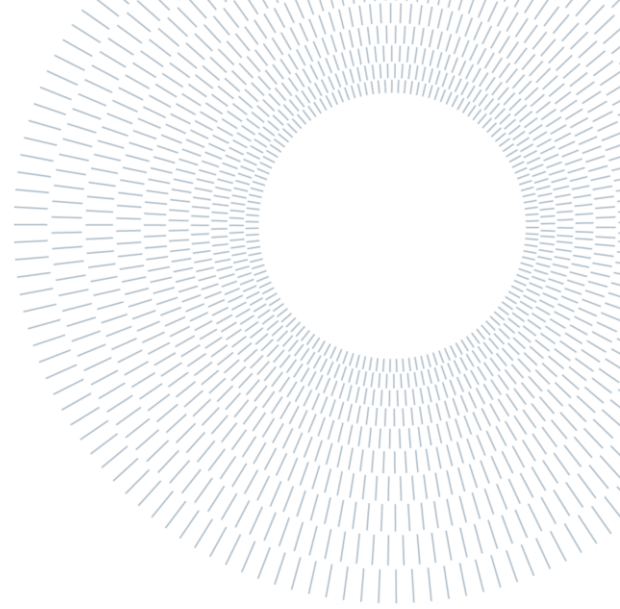




**POLITECNICO
MILANO 1863**

SCUOLA DI INGEGNERIA INDUSTRIALE
E DELL'INFORMAZIONE



EXECUTIVE SUMMARY OF THE THESIS

Public Procurement in times of Emergency: an Analysis of digitalization in Italian Public Universities

TESI MAGISTRALE IN MANAGEMENT ENGINEERING – INGEGNERIA GESTIONALE

AUTHORS: LORENZO MONTANARI, MATTEO MIGLIAVACCA

ADVISOR: TOMMASO AGASISTI

ACADEMIC YEAR: 2021-2022

1 Introduction

1.1 Research question

Our dissertation has the aim to investigate the effect that the digitalization of the procurement process of public Italian universities had in managing the disruption created by the global pandemic. In particular, through this study, we strive to give an answer to the following two research questions:

1. How did the digitalization of procurement processes of public universities affect their capability to respond to the disruption generated by an emergency situation?
2. How did the pandemic emergency have a role in the digitalization of procurement processes and activities and what are the implications of this phenomenon?

1.2 Context

The COVID-19 pandemic completely upset the way of working of every organization, public and private, but also the daily routine of people worldwide. In this scenario, universities were not only impacted on the teaching side, but most importantly on the 'back office', and in particular on the procurement stations, which, in a limited

amount of time, had to satisfy an incredible number of extraordinary requests, while working from home, that was an additional disruption.

1.3 Relevance of the study

Public procurement is one of the most relevant activities of public administration. Every year, in Europe, 250.000 public authorities spend around 14% of GDP (around €2 trillion per year) on the purchase of services, supplies and works (European Commission et al., 2016). In Italy, PAs made purchases above the European threshold for €170 billion in 2019, 9.5% of GDP, a value that doubled in the last 7 years (Agenzia Nazionale Anticorruzione, 2019). This exponential increase in the number of purchases by PAs is expected to become even more significant in the current period, given the growth in economic resources available as a result of the pandemic, contained in the national and European funds for economic recovery (PNRR and NGEU).

2 Literature review

2.1 Introduction

Mintzberg (1980) argues that the organizational design characteristics of public procurement should match both a firm's strategy and the external factors in order to guarantee a positive

impact on performances. Therefore, *Literature review* will focus on the main internal levers proposed by Patrucco et al. (2016), namely **organization** (level of centralization), **processes** (purchasing process) and **tools** (e-procurement tools and smart working) and the main external variable highlighted by Thai (2016), that is the **legal environment** (public procurement regulation), given its strong influence on the Italian public sector.

Between journal articles, books, conference papers, institutional reports, websites and laws, a total of 115 sources was cited for the elaboration of our dissertation.

2.2 Organization

Concerning organizational structure of public institutions, the main factor that was analyzed is the degree of centralization, both internal and external, of PA. The aim was to understand which models could be more flexible and provide more benefits to the procurement function during an emergency, with respect to the specific characteristics of the universities. A total of 15 papers was analyzed on this topic.

