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Developing Governmental Project Management Capability with Use of Maturity Model

ABSTRACT

PURPOSE: The purpose of this paper is to create a maturity model for the governmental level of project management activities.

DESIGN / METHODOLOGY / APPROACH: The data were collected on the basis of literature review and analysis of solutions for public sector project management in over 60 governments (at country, state, or local levels). The work used the methodology of creating maturity models. CMMI® was selected as the reference model.

FINDINGS: The concepts of Governmental Project Implementation Systems (GPIS) and Governmental Project Management (GPM) were introduced. A Governmental Project Management Maturity Model (GPM3) for GPIS / GPM was built. It consists of five levels: Initial, Local, Governmental, Support, and Optimizing.

PRACTICAL IMPLICATIONS: GPM3, as each maturity model, may have three applications: descriptive (assessment of the current maturity level of GPIS/GPM), comparative (comparing maturity between similar governments), and prescriptive – showing the roadmap for improvement of the project management capabilities of governments. This will contribute to the acceleration of the development of administrative units governed by their governments. The model may play such a role at the governmental level of project management as CMMI® or OPM3® do at the organizational level.

ORIGINALITY / VALUE: The proposed model is the first, original maturity model for the governmental level of project management.

Keywords: Project management, maturity model, government, public sector

Article Classification: Research paper

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Motto

I do not ask what projects can do for their governments.
I ask what governments can do for their projects.

1. INTRODUCTION

1.1 Basic concepts

Public sector projects are one area of government activities. To be effective as a whole, any government must be effective in the area of project management.

Many authors have been analyzing the effectiveness and efficiency of public sector projects, finding plenty of reasons for problems and suggesting different remedies. Some of them tie these problems to a single institutional level. For instance, poor governance, inadequate project management, and lack of effective leadership are mentioned by Achterstaat (2013). Patanakul et al. (2016) extend this list with uncertainty about goals, inadequate resources, financial and organizational issues, frequent changes in orders, optimism of owners and project managers, poor risk management, and lack of accountability, system management, governance and project management. The reasons identi-

fied by Ikejemba et al. (2017) are lack of stakeholder cooperation, poor planning and implementation, poor maintenance, and lack of public acceptance and inclusion. Lack of project management experience is mentioned by Blixt and Kirytopoulos (2017), inadequate leadership style by Zhu and Kindardto (2016), public projects' relative complexity (Gasik, 2016), and low salary of project team members by Malinda (2017).

But there are also reasons and ways to improve the implementation of public sector projects related to the governmental level. Regulations influence the success of public projects (Tabish and Jha, 2011) and wrong law hinders public sector project implementation (Batool and Abbas, 2017). Formality and intensity of standard government processes influences public sector projects (Patanakul et al., 2016). Central-level Project Management Offices are needed (Patanakul et al., 2016; Popa, 2016), and the process of awarding projects should be improved (Ikejemba et al., 2017). The procurement process lasts too long because of regulations (POST, 2003).

Entities that can overcome the problems of the first group are the authorities of the public institutions. But at the organizational level, the problems of the second group cannot be solved. This justifies identification of government level in public sector projects efficiency studies.

Public projects are performed in an organizational environment established by the government. This environment may cover processes, methodologies, practices, organizations (including auditing offices and public-sector Project Management Offices), databases, project managers, project management maturity models, project contractors and other elements in a given administrative unit, all of which define, shape or influence the way public sector projects are implemented. This environment will be referred to as the Governmental Project Implementation System (GPIS). The GPIS is controlled by governmental laws, executive orders and other activities and documents, specific to the individual administration. The process of influencing and shaping the GPIS by the government will be referred to as Governmental Project Management (GPM).

A GPIS is a system of components that are organized for a common purpose: effective and efficient project implementation. The performance of each system depends not only on the performance of its components but also on the structure and characteristics of the system as a whole. So, performance of public sector projects depends not only on the activities of the organizations directly implementing them, but also on the characteristics of the GPIS within which these projects are performed.

The GPIS / GPM environment is schematically presented in Figure 1.

