

# iscte

INSTITUTO  
UNIVERSITÁRIO  
DE LISBOA

## **How to overcome the challenges to recruit and retain operational workers in the Engineering Services Sector**

Pedro da Silveira Botelho Grade Mendes

Master in Applied Management

Supervisor:

PhD Leandro Luís Ferreira Pereira, Assistant Professor, ISCTE-IUL

November 2021





Department of Marketing, Strategy and Operations

**How to overcome the challenges to recruit and  
retain operational workers in the Engineering  
Services Sector**

Pedro da Silveira Botelho Grade Mendes

Master in Applied Management

Supervisor:

PhD Leandro Luís Ferreira Pereira, Assistant Professor, ISCTE-IUL

November 2021



## **Acknowledgments**

The following assignment makes up the final individual project in order to conclude the Master's in Applied Management. Following the practical approach of this course, I intended to develop a project with a practical application, combining the worlds of academia and business.

I was fortunate enough to be able to have the guidance of Professor Leandro Pereira, who always went over and beyond to help me and guide me through this assignment. Always accessible and open minded, Professor Leandro has been a true mentor, always pushing for me and motivating me along the way. Furthermore, as I start to change the direction of my professional career and develop a new path within the exciting field of Project Management, Professor Leandro's unvaluable advice and mentoring have been key throughout this journey.

I was also blessed with the openness of ProCME Group's Board, that gave me the opportunity of focusing my work on this great organization – one of the major references in the field of Engineering Services in our country. My idea for this assignment was very well received and throughout the research every interaction with the group's professionals was welcomed and productive. I truly hope this work can bring about some tools and solutions that can contribute to the growth and success of this grand enterprise.

Finally, I would like to thank my family for all the support and encouragement, not only throughout this final project, but along the whole course. Working full-time all along, this learning journey required many "family hours", weeknights and weekends. I'm so grateful for Kika (my wife), Pedro and Xavier (my sons), for their patience and care. Although this was a personal growth and development endeavor, it wouldn't have been possible without them. As it is with them in mind and for them, that I give all I have in everything I propose myself to do and strive to become the better version of myself that I can.



## **Resumo**

Existe uma falta crónica de mão de obra, especializada e não especializada, nos sectores da construção civil e dos serviços de engenharia. Este problema leva a um enorme desafio para as empresas que operam estes sectores – como assegurar um recrutamento e retenção consistente de trabalhadores operacionais nestas indústrias. O principal objectivo deste trabalho foi identificar um conjunto de estratégias e soluções que possam ajudar as empresas destes sectores a ultrapassar esta dificuldade latente. Nesse sentido, foi utilizada a metodologia “Pereira Problem Solving Research Methodology”, a fim de perceber de forma efectiva as principais causas, a tendência e principais impactos deste problema, e ao mesmo tempo identificar possíveis soluções e os seus benefícios esperados. Os resultados mostram que as organizações necessitam de actuar nos dois lados desta questão – Recrutamento e Retenção – de forma proactiva e efectiva, de forma a garantirem um crescimento sustentável das equipas operacionais, assegurado desta forma a sustentabilidade geral do negócio.

**Palavras-chave:** Construção, Emprego, Recrutamento, Retenção, COVID-19, Trabalho

## **Abstract**

There's a chronic shortage in skilled and non-skilled workers for the construction and engineering services industries. This issue leads to a major challenge for companies operating in these sector – how to overcome the challenges to recruit and retain operational workers for these industries. The main goal for this assignment was to identify strategies and solutions that might help companies to overcome this concern. In that regard, the “Pereira Problem Solving Research Methodology” was employed, in order to better understand the underlying causes, trend and main impacts of this matter, while also being able to uncover possible solutions and its expected benefits. The results show that companies need to address both ends of the issue – Recruitment and Retention – in a proactive and effective manner, in order to be able to ensure its operational teams' growth and stability, thus guaranteeing its business sustainability.

**Key words:** Construction, Employment, Recruitment, Retention, COVID-19, Labor

**JEL Classification:** Employment, Unemployment, Wages, Intergenerational Income Distribution, Aggregate Human Capital, and Aggregate Labor Productivity (E24); Labor Demand (J23); Human Capital, Skills, Occupational Choice, Labor Productivity (J24)



## Table of Contents

### Acknowledgments

Abstract.....	i
Key Words.....	i
JEL Classification.....	i
Glossary and List of Abbreviations.....	iv
1. Introduction.....	1
2. Literature Review.....	3
2.1. Construction Labor Demand, Employment and Productivity.....	3
2.2. General Employment: Europe and Portugal.....	5
2.3. COVID-19 Pandemic’s Impact.....	6
2.4. Project Management Performance.....	8
2.5. Project-based Organizations (PBO).....	10
3. Research Methodology.....	13
4. Data Analysis.....	15
4.1. Impact Analysis.....	15
4.2. Trend Analysis.....	17
4.3. Root Causes Analysis.....	18
4.4. Solutions/Strategies.....	19
4.5. Expected Benefits.....	21
5. Results Discussion.....	24
6. Conclusions, Study Limitations and Future Research Suggestions.....	28
7. References.....	31
8. Appendixes.....	34

## **Figures Index**

Figure 1 - Problem Solving Research Methodology Diagram.....	13
Figure 2 - Recruitment and Retention Challenges Identified Main Trends.....	17
Figure 3 - Fishbone Chart on the Recruitment and Retention Challenges Main Causes.....	18
Figure 4 - Fishbone Chart on the Recruitment and Retention Proposed Strategies.....	20
Figure 5 - Tree Diagram on the Expected Benefits.....	22
Figure 6 - Diagram with research results to answer the research problem.....	27

## **Graphs Index**

Graphic 1 - Pareto Diagram with analysis of the impact of the lack of capability to ensure consistent recruitment and retention of operational workers.....	16
---	----

## **Tables Index**

Table 1 - Main themes and related Scientific Paper identification.....	10, 11, 12
Table 2 - Research Questions and Objectives.....	14
Table 3 - Future Research Suggestions.....	30

## **Glossary and List of Abbreviations**

- AECOPS (Associação de Empresas de Construção, Obras Públicas e Serviços - Construction and Public Works and Services Organizations Association)
- CME – Construção e Manutenção Electromecânica (Electromechanical Maintenance and Construction)
- EU – European Union
- EVP – Employee Value Proposition
- FTE – Full Time Employee
- HR – Human Resources
- HRM – Human Resources Management
- ILO – International Labor Organization
- NGO – Non-Governmental Organization
- PBO – Project-based Organizations
- PMBOK – Project Management Body of Knowledge
- PM – Project Management / Project Manager
- PMI – Project Management Institute
- PMO – Project Management Office
- SME – Subject Matter Expert
- SLA – Service Level Agreement



## **1.Introduction**

The goal of this project is to identify the main causes and propose solutions for helping companies operating in the engineering services sector to be able to overcome the structural lack of capability to consistently recruit and retain operational workers – the research problem that guides this assignment.

Throughout the years, several authors have been attempting to address this issue, as it has the tendency to keep evolving negatively. As the workforce keeps ageing and the population is still declining at an accelerated pace, it is expected that labor shortages within the EU space continue to increase. Moreover, this is not just an EU's or even Europe's concern, as labor shortages have been described throughout the world, from Developing and developed countries equally (Juricic et al., 2021). Moreover, one of the root causes for labor shortage is a mismatch between labor demand and supply (Juricic et al., 2021), meaning there's a structural unbalance threatening this industry's sustainability.

This has been an enduring problem in the last decades, within this one and several other sectors of activity that rely on a great deal of low qualification workers, which has been intensely enhanced by the recent COVID-19 pandemic – as it has brought, along with the dramatic public health implications, several economic, social, and behavioral changes, that deeply affect how people deal with work.

The construction industry is no exception, as COVID-19 has been impacting it in various ways, namely instigating a shortage of both labor and key-personnel (Raoufi & Fayek, 2020). This demanding setting provides pertinence for this research, as it seeks to identify some strategies and solutions to help companies within this industry to overcome this matter.

To be able to have a more practical approach on this matter, my work will be based on a case study conducted with a Portuguese Engineering Services Company – Grupo PRoCME. My assignment aims to address not only the root causes and implications of the previously identified problem, but also to explore the internal processes within the Engineering Services Company's teams, and how the lack of recruiting and retaining capabilities is impacting the goal of meeting clients' and projects' specific requirements.

For that reason, the scientific literature consulted to sustain the present study is focused on the topics of Construction Labor Demand, Employment and Productivity, along with the COVID-19 Pandemic's impact on workers recruitment and retainment, but also on subjects like Project Based Organizations, Project Management Performance, and Team Performance – as they portray the company's main activities and dynamics. The idea is to have a better understanding of what is being studied and proposed in these specific fields, both from a theoretical/academic and practice point of view, in order to be able to propose meaningful and impactful practices and processes, that can have a positive effect on the organization's capability to attract, recruit and retain operational workers.

This project will be presented as follows: firstly the "Literature Review" in order to have a scientific base for this study; then the chosen "Research Methodology" will be explained; next the "Data Analysis" where the sample will be characterized and analyzed; followed by the "Result's Discussion", where the research questions will be answered; the "Conclusion, Limitations and Future Research Suggestions" and "References" utilized will close this assignment.

## **2. Literature Review**

In order to have a sound scientific foundation to sustain this study, a comprehensive literature review was conducted. To be able to address the assignment's main theme and research problem, topics such as Construction Labor Demand, Employment and Productivity, but also the COVID-19 Pandemic's impact on workers recruitment and retainment, have been addressed.