2.3 Process

For the definition of the procurement process, the model provided by The Legal Framework for Public Procurement (2020) was adopted. This model focuses on procurement of innovative solutions, which includes also sourcing of e-procurement solutions, the main topic of our study. It is a comprehensive model that ranges from pre-procurement research to management of the contract and of supplier relationship. Together with this model, 18 other sources were used to complement literature about procurement process.

2.4 Tools

2.4.1 E-Procurement

E-procurement is the greatest focus of our research between the internal levers since it is intrinsically linked to the digitalization of the procurement process. Indeed, it is the topic with the highest number of papers analyzed for the literature review (22). In particular, the sources shed light on the critical success factors to the implementation of e-procurement, highlight the benefits it brings to organizations, and define the main digital tools available on the market. Of momentous interest on the latter topic is a report issued by Osservatorio eProcurement nella PA (2006), which describes the

main e-sourcing, e-catalogue, and e-marketplace instruments.

2.4.2 Smart Working

Smart working is of strong importance as it was the main work modality adopted during the national lockdown, in order to guarantee the continuity of operation of every public institution and private company. Also in this case, the critical success factors to the implementation were defined, and it was stressed out the difference between smart working and remote working or teleworking. For this purposes, 10 papers were considered.

3 Legislation

The analysis of regulation is of great importance, since the procurement process in Italy is strongly influenced by the regulatory framework. So, in order to understand how public procurement works, it is necessary to introduce the jurisdiction that regulates its operations. In total, considering Italian laws and decrees, European Directives, and legal papers, 35 sources were considered.

4 Theoretical Framework

The purpose of the authors-made Framework, even though it was elaborated to sustain public universities through an emergency period – for which the COVID-19 emergency is used for its application – is also to be a guide to the implementation of protocols, instruments, and strategies during ordinary periods, in order to be prepared in the case of an emergency, as well as being more efficient in ordinary times.

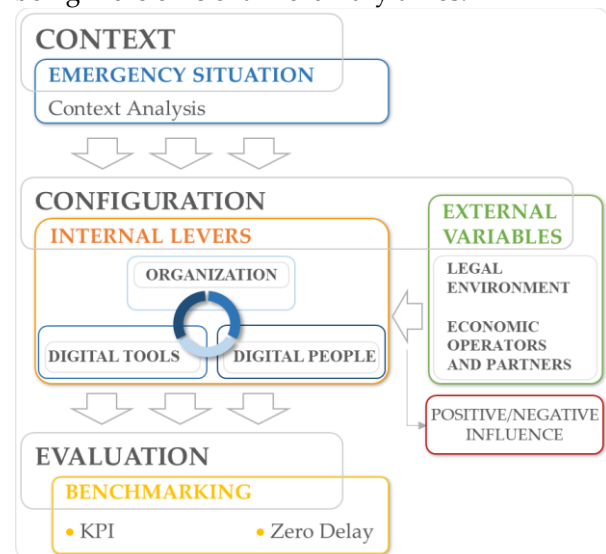


Figure 1 - Theoretical Framework

First of all, the *context* refers to the analysis of the emergency that is being faced. Indeed, understanding the main intrinsic characteristics of an emergency is necessary in order to better

evaluate the usage of internal resources and which have to be the pillars of the internal response.

Then the *configuration* is divided between the *Internal Levers*, or the internal resources that give a positive procurement outcome, and the *External Variables*, with mitigate or worsen the damages brought by an emergency. Without cooperation and coordination between internal configuration and external forces, the efficiency of an organization, analyzed through the *Evaluation* section of the Framework, will be penalized.

Internal Levers refer to the drivers analyzed in Literature review, namely the **organizational structure**, **digitalization** of the procurement process and the **human capital** involved in purchasing activities.

Regarding organization, the Framework refers to the level of centralization of procurement activities. Considering the characteristics of emergency purchases – at the outbreak, demand far exceeds supply, the price is highly volatile, and they are often purchases needed by every department in the organization – a hybrid or centralized organizational structure should provide greater benefits, since they allow for higher purchasing power, and better coordination and training of employees in a short amount of time. These models also favor coordination of people in smart working.

