FROM PROGRAMMING TO PLANS MANAGEMENT

EXTENDED ABSTRACT

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Abstract

Within the context of Portuguese planning practice, the plan's formulation continues to have a significant preponderance when compared to the management component. This dissertation aims to address both the programming and the implementation component of the plans, with a particular focus on PMOT[2].

When the country is facing a severe economic and financial crisis, the uncertainty levels are revealed high, and therefore the performance of territorial planning process must be enhanced in order to achieve the best *value for money*, especially if we consider a context of diminishing public resources.

Usually the territorial planning process, even at the operational level, presupposes action in the medium/long term, which recommends the adoption of new, more flexible approaches, allowing for a continuous adaptation to the ever-evolving reality.

Thus it is intended, initially, to undertake a literature review sustained in the project management knowledge where it is explore concepts such as goal; action; programming; uncertainty; performance, among others. Subsequently there are analyzed the strengths and weaknesses of the legal framework and planning practice in national context, which have direct influence on the PMOT's (un) successful implementation.

Finally, sustained by a case study – PDM[3] de Santiago do Cacém, this dissertation proposes the development of a programming and management model, which will be able to deal with uncertainty and has the ability to tailor the plan according to the evolving reality.

1 – Introduction

The 21st century has brought about a vast new set of challenges to society, with diverse impacts over different countries, but revealing a close relationship with the uncertainty factor.

The pervasive uncertainty that is characteristic to contemporary society has led to the perception of an increasingly changeable context, in which the changes occur faster and unexpectedly, with the establishment of premises that are progressively more difficult to keep track of, and where forecasting exercises tend to lose credibility. In this context it is

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[3] Plano Director Municipal, Municipal Land-use Plan. This is a PMOT's category

important to assume planning as a decision support key-process which helps to reach solutions for the 5 major world's challenges (demographic, economic and financial, social, climate, energy).

An effective answer to the challenges listed above tends to rely on non-standard planning processes, with non-predetermined final solutions, in which the continuous evaluation of the reality evolution is a constant, and where the stakeholders' accountability has to be effective.

It is commonly considered that the Portuguese planning culture is yet to reach full maturity. Despite that lack of a strong planning culture, there has been an effort to strengthen it, notably in the spatial planning domain.

This effort has been mostly based on legalistic initiatives, namely with the publication of *Lei de Bases do Ordenamento do Território e do Urbanismo* (LBOTU) and *Regime Jurídico dos Instrumentos de Gestão Territorial* (RJIGT) which instituted two important landmarks for the planning practice in country. These laws establish the spatial planning policy framework as well the territorial management instruments that materialize it, and triggered the formulation of a significant number of *Instrumentos de Gestão Territorial* (IGT). The incidence of these IGT has been mostly at the municipal level.

Within the context of Portuguese planning practice, the plan's formulation continues to have a significant preponderance when compared to the management component. This dissertation aims to address both the programming and the implementation component of the plans, with a particular focus on *Planos Municipais de Ordenamento do Território* (PMOT).

2 – Objectives

The objectives of this work are:

1) The study of elements and structure of the programming component;
2) The assessment of the legal requirements relating to programming and management inserted in IGT, namely in PMOT;
3) The analysis of existing models that may be applicable in the PMOT actions' programming, and which make use of methodologies and techniques developed in project management area;
4) The study of uncertainty and contingency phenomena, and understanding the consequences for the planning process;
5) The understanding of some methods and tools used for performance evaluation;
6) The research of the relationship between the programming and management component;

7) The development of a programming and management model with application to a *Plano Director Municipal* (PDM), capable of incorporating the uncertainty factor and which has the ability to adapt the plan to an ever-evolving reality in an easy and expedited way.

3 – Research Methodology

Its structure is based on a starting point, followed by four different phases and ending with an end point. The description of each these elements is shown below and focuses mainly on research methods adopted, type of work done, difficulties, relevance in achieving the objectives, as well the generated outputs.

Starting Point

This first step corresponded to the reflection about the subject's relevance and subsequent formulation of key issues and objectives.