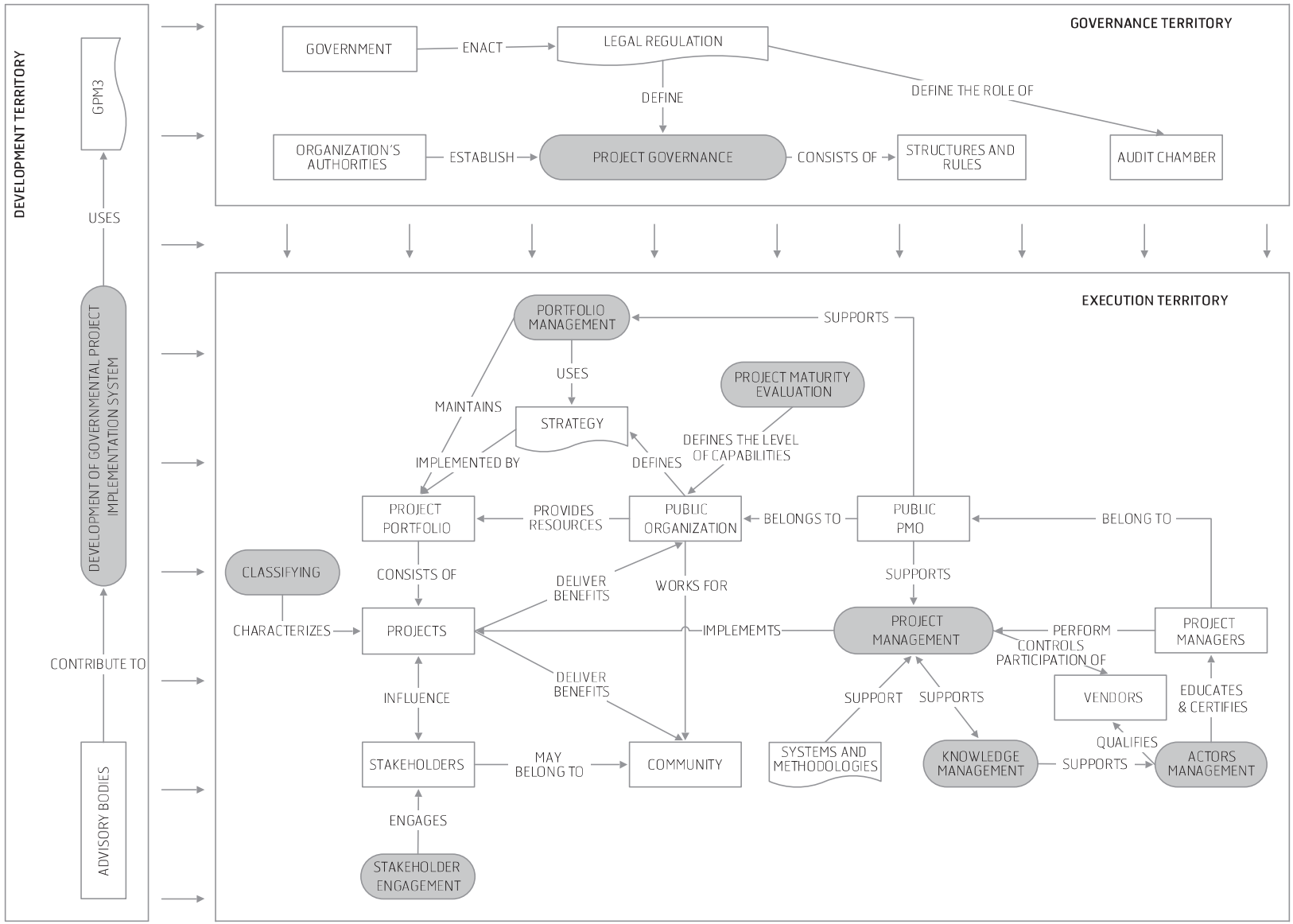
1.2 Maturity Models

Maturity model is one of tools widely applied for improving organizational performance. Maturity models contain the best practices from given area (Wendler, 2012). These practices are grouped into hierarchical sets of elements (maturity levels) describing the features of more and more effective processes (OGC, 2010). The first widely recognized maturity model was Capability Maturity Model (CMM, Paulk et al., 1993) developed for the area of software development. Since then plethora of maturity models have been published. Wendler (2012) lists 237 maturity models. Project management maturity models and its usage are recognized and accepted by professionals (Albrecht and Spang, 2016).

Maturity models may be applied for selected processes, process areas or for whole organizations (Becker et al., 2009). Several researchers, e.g. Shi (2011), Crawford (2006), Besner and Hobbs (2008), Yazici (2009), Jiang et al., (2004), and Spalek (2014), showed that increasing an organization's project management maturity level positively influences the organization's performance.

A public administration managed by a government is a specific type of organization. Therefore, specific types of maturity models may also be applied to the governmental level of project management. The purpose of this article is to build a maturity model for governmental project management that can be used for improving both GPIS and GPM processes. The addressees of this model are primarily the governments overseeing the administrative units, which through the implementation of GPM processes affect the form, structure and quality of their GPISs.

Figure 1. GPIS / GPM structure



source: Gasik, 2017

2. LITERATURE REVIEW

2.1 Sector-Independent Maturity Models

Maturity models are used in all sectors of activity: governmental, private and non-governmental. Many models can be used in each sector. Examples of project management sector-independent maturity models are CMMI® (SEI, 2010), Kerzner's model (Kerzner, 2005) and Crawford's maturity model (Crawford, 2006). Sector-independent maturity models have also been developed for specific types of projects, such as software development (Paulk et al., 1993), agile software development (Chetankumar and Ramachandran, 2009; Humble and Russell, 2009), new services development (Jin et al., 2014), construction (Sun et al., 2009) and many others.

Maturity models have also been developed for process activities. This includes models that are applicable regardless of the business sector. Exemplary maturity models of this type are the business process maturity model (Rosemann and de Bruin, 2005), the resource management maturity model (Mahmood et al., 2015), or the Big Data maturity model (Hansmann, 2017).

2.2 Public Sector Maturity Models

In addition to maturity models that can be used in any sector, there are maturity models that have been developed specifically for the public sector, which include maturity models for projects and maturity models for processes. An additional dimension of classification of public sector maturity models is the organizational level. For the public sector one can consider the single institution level and the governmental level. Like the sector-independent maturity models, the public-sector maturity models can be divided into two types: project-oriented maturity models and process-oriented maturity models. Table 1 shows the classification of maturity models for public sector, taking into account these two dimensions.

Table 1. Public Sector Maturity Models Classification

	Projects	Processes
Organizational Level	Project management organizational level maturity models	Process management organizational level maturity models
Governmental Level	Project management governmental level maturity models	Process management governmental level maturity models

2.2.1 Public-sector Project Management Organizational Level Maturity Models

Project management organizational level maturity models have been developed and applied, for instance, in Canada, Australia, and Greece. Canada has a project management policy in place (TBoCS, 2013). Under this policy, the project management capabilities of public institutions are evaluated using the Standard for Organizational Project Management Capacity (TBoCS, 2013a) which is a kind of maturity model. This model consists of five levels: Limited, Sustaining, Tactical, Evolutionary, and Transformational. The Australian Public Services Commission (APSC, 2012) has developed guidelines that determine the capacity of Australian federal-level public organizations to provide services. There are five levels of maturity in these guidelines: Awareness, General Acceptance, Defined, Manager, and Leader / Excellence. In the Greek public sector, a norm describing the maturity model for public sector institutions has been developed within the scope of the System for Assuring Managerial Capability (SAMC), the ELOT 1429 (GOfS, 2009). This model specifies three levels of maturity.

