Authors	Definitions
Florance,Cristoph and Zicari(2018)	A digital company is one that uses innovative digital tools such as Big Data, artificial intelligence, dematerialised IT systems, social networks and the Internet of Things on a daily basis.
J.Westerman, Bonnet, and McAfee, (2014)	The use of technology to improve business performance and impact has become a major concern for companies around the world. Leaders across different sectors are exploring advances in digital technology, such as data analytics, mobility, social media and embedded smart devices, to optimise the use of traditional technologies, including ERP systems. This transformation aims to redefine customer relationships, internal processes and value propositions.
Stolterman & Fors (2004)	Digital transformation is the change caused or affected by digital Fors, 2004) technology in all aspects of human life.
J.-M. Plane et al (2012)	Digitisation refers to the process of converting a physical object (paper, film, etc.) into a digital format using technology, while digitalisation is a broader process in which digitisation is one of the stages.

Source : Made by ourselves.

Despite the multitude of definitions, there is currently no universally accepted definition of digital transformation and digitalisation, terms that are often used interchangeably (Bloching,

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Leutiger, Oltmanns, & Rossbach, 2015). Researchers emphasise a reciprocity between digitalisation and digital transformation, arguing that a profound organisational transformation is essential to integrate advanced digital technologies such as artificial intelligence, Big Data and blockchain. This transformation, driven, built or enabled by digital technology, changes the way companies conduct business, indicating that successful companies in the digital age are those that are both digital and digitalised (Bilgeri, Wortmann, & Elga, 2017; Hartl & Hess, 2017; Heilig, Schwarze, & Voß, 2017; Mueller & Renken, 2017; Ross, Beath, & Sebastian, 2017). Digital transformation affects the organisational structure and internal functions, among which management control is essential for steering organisational performance.

The Role of Control in Digital Transformation

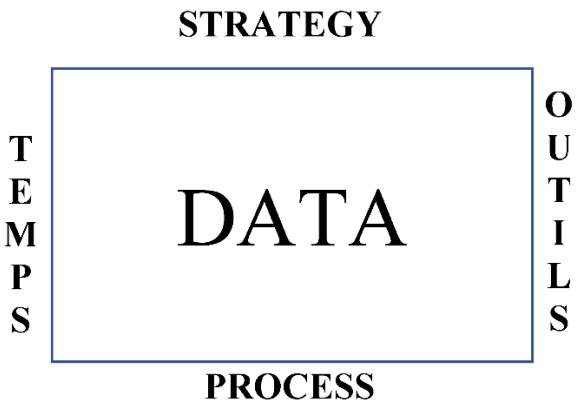
Numerous researchers have demonstrated that the implementation and development of management control systems contribute significantly to improving the performance of organisations. As a result, our understanding of organisational performance has grown considerably since the early days of management control.

Table 3. Summary of some management control definitions.

Authors	Definitions
Anthony (1965)	Management control is the process by which managers obtain assurance that resources are obtained and used effectively and efficiently to achieve the organisation's objectives.
Anthony (1988)	Management control is the process by which managers influence other members of the organisation to implement the organisation's strategies.
H. Bouquin (1994)	Management control refers to the systems and processes that ensure consistency between strategy and practical, day-to-day actions.

Source : Made by ourselves.

Management control, conceived as a steering system, aims to analyse, monitor and evaluate performance indicators (KPIs) in order to optimise a company's overall performance, covering financial, organisational, social and environmental aspects. Since its inception at the beginning of the 20th century by major American companies such as General Motors, the field has evolved, adapting to technological, organisational and strategic advances. It has gone through four eras, from traditional management focused on cost reduction to 4.0 management, which focuses on anticipating the future through automation and Machine Learning. In the digital age, management control is characterised by a 'magic square' centred on data, with strategic, tool, process and time axes.



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Source: R.Appercel (2020), "Formation et pratique pro: contrôle de gestion", ELLIPSES

Figure 2. The magic square of digital management control.

