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A Vademecum for the Project Management of the Italian Construction Public Sector

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ABSTRACT

The present research aims to gather the most impactful political, economic and practical developments of the last 50 years, providing a vademecum to put into practice as a panacea for an alarming issue that concerns the Italian construction industry: the abundance of sites abandoned or put on hold indefinitely in Italy. The vademecum is intended to support ex-ante the professional figures that in Italy manage the construction projects and sites to solve the issues that may affect the success of them. The present research moves from a study that I conducted in London for "THE Italian-Construction Work Sites-On-Hold issue finds a solution in the delayed adoption of the pm role within the process." as my final dissertation in 2020, aimed at addressing the issue mentioned above as a direct link to the absence of construction project management within the Italian scenario. The hypothesis previously investigated are here still considered valid and constitutes the base from which a vademecum of good practices to conduct and manage a construction project as a new research, is built.

In the last few decades, the Italian context, as reported by many studies (Caviglia, 2013; Camprini *et al.,* 2013; Infantino, 2021; Cristinzano *et al.,* 2022) has been presenting a multitude of decrees, laws, norms and regulations that have impacted exponentially on the blocked construction sites resolution and completion. In this research, indeed, after having collected a wholeness of data and progresses, providing the main reglementary and law advancements, and having displayed a critique to the main already present discussion on the topic, it is provided a selection of two cases study of unsuccessful construction public projects. These latter are analysed to understand where and why the construction industry failed them, highlighting the legislative and bureaucratic component of the issue. Finally, the presentation of the vademecum that uses the construction project management best practices to guide future projects to success and avoid the issue of construction sites left on-hold.

INDEX

I. Introduction

The Italian construction industry has been presenting through the past decades until nowadays, an utterly difficult scenario - worsen by the 2007 financial crisis. Many projects proposed, needed and initiated in the urban plannings, remained inactive or simply abandoned halfway the construction works (Girardi, 2012), later on recognised as "*incompiuti*" (trad.: unfinished, unbuilt projects) by Germanà (2020). Indeed, as reported by data, the total number of uncompleted construction works, and so subsequently projects, was still 393 in 2021 (Di Bartolomai, 2021). Less than in previous years, but still a frighteningly large number compared to the investments made and the percentage of gross domestic product that the Italian construction sector represents, accounted for the 18.7% in 2018 (European Commission Report, 2018).

Over the last few decades, the government, together with construction associations, has recognised this alarming issue and has tried to implement various legislative and administrative interventions that have followed one to another as a patchwork of time-limited solutions (Bobbio, 2000) in order to contain the problem but in any matter, to solve it.

On the ground of a consistent literature already present on the topic, I consider this issue worthy of attention and research. Several reasons led to the choice of studying this topic; first, a case study methodology was used to examine the critical phases of a public construction project in Italy with the aim of preparing a vademecum to assist ex-ante project managers in ensuring project success.

Secondly, another study conducted by me in occasion of the final dissertation at the University of Westminster in London in 2020 introduced the issue of construction works on-hold in Italy and focused on the lack of construction project management, proving a link among the two issues and then proposing the second as a remedy to overcome the first. The reasons why a project comes to a halt and which actors were involved were investigated after tracking its phases from conception to its final handout. Hence, in order to build the vademecum I started from the research context where the purpose was to report and analyse chronologically the legislative and administrative interventions – composed by rules, laws and regulations that have followed one to another - in order to build a base from which it would have been reasonable to analyse and understand the case studies. To do so, I have compared and organised the laws, the decreets and regulations commented and confronted by academics into scientific papers. Nevertheless, I also included news, tv reports and construction associations articles published through the years, the get the opinion and view of connoisseurs of the Italian construction sector. The literature critique on the endless number of regulations, legislative revivals and stopgaps takes under consideration also the a very particular unique present period for the issue; after the Covid-19 pandemic, the government has decided to allocate a large amount to founds for the so-called resurgence plan (PRRN: Piano Ripresa e Resilienza Nazionale). In addition, the Russian-Ukrainian conflict situation, which although not taking place in the immediate vicinity of national borders, weighs heavily on future developments - European policies, lack of work-force, materials' prices increase - .

Afterwards, I followed a case study methodological approach by which I put in relation two selected case studies of projects that have inexorably fallen into inactivity. It results crucial for the design of the vademecum, for the cases study choice and to explicit the importance that this issue has, to explain and fully understand the meaning of "incompiuto" (unfinished projects), addressing this in the description of the methodology. Doing so, I explicate the impacts that these unfinished buildings and worksites have on the environment and on human life to give a broader overview on the cases study and assess their degree of influence in the study.

The classification of these unfinished projects is not based the location, proved to be irrelevant (Accattini, 2011), but on three criteria: the sector, the reasons why they stayed unfinished and the function they would have fulfilled when completed.

The two representative cases study, both belonging to the public sector - being the one the most representative for the phenomenon and the one where it has been proven more difficult the dismission of initiated construction projects (Giavazzi and Amighini, 2019)- are compared and researched through their historical, economic, legislative, environmental and social context.

Doing so, this research aimed to analyse the cases study, understanding where and why the construction processes stopped in order to acknowledge the issues and build from there the final guide.

Finally, the research fulfils its main purpose of addressing a practical guide for the project managers in a vademecum so that the earlier developed planning and preparation phase of projects would ensure a successful result, as proved by Mcleamy (2022). From here, the final design of a vademecum, a guide, of good practices that have roots in the construction project management to use for the control and conduction of new projects.

The present thesis is organised in four major sections, as follows:

The first section depicts the research context starting from the research previously conducted in 2020 and original scientific studies.

In the second section, it is presented the research background encompassing critical analysis of the literature. The latter takes into account the illustration of the discussion and expert positions on the issue of blocked construction sites throughout a chronological display of the events that led to past and present decrees, regulations and future plans accountable for the failing construction system as informative section for the later understanding of the cases study.

Thereupon, the third section of the research aims to give a first clarification of the thesis's examined issue: what is the concept of “unfinished” projects (also called *incompiuto*), how it is recognised and the social and environmental weight this latter has. Successively, the classification of case studies and the analysis of the two recognised as representative of public sector through an inductive process.

Finally, a conclusive section for the study comprehends the display of the results of the thesis and the composition of a vademecum, a guide, which embodies the results and delineates the good practices of project management for the successful projects and construction works of future projects.

II. Research Context

This chapter identifies the background of this research which is divided in two main parts: a previously written study in 2020 and the literature review at the present date. The first aims at define the guideline by which this research has started, the second is necessary to chronologically breakdown the entwined juridical Italian system for the public construction project Italian sector.

i. Research Background

This present thesis is inserted in a wider research path which I started in 2020 and whose results are summarised in the thesis titled *'The problem of Italian construction sites finds a solution in the delayed adoption of the role of the prosecutor within the process'*. (Ciammarusti, 2020)

For ease of understanding, I report here the main results of the research and refer to the previous work for further details.

In my personal experience, the interest and study of this topic has deeper roots. With the purpose of understanding an explaining the phenomenon of the blocked construction sites and unfinished projects in Italy, I aimed at finding a connection between this issue and the lack of a Project manager figure Italy. Consequently, the I hypothesised a possible introduction of this professional figure to improve processes and results.

In addition, the research aimed to raise awareness towards the magnitude of the problem of blocked construction sites and thus its causes and consequences.

In this past thesis, the research was composed by two parts: firstly, the literature review, in order to create a solid base of knowledge on the issue and on the experts' points if view; it took under consideration scientific and academic papers but also news reports and a comparison with the Anglo-Saxon system.

Secondly, the research methodology was explained. It was based on a survey via google form made to interview the main stakeholders involved in the Italian construction process including professional designers, construction firms' owners, users and external observes and operatives.

The whole questionnaire was made of 11 questions and was divided into two parts: the first part, made of 8 questions and referred to as the quantitative phase, analysed respondents' professional roles and recognised the role as a variable. Then, the research compared the respondents answers to the subsequent questions with reference to the variable. Either multi-choice, rank-order single-choice and multi-select multiple-choice type of questions were used asking to indicate causes and consequences of suspended constructions sites, what happens after the suspension, if the respondents had any direct experience with the phenomenon and the likelihood of the event to occur. (Question transcript to be found in the Appendix A).

The second part of the questionnaire differed from the first because it had an initial informative purpose made with a descriptive section about project management in order to avoid misunderstandings on the subject and test the common knowledge of the respondents on the topic.

The last three questions were related to the meaning of project management, the likelihood of respondents in considering the appoint of a project manager for a new project and whether, in their opinion, the presence of this role would have contained the problem of blocked construction sites in a future.

Full transcripts of interviews conducted and findings figures are to be read and found in the appendix A.

The results reported that the major part of the construction sites on-hold fall into disuse for years, to abusive occupation, dirt and disrepair causing an enormous damage to the community and environment.

Furthermore, the problem of stalled construction sites turned out to be inevitably related to the lack of an organizational figure, polyglot in the language of a project and in charge of managing time, cost, quality and resources. Interestingly, the response rate given for the question regarding the causes attributed to the central problem was very high: far more than 60 percent believe that the interruptions of construction sites are caused by bureaucratic and legislative problems, which were not adequately resolved prior to the actual operation on the site. This happens to be crucial to report for the sake of this new present research. According to the results of the last two questions, there is a remarkable and very positive conclusion: 89 percent and 93 percent of respondents affirmed that proper planning of construction processes would significantly reduce the risk of construction site delays or suspensions, as well as increased costs.

Another important result lays in the knowledge of respondents regarding the practice of project managers: slightly less than the half of respondents stated to have had no knowledge about project management and not be familiar with the subject at all. This shows that this professional figure has not yet attained the right weight in the field of construction production in Italy.

From the literature review, indeed, it appeared that in the Italian scenario, the professional roles are managed and guarded in public institutions called Ordini Professionali (trad.: Professional Orders) that not only control but also supervise all the people who are part of them responding to the Ministry of Justice. This, in the past, was made not only to assure the right and essential standards of knowledge to practice a profession but also to protect the professionals recognising their position.

However, with the advent of new professions and new roles, this original system became quite obsolete to assure them public recognition. Sabini and Munzio (2017) recognise the problem observing the fact that the professionalisation on new roles in Italy result reluctant, complicated and obstructed in the bureaucratic matters in all fields.

From this, the conclusion was that the lacking of a project management role in Italy is no longer a stand-alone problem of the construction industry but a systemic one. The Italian construction industry does not recognise the figure of the PM (project manager) neither for the role name nor for the role itself, especially in the public sector where the "RUP" (responsabile unico del procedimento) o the "direzione lavori" (trad.: construction works direction) are the most accounted for exploiting the job. Yet, most of the time, these latter are only part of one phase of the project, in a difficult communication with the other parties due to the inevitable fragmentation of the team seen in broader sense as an organization where all the stakeholders are included (Pierotti, 2018)

The already mentioned fragmentation and the unappointed figure of the PM cause a continuous sequence of dilemmas and mistakes for which no stakeholder take the obligation and liability.

The prevailing causes, recognised by the respondents, were related to bureaucracy (excessive regulation, missing documentation) with 66% and design variations (incomplete and incorrect executive project) with 19%. (*ibid.*) The comparison with the Anglo-Saxon system brought a new perspective on the matter: in fact, although even in United Kingdom the body of regulations and standard is considerable, the norms do not overlap and mostly they also refer not only on the construction standards - as happens for Italy - but also and especially on the construction quality management (Howarth and Watson, 2011). In Italy, although are present the standards of quality related to the construction product, it seems to be a lack of management standards for the production itself. This delete a full chapter of the construction process causing the failure of many projects, presenting time and cost overruns, quality that does not comply to the initial expectations, if ever the project get to completion.

Another interesting aspect to note is that the literature (Accattini, 2011 and Arboleda, 2017) as well as my research, on this topic focused more on the actors than the phases, which led to a never-ending blame game as respondents - being part of different phases of the project - pointed fingers at one another. In the course of this previous research, I found crucial to gain an understanding on how the problem is perceived not only socially, but also at the level of the production process in the construction industry.

At this present time, I rather therefore research the actions - more than the actors - that led a project to failure. In this new thesis, I analyse a different aspect of the issue, focusing on the project's phases and identifying the most crucial and influential ones through the analysis of the cases study.

Furthermore, having researched the causes and proved, in this past research, that the bureaucratic and legislative one is the most accredited for the occurrence of the phenomenon, I find essential to further investigate it in the present research.

Finally in my past research I investigated through the respondents what happens subsequently to the abandon of these construction sites and projects, not yet addressing the environmental and social issue properly, which I intend to do in this new thesis to guide the choice of the cases study.

ii. Literature Review

In a theoretical view and in a simple reading of the criticism of the immobility of the Italian unfinished projects there seems to be a lot of willpower but a little actual action. (Camprini *et al.*, 2013)

The causes behind the phenomenon of blocked construction sites in Italy are various but the overlapping of norms, decrees and mandates that creates a complex system, together with a very difficult bureaucracy, discourages entrepreneurs. In fact, the greatest number - 16.2% - of construction company bankruptcies in 2020 is reported (ECSO_CFS_ITALY_2021), decreasing production by 3.3% from 2015 to today (Eurostat, 2021). This is identified as one of the main causes for the immobilisation of the construction sites, but the issue is much more complex and articulated.

