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**Is the organizational performance impacted by  
the usage of collaborative platforms in the  
company?**

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# **IS THE ORGANIZATIONAL PERFORMANCE IMPACTED BY THE USAGE OF COLLABORATIVE PLATFORMS IN THE COMPANY?**

by

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Dissertation presented as partial requirement for obtaining the Master's degree in Information Management, with a specialization in Information systems and technology management.

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## PUBLICATIONS

*“Analysis of the impact of collaborative platforms on the organizational performance” Submitted to a journal of quartile one of Scimago index*

Here below it is presented the abstract written for the submission to a journal of quartile one of Scimago index:

“The present study investigates the impact that collaborative platforms have on the organizational performance. This topic is analyzed through the lens of the task-technology fit model, with the addition of the organizational performance variable. By distributing a questionnaire among workers in various environments, we want to test if the company is affected by how employees use and interact with collaborative tools. Based on 302 responses, the analysis shows a strong correlation between how individuals use and collaborate through groupware and the organizational performance. Taking in consideration the given results and the evaluated responses, it is possible to state that collaborative platforms heavily affect the performance of the whole firm.”

## **ABSTRACT**

The present research analyses how collaborative platforms can have an impact on the organizational performance. In order to investigate the previously mentioned topic, the task-technology fit model was introduced. The organizational performance variable was then added to the model proposed by Goodhue & Thompson in 1995 to add completion to the study. A questionnaire was distributed among professionals in different companies to try to understand their perception regarding collaborative platforms and to test if the organization could be affected by the use that employees do of groupware. by analyzing 302 responses, a strong correlation between how individuals utilize collaborative platforms and how the organization performs. Therefore, after evaluating the given results and responses, it is possible to say that groupware have a great impact on the organizational performance.

## **KEYWORDS**

Collaborative platforms; Organizational performance; Individual performance; Company; Use; TTF.

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## LIST OF ABBREVIATIONS AND ACRONYMS

<b>TTF</b>	Task-technology fit.
<b>IS</b>	Information systems.
<b>IT</b>	Information technology.
<b>ICT</b>	Information and communication technology.
<b>CIC</b>	Collaborative innovation capability.
<b>GDSS</b>	Group decision support systems.
<b>GSS</b>	Group support systems.
<b>PLS-SEM</b>	Partial least squares structural equation modeling.
<b>AVE</b>	Average variance extracted.
<b>HIS</b>	Hotel information system.
<b>TPB</b>	Theory of planned behavior.
<b>IoT</b>	Internet of things.

## 1. INTRODUCTION

Over the last few years, how employees collaborate and communicate with each other, share information and knowledge in the company, and complete tasks, has significantly evolved. As a matter of fact, because the business environment is constantly progressing, new technologies are implemented to achieve and maintain competitive advantage, enhance the overall productivity, and flourish in today's dynamic market (Yunis et al., 2018). By introducing information and communication technologies (ICT) increasing spread of the digital transformation trend, users come to terms with how technology has shaped the way we interact. In this circumstances, collaborative platforms gain great importance. They are considered to be a peculiar kind of software, or rather groupware, that can be considered a strategic asset for companies to boost cooperation, communication, and information exchange (García-Sánchez et al., 2018). Collaborative platforms offer firms a software package that enable the creation of a virtual workspace (Paz, 2020) in which tools and resources are centralized to enable communication and interaction between all the participants. Groupware provides its users the ability to access information and tools for collaboration and, most importantly, they increase the cooperation among individuals (Dahiru Haruna & Mohammed, 2015). Collaborative tools aim to make personnel capable of working better within the organization and streamline projects, making their completion more efficient. Such platforms are considered to be an innovative solution for companies that want to improve their productivity and enhance their employees' performance. The mentioned application is characterized by tools to monitor activities, manage staff and resources, and a document repository. Indeed, the platforms provided are a specific sort of technology that allows organizations to have business processes run faster and more efficiently.

In recent years, it was possible to observe the growth of digital environments that promote the rise of a new digital technology, ICT. This kind of applications allow people to be always interconnected and share information and knowledge better than before (Dávideková & Hvorecký, 2017). By adopting this new way of working and collaborating, daily routines and tasks experienced a dramatic evolution (Jorgenson & Vu, 2016). Beyond the fact that ICT erases spatial distances, it facilitate the storage of large volumes of data, reduce time for the execution of tasks, improve collaboration among individuals, and enhance the way information is exchanged around the globe (Dávideková & Hvorecký, 2017). All of the above mentioned characteristics of ICT are critical strategic assets for companies. In fact, because these "powerful tools are fostering the inter- and intra-enterprise collaboration" (Urikova & Greguš, 2014), they are considered to be important aids for businesses that have the objective of gaining competitive advantage and economic growth in the long run.

The evolution of collaborative tools has gone through different stages (Turban et al., 2011). Between 1980 and 1990, group decision support systems (GDSS) or group support systems (GSS) were introduced to ameliorate the overall team's productivity. Tools that were first proposed during these years, allowed individuals to exchange needed data and the ones that were most implemented were email, teleconference, and shared screens. It was understood that collaborating and sharing data through this software at that time was difficult and information was mostly fragmented. There was a consistent waste of time and inefficiencies, and the consequence was a poor management of knowledge circulating across the company (Turban et al., 2011). Collaboration between team members was limited. However, users had the need to participate actively to the development of ideas by sharing what they knew, their opinions, and experiences (Dávideková & Hvorecký, 2017). What

companies require is a platform where team members can cooperate and handle their tasks in an interconnected way. This would allow the creation of a pool of resources that are managed and redistributed by the group itself in a common environment (Fisher et al., 1997). The demand of an improved software to overcome the previously mentioned issues was increasing and so Web 2.0-based social software were developed. This kind of tools aimed at enhancing the efficiency and effectiveness of group decision-making processes (Turban et al., 2011). As groupware continuously evolved, virtual teams progressively became more common in companies. As a matter of fact, researchers started to describe team's virtualization as "the degree in which the team members combine their virtual presence with the exploitation of communication via technology" (Dávideková & Hvorecký, 2017). It resulted in an increased use of applications and devices that made virtual collaboration a reality, connecting individuals that were physically distant, but still needed to communicate and work together. Collaboration has become crucial for organizations that want to maintain their competitiveness. Therefore, companies that wanted to improve their efficiency and effectiveness started promoting teams so to keep up with a new demanding marketplace (Fisher et al., 1997). The implementation of collaborative platforms is an essential step for those who want to keep up with the fast pace set by the 4th industrial revolution.