State of the Art

It was consisted in the deepening exercise and clarification about the work's theoretical guiding, based on literature review.

The first stage of this literature review focused on the relevant literature research, including different types of sources such as published articles in magazines / journals, books, dissertations and doctoral theses, and papers presented at conferences. In a second stage, the gathered information was evaluated and organized.

Case Study Characterization

This phase relied primarily on studies conducted in the Santiago do Cacém's PDM[4]. At first a set of information concerning the municipality territory was selected, with the primary objective of outlining a comprehensive portrait of that territory.

After developing the municipality's characterization, an analogous process was applied to the plan (Santiago do Cacém's PDM), which exposed the broad development strategy and presented briefly the basic structure of the proposed planning model.

Environment Characterization

A plan cannot be disconnected from the reality over which it operates, so it was along this perspective that a characterization of the environment was developed. This characterization integrated two components - law and stakeholders.

Programming and Management Model

This stage corresponded to the dissertation's proposal phase. Here the conceptual structure of the model was formulated and subsequently applied to the case study. This phase equally integrated and put into context the knowledge acquired in the previous three phases.

[4] The Santiago do Cacém's PDM was the chosen case study for this dissertation.

Ending Point

Concluding the research work, this stage synthesized and added a critical analysis of what has been produced with some notes and clues for future researches.

4 – Theoretical Framework

4.1 – Planning and Plan

Urban planning has, for a long time, been implicitly seen as a process of professional activity though, until the mid-1960s, it was practiced principally as an art form within a traditional design context [3].

In general, the definition of planning in the 60's and 70's, emphasizes its proactive and rational nature, characterized as: a mental process and a method to achieve decisions regardless of the planned phenomenon [13]; an activity centered between knowledge and organized action [5]; and a mental process of influencing the future [4].

The rational planning model, in the broader meaning of the concept, is summarily the process which thinks over the problem, defines and assesses the alternatives to solve it, implements them, and finally monitors its progress.

In this dissertation, based on the presented framework, it is defended that the planning process concept in which the plans shouldn't be seen as *plan-product*, but rather as a structure and framework to support decision making.

It already clear that the approach in the course of this dissertation will focus on the planning process's operational domain, leading to a proper understanding of the plan's figure that is embodied in a listed set of actions to respond to certain objectives defined a priori.

4.2 – Objectives

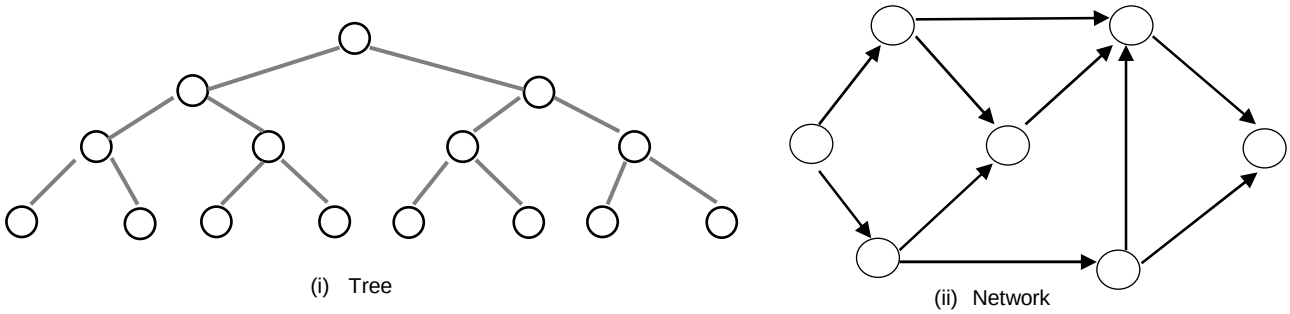
Arising from the existence of an instrument (the plan), it is relevant to discuss the following two questions: "For what do I want a plan?" and "What do I want to get from a plan?".

These two questions require that we address concepts related to the purpose, scope, intentions, expectations, and desires which befall on the planning process, and should be translated in the plan. Within this context emerge three concepts - objective, goal, and target - which are often confused between them, since all describe states / situations that ones wants to reach. However it is important to clarify that these concepts are different in what concerns the time horizon, attributes assigned to them, and also their intended effects.