Due to the specific nature and context of the company's main work - Project Management within the Engineering Services sector - and as a way of finalizing the CME's specific background, 2 main domains were selected in the field of Project Management to be revised as well: Project Management Performance and Project Based Organizations.

This set of topics gives us the scientific basis to better understand this field of work's, and the company's, specific context and dynamics and thus complete the framing of the present general setting.

### **2.1. Construction Labor Demand, Employment and Productivity**

In the last decades, we have been witnessing a dramatic change in the working landscape. The socio-economic evolution, paired with the unprecedented technological revolution underway, has led the way to deep and impactful trends that disrupted the traditional labor market.

This is the case especially for low qualification positions, the backbone of the construction industry. This progressive, yet relentless, dynamic is leading to an ever-demanding challenge for attracting, recruiting, and retaining labor for this specific field of work as it is going through an unprecedented and widespread labor shortage. It is believed that one of the main causes for this labor shortage is a mismatch between labor demand and supply. This situation happens because, although unemployment rates are increasing, both qualified and unqualified workers are not willing to accept or aren't familiar with the ever growing offers (Juricic et al., 2021). Migrant workers may be one possible solution, nevertheless, this option has two main alternatives: either governments focus on the attracting certain groups of migrant workers, according to the needed skills; or they focus on making it easier for migrant workers to enter in general (Juricic et al., 2021).

The construction labor shortage issue was also explored by Bahr and Laszig (2021), as they highlighted the sector's concerns as portrayed in several studies, where bottlenecks in the provision of qualified workers were indicated. They also referred to a survey focused on the German market, where respondent companies emphasized the qualified workers bottleneck, current and future, as the sector's main challenge, ahead of other factors such as labor costs or material and energy prices (Bahr & Laszig, 2021). This problem is becoming worse, as the number of blue-collar apprentices and younger people coming through the system are not sufficient to replace those who leave for retirement (Bahr & Laszig, 2021) – it can be empirically verified that this trend is equally taking place in other European countries such as Portugal. This is a complex matter, as many variables, such as migration, employment, educational behavior, or demographic change, will have an impact on how this labor shortage evolves in the future (Bahr & Laszig, 2021).

As it can be empirically observed, and as reinforced by the mentioned research, the construction industry is in a particular vulnerable position when it comes to the dependency of being able to attract, recruit and retain the necessary workforce. For that reason, Abbaspour and Dabirian (2020), dived in the topic of the importance of evaluating hiring policies in construction projects performance. In their research, the authors emphasized Ernst and Sarabia's (2015) work where it was advocated that the construction industry surpasses any other industry in terms on labor-intensiveness. Consequently, they signal the importance that the Human Resources Management discipline has within this industry, as labor-intensive teams are the backbone of its structure (Abbaspour & Dabirian, 2020).

Directly connected to the labor shortage issue is the que matter of productivity. Tam et al. (2021) attempted to isolate the most significant factors affecting construction labor productivity and suggest some recommendations for improvement based on complementary studies. Among other, some of the suggestions can be related to the topic of retention, such as specific training programs and compensation, benefits, and reward programs to enhance motivation (Tam et al., 2021).

In their essay based on the Portuguese reality, Pinto et al. (2019) focused on the recruitment tactics used by the Portuguese companies in the last decades, in response to the afore-mentioned labor shortage process. This study unfolded a trend of progressive deterioration of people management processes and employment conditions (Pinto et al., 2019). It can be argued that this



type of response ends up perpetuating this problem, as it contributes to the increasing lack of attractiveness of this sector's main activities.

## **2.2. General Employment: Europe and Portugal**

In addition to the specific context of the construction industry, analyzed above, it is important to have a grasp of the major employment tendencies in Europe, as they can give the macro view that helps to explain the present context.

In order to understand the underlying movements and tendencies regarding employment in Europe it is interesting to remember some basic concepts. Marinescu and Mircioi (2018) do exactly that through research that delves factual and theoretical developments regarding employment and unemployment in Europe. They remind us that the labor market doesn't function similarly to other economic markets, where supply and demand interact reducing prices. This happens because employers can offer higher wages to boost motivation and performance, thus leading to unbalanced prices (Marinescu & Mircioi, 2018). This reminds us that the labor market has an increased level of complexity, where several variables play a major part.

Regarding major employment trends in Europe, we can now acknowledge that is an ever-increasing tendency of job polarization – increasing levels of high-skilled and low skilled employment, leading to a decline in the middle-skilled employment (Peugny, 2019). Nonetheless, this trend is not evolving evenly throughout European countries, as different forms and degrees of polarization have been witnessed. According to these authors, Portugal is among a group of countries where this polarization assumes a characteristic form as its proportion of less-skilled employees remains stable (Peugny, 2019). Bridging on to the main theme of the present assignment, this may be a clue that one of the major causes for the lack of available operational workers from the construction and engineering services industries is the high level of competition of other less-skilled jobs in other industries.

Another relevant aspect of the underlying employment trend is the types of contracts in which the current employment tendency is sustained. In the case of Portugal, both open-ended and fixed-term contracts have been present in the labor market in the last decades (Matos & Parent, 2016). Both types of contracts have upsides and downsides. While fixed-term contracts give organizations the agility and flexibility of growing and decreasing their structures according to the market and economic evolution – avoiding procedural costs -, they may lead to precarious employment

conditions. As for the open-ended contracts, although they give employees more confidence, they limit the companies' performance as dismissal costs may be prohibitive, thus impeding market adjustments. In the last decades, fixed-term contracting has assumed an ever-increasing presence in the Portuguese economy (Matos & Parent, 2016).

Directly related to these matters is the concept of collective agreements, as they influence both employees and employers and, consequently, the labor market as a whole. An interesting angle is the example of the Portuguese economy, where companies have favoring collective sectoral agreements, as a way to avoid external competition from non-affiliated firms (Calavia & Rigby, 2020). These types of strategies influence how the overall labor market behaves, thus affecting how companies manage their human resources and recruitment strategies. In the case of CME, the company operates under the AECOPS (Construction and Public Works and Services Organizations Association) collective contract agreement, that frames the activities of every company that operates within these industries.

Yet another example of the impacts of these labor policies in human resources management is how they affect workers' job satisfaction, happiness, and sense of security. Although in Europe the tendency is for union density union power to decline, most unionized workers belong to traditional industries that still have a great relevance in today's economy (Van der Meer, 2019). But the overall movement is leaning to other ways of workers encouragement. Van der Meer's (2019) research points to the fact that direct voice empowerment gives more satisfaction to workers than collective unions.

As society evolves, so does our relationship to work and to our employers too. The last decades have been prone to show us some major trend shifts. These changes should remind companies that the general external context has a great deal of influence on how they should operate in order to be able to better attract, recruit and retain workers and achieve the desired business sustainability.

### **2.3. COVID-19 Pandemic's Impact**

The COVID-19 pandemic is an unprecedented event that has been having a profound and still ongoing impact in several dimensions of our societies, from public health, the economy, social changes and many other. Whilst analyzing the challenges regarding recruiting and retaining operational workers, it is interesting to evaluate as well, the overall impacts that this pandemic is

imposing in general employment across the EU and, more specifically, Portugal – as COVID-19 spreads.

It has been widely studied and documented, since the early days of the pandemic, the negative impact of the pandemic on employment, working conditions and job security throughout the world. Nevertheless, this impact hasn't always been evenly spread, as Kapitsinis and Sykas (2021) observed in their study focused on a set of European countries: Cyprus, France, Spain, Italy, Malta, Croatia, and Portugal. Kapitsinis and Sykas (2021) noted that the economic contraction is having an unbalanced track in the EU. In the European continent, as in the rest of the world, public health measures are having deeper impacts in the vulnerable economies. In the EU this means the economies of the EU south are being more affected than their counterparts in the north (Kapitsinis & Sykas, 2021). The authors further confirm that, in the case of Portugal, the current unemployment downturn is related with the recession that resulted from the severe restrictive measures to contain the pandemic (Kapitsinis & Sykas, 2021).

In this difficult context, one of the most vulnerable groups is migrant workers, who represent a considerable share of the work force in the EU, namely in the Northern, Southern and Western Europe where they reach a share of 17.8% (Podra et al., 2021). In a study that addresses the impact of the COVID-19 Pandemic on the volume of labor migration, Podra et al. (2021) conclude that external labor migration was deeply affected by the public health measures and consequent restrictions put in place by governments worldwide. Despite the negative impact of the pandemic's containment measures, the authors indicate that the need for migrant workforce is bound to grow in the EU as its member states are still in need for low-income workers, in professions usually performed by migrant workers (Podra et al., 2021).

As stated above, Portugal isn't an exception regarding the pandemic's adverse effects on employment and job security. The International Labor Organization (ILO) claims that the effects of the current crisis are greater than the global financial crisis of 2008–2009 and that job insecurity tends to increase (ILO, 2020). In this sense, low-paid jobs in the most affected industries and temporary and precarious workers tend to be one of the most endangered parties. Almeida and Santos (2020) portray Portugal in a delicate position, reflecting on Eurostat data that positions Portugal as EU's 2<sup>nd</sup> country with the highest rate of both employees with a contract of limited duration (59.5%) and temporary work (17.4%), only surpassed by Spain (Almeida & Santos, 2020).