In recent times, the development of collaborative tools experienced a new boost. There has been a significant increase of virtual work environments due to the ongoing pandemic. Organizations, that previously had few employees working remotely, now are faced with the issue of managing the whole personnel from afar (Newman & Ford, 2021). Therefore, firms have found themselves in need of implementing suitable technologies to give their employees the opportunity to perform their daily tasks from home and maintain the usual productivity (Waizenegger et al., 2020). The new working environment created by Covid-19 gives researchers the possibility to investigate how technological tools can come in help and be leveraged by teams to overcome the issues caused by remote work (Waizenegger et al., 2020). As aforementioned, collaborative platforms played an important role in the organization even before the pandemic, by defining working teams that hugely relied on collaboration and communication to achieve business objectives. The fact that now many companies are virtually based, fosters the exploitation of technologies and collaborative tools that before were not utilized to their full potential.

During the development of this research, it will be investigated how people use collaborative platforms to execute everyday tasks and business processes. It will be analyzed how these tools can enhance the individual performance. Hence, defining what are the improvements they could bring to the individual, it will also be possible to define if they have an impact on the organization's productivity. By analyzing collaborative tools and how employees use them to achieve their business objectives, the research's intention is to provide the reader with a clear understanding of collaboration technologies and how organizations can choose the perfect tool to implement, based on users' preferences and expectations. The goal of the current study is to inform readers on the potential of collaborative platforms and what they can bring to the organization. The research wants to present a complete overview of the benefits that collaborative tools can bring to companies, so to help them maintain their competitive advantage. Readers can be inspired from this paper to implement new technologies that support the enhancement of their work performance and allows them able to complete business processes more efficiently. Groupware can be a very powerful tool for companies, provided that they are correctly harmonized with the already existing technology and their characteristics fit with the business processes that need to be executed.

The present paper contains several sections. The following paragraph defines the literature review and the hypotheses to be tested. Subsequently the adopted methodology is presented, so to determine the quantitative bases of the topic and, after this section is completed, the results of the study are shown, analyzed, and discussed. In addition, the reader is presented with a final summary of the study, mentioning the limitations that the research carries with it and recommended suggestions concerning further areas of study that could be explored in the future.

## 2. LITERATURE REVIEW

### 2.1. COLLABORATIVE PLATFORMS

Often, when talking about collaboration technology, people refer to platforms, software, or services that help individuals set in remote locations around the globe to communicate and collaborate in a reliable and self-contained environment. Now firms are rapidly changing their organizational structure and operational processes, determining a shift in the tasks' requirements. Business processes are becoming more cognitively complex, team-work-based, and highly dependent on social interactions and skills (Yang et al., 2017). Therefore, the continuous progress towards a virtually working environment is occurring. In this new context, collaborative platforms are able to bring new interesting devices and instruments that can help users work better together and reach set goals.

Dahiru Haruna and Mohammed (2015) investigated the linkage between collaborative software and organizations. They analyzed how these tools could create a social network where knowledge is shared to increase a company's productivity. The authors defined groupware as a tool designed to ameliorate communication among team members and coordinate tasks, so to simplify the execution of activities (Dahiru Haruna & Mohammed, 2015). Extensive research has been done in companies revealing that there is a strong relationship between the collaborative technology implemented in a firm and its performance. However, it is to notice that groupware are not able to contribute significantly to the performance or the competitive advantage of a company if they are not correctly integrated (Yunis et al., 2018). Thus, collaborative platforms positively influence the firm's performance if they are investigated through the lens of the use variable. In fact, how individuals utilize collaborative tools, affect the efficiency and the ability to innovate of a company (Yunis et al., 2018). Yunis et al. (2018) explored how ICT could affect the organizational performance in terms of the dynamic capabilities of a company. They investigated the relationship between the adoption of a particular technology and the company's performance, by introducing innovation as a factor that has great influence on the implementation of ICT. Choosing a collaborative platform is the best solution for an organization that commits to enhance team's productivity and collaboration's efforts (Wahl & Kitchel, 2016). As a matter of fact, many authors investigated different types of technologies that allow digital collaboration across the organization and support the execution of business processes. Wahl and Kitchel (2016) put to comparison internet-based collaboration tools by reviewing 33 publications and other sources, in order to understand how collaborative relationships are mutating and which technology is more implemented in companies to sustain a digital transformation. Collaboration becomes a key factor for firms that seek to maintain their competitive advantage on the market and decide to rely on innovation to do so (Onyechi & Abeysinghe, 2009). Onyechi and Abeysinghe (2009) investigated how the adoption of new technologies, and in particular collaboration tools, is used in the organization as a strategic mean to better customer satisfaction and improve working practices. Moreover, digital tools have become fundamental for organizational change, by making knowledge and communication their main force of transformation and improvement (Michaelides et al., 2013). Michaelides et al. (2013) analyzed how companies interact in a network and how collaborative technologies could help the coordination of activities and resources. The principal objective of the current research was to understand how knowledge and information flow between all the participants of the network and how collaborative platforms can enhance communication and the business processes of each company. Groupware have become an essential strategic asset for organizations, both in the context of networks and internally.

In fact, in recent times, collaborative platforms are more frequently associated with the concept of governance (Ansell & Gash, 2018). Ansell and Gash (2018) suggested that it is possible to identify collaborative technology as a strategic policy instrument. Starting from the concept of collaborative governance, the authors tried to understand if it was possible to scale-up collaborative platforms, so to exploit them to their full potential.