2.2.2 Public-sector Process Management Organizational Level Maturity Models

Specialized maturity models for public institutions have been developed for process management. For instance, Pullen (2007) developed the Human Performance Technology maturity model for the public sector. Cottam et al. (2004) developed a Customer Relationship Management maturity model for local governments. Happe (2009) developed a community maturity model. The Internal Auditors Research Foundation (IARF, 2009) has developed an internal audit capability model for British public institutions.

2.2.3 Process Management Governmental Level Maturity Models

The creation of specialized models in this group began with the development of the e-government maturity model by

Layne and Lee (2001). They defined four levels of maturity models for e-government: continuous, transaction, vertical integration, and horizontal integration. Fath-Allah et al. (2014) identified 25 e-government maturity models. The maturity model for Health in All Policies (HiAP) (Storm et al., 2014) deals with another area of public administration. This model has six levels: unrecognized, recognized (recognizing the problem), considered, implemented, integrated, and institutionalized.

2.2.4 Attempts to Evaluate Governmental Project Management Maturity

Literature has not yet described a maturity model for government project management that can answer the question of how mature governmental project management is in a given administrative unit. But similar questions were asked by researchers in several countries, who investigated the average level of maturity of project management in the public institutions of a given administrative unit.

In Australia, such studies were conducted by Young et al. (2014) using P3M3® (OGC, 2010). For projects, the average management maturity level was between 1 (benefit management) and 3 (risk management). Prado and Andrade (2015) distinguished the public sector as the subject of part of their project management maturity studies in Brazil. The Prado Project Management Maturity Model has five levels, from 1 (Initial) to 5 (Optimized). The average score for all examined public institutions was 2.5.

In New Zealand, KPMG conducted public sector project management maturity studies (KPMG, 2011) using P3M3®. The study found that 80% of organizations are at level 2 or lower on a scale of 0-5, with 50% of them at levels no higher than 1.5.

However, these studies do not account for one important factor: the impact of GPIS and GPM on project management in public sector institutions. They treat each public institution as a separate unit. But a public administration is an organism composed of cooperating organizations and regulated by its government. So, to adequately describe the level of maturity of public sector project management in a particular administrative unit, one also needs to take into account the governmental level: the maturity of GPIS and GPM. The maturity model used for such assessment will be called the Governmental Project Management Maturity Model (GPM3).

The lack of a Governmental Project Management Maturity Model is an important gap that this article is trying to fill.

3. THE METHODOLOGY OF GPM3 DEVELOPMENT

As the knowledge about maturity models develops, several methods of their creation have been defined. Such methods have been proposed, for example, by de Bruin et al. (2005), Mettler and Rohner (2009), Becker et al. (2009), Maier et al. (2012), and Röglinger et al. (2012). The most general phases of maturity model development are planning, development, evaluation and maintenance. In the planning phase, one must define the purpose of model development, including its scope and audience. A review of existing maturity models for similar models should be performed. In the development phase, it is necessary to determine maturity levels and to indicate practices performed at these levels. In the evaluation phase, the model should be verified and validated. In the maintenance phase, in addition to performing assessments, a results database and the maturity model itself should be maintained.

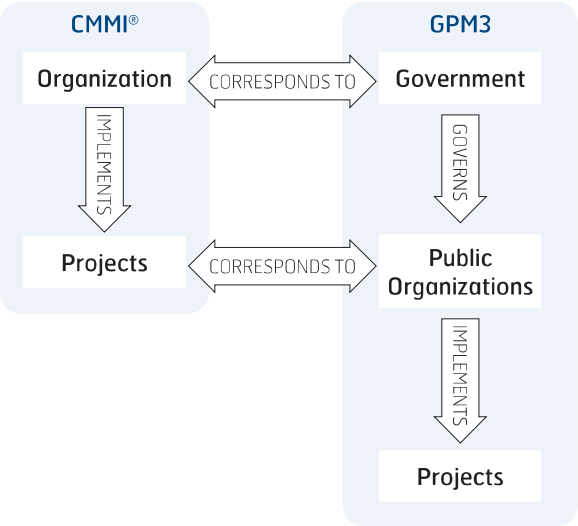
A particular, frequently used method of maturity model development is to build them on the basis of existing models. Maturity models are often built on CMM (or CMMI®) (e.g. Hopkinson, 1996; Ibrahim 2000; Niazi et al., 2005; Rosemann and de Bruin, 2005) or based on OPM3® (e.g. Jia et al., 2011). This approach can be considered a variant of the above-described methodology, where the set of major maturity model constructs is predefined. For models built on CMM, these include definitions of maturity levels. For OPM3® this is the SMCI structure, defined for the areas or processes that are subject to the maturity model. Regardless of the variant of the maturity model, this process must be based on a deep knowledge of the practices applied in the field of interest. The premise of applying this method of maturity modeling can be similar to the structure of the main objects of the base model and of the model being created.

The description of the planning phase may be found above in the Introduction and Literature Review sections.

In our case, CMMI® is the basis for the development phase. CMMI® refers to the implementation of projects in an organization. Our maturity model refers to the project man-

agement capabilities of public administration in a given administrative unit, governed by its government. The CMMI® analogy for organization in our model is the public administration as a whole. The CMMI® analogy for a project in the model is the institution – a component of the administration. In CMMI®, the organization influences the way it performs its own projects. In our model, the government influences the way in which its institutions operate (in the scope of project, program, and portfolio management). These relationships are schematically shown in Figure 2.

Figure 2. CMMI® and GPM3



We have collected knowledge on GPIS / GPM practices in several ways. We have analyzed 262 literature items, 345 documents and source materials and 37 interviews with government project management stakeholders were performed (Gasik, 2017). Data were collected from 67 administrative units, mainly at the country and state level.