As a Business Partner, the digital management controller assists senior management in the development of strategy. For this reason, they change their time horizon, from the short to the long term, by adopting forward-looking thinking. In this process, they use a range of tools such as business intelligence, Big Data and artificial intelligence. Equipped with these new tools, the digital management controller supports the company in setting up efficient and agile processes. To achieve all this, they use massive amounts of data on a daily basis.

Research Methodology

To answer our research question "How can digital transformation contribute to the management of organisational performance", we adopted a qualitative methodology based on a single case study. The case studies therefore enable an in-depth analysis of specific organisations or events that explicitly address the theory. According to Hartley (2004), case studies are also suitable for research questions requiring a detailed understanding of organisational processes because of the richness of the data collected in their context. According to Yin (2009), the use of several sources of data represents an advantage in the development of convergent fields of investigation, a process of triangulation and corroboration. To this end, in our case study we have tried to exploit data from different sources within the company, such as semi-structured interviews, document analysis and site visits, in order to observe what is really happening in the various departments that have adopted a digital transformation project.

Presentation of the Company Under Review

For reasons of confidentiality, we call the company we are studying "BTPMAROC". The choice of "BTPMAROC" is based on two criteria: Firstly, it is a large company with a massive amount of data, known as BIG DATA. Secondly, a company that has adopted a digital transformation project. "BTPMAROC" specialises in building construction, building works and civil engineering, as well as property development and planning. The company has a strong reputation both nationally and internationally thanks to its employees, who are responsible and committed to ensuring decent housing for all social strata in the Kingdom. In order to respect the confidentiality of the company, we will present a brief overview of its hierarchical structure. The company has a highly hierarchical structure, divided into several levels, which allows a clear division of responsibilities within the company to ensure an efficient and coherent organisation to achieve the company's strategic objectives. At the top is general management, which is responsible for the company's overall strategy. Management control reports directly to senior management in order to contribute to the definition and deployment of the company's strategy and to be able to monitor the company's performance at different levels, in particular organisational performance, which is the subject of our study. Below general management are the various divisions and departments. Each division is headed by a director, who is assisted by managers and department heads whose role is to supervise the operational teams and ensure that the strategic objectives are properly implemented.

Data Collection

To explore the diversity of human experience in depth, we chose to conduct semi-structured interviews. To do this, we drew up a well-structured interview guide and sent invitations to the people concerned so that they could take part. We gathered information from specialists with diverse professional backgrounds, ranging from management control to IT engineering. The age of our interviewees varied, as did their level of experience, bringing a wealth of perspectives to our study. Their varied points of view and different experiences contribute to the richness of the data collected and help to shed light on various aspects of digital transformation. To deepen the results of our study we used information from the analysis of internal documents such as process mapping and some

 doi:10.20944/preprints202405.1671.v1

reports from the management committee and the digital strategy board. We also used the content of BTPMAROC's website as an external document, as the Internet is often seen as a preferred means of communication for reasons of accessibility and transparency. This approach will enable us to obtain comprehensive and nuanced perspectives on the influence of digital transformation on a company's organisational performance, particularly in the construction and public works sector.

Data Analysis

For the analysis of our data, after examining various software packages suitable for processing qualitative textual data, we opted for IRAMUTEQ, an open-source software package developed in 2008. This choice was justified by its ability to analyse texts and questionnaires efficiently (Arnoult, 2015). Data must be imported into the software in plain text (.txt) format, in accordance with the structure required by IRAMUTEQ. The results of the analysis are saved in the original folder under the name "Name Of Corpus". The term "Corpus" refers to the entire text submitted for analysis, including all the interviews or articles to be analysed, and "X" represents the specific type or analysis tool used (Loubère & Ratinaud, 2014). The content analysis of our interviews took place in four main stages, illustrated in the following figure.

Stage 1: Transcription of interviews

We opted for a word-for-word transcription, which involved faithfully transcribing the interviews by recording every word spoken by the interviewees.

