Project Management in Portugal

Results of the 2022 pilot study by the Portuguese Project Management Observatory

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Abstract — **The Portuguese Project Management Observatory (PPMO), an initiative of the Portuguese Association of Project Management (APOGEP), is being developed by the University of Minho in partnership with other Higher Education institutions. The main objective of this research was to study the status of project management in Portugal, namely which tools and techniques are most and least used by organizations, the profile of Portuguese project managers, the methodologies used, accomplishment of project indicators and sustainability practices. It was also an objective to compare the results found with a similar study done a year before. The method selected for this study was a survey applied through an online questionnaire directed to Portuguese organizations. The results show that the most used tools and techniques are Activity List, Kick-off Meeting and Gantt Chart; and the least used are Decision Tree, Value Chain and Cost Life Cycle Analysis. As expected, significant differences were found in the income of project managers, when considering variables such as gender, age, current position, education level, and activity sector. Hybrid methodologies are used in a large part of the respondents' organizations. Although some changes were verified between 2021 and 2022, there are no significant changes reported.**

Keywords – hybrid methodologies, Portugal, Portuguese Project Management Observatory

I. INTRODUCTION

The Portuguese Project Management Observatory (PPMO), an initiative of the Portuguese Association of Project Management (APOGEP), is being developed by the University of Minho in partnership with other higher education institutions. Its strategic goal is to promote the development of project management (PM) in Portugal, contributing towards the continuous improvement of PM practices in the organizations (OPGP, 2022).

The main purpose of this research was to evaluate the current state of PM as well as study the evolution of such practices in Portugal.

For this matter, the following research questions (RQ) were defined:

- RQ1: What are the PM tools and techniques more and less used and more or less important for the Portuguese organizations?

- RQ2: What are the factors (age, gender, experience, geographic localization, educational level) which explain the income of PM professionals?

- RQ3: What kinds of methodologies of PM are used in Portuguese organizations and how it affects their projects?

- RQ4: Do the organizations finish the projects in the time, budget and scope originally planned?

- RQ5: Which sustainability practices are more utilized and important for the PM professionals?

- RQ6: How was the evolution of project management in Portugal, from 2021 to 2022?

II. RESEARCH METHODOLOGY

A. Questionnaire survey methodologies

This study employed the strategy known as survey method (Saunders et al., 2019) with the deployment of the questionnaire "Current state of Project Management in Portugal in the scope of the Portuguese Project Management Observatory" to obtain the primary data. The survey was conducted using the online LimeSurvey[1] platform under the assumption of direct administration, in which the respondent completes the questionnaire.

The secondary data was acquired through a 2021 survey within the same scope, which allowed a longitudinal analysis. In addition, it was necessary to maintain a database to prevent the

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[1] https://www.limesurvey.org/en/

data from getting unorganized (Sallis et al., 2022). For that purpose, the software Microsoft Excel® was used.

B. Questionnaire design

The questionnaire was composed by 61 questions within 10 question groups. The groups were:

1. Characterization of the interviewee;
2. Linkage to PM;
3. Characterization of the organization;
4. Satisfaction of the PM professionals;
5. PM tools and techniques;
6. PM methodologies;
7. Programme and portfolio management;
8. Key performance indicators;
9. Sustainability in PM;
10. Feedback.

More detailed information can be seen at https://abrir.link/qqLT8.

C. Data Collection

The questionnaire was sent to a target population that corresponds to all APOGEP members (approximately 800 members), to all members of the Portuguese Project Management Observatory (approximately 53 members) and to students and former students of the PM area of University of Minho (about 207 students and alumni). In total, the questionnaire was sent to approximately 1060 people, thus resulting in a response rate of 4.9%.

The questionnaire was available online from October 1 to November 30, 2022

III. LITERATURE REVIEW

A. Project Management

Project management practices are gaining increasing visibility and importance to organizations (Kwak & Anbari, 2009). Kerzner (2018) argues that best PM practices lead to added business value, greater benefit realization, and better benefits management activities. Roughly 25% of the world GDP is estimated to be linked to PM practices and 16,5 million people are directly involved in this value chain.

However, project management continues being a highly problematic endeavor. The ability of the organization to understand who the customer is, engage with the customer, obtain customer feedback, analyses the feedback, translate, and articulate it into an outcome, is still limited. This includes the ability to follow the voice of the customer into the front end of the project and sustain that activity, as well as the ability of the organization to balance and align customers' views and expectations with the organization's values and strategic goals (Maytorena-Sanchez & Winch, 2022).