The following principles were adopted for the inclusion of practices into research for the model. Firstly, practices enforced by law were considered. Secondly, practices mentioned in source documentation, application of which was confirmed by actors or other stakeholders, were taken into account. Thirdly, the classes of practices listed in the source material from more than one administrative unit were considered. Fourthly, those practices that were confirmed by reference in available reports were included. In qualitative research, it is important to identify the set of analyzed objects. The basic criterion for sample selection in qualitative research is not to determine the sample size but to gain full knowledge of the researched phenomenon (Marshall, 1996; Fossey et al., 2002). Saturation is the criterion for the completion of the review of the practices, i.e., a state in which subsequent material research does not generate new practices (Green and Thorogood, 2004; Bowen, 2008). No new practices were added after analyzing the sources stated above, therefore the state of saturation was achieved. The identified practices were allocated to individual maturity levels.

The evaluation and maintenance phases will be performed in the future. It is planned to select three countries in which evaluation will be carried out using the survey and / or focus group methods.

In the following chapter, for each maturity level first we provide its general characteristics then we describe some example practices.

4. SPECIFICATION OF GPM3

4.1 The Initial Level

At this level, there is no awareness of the importance of project management for the success of the government and the whole administrative unit. Governments sometimes use the term "project", but do not recognize the importance of project management for the proper functioning of the administrative unit. Governments believe that the efficiency of projects depends primarily on technical skills. At this level, the government usually does not provide a stable organizational and legal environment for project implementation. The success of projects depends on the competence and heroism of people, and not on the use of proven processes. Government projects are often abandoned or they exceed the estimated schedule or budget.

The most common form of public administration involvement in projects at this level is the allocation of resources and expectation of results (Judah, 1857; Kozak-Holland and Procter, 2014; Kwak et al., 2014). There are no organizations specialized in the implementation of projects. Audit chambers are not qualified in project management and avoid au-

dits of projects. And if they do perform such audits, they focus on the technical aspect and on individual activities, not on full project management processes (NIK, 2014). Public sector projects can be implemented under the general regulations concerning public contracts (if any), which do not account for the specifics of projects. In the late stage of this maturity level, regulations on individual projects may be enacted, but they do not relate to their management, or they relate to it in a minimal way, usually by requiring the submission of management products (schedule, reports). They do not require the use of project management processes (e.g. RCL, 2009, RCL, 2016).

All governments remained at this level of maturity approximately until the Cold War period.

4.2 The Local Level

At the Local Level, individual public-sector organizations or groups of organizations, like sectors of public administrations, apply project management practices in a systemized way. At this level, organizations create regulations, guidelines and standards for organizational units from the public sector. Entering this level usually begins with the public organization's increased interest in the management of individual projects. A variety of project and program management practices are applied for specific projects, agencies or entire departments, but those practices do not cover the entire public sector.

Public institutions, as separate organizations, implement project management best practices such as those described in project management standards, methodologies (PMBOK® Guide, PMI, 2008, Prince 2®, OGC, 2009 etc.) or organizational-level maturity models. If the maturity assessment of an organization or of some sector, according to any maturity model (CMMI®, OPM3®, P3M3® or any other), would result in a rating higher than the lowest level of maturity, then the public administration to which this organization belongs reaches the Local Level.

The entry onto this level usually begins with the interest of the government in the management of individual projects. In the US in 1956, the Navy began the Polaris project, for which the PERT technique was developed (Lenfle and Loch, 2010). So, we may say that the United States entered the Local Level of GPM3 during the Polaris project. In Australia, some management processes were developed in the early 1960's for constructing the Sydney Opera House (Kouzmin, 1979). This level was further developed in the United States after 1960, when Robert McNamara introduced the DoD Program Planning and Budgeting System (PPBS), emphasizing the up-front analysis, planning and control of projects, and several other processes and techniques (Morris, 1994). The first regulation in the United States to require a specific methodology across the organization were recommendations for using the Cost / Schedule Controls System Criteria (C/SCSC) published in 1967 by the Department of Defense (Abba, 1997).

Currently, many governments are at the Local Level, applying a variety of project and program management practices for specific projects, agencies or entire departments, but which do not cover the entire public sector. In the state of Alaska, the Office of Project Management and Permitting operates, supporting project management in the Department of Natural Resources[1]. In Ireland, the Transport Infrastructure Ireland has published Project Management Guidelines (TII, 2017). In Chile, the Ministry of Housing and Urban Development published Recommendations for project management (MINVU, 2009) for its agencies. The Canadian Major Project Management Office[2] supports the implementation of the most important natural resources projects. This should be considered the capacity of the Local Level of maturity, as it does not cover all the major Canadian public-sector projects. Within departments of American states, Public Project Management Offices are established, for example PDD Vermont[3], dealing with transport projects, the Project Management and Development Branch in the Real Estate Services Division, California[4]. EPMO Vermont is involved in public IT projects (2010). The lowest level of governmental PMO are so-called "Project Agents", persons who help other employees to organize and manage their projects in those institutions (e.g. in the Government of Brazilian state of Minas Gerais, Prado, 2014).

1 http://dnr.alaska.gov/commis/opmp/ (accessed 13 July 2018)
2 http://mpmo.gc.ca/home (accessed 13 July 2018)
3 http://vtransengineering.vermont.gov/about_us (accessed 13 July 2018)
4 http://www.dgs.ca.gov/resd/Programs/ProjectManagement.aspx (accessed 13 July 2018)

Public institutions develop their project management methodologies. For instance, in Brazil, the Central Bank has developed an integrated methodology for project management (Banco Central do Brasil, 2013), used only for this bank. In California, for technology projects, the California Project Management Methodology (CAT, 2011) was developed. In the state of Kansas, the IT project management methodology was published (EPMO Kansas, 2008). These states – and several other – are at the Local Level of GPM3.

