Technology management has a significant impact on digital transformation in the banking sector☆

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ARTICLE INFO

ABSTRACT

Technology management and a good relationship among employees are vital keys to assure any digital transformation process. We may therefore rightly ask "What are the main drivers influencing IT and non-IT employee relationships that may have an impact on digital transformation in the banking sector?". Aiming to identify those drivers, we developed a questionnaire for an exploratory study into employees' perceptions of the IT or non-IT measures undertaken to improve any digital transformation project. We had a sample of 604 bank employees working in software development. Leximancer was used as a qualitative technique tool for content textual analyses. The findings highlighted seven key factors that have an impact on digital transformation, namely: department, lack of cooperation, communication, requests, experience, relationship, and business. Internal clients tend to have a negative perception of IT developers mainly due to a lack of understanding of business requests. This study contributes to scholarship with a conceptual model to explain the main concepts that may affect the relationship between IT and non-IT employees' and departments teamwork in the digital transformation process, in the banking sector specifically. We also contribute by identifying the most important elements to achieve organizational success.

1. Introduction

Information Technology (IT) today has a vital role in any organization, in business success, and in society at large, which is continuously changing and becoming ever more digital. Software developers, internal clients, and external clients, all have important contributions for a successful digital transformation. IT departments must respond quickly to increasing requests for digital transformation and problems posed by customers. They are naturally undergoing new and profound changes as their responsibilities expand, influencing internal and external clients' services, sales, and even digital business strategies (Wessel et al., 2021).

IT no longer relies on the work of a single department, as it did until recently. The IT department needs to work with all business sponsors and all client departments who request different projects for digitalization. As a result, organizations are increasingly turning IT into a driving force in all aspects of digital business to become more agile in software development and digital business services (Kahan, 2018; Wirtz, 2021).

Table 1

Questionnaire Structure – Antecedent of relationship conflicts between employees.

Item	Descriptions	Authors
Closed questions – Characterization of the employees		
Gender	Men and women have different tolerance levels for rapidly changing social relationships.	Heilman (2012)
Age	Age reflects social experience and the ability to deal with job attitudes and relationship conflicts.	Ng and Feldman (2010)
Work experience	Work experience is the experience that a person has while working in a specific field or occupation.	Drory & Ritov (1997)
Work department	Interdepartmental goal reciprocally affects conflict outcomes between quite different departments through constructive arguing (i.e., the broad-minded discussion for mutual benefit) dynamics adopted by workers from different organization departments.	Zhu (2013)
Open questions – In the next six questions, please describe, in a few words:		
Your work experience within Digital Transformation projects …		Pluut et al. (2018)
Examples of your bad collaboration experience with IT Developer …		Meier et al. (2014)
The main reasons for a lack of understanding with IT Department …		Runde (2014)
Examples where IT Department hampers your work development or performance …		Schaetzle (2015)
How do you differentiate your collaboration with IT Department from the collaboration you have with other non-IT Departments?		Liu et al. (2015)
Things that you would change if you could, to improve the collaboration with IT Department …		(Authors)

As organizations increasingly face pressure to quickly innovate and promote digital transformation, managers must improve the collaboration between employees to achieve success. Nevertheless, common problems are unavoidable in most organizations, given their unique and complex nature, and the need to perform various software development tasks and IT services (Currie et al., 2017).

In this complex context, some organizations such as banks are faced with the inclination to promote digital transformation and to introduce innovative changes to guarantee a competitive business position in their increasingly demanding marketplace. Banks are market pioneers, investing billions of dollars and being motivated by innovation encouraged by their important roles, information, and self-service quality (Alalwan et al., 2017).

Banks are undergoing a major digital transformation, driven by the threat of new types of financial technologies (FinTech) that present innovative services attracting the attention of customers and investors alike. Fintech startups are broadly focused on the concept of unbundling banks, offering one type of product or service. These specialized players have disaggregated financial services, allowing consumers to find and assemble their preferred combinations of products, mainly through improving customer-facing facets of financial services (Feyen et al., 2021).

Banks may tie customers in by offering them a range of convincing and renewed services, reducing costs, and enhancing the options and experience they provide, and relying on these features to maintain their competitive advantage. They need to discover the best way to respond to the threat of digital disruption by identifying the key drivers to develop a successful team collaboration, which is indispensable to innovate and succeed. To do so, a diagnosis is needed to determine the extent to which an intervention is required to improve IT collaboration and performance to promote digital transformation success. With this in mind we undertake a search for the key factors or drivers for digital transformation, asking:

what are the main drivers influencing IT and non-IT employees' relationships that may have an impact on digital transformation, in the banking sector?

Our goal is to propose a conceptual model that can explain the main concepts (or dimensions) that affect the collaboration between IT developers and customers (internal clients, as sponsors or employees from non-IT departments) in the banking sector, to understand the reasons and motivations for collaboration in a digital transformation process and development, knowing that strong relationships between employees may stimulate innovation and promote business success (Othman et al., 2018). In sum, we aim to.

a) verify the perceptions of bank employees about the collaboration and relationship conflicts among colleagues in the development of digital transformation projects;
b) determine the main concepts and themes – dimensions – that represent these perceptions;
c) explore possible different perceptions according to employees' gender and work department;
d) propose a conceptual model to explain the main concepts that may affect departments' teamwork (IT and non-IT employees) in the digital transformation process in the banking sector.

In this study we adopt a qualitative methodological approach, based on an online questionnaire (see Table 1) composed of open questions – some data were also collected with closed questions, for the participants' characterization. The data obtained were analyzed and categorized using Leximancer, an adequate qualitative tool for textual data. Leximancer generates a conceptual map that highlights the main themes focused on by the participants, according to the co-variance of the words found most frequently in the answers (Angus-Lipan et al., 2010). This allows us to identify possible causes for a lack of collaboration, which in turn has an impact on organizations' digital transformation.