Although, it hasn't been as hardly hit by this pandemic as other sectors such as tourism that saw its activities abruptly stopped, the construction industry, like many other industries, has been affected by the COVID-19 pandemic in many different aspects of its operations. Some of the most visible impacts are the shortage of both labor workers and specialized professionals (Raoufi & Fayek, 2020). In that regard, and as this research tries to advocate, the way organizations are able to put in place counter measures that help overcome or mitigate these effects is fundamental for the industry's recovery. As Raoufi and Fayek (2020) support, some of these needed measures are putting in place strategies that promote both physical and mental health, protection, and counselling. It is paramount to work to build up employee morale and motivation in order to reduce absenteeism and prevent productivity losses (Raoufi & Fayek, 2020). As the pandemic further accelerated the chronic issues of recruitment and retention in the construction industry, companies need to act fast and effectively.

Regardless of the challenging context, there are always underlying opportunities or alternatives that can lead to positive outcomes. Denny-Smith et al. (2021), defend the construction industry can create social value through its activity in their study entitled "How Construction Employment Can Create Social Value and Assist Recovery from COVID-19". In this research, they describe how, based on practical examples in Australia, where governments partnered with private contractors through new social procurement policies to promote direct employment of targeted vulnerable groups. These authors state that these types of strategies might help mitigate the harmful impacts of the pandemic, such as unemployment and job insecurity (Denny-Smith et al., 2021). These new ways for government and civil society to partner may give us some clues and put us closer to overcome the daunting reality that surrounds us.

#### **2.4. Project Management Performance**

Within the domain of Project Management, studies regarding project and team performance, were analyzed – as a prominent project-company, these factors shape the organization's work and business management (including the recruitment and overall HR policy), and so it is believed that addressing this topics and studies will enrich the present assignment.

The great difference between traditional organizational effectiveness and organizational project management is the focus of the latter in collaboration and team effectiveness, conversely

to the former's attention to individual performance (Jitpaiboon et al., 2019). Bearing this in mind, these authors argue that there are independent and dependent variables possibly affecting project performance (Jitpaiboon et al. 2019). Collective thinking helps team members connect, and the earlier the better to develop this mindset. This group mentality will lead to meaningful bond between team member and managers, promoting a healthy environment that will lead to higher motivation levels and higher project performance (Jitpaiboon et al. 2019).

Team performance is also affected differently, depending on the type of project in hand. Dasí, et al. (2021) approach this matter by examining the concepts of ability, motivation, and opportunity may, or not, define project execution (Dasí et al. 2021). These authors findings point to a major distinction between simple and complex projects. Regarding simple projects, hard the gathering of hard skills can make a difference – like the ability, knowledge, and skills of selected team members. Whilst in more complex projects, the major factor identified is motivation, which can then lead to the enhancement of the former mentioned hard skills and thus project performance (Dasí et al. 2021).

Project performance is a complex subject, as it entails the inherent complexity of projects, “a temporary endeavor undertaken to create a unique product, service, or result; [...] it has a defined beginning and end in time, and therefore defined scope and resources; [...] it is [...] a specific set of operations designed to accomplish a singular goal” (Project Management Institute [PMI], 2019). Therefore, project management practitioners have been on a quest to master the art of designing successful projects since the discipline's inception.

Littman and Littman (2019), acknowledge the importance of ethics in project performance as they state that ethical leadership is the cornerstone of project success. As, in their view, only honest and integrous leaders have the ability to set high standards that can raise the necessary trust between all the involved stakeholders. This way, team members will follow with motivation and dedication, and project stakeholders will be confident that their best interest is safeguarded, thus reducing project risk. These authors further propose six ethical strategies around the concepts of respect, responsibility, fairness, honesty, courage, and kindness, for to project managers to achieve project success.

## 2.5. Project-based Organizations (PBO)

It is also interesting to deep dive in some works around project-based companies, as they can give us some meaningful insights regarding Grupo ProCME’s specific background.

Aubry and Lavoie-Tremblay (2017) have put the spotlight on the importance of organizational design for companies that have to manage multiple projects. In order to perform at their best, organizations must implement an organizational design that best fits their unique context (Aubry & Lavoie-Tremblay, 2017). In their research, the authors acknowledge both the importance and the complexity of this requirement, leading them to coin the term “slow organizational design” that reflects the need for every company to find its own specific model, bearing in mind its own context and historical identity, thus making it difficult to simply copy outside examples. Which is laborious and needs time (Aubry & Lavoie-Tremblay, 2017).

The ability to assess the overall project performance has been raising concerns within project-based organizations, in order to spot inefficiencies and act in a timely manner. Zarei, et al. (2014) have investigated this issue and tried to categorize inefficiencies in 5 major groups: strategy, system, structure, human resources management and PMBOK processes. The author went beyond and advanced a new method for factor identification, signaling the importance of this type of diagnosis in project-based companies as a way to promote consistent project performance (Zarei et al., 2014).

A summary of the main themes and domains with relevance for the present assignment can be found in Table 1, below.

<i>Main Theme</i>	<i>Author</i>	<i>Title</i>	<i>Publication (Year)</i>
Operational Workers Recruitment and Retainment – Constructions Labour Demand, Employment and Productivity; COVID-19 Pandemic’s Impacts	1. Brucker Juricic et al. 2. Bahr and Laszig 3. Nguyen Van Tam et al. 4. Pinto et al.	1. Review of the Construction Labor Demand and Shortages in the EU 2. Productivity development in the construction industry and human capital: a literature review. 3. Critical factors affecting construction labor productivity: A	1. Buildings (2021) 2. Civil Engineering and Urban Planning: An International Journal (CiVEJ) (2021)

	<p>5. Abbaspour and Dabirian</p> <p>6. Podra et al.</p> <p>7. Almeida and Santos</p> <p>8. Kapitsinis and Sykas</p> <p>9. Raoufi and Fayek</p> <p>10. Denny-Smith et al.</p>	<p>comparison between perceptions of project managers and contractors.</p> <p>4. Estrutura económico-productiva, sistema de emprego e qualificações na Construção: uma breve leitura sobre tendências e mudanças recentes</p> <p>5. Evaluation of labor hiring policies in construction projects performance using system dynamics</p> <p>6. The impact of COVID-19 pandemic on the volume of labor migration, employment, and remittances</p> <p>7. The effects of COVID-19 on job security and unemployment in Portugal</p> <p>8. A brief overview on the uneven impact of the Covid-19 pandemic up employment, 2020Q2 and 2020Q3. Evidence from Cyprus, France, Spain, Greece, Italy, Malta, Croatia, and Portugal</p> <p>9. Identifying Actions to Control and Mitigate the Effects of the COVID-19 Pandemic on Construction Organizations: Preliminary Findings</p> <p>10. How Construction Employment Can Create Social Value and Assist Recovery from COVID-19</p>	<p>3. Cogent Business &amp; Management (2021)</p> <p>4. Sociologia: Revista da Faculdade de Letras da Universidade do Porto, Número temático – A construção civil numa perspetiva sociológica: enquadramento e análise (2019)</p> <p>5. International Journal of Productivity and Performance Management (2020)</p> <p>6. Journal of the Geographical Institute Jovan Cvijic (2021)</p> <p>7. International Journal of Sociology and Social Policy (2020)</p> <p>8. University of Aegean/YOUTH Share - Coronavirus Response &amp; Labor Statistics (2021)</p> <p>9. Public Works Management &amp; Policy (2020)</p> <p>10. Sustainability (2021)</p>
--	--	---	--

<p>Project Performance - Project Management (PM) success factors, Team Performance</p>	<p>1. Jitpaiboon et al. 2. Dasí et al. 3. Littman, Michael J. and Littman, Ezra S</p>	<p>1. Critical Success Factors Affecting Project Performance: An Analysis of Tools, Practices, and Managerial Support 2. Teams and Project Performance: An Ability, Motivation, and Opportunity Approach 3. Six Ethical Leadership Strategies for Project Management Success</p>	<p>1. Project Management Journal (2019) 2. Project Management Journal (2021) 3. PM World Journal (2019)</p>
<p>Project-Based Organizations (PBO)</p>	<p>1. Aubry and Lavoie-Tremblay 2. Zarei et al.</p>	<p>1. Rethinking organizational design for managing multiple projects 2. Organizational diagnosis in project-based companies: Challenges and directions</p>	<p>1. International Journal of Project Management January (2018) 2. SAGE Open (2014)</p>

