

JAROSŁAW GÓRECKI*

PROBLEMS ASSOCIATED WITH PROJECT MATURITY IN CONSTRUCTION COMPANIES

DOJRZAŁOŚĆ PROJEKTOWA PRZEDSIĘBIORSTW BUDOWLANYCH

Abstract

This paper describes the problem of project maturity for construction companies when analyzed by their ability to execute construction investment projects. On the basis of survey results it was revealed that the success of a company is connected with the increasing level of project maturity as a condition for a successful project management.

Keywords: project maturity, construction companies, risk management

Streszczenie

Artykuł dotyczy dojrzałości projektowej przedsiębiorstw budowlanych. Przeanalizowano je pod kątem zdolności do realizowania projektów inwestycyjno-budowlanych. Na podstawie wyników badań wskazano, że sukces przedsiębiorstwa budowlanego jest związany z podniesieniem poziomu dojrzałości projektowej, warunkującej skuteczne zarządzanie projektami.

Słowa kluczowe: dojrzałość projektowa, przedsiębiorstwo budowlane, zarządzanie ryzykiem

* Ph.D. Jarosław Górecki, Department of Construction Engineering and Management, Faculty of Civil and Environmental Engineering and Architecture, University of Technology and Life Sciences in Bydgoszcz.

1. Introduction

The construction industry is a unique industry which evokes a necessity for paying special attention to various financial attributes and constraints varying in origin. The constraints, no matter if we call them The Iron Triangle [3], The Golden Triangle [13], or more accurately – The Project Management Triangle [22, p. 8; 21, p. 22; 9] or more complex – The Project Management Diamond [8, p. 471] or even one of the many other names we can use for the concept based on six or more variables, i.a.: scope, schedule, budget, risk, resources, quality, they always become the crucial features of a project. It is therefore obvious that any specific project will always end up being influenced by such constraints, therefore a project manager needs to be focused on them. It has to be said that the project team must be able to assess the situation and balance demands in order to ensure the successful outcome of the project [23, p. 7]. Construction investment projects are basically the investment of money in order to create new or additional assets which a company intends to convert into further assets to provide future benefits. Risk, which is in fact a definition of the situation mentioned above, is a key factor affecting the success of the project [5, p. 18-27]. According to some studies [4], there is a specific relationship between the success of a project and the success of an enterprise. Moreover, it was revealed that there is a connection between the success of construction enterprises and their successful investment-construction projects [14, p. 278-285]. In general, however, they create a risk (as previously noted) in achieving two main objectives (schedule and budget) which can cause conflicts between owners and contractors which can lead to claims [12, pp. 20-29]. A response to the need for eliminating uncertainties and reducing risks coming from economic activity is an attempt to improve project management capabilities. For this reason construction companies need to pay more attention to the phenomenon known as project maturity.

2. Maturity of construction project management in polish construction companies

Before project maturity can be listed as a major factor, we must first understand what it means. In fact, maturity can be defined as the quality or state of being mature. If the concept of maturity is applied to an organisation it may refer to a state where an organisation is in a perfect condition to achieve its objectives. Consequently, project maturity can mean that an organisation is perfectly conditioned to deal with its projects [2].

A narrower concept of project maturity has been presented by various scientists. For example, maturity of risk management in large-scale construction projects and therefore models based on this phenomenon can effectively help organizations to understand the level of current practice in terms of their capabilities in risk management, as well as their strengths and weaknesses towards future risk management practice, in order to take appropriate actions to improve their risk management performances [17]. According to Deloitte's report, "construction companies rate the maturity of construction project management relatively high, and therefore a great number of organisations are well prepared for worsening market conditions" [11]. In 2012 Deloitte's researchers examined every answer received from thirty nine polish construction companies operating countrywide. Those companies were classified by three factors: revenue generated in 2010 in PLN, capital origin and presence on

the Warsaw Stock Exchange. A structure of the sample [11]: up to 150 million PLN: 36%, 150–500 million PLN: 46%, over 500 million PLN: 18%.

According to the report, the concept of maturity refers to the comparative level of advancement that an organization has regarding any given activity or sets of activities. Organizations with more fully-defined and actively used policies, standards, and practices are considered more mature than the others. All respondents indicated one out of five maturity levels described below for each knowledge area.