This study links the knowledge about employees' collaboration and organizational digital transformation through a qualitative analysis aiming to produce a conceptual model – an analytical tool that, in this case, may identify and highlight the key drivers for a digital transformation in the organization, which can be used by both researchers and professionals to better manage employees and boost digital transformation.

Although there is a substantial body of theoretical and empirical work on banks' digital channels, little qualitative research has been conducted on banks' financial reports to understand the digital strategies employed.

This research contributes to a better understanding of how banks address digital transformation and how the relationships among employees affect information technology in bank projects. Furthermore, we join the effects of digital transformation on performance and the relationship conflicts between employees.

The development of a new theoretical approach contributes to knowledge in this scholarly field and as a result facilitates a better understanding of complex challenges and potential solutions. Additionally, the study provides a theoretical conceptual framework (see Fig. 3) for comprehending how qualitative researchers often strive to add to theory and knowledge that may be used across industries, such as the digital transformation of banking and interactions between IT employees (Tam et al., 2021).

Professionals can make practical contributions by implementing a digital strategy to meet customer needs with good employee collaboration, efficiency, and performance (Khan et al., 2020). This gives them crucial practical knowledge and enables them to foresee whether their relationships with IT will have an impact on the success of the digital strategies implemented.

2. Theoretical background

2.1. The importance of information technology (IT) in the organization's digital transformation

Information technology (IT) is extremely valuable for organizations to proceed with digital transformation, gaining a competitive advantage, improving customer service, enhancing product and service quality, and integrating supplier and client operations with

more choices than ever to improve their business (Teece, 2010).

Digital transformation is the aggregate of automatic innovation in all facets of a business, fundamentally changing how organizations work and deliver value to employees and clients (Gong & Ribiere, 2021). It operates like a social and cultural alternative that consistently challenges the organization's *status quo* and operating model (Fernández-Rovira et al., 2021).

In this competitive and fast-moving world, in which technological innovation and consumer demands are in continuous change, organizations, departments, teams, and individuals must deal with a vast range of technologies and complex business operations in almost every aspect of their daily work. Success often reflects an organization's ability to work together, sharing the same goals and developing adaptive software in endlessly changing environments using digital transformation (Fitzgerald & Stol, 2014). Therefore, organizations must react quickly and improve themselves, perfecting software efficiency and aiming for excellence. Digital technology enables organizations to set, target, and monitor goals, improve innovation, and efficiency, speed development, and cut costs (Machado et al., 2019). However, employees' ability to collaborate and their ability to improve systems are the most important factors to ensure software quality and an adequate digital transformation (Crawford et al., 2014).

2.2. Impact of collaboration in digital transformation

Inappropriate employee collaboration in defining the digital transformation may result in operational failures (Adler-Milstein et al., 2009). It also may reflect a situation in which a developer or internal client does not respond to the other as expected, raising misunderstandings about some IT specifications (Runde, 2014). The success factors for an effective digital transformation are workplace collaboration and good communication between team members to prevent negative impacts on sustainable digital development strategy in this digital transformation era (Nayal et al., 2022).

Misunderstanding often arises during software development, involving employees with different backgrounds and orientations working together on a project concerning IT transformation business (Filippetto et al., 2021). Collaboration and communication between people working together in digital transformation is crucial to get reliable applications with the fewest usability issues possible. Proper skills to deal with relationships between teams and within team members can assist project directors and other managers to effectively resolve disputes, contributing to a more productive organization.

Managers have to deal with a lack of collaboration in software development and ascertain ways to minimize, avoid or solve it, concentrate on software quality, time-to-market, cut price, and meet customer needs. When employees do not collaborate toward the same goal, an organization may expect high costs, low software quality, and poor customer service (Liu et al., 2015).

2.3. Understanding the causes of poor team collaboration

Poor cooperation collaboration in digital transformation teams can be linked to differences in values, attitudes, demands, opinions, expectations, perceptions, ideas, and personalities (Mehra & Sharma, 2018). The disagreement between employees, departments, managers, or teams (Boddy, 2014) about the best procedures or activities to accomplish the digital transformation goal (Meier et al., 2014), may lead to troubled developments that usually harm the organization's business. Poor collaboration between employees may occur in different contexts, from stressful situations associated with constant change in IT software development or services (Liu et al., 2015), to minor disagreements between co-workers and supervisors, assaults on others, or disrespectful attitudes and even interpersonal rejection (Meier et al., 2014). Undefined, insufficient, or inadequate IT requirements (and business procedures) translate into incomplete or incorrect information about an IT project and may also lead to a poor relationship in the workplace, contributing to a project failure (Kettunen & Laanti, 2005).

In sum, poor cooperation between IT developers and customers may depend on five objective factors: 1) Undefined IT Requirements; 2) Lack of work recognition and reward; 3) Inappropriate employee behavior; 4) Uncertain business goals, and 5) Lack of technological capability/response. Few studies report comprehensive assessments of the lack of collaboration involving IT developers and internal clients (Meier et al., 2014).

2.4. Lack of business response or IT capability

IT evolves quickly, following market and business demands to improve software and offer better services. Even IT employees with advanced technological skills find it difficult to keep up with all the changes and uncertainty in a continuous technological digital revolution (Meyer, 2009). Thus, organizations, managers, and employees must focus on the human aspect in the current environment (Allen et al., 2007). The lack of security on what to expect, or an insufficient technological or business response, affects the role, proficiency, adaptiveness, innovation, and desirable performance of the employees (Griffin et al., 2007). New information technologies and systems require a great effort, having a broad impact on employees, especially on those with less experience, shifting the nature of their tasks, workflows and, thus the jobs themselves (Liang et al., 2007). If employees think the organization tries to cling to the past, they may consider that such stubbornness negatively affects them, thus becoming more challenging and combative, rather than supportive and interactive to address the changes.