Step 2: Data cleansing

This is an important stage, which consists of deleting all the information deemed irrelevant and identifying the information that absolutely must be corrected to make it significant for the results of our study (spelling mistakes, punctuation errors or changes to the vocabulary so that it is interpreted by the software in the way desired and expected by the research carried out).

Step 3: Data coding

We used two types of coding: open coding and axial coding.

In open coding, we carefully read the transcripts of all the interviews and gradually identified the elements to be grouped under a "code". In axial coding, we then made a general comparison of all the codes in order to classify them according to common themes or axes.

Step 4: Preparing the script

Directly after coding the data, we had to prepare the document for import into the software. Indeed, this requires the text to be represented by four stars (****), followed by a series of variables with asterisks (*VAR1, *VAR2...), oriented towards the axial coding elements, which are in turn preceded by a hyphen and an asterisk "-*". In total, we created 4 documents; one for each axis (3 axes in total) and an overall final document comprising the data from all the interviews conducted.

 doi:10.20944/preprints202405.1671.v1

Source: figure drawn by ourselves

Figure 3. Content analysis stages.

Results and Discussion

We present the results of our study according to three types of analysis:

- **Statistical analysis and word clouds**: this method displays the most frequently used terms in the corpus studied, providing an immediate overview of the predominant themes.
- **Analysis using a general approach (Descending Hierarchical Classification)**: this technique is used to group elements of the corpus into categories based on their similarity, making it easier to detect structures or patterns.
- **In-depth analysis (Similarity Analysis)**: this approach focuses on identifying relationships and networks of similarities between text segments, enabling detailed exploration of the data.

Statistical Analysis and Word Clouds

Statistical Analysis of Text

In the context of a qualitative study, statistical text analysis organises the data from a textual corpus. It allows the data to be analysed and quantified according to frequency and grammatical category, providing a method for structuring and interpreting large sets of text quantitatively.

Résumé | **Formes actives** | Formes supplémentaires | Total

Forme	Freq.	Types
donnée	19	nom
transformation_digitale	16	nr
performance_entreprise	12	nr
gestion	10	nom
sécurité	9	nom
permettre	8	ver
digitalisation	7	nr
entreprise	7	nom

Source: IRAMUTEQ software

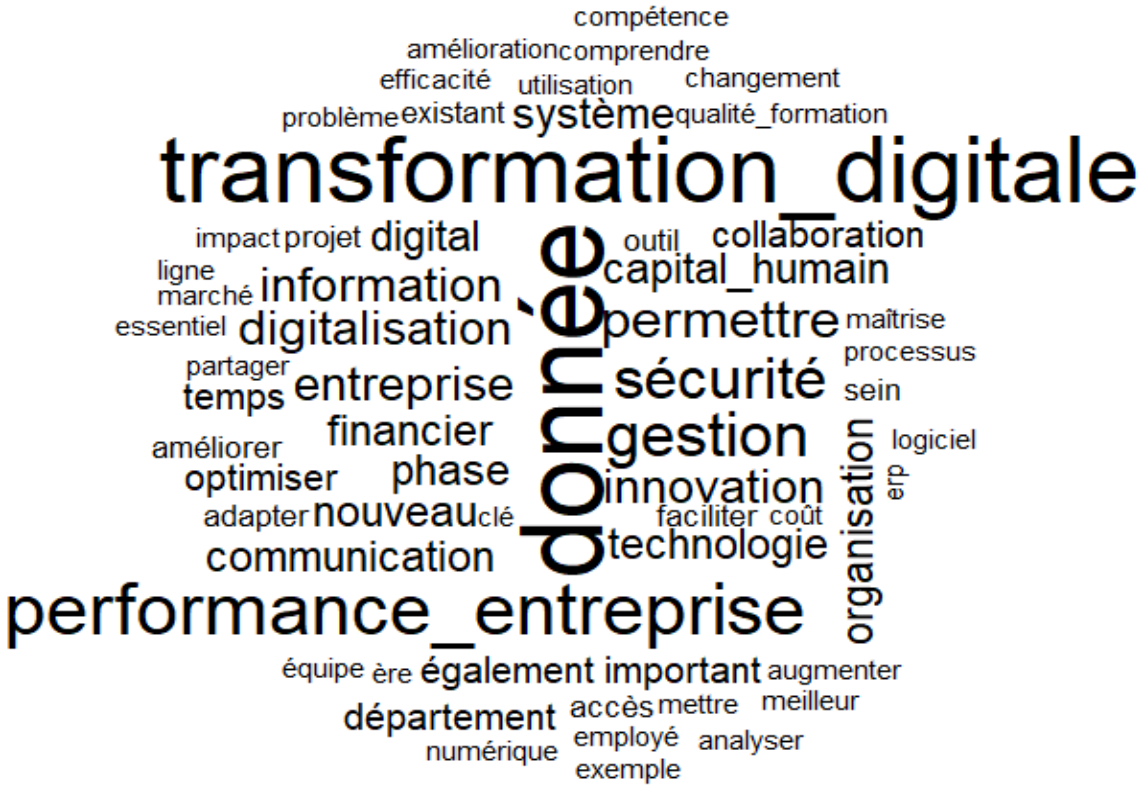
Figure 4. Extract from the statistical analysis.