At this level, the benefits of project management are observable only in public organizations and agencies that implement their own practices for project management. The knowledge gathered, which remains with the institution at the Local Level, would need to be shared to raise GPIS / GPM to a higher level. Ideally, the government, because of examples of success in the organizations at the lower level, realizes that the introduction of structured project management provides benefits. It then introduces these processes for the whole area of its operation. This moves it to the next level of maturity.

4.3 The Governmental Level

At the Governmental Level, the government recognizes the importance of project management for government, administration and the whole administrative unit's functioning and development, and becomes the main subject involved in shaping an approach to the management of all public-sector projects performed in these administrative units. The main manifestation of this commitment is the preparation by the government of laws, regulations, executive orders, standards, and guidelines on project governance and project management. The factor distinguishing the Governmental Level from the Local Level is that of coverage of all public-sector projects (usually above a certain budget threshold) by governance and project management processes.

There are six main areas of public sector projects implementation: governance, portfolio management, institutions supporting project management (like PMO), project management processes, actor management (including project managers and vendors), and stakeholder engagement (Gasik, 2016b).

In the area of governance, the processes for making the most important decisions are defined for all projects in a given administrative unit. Accountability for these projects and decisions is unambiguous. Policies, guidelines, standards and regulations for project management are published at this maturity level. Probably the first regulation concerning all the programs of a specific country was Circular A-109 issued in 1976 by the American OMB (1976). This document extended the use of the proven methods of DoD's C / SCSC approach to other federal departments. In Norway, all the major projects must pass the Quality at Entry process (Berg, 2012). British Office of Government Commerce (OGC) defined the OGC Gateway Process™ describing the ways of making the most important project decisions (OGC, 2007). Governmental audit chambers play an important role in project implementation. They provide independent insight into the current status of public projects execution. They can also elaborate recommendations on modes of project implementation designed for public organizations (GAO, 2009, GAO, 2012, ANAO, 2010).

There are defined rules for including projects in the portfolios of individual organizations or in a governmental portfolio at the Governmental Level. The rules for project or program initiation are defined – but not necessarily the exact criteria, which may be specific to each type of program or project, or for separate governmental sectors. There are also rules for portfolio maintenance and control. For instance, the GPRA (White House, 1993) regulation describes how to build a portfolio of programs in US federal organizations. The methods of selecting projects for implementation are defined in India (PMD India, 2013). In New Zealand, guidelines for major projects and programs monitoring are in effect (SSC New Zealand, 2011). In New South Wales, guidelines for the evaluation of all public-sector projects with respect to the value they deliver were developed (NSW Government, 2016). In Argentina (MEFP, 2015) and Peru (MEyF, 2015) there exist similar processes for selection of projects to national public investment portfolio.

Governmental level Project Management Offices exist, whose main goal is to implement the rules of project management in their respective administrative units. They do not replace local PMOs but may play the role similar to a center of excellence (Hill, 2004, p. xvii). They monitor major project implementations by collecting performance data. They also perform or support tasks for other Governmental Level activities, like maintaining project management processes, facilitating stakeholder engagement, implementing project manager education and certification, maintaining registers of authorized project suppliers, etc.

In the United States, the Office of Management and Budget, which supervises the implementation of major programs, reports directly to the president[5]. In the Australian state of Victoria, there is the position of Minister for Major Projects, responsible for all major projects[6]. In the UK, the Infrastructure and Project Authority works within the structures of the Office of the Prime Minister (IPA, 2016). In Singapore, the Centre for Public Project Management functions[7]. In India, there are several organizations involved in the management of public sector projects at the federal level. NITI Aayog (NITI, 2016) is responsible for the selection of projects for implementation, and Ministry of Statistics and Program Implementation[8] for monitoring project implementation. In the Australian state of Victoria, the Department of Economic Development, Jobs, Transportation and Resources supervises the implementation of major projects[9].

Management standards and/or methodologies exist for programs and projects. There may be different methodologies for different sectors (e.g., specific to construction projects or to IT projects), and these methodologies cover all governmental projects. These methodologies cover or are supplemented by change management processes. They cover business effect evaluation processes.

PMBOK® Guide (PMI, 2008) has been recognized as a standard in the United States by ANSI. Prince 2® (OGC, 2009) was developed at the request of the British government for use in government projects in the UK. In the state of New York, a project management methodology based on the PMBOK® Guide has been developed by a group of experienced project managers. This methodology applies to all projects in the state of New York (IT, software, engineering, business development, etc., NY SOT, 2003). Tasmania has developed guidelines for Tasmanian Government Project Management (OEG Tasmania, 2011). The Tasmanian ICT Policy Board has recommended applying these guidelines to all projects implemented by the Tasmanian public sector. In Michigan the Project Management Methodology has been developed (PMRC Michigan, 2004). This methodology is based on the standards of the Project Management Institute (PMI, 2008). It is very complex, involving an extensive set of forms. In Scotland, guidelines applicable to all government projects and programs have been published (Scottish Government, 2013). In Canada, the Policy on the Management of Projects (TBoCS, 2013) is in effect.

Regulations concerning the education and skills of public sector project managers and other main stakeholders are introduced.

In the UK, managers of public sector projects with a value exceeding a certain threshold must complete a course in Major Programme Management at Saïd Business School at Oxford University (University of Oxford, 2012). A system of project manager training, education, and knowledge transfer is present and working effectively. In the state of Michigan, comprehensive training is provided for project managers, including basics, soft skills and advanced topics (MDTMB Michigan, 2013). A certification system is implemented. In the United States, at the federal level, the Office of Personnel Management defined guidelines for jobs related to project management in the public sector (OPM, 2013).