## **2.2. TASK-TECHNOLOGY FIT MODEL AND HYPOTHESES**

The focus of this study is to measure and evaluate if collaborative platforms are a technology that is “fit” to support the completion of an individual’s tasks and if the connection between the usage of a particular technology and the performance exists. Therefore, to understand what was previously mentioned, the task-technology fit (TTF) model designed by Goodhue & Thompson (1995) is introduced. Task-technology fit theory conceptualizes that “information technology (IT) is more likely to have a positive impact on individual performance and be used if the capabilities of the IT match the tasks that the user must perform” (Goodhue & Thompson, 1995). The proposed model is particularly significant to understand and predict how a certain technology is used in the organization’s context (D’Ambra et al., 2013). Goodhue and Thompson (1995) state that a greater match between tasks characteristics and technology characteristics determines a greater impact on the performance. The most important implication of this model is the correlation that identifies between the technology in use and the performance, besides giving insights on how TTF can be a determinant factor in the acquisition of the technology (Kim et al., 2010). Task-technology fit model is composed by five constructs: task characteristics, technology characteristics, TTF, use, and individual performance. A task can be defined as the actions that an individual does to transform specific inputs in outputs with added value (Goodhue & Thompson, 1995). In this context, tasks characteristics refer to those actions that are performed with the aid of a certain technology (D’Ambra et al., 2013). Technology indicates tools (ex. hardware, software, data, etc.) that an individual might utilize to perform his/her daily tasks (D’Ambra et al., 2013). It is necessary to thoroughly consider what an individual might need in order to adopt the right technology (D’Ambra et al., 2013). Thus, the technology characteristics variable refers to all the features that a tool must have to match the task characteristics. The TTF construct indicates exactly the match existing between the technology and the task that an individual must perform. Moreover, to evaluate the impacts of TTF on the performance, defining the use variable is necessary, since how an individual utilizes a certain technology to perform everyday tasks greatly affects his/her performance (Goodhue & Thompson, 1995). How individuals interact with a given technology is taken in great consideration so to understand if the implemented tools are appropriate for the tasks that need to be executed. Each variable previously mentioned, have an impact on the performance. With the term performance Goodhue & Thompson (1995) refer to the accomplishment of a number of tasks by an individual. Moreover, it is possible to have high levels of performance if the person that utilizes the IT is satisfied with it and if the levels of TTF are high (D’Ambra et al., 2013).

The task-technology fit model is commonly applied in research when evaluating the impact that IT has on the performance. In the state of knowledge, the TTF theory was utilized by many authors, and it is still relevant for those researchers that want to investigate the impacts on the performance based on technology and tasks’ characteristic. The model has been actively researched and investigated taking in consideration different information systems (Aljukhadar et al., 2014). Kim et al. (2010) decided to

examine, through the lens of TTF combined with the technology acceptance model (TAM), hotel information systems (HIS) and how users' needs and perceptions influence the usage of the system. Yu & Yu (2010) utilized TTF to predict how online learning systems are utilized. The authors integrated the TTF model and the theory of planned behavior (TPB) to fully grasp how the electronic media learning environment has evolved through the years and how individuals are reacting to the change. Furthermore, TTF has been utilized in research to validate obtained results, as it was done by Sinha et al. (2019) that wanted to analyze the impact that internet of things (IoT) has on disaster management. The study proposes an IoT solution that is capable of determining what is necessary to plan a rescue operation in case of natural disasters (Sinha et al., 2019). In addition to the previously mentioned studies, the TTF model has been applied to different papers that investigated, for example, learning managing systems (LMSs) supporting tasks in universities (McGill & Klobas, 2009), group support systems (GSS) designed to help problem-solving in group meetings (Zigurs & Buckland, 1998), and the effectiveness of virtual collaboration by evaluating the alignment between tasks and collaboration tools (Yang et al., 2017).

As previously stated, the TTF model can be used in combination with other research models, so to add completion and a broader view to the investigation. TAM is an example of construct that can be incorporated with TTF because it specifies the use variable, introducing the "perceived ease of use", "perceived usefulness", and "intention of use" constructs that are considered to be key factors for the users' acceptance of a technology (Kim et al., 2010). TAM was first developed by Davis (1987) for the IS research field and evaluates the connection that there is between beliefs and perceptions and the actual usage of the IT. Both TAM and TTF present a similar perspective on utilization behavior and, if integrated correctly, they could offer an insightful outlook on how users envision and choose IT (Dishaw & Strong, 1999). In the journal article elaborated by Chen (2019), the TAM-TTF model is further extended with the addition of the "perception" variable. The researcher wanted to understand how individuals perceive the value of a given technology and what are the factors that make them adopt certain tools. The perceived usefulness and perceived ease of use was discovered to deeply affect users' IT adoption (Chen, 2019). With the combination of TAM and TTF, the psychological factor is introduced in the discussion regarding the adoption of technologies and their implementation in a company (Schepers & Wetzels, 2007).

With the aim of adding insightful point of views regarding collaborative platforms, the proposed research has introduced the task-technology fit model. The organizational performance variable is added to the model proposed by Goodhue & Thompson (1995), with the intention to add completion to the research. The goal is to analyze if collaborative platforms can have an impact on the organizational performance and if the chosen technology is fit for the tasks and business processes that individuals must perform.

Following the evaluation of the research model that will be used to conduct this study, it is necessary to define the hypotheses that will be tested:

**H1.** Task characteristics influence task-technology fit.

**H2.** Technology characteristics of collaborative platforms influence task-technology fit.

**H3.** TTF of collaborative platforms has a positive impact on the individual performance.

**H4.** TTF of collaborative platforms has a positive impact on the use.

**H5.** The use of collaborative platforms positively influences their individual performance.

### **2.3. ORGANIZATIONAL PERFORMANCE**

Following the definition of the TTF model, here it is presented an expanded view of the IS success theory, by introducing the organizational performance dependent variable (DeLone & McLean, 1992). Notably, Jenster (1986) defined nonfinancial measures, as productivity or innovation, to analyse the success of information technology in a company. As it was done in Jenster's research paper (1986), this study wants to investigate the success of information systems in enhancing the overall firm's performance, by using nonfinancial measures like, for example, efficiency, effectiveness, and time savings. Organizations that are capable of managing correctly their physical, human, and knowledge resources are able to achieve competitive advantage, in fact they need to correctly leverage tools that are implemented in the company to fully exploit their potential (Jacks et al., 2011). Therefore, to understand better the IT business value, it is necessary to add the organizational performance variable to the TTF model.