The extract highlights the significant presence of the terms 'data', 'digital transformation', 'business performance' and 'management', with frequencies ranging from 19 to 10. This observation is consistent since a link can be established between these four words. Data is the raw material for the work of the interviewees, whether they are data analysts, management controllers or IT engineers. Because of its volume, this data needs to be digitised to optimise its management, thus requiring a successful digital transformation process. This naturally contributes to improving business performance.

Word Cloud of the General Corpus

The following figure provides a visual representation of the most significant words in our study. The size and shape of the words vary according to their frequency in the corpus.

 doi:10.20944/preprints202405.1671.v1



Source: IRAMUTEQ software

Figure 5. Word cloud of the corpus.

Summarising the results of the word cloud in the corpus reveals a complementary vision of the digital transformation process and its implications for organisational performance, which refers to the effective management of the organisation, as well as for corporate performance, a broader measure encompassing financial results in particular.

At the heart of the word cloud, the terms 'data', 'digital transformation', 'performance' and 'management' stand out, clearly reflecting the focus of our research. These terms underline the essential role of data management in driving performance in the age of digital transformation.

The second level highlights the importance of 'security', 'digitalisation', 'information', 'innovation' and 'human capital'. These terms reveal that, over and above the adoption of new technologies, digital transformation also involves challenges in terms of data security, innovation and the involvement of human capital.

At the third level, terms such as "digital communication", "financial", "organisation", "system", "technology", "collaboration" and "department" highlight the role of information and communication technologies in improving internal communication, financial results and inter-departmental collaboration.