B. Traditional Project Management

According to the Project Management Institute (PMI), the traditional project management (TPM) has four generic phases: starting the project, organizing, and preparing, carrying out the work, and completing the project. The phases are sequential and there are gates between them (Shigenobu, 2021). PMBOK presents 49 processes organized in the following process groups: initiating, planning, executing, monitoring, and controlling and closing (PMI, 2021). TPM is driven by disciplined planning and control methods that are motivated by the assumption that project requirements and activities are predictable and that events and risks affecting the project are predictable and controllable.

C. Agile Project Management

Agile PM has gained increasing popularity since 2001, driven by the notorious development of information systems (Highsmith & Highsmith, 2010).

Among agile methodologies, Scrum creates a fast and efficient information flow and is successfully able to reduce execution times, using artifacts. Rubin (2012) states that Scrum is an agile approach for developing innovative products and services.

D. Project Management Tools and Techniques

There are studies about the tools and techniques with more weight in organizations. For the purpose of this study, such tools were gathered from Miranda (2022), Tereso et al. (2019), Fernandes et al (2021), Besner and Hobbs (2006), and Papke-Shields et al. (2010).

Project managers also possess an increasing number of applications offering a diverse range of functions in the areas of project planning, monitoring and continuous evaluation of project implementation (Kostalova et al., 2015).

IV. RESULTS AND DISCUSSION

A. Dataset

Of the 52 respondents, 57.69% were male, 40.38% were female and 1.92% were non-binary (see Fig. 1).
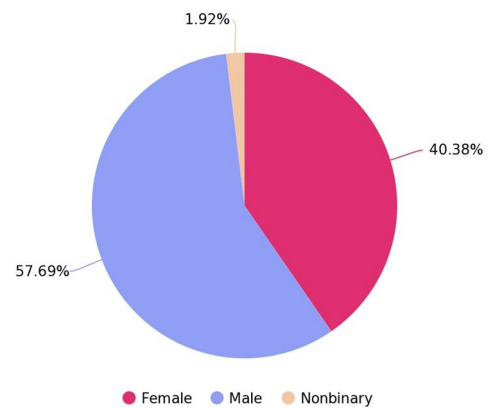

Figure 1. Respondents by gender.

The average age recorded was 43.75 years with a standard deviation of 14.24 years. The minimum age was 22 and the maximum 71 years old.

Fig. 2 shows the crossing of the variable age with the variable gender.
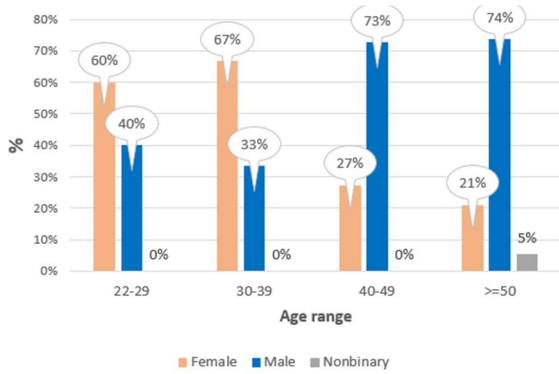
Figure 2.   Respondents by gender/per age.

As we can verify between the age of 22 and 49 years old, the majority of the respondents are female. The oldest respondents – with more than 40 years old – are male.

On other hand, 92.31% of the sample assigned their residence to Portugal continental, 5.77% to the islands of Madeira and 1.92% to Azores archipelago (see Fig. 3).
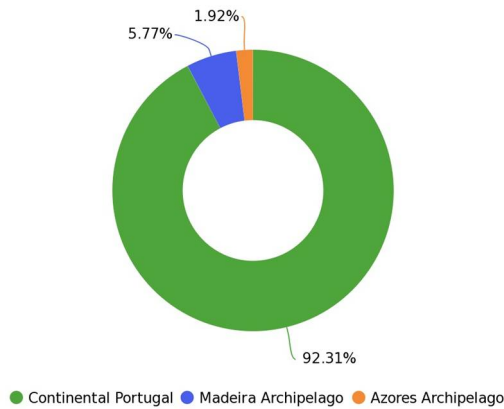

Figure 3.   Respondents by place of residence.