Including vendors in public projects implementation is based on existing legal regulations on public procurement (e.g., President of the Republic of China, 2011). Such regulations usually define the general rules of conduct for the conclusion and execution of contracts between a public and a private party, not only in the area of public project implementation. These regulations form a complex legal system and their detailed analysis is beyond the scope of this study. The public procurement system covering public sector projects, specifying the rules of public tenders is established (e.g. Federal Acquisition Regulations in the USA, GSA et al., 2005). Registers of public project suppliers (in Australia: DoFD, 2012; in Hong Kong[10]) and project managers exist (in RSA[11]).

5 http://www.whitehouse.gov/omb (accessed 16 July 2018)
6 http:// https://www.premier.vic.gov.au/category/ministers/minister-for-major-projects/ / (accessed 16 July 2018)
7 https://www.gov.sg/sgdi/ministries/mof/departments/cp2m-1 (accessed 16 July 2018)
8 http://www.mospi.gov.in/project-monitoring (accessed 16 July 2018)
9 http://economicdevelopment.vic.gov.au/significant-projects (accessed 13 July 2018)
10 http://www.archsd.gov.hk/en/about-us/organization-structure.aspx (accessed 13 July 2018)
11 http://thyme.dbbee.com/u/KLFNI920V7/Registered_Search-qbdsl.wbsp (accessed 13 July 2018).

Stakeholders are engaged in projects. Information about public sector projects, especially business cases, plans and performance reports, is publicly available. The channels of communications between project stakeholders and project teams are established. There are well defined rules for community representatives' involvement in public projects and programs.

In Argentina (MEFP, 2015) and Peru (MEyF, 2015) and in many other countries and states information on project performance are available on web-pages. The Scottish Government requires identification and engagement of stakeholders into public sector projects and programs (Scottish Government, 2013). In Western Australia, consultations take place with stakeholders such as indigenous people, sub-contractors, community members, suppliers, consultants, local governments, residents, state agencies and landowners (DoSD Western Australia, 2013).

At this level of maturity, a government as a whole recognizes the importance of project and program management for the development of its administrative unit. The government has tools to shape the implementation of their projects. This increases the probability of success of all projects, programs and the entire portfolio of public sector projects of the administrative unit. Best practices are disseminated to all organizational units. Due to the common language stemming from the existence of pan-governmental organizations, processes and methodologies, it is possible to exchange knowledge between government organizations.

This maturity level corresponds to CMMI®'s Defined Level.

4.4 The Support Level

At the Support Level, the government actively engages in activities that increase its public-sector projects' chances for success. They are no longer only the party that defines the procedures of public sector project execution and controls its fulfillment; they also do their best to assure project success.

Public projects may face problems specific to a public administration. These problems relate, for instance, to laws, regulations, practices, groups of specific stakeholders, the structure and operation of public institutions, and any clearances and approvals needed for public projects. Removal of the problems facing the project and inclusion of professionals from specialized governmental organizational units increase the chance of project success. Removing issues using (dedicated) institutions is a practice at this level of maturity. Project teams may submit problems to these institutions and expect help in solving them. The institution providing such help may do it alone or may organize inter-institutional teams consisting of representatives from other competent institutions.

In India, governmental project support is implemented by the Project Monitoring Group (PMG, Cabinet Secretariat, 2014). To PMG, through the e-PMS electronic platform, anyone (from public or private sector) may report problems encountered in project implementation. PMG is the point of contact between project teams and the government organizations that can help in accelerating the implementation of the stalled project. PMG itself does not solve problems, but directs them to the appropriate ministries and monitors the problem-solving process. This may take the form of meetings of the staff of the Cabinet Committee on Investment, representatives of ministries and representatives of projects. In Australia, at the Commonwealth level, within the Ministry of Infrastructure and Regional Development there exists a Major Project Facilitation Agency (MPFA[12]). It supports the implementation of projects that are important for the development of the administrative unit's economy.

In the United States, in large projects, the government together with the contractor performs Integrated Baseline Reviews (GSA et al., 2005, p. 34.203), the purpose of which is, among others, to identify project risks and developing plans to mitigate these risks. A similar way to support the implementation of public sector projects is performance of project gate reviews, which were developed by British OGC and are a component of the above mentioned OGC Gateway Process™ (OGC, 2007). The purpose of gate reviews is to assess project status and provide recommendations for its further efficient implementation (AG DoF, 2015, p. 20). Gate review processes have been implemented, among others, in Victoria (DTF Victoria, 2013), Texas (DIR, 2006, pp. 15-16),

12 https://www.business.gov.au/advisory-services/major-projects-facilitation-agency (accessed 17 July 2018)

Queensland[13], New South Wales (NSW Procure Point, 2013), and New Zealand[14].

It is possible to support the execution of only one specific project phase. For example, in the Australian state of Western Australia, the agency conducting a project that is important to the development of the state (government or private) supports the project launching process. There are three levels of involvement, depending on the size and importance of the project (DPC Western Australia, 2009). The lowest level is the provision of training, and the highest – assignment of a person to lead project launching at the parliamentary level.

The minimum level of facilitation provided to project implementation is the preparation of documents that are needed to obtain the necessary permits and clearances (PMB California, 2013).

Some support may be provided by single individuals. Their knowledge and expertise can assist the implementation of public sector projects at various stages.

EPMO North Carolina[15] may assign advisors to a project. Their main task is to verify and supervise project management. These advisors may, among others, evaluate the ability of managers to carry their project, recommend actions on the further course of the project to the state director for IT, check whether the agency is prepared for the next steps of the project, identify risks, recommend corrective actions and possibly escalate them, be a mentor for the project manager, provide necessary data to be taken into account in project plans, check the tender specifications.

Another personalized practice is assigning so called "project patrons", i.e., persons whose role is to represent the project at the government forums and other community meetings. They have more external roles than advisors, whose role is internal to the projects.