In order to fully exploit the advantages of smart working it is important to start a process of change management and to introduce a culture of **working by objectives**, adopting new models of leadership based on these principles: **sense of community**, **empowerment**, **flexibility**, and **virtuality** (Gangai, 2021). Work by objectives is not simply a new mechanism for controlling employees, but it has a more strategic importance: it allows the entire organization, through the analysis of objectives, to address the strategic management of the team and of individuals, going to define the priorities of intervention to improve performance.

The cardinal point for the beginning of smart working is digitalization of the process. Consequently, institutions that enter an emergency with a low level of digitalization will not be able to start smart working, but with the introduction of certain digital enablers they can ‘dab the wound’

and guarantee continuity of operations in a short amount of time. These enablers are **communication** and **cloud-storage systems**, **IT security** (VPNs and digital signature) protocols and simple **reporting systems** for work by objectives. These digital enablers allow the continuity of operations in **remote working**¹, while the full **digitalization** of the procurement process is fundamental to carry out activities in **smart working** and maintain, or even improve, the level of **efficiency** of the office. Indeed, smart working and digitalization of the processes are intrinsically linked to one another, since without digitalization, smart working is not feasible.

External variables are represented by the **legislation** in force, and the **relationships** between public entities and between public institutions and private firms. The main impact to the *internal levers* is given by the legal framework since the regulation is strongly influencing the behavior of public buyers and economic operators. Most of all it is important the digitalization of critical public national infrastructures that can provide a reduction of times to procure goods and services from the MEPA platform, which usage is compulsory for purchases above 5.000€. Indeed, between the reforms proposed by the New Code that are not yet implemented, there is the **National Database of Economic Operators**, which should replace the existing database and make background checks instantaneous. Moreover, the implementation of a **national e-procurement strategy** should be a priority to give a direction for the implementation of procurement tools and the definition of **common standards** for digital solutions (European Commission et al., 2016). Secondly, relationships with other public organizations and private partners is essential to share knowledge about a possible emergency as well as to share best practices for acting during an emergency and to use digital tools to solve issues. Lastly, *evaluation* should be used to keep track of the performances reached, by **benchmarking** with previous years **KPIs** as well as with those of other comparable public administrations, with the objectives of **minimizing delays** and interruptions in the services offered by the universities and in research activities.

¹ Remote working is based on the idea that an employee has a fixed work position different from the office and its responsibilities are transferred to this new working position, typically the employee’s home (Capoferro,

2022). It is not smart working, which implies personalization, flexibility, and virtuality of the working position and of working hours. (Capoferro, 2022)

5 Empirical analysis

5.1 Methodology

The research follows a **mixed-method** approach which combines **survey** and **case study** methodologies, since it allows to “collect a richer and stronger array of evidence than can be accomplished by any single method alone” (Yin, 2017). First, a survey was elaborated to explore the setting of the procurement process in Italian public universities and their digitalization before and during the pandemic. The survey received a response rate of 31%². Then the SIOPE database and public reports of all 67 public universities were research for quantitative and qualitative information regarding procurement during the pandemic emergency. Lastly, the more interesting universities were contacted for an interview, in order to elaborate unique case studies³.

5.2 Results

From the survey, it emerged that the majority of the respondents, independently of their size⁴, is adopting a hybrid model (11), followed by 6 implementing centralization above direct awarding threshold and 3 fully centralized. Of these three, two are small universities while one is large. The last university, medium in size, is adoption a decentralized organizational structure. As shown in Table 1 - Average variation from 2019 to 2020 of the above indicators, total costs, active suppliers and number of orders decreased due to the reduction in ordinary activities as a consequence of the global pandemic, as highlighted in the universities' reports.

	Costs	Suppliers	Orders
Variation	-8,76%	-16,83%	-16,16%

Table 1 - Average variation from 2019 to 2020 of the above indicators

In the majority of the respondents, continuity of activities (procurement, research, and didactics) was guaranteed, and only in 3 universities the delay in restarting didactics was above 2 weeks – two universities delayed of 30 and one of 60 days. Half of the sample recorded a previous experience of smart working, of which some only had experimental and limited experience in it.

Concerning digitalization of the process, Figure 2 shows that digitalization is strong only in *research of suppliers*, *managing the tendering phase* and *administrative management of the contracts*, while the

other phases are, on average, digitalized in less than 50% of the sample.

