

Assessment of Sustainability by Project Management Maturity Models

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Abstract: Sustainability is included in a wide range of activities, including the implementation of changes and the execution of projects. On a general level, a number of tools are available to assess sustainability, and to what extent and is integration into social activities. Specific project management maturity models are available for the assessment of sustainability within project environment. The aim of the article is to identify and interrogate 70 plus project management maturity models focused on sustainability. The study will evaluate the range of this assessment based on the indicators of sustainability and evaluate the usage of such models and attitude of project managers to sustainability in practice. Three project management maturity models with a particular focus on sustainability have been identified with a defined methodology, they evaluate key sustainability indicators in project. On the flip side their usage in practice is insufficient. In the Czech Republic and Ireland these tools are almost unknown among project managers.

Keywords: project management; project management maturity models; sustainability; Czech Republic; Ireland

JEL Classification: O22; Q01

1. Introduction

In accordance with the latest trends in the field of project management (Kostalova & McGrath, 2020) one of the areas, that is at the forefront, is the implementation and assessment of sustainability in projects. Sustainability can be evaluated from the project output point of view and project processes point of view. The adaption of sustainable approaches is slow despite it being recognized as a key capability for almost all activities of human society in the developed world.

Sustainability itself has many definitions and there is a long-term discussion about its definition (Brown et al. 1987; Watkin, 1999; Waseen & Kota, 2017). Its main goal is to balance economic growth, social wellbeing and reasonable distribution and use of natural resources (Keating, 1993; Henderson & Loreau, 2023). Sustainable goals are also specified by international standards like Global Reporting Initiative (GRI) (GRI, 2016), UN Global Compact (2014), AA 1000 AccountAbility (2018), the OECD Guidelines for Multinational Enterprises (2011), SA 8000 (Social Accountability International, 2014), or ISO 26000 (ISO 26000, 2010) or by European Union in Green Deal (European Commission, 2020). Assessment of sustainability is evaluated by many types of tools. There are sustainability maturity models

available such as the Maturity Model for Sustainability in New Product Development (Hynds et al, 2014), Business Sustainability Maturity Model (Cagnin et al., 2005), and model measured Business Sustainability Maturity Levels (Meza-Ruiz et al., 2017).

In area of project management there are also international standards like PMI (Project Management Institute, 2021), IPMA (International Project Management Association, 2020), and PRINCE2 (2022). Based on these standards or methodologies the project management maturity models (PMMMs) have been developed and adapted to assess the maturity of project, program and portfolio management. The view on project management from sustainable point of view is connected with expanding the sustainable approach generally. In addition to the basic project management assessment tools, with this approach there are new criteria for evaluating the extent to which the project itself or its outputs are in line with sustainable goals. Silvius and Schipper (2015), Martens and Carvalho (2016), Carvalho and Rabechini (2017) specify the sustainable project management and recommend to evaluate success of projects and its project management also from this point of view.

The objective of the research is to specify the PMMMs oriented on evaluation of sustainability in project management, evaluation the range of this assessment based on the indicators of sustainability and evaluate the usage of such models in practice.

2. Literature Review

As a result of a literature review among more than 70 PMMMs for assessing the level of project management (Ofori & Deffor, 2013; Spalek, 2015; Kwak et al., 2015; Iqbal, 2016; Kostalova & Tetreanova, 2018), three models that focus on the assessment of sustainability in project management were identified, all of them with a focus on the assessment of the sustainability of the output and with a focus on the assessment of the sustainability of the procedures themselves within the project:

- Sustainable Project Management Maturity Model (Silvius et al., 2012, Silvius & Schipper, 2015).
- The GPM® Organizational Model for Sustainable Organizations, Portfolios, Programs, and Projects (Carboni et al., 2018; GPM, 2019; GPM, 2009).
- Management Maturity Model for project-based organizational performance assessment (Langston & Ghanbaripour, 2016).

Sustainable Project Management Maturity Model (Silvius et al., 2012, Silvius & Schipper, 2015) is a model focused on the assessment of sustainability in project management, but the approach to sustainability at the organizational level is also assessed. The model focuses on evaluating the level of sustainability in project management. It also considers the organization's overall approach to sustainability. It is based on the basic principles of sustainability:

- Sustainability is focused on balancing or harmonizing social, environmental and economic interests.
- Sustainability is both short-term and long-term oriented.
- Sustainability is about local and global orientation.
- Sustainability is about consumption of income not capital.
- Sustainability is about transparency and accountability.