3. Methodology

3.1. Research design and instrument

The failure of digital transformation in an organization is quite common and may indicate poor cooperation between team members that negatively affect the organization's performance (Huo et al., 2016). Having this focus, according to the literature review and recalling our research question ("What are the main drivers influencing the collaboration between IT developers and internal clients that may have an impact on digital transformation in the banking sector?"), we developed a questionnaire with two groups of questions (see Table 1).

- A first group, with closed questions: some socio-demographic items to characterize the participants' profiles;
- A second group – to verify the perceptions about working with the IT developer or IT department – with six open questions to explore the perceptions of the internal clients (IT or non-IT employees) about the relationships they maintain and any possible difficulty or lack of collaboration with IT developers or with the team, specifically the IT department (see Table 1) concerning: 1- work experience …; 2- conflict experience …; 3- main reasons for a conflict …; 4- examples of possible communication difficulties …; 5- differences in their relationship with the IT department and with other departments …; 6- what would they change to improve the relationship with the IT Department.

This online questionnaire was made available by the banks' human resources departments, through corporate email service (back-office) to employees of the 10 largest Portuguese banks (by number of human resources – according to APB-Portuguese Bank Association) that.

a) work in collaboration with the IT projects; or b) were (at the time) receiving IT digital services. Employees' responses from those 10 different banks provided the data needed to examine their perceptions about their relationship and collaboration – with the IT developer (in the case of IT employees) or with the employees of the IT department services (in the case of internal clients – non IT employees or sponsors).

The questionnaire was online for 3 months (from November to December 2021).

First, we proceeded to participants' characterization, not only to identify their profiles but also to explore the influence of gender and work department (as independent variables) in the dimensions of the relationship conflict perceptions (as dependent variables). These dimensions are defined according to the themes and concepts found using Leximancer following the data content (textual) analysis (see Table 1).

3.2. Sample characteristics

We had a sample of bank employees that work with or within the IT department (N = 604): 61% men and 39% women. Only 7% of the participants were less than 26 years old and 66% were more than 45 years old; 86% had more than 10 years of working experience; 9% worked in the IT department and 91% in another department and were IT clients (see Table 2).

3.3. Tool and procedure

In the first step we performed a textual content analysis with the data obtained from all answers (to the six open questions), using Leximancer V.4.5, aiming to: a) verify the perceptions of bank employees about the collaboration and (possible) relationship conflicts during the development of digital transformation projects; b) determine and examine the underlying concepts (common text elements identified here as "concept names") and themes (representing clusters of finding concepts) in the bank employees' responses; c) explore possible different perceptions according to employees' gender and work department.

Leximancer is especially well suited for exploratory research of comprehensive conceptual models, facilitating the extraction and selection of reliable and reproducible concepts and themes (or thematic clusters), based on Bayesian probability theory, in which fragmented pieces of evidence can be used to predict what happens in a system, without inducing any expectation biases, common to manually coded text analyses (Smith & Humphreys, 2006). Leximancer is often used for both conceptual and relational analyses of textual data, having a close agreement with expert judgment (face validity) and an ability to handle "short and ungrammatical comments" (Campbell et al., 2011).

The most relevant/frequent words, according to participants' responses, were identified as keywords, based on their lexical meaning, employing exploratory factor analysis (Scott, 2008). Leximancer has a quantitative approach to conducting qualitative analysis (Indulska et al., 2011), providing an overall conceptual structure with detailed information on specific topics, such as employees' perceptions of their relationships. Participants answered the open questions with one to four sentences (and a total of 47,745 words were collected and analyzed). The analysis comprised four steps.

1) Exploratory analysis – An initial exploratory analysis represented the data in word clusters, named entities, or concepts. As in other analytical methods, in-text analysis data is interpreted in a grounded way, to elicit meaning, increase understanding, and improve empirical knowledge. All data were combined in an Excel spreadsheet and then uploaded to Leximancer, running an overall

Table 2
Participants' characterization.

Sample & Demographics		N = 604	%
Gender	Men	366	61%
	Women	238	39%
Age	25 years old or less	40	7%
	From 26 to 45 years	166	27%
	From 46 to 55 years	228	38%
	56 years or more	170	28%
Department	IT clients	550	91%
	Works in IT department	54	9%
Work experience	5 years or less	86	14%
	From 6 to 15 years	110	18%
	From 16 to 20 years	134	22%
	21 years and more	274	46%
	Total	**604**	**100%**

analysis of the most frequent concepts – although most of the analytical processes were performed by the software, some manual interventions were required in order to reduce similar words, singular and plural forms, or words with the same etymological root of a simple word (e.g., "employee" and "employees", "understand" and "understanding", "change" and "changed", etc.). In this initial overall analysis, some other words were excluded because they did not add meaning to the results (e.g., "this", "some", and "remember").

2) Concepts analysis process – The concepts (as the main dimensions of the participants' perceptions) were further explored, including the gender and work department tags (TAG), to verify the influence of gender and department work on the representations of the relationship conflicts. These analyses revealed that some concepts are linked to a greater or lesser extent to gender or the respondent's department (Gilal et al., 2016).[1]

3) Key Concepts identification – A visual concept map complemented by statistical outputs was generated to (1) determine the main topics in textual data; (2) highlight the relationships between topics; and (3) indicate which source files (or employees) may be characterized by topics (Angus et al., 2013). This is very helpful (1) not only to search for key themes and concepts in textual data; (2) to analyze textual data clusters in a graphical format (i.e., a concept map); and (3) to navigate through the concepts while mining the text for deeper contextual associations (Cretchley, Gallois, et al., 2010).