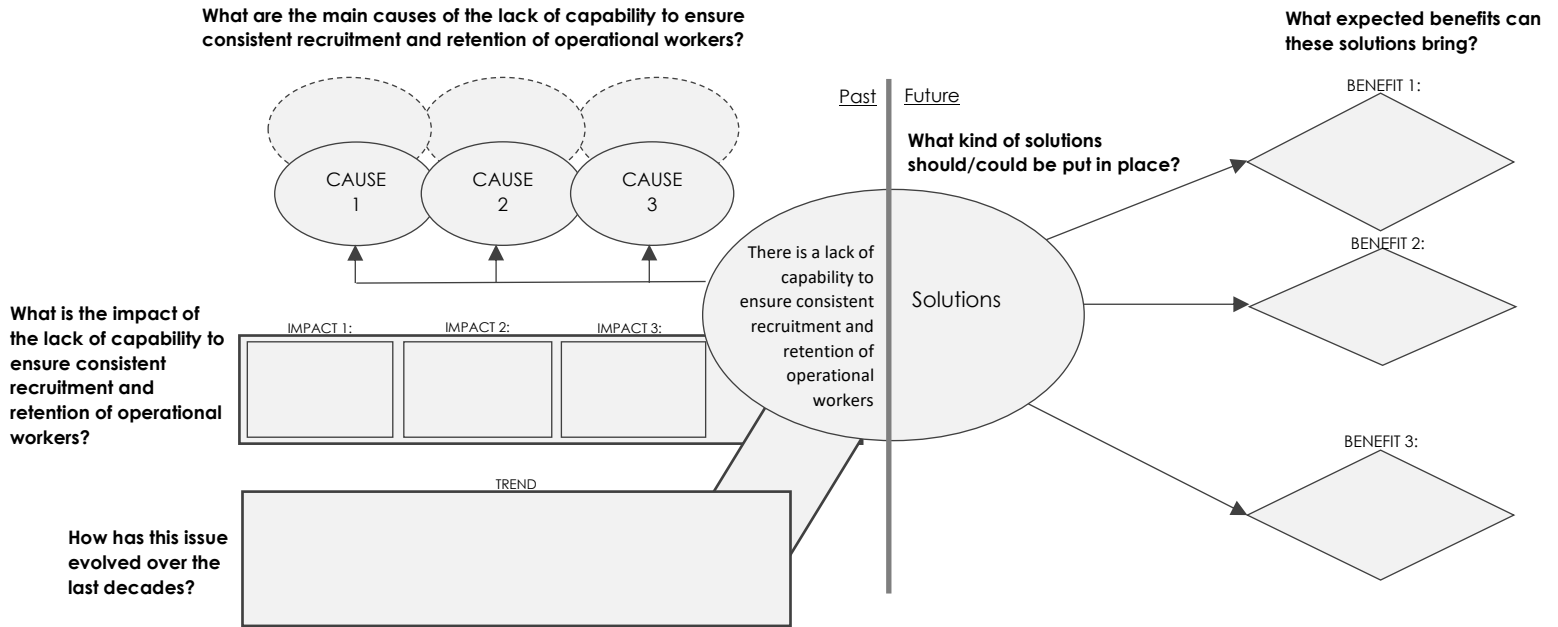
**Table 1** – Main themes and related Scientific Paper identification

*Source: author*



### 3. Research Methodology

Following the literature review, which provides the scientific/academic foundation for this assignment, a research methodology was selected to be able to perform this study. The chosen methodology was “Pereira Problem Solving Research Methodology” (Pereira, 2021), as portrayed in Figure 1 below.



**Figure 1** – Problem Solving Research Methodology Diagram.

Source: adapted from Pereira et al. (2021)

This methodology proposes a scientific approach based on the identification of a main research problem – “The lack of capability to ensure consistent recruitment and retention of operational workers”. This research problem is then decomposed in research questions aiming to address the root causes for the problem, its impacts, and the observed tendency. This work will then lead to possible solutions and its expected benefits.

In order to get the insights for the topics mentioned above, a set of interviews were arranged with internal stakeholders as well as some external Subject Matter Experts (SME) on the human resources and recruitment sector. Table 2, below, summarizes the research questions that guided the interviews.

<b>Research Questions</b>	<b>Research Objectives</b>
What is the impact of the lack of capability to ensure consistent recruitment and retention of operational workers?	Get to know the real impact of this problem on the day-to-day activities and overall business objectives
How has this issue evolved over the last decades?	To be able to analyze the underlying tendency of this issue
What are the main causes of the lack of capability to ensure consistent recruitment and retention of operational workers?	To be able to identify the main root causes of this problem
What kind of solutions or strategies should or could be put in place in order to recruit and retain more effectively?	Gather and analyze possible solutions to the problem
What expected benefits can these solutions bring?	To be able to identify the expected benefits of the suggested solutions

**Table 2** – Research Questions and Objectives

*Source: author*

All the interviews had the duration of approximately 20 minutes. Some were performed in person, while others were completed via conference calls. The script was composed of 8 questions: 3 for sample characterization (1 to 3) and 5 research questions (4 to 8). The scrip can be found in the attachments chapter.

#### **4. Data Analysis**

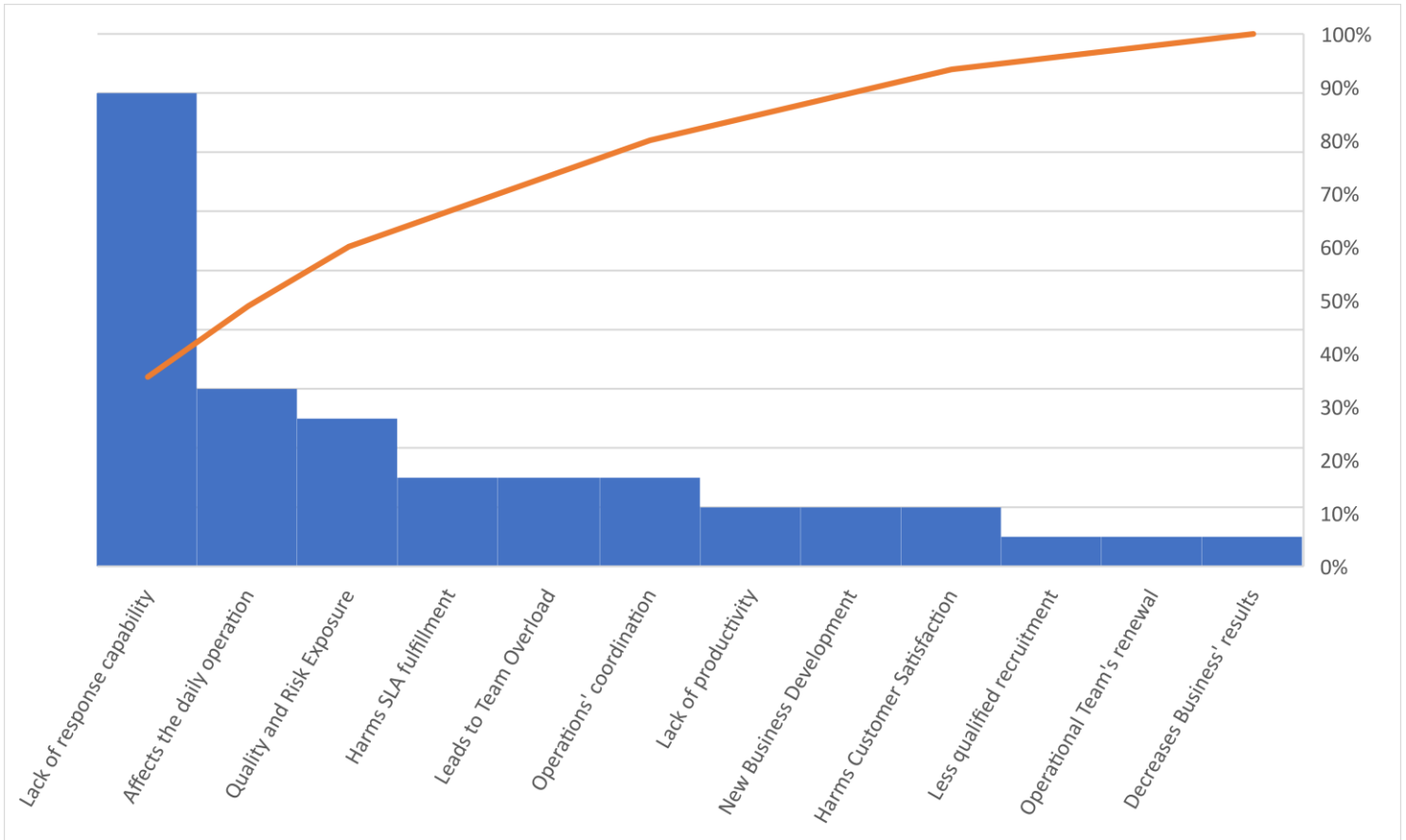
The target population for these interviews was composed of 21 internal stakeholders, from Top Management to Middle Management and Field Team Leaders – from several business units and functional areas - in order to have a broad perspective, from all levels within the organization. Additionally, 5 external SMEs were interviewed as well, to provide some industry benchmark and a stronger scientific knowledge base for the assignment. The interviews were conducted between October 14 and November 4, 2021. It was performed a non-probability convenience sampling, as the author directly selected and invited the interviewees.

#### **Sample Characterization**

The sample was composed of 26 interviewees: 21 internal stakeholders (CME full-time employees) and 5 additional external stakeholders – Subject Matter Experts in the HR and Recruitment fields. Within the interviewees, a share of 50% was made up of Management professionals – Top Management (11,5%); Middle Management (15,40%); First Line Managers (23,10%). Roughly, a quarter of the interviewed sample were field team members – Operational Managers – Field Team (11,5%); Field Team - Team Leaders (11,5%). The sample was completed with CME FTEs (7,7%) and External SMEs (19,20%). The control variable involved a minimum of at least 5 years of working experience within this area. The average working experience within the interviewed internal stakeholders is 20,8 years. As for the external stakeholders surveyed, the average is 13 years of working experience in the HR and Recruitment sector.

#### **4.1. Impact analysis**

In order to understand the most meaningful impacts of the lack of capability to consistently recruit and retain operational workers, a Pareto diagram was used to represent the obtained results (Graph 1).