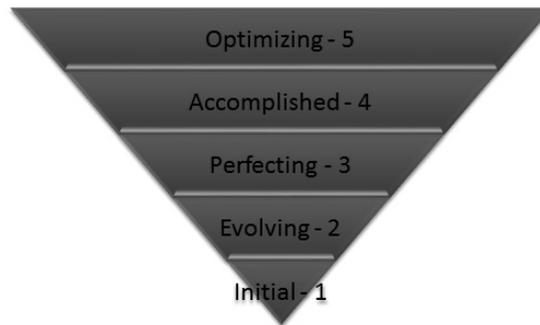


Fig. 1. Five maturity levels proposed by Deloitte (explanation below), source: own elaboration based on [11]

“1” (Initial) is a level featured by lack of standards or formal processes. “2” (Evolving) describes a level where some projects have developed best practice processes based on industry or consultant input and these processes are followed. However, processes are not routinely shared off project and are not been identified as standard. “3” (Perfecting) is a maturity level in which the organisation is developing its own best practice standards and centrally controlled project management processes. “4” (Accomplished) means that best practice process has been developed and rolled out across the organization. “5” (Optimizing) – the highest level of maturity – describes a best practice process which has been rolled out across the organisation and is being used on every applicable project. Project managers have a good understanding of the process, any problems that occur are resolved, and project feedback is provided on process improvement. In addition, the process has been optimized based on project feedback and knowledge of industry best practices [11].

It is worth underlining the fact that according to the Deloitte’s report, the overall result of the level of the construction project management maturity in Poland is 3,50. The indicator is calculated as a weighted average of values (namely maturity levels from 1 to 5) scaled by their importance (percentage of respondents selecting proper answer). Moreover, the indicator value of 3,50 implies that researched companies rate their project management maturity between a level of “Perfecting” and the level “Accomplished”.

The most reasonable conclusion of the survey results might be that companies try harder to develop their capabilities in terms of those areas that are officially introduced into law regulations. Occupational safety and health regulations, public procurement law, standardization like in particular quality standards (e.g. ISO) or some accounting regulations make companies to improve their current practice (procedures, behaviour etc.) and at the same time it gives them an opportunity to develop their maturity in these areas.

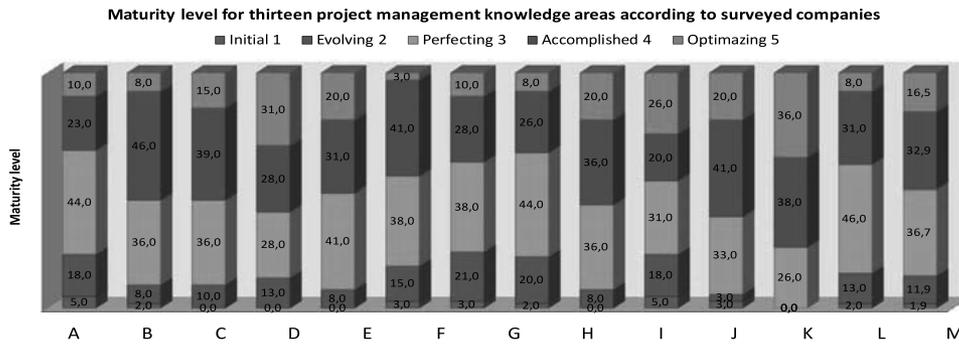


Fig. 2. Maturity levels for thirteen project management knowledge areas according to thirty nine polish construction companies (A – Project Integration Management, B – Project Scope Management, C – Project Time Management, D – Project Cost Management, E – Project Quality Management, F – Project Human Resource Management, G – Project Communication Management, H – Project Risk Management, I – Project Procurement Management, J – Project Environmental Management, K – Project Financial Management, L – Project Safety Management, M – Project Claim Management, N – Construction project management, overall scores), source: own elaboration based on [11]

3. Project maturity – is it really possible?

Literature review [10] recalls an explanation of the project maturity origins. A predecessor of this concept was process maturity created by the Total Quality Management movement. A need for process maturity resulted from efforts to reduce variability in the process and to improve its mean performance. Large-scale construction projects are practically always connected with risk factors which generally lead to adverse impacts and costly consequences in project management [17].