It is therefore necessary to take several steps back in time and analyse what were the main turning points at the political, bureaucratic, legislative and economic level to define what are the main regulatory and legislative steps in the field of public work in order to provide the most exhaustive overview of the current situation.

To grant a broader view on the issue, in this study I cross-analysed not only the legislations on their own, but in relation to academics' papers and opinions, news and construction associations' reports.

However, this literature review is the result of a research work and as such may neglect some documents that, although important, have been deemed irrelevant to the purpose. The intention and nature of this literature critique is to give an overview, a broader context in which to insert the cases study investigated in the present thesis. Thus, to display where their construction works stopped, but mostly how these could be overcome in the future with the support of the vademecum.

In 1975 with the start year of the Second Italian Republic, Bretton Woods agreements led to globalisation, which started in the United States and joined Europe helping it to recover after the Second World War (Caviglia, 2013). As a consequence, the Italian scenario became subjected to European new policies affecting more and more the Italian housing arrangements. Hence, when in 2007 it was experienced a global financial crisis, also the Italian manufacturing sectors were solidly hit. (Asso, 2011).

Asso (2011) argues that investments in public works, in the construction sector and heavy industries made a modest contribution to long term growth and had relatively small multiplier effects, widening the gap between the north and south of the country.

Guareschi and Rahola (2015), argues that this historical period had been an explosion of urban spaces - according to the theories of Henri Lefebvre - but, in a way, market-oriented.

This type of expansion appears above all as the unstable, dynamic and conflictual space produced from urbanization, in some ways an expansion that goes toward its continuous waste (*ibid.)*. To regulate and organise this growth, the Italian legislation, year after year, tried to cope and adapt to the system. Coming from this context of expansion, in 1994 it was enforced Merloni Law 109/1994 for the Public Works Management System: it was introduced the principle of 'maximum discount', later turned out to be an inefficient system for the quality of realisation (Camprini et al., 2013). This principle, in fact, as De Vivo (2005) argues, led way too many times to controversies and litigations that only brought to additional charges but mostly, time overruns blocking the sites and the construction projects.

In 2002 another hidden issue was emerging: the investigation "Mani Pulite"-Tangentopoli where judges Di Pietro, Colombo, Davigo uncover a system of illicit financing of political parties. (Travaglio, Barbacetto, Gomez, 2012).

This investigation contributed to the blockage of numerous public and private construction sites. Corruption was involved in the process on a daily basis assuming various forms. The situation was out of control and the construction sites and project, that even for a small detail could result involved in the investigation, were suspended or closed (Colombo, 2015).

At that time the desire was to homologate the Italian construction sector to European systems in order to provide higher levels of competition and to implement a project management system in companies, rather than the simple production. As reported, the construction industry's financial investment statistics was showing a reduction of 11.4% in 1994 (Camprini *et al.*, 2013) and thus it resulted a market, the construction one, that was already suffering, happened to be in clear difficulty.

Merloni, in fact, for the drafting of the law from which it then takes its name, was inspired by the documents of the Project Management Institute in London, giving the construction sector an innovative industrial meaning.*(Ibid.)* These changes led companies not to carry out projects in the ordinary way, but rather to analyse projects according to objectives to be completed within certain time and cost limits in which management and maintenance costs were finally included, representing the biggest stumbling block in public administration costs. Unfortunately, however, with this system there was no real final requirement consisting of end goals and intermediaries, so that it was made possible to change projects during the construction, only depending on the availability of funding (Accattini, 2011).
Following to this, as De Vivo (2015) points out, the evolution of Merloni Law translated into the regulatory framework provides for more extensive use of the *most economically advantageous tender* (offerta economicamente più vantaggiosa) in 2006. The latter was the art.83 "Criterio dell'offerta economicamente più vantaggiosa" from a regulation of execution and implementation of the legislative decree dated 12/04/2006 n.163 from the Code of Public Procurement related to works, services and supplies in implementation of Directives 2004/17/EC and 2004/18/EC. It considered not only the economic demand but also the technical-qualitative aspects of the offer. This will lay the foundations for what in the future will be the partnership between public and private: as De Vivo (2015) reminds, the project financing was finally taken under consideration as private funds to support public projects.

This premature move translated in decreet in 2006: on the 7th July 2006 D.lgs. 163/2006 Public-private partnership (PPP). The concept of PPP refers to a wide range of partnership models between public authorities and enterprises with the aim of financing the construction, the renovation, the management or the maintenance of a public project. The partnership does not anticipate an univocal outcome but it can take up to many forms: to generate income for the private investors, to obtain a public contribution in case the private project generates social benefits for the whole community, to request service supply of services to private parts. PPP operations are usually characterised by a timeframe set for the collaboration, the finance part, the organizational charts of roles e the risks repartition.

The art. 180 asserts about the technical-economic feasibility and final design of works or related services. It divides works into hot and cold works. The former are characterised by being able to charge a service price to users for using the service offered. The second ones have a dominant social function, therefore tariffs are not applicable or are so low that they do not generate cash flows to repay the investment made.

Russo (2008) discusses that at that time, the need of public infrastructure was real, but the public funds were not able address this issue, the PPP (private-public partnership) was considered a solution as in the Anglo-Saxon construction industry that in Italy unfortunately, due to clear systemic problems, it could have never really taken off. She asserts that the difficulties inherent in our legal and administrative system of using contracts to implement a precise allocation of risk and an equally precise definition of the risks assumed by the parties, were quite a deal-breaker.

Also Gallia (2008) agrees on these points: the partnership, he says, should not be intended as a panacea for a public sector constrained by financial problems.

The PPP presents, indeed, some critic turnovers such as: firstly, the inability of the public administration in being on the same level of private parties, for a correct evaluation of contractual liabilities for an effective activity of monitoring. Secondly, the inability of appointing the right preliminary verifications of feasibility and benefits in order to optimize costs for the PA. Thirdly, the complexity of procedures that inevitably carry time overruns and extensions of time before the execution of construction works.

It results that 2006 with the introduction of the PPP and the also the principle of the 'most economically advantageous tender' built a quite complex system (Gallia, 2008); the European Court of Justice did not completely opposed to the maximum discount (Merloni Law 109/1994), which was still considers functional in many cases. Differently from what asserted by Russo (2008) and Gallia (2008) it results that the construction industry, precisely in 2006, underwent a substantial improvement in terms of production. The 'most economically advantageous tender' principle brought many projects to be better thought through before hands in terms of quality as well as cost, hence a more studied planning phase was implemented. According to this principle, in fact, price must always be counterbalanced by qualitative performance evaluations according to a qualification system involving both companies (SOA certifications) and contracting companies (ANAC).

A turning point and a milestone for this very research is constituted by the 2007-2008 A global financial crisis, also known as "sub-prime crisis" whose effects are widely visible in the following years, hit contingently also the Italian construction industry. The crisis was caused by a financial shock linked to securitisation transactions placed by banks on the market used as financial instruments to increase their liquidity.

The value of these instruments, called derivatives, was coming from other underlying instruments - represented in this case by mortgages (prime) granted to Americans for the purchase of homes. However, when the US economy recovered in 2004, the FED (Federal Reserve Bank) increased the interest rates and loan repayments became much more difficult for debtors to face causing numerous cases of insolvency. (Raviolo, 2019)

This crisis, started in the United States, rapidly diffused in Europe as well. The construction industry went through two phases: the first of recession from the half of 2008 to the half of 2009 and the second, less intense, in the period between 2012 and 2013 (Rugiero, Travaglini, Federici, 2018). In 2008, in fact, as it is highlighted by data in Fig.1, the already experts' foreseen weaknesses in the sector made the public administration struggling to deploy the necessary public resources effectively and the Italian companies that, despite the Merloni system's attempts to broaden views by conforming with project management policies in other European member states, yet struggle to face such times (Camprini et al., 2013).

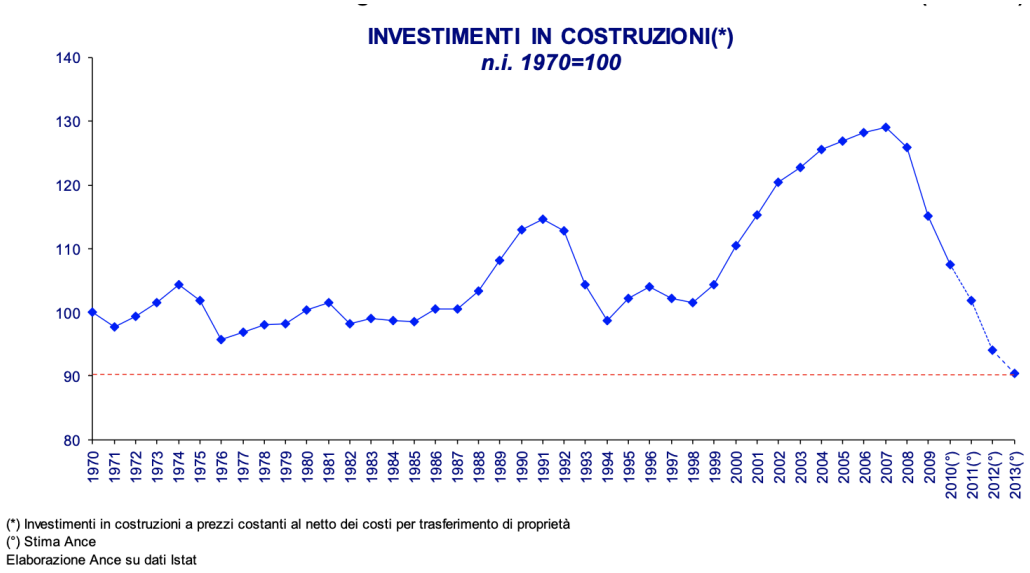


Figure 1:Construction Investments (source: osservatorio costruzioni ANCE 2012)

As even Cerniglia and Saraceno (2020) summarize in their research, Italy has gone through a serious decrease of investments since 2009, especially impacting public sector which was accounted for the 60% on the overall public investments in Italy. The real issue, however, seems to be constituted by the never-ending decrees, law, procedures and regulations that overlap and that change so fast that the system is not able to adjust to them, forcing the public administration to stop, reconsider and reassess.

In the private sector the situation is any different: the real estate system, which is also alienated from the changes, collapses starting from the Tangentopoli phenomenon. (Granzotto, 2014). As reported by Granzotto, via CRESME, the Economic indicators of construction: credit, production, investments (var. %) dropped severely for the residential sector to -19.2, for public projects -5.8 and for non-residential to -15.9.

The financial crisis puts a strain on the sector, which recorded a drop in public production a drop of the 49.5% (Camprini). The amount of companies still able to bid in the tendering phases is low; the reduction affects mostly southern Italy and companies with less than 200 employees. The workforce is at its lowest, recording an overall reduction among sectors of around -30%. (ANCE, 2012).

After three long years of recession, starting form 2015, Italian economy started to grow again stabilizing the situation only in 2017, with a GDP growing of the 1,7% (Rugiero *et al.*, 2018).

Nevertheless, the public administration was in serious difficulties into paying the companies for public projects, delaying in most cases by 30 days, even reaching 90-120 days of delay for lack of funds and due to the fact that the public administration since 2015 could no longer reimburse VAT directly to companies. (Rugiero *et al.*, 2018; Deppieri, 2021) As a direct consequence, It was recorded a shortage in the liquidity of construction companies to continue the construction works that, then, inevitably stopped working. (2021 a 2016 ECSO).

In 2016 is composed and issued the new Procurement Code (Nuovo Codice Appalti, d.lgs. 50/2016) by the hand of Italian authorities, among which ANAC (anti-corruption authority), in order to prevent malfeasance due to the illicitness and shady processes in the construction sector.

However, this entails, for the fear that mistakes could have been misread for malfeasance, created a psychological terrorism on public administration officials who constantly asked ANAC for prior opinions before allowing building permits or concessions. This, then led to serious delays in public bureaucracy of construction sites and projects. (Infantino, 2021 and Cristinziano *et al.*, 2022). The new Procurement Code will subsequently be subject to 180 amendments.

Despite this, on one hand, in the period from 2016 to 2020, the number of blocked construction sites and thus unfinished projects fell from 698 to 393. (ISTAT, 2022)

On the other hand, in 2019 although it was introduced the Decree-Law No. 32/2019 also known as the Decreto Sblocca Cantieri (D.L. 32/2019) decree - then converted to law in June 2019 L. 55 14/06/2019. This law, primarily designed to simplify tendering and contracting procedures, has had a positive effect on the reopening of public works, as per interest of the Art. 5-quinquies bill. In the latter Art.5, in fact, urgent provisions are requested for the restart of the most important Italian infrastructure works only, leaving behind the bulkiest part of the issue: the small and medium intervention that regardless the size have an enormous impact on the social and urban life (Vitale, 2019). Vitale (2019) points out that the new regulations aimed in principle at speeding up and simplifying procedures have done nothing but the opposite, creating uncertainty and disorientation regarding the legal framework.