- Sustainability is about personal values and an ethical approach.

The author of the model is team led by G. Silvius from Netherlands (2012). The model focuses on evaluation two areas:

- Project process – assesses how processes are carried out and their impact on sustainability.
- Project product outputs – assesses to what extent stakeholders are impacted during the development of the project outputs and what impact the project outputs have on the environment.

The model has four levels, the contribution to sustainability increases gradually (Silvius & Schipper, 2015):

- Level 1: Compliant – Sustainability is considered minimalistic and implicit, and (only) with the intention to comply with laws and regulations.
- Level 2: Reactive – Sustainability is considered explicitly, with the intention to reduce negative impacts of the project.
- Level 3: Proactive – Sustainability is explicitly considered as one of the areas that the project contributes to.
- Level 4: Purpose – Contributing to (this aspect of) sustainability is one of the drivers behind the project and sustainability considerations are included in the justification of the project.

Each level has recommended values of economic, environmental and social sustainability indicators. By raising the level according to the model, the organization as a whole also moves from reactive to proactive, to an organization that positively affects the sustainability of its environment and its activities.

GPM® Organizational Model for Sustainable Organizations, Portfolios, Programs, and Projects (Carboni et al., 2018; GPM, 2019; GPM, 2009) (PSM3™) is a model evaluating the degree of sustainability considered within the organization's projects. The model is based on the GPMTM Standard for Sustainability in Project Management of the American social society Green project management, introduced in 2010, which defines six principles of sustainability that should be incorporated into project management to make it sustainable. These principles are (Carboni et al., 2018):

- Commitment and accountability – recognize the fundamental rights of all to a healthy, clean and safe environment, equal opportunity, fair remuneration, ethical procurement and compliance.
- Ethics and decision making – promote ethical approaches and decision-making at the level of the organization with respect for universal principles through the identification, mitigation and prevention of adverse short-term and long-term impacts on society and the environment:
- Integrated and transparent – to support the interdependence of economic development, social integrity and environmental protection in all aspects of governance, practice and reporting.
- Principles and values based – protect and improve our natural resource base by improving the ways we develop and use technologies and resources.

- Social and ecological equity – assess human vulnerability and impact on ecologically sensitive areas and centers through demographic dynamics of population growth.
- Economic prosperity – adhere to fiscal strategies, goals that balance the needs of stakeholders, including immediate needs, and the needs of future generations.

Model PSM3™ has got six levels of maturity (GPM, 2019; GPM, 2009). The model assesses sustainability within 24 areas. The lowest level is defined as undefined, indicating a lack of sustainability practices and balancing on the edge regarding compliance with social and legal rules. The second level is called provisional. It is characteristic of organizations with ad hoc sustainable practices with little consistency. The third level, foundational, refers to the level where the organization already complies with the rules in the area of health, safety and environmental protection. The fourth level essential indicates a proactive approach of the organization towards increasing profitability using eco-friendly practices. The fifth level, called optimized, aligns company principles and values with a sustainable model, looks for opportunities to improve products and services. The highest level of principled, based on decisions to create value to improve society and the environment through its products and services (GPM, 2019; GPM, 2009). The assessment can be carried out by external GPM experts. In addition to evaluation as a service, GPM also offers certification of knowledge in the field of sustainable project management and trainer training, available here (GPM, 2019; GPM, 2009).

A Management Maturity Model (MMM) for project-based organizational performance assessment (Langston & Ghanbaripour, 2016) was developed by the authors to assess project management at the organizational level using a tailored, strategically oriented and practical methodology without having to adhere to rigid maturity assessment approaches. It can be used to evaluate the management of projects, programs and portfolio management. The model is developed cognizant with the fact that it is not possible to use a universal evaluation procedure for all organizations, regardless of their scope, scope, complexity and types of projects that are implemented in the organization. The model is partly based on the approach of defining competences with the help of IPMA competencies and PMI's knowledge areas listed in PMBoK (Project Management Institute, 2021). It also tries to include a modern approach to so-called sustainable project management or environmental project management, i.e. sustainable project management in a way that takes into account the impact on the environment, both from the perspective of planning and implementation procedures, and from the perspective of project outputs (Silvius et al., 2012; Ebbensen & Hope, 2013; Hwang & Ng, 2013).