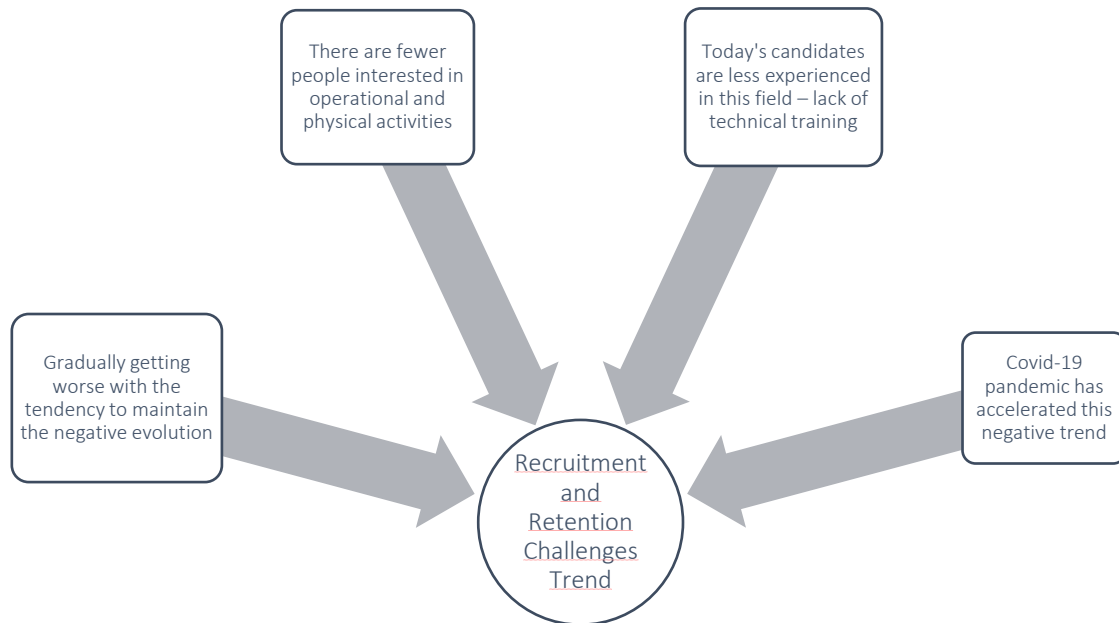
**Graph 1** – Pareto Diagram with analysis of the impact of the lack of capability to ensure consistent recruitment and retention of operational workers

*Source: author*

It is clear to see that the “Lack of Response Capability in the Field” was the most meaningful impact singled out by the respondents. This has to do with the fact that most of the activities performed by the operational workforce in the Construction and Engineering Services Industries are still highly dependent on physical ability and manpower – thus entailing the need for having large teams in the field in order to be able to scale the operations and grow the business. It is interesting to acknowledge that the factors highlighted subsequently were, on the one hand, Operations Management related – “Affects the daily operation” – and on the other hand, Quality and Risk related – “Loss of Quality Production and Risk Exposure”. In fact, construction and engineering operations are usually complex endeavors in terms of organization, where Quality and Risk Mitigation are paramount. Other identified factor with less relevancy are Customer satisfaction and team performance and motivation.

## 4.2. Trend Analysis

The trend analysis tries to respond to the research question – “How has this issue evolved over the last decades?” To represent the findings, a Radial Convergent Diagram was used (Figure 2).



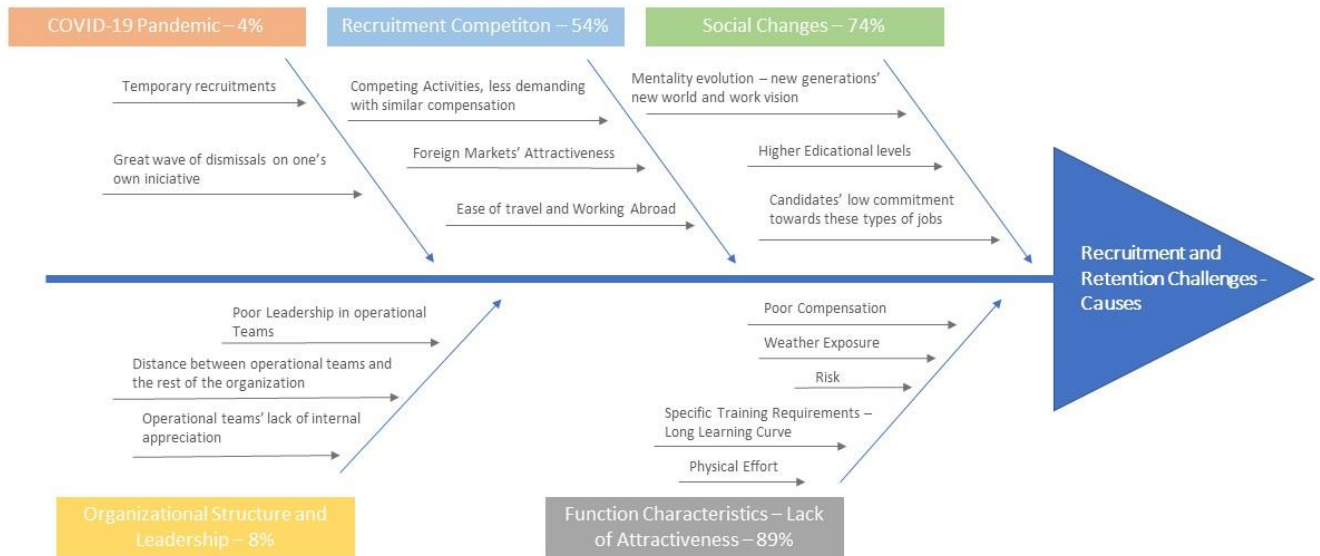
**Figure 2** – Recruitment and Retention Challenges Identified Main Trends

*Source: author*

The overwhelming majority of interviewees agreed that this evolution has been gradual, yet relentless, and towards a negative direction. More than 3 quarters of respondents stated that this problem is “gradually getting worse with the tendency to maintain the negative evolution”. Other highlighted trends are the effect of the COVID-19 Pandemic as an accelerator of this evolution, the fact that nowadays operational and eminently physical activities attract fewer people, and present candidates lack the technical and practical training and skills previous generations had. There are several underlying causes that may explain this phenomenon, as we will see in the next research question analysis.

### 4.3. Root Causes Analysis

In order to represent and group the several identified underlying causes for this issue, a fishbone chart was prepared. The causes were grouped in 5 main segments, according to the gathered feedback, “Social Changes”; “Recruitment Competition”; “COVID-19 Pandemic”; “Function Characteristics – Lack of Attractiveness”; “Organizational Structure and Leadership” (Figure 3).



**Figure 3** – Fishbone Chart on the Recruitment and Retention Challenges Main Causes

Source: author

Analyzing the chart, it's noticeable that there are 2 main segments, as far as the interviewees are concerned, that may help to explain the challenges to recruit and retain operational workers within this sector. On the one hand, there are the specific characteristics of these types of operational functions in general such as the entailed physical effort, weather exposure and the underlying risk. Another major factor within this segment is also the generally poor compensation associated with these activities. In the specific case of CME, and other engineering services companies, another difficulty is the specific technical training required to the operational teams – with a long learning curve, workers need to undergo not only the technical training, but also gain field experience and skill, which takes years to master. The second most important segment identified is related to social changes and mentality evolution. As the quality of life

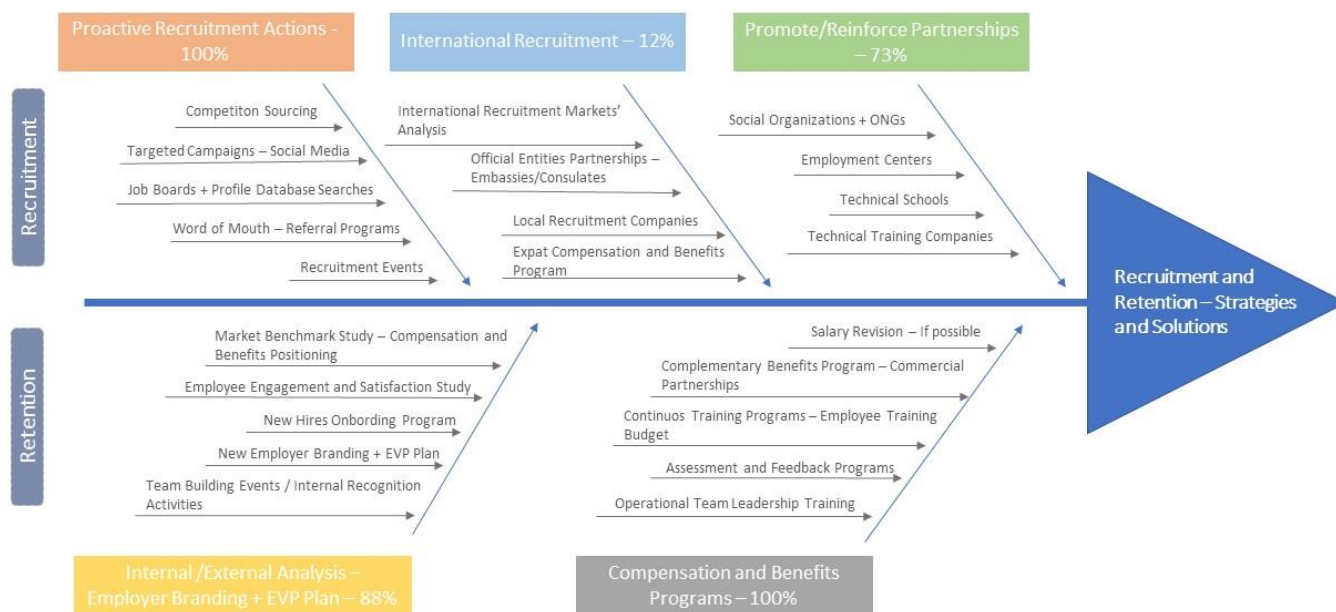
progresses in the western world, the education levels are progressively increasing as well. Young people experience a new and “bigger” world which has led to a different approach to life and work – young people want to experiment and try new things. The idea of learning a craft and perfect it throughout life is no longer appealing. Furthermore, young people do not have the pragmatic and resilient approach to work previous generations had – the idea that you should find a job that is stable and certain and persevere no matter how difficult it could be. Additionally, the few who end up trying out these operational roles do it mostly out of need, showing a very low commitment – as they tend to leave as soon as they’re able to find an alternative.