When it comes to the education level, 44.23% had a master's degree, 40.38% a bachelor's degree, and 7.69% a doctor's degree as presented at Figure 4.
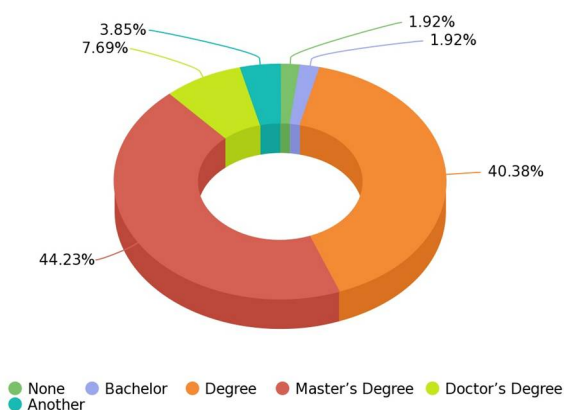

Figure 4.   Respondents by level of education.
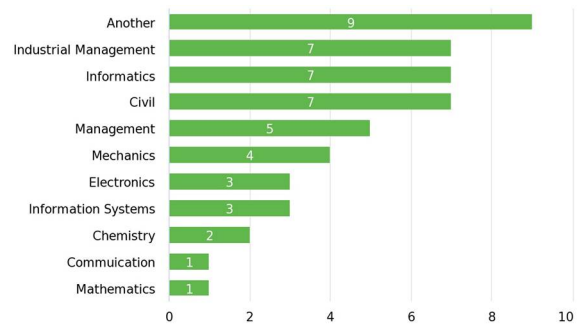
The area of education is presented in Fig. 5.

Figure 5.   Respondents by education background.

B. Answers to the Research Questions

Next, we will present the answers obtained for the RQ presented.

For RQ1, it was possible to conclude that the top 10 tools and techniques used in Portugal are the ones shown in Table I.

TABLE I.   MOST USED TOOLS AND TECHNIQUES

Tools and Techniques	Classification
Activity List	1
Kick-off Meeting	2
Gantt Chart	3
Progress Meetings	4
Project Work Description	5
Requirement Analysis	6
Progress Reports	7
Closing Project Documentation	8
Milestone Planning	9
Work Breakdown Structure	10

On the other hand, we concluded that the 10 least used tools and techniques were the ones presented in Table II.

TABLE II.   LEAST USED TOOLS AND TECHNIQUES

Tools and Techniques	Classification
Decision Tree	69
Value Analysis	70
Cost Lifecycle Analysis	71
Critical Chain Method	72
Learning Curve	73
Parametric Estimation	74
Value Added Management	75
PM Simulation Software	76
Bidding Conferences	77
Monte Carlo analysis	78

It was also possible to obtain the top 10 tools and techniques considered to be most important by the PM professionals (Table III).

TABLE III.   MOST IMPORTANT TOOLS AND TECHNIQUES

Tools and Techniques	Classification
Activity List	1
Project Work Description	2
Requirements Analysis	3
Gantt Chart	4
Risk Identification	5

Tools and Techniques	Classification
Project Closeout Documentation	6
Lessons Learned / Post-mortem Meetings	7
Responsibility Matrix	8
Team Performance Evaluation	9
Issues Log	10

Conversely, the 10 tools and techniques considered to be the least important by the PM specialists are in Table IV.

TABLE IV.   LEAST IMPORTANT TOOLS AND TECHNIQUES

Tools and Techniques	Classification
Tendency Graphs	69
Baseline Redefinition	70
PM Simulation Software	71
Decision Tree	72
Critical Chain Method	73
Value Added Management	74
Learning Curve	75
Parametric Estimation	76
Monte Carlo analysis	77
Biding Conferences	78

As for RQ2, although gender differences aren't related with job skills, it may be an important factor when it comes to earnings.

According to the Fig. 6, we can conclude that male professionals are likely to earn 12,592€ more per year, which is 44% higher compared to female professionals.
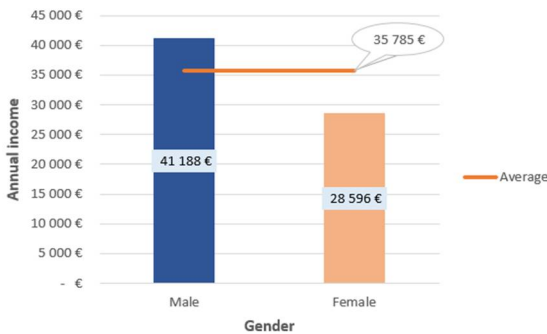

Figure 6.   Annual income by gender.