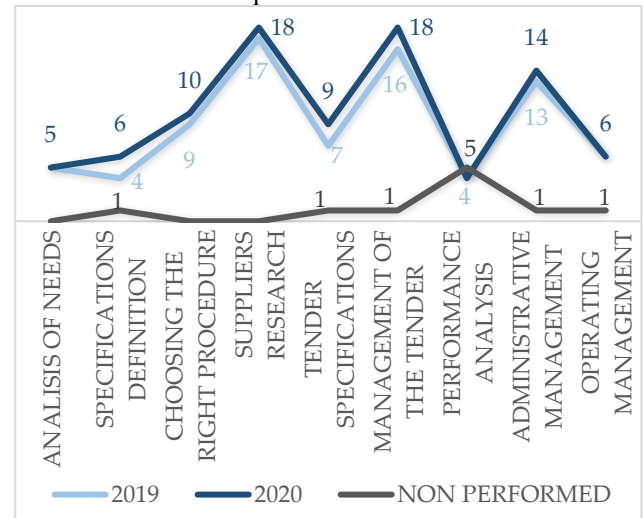


Figure 2 - Total digitalization before and during the pandemic

Considering the case studies, except for Università di Camerino, all universities adopt a centralized-above-threshold structure. Before the pandemic, Politecnico di Milano stands out for the level of digitalization, followed by Politecnico di Torino and Università di Camerino. Ca' Foscari had a medium level of digitalization, while Università di Bergamo and Università degli Studi di Bologna had only few activities digitalized.

Thanks to the cooperation with ICT services, all the universities, even the two less digitalized, managed to start working from home in less than a week, through the adoption of digital enablers that allowed external access to university resources in the case of Università di Bergamo (Remote desktop) and Università degli Studi di Bologna (VPN and digital signature).

The subjects of the cases are also in accordance that the external variables, namely the emergency decrees, did not bring a strong simplification of procurement practices as it was hoped for, but only the increase of direct awarding threshold was, for Politecnico di Milano, Università di Camerino and Università di Bergamo, of aid during the pandemic period.

5.3 Critical Analysis

Both the survey and the case studies show that hybrid and centralized above threshold models are the most used, and the most impactful in terms of flexibility they provide to the response of universities, as well as the advantages in ordinary

² 21 responding universities out of 67

³ The case studies were elaborated for the following universities: Politecnico di Milano, Politecnico di Torino, Università degli Studi di

Bergamo, Università di Camerino, Università degli Studi di Bologna, and Università Ca' Foscari

⁴ Sizes were defined based on the Censis Foundation classification

times, which also support the perspective proposed by the Theoretical Framework.

From a quantitative point of view, the clear reduction in costs, suppliers, and orders could be, for some categories of cost, reversible, for example in the case of missions (blocked due to the temporary lockdown), but could also be irreversible, like for paper usage due to the propensity towards digitalization and sustainability of processes.

As seen in *Results*, continuity of operations was guaranteed in almost all the universities thanks to the strong cooperation with ICT offices, that was necessary to implement the digital enablers discussed in the Framework. Indeed, since the most important phases of the procurement processes were already digitalized by the majority of the universities, the adoption of digital enablers, was sufficient to start remote working in a short amount of time at the beginning of the lockdown. Also, it emerged that those universities fully digitalized, like Politecnico di Milano, were able to switch to a smart working setting without great issues and with a strong level of efficiency, also thanks to previous smart working experiences.

6 Conclusion and Implications

In conclusion, through our analyses it was possible to understand that the digitalization of the Italian public universities is highly heterogeneous, and the scenarios of digitalization vary from universities that are fully digitalized to universities with the minimal, mandatory level of digitalization. Those universities completely digitalized were able to adapt to the situation by effectively and efficiently moving activities in smart working with minimal issues, while universities with a medium level of digitalization saw that the simple implementation of digital enablers allowed the whole office to work remotely with low losses in efficiency.

Secondly, in the case of low digitalization of the procurement process, it can be said that digitalization is not a route that can be walked during an emergency, but the pandemic worked as an accelerator towards digitalization of the processes. Indeed, the context of the global pandemic is very demanding on the procurement office and would not allow to focus also on the adoption of new digital platforms. What can be done is to take advantage of digital enablers. Digital enablers require low digital skills and are commonly used in day-to-day activities –

smartphones, shared folders, video chatting services – and can be used in order to allow for the continuation of activities from remote.