When an initiative is submitted to OPMP Alaska[16], a coordinator is assigned to it. He / she helps the proponent to launch the project, including obtaining permits and clearances. A similar function is performed in MP Victoria[17]. Patrons of a major project are nominated there – whose role is to represent the project at the forums of government and other communities.

Introducing the partnership approach to project implementation is another practice at the Support Level. A partnership is a form of cooperation between customers and suppliers, characterized by a greater level of openness, communication, mutual trust and information exchange, and by gain and pain sharing (OGC, 2003). Such an approach is conducive to project success. Performing common project reviews with representatives of both parties, the private supplier and the public client, is an example of the partnership approach.

At this maturity level, the government is not only the party that defines the paths of public sector project execution, but the one that provides the best expertise and impetus to its projects. Removal of the problems facing the project and inclusion of professionals from specialized governmental organizational units increase the chance of project success. Their knowledge and expertise can assist the implementation of public sector projects at various stages of their implementation. It is worth noting that governmental support may also cover projects other than public sector ones – like PMG does in India. That contributes even more effectively to the administrative unit's development.

This maturity level aligns with the Quantitatively Managed Level in CMMI®. Their common characteristic is focus on the performance of project management processes.

4.5 The Optimizing Level

The Optimizing Level is where mechanisms for continuous improvement of GPIS and GPM are implemented. Objectives related to project management enter governmental strategies at this level of GPM3. Processes that use the knowledge accumulated from previously implemented projects oper-

13 https://www.treasury.qld.gov.au/projects-infrastructure/initiatives/gateway-reviews/index.php (accessed 16 July 2018)
14 https://treasury.govt.nz/information-and-services/state-sector-leadership/investment-management/review-investment-reviews/gateway-reviews (accessed 16 July 2018)
15 https://it.nc.gov/statewide-programs (accessed 16 July 2018)
16 http://dnr.alaska.gov/commis/opmp/ (accessed 13 July 2018)
17 http://www.majorprojects.vic.gov.au/ (accessed 10 October 2016)

ate to improve the management of projects in individual organizations or to improve the GPIS as a whole. Therefore, the probability of success is even greater than at the Support Level. There are two forms of the Optimizing Level: the Individual Optimizing Level and the System Optimizing Level.

The Individual Optimizing Level is focused on the component public sector institutions. The project management processes in each individual public organization are continuously improved. Regulations requiring use of particular organization-level maturity models (CMMI®, OPM3® etc.) by each organization are issued.

In Australia, for organizations subject to the Financial Management and Accountability Act of 1997 (Parliament of Australia, 2005), the P3M3® was adopted as the methodology for assessment and improvement of project management maturity. These organizations must perform an annual evaluation of their project management maturity and report their results to the Ministry of Finance (AG DoFD, 2012). In Canada, a policy requiring continuous assessment and improvement of program management in public organizations has been implemented (TBoCS Canada, 2013). The aim of the establishment of IPA in the UK, among others, was to work with departments to create project and program management capacity (IPA, 2016).

In the United States the Program Management Improvement and Accountability Act was enacted (PMIAA, US Congress, 2015). A practice of the Individual Optimizing Level described in this document is the requirement that there be a program management improvement policy in each federal organization. It also requires nomination of a senior executive responsible for enhancing the role of program managers in his/her agencies.

The System Optimizing Level is focused on improvement of the GPIS as a whole. Three main categories of practices at this level are: general practices, implementing processes for continuous GPIS process improvement and establishing advisory bodies for public-sector projects implementation.

Placing the requirement of GPIS and GPM improvement in national long-term strategies is a practice of general nature. This is required, for instance, by Hawaii's strategy of development (Hawaii OIMT, 2013). In India, the 12th 5-Year Plan requires improvement of national project management capabilities (Planning Commission, 2011, p. 12).

The process-oriented optimizing practices are visible, for example in Michigan State project management methodology, which focuses on gathering knowledge from completed projects in order to improve future projects (PMRC Michigan, 2004). A formal process of project management methodologies improvement is defined by the state of Missouri (OOA Missouri, n.d.). In Norway, the Concept Research Programme, located at the Norwegian University of Science and Technology, assists in and analyzes the development of the project initiation system (NTNU, 2013). This program is funded by Norway Ministry of Finance. The purpose of the program is to improve the use of resources and improve the effects of large infrastructure projects.

Establishing a project management advisory body or institution having a goal of improving GPIS is an organizational practice of the GPM3 System Optimizing Level. One of such institution may be an audit chamber, having deep insight into public sector project processes. A group of experts generating recommendations for the improvement of GPIS operates, for example, at the US Government Accountability Office.

An organizational practice described in PMIAA is the establishment of the Program Management Policy Council at Office of Management and Budget. The Deputy Director of OMB is responsible, among others, for establishing a strategic plan for project and program management in the federal administration. In the UK, the Programme and Project Management Council (PPMC) was established, with the aim of improving methods of project implementation in the British government. Currently, the Infrastructure and Project Authority is responsible for functions related to the improvement of British projects and programs implementation. They analyze and draw conclusions from the implementation of the UK's largest projects (IPA, 2016a). One of the objectives of running ICT Policy Board of Tasmania[18] is to advise on improvement of project management methodologies. In Scotland, the Project and Program Management Center of Excellence (PPM-CoE) was established, whose task, among

18 http://www.egovernment.tas.gov.au/current_activities/modernising_ict_governance (accessed 16 July 2018)

others, is to improve the capacity for project and program management[19].

The following directions for GPIS improvements at the System Optimizing Level may be defined (Gasik, 2016b): general (such as applying maturity models for the organization's maturity assessment), business (such as reducing implementation cycle time or maximizing the social effects of projects), managerial (such as better risk or personnel management processes), operational (establishing project management institutions, e.g., the central PMO for major projects), and knowledge-related (such as organization and delivery of training and promotion of the knowledge of project management methodologies).