Age and years of experience are expected to be directly proportional to the annual income of a professional. In the context of project management, the results shown in Fig. 7 and Fig. 8 were obtained.
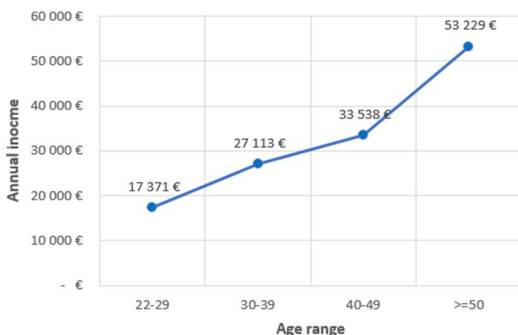

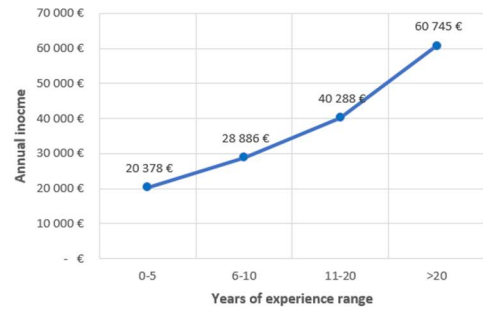Figure 7.   Annual income by age.

Figure 8.   Annual income by years of experience.

When comparing the main regions of Portugal, Lisbon was the city where PM earnings were the highest on average, followed by Braga and, lastly, Porto (see Fig. 9).
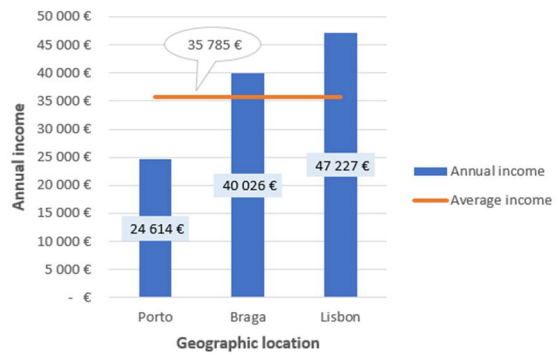

Figure 9.   Annual income by geographic location.

To answer RQ3, from the data evaluation, it was possible to conclude that hybrid methodologies are used by 38.46% of the respondents' organizations. Others claim using traditional (36.54%) and agile methodologies (17.31%). The rest of the respondents (7.69%) didn't answer.

As for RQ4, as the data shows, all three main factors had similar results, with a rate above 50%, which implies that more than half of the projects finished within scheduled, budget and scope (see Table V).

TABLE V.   PERCENTAGE OF PROJECTS COMPLETED AS EXPECTED

Finished on time	Finished within budget	Finished on scope
56.88%	57.16%	54.10 %

For RQ5, the data shows the top 3 most used sustainability practices are:

- Less printing, more energy efficient printers;
- Cloud computation technologies;
- Extension of the useful life of computers and screens.

On the other hand, the least used practices are:

- Use of subsidies to increase investment in sustainability technologies;
- Adoption of urban renewable sources (wind turbines or photovoltaic);
- Adapting buildings to capture rainwater.

Jumping to the perceived importance of each practice, the 3 practices considered most important are:

- Less printing, more energy efficient printers;
- Apply sustainable solution for heating the workplace:
- Adoption of urban renewable sources (wind turbines or photovoltaic).

The practices viewed as least important are:

- Life cycle cost analysis;
- Road travelling for international meetings;
- Cameras turned off during online meetings.

Finally, to answer RQ6, we will analyze different variables.

Gender

In 2021 there was a higher percentage of respondents of the male gender (60.15%) when compared to 2022 (57.69%). However, in both years, the PM field is still male dominated.

Age

In 2022, the average age of PM professionals was 43.75 years, which is above the 42.25 years obtained in the previous year.

Localization of the PM organizations

In 2021, the organizations where mainly located in Lisbon, Braga, and Porto (by decreasing order of presence). In 2022, the cities with highest number of professionals are still the same however in different order. Lisbon is still leading, followed by Porto and finally Braga.

Education level

The most common level of education in PM is master's degree, followed by bachelor's degree and then doctor degree. It remained unchanged from 2021 to 2022.