Another interesting segment identified has to do with the recruitment competition for these operational activities. On one side we have competing activities (other roles on different sectors) that are less demanding or risky, with the same level of compensation – for example, supermarket cashiers, logistic operators, or transportation drivers or last mile deliveries. On the other side, in the global economy we live in, it is increasingly easier to travel and work abroad. Workers from this sector are then tempted by stronger foreign markets where compensation is much higher (for example, northern Europe).

Two other segments were mentioned and are relevant to highlight as well. The COVID-19 Pandemic has had a tremendous and cross-sectional impact in the last year and a half and this sector has been no exception. In this period, a wave of dismissals has been witnessed – be it forced, as several companies didn’t survive the crisis or had to undergo major adjustments to make it, or in one’s own initiative (the so called “Great Resignation” movement). Organizational Structure and Leadership was likewise referred to as a root cause for this recruitment and retention challenge – there’s a gap between operational teams and the “office organization” that leads to a lack of appreciation and awareness for the importance of the operational work. Leadership problems in the field teams also contribute to retention challenges within these operational groups.

#### **4.4. Solutions / Strategies – How to recruit and retain more effectively?**

Respondents were asked on what kind of strategies and solutions should or could be put in place in order to overcome this problematic. The fishbone chart was elected as the best way to represent the shared feedback, as it allows to group ideas in major sections – Recruitment and Retention -, and further explore them in an organized way, as portrayed below in figure 4.



**Figure 4** – Fishbone Chart on the Recruitment and Retention Proposed Strategies

Source: author

There has been a large consensus between respondents over which key areas should be addressed, as most of them were mentioned by the majority, if not all, of them. Within each major area, a set of the most relevant strategies and activities were listed. In terms of “Recruitment” strategies, 3 segments were distinguished. One segment that received the support of all respondents was the need to entail further “Proactive Recruitment Actions”. As the balance of weight has shifted in the recruitment market, it is companies’ responsibility to craft new ways to find and attract candidates.

For this purpose, some strategies were recommended like targeted campaigns in social media, investment in job boards and profile database searches and company recruitment events. Tactics like word of mouth – referral programs - and competition sourcing were equally indicated. Related to these proactive recruitment strategies is a segment widely defended as well – “Partnerships”. Respondents believe that engaging in new or reinforcing existing partnerships with several types of entities may help bridge this recruitment gap. Entities like Social Organizations or NGOs,



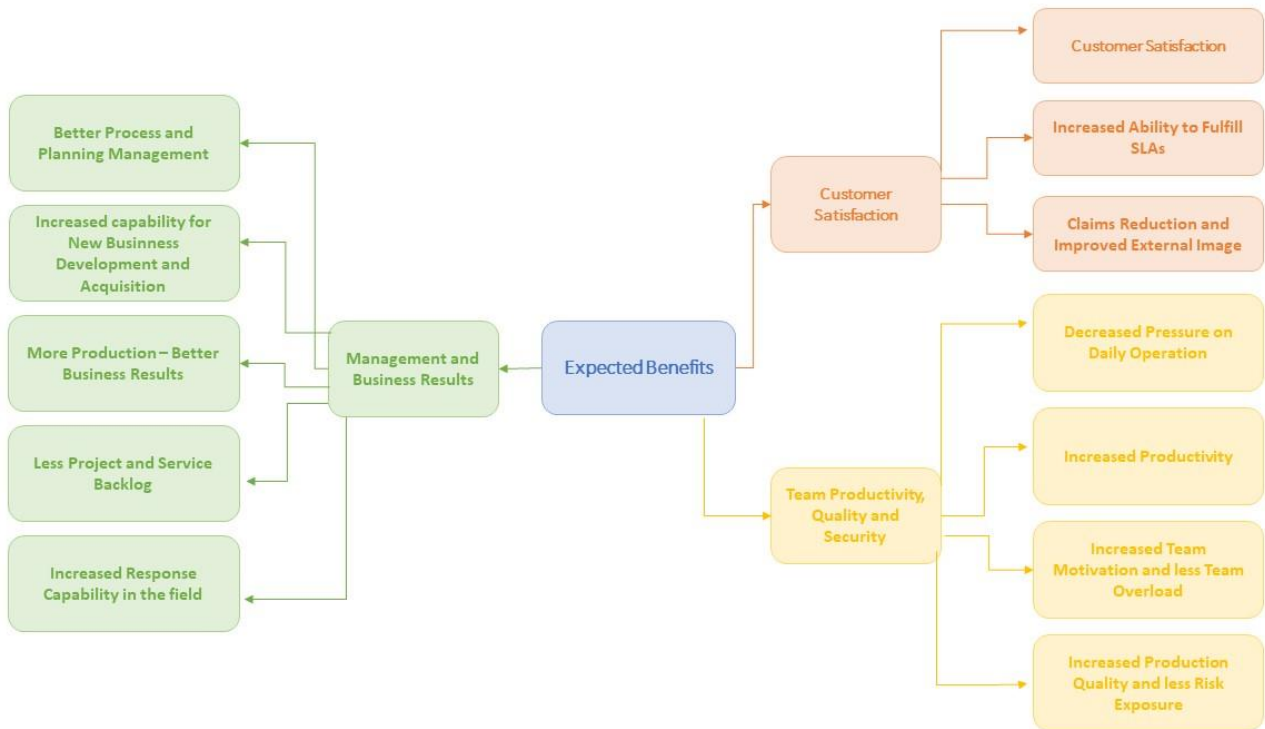
Employment Centers, Technical Schools and Technical Training Companies were appointed. “International Recruitment” was also referred as a recruitment strategy worth developing. In this sense, tactics like international recruitment markets’ analysis and selection, protocols with official entities (Embassies, Consulates, etc.), local recruitment companies hiring and the development of an expat compensation and benefits specific program were advised.

As for “Retention” strategies, the need to rethink the “Compensation and Benefits Programs” was widely defended. Salary revisions were suggested whenever possible, but also continuous training and employee development programs, assessment and feedback systems and a broader complementary benefits program (commercial partnerships) was proposed as well.

Strongly advocated was also the execution of a “comprehensive analysis, both internal and external, and refinement of the Organization’s Employer Branding Plan and Employee Value Proposition (EVP)”, which should work as a laying ground for all the previously mentioned strategies. This analysis should comprise a market benchmark and an employee engagement and satisfaction survey. The definition of an enhanced employer branding and EVP plan should include a new hire onboarding plan as well as an internal recognition activities program, according to the respondents.

#### **4.5. Expected Benefits Analysis**

As for the expected benefits of the previously mentioned strategies, the feedback was arranged in three major groups – “Management and Business Results”; “Customer Satisfaction”; “Team Productivity, Quality and Security”. For that reason, a tree diagram was selected to better represent the findings, as pictured below in figure 5.



**Figure 5** – Tree Diagram on the Expected Benefits

*Source: author*

The expected benefits of the proposed solutions were also discussed with the interviewees in order to try to anticipate results and define a sustainable approach to solving this persistent challenge. Within the gathered feedback, 3 main areas arose. Expected benefits in the area of “Management and Business Results” were signaled by all members of the surveyed group (100% of respondents).

Among them are benefits such as “better process and planning management”, “increased capability for new business development and acquisition”, “more production – better business results”, “less project and service backlog” and “increased response capability in the field”. Roughly 70% of respondents highlighted benefits related to “Team Productivity, Quality and Security”. “Decreased pressure on daily operation”, “increased productivity”, “increased team motivation and less team overload” and “increased production quality and less risk exposure” were the main gains predicted. Finally, almost a third of the interviewed sample (65% of respondents) referred expected benefits within the “Customer Satisfaction” dimension. Benefits like “customer

satisfaction”, “increased ability to fulfill SLAs” and “claims reduction and improved external image” were the most elected advantages.

## 5. Results Discussion

This research was allowed to deep dive in a practical example, in order to be able to verify if both the empirical assumptions and also the findings from previous works, consulted during the literature review, are consistent with the reality on the field. Although, this study has the basic limitation of being anchored in just one example (this practical case study on ProCME Group) - one future research suggestion is to amplify this study to other organizations on this industry in Portugal -, it is believed that this example is paradigmatic, and its findings may be extrapolated at least within the Portuguese construction and engineering services industries. The sample was then selected in order to integrate a wide range of sensitivities within the organization, as well some external validation from the HR industry's SMEs, to be able to further widen the range and scope of the expected findings.

When asked about the impacts of the lack of capability to ensure a consistent recruitment and retention of operational workers, one major factor emerged – the lack of response capability in the field. This is consistent with the work of Abbaspour and Dabirian (2020), where it is defended that the construction industry is arguably more labor-intensive than any other, and so heavily dependent on human resources. The other highlighted factors by the respondents, regarding Productivity, Quality and Security, Operations Management and other, are also congruent with the findings of Bahr and Laszig (2021) in their study on productivity development in the construction industry and human capital, that indicate that workers shortage in this sector leads to productivity and management quality issues.