4) Concept Map identification – The final step consisted of an analysis of the pattern of the concepts grouped in themes, to view in detail the thematic clusters underlying employees' relationships. Leximancer aggregates concepts in several levels, to represent themes, offering insight into their interconnection. It can identify clusters of words according to their frequencies that generally appear together, close to the main text – a possible concept – which is then grouped in a net with all concepts. The concepts are clustered into higher-level themes (as dimensions of the verified perceptions), shown as colored circles – which are heat-mapped – to highlight the relationships between concepts and the proximity of the themes with each concept. The closer a theme is to a concept, the stronger is the association of that concept. Through this procedure, we analyzed the data obtained from participants in a visual/graphic mode, known as conceptual maps.

4. Results

Using Leximancer we determined 24 concepts, grouped into seven themes (see Fig. 1). Concepts are represented by dots; the larger the dot is, the more prominent the concept is. Concepts close to each other are grouped into themes, which are displayed as colored bands. The color of each theme demonstrates its prominence, while the size of the circle is not relevant. The most important theme is red, and the colors progress according to the color wheel, so, the least important theme is purple (Anagnostopoulos & Bason, 2015).

The concept map highlights the seven main themes covering the collaboration and relationship that participants have with software developers and IT departments, examples of relationship conflicts, the main reasons for these conflicts, and how relationships may be improved – considering the suggestions of participants.

A concept map is heat-mapped, whereby hot colors (red, orange) denote the most important concepts or greater frequency of being mentioned, and cool colors (blue, green), denote the least important. Considering the participants' perceptions, the most important theme in relationship conflicts is "requests" (see Fig. 1), which highlights a cluster of concepts with which it is connected, including "project", "people", "issues", "deal", and "time" (e.g., requests of projects are developed by people, involve several issues and negotiation between colleagues, and need time to be completed). The theme "departments" enhances the "work" developed by each "company" "department" according to the "requests" made and the "experience" of the employees.

The most prominent theme is the "departments" (1056 hits or number of text blocks associated with the theme), including the inter "departments" and multiple "teams" within the "company" and their "work" relation, also linked to the "experience". The second

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[1] The interpersonal and interdepartmental relationships are not easy. Problems arise over time, given the difficulties, misunderstandings, questions, and pressure. Nevertheless, women reveal being more sensitive than men to a sudden or unforeseen change, and report more conflicts and discomfort than men (Heilman, 2012).
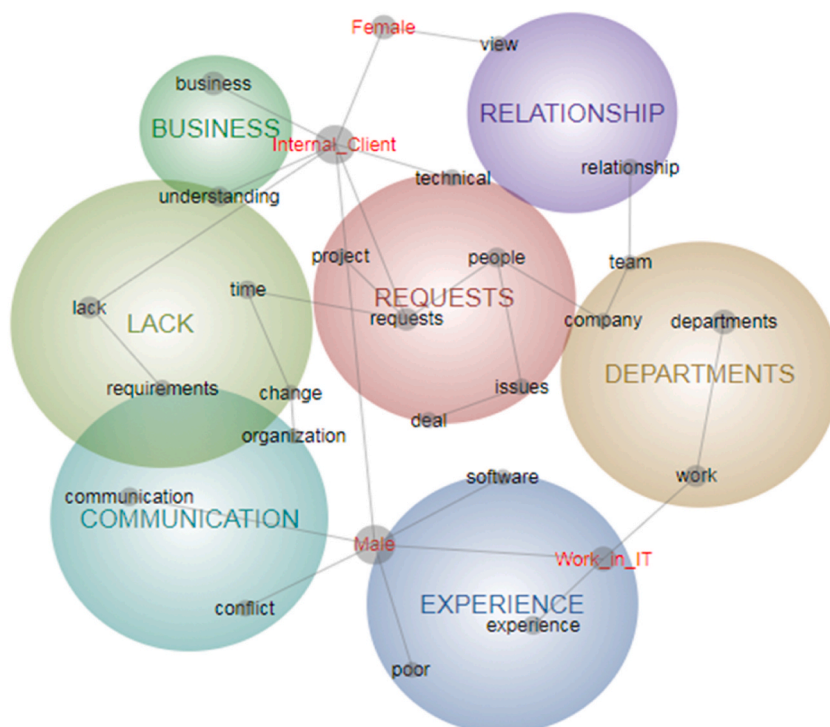
Fig. 1. Concept Map - Determinants of the relationship between IT employees and IT clients.

theme, "business" (832 hits), underscores the relationship with the clients and the (mutual) "understanding" of the "business". The third theme, "lack" (672 hits), mainly addresses the "lack" of "time" and of prior "requirements" necessary for any "change" in tasks. The fourth theme – which is a central theme – "requests" (544 hits), especially mentions the "technical" details of the "project", "people", multiple "requests", and reported "issues" that are difficult to "deal [with]". Summarizing, clients have issues to be solved, according to the projects and the requests to be understood and accomplished. The fifth theme, "Communication" (480 hits), mainly highlights the "communication" process – important for collaboration – in the "organization" and to avoid interpersonal "conflict". The sixth theme, "experience" (416 hits), is particularly related to the staff's "experience" in "software" development or, on the opposite side, their "poor" experience. The last theme, "relationship" (288 hits), reveals the importance to work as a team in a company, to share a "view" (about the organization) or a manner of looking into a working relationship.