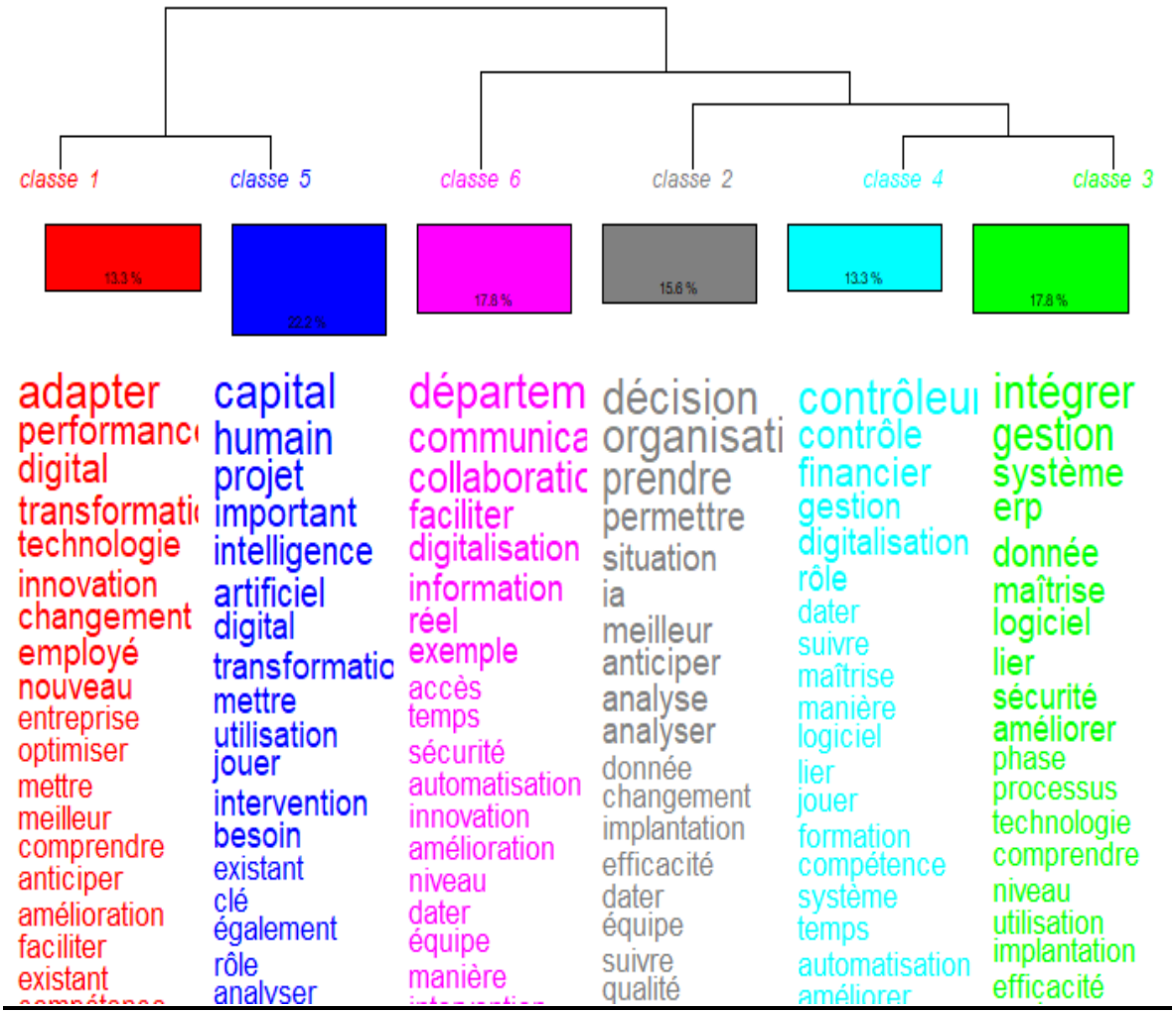
Finally, at the fourth level, we find the words 'improvement', 'skills', 'change', 'quality of training', 'effectiveness' and 'employee'. These terms suggest the human and organisational challenges associated with digital transformation, including the need to develop new skills, manage resistance to change and improve the quality of training to ensure employee effectiveness in an increasingly digitised working environment.

In summary, this word cloud highlights the importance of technological, organisational and human aspects in the success of a digital transformation project. It highlights the need to manage data effectively and securely in order to monitor and evaluate organisational performance, underlining the need for an integrated approach to successfully navigate this complex process.

 doi:10.20944/preprints202405.1671.v1

Analysis Using the General Approach (Descending Hierarchical Classification)

Descending Hierarchical Classification (DHC) is a classification method that organises items into groups based on their similarity. It generates a dendrogram, a graphical representation in the form of a tree structure illustrating how the classes are made up. This technique groups items hierarchically, making it easier to identify common themes by their level of similarity.



Source: IRAMUTEQ software

Figure 6. Descending hierarchical classification.

Descending Hierarchical Classification (DHC) was used to identify 6 distinct classes, each shedding light on different aspects of our subject of study. These classes and their themes can be grouped together under a common theme, as shown in the table below.

Table 4. Themes of the classes of the Descending Hierarchical Classification.