Fields of study

Informatics is the area of expertise with the most PM practitioners followed by civil engineering and industrial and management engineering in 2021. Following this trend, in 2022 the top fields of education are industrial and management engineering, civil engineering and informatics.

PM professionals' certifications

In 2022, 57.69% of PM have at least one certification in the area, whereas in 2021 this value was 44.40%.

Organizational certifications

Both in 2022 and 2021 yield similar results regarding the organizations' certifications. In both years, more than 50% have at least one certification.

PM professional earnings

The average gross income in 2021 was registered at 29,928.58€ annually. This variable increased in 2022, standing at 35,787.10€.

Most popular tools and techniques

The ten most and least used GP tools and techniques in 2021 and 2022 were those present in Table VI and Table VII.

TABLE VI.   PM TOOLS AND TECHNIQUE MOST USED IN 2021 AND 2022

Most popular PM tools 2021	Most popular PM tools 2022
Kick-off Meeting	Activity List
Progress Meetings	Kick-off Meeting
Project Work Description	Gantt Chart
Gantt Chart	Progress Meetings
Activity List	Project Work Description
Project Closeout Documentation	Requirements analysis
Requirements Analysis	Progress Reports
Progress Reports	Project Closeout Documentation
Project Charter	Milestone planning
Milestone planning	Work Breakdown Structure

TABLE VII.   PM TOOLS AND TECHNIQUE LEAST USED IN 2021 AND 2022

Least popular PM tools 2021	Least popular PM tools 2022
Probabilistic Estimation of Duration/PERT	Decision Tree
Trend Graph	Value Added Management
Value Added Management	Cost Life Cycle Analysis
Critical Chain Method	Critical Chain Method
Learning Curve	Trend Graph
Parametric Estimation	Parametric Estimation
Bidding Conferences	Value Added Management
PM Simulation Software	PM Simulation Software
Decision Tree	Bidding Conferences
Monte Carlo Analysis	Monte Carlo Analysis

Most popular PM methodologies

The hybrid/agile methodologies were both preferred in 2021 and 2022, over traditional methodologies. Scrum was the most popular framework used.

V.   CONCLUSIONS AND FUTURE WORK

A.   Conclusions

The response to the RQ1, the most popular techniques used are Activity List, Kick-off Meeting, Gantt Chart, Progress Meetings, and Project Work Description. The most important tools and techniques, according to PM professionals, are Activity List, Project Work Description, Requirements Analysis, Gantt Chart, and Risk Identification.

On the other hand, the least used tools and techniques are Parametric Estimation, Value Added Management, PM Simulation Software, Bidding Conferences, and Monte Carlo Analysis and the least important tools and techniques are Value Added Management, Learning Curve, Parametric Estimation, Monte Carlo Analysis, and Bid Conferences.

When it comes to the RQ2, the annual earning is significantly affected by the gender, years of experience, age and geographic localization of the professionals and organizations.

The most popular methodologies of PM in Portugal in RQ3 are hybrid methodologies. These methodologies achieve the best results in projects as well.

In response to RQ4, more than half of the projects finish within the scheduled time, budget, and scope.

In RQ5, the most used sustainability practice in PM is the reduction of printing and the use of more energy efficient printers. This is considered to be the most important practice as well. On the other hand, in general the practices which required higher investments and overall implementation difficulty are the least used, although some of them are considered important.

Finally, in RQ6 we conclude that the least popular tools and techniques in PM in 2022 are very identical to the results in 2021. In the most popular category, 9 of the existing toolsets were present in both years and 8 in the least popular. The results for each year are very similar, with a key evolution in earnings from 2021 to 2022, the disparity between genders kept sensibly the same and the certifications in PM increased slightly. On the contrary, some results were not so satisfactory, as Lisbon increased its share and centralization with the most organizations and superior gross income when compared to other localizations.

It's also worth to mention some limitations, the size of the questionnaire was too extensive, and the feedback of the respondents mentioned this key point. This factor limited the number of responses, with a total of 162 incomplete answers.

B. Future work

It would be interesting to increase the scope of this study to new subjects such as Portfolio Management and Program Management, especially in regard to the least and most important tools.

The realization of the comparison of this annual research with international studies, such as Pulse of the Profession, would be extremely interesting as well, since it would allow a comparison between the current state in Portugal and the international context.

This is the second edition of this study, and it is currently planned to be continued on an annual basis, in the scope of the Portuguese Project Management Observatory.

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