Bearing in mind that objectives correspond to the basis for the action's development, in this dissertation the concept of 'objective' is assumed as: limited time-framed pathways, associated with a target, which imply a specific effort (resource consumer), clear and concise in terms of the results which they wish to achieve (outcomes), and possible to quantify and measure, particularly through evaluation and monitoring procedures.

To organize a system of objectives or a system of objectives/actions there are two possible structures for represent the relationships between the system's elements: (i) the tree and (ii) the network, as illustrated in Figure 1.

Figure 1 – **Representation structures for system's elements**



(i) Tree (ii) Network

4.3 – Actions

The actions are themselves a response to the questions of "what to do?", "when to do?", "how to do?", "where to do?" and "who does?", necessary in achieving the plan's objectives. Given these issues, an action is defined as follows:

- Has a discrete and finite set of attributes that consist in the more convenient identification and description of their characteristics;
- Can be broken down into a finite set of tasks which are undertaken, whenever its complexity justifies it;
- Has finite and predetermined duration;
- Is characterized by two key moments - beginning and end;
- Is integrable (adding all actions results in the final product = plan);
- Is measurable;
- Maintains restrictions and sequentiality relationships with other actions;
- Implies the availability of means for its achievement (resources).

The use of *Work Breakdown Structure* (WBS) is desirable to achieve an efficient and effective identification of actions. The WBS isn't more than "the decomposition of project's components in a hierarchical scheme guided by its results, which organizes and defines fully the scope of the project" [11]. In applying this tool one should have present the basic idea that it is preferable, wherever justified, to breakdown an action in simpler units, since each is separable and can be properly characterized.

The development of this dissertation advocates a typology system that distinguishes the strategic actions from non-strategic actions, where the first ones are associated with a dynamic character, ie contribute to a change process under certain context conditions, and that decision-makers are willing to allocate a greater amount of resources, while the second ones are associated with a more static (continuity of the reality's state of current reality) and their implementation requires a smaller amount of resources.

4.4 – Programming

In the field of project management there are some key variables which assume dominance in the various processes arising during each project's life cycle, including the scope, time, cost, resources and the inherent quality of its implementation. It is on these variables that programming focuses.

In the actions' programming, the estimate for their durations plays a crucial role. In order to obtain reliable estimates it is usual to resort to various methods such as: historical method; intuitive method; standardized formula method. It's relevant the fact that these methods have proven their effectiveness in many projects with standard activities, actually not directly relatable to the plan.

In addition to defining the actions' duration, regarding the time variable, it is equally important to analyze the sequential relationships and constraints that occur between actions.

There are well known models for programming actions, such as *Program Evaluation and Review Technique* (PERT) and *Critical Path Method* (CPM). These models have as inputs: the identification of actions; the identification of the sequential relationships; and estimated activities' duration: On the other hand, these models' outputs correspond to the determination of the project's minimum duration, temporal location and identification of activities that determine this minimum.

The cost is another variable that intervenes in the programming function, so the balance between the costs and the financial resources available is essential in the implementation of any action. It is therefore necessary to budget well those costs.

There are different approaches which can be applied to estimate the costs, but only two are mentioned. The first is based on historical costs related to previous similar actions and has performed, while the second relies on the composition of the overall cost of each action based on current unit costs.

So far we have discussed variables directly associated with the element – actions –, such as the scope, time and cost, but now approach is needed to another element – resources –, constituting itself as a variable for programming function. There are various types of resources necessary to carry out a project, including human, material and financial, but the last ones deserve special attention for their special characteristics.

In the project management, joining the needed resources to the action being taken is called an allocation relationship, and in the particular case of financial resources, this concept is especially useful because they are derived flows of expenditure and revenue over time. The progress of these varied expenses and revenues requires an effort to balance their flows within the project's timeframe, which may be achievable through the establishment of a consistent framework for prioritizing actions.