As asserted, though, by Cristinzano *et al.* (2022) the Sblocca Cantieri decree, than law, was an actual and legit way to solve juridic controversies situation and litigations in the procurement phase through arbitration: instead of proceeding in the longest legislative way possible, involving administrative and civil jurisdiction, in this case the ordinary one - composed by three degrees of appeal: firstly to TAR (tribunale amministrativo generale, trad.: regional administrative court), then the State Council and finally Cassation - the two litigious parties appeal simply to arbitration to work as a judge and save a lot of time in the procedure.

In this paper however is made clear how this way to overcoming the various longer steps would implicate that some obligations would not be taken into consideration, being negligent for the justice. In this sense, notes that the introduction of a norm with an aim could bring new problems for the persecution of second aim (Filimon, 2021).

Indeed, for quite a long time, three different systems of discipline coexist and overlap: Presidential Decree 207/2010, A.N.A.C. guidelines and the 'sblocca cantieri' decree. Is therefore, true that the governmental main aim of simplifying and slimming the regulatory and administrative framework of public procurement, to date, the judgement may only be suspended and postponed. This is to be found in the fact that frequent changes in the regulatory framework worsen the situation, contributing to the uncertainty faced by both public administrations and bidding construction companies. (*ibid.*) This Sblocca Cantieri decree, however, has not clearly solved the issue. The PA still struggled a lot to receive founds at in the right times in order to appoint the right people for the workload expected. Even RAI - one of the most famous Italian television channel - back to 2007 conducted a report called "Lavori Sfiniti" (trad.: Exhausted -Construction- Works) to address this issue.

This TV report, they asked themselves more or less the same questions I am addressing in this research: why is it that in Italy public works are never known how much they cost and when they finish? What is behind a construction site that does not go ahead? Whose responsibility is it when the final balance exceeds the budget? There is a public administration that fails to plan well, fails to find funding on time, fails to distinguish unreliable companies from reliable ones. There are companies that make impossible reductions in order to win the tenders and thus fail or delay the works but above all, there are the authorisations that take more than six years to arrive and eventually, all it takes is one municipality getting in the way and we have to start all over again. (Rimini, 2007)

This topic, therefore, results very controversial for the experts. In this worrying background, the public projects stay still and suspended for years, of which ANCE counted 574 cases (ANCE, 2019) worthy about 39billions of euros, surely decreasing from the 647 cases of 2017 (ANCE, 2017), also as a result of the Sbloccacantieri decree. (Cerniglia and Saraceno, 2020).

The last two years until nowadays, although considered on the long run, a short period of time, have had quite an impact. With the advent of the pandemic period due to Covid-19, It has been individuated a Second Great Financial Crisis; as the International Monetary Fund calls it: 'The Great Lockdown'. In order to contain the risk of Covid-19 contagion, the Council of Ministers' Presidency suspended production activities, forcing entire production sectors to close.

The maximum reduction of movement was enforced and so, also the construction sites had gone through closure and suspension of works. (Centra et al, 2020).

This critical time was characterised by an increase in the prices for materials and services of +25%, so that many construction companies went to bankrupt with the direct consequence of project insolvencies. (ISTAT, 2022)

Some experts assert this has been the first great recession since the Great Depression, with both advanced economies and emerging market economies experiencing negative growth (Gopinath, 2020). Some other experts, compare this period to the recession of 2008 (Centra et al, 2020; Cartei, 2020). Cartei (2020) indeed asserts that if a comparison can be put in place among the two critic periods, the one of 2008 and the post-pandemic one, the measure to take to overcome it should not be the same; she stresses that only the financial policy could actually work. She believes that increasing the public debt in order to invest and finance public works is the only way to pursue.

As a matter of fact, in 2021, the Italian government has composed the PNRR (National Recovery and Resilience Plan) through which investments for more than EUR 191.5 billion has been made available for the country to invest and cope with the effects of the crisis. This provision has translated into decreet d.l. 80/2021 (converted to law 113/2021). Among the missions of the plan, the third concerns infrastructure and sustainable mobility, where have been planned investments of EUR 28.2 billion.

According to Infantino (2021), there are similarities with the provisions composed for the new procurement code, by which, he suggests, the construction industry and the legislation should learn. The Public Administration, in this sense, should not be constrained again in a set of norms and regulations at the expenses of a non-perfect anti-corruption system (*ibid.).* This should free the PA and not let it fall again in the same mistakes made in the past that allocate all the resources on the legit hunt at the illicit, making eventually numerous construction sites stop.

Nevertheless, as D'Ancona (2021) proposes in his research, the point of this plan was aimed at simplifying the bureaucratic procedures in terms of acceptance of project in the feasibility stage to speed up the processes; furthermore, the elimination of multiple design levels can on the simplify the project approval process on the one hand, on the other hand it may lead to the approval of projects that are inadequate in terms of quality.

Giacomelli *et al.* (2021) assert that the recovery plan and economic measures taken to sustain enterprises could be actually effective. The latter although, when asking for loans to preserve the internal economy, could simply experience a delayed failure due to a structural matter more than financial.

However, the problem continues to be the already open construction sites, which are already blocked. The funds partly concern some of these projects, but the majority is not mentioned. Here the reform is streamlined to help companies in 2022 in the public sector. Regarding the private sector, unless clauses were made in the initial contracts concerning these types of emergencies, nothing can be done about inflation because the projects are not covered by the state (PNRR, 2021).

Together with the PNRR, it was enforced on the 30th December 2021 Bilancio Law n.234. This law was designed to reduce fiscal charges for an amount of EUR 8 billion and prolong the house renovation bonuses made in 2022. Bilancio Law is part of a growing economic context in which the construction sector, after the long recession that reduced production levels by more than a third and the effects induced by the Covid-19, is showing positive signs, driven above all by tax incentives on renovations and by the recovery of public investments, also supported by the important reforms and simplifications implemented in the last year.

The Legge Bilancio goes in the direction of reinforcing this trend by allocating further substantial resources for the implementation of public works, also in order to give continuity to the National Recovery and Resilience Plan (PNRR) beyond the 2026 horizon.

In terms of public investments, the Legge Bilancio alone provides for resources for new infrastructures amounting to EUR 39.6 billion over the next 15 years, of which EUR 7.2 billion in the three-year period 2022-2024 (2.4 in 2022, 2.1 in 2023 and 2.7 in 2024). The financial commitment is largely deferred, reflecting the government's willingness to intervene after the end of the PNRR. (Arlotti and Spina, 2022).

Finally, the Russian-Ukrainian war and inflation that whole Europe is experiencing is being a contribution to the issue.

As addressed by Gibellieri (2020) the automotive and the construction sectors in Europe, suffered severe losses following the crises, cutting steel demand by a significant amount. There were significant social and economic consequences, including closures of material plants and large-scale restructuring of companies and 40,000 jobs were lost between the start of the crisis and 2013. As a result of the crisis, production costs have risen significantly, especially for raw materials (e.g. iron ore and coking coal); over the long term, the industry lost about 78,000 jobs. (European Commission, 2013).

Yet, the statistics shows how within the construction field, against all the odds, in 2021 the Italian investments have increased substantially (+17.0%) - with respect to other countries such as Germany (+1.1%) and France (+11.6%) - consequently increasing also the GDP (ISTAT, 2022).

Experts in the field, however, Gabriele Buia (ANCE President - National Association for Building Contractors) for example controversially asserts that construction industry in Italy is the last link of the country production chain so it is not so likely to provide a real impact. With ANCE they have been monitoring 800 public projects that are mostly (87%) unlikely to cope with inflation, thus very unlikely to be completed. (ANCE, 2022)

It is a long and complex supply chain system connecting the construction sector to over 80% of other economic sectors (FLC, 2020). Open construction sites are the result of contracts signed before the price increase, now subject to a clear increase. (Giangrande, 2022).

This present literature, necessary to create a broader framework for understanding the phenomenon investigated in this thesis, is necessary for the construction of the thoughts that will arise later in the drafting of the vademecum. The knowledge and awareness of the bureaucratic situation as the ultimate point of the social, political and legislative phenomena that have affected the Italian state over the last few decades, is one of the key factors in hypothesising what future steps can be taken to change the often-unsuccessful trend of Italian construction sites. (Renzi, 2017 and Infantino, 2021)

This chronological display of the events shows how if the construction sites, the building and infrastructure projects stay still for years, one of the main reasons for this phenomenon to occur is the overproduction of laws, norms and regulations that intertwines and make the bureaucratic phase complex not just for the PA but for all the stakeholders involved in the construction process

Yet, although in the Italian construction system, the legislation and the bureaucratic phases are surely, as discussed by experts, is a real and central issue to this research, into the final addressing of a project is not the only one. In a broad management scheme, certain phases of the projects constitute the most critical part; on one hand there is the bureaucratic and on another hand, the design one. (Smith, 2010; Sundstorm, 1990).

In the next paragraphs I assess another recurring issue that brings project to an halt in order to enlarge the understanding for the analysis for the cases study. In the early phases in fact, as explained by Patrick MacLeamy in 2000, as a development of the diagram of B. Paulson in 1976, the more the project advances in the further steps the higher the cost increases to make changes or modifications. This is shown in fig. 2, by the green curve.

What has been shown, however, is that actually in some phases, the modifications, the delays, the suspensions have much less weight on the success of the project than a variation to the initially definitive design.

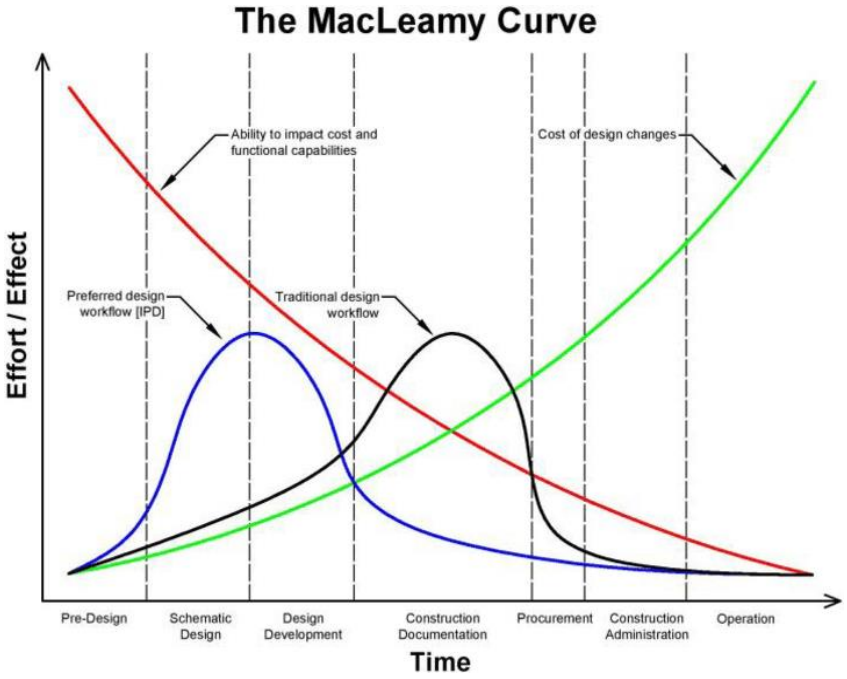


Figure 2: The MacLeamy Curve (source: MacLeamy, P. (2004). Collaboration, integrated information and the project lifecycle in building design, construction and operation. WP-1202, The construction users roundtable.)

Furthermore, the ability to change design is immensely easier in the very beginning – Preferred design workflow, blue line on the chart - and so is controlling the cost and the budgeting. Indeed, as soon as the project move to the further steps, it gets exponentially minor our ability to control variables' overruns as time, cost and quality that influences the final result – as shown by the red arch -. (Pagnacco *et al.*, 2019)

In the traditional design process, the heavy work and the most critical phases, where the costs are higher and the ability is lower, are outlined in the construction documentation stage (McLeamy, 2022). Thus, it results much more expensive to carry out modifications.

This, as McLeamy argues, should shift in the initial stages (pre-design or schematic design phases) when the costs are lower and the ability to correct and reshape are higher hence, cheaper. (Lu *et al.,* 2014)

Secondly, Pagnacco et al. (2019) argue that this theory, although interesting when the actors do not change during the process, in the construction sector, known as a sector in which teams are hardly composed of the same people in all phases, tends to no longer be completely effective as a "flexible and iterative workflow" is required.

They find parametric design as a solution to this question in order to obtain rapid feedbacks to the modifications.