The gender Tags reveal that men's perceptions encompass the concepts of "communication", "poor", "conflict", and "software" (and are more associated with "work in IT" than "internal clients"), and women's perceptions are linked to "internal clients" and include "view" underlining "relationship". Everyone has his/her preferences regarding relationships (El Asri et al., 2019). The work department Tags reveal that clients (non-IT employees) highlight "business", "understanding", "lack", "project", "requests", and "technical", while IT employees identify "work" and "experience" (as important factors in software development).

5. Discussion

Seven main themes and 24 concepts were identified to represent the participants' perceptions about their collaboration with IT colleagues (see Fig. 1). We first discuss the implications of these perceptions; then, we analyze the links between the Tags (referring to the characterization/independent variables gender and department) and the themes and concepts; finally, we analyze the frequencies (i.e., the number of occurrences of each concept, designated by counts) of gender and department (and their implications).

5.1. Themes and concepts

"Departments" is the first main theme, representing four concepts (departments, work, team, and company). The weak relationships between departments cause stress, underappreciation, job dissatisfaction, and a lack of collaboration between employees and departments (Samnani & Singh, 2016). The department is very close to request and this one to relationship (see Fig. 1), showing the importance of strong interdepartmental collaboration and teamwork to achieve innovation and business goals (Kane et al., 2017).

Employees have a broad perception regarding the relationship with IT departments that can help them work as a team, cooperate, and improve their mood and performance. Participants refer to "Department" to denote communication problems, e.g., "Communication with IT department is more difficult since there are business concepts that are not well understood.", "… there are several obstacles: a very closed system, a great stigma for those who are not computer users", "… understand how IT can achieve …", "The

union within the various Departments is not the same among IT Department.", and "… sometimes is not possible to perform and especially with poor information in the requests for work to be performed".

"Business" is the second main theme, embodying two concepts (business and understanding). Tongur and Engwall (2014) argue that business and technology are interdependent, challenging employees to be evaluated by their business and technology knowledge. In a competitive environment the market and regulatory entities force changes in the business process and understanding (changes the *status quo*) and, therefore, its inability to deal with conflict, since they disagree with the changes they must technically perform and process (Krantz, 2018). Participants enforce the importance of business knowledge – understanding the business domain – and that is essential to make a company work, enabling the use of that knowledge to create innovation, organizational performance, and business value (Kasemsap, 2017). Understanding how the company's business and process workflows benefits the relationships between employees – facilitates motivation, communication, innovation, organization, and business improvement (Quinn, 2018). Quoting words of the participants, "business" highlights that technical understanding improves communication and relationship with the IT department, e.g., "Communication with IT department is more difficult since there are business concepts that are not well understood …", "Business doesn't know how to translate their business and requirements to IT language", "Business doesn't understand that IT sometimes it isn't the solution for the Business Problem", "… IT team does not understand the severity of certain services being down.", and "More clarity in communication for a better understanding of needs".

"Lack" is the third main theme, integrating four concepts (lack, requirements, change, and time). The missing, incomplete or incorrect requirements, unexpected or successive changes, and restricted time for software development constitute factors that impact the business, product, or service time delivery (Gu et al., 2021). Lack is very close to communication and business themes (see Fig. 1), which are essential for IT project success (Mir & Pinnington, 2014). In a rapidly changing organizational environment (like regulation, business, and technology), communication becomes more complex to define all product or service requirements for rapid technological implementation, risking a lack of common understanding that may result in conflicts and business failure (Bano & Zowghi, 2015). As examples, participants mentioned: "From my experience, the main reasons are: time of development (the final user always thinks it's too much time and wants to have the final result sooner) lack of requirements or bad requirements that lead to unsatisfactory results", "Frequent change requests with impact on the development, but the user often don't understand why.", "Lack of requirements or change requirements that lead to unsatisfactory results.", "Main conflicts I've seen have originated from IT Departments include poor Project Management, both in time & quality", and "Lack of Communication Lack of deliveries".

"Requests" is another main theme, involving six concepts (requests, people, technical, issues, deal, and project). A request means that someone is doing an IT service or software development that a client has asked for. The request is a technical issue of applying technology or working out technical solutions involving a great deal of people skills (IT and non-IT employees) working in a cross-functional team, focused on the desired project goal (Baker, 2017). IT services and software development (e.g., projects or requests) depend on people's effective participation and the relationships between clients and computer and information systems technicians (Bano & Zowghi, 2015). People develop emotional awareness or intelligence according to other people's emotional cues over time (Jurado & Rodriguez, 2015). These emotional clues depend on personal qualities, such as perseverance, self-control, and skill in getting along with others, and this could result in emotional Intelligence at work, leading more people engaged and committed to the organization's success (Njoroge & Yazdanifard, 2014). As an example, participants assigned the need for more collaboration, communication, and technical skills, to deal with the requests and project issues: "People should have some training to avoid basic issues and at the same time, IT should have behavioral training to deal with the difficulties of less experienced users - having a perfect notion that is not easy.", "Mutual sessions where each department gets to collaborate on a project with multiple outcomes to produce an understanding of each", "They don't understand what I ask, lack of technical knowledge, no knowledge of the correct processes", "The problem is not the departments, but the people who are part of them – they don't talk to each other.", and "The conflicts that exist are related to tight timings and that sometimes are not possible to perform and especially with poor information in the requests for work to be performed".