It is primarily worth noting that there is a difference between price risk (mainly connected with commodity [7] and arising out of adverse movements in the world prices, exchange rates and etc.) and cost risk which have technological and organizational origins. There are many definitions of cost risk which can be associated with a probability of loss due to cost overrun [6]. Investigation of this phenomenon and the factors affecting cost overruns for construction projects have attracted the interest of many researchers and practitioners [12]. More precisely, cost risk is the risk associated with the ability of the project to achieve the planned life-cycle costs. Thus, cost risk includes both design/construction and operating costs. John P. Kindinger and John L. Darby notice that there are two major elements of cost risk: the accuracy and completeness of the cost estimates for the planned activities and the risk that cost performance which will be affected adversely by a failure to manage technical risks, namely those events or issues associated with the scope definition, research and development (R&D), design, construction, and operation which could affect the actual level of performance vs. that specified in the project mission need and performance requirements documents [18]. Apart from price risk and cost risk, it is important to specify a variety of risk factors in construction projects. There are more crucial risks, such as time related risks [16, 19, 20, 24], quality related risks, design drawing errors, natural hazards and environment

related risks [16, 19], safety related risks [1, 16, 19] as well as many others. In the following part of the article, some issues connected with human resource management and an impact of Generation Y on project maturity were also discussed.

4. Generation Y – chance or pitfall

Generation gaps between employees are a well-known problem [15]. But in the early 2000s, a brand new group of employees called Millennials (Millennial Generation, also known as Generation Y) became active on the labour market. This term was created in order to describe a group of people born from the early 1980s to the early 2000s. Whereas those dates are rather approximate, the phrase Generation Y first appeared in an August 1993 Ad Age editorial to describe teenagers of the day, which they defined as different from Generation X, and then aged 11 or younger as well as the teenagers of the upcoming ten years [27]. Since then, a phenomenon of Generation Y has attracted many sociologists and scientists carrying out research on the current problem connected with a suitability of the new group of employees in the organization. “Demography, not technology is creating the future” [25]. Some professionals maintain that Generation Y is not always an opportunity for the organization to build its competitive advantage but a kind of challenge. Millennials have been spoiled by their parents so probably they would feel appreciated if they were often rewarded for their efforts by employers [15, 26].

Moreover, it is significant to employ the best candidates, to manage them and to retain successfully the most valuable Generation Y employees. To do so, managers should understand a sociological background affecting employees’ behaviour.

5. Towards project maturity – own elaboration

A recent survey was conducted by the author in 2013 among 18 foreign construction companies. The sample was established after having sent an online questionnaire to 60 construction companies from abroad. All respondents were experienced in construction management and responsible for managing employees in their companies. None of these companies were classed as micro or small enterprises. The majority of them (50%) were described as large enterprise employing 250–999 employees. 33% were described as medium enterprise (50–249 employees). It is significant that 66% of the surveyed companies operated on the international market. Besides, respondents admitted that a business coverage can be described as regional (17%) or a national scale (17%). Among the companies that participated in the survey, none were present on the local or global market. The majority of the foreign construction companies in the survey stated that their main business activity area was in the construction of the roads (83%). The research presents the types of organizational structure implemented by surveyed companies. Whereas 33% respondents maintain their company has functional organizational structure, the same number of them answer there is a project organizational structure which is clear evidence of project manager awareness to create the right conditions for project management. Furthermore, a project organizational structure that was perceived in one-third of surveyed companies can prove that they are more project-

matured that the others. Only 17% respondents answered that their company had no official certified management system. The rest of the possible choices could be multiple so 50% surveyed companies have both ISO 9000 and ISO 14 000 management systems. The majority of the companies are equipped with some project management software (67%).