Although the culture of parametric design has even been implemented with the extension of a shared database of which BIM (Building Information Modelling) as suggested by Zhang (2018) is the final product in the way that no data would be lost among participants in the full life cycle, the industry culture still need a professional physical figure to orchestrate the whole process.

The communication despite facilitated by the software implementation, has to face the reality of a sector that not only is living a transitional period of change but presents a real acknowledged issue as the amount of construction sites abandoned or on hold by which communication itself results poorly accomplished. Furthermore, the construction industry is still among the various participative sectors - one third of growth +6.5% in 2021 (ANCE, 2022) - at GDP one of the least automated sectors, where work performed by individuals remains the basis of final productivity.

In the next chapter, I explain the methodology chosen for the research based on a case study analysis. The two study cases chosen are public projects were the construction works stopped and never started again, remaining on-hold for years. Through the analysis, mindful of the literature review explored in this chapter, I study why and where the construction process came to a standstill mainly from the legislative and bureaucratic point of view. This builds data and knowledge for the construction and reasoning of the final aim of this research: the composition of the guide, the vademecum, for future projects and construction works.

III. Vademecum Design

i. Research Methodology: The Case Study Approach (CSA)

"*The essence of a case study, the central tendency among all types of case study, is that it tries to illuminate a decision or set of decisions: why, they were taken, how they were implemented, and with what result*."

Robert (2018) quotes Schramm (1971).

The aim of this study is to design a vademecum, understood as a guide able to assist and support the professional figures that are in charge of the project management, to reach successful outcomes in construction projects that belong to the Italian public sector. This interest behind this research comes from an issue that the Italian construction sector had been facing for years now: project insolvencies and construction sites on-hold due to litigations over time and cost overruns occur on a daily basis.

In order to design the guide, and thus to reach the purpose, I decided to follow a qualitative research approach that uses an inductive reasoning process; the results are obtained by the observation of elements and/or phenomes (Williams, 2007). The inductive process is linked to the paradigms of complexity (multidimensionality of experiences), contextuality (phenomena are considered taking into account situational realities) and process (survey data are dependent on the temporal dimension that characterises the research process). (Semeraro, 2011).

Creswell (2013) states that this method is a way of exploring the processes, the activities and the events that led to a situation or a condition in a certain time and place. This helps to build a theory, a vademecum in my case, by the

observation and the theoretical thinking without the need of testing it empirically (Khan, 2014).

As a results, as Glaser and Strauss (1967) suggested, the qualitative research approach leads to a final development of the theories already put in place by other scholars and experts, acknowledged by the literature. Grey (2009) as well, agrees on this point, asserting that the results coming from this type of research can be considered a development of pre-existing conjectures and hypothesis.

The prior observation on the phenomes gives the author the chance to make observation and duly give the events a meaning (Grove, 2009). As asserted by Holloway and Wheeler (2002), the qualitative research is a holistic method to provide new knowledges: it analyses a wide picture of perspectives and experiences to reach final results.

Out of whole the advantages of this research method, the absence of bias in the data collection process is one of them. The researcher results then, neutral in comparison with the data that analyse as they simply are. (Kahn, 2014)

- **Introduction to the Methodology and Process Description**

Among the various inductive methods for the exploitation of a qualitative research methodology, I decided to focus on the case study approach, which I structured in five phases: planning, designing, preparing, collecting, analysing. It is based on the intention of choosing two of the most significant case studies and discern them in terms of analysis criteria of which historical context, norms, possible political involvements, stakeholders' relationship and reasons behind the closure of the construction site. In this way, it is possible to recognise some common characters that made the project freeze.

As Creswell (2013) argues, an appropriate case study research should consist of four elements: problem, context, issues and lesson learned and as matter of fact the volume of data as to be significant and space on different levels of knowledge: interviews, records, documentation, drawings and materials of any sort.

In this way, the understanding is comprehensive and extended (Cavaye, 1996) without creating assumptions or presumptive assessments on the issue researched. The advantage in using this method, which also are the reasons why I considered it the most valid for this study, is the fact that is able to capture reality as it is, providing a full context where there are present multiple variables and different aspects to be considered.

Furthermore, since the final purpose of the research is not to make assumptions on the aforementioned but to build a vademecum for future purposes, generalisations are most likely excluded.

This method fits with the purpose of the research because as suggested by Leedy and Ormrod (2001), the case study approach can shed light on a situation insufficiently known or understood as per the legislative condition that characterises the phenomenon studied in this research.

From the study carried out by Cavaye (1996), it is interesting observing how the case study method gathers, differently from other methods considered, all the characteristics which can better suit my research.

	Case research	Field studies	Action research	Application description	Ethnography
Use of case method	X	X	X	X	X
Aims for understanding of context	X		X	X	X
Does not defines a priori constructs	X		X	X	X
Topic defined by researcher	X	X		X	X
No intent of interference in phenomenon	X	X		X	X
Attempts to contribute to knowledge	X	X	X		X
Relates findings to generalizable theory	X	X	X		
Interpretation from researcher's point of view	X	X	X	X	

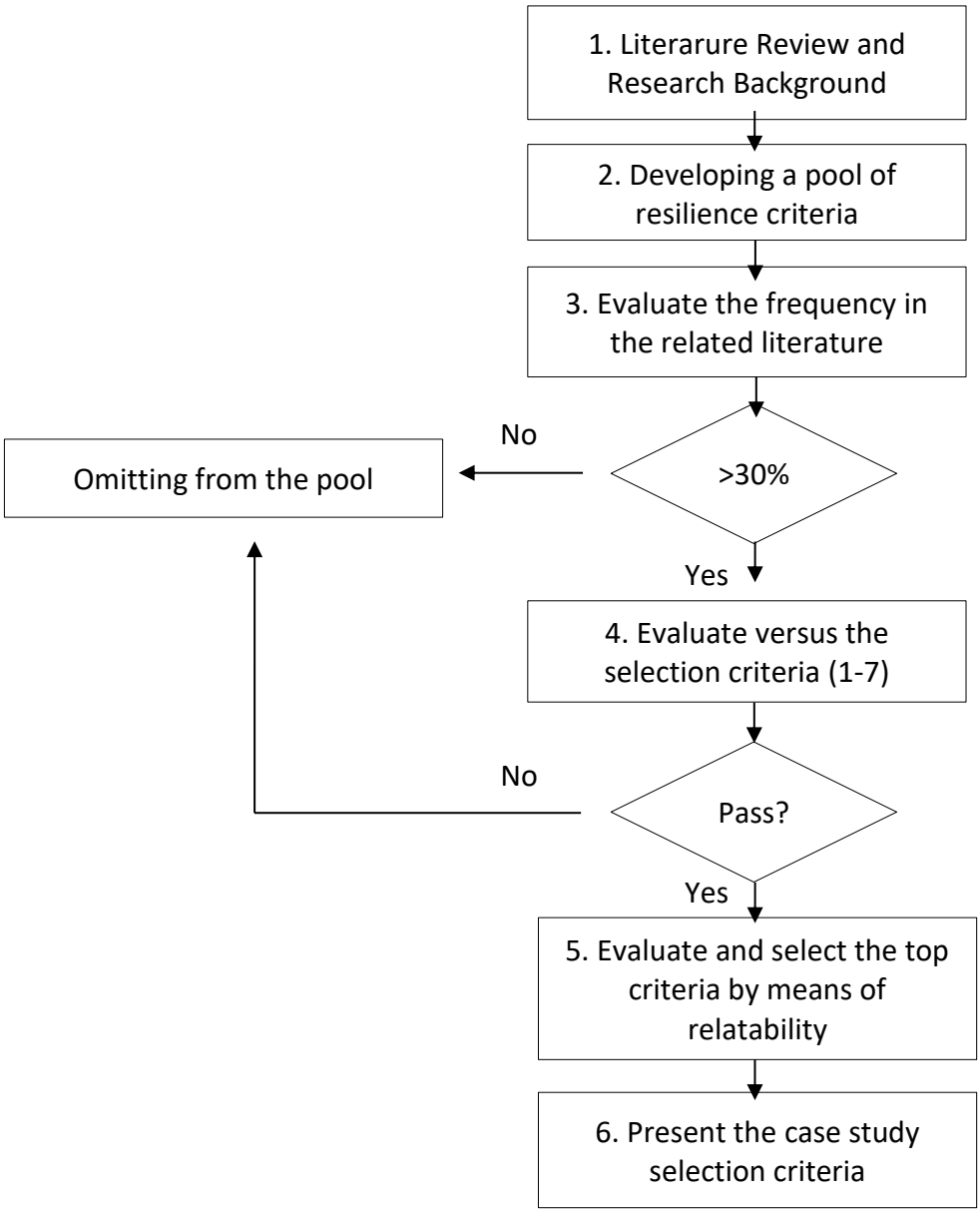
Figure 3: Characteristics comparison of Case Study Method with other inductive research processes. (Cavaye, 2003)

The case study method cover the requirements of this research, allowing the needed flexibility on the way the events have happened and enough focus on the events that are still happening.

The key questions that guided me for the exploitation of this thesis, that in the research background were *how* and *in what way*, for this chapter are *when, where* and *why*: when and where happened (explained in the case study context) and why the phenomena of the abandoned construction sites occurred (explained by the legislative background on the case studies that brought them to failure). The report of the historical data, the context and the comparison of the two case studies give a thoughtful understanding of the issue and report results useful for the composition of the final vademecum.

- **Selection Criteria**

The case study research was developed in five phases: planning, designing, preparing, collecting, analysing of which I propose an itinerant diagram.



After having clarified the research question that aimed at designing a vademecum for managing public sector construction project in Italy, I designed a protocol for the data collection. In this case, the collection of data is strictly related to public domain documentation, newspapers and academic papers.

The case studies selected and analysed have resonated for importance and for relevance due to the financial and the reputational public involvement in the projects. Through the years, the governmental websites has listed yearly the unfinished projects that occurred, upgrading every version whether the project re-started or remained on-hold. The ministry of infrastructure and transports, indeed, has produced a document, available online, that for each public project specifies:

1. Designated Contracting Authority - which represents the procuring entity responsible for the contract undertake which usually in public sector Italian projects is the town, district, region municipality or governmental institutions (i.e. the ASL, azienda sanitaria locale, which is the local health authority or the institution for the council houses).
2. CUP (Codice Unico di Progetto): it is the code that identifies a public financial investment project and it is the principal functioning tool for the MIP, Sistema di Monitoraggio degli Investimenti Pubblici (trad: Monitoring System for Public Investments), even when private resources were involved.
3. Unfinished Work Status: it is the status of the construction site that by the art. 1 number 2 of the D.M. 42/2013, can be defined:
    - Letter a: the construction works, started, are interrupted beyond the contractually envisaged deadline for completion;

- letter b: the construction works, started, have been interrupted within the contractually envisaged deadline for completion, since the conditions for their restart do not exist at present;
- letter c: the construction works, having been completed, have not been tested within the term envisaged as the work does not meet all the requirements envisaged by the specifications and the relevant executive project, as ascertained during the testing operations.

4. Area of Interest: this is related to the administrative division of the Italian territory: municipal, provincial, regional, national.
5. Unfinished Work Description: it is the name of the project under which has been signed the contract. Sometimes, this contain also a brief description of the work.
6. ISTAT/NUTS Work Localisation Code; ISTAT stands for Istituto Nazionale di Statistica (trad: National Statistics Institute) and it serves the country with the production, post and share of high-quality statistic information, analysis and previsions in economic, environmental and social fields. NUTS stands for Nomenclatura delle Unità Territoriali Statistiche (trad.: Nomenclature of Statistical Territorial Units). This code is necessary to keep track of the project statistical purposes of Italian administration units.
7. Last Total Upgraded Intervention Q.E.: which is the last upgraded data in regards with the purchasing securities put in place for the project financing; it is the amount invested for the project.
8. Amount of Charges for the Completion of Work.
9. Percentage of Accomplished Work: which is the percentage of the construction works completed, calculated on the total included the tests and completion of works certificate production.

10. Usability of work: which comes with a binary answer YES/NO. Even if the project is not completed, the contracting stations, with regard to the choice of splitting contracts, carried out a proper planning of interventions and certify the functionality, usability and feasibility of each lot only in cases where the "parts" of an intervention, individually considered, show autonomous functionality and their own utility related to the public interest, independently of the realisation of the overall work. (Lazzini, 2005)
11. Reduced use of the work: whether the work although not finished in dimensions as per contract, it has been resized and diminished in volume from the initial design.
12. Networked Work: as per the art.3 n.1 letter c from the Procurement Code D. Lgs. 18/04/2016 n.50, it is defined a networked work, a work destined for the movement of people and tangible and intangible goods, which are predominantly one-dimensional in their development and cover vast expanses of territory.
13. Constitutes a discontinuation of the Network: if the unfinished construction work, compromise the continuity of the aforementioned network, blocking then other lots, projects or activities.
14. Causes of the Work Non-Completion: as per the Art.1 n.1 of the D.M. 42/2013, it is defined by five letters:
    a) lack of funds;
    b) technical causes;
    c) new technical standards or legal provisions;

d) bankruptcy, compulsory liquidation and composition with creditors of the contracting company, termination of the contract pursuant to Articles 135 and 136 of Legislative Decree No. 163 of 12 April 2006, or termination of the contract pursuant to the applicable anti-mafia provisions;

e) lack of interest in completion on the part of the contracting authority, contracting entity or other contracting entity, as referred to in Article 3 of Legislative Decree No 163 of 12 April 2006.