After the actions' modeling and the resources' allocation, it is necessary to locate the project in a timescale, a procedure commonly referred to as scheduling. This timing is influenced by various types of constraints such as the sequential relationships between actions, the financial strength and resources to be allocated, legal aspects, as well as choices made by decision makers.

The most common representation form to schedule a project corresponds to the Gantt Chart (also called bar graph).

4.5 – Uncertainty, Risk and Contingency

The concept of programming, appealing as it may be due to the need for the plan become more accurate, should be used with caution, as in terms of implementation, we must not forget that the precise procedures / methodologies should be used only when there is certainty.

In this sense it's important to discuss the concepts of uncertainty, risk and contingency, since they all have a close relationship with the non-deterministic nature of reality over which the planning process focuses.

Planning is about changing the future, or at least the expected future. Therefore, understanding what is known and unknown about the future, and the links between the past, the present, and the future, and how we act on this understanding are critical issues and challenges [1]. That's why planning means, essentially, controlling uncertainty – either by taking action now to secure the future, or by preparing actions to be taken in case an event occurs [9].

The definition of uncertainty isn't easy and clear but it's known that it is created by the planning process itself or through changes in the environment or planning context.

For the development of this dissertation there is an own stance on the uncertainty concept: uncertainty affects the understanding of a future state for which there is total ignorance, ie you can't even mark out a range of possible alternative states for future. Add to that the wide spectrum of possibilities brought about by uncertainty, which are not limited to the negative impact it can have on the plan's outcomes and objectives but extends its influence field for the generated positive effects and to the new alternatives (opportunities) which are potentially better than initially planned.

A concept related with uncertainty is that of risk, which is more noticeable and well defined. The *Project Management Body of Knowledge* (PMBOK), a reference in project management, defines risk as an uncertain event or condition that, if occurs, has a positive or a negative effect on at least one project objective, such as time, cost, scope or quality. It's understood that, in the context of territorial planning, a risk is a situation which calls into question the realization of the plan's fundamental goals (at least one of them), a risk event corresponding

to an event, if it occurs, triggers a risk, as a risk factor is a variable, controllable or not, which influences the intensity of risk, and finally the risk intensity coincides with the probability of that state occurring or the product of the probability of occurrence and impact.

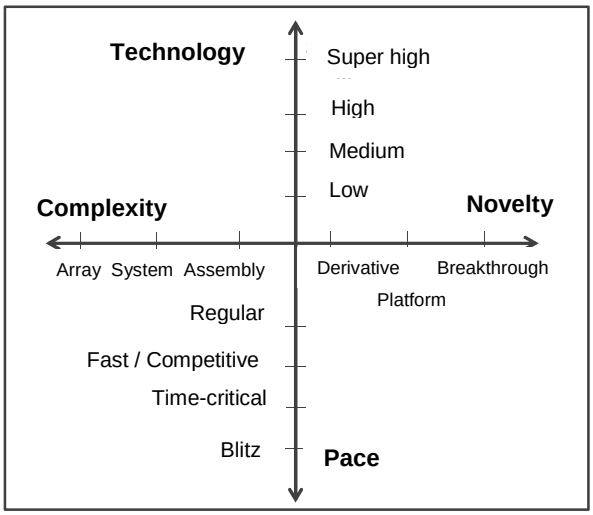
Actually this is a good opportunity to explore the paradigm shift, necessary and beneficial, as regards the transformation of classical risk management into uncertainty management. As previously considered, the planning process is far from resembling a controllable system and hence the uncertainty is always present and a factor with which it has to deal with. So there is the need to adopt a reactive response, effectively and efficiently, to deal with something that is a completely unknown, hence the emergence of the proposed contingency concept.

Taking into account its strong relationship with the concept of uncertainty, the proper understanding regarding the contingency concept corresponds to an event that may occur in the future and not predictable on which the plan has no control, arising and dependent from the combination of planning process internal and external factors (contingency factors), and that in the event of effecting itself leads to changes in the initially stipulated programming.

A contingency approach, both at the programming and managing stage, can be a way to deal with uncertainty and risk as well as their effects. The *Project Contingency Theory* (PCT) argues that the best approach to managing a project depends on context: different conditions require different project organizational characteristics, and the effectiveness of the project is related to how well organization and conditions fit each other.