The GPIS improvement processes at the System Optimizing Levels deal with the whole GPIS, and not with particular institutions like at the Individual Optimizing Level.

The GPM3's Optimizing Level is the equivalent of CMMI®'s Optimizing Level.

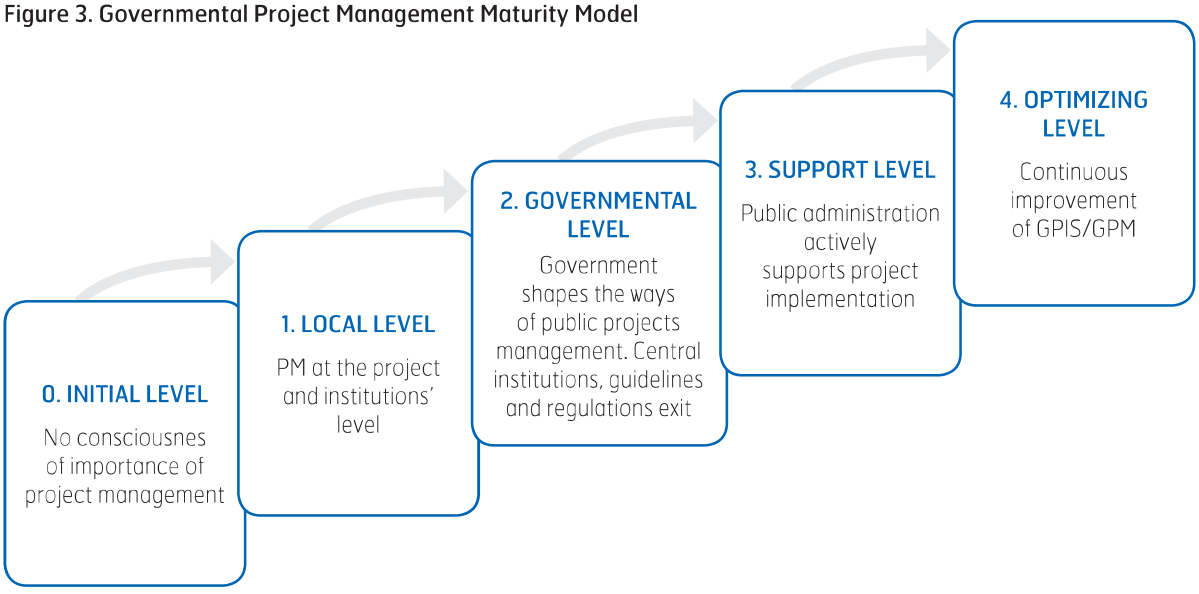
The Governmental Project Management Maturity Model is schematically presented in Figure 3.

5. CONCLUSIONS

This article attempts to systemize the area of public sector project management, introducing concepts such as the Governmental Project Implementation System, Governmental Project Management and the Governmental Project Management Maturity Model.

GPM3 can be seen from the perspective of the development of government capabilities. Government capability is the ability of government to perform its activities in an efficient manner (Bäck and Hadenius, 2008). Capabilities should be stable, i.e. they should produce substantially similar outcomes in similar situations (Weaver and Rockman, 1993: 6). Government capability development is the processes shaping governmental capabilities (Ndou and Sebola, 2016). Capability development is a process in which people, organizations and society as a whole unleash, strengthen, create, adapt and maintain capacity (Bester, 2015). Capabilities can be developed in all areas of government activities such as transport, defense, culture, security or health. But to be able to develop any governmental capability, government should have the capability to perform interventions (or changes). Implementing any change is equivalent to the capability of implementing projects and programs. The capability to implement projects and programs decides how ef-

Figure 3. Governmental Project Management Maturity Model



19 http://www.gov.scot/Topics/Government/ProgrammeProject-Delivery (accessed 13 July 2018)

ficiently any government can increase their capabilities in any elementary area. Hence project management may be treated as a meta-capability and GPM3 can be considered a tool for governmental meta-capability development.

Project management tries to meet the demand of project managers for ways to manage a single project. Organizational project management tries to meet the demand of the boards of organizations for ways to organize the company to efficiently manage its projects, programs and project portfolios. Governmental project management tries to solve the problem faced by governments: how to organize the management of projects and programs in the public sector of an administrative unit in order to provide stable management and development that is consistent with the administrative unit's capabilities.

The Governmental Project Management Maturity Model, like other maturity models, may have three types of applications: descriptive, prescriptive, and comparative (de Bruin et al., 2005; Pöppelbuß et al., 2011).

The descriptive application of GPM3 generates an assessment of the current state of the GPIS and GPM in given administrative unit. Therefore, it can be used to assess the level of effectiveness of public investment as made, for example, by the International Monetary Fund (Dabla-Norris et al., 2010). Studies of governmental project management maturity also can complement the above-mentioned (point 2.2.4) existing research on the average maturity level in public institutions in different administrative units (countries, states, local communities). A full methodology for assessing public sector project management in any administrative unit should consist of these two types of maturity assessments.

The prescriptive application shows the roadmap for improvement of GPIS / GPM. Thus, it can be a tool that helps improve the manner in which public administration functions, affecting the well-being of whole communities. For instance, it may be used by organizations specialized in supporting supranational development and aid organizations, which are currently more focused on managing individual projects rather than on organizing the GPIS and GPM. With the GPM3, those organizations will be able to define characteristics and roadmaps for development of project management capabilities tailored to a given administrative unit.

The comparative application enables comparison of the GPISs and GPMs between sibling administrative units. For instance, in a country with a federal structure consisting of autonomous states, it will enable comparison of the maturity of GPM in these states. GPM3 could become the basis for defining the area of knowledge that, tentatively, could be called Comparative Public Project Management – which will become part of the long-established discipline of Comparative Public Administration (e.g. Riggs, 1954; Heady, 2001; Fitzpatrick et al., 2011; Jreisat 2012).

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