When asked to analyze the evolution of this matter and the underlying trend, the vast majority of stakeholders agreed in some major trends. The idea that the challenges brought up by this operational worker shortage are still ongoing and have the tendency to aggravate in the next years was widely supported, which takes us back to the idea advocated by Juricic et al. (2021) that labor shortages in the EU are expected to increase in the future due to a declining population and aging workforce. Also indicated were the notion that there are fewer people interested in operational and physical activities – in regard to the social changes associated with the new generations arriving to the workforce – and that there today's candidates lack technical training – pointing to a skills mismatch problem. Bahr and Laszig (2021) also address demographic developments and skills mismatch as underlying tendencies within the industry. As for Tam et al. (2021) refer labors experience and skills as one of the major factors impacting productivity in the construction sector.

The COVID-19 pandemic also arose as one important issue, as it is said to be an accelerator of this primary trend of workers shortage within this field of work. In the last few months, a lot of research has been focusing on this matter. Kapitsinis and Sykas (2021) demonstrate how uneven the pandemic's impact has been, as it hit the hardest economically the weak and vulnerable economies of the EU south.

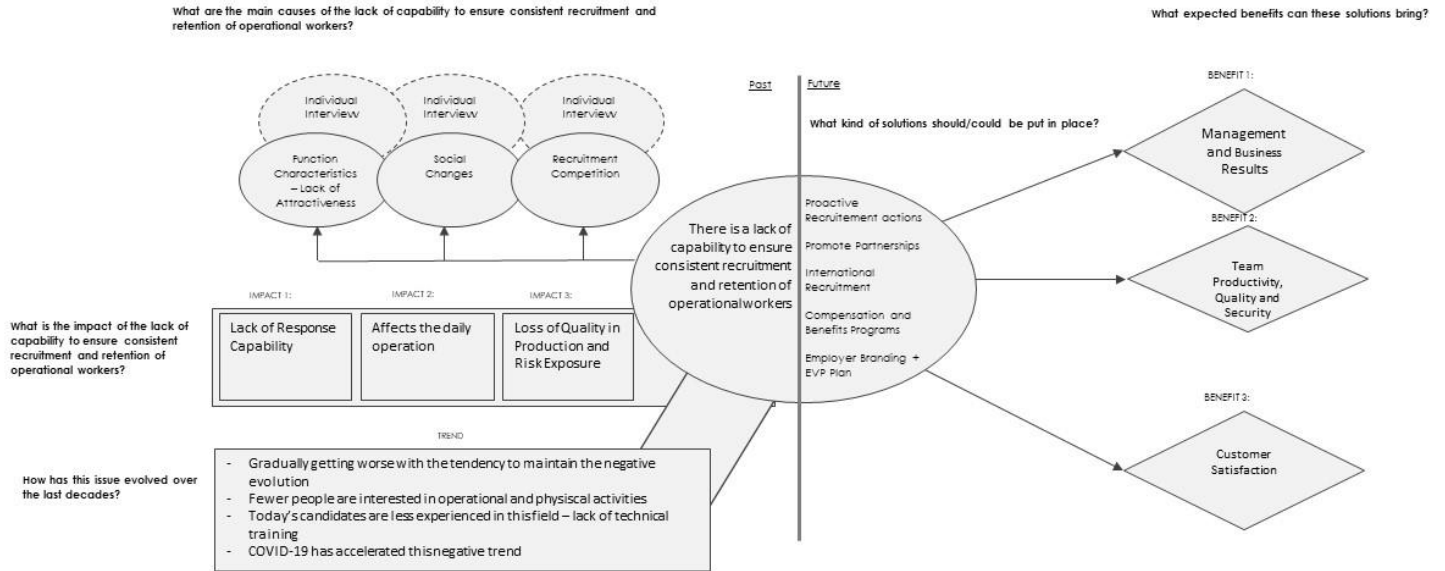
As the research went on, respondents were asked to share their feedback on the main causes leading to this challenging context. The main factors reported were grouped in 5 main segments that reflect the major areas of concern on this matter. Some of the segments identified are in line with arguments present in the consulted research on the literature review, such as COVID-19 pandemic, Social and Demographic changes, and recruitment competition. The COVID-19 pandemic for example, is appointed by several authors, such as Raoufi and Fayek (2020) that refer the COVID-19 related shortage of specialized labor and key-personnel on construction projects as one of the current challenges of this industry. The social and demographic changes are specifically referred in the works of Juricic et al. (2021) and Bahr and Laszig (2021) as one of major causes for labor shortages and the subsequent challenges of recruiting and retaining operational workers within these industries. Recruitment competition is also referred in published research as one central piece in this issue, as companies face both the competition of foreign markets and companies within the same sector, and even the competition of companies in different sectors that might have more attracting conditions and propositions to offer workers. Bahr and Laszig refer these situations in their work, indicating how the recruitment of foreign worker is an increasingly common solution entailed by organizations, but also remind that the risk of staff moving to other sectors is also a further concern nowadays. Interestingly, some other causes were indicated by the respondents that complement the published arguments. A major share of the interviewees agreed that the lack of attractiveness of the activities and functions within these industries is one of the most important causes for this problem – as they tend to be highly physical, exposed to weather conditions, poorly compensated, risky, and sometimes require specific technical skills and training which are difficult to master. Another segment identified as a root cause is concerned to organizational structure and Leadership. The main factors in this segment, also complement the findings of the discussed literature review. The quality of leadership in the operational teams, the distance between the operational teams and the rest of the organizations, which leads to a sense of

lack of internal appreciation were referred as relevant factor that can lead to recruitment and retention difficulties.

As far as possible solutions and strategies are concerned, the gathered feedback reinforced the need for companies to act both from a recruitment standpoint and a retention one as well. In terms of recruitment, all the contributions emphasize the notion that companies should be more proactive and find the best platforms, channels, and ways of finding and connecting with the candidates/workers where they are. This means going all out and invest in a diverse strategy that comprehends proactive sourcing (job boards and social media), competition sourcing, protocols and partnerships with relevant entities and also international recruitment, in line of what Podra et al. (2021) found regarding the weight of migrant workers in the EU's several countries. On the other hand, the respondents also signaled the extreme importance of working on the retention side of this equation. This means, according to the stakeholders' opinion, defining a consistent message to the market about what distinguishes (employer branding) each organization and its value proposition for employees (EVP). Furthermore, creating the internal conditions that help employees feel secure, satisfied, and challenged – revising compensation conditions and working on continuous training and development programs. These ideas are consistent with recommendations of Tam et al. (2021) on the importance of improving workers motivation, but also their experience and skills. Additionally, Abbaspour and Dabirian (2020) advocate as well the importance of human resources management due to the labor-oriented nature of the construction industry.

In terms of expected benefits, the results show us that that the most important dimensions that tend to be improved by the mentioned strategies are “Management and Business Results”, Team Productivity, Quality and Security, and Customer Satisfaction. It is important to highlight that the management and business results dimension was the one where all of the respondents agreed on – among all interviewees, the notions of better process management, increased capability for new business development, better business results, less project back log and increased response capability in the field were supported. Both customer satisfaction and Team Productivity, Quality and Security were claimed by roughly 2/3s of respondents.

Figure 6 below, encapsulates the answers to the research questions, based on the previously appointed results discussion.



**Figure 6** – Diagram with research results to answer the research problem

Source: adapted from Pereira et al. (2021)

## **6. Conclusions, Study Limitations and Future Research Suggestions**

With the present assignment it was possible to uncover the major underlying tendencies in the recruitment and retention of professional workers for operational positions within the construction and engineering services industries. Both the consulted research and the interviewed stakeholders where clear, and almost consensual about the major causes that help explain the present context – Social Changes, Functions' and activities' Lack of Attractiveness and Recruitment Competition from other activities have risen above the rest.

In terms of social changes, trends such as the increased overall level of education, along with technological vertiginous advancements that paved the way for a new economy (the “gig economy”) with almost endless possibilities, where everyone has a chance to succeed. With more knowledge and more possibilities, younger generations no longer have an interest in traditional occupations, nor look at work the same way. Furthermore, the mentality of new generations has also dramatically changed, specially from generation Y (Millennials, 1981-1996) and Gen Z (1997-2021). It's all about experimenting nowadays, so mastering a craft or choosing a single career path no longer seems like a valid option. The hopes, dreams, expectations and desires regarding life and work have shifted – the new generations no longer have a pragmatism view on work, nor do they have the resilience or intention of putting up with what goes against their beliefs. This labor shortage is even further aggravated by globalization, connectivity and the increased ability and ease to travel and work everywhere in the world, but also by the relentless aging trend of western societies.

As for the operational activities within these industries, its attractiveness has been consistently decreasing as well. To the poor salary conditions, we must add the required physical effort, weather exposure and overall risk.

Another pending issue is the competition of other types of activities with similar payment conditions that require less effort and risk, thus becoming more appealing, such as transport and logistics, retail, last-mile deliveries, among many others.

Combining all these factors, it is clear that these industries face a striking challenge when it comes to the ability to reinforce and renew its operational teams. The need form adaptation is a matter of business sustainability. Companies must find new ways of appealing and attracting candidates but also develop a new type of professional relationship that fosters employee satisfaction and engagement. This new reality requires a new work paradigm for these industries.



Hence, organizations within these industries must work on two separate fields that, although connected and complementary, require different approaches and strategies – Recruitment and Retention.