This division and specification helped me to select the cases and collect data for the analysis of the case studies. The criteria on which I based the selection were chosen accordingly to the research method applied by Shaaban and Scheffran (2017). This is a process made of 6 phases to go through, in order to select the criteria, as shown in the infographic.

As shown in the flowchart, it was crucial to find documentation and literature at first on the case study, otherwise the analysis would have been not properly addressed. The literature mentioned was related to case study and consisted of scholars' papers (D'Auria and Strollo, 2015, Alviti, 2018; Bozzato, 2009; Giancotti, 2019; Germanà, 2020) but also newspapers' reports and accredited construction institutions or associations articles/reports. For the 2nd phase of the selection criteria method, I researched the literature on the pool of possible suitable case studies (unfinished projects) mentioned in the governmental lists. Successively, I evaluated the amount of information I could find regarding the aforementioned.

After having created my new pool of research, much smaller from the amount of possible, I decided to assess them under new criteria in respect with Shaaban and Scheffran (2017) method:

1. Data availability - possibility to collect data about the criteria.
2. Consistency with the objective of the research: is this criteria concurring to make me develop results for the design of the vademecum? Is it pertinent with my research question?
3. Independence - are the criteria working independently from one another?
4. Measurability - is the criteria measurable to obtain results in a qualitative way as it is my research methodology?
5. Simplicity - Is the criteria chosen difficult to understand from peers and experts in the field?
6. Sensitivity - If the results coming from this criteria are going to be accurate and bias-free in order to allowing trends.
7. Reliability - if the criteria can assess widely and solidly the topic.

In the fourth phase of the criteria assessment method, I questioned every criteria of my pool in regards with the above listed seven questions. The last phase, the fifth, I sorted the final criteria for the selection of the case studies.

- Data availability - many would have been the interesting cases to analyse but very difficult to source information about the aforementioned. I decided then, to choose case studies of which I was sure I could find documentation about. I decided to exclude from the pool, each case on which less than 2 scholars' studies were carried out and no mentions on experts or newspapers could be found;

- Location: for the sake of the research, although the listing system divides the unfinished projects by region, I chose one case study belonging to the centre-north of Italy and one from the south. Scholars (Accattini, 2017; Video, 2018) and surveys (Anagrafe Opere Incompiute, from 2011 to 2022) show that the location for unfinished public works is not related to one specific area of the Italian peninsula. Thus, I decided to take under consideration various geographical areas in order to avoid the bias of the geographical - and directly related administrative and political;
- Economic Dimension: the amount of financial investment made to sustain the project and whether the founds were not only national but also at the European.
- Project Suspension Reasons: why the project construction works have been suspended and why the project remained in a condition of immobility.
- Function: the use/function exploited by the project; I decided to analyse different construction typologies in order to allow, during the comparison phase, to provide a broader sense to the research not bonded to specific conditions (Norton, 2010).

ii. Case Study Choice Background

To conduct the choice of the cases and for then study them in-depth, among the numerous cases present, firstly it has been crucial to assess the semantic matter - what is an unfinished construction project, a blocked and unfinished construction site - and why is important to study this phenomenon. The social and environmental involvement and impact they have on our reality is equally compelling to appraise. This was done In order to contextualise them

and give a wide understanding of the aforementioned in order to properly analyse them.

- **The semantic and the social and environmental involvement of an Incompiuto**

This present paragraph aims, on the one hand, to display and explain what is an unfinished construction project and on the other hand, the poetic behind this phenomenon to which, through the years, academics have been conferred it the name of "Incompiuto" (Alterazioni Video, 2006; Arboleda 2017; Germanà, 2020). I believed it was crucial in the research to include a chapter that explored in this sense the issue, not only because close to my personal vision but also in order to give the fullest and broadest view on how it is perceived by scholars and experts.
The underneath principles of this obvious dichotomy can be attributed to the basic human desire of exploring the beauty and the poetic element in a bankrupted and low-responsive system, finding the pleasant even when the situation clearly would not allow it.

An unfinished construction project is a project of which the construction works had to be suspended due to problems of various nature and that never started again, leaving the site in an intermediate state, never dismissed nor dismantled until the present time. The suspension process of public construction works can be enforced either by the authorities or by whom is in charge of the project management (RUP or Direttore dei Lavori). In the first case, the authority of the council town, by the article n.27 clause 3 of the decreet DPR 380/2001, due to precautionary measures, enforce the suspension by which the construction works have to cease any activity in order to not incur in illegal activity to the detriment of the urban public space.

In such wise, the suspension of construction works lasts 45 days, after which either they restart in the eventuality that it has been carried out a resolution of the issues addressed in the first place, or continue to be delayed due to the final decision taken by the PA. (De Filippo, 2015; Grandi, 2017)

Diversely, when the suspension is enforced by the RUP or Direttore dei Lavori, either for necessary suspension reasons - due to force majeure, climatic conditions, special circumstances - or for discretional suspension reasons - necessity or public interest (for example, missing founds) - the matter falls under the article n.158 n.8 DPR 207/10 that governs the legitimate works suspension.

On this matter, it concur also the article n.1460 regarding the plea of non-performance, which allows a party to a contract for consideration to refuse to perform its obligation if the other party/parties do not perform or in case the works cannot be carried out complying to the standards.

In this case as well, the suspension is set in a time frame: 6 months or 1/4 of the contractual time, beyond which the contractor has the possibility of requesting the administration for the termination of the contract - without compensation -. If the administration denies its consent, the contractor shall be entitled to compensation for the additional costs beyond the above-mentioned terms. (Cancrini and Piselli, 2008; De Carlo, 2005).

Despite the reason that brings construction sites to a suspension though, the resolution is very often not immediate, involving other parties and other legal provisions that keep construction sites in a state of incompleteness for years.

Another view, less technical on this issue has been widely investigated: the aesthetic of the unfinished construction works and the poetic that this phenomenon carries. As Germanà (2020) asserts, the immobility of this construction sites "from transitory becomes permanent" and so she moves the spotlight or rather, change the perspective used so far to describe the situation.

The unfinished construction sites thus become places for reflection and concern for the re-construction of something that, practically speaking, has never existed at all. Places to re-invent an amorphous reality. The literature suggests a poetic, aesthetic vision of the unbuilt as identifying other spaces, a new category of study in which to detach oneself from the 'modern' complete vision of a project and instead approach a new intrinsic romanticism of the struggle against the programmability of events, schedules, and chronology linked to the built sector (Germanà, 2020).

This also means distancing oneself from the expectations that a project entails as aesthetic, physical and functional results. A vision is then introduced that opens the perspective to new, different developments, but does not forget the potential.

However, to imagine an element such as a building, considered a physical asset and an immovable good as distant from the dynamics of time and space is quite naïve: the urban deprivation to citizens of an open space, instead, of something mobile and in the process of becoming is more in keeping with today's needs. The immobility of spaces, often inaccessible, due to the obvious dangers of construction sites, unauthorised occupations and the degradation of the surrounding unbuilt area is also a part of the unfinished project.

In fact, the importance of this phenomenon has grown exponentially in recent years: Alterazioni Video and Fonsbury Architecture in 2006 (Arboleda, 2017; Video, 2018) together had surveyed 395 cases of unfinished projects, mainly in southern Italy, but that with years it had spread exponentially throughout the peninsula.

In fact, the paradox between being intangible heritage but immovable and non-cultural assets is incomprehensible. Intangible insofar as they are unusable, having no function but part of the historical, urban and cultural context, but tangible insofar as they are physically present and occupy an actual portion of territory.

Pétursdóttir (2013), in fact, discusses this very topic, asking when a tangible good becomes a heritage and when a waste by comparing modernity and tradition, centre and periphery, culture and nature, taking two buildings in Iceland as examples. These bodies are certainly objects of an adventurous and worthwhile past, but in a state of inaccessibility, ruin and "ghostlike" (ibid.) they are merely backdrops to a past that never existed and a future that will never exist, wandering in the limbo of possibilities never fulfilled.

These, however, are the result of a societal dynamic whereby objects are loaded with meaning, value, weight, substance and durability. The result is a city that only responds to the law of dynamism and evolution, leaving behind these decaying skeletons and losing interest in incorporating them, resulting in small black spots in the urban fabric, impossible to place in any category.

The study carried out by Arboleda (2017) is also interesting for the purposes of this thesis because of the mention of some cases of interrupted projects, but which I would more appraise, in the light of this research, as cases of a failed project management. This collaborate to reasonably prove a strict connection between the interruption in Italian construction sites and the difficulties encountered by project managers, RUP and Direttore dei Lavori to make them reach success.

The case of the lift in Sutera, Sicily, is a glaring example of this: the construction site started in 2012 of a project financed by European funds (EUR 2mln) remained blocked for years because there was no economic plan to keep it in operation by the municipality once it was finished. Thus, left in this state of indefinite transition, an object that was not part of the original environmental and natural context, it was not even demolished but left to decay, constituting a new landmark and letting nature reappropriate it at the expense of nature itself.
Yet to this day, in 2022 they have been allocated another EUR 76K to allow the project completion.
These elements, billed as hotels prepared for aliens (Arboleda, 2017) or in an unborn, aborted child (Germanà, 2020), remain floating in a time that does not exist, has never existed and most likely never will exist given the amount of funds invested with the 2021 PNRR (national recovery and resilience plan) already divided into new sustainable mobility and infrastructure constructions.

As Germanà (2022) asserts, in reading the blocked construction sites while being aware and conscious of the fascination and artistic interest that derives from them, the environmental and social interest cannot but become apparent. These construction failures present many problems including the unprofitable use of energy and economic resources; among which, the land waste and the difficulty in recovering or reuse the areas in an immediate future. The lands, which remain occupied while waiting for an administrative nomination or funds or even for the project to be taken over, cause discomfort on many human and environmental scales (Accattini, 2011).

Today's problem of climate change and global warming is not far removed from the construction sites on hold.

It has in fact been shown by ESA (European Space Agency) that in the cities or, in any case, in the urbanised areas of three sample cities Milan (Fig.3), Paris (Fig.4) and Prague, the peaks of intense red, or heat islands, are found in areas where vegetation is practically absent, while moving to Parco Sempione, Milan, or the banks of the Seine, Paris, the situation improves considerably. This is due to the phenomenon called 'evapotranspiration': thanks to it, the water on the surface layer of plants and soil evaporates.

As the moisture in the soil is released, the heat in the environment is absorbed and thus the temperature drops. The problem, also referred to as soil sealing, which prevents the soil from breathing is the action whereby the soil is sealed, making it practically impermeable as it is covered by building materials. *(Ibid.)*

Image 1: Land Surface Temperature in Milan on 18 June 2022 (source: ESA website)

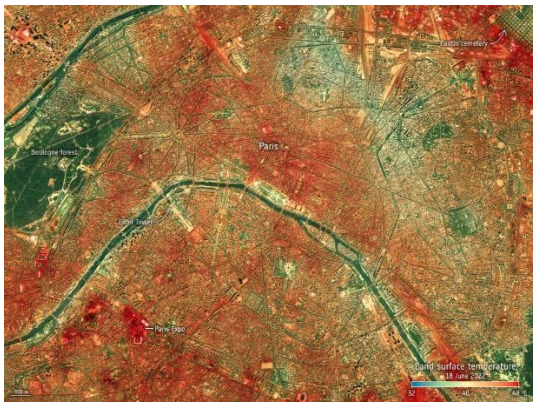


Image 2Land Surface Temperature in Paris on 18 June 2022 (source: ESA website)

In Italy, however, concrete, asphalt, buildings and other constructions are increasing by 16 hectares per day, so temperatures will continue to rise over the years.

The rampant presence of concrete and asphalt also has other consequences: these materials absorb a great deal of heat compared to an equivalent volume of soil and air, releasing it and functioning as maxi-sponges.

This is why the temperature range in the city between day and night is practically irrelevant, a phenomenon also known as the urban heat island effect. Unless action is taken to increase green spaces in cities or to limit where possible the occupation of land that has no function or use (e.g., areas occupied by blocked construction sites), the situation will remain still.

Munafò et al. (2013) assessing the growth rate of soil sealing in Italy, quotes the study of Salvati et al. (2012) which argues that soil sealing is a silent form of degradation that creeps in and hides its importance and identity as such by altering the quality and services offered by a functioning environmental ecosystem. In this study the Italian case is analysed, reporting an exponential growth of conversion of vacant land to urban regardless of region.