Class	Class theme
Class 1	"Adapting skills for a successful digital transformation.
Class 2	"Organisational and decision-making process management in the digital age".
Class 3	"Integrating digital tools to optimise data analysis".

 doi:10.20944/preprints202405.1671.v1

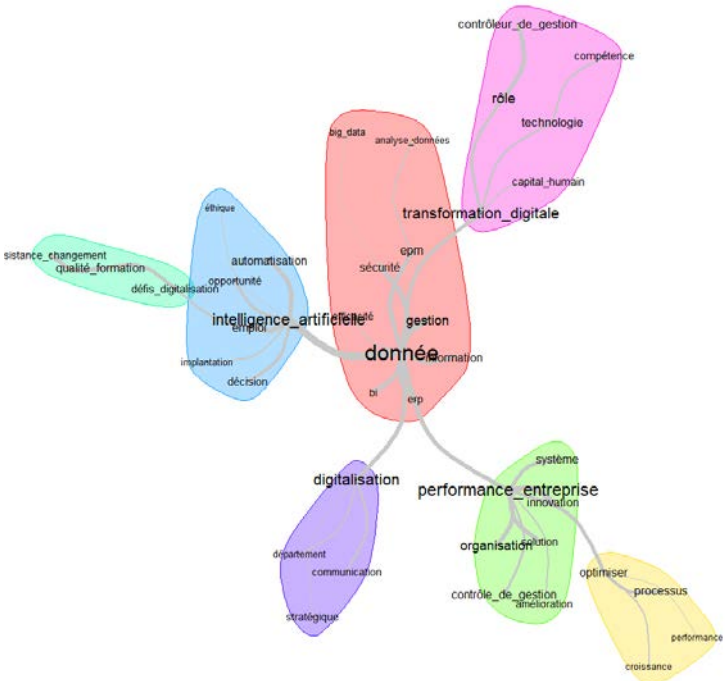
Class 4	"The crucial role of the management controller in driving digital transformation".
Class 5	"Valuing human capital in digital transformation projects
Class 6	"Improving communication and collaboration through digitalization".

Source: Compiled by us using IRAMUTEQ results.

- **Class 1:** The interpretation of this class suggests that human capital needs to develop new skills through technical training aimed at mastering the cybersecurity process and optimising the use of digital tools, and soft skills training to deploy the managerial skills needed to support this change.
- **Class 2:** This class underlines the fact that digital transformation enables relevant analysis of data and anticipation of the future, ensuring better management of the decision-making and organisational process.
- **Class 3:** This class clearly illustrates that the integration of digital tools leads to secure data management, which improves the efficiency of the organisational process.
- **Class 4:** This class highlights the fact that digitisation enables the management controller to play a role in driving the transformation and strengthening his position as a business partner.
- **Class 5:** Class 5 suggests that digital transformation enables human resources to be developed and used more effectively within the organisation, redirecting human effort towards more strategic and innovative activities.
- **Class 6:** Analysis of this class shows that digital technologies such as project management platforms, document management software and videoconferencing solutions promote connectivity, collaboration and sharing between the various stakeholders.

In-Depth Analysis (Similarity Analysis)

An in-depth analysis of the results is useful for refining the results obtained in General Approach Analysis. The analysis produced by the IRAMUTEQ software is the Analysis Of Similarity (ADS). ADS is a graphical representation in the form of a tree of connected words and is based on the key concepts of the study as well as on the graph theory used in relational data analysis (RDA).



Source: IRAMUTEQ software

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Figure 7. Similarity analysis tree.

The Similarity Analysis of the corpus gives us a more in-depth view of the structure of the discussions surrounding digital transformation. We can see a clear hierarchical structure, organised around five main themes: "Data", "Digital Transformation", "Artificial Intelligence", "Digitalisation" and "Business Performance".