The research on the organizational performance variable is vast. In fact, many authors put into question what is constituting it (Selden & Sowa, 2004). Researchers like Etzioni (1964) and Price (1972) define performance as a set of organizational goals and methodologies to achieve said goals (Selden & Sowa, 2004). The focus of their study is on internal factors that determine the way that a company achieves its proposed objectives. Furthermore, it was investigated that organizational control can be obtained with a correct management of communication systems, defined procedures and policies (Selden & Sowa, 2004). So, while there is a consistent portion of authors that believe that organizational performance is influenced in large part by factors internal the firm, there is also a group of scholars, as Seashore & Yuchtman (1967), that believe that, in order to develop the performance criteria, they should analyse external factors. Seashore & Yuchtman (1967) proposed that a company can gain competitive advantage if it can correctly exploit the resources of the environment. Similarly, Selden & Sowa (2004) state that the major indicator of performance for a firm is its ability to maintain enough resources to survive and compete in the market. In light of what was said until now, the organizational performance can be measured by taking in consideration multiple factors, both internal and external the organization, but in this paper performance consists in the alignment of resources and knowledge used to gain competitive advantage and respond to external changes (Tvorik & McGivern, 1996). Moreover, how a firm leverages its pool of resources is determinant in the achievement of important gains in terms of performance and of competitive advantage (Tvorik & McGivern, 1996).

Damapanpour, F; Sabat, K.A.; & Evan (1989) investigated the correlation between technical innovation and organizational performance. The authors stated that the implementation of an innovative technical tool can be one of the primary causes of the enhancement of organizational effectiveness. However, Damapanpour, F; Sabat, K.A.; & Evan (1989) wanted to clarify in their discussion that it is not only the technical innovation that brings a positive influence to the company, but it's also how the technical innovation is used and managed that is a determinant factor for the performance.

It is possible to define the below mentioned hypotheses, after determining that the organizational performance can be influenced by innovative tools that are implemented in a company and how these tools are then used by the staff.

**H6.** How collaborative platforms are used in the organization has a positive impact on the organizational performance.

**H7.** How individuals perform is positively correlated to the organizational performance.

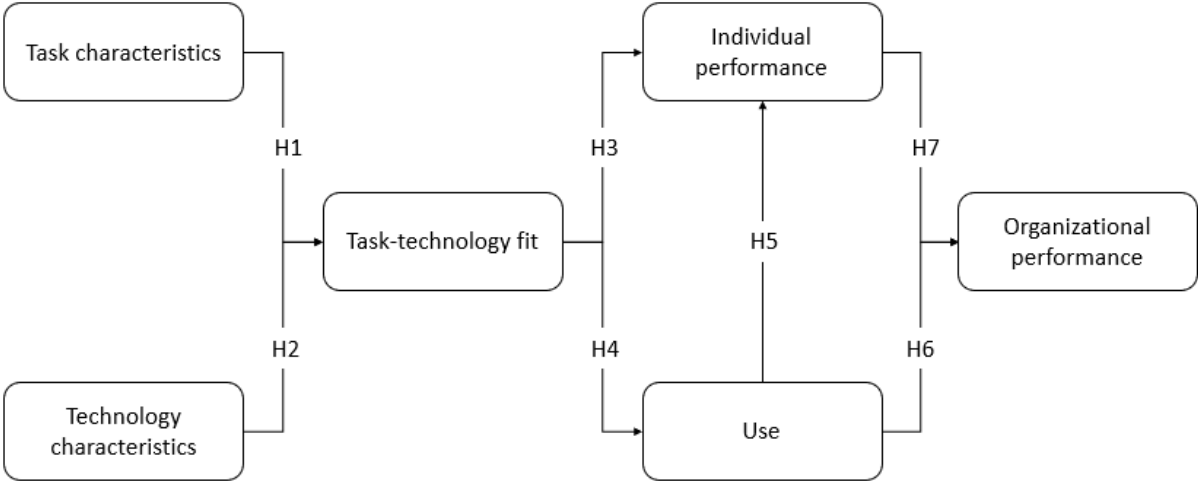


Figure 1 – TTF model with the addition of the organizational performance dimension (Goodhue & Thompson, 1995).

### 3. METHODOLOGY

#### 3.1. MEASUREMENT

Data was gathered using a questionnaire which was directed to a broad pool of people. Everyone who was currently working or had worked in a company where collaborative platforms or any kind of collaboration tool are utilized, was involved. As a result of the ongoing pandemic, many workers have found themselves operating from home and organizations had to comply with the new business needs that recently surfaced, providing collaborative tools so their employees could continue to carry out their daily tasks. Moreover, before distributing the questionnaire, a pilot version of the survey was proposed to 30 individuals. This step was necessary to determine if the presented questions were sufficiently clear and if respondents would have been able to easily comprehend all the constructs. The proposed survey was initially developed in English and, consequently, translated in Italian. All questions were translated in Italian and then back to English to make sure that the translation was consistent and understandable (Richard W. Brislin, 1970). All the items presented in Table 1, were utilized for measurement purposes. The task characteristics construct was adapted from Park (2019), the technology characteristics construct from Rahi et al. (2020), the task-technology fit one from Lin and Huang (2008), and lastly the individual performance, use, and organizational performance constructs were defined based on Urbach et al. (2010). All the items present some modifications to fit the scope of the research. The constructs mentioned in Table 1 were estimated using a numerical scale that ranges from “strongly disagree” (1) to “strongly agree” (7), so to define a strong scoring system. The survey was live from February 2021 to March 2021 and a total of 302 responses were collected. Respondents answered the survey from different parts of the world, because it was distributed via social networks and email to a vast network of people. The questionnaire was posted on different social network groups where professionals exchanged tips and ideas regarding popular collaborative platforms (ex. Microsoft Teams and Salesforce). The questionnaire’s link was proposed to approximately 1000 people, with a complete introduction to the study they were taking part in and a brief explanation of the concept of collaborative platforms and their purpose. While examining all the received responses, almost 150 responses were deleted because of incompleteness, therefore leaving 302 effective and complete answers to analyze.