In terms of the recruitment effort, it is patent that organizations must embrace a proactive and dynamic approach. The labor market balance has shifted and so it is on organizations now to be able to find, engage and attract candidates. Long gone are the days of sitting back and selecting inbound applications, companies need to work on their recruitment marketing (Employer Branding) and employee value propositions (EVP) in order to address the market with the right messaging. Additionally, companies should be able to identify the best channels and platforms to reach candidates (specialized job boards, social media) and promote partnerships and protocols with relevant entities (employment centers, technical schools, training companies and many others). International recruitment is also an increasingly important solution to mitigate the domestic challenges – in this regard, specific strategies should be put in place in order to succeed. Adaptability and flexibility must be the norm, as companies will have to permanently access and update strategies.

With regards to retention, a new dynamic should be put in place, anchored in a fundamental idea – bridging the gap between operational and field teams and the rest of the organization (the “office organization”), enhancing communication and proximity. Technical and operational teams must feel that they belong, must share the organization’s mission and values, and, most importantly, must feel appreciated and valued by their colleagues, and the organization plays an important role to that extent. It is also imperative that these workers feel heard (the organization must put in place regular engagement and satisfaction surveys to be able to feel the operational team’s pulse in terms of satisfaction and expectations. As a complement, companies must work in terms of adding flexibility to its compensation and benefits plans so that they’re able to meet the specific needs and expectations of each group of workers. At the same time, concrete personal and career development plans need to be put in place in order to provide real learning and growth paths within the workers journey in the company – boosting motivation and performance.

It is commonly said that people and teams are companies’ most valuable assets. In this new era, it is of utmost importance that companies are able the “walk the talk” and truly testify this moto in real, tangible, people-centric actions, and strategies. This is especially true in these labor-dependent industries, such as the construction and engineering services ones, where the success in

implementing this new mindset will be responsible to make or break entire businesses. The findings of this assignment present a clear path for construction and engineering services companies to address this challenge.

This study has the clear limitation of being focused on one single company on a specific market. Additional and more broaden research would be useful in the future in order to be able to confirm these findings regarding different companies and different markets (countries). Some possible research suggestions are listed in the table below (Table 3).

<b>Research Proposals</b>
Broaden the present research to other companies within these sectors, in the Portuguese market
Broaden the present research to other markets (countries)
Set additional research with ProCME Group in order to be able to measure the results of the implementation of the suggested solutions and strategies
Set additional research focused on recruitment strategies for these industries
Set additional research focused on retention strategies for these industries

**Table 3 – Future Research Suggestions**

*Source: author*

## 7. References

- Abbaspour, S. and Dabirian, S., 2020. Evaluation of labor hiring policies in construction projects performance using system dynamics. *International Journal of Productivity and Performance Management*, Vol. 69 No. 1, pp. 22-43. <https://doi.org/10.1108/IJPPM-03-2019-0134>
- Almeida, Fernando, Santos, José Duarte, 2020. The effects of COVID-19 on job security and unemployment in Portugal. *International Journal of Sociology and Social Policy* Vol. 40 No. 9/10, 2020 pp. 995-1003. DOI 10.1108/IJSSP-07-2020-0291
- Aubry, Monique, Lavoie-Tremblay, Mélanie, 2017. Rethinking organizational design for managing multiple projects. *International Journal of Project Management*. January 2018 36(1):12-26. DOI: 10.1016/j.ijproman.2017.05.012
- Bahr, Matthias, Laszig, Leif, 2021. Productivity development in the construction industry and human capital: a literature review. *Civil Engineering and Urban Planning: An International Journal (CiVEJ)* Vol.8, No.1, March 2021. DOI:10.5121/civej.2021.8101 1.
- Calavia, Miguel Ángel García, Rigby, Michael, 2020. The extension of collective agreements in France, Portugal and Spain. *Transfer* 2020, Vol. 26(4) 399–414. DOI: 10.1177/1024258920970131
- Dasí, Àngels, Pedersen, Torben, Lopes Barakat, Lívia, Rangel Alves, Tiago, 2021. Teams and Project Performance: An Ability, Motivation, and Opportunity Approach. *Project Management Journal*. Feb2021, Vol. 52 Issue 1, p75-89. DOI:10.1177/8756972820953958
- Denny-Smith, G.; Sunindijo, R.Y.; Loosemore, M.; Williams, M.; Piggott, L., 2021. How Construction Employment Can Create Social Value and Assist Recovery from COVID-19. *Sustainability*, 13, 988. <https://doi.org/10.3390/su13020988>
- Jitpaiboon, T., Smith, S.M., Gu, Q., 2019. Critical Success Factors Affecting Project Performance: An Analysis of Tools, Practices, and Managerial Support. *Project Management Journal*. 1 June 2019, 50(3):271-287. DOI: 10.1177/8756972819833545
- Juricic, B., Galic, M., Marenjak, S., 2021. Review of the Construction Labour Demand and Shortages in the EU. *Buildings* 2021,11, 17. DOI: <https://doi.org/10.3390/buildings11010017>
- Kapitsinis, Nikos, Sykas, George, 2021. A brief overview on the uneven impact of the Covid-19 pandemic up employment, 2020Q2 and 2020Q3. Evidence from Cyprus, France, Spain,

- Greece, Italy, Malta, Croatia and Portugal. University of Aegean/YOUTH Share - Coronavirus Response & Labour Statistics. <http://orca.cardiff.ac.uk/id/eprint/139124>
- Littman, Michael J., Littman, Ezra S., 2019. Six Ethical Leadership Strategies for Project Management Success. *PM World Journal*. Vol. VIII, Issue X – November 2019.
- Marinescu, Cristian, Mircioi, Ileana, 2018. Employment and Unemployment in Europe. Factual and Theoretical Developments. “Ovidius” University Annals, Economic Sciences Series Volume XVIII, Issue 2 /2018. DOI: 134922398
- Matos, Ana Damas de, Parent, Daniel, 2016. Which firms create fixed-term employment? Evidence from Portugal. *Labour Economics* 41 (2016) 348–362. <http://dx.doi.org/10.1016/j.labeco.2016.05.027>
- Pereira, L.; Santos, R.; Sempiterno, M.; Da Costa, R.; Dias, A.; António, N. (2021). Pereira Problem Solving: Business Research Methodology to Explore Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*. 7, 84. DOI: 10.3390/joitmc7010084
- Peugny, Camille, 2019. The decline in middle-skilled employment in 12 European countries: New evidence for job polarization. *Research and Politics* January-March 2019: 1–7. <https://doi.org/10.1177/205316801882313>
- PINTO, José Madureira; RODRIGUES, Vanessa; COELHO, Maria Inês, 2019. Estrutura económico-productiva, sistema de emprego e qualificações na Construção: uma breve leitura sobre tendências e mudanças recentes, *Sociologia: Revista da Faculdade de Letras da Universidade do Porto*, Número temático – A construção civil numa perspetiva sociológica: enquadramento e análise, pp. 10-34. DOI: 10.21747/08723419/soctem2019a1
- Podra, Olha, Petryshyn, Nataliia, Bayik, Oksana, Bobko, Ulyana, Levkiv, Halyna, 2021. The impact of COVID-19 pandemic on the volume of labor migration, employment, and remittances. *J. Geogr. Inst. Cvijic*. 2021, 71(2), pp. 195–202. <https://doi.org/10.2298/IJGI2102195P>
- Raoufi, Mohammad, Fayek, Aminah Robinson, 2020. Identifying Actions to Control and Mitigate the Effects of the COVID-19 Pandemic on Construction Organizations: Preliminary Findings. *Public Works Management & Policy*. Oct2020, p1. DOI: 10.1177/1087724x20969164
- Tam, Nguyen Van, Toan, Nguyen Quoc, Hai, Dinh Tuan & Quy, Nguyen Le Dinh, 2021. Critical factors affecting construction labor productivity: A comparison between perceptions of project

managers and contractors. *Cogent Business & Management*, 8:1, 1863303. DOI: 10.1080/23311975.2020.1863303

Van der Meer, Peter H, 2019. What makes workers happy: Empowerment, unions or both? *European Journal of Industrial Relations* 2019, Vol. 25(4) 363–376. <https://doi.org/10.1177/0959680118817683>

Zarei, B., Chaghooee, Y., Ghapanchi, F., 2014. Organizational diagnosis in project-based companies: Challenges and directions. *SAGE Open*. 11 June 2014, 4(2). DOI: 10.1177/2158244014537498

## 8. Appendixes

### Appendix A - Guião de Entrevistas / Interviews Script

#### Research Question:

Como ultrapassar os desafios para recrutar e reter trabalhadores operacionais no sector dos serviços de engenharia

How to overcome the challenges to recruit and retain operational workers in the Engineering Services Sector

1- Qual a função que desempenha na Organização?

What is your current role within the organization?

2- Há quantos anos desempenha este cargo?

How long have you been performing this role?

3- Quantos anos de experiência tem nesta área, ou no desempenho deste tipo de funções?

How many years of professional experience do you have in this field of expertise or in this type of role?

4- Qual o impacto da falta de capacidade para assegurar o recrutamento e retenção consistente de mão-de-obra operacional?

What is the impact of the lack of capability to ensure consistent recruitment and retention of operational workers?

5- Como tem evoluído este prolema ao longo dos últimos anos?

How has this issue evolved over the last decades?

6- Quais as principais causas para esta falta de capacidade para assegurar o recrutamento e retenção consistente de mão-de-obra operacional?

What are the main causes of the lack of capability to ensure consistent recruitment and retention of operational workers?

7- Que tipo de soluções/estratégias poderão ser postas em prática para passar a recrutar e reter trabalhadores operacionais de forma mais eficaz?

What kind of solutions or strategies should or could be put in place in order to recruit and retain more effectively?

8- Quais os benefícios expectáveis que estas soluções/estratégias poderão trazer?

What expected benefits can these solutions bring?