The environmental damage also comes, as discussed by Wu *et al. (*2014) and Menegaki and Damigos (2018), from the management of construction and demolition waste. In the study they assess the most pollutive materials and the ones most difficult to recycle such as glass, plastic, ferrous metals (of which Italy results to be the second consuming country only after Germany, in Europe), non-ferrous metals, mixed ferrous metals, wood and so on, pointing out the difficulty of legislations and regulations to dispose these components.

The problem of the unfinished therefore governs the process by which buildings are identified as mega-waste that is impossible to dispose of, not only because of the land used and wasted but also because of the materials and resources used to build them.

With the intention of demonstrating not only the social but also the environmental impact that these incomplete structures represent, the literature helped me to create a general historical, economic and legislative framework.

Moreover, it was necessary for me to take the next steps in choosing examples characterising some of the "eras" I mentioned in the time sequence, but also in drawing up, at the end of the research, the vademecum taking into account the critical issues that unfinished construction entails on a small but also large scale.

- **Presentation of the Case Studies**

Case study 1: Città dello Sport, Rome – Lazio

+ Problem

The idea of enriching Rome with a large multi-purpose sports centre materialised when, in 2005, the city won the finals of the 2009 World Championships of Aquatic Disciplines. The site chosen for the construction of the Città dello Sport (Sport City), designed to upgrade the existing Foro Italico sports complex, is the Tor Vergata University Campus, in the southeaster suburbs of the capital. This decision matured due to a series of logistical, functional and social considerations, including the opportunity to integrate important public services in a part of the city undergoing strong expansion, to complete the Campus' infrastructural and structural endowments, and to create a decisive landscape and urban reference in the cluttered Roman suburbs. Unfortunately, the project will never come to an end; at least, not the one everyone hoped for. The project stayed unfinished and the cost of 11 times the one expected in the initial foreseen investment of 60mln.

Image 3: Città dello Sport - Tor Vergata (source: https://www.urbexstory.com/post/vela-di-calatrava)

+ project ID card

Registered Name: Città dello Sport Roma Tor Vergata
Designated Contracting Authority: Agenzia del Demanio - Direzione Roma Capitale
Unfinished Work Status: Lett. a)
Area of Interest: Nazionale
Unfinished Work Description: CITTA' DELLO SPORT - Comune di Roma - Presidenza del Consiglio dei Ministri - Università degli Studi di Roma Tor Vergata
Last Total Upgraded Intervention Q.E.: EUR 607.983.772,14
Amount of Charges for the Completion of Work: EUR 406.434.055,58
% Accomplished Work: 16,25%
Usability of work: YES
Reduced use of the work: YES
Networked Work: NO
Constitutes a discontinuation of the Network: N/A
Causes of the Work Non-Completion: Lett. a).
(source: Elenco - Anagrafe delle Opere Incompiute 2021, 2022)

+ Project Stakeholders

Design Development: Santiago Calatrava
Municipality: Walter Veltroni
Main Contractor: Vianini Lavori
Client: Capital of Rome Municipality
Land Owner: Università di Tor Vergata
Cost/Capital Manager: Civil Protection with Guido Bertolaso and Angelo Balducci
Project Funding: European and national public funds.

+ Context

In the early 2000s, the public administration of Roma Capitale had decided to revitalise the suburbs of Rome, among which the construction of Città dello Sport in Tor Vergata, the refurbishment of the facilities of the Foro Italico e the upgrading of the Ostia facilities. (Accattini, 2017).

For the realisation of Tor Vergata pole started the tender process for the construction of a multifunctional sports centre, the project was estimated at an initial sum of EUR 60 million and the delivery by the end of 2008. (Vomero, 2008)

However, when Rome shortly afterwards, in a competition with the Japanese city Yokahona in 2006, was awarded the opportunity to host the finals of the 2009 World Aquatic Disciplines Championships, conditions changed and the project took on a new perspective. From EUR 60 mln, the cost of the project rose to EUR 120 mln when the tender was awarded.

The project was entrusted to the renowned Spanish architect Santiago Calatrava, who made several changes to the initial project so that it could actually host an international mega-event: architecture, construction technology, structure, design and art intertwined to create two arenas with 8,000 and 15,000 seats respectively.

The structure would have included basketball and volleyball courts, four swimming pools, an athletics track and numerous football, five-a-side football and tennis courts, all set in a 30-hectare green area. (Ippolito, 2021). The project was approved at the Services Conference in September 2006.

The construction contractor company that received the assignment was Vianini Lavori of the Caltagirone group, while the Civil Protection under Guido Bertolaso and Angelo Balducci was entrusted with the management of the funds through a decree signed by the then Prime Minister Silvio Berlusconi.

In 2006, the architect finally presented the final project proposal with a model showing a complex and daring structure, which caused the cost to already double again: from EUR 120 million to 240 million. In fact, two large steel and glass shells were proposed: the first hosting a water polo arena with two pools, one 50 metres and the other 25 for diving, a third pool outside the domes for a total length of another 50 metres. The second, housing basketball and volleyball courts.
In 2007, construction works began, but was immediately interrupted and suspended due to company changes and legal problems; nothing was built yet, but the costs continued to rise and the timeframe lengthened considerably. Despite the fact that the project was now executive, accommodation for athletes, car parks, new road and sewerage systems were added.
The city council and the Campidoglio then realised that the time for the construction of the entire planned facility was insufficient given the imminent opening ceremony of the World Championships. The mega-event would therefore be moved to the Foro Italico - which had already hosted the world swimming championships in 1994. The Foro, already fully fit to host the competitions, underwent renovations for an additional EUR 45 million. The sports city was not suspended, however, but the works continued at Tor Vergata, justifying the new sports city as an area with an integrative function.

In June 2008, the capital manager was changed and Claudio Rinaldi took over, and in October of the same year, Gianni Alemanno became the new mayor of Rome.

The European Union warned of a possible fine due to irregularities in the procurement procedures on Tor Vergata project (Accattini, 2017).

The costs for which the team had been pinned down were later implicated in an investigation called the 'procurement clique' consisting of 33 people, which the public prosecutor's office continues to investigate to this day. (Bernardini, 2015).

In January 2009, the Prime Minister officially announced that the work, since it could not be completed in time, would not be ready to host the competitions in June, in fact it was only in 2010 that the first traces of Calatrava's mega-project began to appear.

In 2011, thanks to Rome's candidature for the 2020 Olympics, EUR 660 million were estimated for the completion of the initial work - 11 times the cost forecast in 2005 - which, however, was never followed up given the Italian economic difficulties of that period.

In February 2012, the Mayor Alemanno claimed that he had found private investors, including the private Swiss company NEC Group International in association with HRS Ltd, willing to invest EUR 380 million of the total 660 to complete the site and asking in return for 25 years of facility management and a building permit for a shopping centre in a vacant area of the lot.

This near-optimal solution to rebuild an unfinished construction site was never realised due to the Prime Minister Mario Monti who failed at eventually proposing the city to host the 2020 Olympics.

In 2014, when the construction site had not yet restarted, Codacons - a recognised environmental protection association - demanded the demolition and decommissioning of the structure as it was recognised as damaging the landscape and the community.

The University of Tor Vergata, on the other hand, which was involved in the project because it would have brought added value and new spaces for students, requested a change of use to transform it into the world's largest botanical garden, investing EUR 60 million for the completion of the roof and EUR 426 million for total completion. (Romano, 2021)

In 2020, the financial loss was huge and without any entity to be accounted for liability. The Public Accounts Prosecutor's Office has filed the file on the investigations related to the construction of the Tor Vergata sports city and the Ostia, Valco San Paolo, Pietralata and Foro Italico swimming centres.

In 2021, thanks to the Budget Law 2021 art.1 number 557-560 30/12/2020 no. 178, EUR 25 million have been authorised, a derisory sum compared to the amount needed for completion, but which would allow the State Property Agency to manage and enhance the projects already developed. Therefore, EUR 3 million per year were allocated for the three-year period 2021-2023 for the ordinary and extraordinary maintenance of the lot, the functional recovery of the completed works, and safety enhancement.

Furthermore, ownership was transferred from the University of Rome Tor Vergata to the State Property Agency. (Agenzia del Demanio, 2021; Ministero dell'economia e delle Finanze, 2022).

On the website of the Lazio region, at the end of 2021, in fact, EUR 350 mln is mentioned from PNRR funds for the University of Tor Vergata to create Italy's first Open Innovation district. (Regione Lazio Notizie, 2021). Today, in 2022, the structure has not undergone any changes, remaining an open construction site, or rather blocked and unfinished, despite the fact that the community, given the amount of proposals and projects made, does not see it as a nuisance but rather as an opportunity to be exploited. (Barbarisi, 19/04/2022)

+ Status of the work - Issue

The project, built for 16.25 % of the total planned work has, to this date, completed the foundations and the skeleton of the reinforced concrete structure: a very complex and resource-intensive to produce, transport and erect. The visible structure is composed of annular inverted beams and partitions, also made of concrete, which are entirely solid slab decks. Part of the bleachers and two pools were also closed to completion.

In addition, it was also realised the skeleton of the foyer, a communication element between the Palasport and the Palanuoto, which would have housed shops, characterised by a large central spine arch and a system of transverse arches.

Moreover, only the skeleton of what would have been the steel and opaque glass roof in the shape of an inverted shell composed of two pavilions was built; the amount of steel used for this operation, then left unexploited is abnormal - 7 million kg of steel, the same, as Ippolito (2021) notes, used to build the Eiffel Tower.

Various procedures were involved in the erection of this roof and the assembly of the steelwork, including 186 assembly steps. In addition, two types of cranes were used, one main crane for lifting loads and the second for moving and supporting. The cranes used, as shown in image 1, were special machines - one crawler and the other wheeled - among the largest in Europe as they had a lattice girder extension of 138 m, which meant that 27 articulated lorries had to be involved for their transport. (D'Auria and Strollo, 2015).

The amount of EUR 406 mln was estimated for the completion of the work today. (Ippolito, 2021; Alviti, 2018).

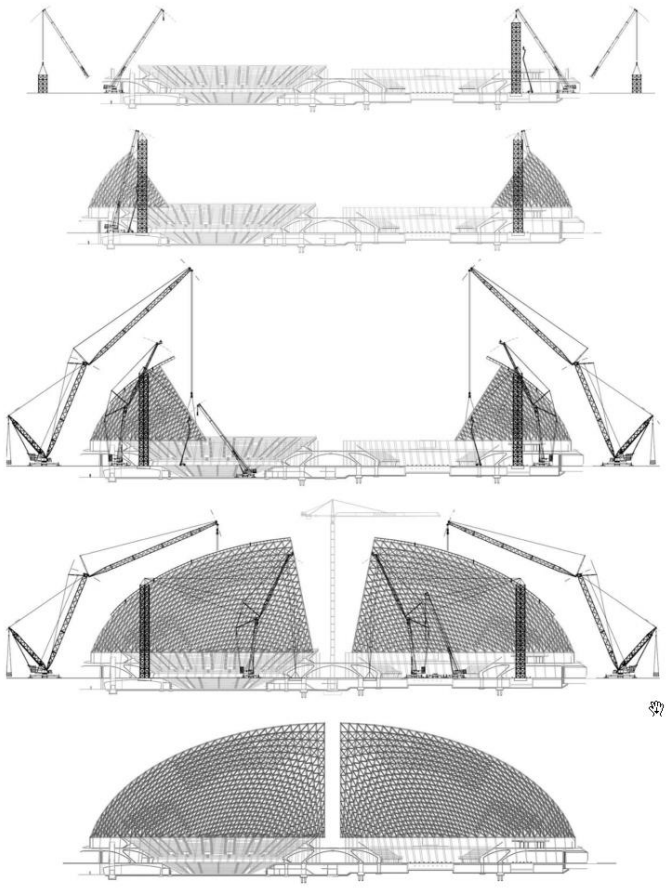


Image 4: Installation phases for the glass and steel roof via loading cranes and several support and handling cranes (source: D'Auria and Strollo, 2015)

+ Lesson Learned

The City of Sport in Rome was a very complex project involving an immense number of people, time and resources. The lack of management of the project and the lack of a figure who would take care of the liaison between the stakeholders, together with mismanagement of funds, costs, and capital, led the project to an expected failure that still persists today, damaging the environment and the community of the Tor Vergata area.

As per the filing document of the Public Prosecutor's Office cites, the waste was caused by "planning deficits, design inadequacies, insufficient appropriations with respect to the programmes, and design changes: all circumstances that contributed to the mismanagement of the project and affected its completion".

The circumstances cited in fact bring us back to a topic of crucial importance for this research of mine and for the drafting of the Vademecum; the project failed because all those phases that project management activity is concerned, failed. According to the 8 sages of RIBA, the phases are:

0. Strategic Definition; 1. Preparation and briefing; 2. Concept Design; 3. Spatial Coordination; 4. Technical Design; 5. Manufacturing and Construction; 6. Handover; 7. Use. (RIBA, 2020)

Focusing on the first 5 phases (0 to 4), there was insufficient planning and scheduling of time, costs and resources.