Managerial Implications	Policy Implications
Importance in supporting coordination (internal and external)	Legislation that give real support to procurement practitioners
Give more relevance to emergency action plans	
Change management: digital culture and digital skills	Restructuring the Public Contracts Code to speed up procurement procedures
Mapping processes and process reengineering	CPBs and central infrastructure to sustain procurement
Importance of the organizational structure	Importance of recovery funds to invest in digitalization

Table 2 - Implications

In Table 2 are presented the managerial and policy level implication of our study. At both levels, ‘**proactivity**’ should be considered a keystone.

At the **managerial level**, it is fundamental to adopt an organizational structure that is performing in ordinary times and flexible enough to react to emergencies, to redact **emergency action plans**, start a process of **change management** and raise awareness in digital tools. Change management and **digital awareness** are the first milestones to map and reengineer procurement processes for the purpose of making them fully suitable to digital platforms. All this should be done while sharing **best practices** with other departments and other public institutions, in the interest of a better public administration.

On the **policy side**, legislators should aim at providing **real simplification**, not only with emergency decrees, but also with a restructuring of the Code of Public Contracts in the optics of reducing the time to complete procedures in ordinary periods. For this purpose, it is also fundamental to **invest** in national procurement infrastructures that are touchpoints of the procurement process, such as the **national database for economic operators**.

7 Limitations and future avenues for the research

This study has three main limitations: it considers only public universities, which are more digitalized with respect to the average of PA, and it takes as an example COVID-19 for the elaboration of the Theoretical Framework, which is

a peculiar type of emergency. Also, a limitation is given by the methodology implemented. A different methodology (only qualitative or only quantitative) might provide different insights. These limitations can become a starting point for future studies since researchers should be encouraged to use our Framework to explore different contexts and verify its applicability.

8 Bibliography

- Action 4 - The legal framework of responsible and innovative procurement put into practice.* (2020, May 8). Retrieved from European Commission: Futurium: Urban Agenda for the EU: futurium.ec.europa.eu/en/urban-agenda/public-procurement/library/action-4-legal-framework-responsible-and-innovative-procurement-put-practice
- Agenzia Nazionale Anticorruzione. (2019). *Relazione Annuale 2018*. Rome: Camera dei Deputati.
- Capoferro, P. (2022, February 9). *Smart Working: che cos'è, a cosa serve, perché è importante per il business*. Retrieved from Network Digital 360: www.digital4.biz/hr/smart-working/smart-working-che-cos-e-a-cosa-serve-e-perche-e-cosi-importante-per-il-business/
- European Commission, Directorate-General for the Internal Market and Services, Sadée, C., Lifonti, R., & Bardellini, M. (2016). *Study on e-procurement measurement and benchmarking Markt 2011/097/C : Lot 1 : public procurement performance indicators : D4 final study report*. European Commission. Retrieved from <https://data.europa.eu/doi/10.2780/94897>
- Gangai, A. (2021, January 28). *Come gestire lo Smart Working: ruolo dei manager e sistemi di monitoraggio*. Retrieved from Osservatori.net: https://blog.osservatori.net/it_it/gestione-smart-working?hsLang=it-it
- Mintzberg, H. (1980). Structure in 5's: A Synthesis of the Research on Organization Design. *Management Science*, 26(3), 322-341. doi:10.1287/mnsc.26.3.322
- Osservatorio eProcurement nella PA. (2006). *L'eProcurement nella Pubblica Amministrazione italiana: innovare la gestione degli acquisti*. Politecnico di Milano, School of Management. Retrieved from www.osservatori.net/it/prodotti/formato/report/l-eprocurement-nella-pubblica-amministrazione-italiana-innovare-la-gestione-degli-acquisti
- Patrucco, A. S., Luzzini, D., Ronchi, S., & Walker, H. (2016). Organizational Configurations for Local Government Procurement. *Proceedings*. 2016. Academy of Management. doi:10.5465/ambpp.2016.12151abstract
- Thai, K. V. (2016). Global Public Procurement Theories and Practices: An Introduction. In K. V. Thai (Ed.), *Global Public Procurement Theories and Practices* (Vol. 18, pp. 1-14). Cham, Switzerland: Springer. doi:10.1007/978-3-319-49280-3_1
- Yin, R. K. (2017). *Case Study Research and Applications: Design and Methods* (6th ed.). Los Angeles, CA: SAGE.