Table 1 – Items.

Constructs	Items	Adapted from
Task Characteristics	TAC1 – I have to collaborate with others in my work. TAC2 – My work is dependent on receiving accurate information from others. TAC3 – My work requires frequent coordination with the efforts of others.	(Park, 2019)
Technology Characteristics	TECHC1 – Collaborative platforms provide a quick service. TECHC2 – Collaborative platforms provide ubiquitous services. TECHC3 – Collaborative platforms provide secure services.	(Rahi et al., 2020)

Task- Technology Fit	<p>TTF1 – The functionalities of collaborative platforms are very adequate.</p> <p>TTF2 – The functionalities of collaborative platforms are very appropriate.</p> <p>TTF3 – The functionalities of collaborative platforms are very useful.</p> <p>TTF4 – The functionalities of collaborative platforms are very compatible with my tasks.</p> <p>TTF5 – The functionalities of collaborative platforms made my tasks very easy.</p> <p>TTF6 – In general, the functionalities of collaborative platforms were best fit for my tasks.</p>	(Lin & Huang, 2008)
Individual Performance	<p>INDP1 – Collaborative platforms enable me to accomplish tasks more quickly.</p> <p>INDP2 – Collaborative platforms improve my job performance.</p> <p>INDP3 – Collaborative platforms increase my productivity.</p> <p>INDP4 – Collaborative platforms enhance my job effectiveness.</p> <p>INDP5 – Collaborative platforms make it easier to accomplish tasks.</p> <p>INDP6 – Collaborative platforms are useful for my job.</p>	(Urbach et al., 2010)
Use	<p>USE1 – I can retrieve information on collaborative platforms.</p> <p>USE2 – I can share information on collaborative platforms.</p> <p>USE3 – I can communicate with colleagues on collaborative platforms.</p> <p>USE4 – I can store and share documents on collaborative platforms.</p> <p>USE5 – I can network with colleagues on collaborative platforms.</p> <p>USE6 – I can execute work processes on collaborative platforms.</p>	(Urbach et al., 2010)
Organizational Performance	<p>ORGP1 – Collaborative platforms have helped my organization improve the efficiency of internal operations.</p> <p>ORGP2 – Collaborative platforms have helped my organization improve the quality of working results.</p> <p>ORGP3 – Collaborative platforms have helped my organization enhance and improve coordination within the organization.</p> <p>ORGP4 – Collaborative platforms have helped my organization enhance and improve collaboration within the organization.</p> <p>ORGP5 – Collaborative platforms have helped my organization make itself an overall success.</p>	(Urbach et al., 2010)

### 3.2. DATA

Table 2 presents the demographic characteristics of all the respondents. The analysis indicated that 66% of the sample were females and 60% of all the responses were from people under 25 years old, this is because the survey was also distributed to university students both in Portugal and Italy. The majority of the respondents completed a bachelor's degree (43%) or a master's degree (30%). For what concerns the employment status of the participants, it is possible to notice that the preponderance is currently working, but there is not a prevalence regarding the company's dimension. 58% of the respondents said that the organization where they are employed is located only in the country they are currently working in. To analyze survey's data, the common method bias was examined by using Harman's one factor test (Podsakoff et al., 2003). The previously mentioned test did not detect significant common method bias in the dataset. Moreover, it was employed the marker variable technique to test for common method bias (Lindell & Whitney, 2001; Malhotra et al., 2006). Taking in consideration the proposed dataset, no significant common method bias was found.

Table 2 – Sample Characteristics.

Distribution (n=302)					
<i>Gender</i>			<i>Education</i>		
Female	199	66%	High School Graduate	58	19%
Male	103	34%	Bachelor's degree	129	43%
			Master's degree	91	30%
			Doctorate	11	4%
			Professional degree	5	2%
			Other	8	3%
<i>Age</i>			<i>Employment status</i>		
<= 25	181	60%	Full-time	112	37%
26-30	46	15%	Part-time	64	21%
31-35	23	8%	Inter	33	11%
36-40	13	4%	Seeking opportunities	30	10%
41-50	12	4%	Retired	2	1%
>50	27	9%	Self-employed	16	5%
			Unemployed	16	5%
			Student	19	6%
			Other	10	3%
<i>Company's dimension</i>			<i>Company's location</i>		
Micro	76	25%	We are well represented around the globe.	71	24%
Small	73	24%	It has different locations around the globe, but not in many countries.	36	12%
Medium	47	16%	In another couple of offices across the continent.	19	6%
Large	106	35%	Only in the country I'm currently working.	176	58%

## 4. RESULTS

Data was analyzed applying the partial least squares structural equation modelling (PLS-SEM) via the SmartPLS 3.2.7 software. The proposed method of analysis, provides a coherent and logical system to process and investigate data previously collected, based on data requirements, model complexity and relationship specifications (Cepeda-Carrion et al., 2019). "PLS-SEM estimates partial model structures by combining principal components analysis with ordinary least squares regressions" (Cepeda-Carrion et al., 2019).

With the aim of evaluating the PLS-SEM results, the measurement model and the structural model were analyzed. The first step consists in the estimation of the measurement model through internal consistency, convergent validity, and discriminant validity. Consequently, the structural model was assessed following the standard guidelines provided by Sarstedt et al. (2017), and testing the formulated hypotheses and tackling the relationships among the latent variables (Sarstedt et al., 2017).

### 4.1. MEASUREMENT MODEL

The tables presented below (Table 3, Table 4, Table 5), show the results obtained for the analysis of the measurement model.