According [12], the myth that a single method can fit all types of projects (one size fits all) has led to dissatisfaction with the area of project management. As a result of this, in his research, he argues that the ‘‘one size fits all” approach is suboptimal, and that a project’s structure and management practices should be tailored to suit its context. They proposed a model which is composed by 4 contingency factors (novelty-V; complexity-C; technology-T; pace-P), very focused in engineering-based projects but which may be applicable to the programming and managing of plans.

Figure 2 – NCTR Diamond Model



Source: *Adapted* Shenhar et al., 2007

4.6 – Performance

Accompanying the era of the modernist planning approach, the focus of the plan evaluation or assessment was on developing criteria for determining “good plans”. As [2] noted “If planning is to have any credibility as a discipline or a profession, evaluation criteria must enable a real judgment of planning effectiveness: good planning must be distinguishable from bad.”

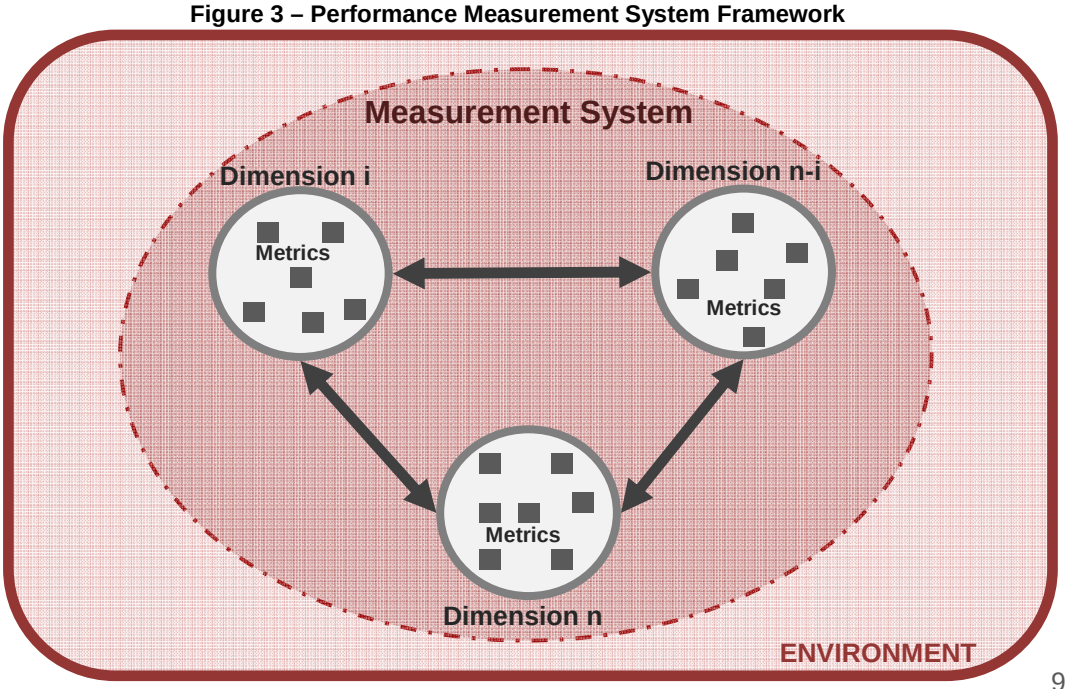
Unlike the compliance perspective based on an assessment of the correspondence between what is desired *a priori* (intentions, objectives, goals) and what is actually achieved / implemented (outcomes and impacts of actions), the performance perspective tries to go beyond by arguing that mere conformance is not sufficient as a plan’s measure of success. As derived from the uncertainty present in the planning process what was initially programmed does not always correspond to the best solution during the plan’s implementation, as such the performance perspective is favored since it copes well with the plan’s necessary flexibility.

The performance concept, widely used in the management area, incorporates two fundamental concepts, the effectiveness and efficiency.