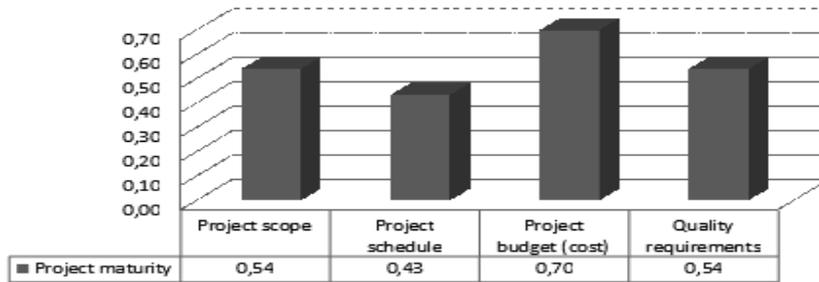


Fig. 3. Project maturity of the surveyed construction companies according to the respondents, source: own elaboration

In the figures above are results of project maturity calculations based on answers received and are represented by four different areas of project management. Organisations that decided to participate in the survey were requested to indicate an average probability of planned four main factors (project scope, project schedule, project budget and quality requirements) of the construction investment projects that have been executed by them. The concept of project maturity was created as a weighted average of values (namely an average probability of planned factors: 0.00–0.20, 0.21–0.40, 0.41–0.60, 0.61–0.80 and 0.81–1.00) scaled by their importance (number of respondents selecting proper answer). Moreover, the indicator value of 1,0 implies that researched companies rate their project management maturity as perfect (fully matured organization) whereas 0,0 means an organization is not project mature at all. Furthermore, there are three ranges of the indicator that classify three levels of project maturity: 0,00–0,33 – low level of project maturity, 0,33–0,66 – medium level of project maturity, 0,66–1,00 – high level of project maturity. Moreover, according to the survey, the overall score of project maturity among foreign construction companies was calculated as 0,55 (medium).

A perception (subjective interpretation) of respondents regarding project maturity of construction companies demonstrates that the majority maintain that their companies are quite matured (medium level – 33%) or matured (high level – 33%) in project management.

6. Conclusions

According to the results of the surveys presented in the article, it was revealed that both Polish and foreign companies appreciate the value of project management. They understand the importance of continuous improvements in project management capabilities.

On the basis of previous findings regarding project maturity, there is no doubt construction companies should try to improve their ability to manage projects.

The need for improving performance and perfecting risk management can be a good reason for creating a five-step model of continuous improvement of project maturity: 1. Planning ability, 2. Project management, 3. Maturity measurement, 4. Maturity evaluation, 5. Project maturity.

It might be a good solution for companies to engage in a constant pursuit of maturity. Indeed, it is a pursuit because as it was described previously, a fully matured organisation is just a theoretical concept.

Unfortunately, the survey did not touch a crucial issue – the aspect of Generation Y and their role in construction companies. Research into the role played by Gen-Y employees in the construction industry might be a good resolution for the future. Supposedly, as soon as modern managers of construction companies are able to profit from the skills of Generation Y, to employ and to retain the best of them, companies could reach a competitive advantage which would be enormously beneficial in today's turbulent economic environment.

References

- [1] Aminbakhsh S., Gunduz M., Sonmez R., *Safety risk assessment using analytic hierarchy process (AHP) during planning and budgeting of construction projects*, Journal of Safety Research, Vol. 46, September 2013, 99-105.
- [2] Andersen E. S., Jessen S. A., *Project maturity in organisations*, International Journal of Project Management, Vol. 21, August 2003, 457-461.
- [3] Atkinson R., *Project management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria*, International Journal of Project Management, Vol. 17, No. 6, 1999, 337-342.
- [4] Bizon-Górecka J., *The Risk Management Strategies in the Enterprise – Risk of an Enterprise and Risk of a Project*, Scientific Society For Organization And Management Office, Bydgoszcz 2008.
- [5] Bizon-Górecka J., Górecki J., *Risk pyramid in the enterprise*, [In:] *Studies & Proceedings of the Polish Association for Knowledge Management*, No. 19, Polish Association for Knowledge Management, Bydgoszcz 2009, 18-27.
- [6] "BusinessDictionary.com" (<http://www.businessdictionary.com/definition/cost-risk.html> – 27.09.12).
- [7] Claessens S., Duncan R.C., *Managing Commodity Price Risk in Developing Countries*, The Johns Hopkins University Press, Baltimore and London 1993.
- [8] Cleland D., Ireland L., *Project Manager's Handbook: Applying Best Practices Across Global Industries*, The McGraw-Hill Companies, Inc., New York 2007.
- [9] Cobb C.G., *Making Sense of Agile Project Management. Balancing Control and Agility*, John Wiley & Sons, Inc., Hoboken, New Jersey 2011.
- [10] Cooke-Davies T.J., Arzymanow A., *The maturity of project management in different industries: An investigation into variations between project management models*, International Journal of Project Management, Vol. 21, August 2003, 471-478.
- [11] Deloitte Poland. Member of Deloitte Touche Tohmatsu Limited, *Polish construction companies 2012. Maturity of Construction Project Management*, 2012.