To begin, the indicator loading should be assessed. Loadings that present a value over .708 are preferable, because they show that the construct represents more than the 50% of the indicator's variance, so giving an acceptable item reliability (Hair et al., 2019). Based on what was previously stated, every item meets the requirements and the loadings (in bold) register values greater than their cross loadings (Table 3). Following this estimation, the internal consistency reliability needs to be assessed. In the evaluation of the mentioned factor, two measures are taken in consideration: composite reliability and Cronbach's alpha. Items that show values of composite reliability between .7 and .9 are "satisfactory to good" (Hair et al., 2019) and, in the presented case, all constructs meet the requirements. For what concerns the Cronbach's alpha measure, all items must propose values that are above .7, as it is in this study. Continuing with the estimation of the measurement model, the convergent validity of the constructs must be analyzed. Convergent validity is the degree to which each construct is connected so to explain the variance of its items (Hair et al., 2019). The average variance extracted (AVE) is the metric that is used in this case. AVE is valuable if it is .5 or above, so to explain minimum the 50% of the variance of items (Hair et al., 2019). In the proposed case, the items respect the given demand. The last step in the evaluation of the measurement model is the analysis of the discriminant validity, that is the degree to which a particular item is empirically separated from other items in the structural model (Hair et al., 2019). In this respect, loadings must be greater than cross loadings, the square root of AVE must have values bigger than the correlation constructs and heterotrait-monotrait ratio (HTMT) must be less than .9. It is possible to say that all the items presented in this study meet the proposed requirements.

Table 3 - PLS loadings and cross-loading.

Constructs		TASK	TECH	TTF	USE	INDP	ORGP
Task	TASK1	<b>.862</b>	.456	.459	.424	.422	.343
characteristics	TASK2	<b>.839</b>	.477	.402	.418	.338	.323
	TASK3	<b>.888</b>	.458	.439	.499	.417	.390
Technology	TECH1	.528	<b>.877</b>	.680	.639	.555	.483
characteristics	TECH2	.423	<b>.845</b>	.536	.476	.411	.340
	TECH3	.378	<b>.784</b>	.552	.509	.422	.383
Task-technology fit	TTF1	.451	.661	<b>.831</b>	.597	.589	.487
	TTF2	.402	.637	<b>.826</b>	.618	.545	.495
	TTF3	.457	.656	<b>.810</b>	.670	.545	.493
	TTF4	.464	.583	<b>.883</b>	.652	.691	.552
	TTF5	.378	.524	<b>.837</b>	.600	.765	.614
	TTF6	.379	.528	<b>.844</b>	.599	.756	.618
Use	USE1	.447	.542	.624	<b>.821</b>	.629	.512
	USE2	.505	.608	.661	<b>.864</b>	.571	.505
	USE3	.447	.597	.649	<b>.817</b>	.536	.494
	USE4	.381	.527	.551	<b>.824</b>	.546	.479
	USE5	.406	.506	.585	<b>.804</b>	.580	.555
	USE6	.354	.436	.574	<b>.781</b>	.611	.573
Individual performance	INDP1	.432	.542	.730	.633	<b>.876</b>	.617
	INDP2	.386	.484	.665	.625	<b>.902</b>	.654
	INDP3	.380	.465	.662	.587	<b>.897</b>	.647
	INDP4	.344	.423	.638	.554	<b>.893</b>	.659
	INDP5	.413	.515	.685	.665	<b>.900</b>	.683
	INDP6	.467	.546	.736	.695	<b>.850</b>	.638
Organizational performance	ORGP1	.388	.479	.602	.605	.652	<b>.893</b>
	ORGP2	.397	.426	.570	.566	.679	<b>.918</b>
	ORGP3	.349	.470	.605	.595	.679	<b>.912</b>
	ORGP4	.378	.437	.596	.583	.661	<b>.914</b>
	ORGP5	.330	.383	.555	.521	.638	<b>.878</b>

Table 4 - Means, standard deviations, correlations, and reliability and validity measures (CR, CA, and AVE) of latent variables.

Constructs	Mean	SD	CA	CR	TASK	TECH	TTF	USE	INDP	ORGP
TASK	5.488	1.339	.830	.898	<b>.864</b>					
TECH	5.286	1.156	.785	.874	.536	<b>.836</b>				
TTF	5.131	1.160	.916	.934	.503	.712	<b>.839</b>			
USE	5.415	1.222	.902	.924	.518	.655	.743	<b>.819</b>		
INDP	4.949	1.353	.945	.957	.457	.561	.775	.708	<b>.887</b>	
ORGP	4.854	1.413	.943	.957	.408	.487	.648	.636	.733	<b>.903</b>

Table 5 - Heterotrait-Monotrait Ratio of correlations (HTMT).

Constructs	TASK	TECH	TTF	USE	INDP	ORGP
TASK						
TECH	.658					
TTF	.576	.833				
USE	.598	.769	.816			
INDP	.512	.641	.830	.764		
ORGP	.460	.558	.697	.688	.776	

## 4.2. STRUCTURAL MODEL

Following the definition of the measurement model, the PLS-SEM analysis contemplates the definition of the structural model. At this point the examination is focused on verifying if there are problems regarding a potential collinearity among the constructs. The criteria used in this process are the coefficient of determination ( $R^2$ ) and the path coefficients (Sarstedt et al., 2017). "Computation of the path coefficients linking the constructs is based on a series of regression analyses" (Sarstedt et al., 2017). Because of this, it must be established that collinearity issues are not biasing the regression results (Sarstedt et al., 2017). VIF values need to be evaluated in this case, thus they should be lower than 5 to avoid issues, as it is in the proposed study. Because there is no issue regarding the collinearity, now it is possible to examine the  $R^2$  value.  $R^2$  measures the variance, therefore providing a measure for the model's explanatory power. If  $R^2$  presents values around 0.75, the explanatory power can be considered substantial, when values are close to 0.50, the explanatory power decreases, becoming moderate (Hair et al., 2019). As it is possible to see from the results shown in Figure 2 below, all variables have moderate explanatory power. Figure 2 - Structural model results. Figure 2 gives the reader a view of the path coefficients and t-statistics that are coming from the bootstrapping with 5,000 resamples.