As is identified in the study carried out by Trento and Spaziani (2019), who analysed a series of unfinished works - including that of Tor Vergata - this project was not only blocked by a lack of funds or by the fact that funds were multiplied over the years, struggling to arrive, understandably, at an end. It was rather because of poor organisation of the project. In this case, therefore, lack of funds is not a cause but a consequence of unsuccessful and sloppy planning.
Moreover, risk management did not occur completely, yet the project attracted the attention and the interest not only of the district area but of the entire nation for a mega event.

The case of Città dello Sport in Tor Vergata is the cleat example of a failing project management in the public sector. Various concerns in the process have arisen in the project preparation and briefing: firstly, there were not identified the deliverables properly; during a construction project, especially of those dimension and entity, variables and design modifications are conventional and usually considered in the possible risks to encounter during the construction phase. However, the initial design and the cost offer was microscopic in respect with the final request, changing constantly the scope and not keeping it aligned to the initial objectives.
Secondly, the project constraints regarding not just time and costs, but also technological, environmental, infrastructural, of safety and performance were not properly addressed. The project, indeed, although the various problems that occurred kept on changing and the stakeholders kept on investing on something that was damaging and consuming resources. Thirdly, the liaison among the stakeholders was not mentioned, if not for illicit relationships.

Case study 2: Diga sul fiume Melito, Gimigliano - Calabria

+ Problem

The Dam on the Melito stream in Gimigliano, starts in the ‘80s when with the funds of the Cassa del Mezzogiorno (a real state fund to finance extraordinary works of public interest in southern Italy, also known as Casmez) it was decided to finance a project for the largest reservoir in the south to serve the countryside of the neighbouring municipalities and create a lake to serve the public in a structure 180m high, 1.5 km long and holding 108 cubic metres of water. The project, studied by engineers and geologists, was approved in 1982. Four different construction companies changed hands over the years but, due to litigations, the project was never completed. At present, after 40 years, only 13% is complete.

Image 5:Diga sul fiume Melito, Gimigliano - Calabria (source: https://gsud.cdn-immedia.net/2021/03/diga_melito.jpg)

+ Project ID Card

Registered Name: Città dello Sport Roma Tor Vergata
Designated Contracting Authority:
Unfinished Work Status/ Principal Criticality: A1.1 Insufficienza del sistema delle fonti per garantire la sicurezza dell'approvvigionamento
Area of Interest: National
Unfinished Work Description: Completamento sbarramento di Gimigliano sul torrente Melito (Sbarramento, galleria di derivazione, centrale idroelettrica, opere complementari e interconnessioni)
Last Total Upgraded Intervention Q.E.: EUR 259 mln
Amount of Charges for the Completion of Work: EUR 200 mln
% Accomplished Work: 13,08%
Usability of work: NO
Reduced use of the work: YES
Networked Work: YES
Constitutes a discontinuation of the Network: N/A
Causes of the Work Non-Completion: Lett. a).
(source: Piano degli interventi di completamento delle dighe della Regione Calabria, 2019)

+ Project Stakeholders

Design Development: Opera di Sbarramento di Gimigliano sul fiume Melito (Catanzaro)
Municipality: Consorzi Raggruppati di Catanzaro
Contracting Authority: Consorzio di Bonifica Jonio Catanzarese (Alli-Punta)
Main Contractor: Italconsult - Italstrade S.p.A. - Astaldi S.p.A. - SAFAB S.p.A.
Client: Avvocatura dello Stato
Land Owner: National Public Territory
Cost/Capital Manager: N/A
Project Funding: National public funds.

+ Context:

It was the 1960s when in Italy, or more precisely, in southern Italy, people began to think about where to place the Melito river dam. Following the opinions of experts and consultants such as geologists, engineers and government officials, the Consorzi Raggruppati of Catanzaro chose Gimigliano, in the province of Catanzaro, to meet the water needs of 50 municipalities.

In 1975, the Cassa del Mezzogiorno was already beginning feasibility studies through the ITACONSULT company of Rome, entrusting the project to the Professor Arrigo Croce and the engineer Giorgio Visentini in collaboration with the geologist Professor R. Barbier and the National Polytechnic Institute of Grenoble. The team, even at this early stage, developed discordant opinions about the stability of the structure; the foundations of the banks of the work and the reservoir would still be susceptible to the movement of landslides along the river due to tectonic soils. (Visentini, 2012)

However, following numerous new land and soil investigations, a second project was carried out by engineer Enzo Beneo that took into consideration the more pessimistic options and worst-case scenario in order to give it greater safety.

In 1982, this last project for the construction of the dam was established by the Cassa per il Mezzogiorno and approved by the IV Section of the Higher Council of Public Works.

The Cassa, through surveys and feasibility studies in order to meet the needs of the various parties directly and indirectly involved in the works, proposed Special Plan No. 26 dividing the large project into three parts - northern, central and southern - so as to make the macro-project more manageable in micro-projects of which the hydraulic works and interconnected water resources could be better controlled. (Accattini, 2011).

It was supposed to be one of the largest infrastructures in the southern Italy, right at the foot of the Sila upland. The dimensions were enormous: 15 million cubic metres of material, a maximum height of 108 metres for a crown development of 1.5 km and the capacity to cage 108 million cubic metres of water, and a large cost: EUR 259.7 million (ITL 530bln). (Ippolito, 2021)

It was only in 1991 that the contract for the work was won by Italstrade S.p.A. in association with Astaldi S.p.A. and that when 5% of the work was completed, the contract was already suspended due to the Ministry of the Environment on the Territory for 'lack of environmental compatibility'. The contract was then reopened eight years later for the sum of EUR 97.4 million.

In 1994, however, the competence of the hydraulic networks had passed into the hands of the Region for several years, and in an attempt to standardise some of the processes to the new regulations of 5/01/1994 no. 36, it had delimited the A.T.O. Ambito Territoriale Ottimale - the territorial area in which the Integrated Water Service is competent.

Starting in 2001, an endless series of disputes began between the Ministries of the Environment and Public Works and the Consorzio Alli-Punta di Copanello Land Reclamation, responsible for carrying out the work. After years of exhausting negotiations, fundings still struggled to be provided by the right time to have the construction site duly proceed according to the established schedule. In the archive of the Court of Cassation, they even confirmed that the environmental impact assessment was actually assessed as marginal.

In July 2003, Astaldi and Italstrade, by then having become a single entity, signed the transaction with the Consorzio with updated prices (+53% of the initial cost) very different from the ones far back to the 1991.

However, Astaldi had previously called for a termination of the contract, demanding payment for the work performed up to that time, as well as compensation for damages and loss of profit: EUR 259.7 million (ITL 530bln) much higher that the new transaction and the subsequent supplementary deed of the end of 2004. (Visentini, 2012). Disagreements, between the Consorzio and the Direzione Lavori (Works Direction) on one side, and the Company on the other, never came to a conclusion, despite estimating the final date for the project delivery in 2009.

In September 2006, Astaldi filed for arbitration. The arbitration award established Astaldi's right to be compensated for the damage suffered: 89 million, which, for the time being. The latter damage will not be paid by the Consorzio, which has likewise, in the meantime appealed to the court. (Accattini, 2011). The project was then re-tendered for again a new sum of EUR 19m (Ippolito, 2021)

In October 2008, 26 years after the Cassa per il Mezzogiorno's decision, the Consorzio awarded the contract for the lining of two tunnels that had remained uncovered and therefore susceptible to deterioration since the suspension of work. The new investment of EUR 24 million was allocated to a new contractor, SAFAB S.p.A. (Visentini, 2012).

In November 2008, the works on the tunnel was started as reported by Accatini (2011), expected to end in 2015, but in April of that year, work was suspended again.

To this day, in 2022, the construction site remains unfinished in disagreement with the tight schedule, of which not even Ippolito (2021) reports any update.

+ Status of the work - Issue

At present, a financing plan has been proposed on Development and Cohesion Fund 2021-2027 for which a technical-economic feasibility study is being carried out.

In 2018, about EUR 200 mln has been estimated for the completion of the works started and the community seems to agree with the mayor of Gimigliano, Massimo Chiarella, for the allocation of the resources; he stated that the hydrogeological damage the territory has been subjected to for decades, should deserve, at the very least, to be secured and completed. The dam and the infrastructure connected touch and affect 50 municipalities.

The use of EUR 47 million for having completed not even 1/5 of the whole project in 40 years and having had, as its only result, the expropriation of surrounding homes (a total of 200 families) and the use of public soil that has remained unexploited since then. (Giangrande, 2020) According to Jappelli et al. (2011), the project failure was due to the fact that the project that lasted for years caused a knowledge gap and fragmentation in the working team. Back then, the chances to keep track and record of the needed information was much harder than with the digitalisation at this present time. The difficult generational transfer of the residual experience accumulated over the last century can only take place through a great joint effort enlightened by a firm holistic approach capable of balancing prejudice and subculture.

+ Lesson Learned

One might think that the failure of the project was due to those initial discrepancies between the feasibility and geognostic studies and the as a result, the design modifications or the litigation over the technicalities. However, as demonstrated by the research carried out by Costanzo et al. (2011), the whole analysis methods used in this study, from the most simplified to the most advanced, seem to indicate that the maximum displacements expected for the Melito dam are such that there is no fear of either overall collapse or loss of seal - even under the most extreme seismic actions considered-. For sure then, the experts had to carry out studies and years of analysis to reach this result, it could maybe not be clear at the start.

But then, why starting a project being unsure it could actually be feasible? Why investing millions for a project that divided scholars and experts for the uncertainty of the result?

The real dilemma of this unfinished work is therefore another: the bureaucratic difficulties and profit-making disputes of the various parties.

In fact, as reported in newspaper articles (La Repubblica, 19 October 2020 by Antonio Fraschilla), there are two disputes in this project: the first, between the Ministries of Public Works and the Environment on the one hand, and the Region and the Alli-Punta di Copanello Land Reclamation Consortium (the contracting station) on the other. the second, between the Astaldi company and the Alli-Punta Land Reclamation Consorzio for the payment of the works carried out. The relations between the stakeholders, which were very complex due to the uncommon interests involved, were worsened by an unorganized and unplanned system.

There was certainly no lack of timetables or feasibility studies, but the common objectives were missing. As reported by Melis's study (2017), the procedures with the highest amounts of money involved are also the most contested and involved in disputes (almost 50% of unfinished projects). As shown in the table 1, the number of appeals increases depending on the amount of the tender, probably due to the fact that the process has to face and sustain the judgement of several bodies, institutions and parties.

TENDER BLOCKED DUE LITIGATION AND CONTENTIOUS MATTER			
	2015	**2016**	**2015-2016**
Contracted Tender	233	215	448
Economic Value (bln)	11.501bln€	6.416 bln€	17.917 bln€
Appeal/Contentious			125
% Appeal/Contentious			28%

Table 1: Ternder Blocked due to Litigation and Contentious Matter (data source: elaborazione centro studi fondazione Ergo su dati di Consiglio di stato)

- **Case Studies Comparison and lesson learned**

There were five criteria for choosing the case studies analysed at the beginning of the study: data availability, location, economic dimensions, project suspension reasons and function.

The first case analysed, the Sport City at Tor Vergata, was a much discussed case not only for the importance and prestige of the architect involved but also for the majesty and grandeur of the project and the funds used to finance it. The project, which was blocked due to missing funds, turned out to be in fact a consequence of poor planning and cost planning in the first place. Similarly, the Dam in Gimigliano project suffered significant budget changes and difficulties in getting the funds to the company.

The similarities between the two case studies do not only concern the considerable complexity of the projects, but also the fact that they are projects that started and lasted for decades. The time span of the construction site was not considered among the criteria for choosing the case studies, but turns out to be, at the end of the analysis, a characterising element.

In fact, Melis 2019, suggests that the timeframe of public works for infrastructures is clearly characterising the difficulty in the project completion compared to the private sector.

In both projects, the parties involved in the process did not refer to a neutral body or manager who did not serve the interests of one party, resulting in a series of disputes to defend their interests. The common lack of this figure during public procurement creates inhomogeneity, but above all, corrective actions are not taken in the needed timely manner.

A substantial difference between the two case studies is the initial division of labour, also known in the technical field of project management as WBS: work breakdown structure. (Söderlund, 2012)

In the case of the Gimigliano Dam, the project had been thoroughly thought out, tasks and sub-projects had been divided, and numerous feasibility studies had been planned in order not to run into later technical problems. In the case of the Tor Vergata Sports City, on the other hand, the final project, which was different and constantly subject to additions and modifications, had been proposed years after the contract had been awarded, changing the cards on the table and thus preventing a proper division of the work into sub-projects. This also prevented the actors involved from taking responsibility for specific objectives that were clear to all stakeholders, resulting in a series of unresolvable conflicts.