- [12] Edieb A.S., *DSS-PL: Decision Support System for Risk Assessment of Pipeline Projects*, Cost Engineering, 11 November 2007, 20-29.
- [13] Gardiner P. D. and Stewart K., *Revisiting the golden triangle of cost, time and quality: the role of NPV in project control, success and failure*, International Journal of Project Management 18, 2000, 251-256.
- [14] Górecki J., *From project success to the success of the construction enterprise*, [In:] *Papers and Reports of the Faculty of Management of Gdansk University*, Vol. 1, Sopot, The Foundation for the Development of Gdańsk University, 2009, 278-285.
- [15] Górecki J., *Pokolenie Y wyzwaniem dla organizacji*, [In:] H. Czubasiewicz, Z. Mokwa and P. Walentynowicz (Eds.): *Uwarunkowania sukcesu organizacji*, Gdańsk, Fundacja Rozwoju Uniwersytetu Gdańskiego, 2013, 189-199.
- [16] Hwang B.-G., Zhao X., Shu Gay M.J., *Public private partnership projects in Singapore: Factors, critical risks and preferred risk allocation from the perspective of contractors*, International Journal of Project Management, Vol. 31, 2013, 424-433.
- [17] Jia G., Ni X., Chen Z., Hong B., Chen Y., Yang F., Lin C., *Measuring the maturity of risk management in large-scale construction projects*, Automation in Construction, Vol. 34, September 2013, 56-66.
- [18] Kindinger J.P., Darby J.L., *Risk Factor Analysis – A New Qualitative Risk Management Tool*, [In:] *Proceedings of the Project Management Institute Annual Seminars & Symposium*, Houston, Texas, 2000.
- [19] Kuo Y.-C. and Lu S.-T., *Using fuzzy multiple criteria decision making approach to enhance risk assessment for metropolitan construction projects*, International Journal of Project Management, Vol. 31, May 2013, 602-614.
- [20] Luu V.T., Kim S.-Y., Tuan N.V., Ogunlana S.O., *Quantifying schedule risk in construction projects using Bayesian belief networks*, International Journal of Project Management, Vol. 27, January 2009, 39-50.
- [21] McGhee P.P. and McAliney P., *Painless Project Management. A Step-By-Step Guide for Planning, Executing, and Managing Projects*, John Wiley & Sons, Inc., Hoboken, New Jersey 2007.
- [22] Newell M.W., Grashina M.N., *The Project Management Question and Answer Book*, AMACOM, New York 2003.
- [23] Project Management Institute, *A Guide to the Project Management Body of Knowledge (PMBOK® Guide) – Fourth Edition*, Newtown Square, Pennsylvania: Project Management Institute, Inc., 2008, 7.
- [24] Taroun A., *Towards a better modelling and assessment of construction risk: Insights from a literature review*, International Journal of Project Management, Vol. 32, January 2014, 101-115.
- [25] Urwin R., *Generation Y. Attracting, engaging and leading a new generation at work*, Drake International, 2006 (http://hrsinsider.ca/wp-content/uploads/2014/01/white_paper-generation_y.pdf – 14.01.2014).
- [26] Van den Bergh J., Behrer M., *Jak kreować marki, które pokocha pokolenie Y?*, Samo Sedno, Warszawa 2012.
- [27] wikipedia.org (<http://en.wikipedia.org/wiki/Millennials> – 14.01.2014).