It defines six key project indicators important for assessing project success (value, efficiency, speed, innovativeness, level of complexity and impact) and other overall key indicators aimed at evaluating the cumulative effects of the four success factors (scope, cost, time and risk). A calculation method is defined for all indicators. Maturity values are calculated for 28 items and the total maturity at the level of project, program and portfolio management consists of these (Langston & Ghanbaripour, 2016). A deeper assessment of these 28 items is not possible because they are not presented in detail.

The model is focused on the strategic and continuous improvement of project management in the organization and uses the PDCA procedure (Sokovic et al., 2010) from quality

management (P – plan: set goals, D – do: measure outputs, C – check: performance assessment and A – act: improve according to identified deficiencies.). Thus, it is evaluated to what extent this procedure is applied in individual dimensions. The evaluation takes place by self-assessment with control by evaluators. Templates for the count are freely available on request from the authors. This assumes that trained evaluators with certification in the area are available. The authors assume an active role of associations in the field of project management such as IPMA or APM and offering a model for evaluation, possibly creating a database of suitable evaluators (Langston & Ghanbaripour, 2016).

3. Methodology

The basis of the research was the primary analysis of secondary sources on the topic of PMMMs and identification of sustainable oriented PMMMs. The goal was to identify PMMMs oriented to the assessment of sustainability of project management. Compare how the models are designed, what evaluation method they use and what indicators of sustainability they assess, based on the sustainability indicators for PMMMs assessment identified by Kostalova and McGrath (2021). Furthermore, the goal of the research was to assess whether these models are known to experts in practice and how widespread they are in practice. Due to the transnational availability of these models, this analysis was extended to two European countries, the Czech Republic and Ireland. To fulfill this goal, qualitative research methods were chosen, namely comparative analysis and structured interviews with project managers – experts from practice in the Czech Republic and Ireland.

4. Results

In the first part of the research, sustainability oriented PMMMs were assessed and compared from the perspective of sustainability indicators for PMMMs assessment (Kostalova & Grath, 2021). The summary of sustainable indicators has been prepared based on the general sustainable indicators by GRI standard (2016), Meza-Ruiz et al. (2017), Martens and Carvalho (2016), Lin et al. (2017) and Banishashemi et al. (2017) (see Table 1). Management Maturity Model (MMM) for project-based organizational performance assessment (Langston & Ghanbaripour, 2016) is presented in available publications only generally, in group of indicators focused on impact of projects the evaluation of sustainability in outcomes and resource consumption is mentioned, but the detail overview of indicators that are focused on sustainability is not available. Based on that only Sustainable Project Management Maturity Model (Silvius et al., 2012, Silvius & Schipper, 2015) and PSM3™ (Carboni et al., 2018; GPM, 2019; GPM, 2009) (PSM3™) are assessed.

In the second part of the research, project managers from practice in the Czech Republic and Ireland were interviewed. The research respondents included project managers from private practice, public sector and non-profit sector (10 respondent from each country). Data were obtained in the form of a structured interview.

In the Czech Republic, among the interviewed project managers, sustainability is rated as a very important area. However, its application to the practice of solving organizations is weaker. The majority agreed that they perceive the incorporation of a sustainable approach

Table 1. Sustainability Indicators for PMMMs assessment (Part 1). Own processing based on the GRI standard (2016), Meza-Ruiz et al. (2017), Martens and Carvalho (2016), Lin et al. (2017), Banishashemi et al. (2017) and Kostalova and McGrath (2021)