The model explains 52.7% of the variation of the task-technology fit variable. Task characteristics ( $\hat{\beta} = .171$ ,  $p < .1$ ) and technology characteristics ( $\hat{\beta} = .620$ ,  $p < .001$ ) are statistically significant, meaning that both H1 and H2 are confirmed. The model explains 64% of the variation of the individual performance. Task-technology fit ( $\hat{\beta} = .555$ ,  $p < .001$ ) and use ( $\hat{\beta} = .296$ ,  $p < .001$ ) are statistically significant, supporting H3 and H5. The model explains 55.1% of the variation of use. Task-technology fit ( $\hat{\beta} = .743$ ,  $p < .001$ ) is statistically significant, confirming H4. For what concerns the organizational performance variable, it is possible to notice that it is explained the 56.5% of the variation. Therefore, the model shows that both the individual performance ( $\hat{\beta} = .568$ ,  $p < .001$ ) and the use ( $\hat{\beta} = .234$ ,  $p < .001$ ) variable have impact on the organizational performance. Based on what was previously stated, H7 and H6 are confirmed.

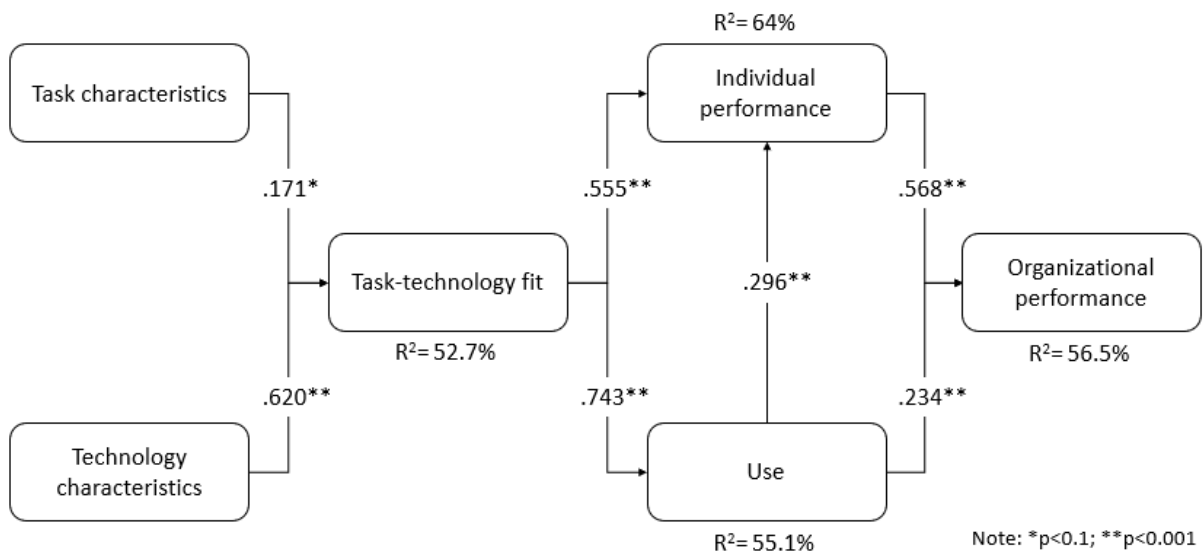


Figure 2 - Structural model results.

Notes: "bootstrapping based on 5,000 resamples"; "the variance inflation factor (VIF) is lower than 5".

## 5. DISCUSSION

The intent of the proposed investigation was to comprehend if the use of collaborative platforms can have a purposeful influence on the business' performance. By sending out a questionnaire that investigates how individuals use groupware and the benefits they can obtain from the application of these tools, the goal was to see if collaborative platforms have a positive effect on the efficiency, effectiveness, and productivity of employees and, consequently, if also the company was positively affected.

As it was previously stated, the research model that was selected for this study is the task-technology fit (TTF) model, with the incorporation of an additional variable, the organizational performance. The focus of the TTF model is the individual performance and how IT is more likely to be used if there is a match between set tasks and the technology in use (Goodhue & Thompson, 1995). It was decided to incorporate the organizational performance variable with TTF model because, nowadays, it is one of the most relevant constructs in management research (Richard et al., 2009). Another reason to include this variable in the present study is that it gives an interesting insight to the effects that a certain technology and collaboration among team members can produce on the company intended as a unit and not only on the single employee. All the previously stated hypotheses were confirmed and, in particular, it is possible to notice that the given results demonstrate that all the variables presented in the TTF model are ultimately affecting the organizational performance. In fact, this variable presents a  $R^2$  of .565%, meaning that the use and individual performance are significant in explaining organizational performance. Because the variation is around .50%, then circa half of the observed variation can be explained by the model's input. The reported results show important findings regarding the use that workers make of collaborative platforms. It is worth to notice that a company can be considered successful if it is able to implement and supply its employees with tools that foster a collective collaboration (Bissaliyev, 2017). How individuals employ groupware in a diversity of contexts to collaborate and cooperate with other people across the company becomes fundamental in the understanding of the impacts on the performance. In conclusion, the study shows that TTF heartily impacts the use variable, because there is the 55,1% of variation in use thus validating H4. As a matter of fact, the study states that the utilization of collaborative tools done by individuals is strongly conditioned by the existing match between the performed tasks and the used technology.