"Communication" is the fifth main theme, linking three concepts (communication, conflict, and organization). Communication between individuals and teams plays a vital role in coordinating and aligning the various IT projects and activities toward a business goal (Bjarnason & Sharp, 2017). Communication is essential for work, wellbeing, creativity, and the generation of new ideas and innovations (Juholin et al., 2015, pp. 323–346), playing a vital role in successful software or service development, assuring the coordination between IT clients and IT departments. Project failures and conflicts within the organization and between employees are often due to miscommunication (Bjarnason & Sharp, 2017). Good employee communication leads to engagement, positive behaviors, and business growth (Kang & Sung, 2017). Foci of interpersonal conflicts may over time escalate into bullying, especially if badly managed (Baillien et al., 2016). As an example, participants highlight the importance of more collaboration, communication, and technical skills to deal with the requests and project issues: "Past Experience as Manager in an IT Department Current Experience in Providing solutions (e.g. APM, UX) that tackle the divide between IT & the rest of the Organization.", "IT is speaking 'Chinese' and uses complicated terms, with a clear communication failure/gap.", "IT should take an important role in the management side of the organization. If they only contribute to maintaining hard/software the relation with the rest of the enterprise won't be as good and IT won't add value.", "Some conflicts are essentially arbitrary, meaning it doesn't matter who wins, only that the problem is resolved so everyone can get back to work.", and "Poor communication is one of the main causes of conflict".

"Experience" is the sixth theme, including three concepts (experience, poor, and software). Employees' experience joins together a diverse array of technologies and business processes. Due to the rapid speed of technological evolution, IT employees are expected to be proficient in a wide range of skill sets and business paradigms (Barua et al., 2014). Enhancing employees' knowledge and experience is important for team performance but requires an increment in communication and team spirit. However, there is a lack of understanding in many organizations about software requirements and how to develop software quickly, with high performance, due to a

weak team spirit and a low degree of respect for each other ((Van der Lippe & Lippényi, 2020). Thus, the IT department employees, working with technology and having business knowledge, create value for clients and outcomes that advance the overall well-being of all the organization's employees (Blocker & Barrios, 2015). "Experience" alluded to weak expectations with IT services and software delivery: "My experience has some constraints about the software working properly, with the updates from the IT department in the software always bring a stress and the tools normally doesn't work after the upgrade.", "Users should have some training to avoid basic issues and at the same time, IT should have behavioral training to deal with the difficulties of poor experienced users – having a perfect notion that is not easy.", "Competing expectations unqualified staff in key roles poor procedures in the software lifecycle.", "IT should take an important role in the management side of the organization. If they only contribute to maintaining hard/software the relation with the rest of the enterprise won't be as good and IT won't add value.", and "Conflicts arise inside IT Department (essentially between Dev & Ops), and between IT Departments and the rest of the Organization. Main conflicts I've seen have originated from IT Departments include poor Project Management, both in time & quality".

Finally, "relationship" represents two concepts (relationship and view). Poor relationships cause stress, underappreciation, job dissatisfaction, and conflicts between employees and departments (Prause & Mujtaba, 2015). The relationship theme is very close to the request theme (see Fig. 1), highlighting how a strong collaboration between employees from different departments and teamwork are essential to meet innovation and business goals (Oeij et al., 2017). Good employer-employee relations create happy workers, which leads to increased innovation and performance, reduced turnover, and customer satisfaction (Perales & Tomaszewski, 2016). A firm with successful and satisfied employees may have a competitive advantage over other organizations (Perales & Tomaszewski, 2016). Relationships between employees should support a friendly and solid community (Tomazevic et al., 2014). For example, participants highlighted different perspectives about the requests and business: "Sometimes IT and the other departments have a different point of view.", "There is no differentiation, although the relationship with the people with whom one works directly and more closely is more relaxed.", "My relationship is healthy, but I think an investment in soft skills would not harm IT if it relates better to other departments.", "Issues not being sorted different points of view arrogance from the IT mates. To give a more comprehensive view of the needs of the business to allow a better understanding of the timings requested.", and "As audited, you view the audit with suspicion, as someone who will only convey what runs/went wrong. They do not come to auditing as a partner".

5.2. Around the tags

To verify how gender and work department is associated with the perceptions of relationship conflicts, four Tags[2] were defined to represent the concepts of gender (Female/Women and Male/Men) and work department (Work-in, for IT department employees), and internal client, for employees from other departments (see Fig. 1, Tables 3 and 4).

Gender is commonly associated with differences in personality and perspective in certain tasks involving conflict issues (Gerpott & Kearney, 2017). "Female" is close to "Relationship" and "Male" is closest to "Communication" and "Experience" (see Fig. 1). Women seem to favor communication through the relationships established with colleagues to achieve the requests or needed goals for the organization's success (in other words, bringing business goals closer to the IT requests, through the internal clients). Both men and women have problems associated with interpersonal relationships, but women seem to be more sensitive and tend to experience more conflicts than do men (Heilman, 2012). Women tend to avoid or be less effective in resolving a dispute or conflict and are more relationship-oriented to accomplish tasks than are men. They also reveal more fear and are less aggressive in conflicts, tending to view their partners in idealized ways (Prause & Mujtaba, 2015). Contrarily, men usually try to take a higher hierarchical position to dominate a conflict (Gilal et al., 2016).

Table 3 shows the frequency of occurrences (i.e., word counts) for each concept, by gender, in ranked lists: for men, nothing is more important than "work", and then the "requests" to be answered, with "understanding"; women focus the attention on "departments", "business", and "lack" of view or perspective. Conflict and relationship conflict were mentioned more often by men than by women, considering employee relationships with the IT department, while we see that women gave more importance to the communication between the persons in the different departments to achieve the desired goals.

When employees from different departments work on the same goal, they should combine their opinions and suggestions, sharing interpretations and activities, and offering a comprehensive and comprehensible resource for everyone within the organization (Nikula et al., 2010). Although having different backgrounds and experiences, employees can promote a common understanding, which prevents possible conflicts (Zhang et al., 2014). The concept of "Internal Client" is close to "Business", "Lack", and "Request" themes (see Fig. 1), showing how important a clear scope and purpose are with effective business requirements (Rouhani et al., 2015). IT department employees, "Work-in", are close to "Departments" and "Experience", showing a focus to provide support and efficiently carry out IT tasks, with their technical experience (Kucherov & Zamulin, 2016).