Group	Sustainability Indicators for PMMMs assessment	Sustainable Project Management Maturity Model	PSM3™
General Sustainability Indicators	Managerial Approach	-	X
	Business Ethics	X	X
	Innovation Management	-	-
	Organizational Culture Management	-	X
	Responsibility for Product and Services	X	-
	Assessment of Technological Feasibility of Project	-	X
	Improvement	-	-
	Obey Law and observe disciplines	X	-
	Ensure Quality and Safety	X	-
	Philanthropy	-	X
	Transparent Information and Reporting	X	X
	Green Designing and Construction	X	-
	Collaboration	X	-
	Implementing an Effective Quality Control	-	-
	Implementing an Effective Project Risk Management	-	X
	Strategic Management	X	-
	Knowledge Management	X	-
	Awareness of Sustainability	X	-
	No Conflict of Interest	X	-
	Effective Project Control	X	-
Lessons Learned Focused on Sustainability	X	-	
Economic Sustainability Indicators	Assessment of Economic Feasibility of Project	X	X
	Financial and Economic Performance	X	
	Financial Benefits from Good Social and Environmental Practices	X	X
	Ensure Shareholders Economic Interest	-	-
	Market Presence	X	X
	Indirect Economic Impacts	X	X
	Transparent and competitive procurement processes	X	X
	Anti-corruption	X	X
	Anti-competitive Behavior	X	X
	Tax	-	-
	Cost Management	-	-
	Increase in Profitability	X	-
	Reasonable Return on Investment	X	X
	Perpetuation of Environmental Benefit of the Project	-	X
	Efficiency Utilize Resources	-	-
Recycling of Resources	X	X	
Environmental Sustainability Indicators	Nature Resources Minimization	X	-
	Materials Minimization	X	-
	Energy Minimization	X	X
	Water and Effluents Minimization	X	X
	Ground, Ground Pollution	-	X
	Air, Air Pollution	X	X
	Biodiversity	X	X
Emissions	X	X	

Table 1. Sustainability Indicators for PMMMs assessment (Part 2). Own processing based on the GRI standard (2016), Meza-Ruiz et al. (2017), Martens and Carvalho (2016), Lin et al. (2017), Banishashemi et al. (2017) and Kostalova and McGrath (2021)

Group	Sustainability Indicators for PMMMs assessment	Sustainable Project Management Maturity Model	PSM3™
Environmental Sustainability Indicators	Waste Management	X	X
	Environmental Compliance	X	-
	Supplier Environmental Assessment	X	X
	Eco-efficiency	-	-
	Management of Environmental Impacts	X	-
	Environmental Policy Management	-	-
	Environmental Commitment and Responsibility	X	-
	Protect Environment	-	-
Social Sustainability Indicators	Employment	X	X
	Labor/Management Relations	X	X
	Occupational Health and Safety	X	X
	Training and Education	X	X
	Support and cooperation of Project Management Team in delivering a sustainable project	X	-
	Diversity and Equal Opportunity	X	X
	Non-discrimination	X	X
	Freedom of Association and Collective Bargaining	X	
	Child Labor Forced or Compulsory Labor	X	X
	Security Practices	X	-
	Rights of Indigenous People		X
	Human Rights Assessment	X	X
	Local Communities/Relationship with Society	X	X
	Relationship with Stakeholders	X	X
	Relationship with Suppliers and Contractors	X	-
	Supplier Social Assessment	X	-
	Public Policy	X	X
	Community involvement	X	X
	Customer Health and Safety	X	X
	Customer Relationship Management	X	X
	Marketing and Labeling	X	X
	Customer Privacy	X	X
	Socioeconomic Compliance		X
	Participation and Involvement of Stakeholders	X	X
	Impact on the Professional Life of the Team Members	X	-
	Satisfaction and Productivity of the Team	-	-
Perpetuation of Social Benefit of the Project	-	X	
Motivation	-	-	
Human Capital Development	X	-	
Corporate Citizenship	-	-	

Note: X = indicator is evaluated, - = indicator is not evaluated.

into project management as very important, especially from a personal point of view. However, the majority agreed that this is not the case at the organizational level, where the emphasis on a sustainable approach is much less intensive. The reason is not so much a lack of interest in this area, but a prevailing view within organizations that there are more

important and acute items for immediate management (management of the basic parameters of projects – scope, time, budget, changes and risk management).

The positive thing is that the majority of project managers confirmed that project management is connected to the strategic management of organizations and in several cases, sustainability is starting to become a part of strategic visions and thus is also reflected in the definition of project products or outputs (banking and insurance sectors, logistics, R&D).