The concept of effectiveness is concerned with “doing the right thing”, which means applying the best strategies and implement their actions to achieve a competitive advantage. The efficiency concept, related to doing the thing well, points towards the process implementation through the use of a minimum of resources, and is usually expressed as the ratio between outputs and inputs.

[10] define performance measurement, in the strict sense, as the process of quantifying the action’s efficiency and effectiveness. Based on [10] we can be define a system of performance measurement / evaluation as the set of performance measures or metrics used to quantify both the efficiency and effectiveness of all actions, as shown in Figure 3.

Figure 3 – Performance Measurement System Framework



Given its multidimensional character, it is difficult to define a performance measurement system that suits any situation (organization and / or project). In addressing this issue and knowing that way those systems are configured has a stand in the decision making support, it is opportune to share the [8] view which indicates that the formulation of a performance measurement system faces two fundamental issues: i) how to build a system that provides sufficient information easily stored and made available for viewing or to be modified, ii) which type of tool is suitable to analyze the information (outcomes) according to the perception / position of the decision makers.

To meet the first question raised above, the issue of *Key Performance Indicators* (KPI) will be discussed as a quick response to the necessary information's availability, while for the second issue will be approached resorting to a widely used tool in strategic management, the *Balanced Socrecard* (BSC).

The KPI generally constitute themselves as a tool used to identify and measure aspects of an organization or project to determine its success. They are few, measurable, objective, and above all action-oriented, characteristics which allow them to provide instantaneous flashes on how well they are running the predefined objectives.

These KPI are the support of the BSC which is a model introduced by Kaplan and Norton in the 1990's and whose main purpose was helping organizations to assess whether they were doing the right things and on the right way, ie to conduct an overall measurement of their performance.

BSC is today likely the most widespread performance measurement system, establishing itself as a management system that enables organizations to clarify their vision and strategy and translate them into action [7]. The main objective of this system is to provide a set of measures that would lead to a quick and comprehensive business vision to top managers, which is based on four different perspectives: i) the customer's perspective; ii) internal perspective; iii) innovation and learning perspective, iv) financial perspective.

4.7 – Flexible management

The flexibility / adaption capacity of the planning process corresponds, it is argued, the ability to make the plan and its management less restrictive to the point of allowing them to react timely to changing and evolving context.

The plan's management includes its implementation, in which occurs the concretion of the objectives, goals and actions, which until that stage were just written words in the plan-document, dealing with bureaucratic delays and legal difficulties by adjusting the appropriate schedules and deadlines, as well anticipate alternative actions.

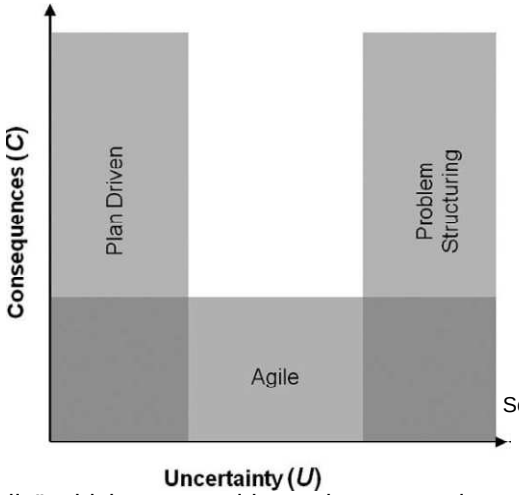
Planning and its implementation are often regarded as separate processes with their own actor networks and their interests and, respectively, considered rather opposed. We could

say there is an “implementation gap” linked to the knowledge disconnection between plan formulation and implementation. For this gap contribute some factors such as time, political-institutional context and attributes of the plan, which in turn also contribute to the implementation dynamics themselves.

In facing these dynamics it is necessary to introduce dynamic management mechanisms that confer flexibility to the implementation process. In this way, for flexibility to be synonymous with the plan’s success, there is a crucial element that must always be available and updated - information - which is obtained through the monitoring and evaluation procedures.

By combining the project’s management styles emerges a project’s contingency methodology proposed by [6], "UC-Framework". This methodology identifies three models / styles of management: "plan driven"," problem structuring” and “agile".