Table 4 provides ranked lists for work department: for internal clients (non-IT employees) "business", "departments", and "work" are the top occurrences, and for IT employees "departments", "experience", and "lack" are the most important concepts. IT employees (more than the non-IT colleagues) give more importance to the experience than to the business. "Conflict" is the top concept among IT clients (or non-IT employees) when they consider their relationship with IT colleagues (see Table 4).

In sum, when describing the relationships – and possible conflicts – with IT colleagues, men's perceptions are close to the internal clients (or non-IT employees') perceptions, and women's perceptions are close to those of IT employees (see Tables 3 and 4).

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[2] Note: Leximancer places TAGs close to a particular theme or concept, according to the frequency of those terms in the section tagged.

Table 3
Gender tags.

Tag Concept: Gender Male			Tag Concept: Gender Female	
Related Name-Like	Counts		Related Name-Like	Counts
work	224		departments	116
requests	124		business	112
understanding	124		lack	80
communication	112		view	48
experience	112		people	48
conflict	80		communication	48
relationship	64		understanding	36

Table 4
Work department Tag.

Tag Concept: Internal client			Tag Concept: Work_in_IT	
Related Name-Like	Counts		Related Name-Like	Counts
business	272		departments	112
departments	224		experience	96
work	192		lack	96
understanding	128		work	64
communication	112		people	48
requests	112		communication	48
conflict	80		requests	48

We also distinguished participants' perceptions according to the department where they work (work department), using Leximancer to produce an "Insight Quadrant graphic" displaying the combination of concepts (dependent variables), with relative frequencies and the Tags strength (see Fig. 2 and Table 5).

Considering the ranking concepts associated with the employees' department (for non-IT employees or IT employees), concepts like conflict, understanding, business, relationship, and communication are the most important (with strength values greater than 69%) for the clients. IT employees gave more importance to experience (66%) to be prepared to answer a request, develop a project, and meet a goal; for the non-IT, communication is fundamental to understanding what is relevant to do, meeting the company's goals (see Table 5). A good relationship is desirable to enable employees, as colleagues, to discuss any issue and avoid (undesirable) conflicts, and this is only possible if they have good communication and mutual understanding.

The conflict has negative effects (like lack of business understanding, experience, and communication) on the successful completion of the project requested. In contrast, good work team relationships can help the organizations meet their project and
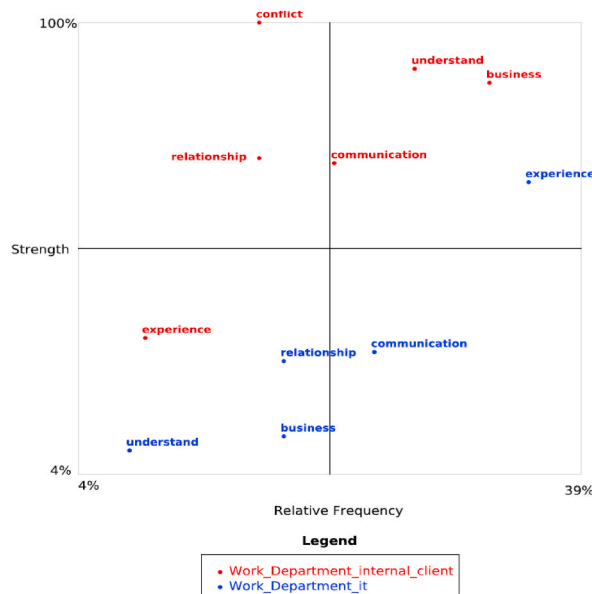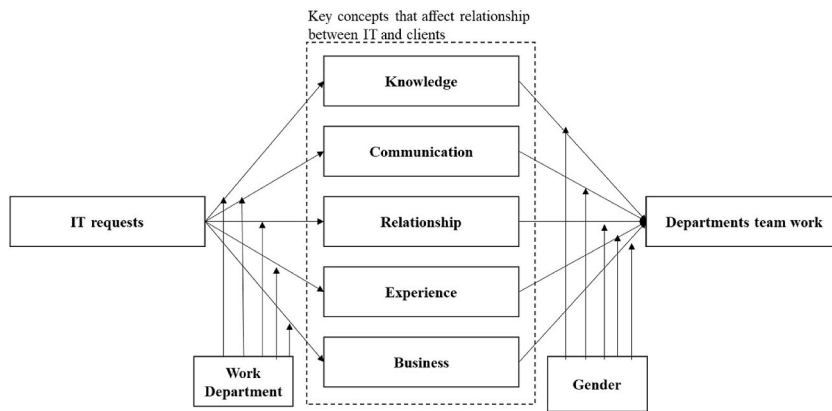

Fig. 2. Insight Quadrant graphic.

Fig. 3. Conceptual explanatory model of the main concepts that may affect the relationship between IT and non-IT employees.

Table 5
Ranked concepts for categories.

Category: Work_Department_internal_client

Concept	Rel Freq (%)	Strengh (%)	Prominence
conflict	9	100	3.7
understand	19	90	3.4
business	26	87	3.3
relationship	9	71	2.7
communication	13	70	2.6
experience	6	33	1.2

Category: Work_Department_it

Concept	Rel Freq (%)	Strengh (%)	Prominence
experience	32	66	7.0
communication	16	30	3.1
relationship	11	28	3.0
business	11	12	1.3
understand	5	9	0.9
conflict	< 1	< 1	0.0

business goals (Jain, 2018; Wu et al., 2018).