- The 'Data' group (highlighted in red) is divided into two interesting subgroups: 'management and securitý and 'digital transformation' (shown in purple). This structure could indicate that discussions around data in the context of digital transformation are often linked to management and securitý issues, reflecting participants' concern for the protection and effective use of data in a digital transformation context.
- The 'Artificial Intelligence' group (representeď in blue) is also divided into two distinct sub-groups: 'Automation' and 'Digitalisation Challenges'. This structure highlights the interconnection between artificial intelligence, automation and the challenges of digital transformation, suggesting that artificial intelligence is often perceived as an automation tool, but that its implementation also presents significant challenges in the context of digitalisation.
- The 'Business Performance' group (in green) is subdivided into two main sub-groups: 'Organisation' and 'Optimisation' (in yellow). This organisation suggests that business performance in the context of digital transformation is closely linked to issues of organisation and optimisation. This could reflect the idea that digital transformation is seen as a way to improve organisational efficiencý and business process optimisation.

Similarity Analysis offers a rich and nuanced picture of how these themes are interconnected in discussions about digital transformation, revealing valuable insights into how stakeholders perceive and navigate this complex process.

Summary of Qualitative Analysis

The multi-method approach used, including Textual Analysis, CHD and AS, enabled us to pinpoint the interactions and links between digital transformation and organisational performance management.

The analysis highlights that the quality, quantity, management and security of data are essential for a successful digital transformation. Indeed, machines need to consume a large mass of data (BIG DATA) to develop their ability to accumulate knowledge, anticipate situations, make in-depth analyses and take informed decisions. Big data can also identify relevant key performance indicators (KPIs) and track their evolution over time in order to measure and evaluate organisational performance. Digital tools such as Enterprise Performance Management (EPM) systems, Business Intelligence (BI) software and Enterprise Resource Planning (ERP) systems are used to collect, analyse and interpret data. They are integrated into business performance management and monitoring, facilitating data-driven strategic decision-making.

Management control plays a crucial role in steering organisational performance, particularly through digital transformation. It is positioned as a key player, using its analytical and financial expertise to support business growth and optimise internal processes. This suggests that the management controller is no longer confined to his traditional role of monitoring and controlling financial operations. He or she plays a proactive role in driving change and managing the complexitý associated with the digitalisation of business processes.

Digital transformation has the potential to unlock strategic value within organisations. It makes it possible to rethink planning and analysis in a professional context, relieving employees of certain repetitive tasks. This enables workers to add more strategic value, by focusing on higher-level activities that require human skills, such as critical thinking and innovation.

To ensure the success of digital transformation, companies must not only adopt new technologies, but also invest in developing the skills of their staff through training. Digital transformation is not simply a matter of introducing new technologies into the business. It is a broader process that requires cultural change, adaptation of existing skills and a willingness to

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innovate. The success of digital transformation therefore depends on the company's ability to train its staff in the new digital skills and to foster a culture of innovation.

Conclusions and Outlook

This article represents an attempt to understand a subject of crucial importance. We have attempted to provide an answer to our research problem: "How can digital transformation contribute to the management of organisational performance?

The results of this research highlight the crucial importance of adapting to new technologies and the need for companies to take concrete steps to integrate digital strategies into their business model. Our main conclusions are as follows:

The importance of data, and in particular Big Data, in improving the management of organisational performance.

Management control, at the heart of data, whose digitalisation involves the use of tools that collect, analyse and even generate forecasts automatically, thereby helping to optimise organisational performance.

Digital transformation makes a positive contribution to organisational performance management if, and only if, ongoing support is put in place, which can be provided by digital transformation trainers and consultants. Without this support, the positive benefits of digital transformation would remain theoretical.

However, this study limits the possibility of generalising these results to other organisations, since we have adopted the method of single case studies. This approach aims to describe complex phenomena rather than measure their frequency and correlations and extrapolate them to the general population (Eisenhardt, 1989). This opens up potential avenues of investigation to be explored in order to guide future research. An expansion of this study to several companies would provide more reliable results. A mixed-methods approach would also be desirable: the qualitative study would allow a set of reliable constructs to be developed, while the quantitative study would allow these constructs to be tested. By understanding the different approaches, a measurement model can be established.

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