The uncompletion of these two major construction project, similarly in fact, caused in both cases an enormous environmental, collective-social and resource damage.

iii. Vademecum Design

Finally, the vademecum design comes to light not only as the final phase of this research but also as an addition to the already present literature on the topic;

Trento and Spaziani as well, in fact, in 2019 have delineated guidelines for new policies aimed at intervene on unfinished public construction projects in Italy. They defined 7 directions:

1. Ex-ante interventions: it is suggested to have more awareness of the whole life cycle of a project, starting from the data observed in the archive for unfinished public projects recognise an efficient plan of action in order to monitor and prioritise the most impactful actions that bring a project to a failure. Doing so, it is recommended to intervene sooner to save the public founds.
2. Ex post intervention: it is suggested to plan and design new function for the projects suspended when compatible with the regulations in force.
3. Sblocca Cantieri decreet: it is advised the modification of the regulations in order to simplify the procedures. Trento and Spanzani (2019), indeed, propose as by decreet, that in case of failure or forced liquidation of the construction company procured, they must continue the works in arrangement with a substituted company. This works when a company, submitting the bid for a tender, has to indicate a substitution in the eventuality of not being able to complete the construction works. In this way, it is diminished the fragmentation and improved the continuity for the exploitation of the public contract.

4. Executive times reduction, that they prove that the timeframe for the execution of the infrastructural public projects range is nearly 4,6 years which is a number quite high.
5. Public funding time reduction: the 70% of construction companies report delays for the invoices forwarded to the public administrations, which though, the European policies seem to ignore.
6. More efficient administrative jurisdiction; the amount of litigations and contentious activities is around the 2.7% in the general construction sector. They noted, however, that in the construction sector of unfinished projects the proportion is much higher and more impactive: one appeal on three has suspension effects.
7. More efficient use of the European funds; from the document of State of Implementation of European Structural Funds by member state, it is visible how Italy has demanded only the 70% of the provided funds and spent only the 27%. (EU overview of implementation by member state, 2019).

Starting from this base, I would like to focus my contribution to only the first point they treated: the ex-ante interventions. The case studies analysis strongly proved the cruciality of the planning and the briefing part of a project. My results and guide could be summarised in four main points, to address when approaching a new project:

+ Project Briefing

The representation of the scope in a structured form that allows one to understand its composition, to estimate its feasibility in terms of time and cost, and to facilitate the subsequent planning, implementation and verification phases. In order to compose an efficient briefing it is necessary to address four main fields:

- the *products* that has to be created in the project domain;
- the *activities* related to the products;
- the *responsibilities* for the execution of the aforementioned activities;
- the *allocation of the resources* needed for complete the activities.

As a consequence, it will be defined an operational plan that designates a representative road-map to know the x actor involved in y activity and that operates in a z way. The last, crucial variable is the time: what is the estimated time for completing that activity in those conditions.

+ Project Scheduling and planification

Once, the activities, the operatives, the resources and time have been defined and individuated, the next phases are the planning and scheduling ones. The planification can follows various approaches: the waterfall, the incremental, the iterative and the agile. During this phase, it is crucial to not only allocate the variables aforementioned but to especially establish the links among them. These connections build a solid and reliable plan that constantly reminds what that activity was supposed to bring, in what time and cost, with what resources and the timeframe. It derives that the amount of resources is much more limited and controlled, it cannot keep on growing unless there is a variation in the contract/offer. (Eadie et al., 2013)

+ WBS - Work Breakdown Structure

It is the practice by which the main project of which there are recognised the main aim and objectives, it is divided in smaller parts with a hierarchical and systemic approach. In this way, the activity are easier seen as smaller and more approachable even in the problem solving (Yahyapour et al., 2015). The breakdown can be done following various logics: functional, spatial, based on the performances, by the workflow needed, physical. The choice for the logic

depends on the type of project and the project brief. The more the WBS is complete, the more it is guaranteed that the technical and organisational aspects are taken in consideration from the start. To do so, it is possible to use a matrix of responsibilities that represents what has to be done and who is in charge of doing so.

+ On-time verifications

I believe it is necessary to implement a system by which it is possible to constantly verify the alignment with the objectives of a project among the stakeholders involved. Doing so, the documentation, formalisation and acceptance of the events and possible interferences to the good practices are recorded. Even in the circumstances in which the construction company, the professionals or a whatsoever party fails into their duty, the fragmentation and the chances to miss information is much lower. The implementation of the BIM technologies helps majorly in this case: the database of information keep record of design modifications or possible risks involved in the practice. Indeed, the risk management should be enhanced, especially in the field of public projects. It is through the WBS structure as well, that it is possible to keep track of the project and stakeholder activities and performances.

Overall, it is suggested an agile methodology of Project Management which consists in dividing a project into phases to facilitate its management. Throughout the process, stakeholders are continually consulted and continuous improvements are made. Teams cycle through three stages when they begin working on a project: planning, executing, and evaluating. The importance of continuous communication between team members and project stakeholders cannot be overstated.

IV. Conclusions

The aim of this research was to eventually design a vademecum, a guide, for who's in charge of the project management in the construction Italian public sector. The main reason is to reduce the worrying amount of unfinished projects and improve the management of the initial phases of a project. Since the art. 44-bis ddl 201/2011 when it was finally decided to report and register the whole totality of unfinished construction sites in Italy, it has been recognised the issue through the institution of the Ministry of Infrastructures and Transports, but is yet a way too common phenomenon that provides at this day 379 unfinished construction sites of which needed funds for completion are around EUR 428mln. (Quadro Nazionale Opere Incompiute al 30/06/2022 – Rilevazione Scp 2021). Since 2013, the partnership between the Ministry of Infrastructures and Transports together with the Italian Regions Administration have allowed to observe and investigate the public procured contracts. From this, it was developed a computerised system for the monitoring of unfinished construction sites (SIMOI), then listed and posted online. Starting from these data, the research background and the literature review, I initiated the definition of the guidelines of my study. The lesson learned from the first part of this research, helped me then, to define the methodology and successively the selection criteria for the case study choice. The literature brought me to understand and break down the whole entwined system of norms, laws, decreets and regulations that revolve around the object of my study and that, indubitably, affect the issue. The chronological division and the scholars' and experts' notions and ideas enriched mine but mostly reasoned the cruciality of this research aim. It resulted evident how scholars mostly find a resolution of this issue in the aesthetic behind the phenomenon that this research instead addressed under a more pragmatic light using decrees, laws and norms already in place

within the system in order to overcome the constant decline in the construction sites objects achievement.

The research, indeed, moved in the direction of the case study analysis since a qualitative method was preferred to the quantitate for matter of time and relatability to the sake of this research; the qualitative approach is recommended for new knowledges because the subject is analysed from various perspective, encompassing them all. (Holloway and Wheeler, 2002).

Furthermore, this type of research is bias-less during the data collecting phase as it analyses the events purely as they happened. Thus, it derives that the researcher stays neutral in relation to them (Kahn, 2014). As per my research, using a case study approach, I purely analysed the event and the context drawing, though, my conclusions.

From the lesson learned given by the case study analysis and the opinions regarding the project management of the academics, the vademecum resulted as a framework of guidelines for the best practices to put in place in order to achieve successful outcomes. The results lead to the request for a more accurate definition of the structure: this study proves how the systemic issue that regards the Italian public sector in construction can only be overcame by an agile approach where the communication among stakeholders so that modifications, variations and contingences can be treated beforehand and managed in a risk assessment.

However, a limit of this research method is constituted by the fact that results cannot be statistically extended to whole cases and mostly, it is difficult to prove cause-effect connections among the mentioned variables. Thus, to overcome this limit, this research selected but also, studied and compared two case studies to broader the view on the topic. The limit of this research lays also in the focus on the public sector only but a greater focus on the private could produce interesting findings that account more for the project

management in construction in a broader view in order to strengthen this role in the Italian system.

A further study could assess the long-term effects of the appointment of these best practices and guidelines on a starting public construction project in order to prove the effectiveness of this research.

Ensuring appropriate systems, services and support for the project managers in charge (RUP and Direzione ai Lavori) should be a priority for the government and the public administration that seems to find resolution only in the appointment of resources instead of a frame worked system where the norms and the regulations states clearly the course of action in case of a blockage.

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VI. APPENDIX A - Transcript

Using Google Forms, an online survey with multiple choice questions was conducted to collect data. This questionnaire was divided into two parts. It contains 11 questions: the first part, considered as the quantitative phase, was designed to analyse the professional role of respondents and to compare what, based on this variable, each figure would have answered in subsequent questions.

This first part consisted of 8 questions (the questions below are not listed in the original order):

- 4 Singles-Select Multiple-Choice questions were asked as follows:
    1. "Indicate the occupation status of the interviewee" in which the possible choices were divided into:

       1.1 Owner/Administrator of the construction company-construction firm

       1.2 Professional Designer

       1.3 Client/Real estate investor/Owner

       1.4 Works Operative

       1.5 Student/Graduate in relevant subject (construction)

       1.6 External observer
    2. “Indicate the main reason why construction yards in Italy are blocked or temporarily suspended" in which the possible choices were divided into:

       2.1 Bureaucratic (excessive regulation, missing documentation) or contractual problems;

       2.2 Variations (incomplete and incorrect executive project);

       2.3 Inadequate work administration (disorganization, dissatisfactory or absent planning, incompetent firm);

       2.4 Adverse weather conditions;

2. 5 All the previous.

3. “What usually happens, in Italy, consequentially to the closing of the construction site or to the suspension of the activities" in which the possible choices were divided in:

   3.1 The yard area remains occupied by the unfinished property with consequent abandonment, illegal occupation, dirt, dangers occupying otherwise reusable soil;

   3.2 The worksite is cleared complying to the regulations and put on of new developments.

   3.3 The worksite is cleared, but usually not complying to the regulations nor in a sustainable way.

4. “Do you know or have direct experience in the field of project management/construction management?”, where the possible choices where:

   4.1 Yes, I usually perform this task.

   4.2 Yes, I know what it is but I never performed this task.

   4.3 Yes, I know what it is and I do not think It is beneficial.

   4.4 No, I have no idea.

- 3 Rank-Order Single-Choice questions, where participants were asked to respond using a 5-point Likert scale ranging from 1 (very rarely), 2 (rarely), 3 (neutral), 4 (often), 5 (very often) in order to measure the frequency of occurrence of the phenomenon.

  This type of questions was stated as follows:

  5. “How often, in Italy, were you involved in a blocked construction site? Indicate the frequency on the scale from 1 to 5"
  6. “In your opinion, could the proper planning of the construction process at all stages prevent delays in the execution of the

works or the suspension of the works? Indicate the likelihood of this event to happen on the scale from 1 to 5”

7. “In your opinion, could proper planning of the construction process at all stages prevent the occurrence of increased costs and so improve productivity? Indicate the likelihood of this event to happen on the scale from 1 to 5”

- 1 Multi-Select Multiple-Choice questions, where participants were left free to select one or more responses. The questions were articulated in this way:

8. “What, in your assessment, are the most likely consequences of the closure of incomplete construction sites?”, where the possible options where divided in:

   8.1 Damages/Losses for the owner or investor.

   8.2 Land waste and consumption difficult to recover in the immediate future.

   8.3 Degradation of the urban environment.

   8.4 Occupational and social damages.

As opposed to the first part, the second part includes an educational component, in which the respondent is provided with a comprehensive definition of project management. As a result, the respondents' knowledge and awareness of the topic will be strengthened and the examinee body will be prepared to respond to the next question. I tried to avoid possible misunderstandings and confusion on the subjects, limiting the margins of error.

After this section, the second parts consist of 3 questions:

- 2 Singles-Select Multiple-Choice questions were asked as follows:

9. “Now that you have briefly understood what Project Management is about, would you consider it a job already

conducted by one or more professionals in Italy?" in which the possible choices were divided into:

9.1 Yes, it is one: the construction supervision deals with all these aspects.

9.2 There is no professional that deals with all stages in all their parts.

10. "If you were about to start a project, would you consider to have the support of professionals who can advise you during all phases of the process and implement the results, doing your interests?" in which the possible choices were divided into:

10.1 Yes, I would rather pay a professional to back me up, advise me, and make sure of the successfully delivery of the project.

10.2 Yes, I would love to, but it would have an additional cost that I would not be eager to pay.

10.3 No, I would not be interested because, being in the business, I could manage it without any problem.

10.4 No, I would not be interested.

10.5 Add a different answer not listed

- 1 Rank-Order Single-Choice question, where participants were asked to respond using a 5-point Likert scale ranging from 1 (very inconvenient), 2 (inconvenient), 3 (neutral), 4 (convenient), 5 (very convenient) in order to measure the perception and the opinion:

11. "How useful do you think it is to have a person or a team of people who take care of the project from start to finish, alongside the other professionals?"