### 5.1. THEORETICAL IMPLICATIONS

The research regarding the effect of collaborative platforms on the organizational performance based on the TTF model is not yet, as of today, deeply investigated. Therefore, the aim of the proposed research is to include in the existing body of knowledge insights about how companies can enhance their productivity by implementing a specific technology. From what was stated in the literature review section following the work of Yang et al. (2017), business processes are changing and becoming more dependent on social interactions and team-work-based, creating a new virtual environment where collaboration is key. This theme was further elaborated showing that collaborative platforms generate an increase of productivity across the firm and enhance business operations (Bissaliyev, 2017). Individuals tend to perform better because they are able to access a variety of services through the platform itself that allows them to exchange data and information (Bissaliyev, 2017). The quality

of the work performed by the team, intended as a unit, can be partially explained measuring the quality of collaboration and coordination among team members (Hoegl, M., & Gemuenden, 2001). Therefore, teamwork and communication can be considered the two most important factors in the company's environment. Qin et al. (2016) affirmed that when employees recognize that the team performs qualitatively well, they tend to use more collaborative tools. The increase in usage of collaborative platforms must be sustained by a correct integration of the technology in the company. In fact, the way a IT tool is used can augment the efficiency in a firm (Yunis et al., 2018). Resuming what was studied by Dahiru Haruna & Mohammed (2015), employees are starting to heavily rely on collaborative platforms to communicate and cooperate with each other to achieve shared objectives and create business value in a more efficient manner. Thanks to this new *modus operandi* and the increased coordination of activities and resources (Michaelides et al., 2013), the individual performance has increased, time wastes are avoided, and the overall firm's productivity has improved.

The main objective of the present study is to investigate the organizational performance variable and to do so it was analysed how technologies and individuals are operating in the company. There is a stress on the word performance, that is here associated with how good a company is in leveraging its pool of resources to gain competitive advantage (Tvorik & Mcgivern, 1996). Almatrooshi et al. (2016) stated that to measure the success of a firm it is necessary to consider the organisational performance; this means that what is measured is how effective strategies and policies are implemented in order to achieve business objectives (Selden & Sowa, 2004). Therefore, it is possible to affirm that, in the information technology context, the word strategy is directly connected to the implementation and the harmonization of technologies in a company. The term performance was here introduced to try to measure the overall execution of tasks and business processes in a firm through the lens of IT. However, it is indicating a series of elements that work together to enforce the success and the effectiveness of the organization, thus the factors that have a direct and indirect impact on the overall performance are various (Almatrooshi et al., 2016). In the proposed research, it was investigated the effectiveness of the company that embodies the individual performance (Almatrooshi et al., 2016). Therefore, by analysing how individuals perform and how they use a particular technology, it was possible to understand how the organization was affected by the implementation of collaborative tools. To this end, the present study puts its focus on the effects that the usage of collaborative platforms has on the organizational performance, by thoroughly analyzing the use variable in the TTF model's structure. The TTF model was applied to this study with the addition of the organizational performance variable so to take a step further from the classic configuration of the model and analyze the company intended as an ensemble of individuals collaborating to achieve a common goal. With this introduction the aim is to add to the body of knowledge a new prospective on what are the current dynamics in a company and evaluate what a particular technology can do to amplify the potential of a firm.

## **5.2. PRACTICAL IMPLICATIONS**

The main objective of this analysis is to understand how collaborative platforms impact and enhance the overall performance of the organization. The reported results demonstrate that: the way groupware are utilized in the company can foster the organizational performance; benefits generated by collaborative tools do not come only from the adoption of the technology, but mainly from how

they are used and diffused (Yunis et al., 2018). It is fundamental for a company to seize and manage correctly the new virtual environment created by collaborative platforms, so to fully grasp their potential and benefit from their implementation (Yunis et al., 2018). It becomes necessary for managers and decision makers in a company to have a complete comprehension of the technology that they want to implement. By understanding what are the needs and necessities of the individuals that would use collaborative platforms, it is possible to better use and integrate them into the various business processes. Another key element to remember is that how an organization performs largely depends on the abilities of its managers/leaders to correctly implement a technology (Almatrooshi et al., 2016). On this note, it is also fundamental to define relevant strategies to monitor and continuously exploit the opportunities and benefits generated by collaborative platforms to maintain the obtained competitive advantage. Data from this study reveal that users tend to utilize more frequently and purposefully a technology if it supports and eases the execution of their daily tasks. If the implemented technology gives the individual the opportunity to carry on his/her activities in a better manner and with noticeable time savings, it is highly probable that it will be utilized and, consequently, it will give a significant boost to the overall productivity.

All things considered, there are noticeable practical implications both for the end user and for the executives that decide to introduce collaborative platforms in their companies. On one hand, users would profit from the introduction of collaborative tools because they will be able to constantly collaborate with their team members, information and ideas will be shared, and documents will always be available. This means that working in teams would become easier and effortless, thus acquiring important benefits as to the quality of the output and the efficiency of the business process. On the other hand, executives, and the company in general, would benefit from the introduction of this new virtual environment, because the workforce has become better off since its implementation. This effect could be explained as a sort of chain reaction, if all the members of a group have been affected by the same event and they enhanced their performance because of it, then the whole company would indirectly be influenced by the positive trend.

## 6. CONCLUSIONS

The research aimed at comprehending how collaborative platforms are used to perform business processes and how their usage can enhance the productivity and, in particular, the company's performance as a whole. Therefore, to answer the proposed research question, a model was developed. Starting from the TTF model, the organizational performance variable was added to investigate how the overall productivity was swayed by both the use of the technology and the individual performance. The model was tested by distributing the survey among workers that were familiar with collaborative platforms and could give a clear prospective on the given topic. The results confirmed the proposed hypotheses, and it was possible to observe that how individuals perform and use a technology has a great effect on the firm's performance. Therefore, starting from the match that exists between technology characteristics and the tasks that the individual must execute to achieve business objectives, the study proceeded to investigate how this could affect the performance and the use that employees make of a given technology. Following this analysis, it was possible to investigate the organization intended as a set of resources that collaborate with the purpose of reaching a common goal.

Nonetheless, the proposed research has its own limitations. The first one being that it does not take in consideration the respondents' cultural background, and another is that the internal organization of the company is not pondered. It would be interesting to analyze how individuals use a specific technology by examining their culture and their habits while collaborating and communicating with each other. For what concerns the structure of a company, it would be compelling to understand if an organization is more prone to implement a particular technology if it is used to work in cross-functional teams or individually, reporting only later the results to each manager. Although the study shows some of its inherent limitations, arguably it proposes that it proposes valuable and solid results that could be successfully incorporated in future studies to further avenues of investigation centered the topic of collaborative platforms and its many facets.

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