At this point, we recall our fourth objective and propose a conceptual model to explain the key concepts associated with the relationship between IT and non-IT employees – and that can affect these relationships, leading to (undesirable) conflict.

This study reveals the conflicts that emerge from the relationships between IT employees and internal clients in the banking sector. Using Leximancer the relational links between specific concepts were determined (Cretchley, Gallois, et al., 2010), obtaining important indicators to underpin the analysis of textual data, "from words to meaning and insight", and deriving a consistent conceptual framework (Crofts & Bisman, 2010; Smith & Humphreys, 2006). In this context, we suggest a conceptual model, grounded both in the literature review and in our findings, providing an understanding of the concepts that may affect the relationship between IT employees and internal clients, predicting possible conflicts in a sequence of IT requests and teamwork involving different departments (see Fig. 3).

Identical results were obtained in research employing quantitative techniques that relied on numerical or quantifiable data, as opposed to qualitative-methods studies, illustrating how individuals respond to a certain phenomenon. Previous studies, which focused mostly on non-banking industries, have reinforced the value of knowledge, communication, and business relationship in the

education field (Perusso et al., 2021); and knowledge, communication, and experience, in innovative teams in the oil sector (Abdulmuhsin & Tarhini, 2021). Our study differs from these not just because we employed qualitative methodologies and semantic text analysis, and because we have a detailed view of the banking industry's digital transformation, IT requirements, departmental teamwork, and employee relationships.

Another of the originalities of our study derives from the holistic understanding of the dynamics in IT department services in the banking sector considering the relationship and conflicts with IT clients. This empirical knowledge may support problem-solving interventions in conflict management, due to the identification of the main themes in which managers may focus their attention to promote a better relationship between employees, also boosting work productivity – especially in digital transformation projects. As far as we know, no other studies use Leximancer as an analytical tool to identify the main relationship conflicts between employees in the banking context – schematically summarized through concepts clustered into higher-level themes represented in a concept map (see Figs. 1 and 3).

6. Conclusions

It is unquestionable that the growing digitalization of the economy, with the emergence of new actors such as fintech, has profoundly transformed the functioning of the banking sector. Such changes were already underway before the pandemic, and they will likely accelerate in the post-pandemic period, given their influence that prevails in all (business) areas. The digital experience in financial services is characterized by the integration of services and channels. Efficiency and high quality of those services aim to provide an adequate experience to all customers – while at the same time offering personalized and customized solutions.

In the present study, we verified and analyzed the main drivers that influence work relationships between IT and non-IT employees, considering their impact on IT projects of digital transformation in the banking sector. We must note that to date few studies have been undertaken in banks regarding relationship conflicts between employees from different departments – particularly associated with the development of IT projects. We used an innovative approach inasmuch as our research: 1) emphasizes employees' experiences with IT department services; 2) is based on employees' spontaneously generated responses; 3) adopts Leximancer software for a quantitative approach to perform the content analysis of qualitative (textual) data; and 4) proposes a conceptual map, to identify and illustrate, in a graphic way, the main themes and concepts that represent the relationships during the development of software.

Our findings highlighted seven main drivers, or key factors, that may have an impact on digital transformation, namely: 1) department (especially the importance of the IT department as a central piece in internal digital transformation tasks and process); 2) lack (of cooperation); 3) communication; 4) requests (from internal clients to IT department); 5) experience (in particular from the IT employees and developers); 6) relationship (between software developers and internal clients); and 7) business. In sum, this study isolated seven themes that taken together, and in interaction, explain the influence of relationship conflict associated with poor collaboration on the digital transformation process in the banking sector: 1) departments, 2) business, 3) lack, 4) requests, 5) communication, 6) experience, and 7) relationship.

The participants related that they sometimes talked and understood each other, thereby working together successfully, but there were other times when something went awry and they felt misunderstood, failed to communicate, and/or not could not cooperate at all. They agreed that communication between IT developers and (internal) clients is not easy, mainly due to lack of spare time and adequate understanding of requirements, difficulty to express those requirements, poor dialogue, or unclear business goals, all of which resulted in project failures, deterioration of their work relationship as colleagues (and teams), and inevitably, relationship conflicts in the workplace.

The present study offers support theory for the proposed conceptual model of the main concepts that may affect the relationship between IT and non-IT employees (Fig. 3), and a preliminary theoretical basis for comparison in future research. This study differs from previous work as we focused on the key concepts that affect bank employees working in software development to succeed at digital transformation in the banking sector. Digital transformation is an imperative for banks and all the employees need to be involved. The added value of this study in the context of software development for digital transformation in the banking sector resides in the call for attention to a new relationship approach supported by employees' communication, technical experience, and business knowledge.

Researchers, company managers, IT managers, and IT organizations (in general) can benefit from our findings to promote better collaboration and communication between teams and employees that will consequently lead to a better digital transformation process and innovation, highlighting a possible competitive advantage for banks (including the case of e-banking). Although the present study contributes a new conceptual model to explain the main concepts that may affect the relationship between IT and non-IT employees, it also offers valuable insights into banks' digital transformation strategies. We admit the limitations of our research since the exploratory sample is composed mainly of customers/participants of Portuguese banks, which hinders the generalizability of the findings to other geographical and industry contexts. The combination of keywords and concepts might also be insufficient to fully capture the main drivers influencing IT and non-IT employees' relationships.

In addition, we cannot be sure that our sample of persons working in a traditional finance setting, given the age of the participants, might prevent our results from being generalizable to more modern fintech firms, or younger firms. Future research can focus on financial Institutions in other geographic regions, including more participants and, as a result, larger data sets for statistical analyses. Future studies can also explore employee relationships considering the new remote work paradigm in the finance context.

Data availability

Data will be made available on request.

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