Figure 4 – UC Framework



Source: Howell et al. 2009

The third model, the "agile” which we consider to be appropriate to apply in the territorial plan’s management, can be defined as a set of methodologies that integrate:

- The assumption that the objectives of the project were poorly defined in the early stages;
- A highly iterative process that involves the partial targets, followed by the redefinition of those goals based on feedback from its implementation.

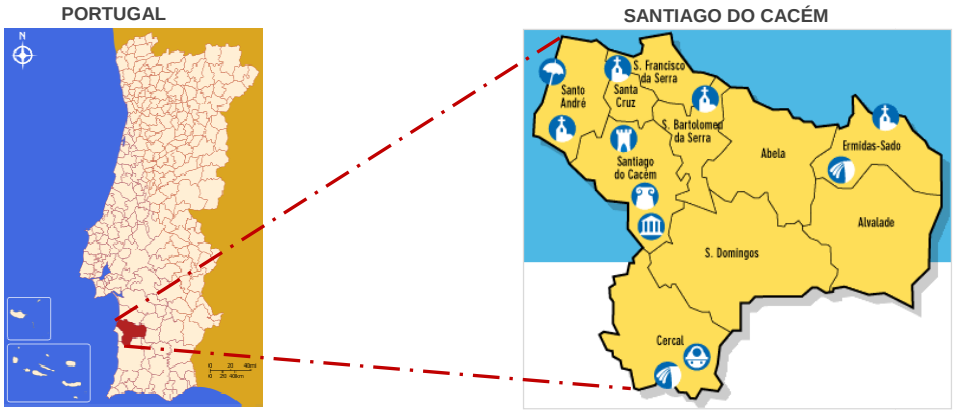
5 – Case Study

The chosen case study for this dissertation is the Santiago do Cacém’s PDM: Santiago do Cacém is a Portuguese municipality, located in Alentejo Litoral sub-region, with a total area of ~1060 km^2 and where live 29.749 inhabitants (Censos 2011).

In terms of area it is the 12^{th} largest municipality in the country, occupies about 20% of the Alentejo Litoral area, and represents approximately 31% of this sub-region’s population, giving it the status of the most populous municipality in the sub-region.

The distance between Santiago do Cacém and Lisbon is around 150 km, lies approximately 100 km from Setúbal, 150 km from Faro, 140 km from Spain, and the nearest town of neighboring municipalities is Sines at a distance of 18 km .

Figure 5 – Santiago do Cacém municipality



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The strategy outlined for the Santiago do Cacém's PDM is organized in a tree structure founded on 4 distinct strategic lines and one transversal strategic line which all of them are then break down into objectives and correspondent actions. These strategic lines are: I – Enhancement and Conservation of Natural Heritage; II – Qualification and Innovation of Economy; III – Improvement and Sustainable Mobility; IV – Balance and Cohesion of Urban and Rural Areas; Transversal – Governance and External Relationships.

6 – Programming and management model

The main objectives of this model's conception are:

a) Program the plan's actions in order to give effective contributions to its management;
b) Generate a system which allows to compile, process and analyze the information regarding the progress made by the plan;
c) Provide information to the decision-making responsible about the plan's performance;
d) Predict plan's adaptation mechanisms.

For the model's developing is chosen a form in which its structure is based on three components (1 - programming, 2 - coordination between programming and 3 - management, management).

7 – Conclusions / Steps forward

Finishing this dissertation there are more elements that can contribute for solve the uncertainty's problem at the land-use plans' implementation. In the complex context of urban planning it's impossible to generate a plan which covering all possible contingent factors so the unique way to exceed this barrier is to have a flexible programming model associated to a ongoing evaluation system that together will allow adjusting the plan for the constant reality's change, as proposed.

For the future, it is aimed to:

- Detail the model's operation, notably through:
  - Developing appropriate performance indicators;
  - Proposal of the plan's adaptation mechanisms.
- Apply the model's components 2 and 3 to PDM de Santiago do Cacém;
- Test and adjust the model for the different type of PMOT (PDM, PU; PP).

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