If the success criteria for projects are evaluated with a focus on sustainability, rather than just an assessment of social aspects or indicators, safety and impact on health, prioritization of online meetings of international teams, paperless administration, energy saving and a turn to recyclable materials. In some companies, sustainable indicators become part of an in-house evaluation procedures as part of internal audit, they are not aimed directly at project management, but all activity in the organization is assessed with their help.

In many cases, project managers connected sustainable project management with the company's overall approach – the development of a sustainable corporate culture, the expansion of Corporate social responsibility (CSR) or environmental, social and government (ESG) investment, product specification and reporting. Regarding the awareness of sustainable PMMMs among ten project managers from the Czech Republic only one declared knowledge of PSM3™. Most of them declared that in case of availability of a simple tool for evaluation, they will use PMMMs and sustainable PMMMs. They generally expect changes in this area from the external environment and society rather than strengthening the sustainable approach from internal initiatives.

In the Irish context, the linkage of project controls with sustainability is significant. There have been various theories that address sustainable processes such as 'lean sustainability' that may be effective for improving project efficiency and process waste, there is still limited knowledge around how to effectively use such theories and concepts to adopt in project controls. Sustainability is foundationally concerned with three pillars being profit, people and the planet. In the Irish project management community, there is a tendency to interpret the concepts of sustainability in the context of leadership rather than being prescriptive in finding ways to practically adopt sustainability concepts to enhance the efficiency of project activities.

In the Irish context project controls for sustainability has only progressed as far as diagnostic controls are concerned such as key performance indicators and monitoring such as project control tools and project health checks. However, there is agreement that using such tools does not accurately reflect the complete image of the project during its life cycle towards achieving sustainable goal outcomes.

Furthermore, in the Irish context, there is a significant awareness of executive support, and cross-functional support and the changing role of project managers and acceptance that they must supplement their traditional functions with broader awareness of sustainability knowledge and skills to meet today's professional demands. The modern project manager fulfils not only the traditional roles of project management but also must manage the project in the most efficient and effective manner with respect to sustainability.

5. Discussion

Insufficient knowledge of the way how to evaluate sustainability in project management could be connected with the overall situation in area of project management, where, based on the study in 2015, 2016 and 2017 the usage of project management methods and tools is mainly on the medium level (Taraba, 2018). In contrast, the situation in Ireland is more developed, sustainability is accepted in project controls with regard to project effectiveness and is required as a project manager competency. But still is there the space to improve it.

Ignorance or low awareness of the issue of sustainable project management is closely related to the issue of insufficient education in the field of project management (Kostalova, et al., 2018) and to the general expansion of knowledge in a certain area including the overall approach to knowledge management in the company (Dorskocil & Smolikova, 2012).

An interesting observation is also the different understanding of the concept of sustainability. In addition to the meaning associated with ecological, social and economic responsibility, the connection sustainability with rules of national or European structural and investment funds' co-financed or financed projects appeared among the representatives of the non-profit and public sector, where the term sustainability refers to a set period of time during which the outputs of projects are to be used by the target group. Similarly, the term is also used by Vrchota et al. (2021).

In general, it can be stated that the incorporation of a sustainable approach into the project management processes or/and in outputs is currently insufficient. There is a lack of awareness of how sustainability evaluates in general and within project management. It is therefore possible to positively evaluate the effort to incorporate sustainability into the project management international standards (see Introduction). An example is the IPMA next version of IPMA Competence Baseline (ICB 4+) will include sustainability as one of the basic parameters of projects and required competence of project managers (Carboni, 2015).

6. Conclusions

Sustainability in project management is interwoven into dealing with stakeholder engagement, complexity and managing and balancing project related risks. The overall findings from this study are that while the integration of sustainability into PMMMs is slowly evolving and improving, there is much work to be done. The greatest limitation of this study was the limited time to carry out this study as only a certain level of analysis could have been undertaken. The researchers background in project management maturity research may have influenced results and findings on an unconscious basis, although all efforts were made to be neutral in this study.

The world is changing at an unprecedented rate, the project management sector must innovate and adapt to reflect the changing landscape of sustainability. The sector must strive to be proactive and lead genuine change in areas of sustainability and climate action, while prioritizing and balancing successful project outcomes.

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References

- AccountAbility. (2018). *AA1000 Accountability Principles*. <https://www.accountability.org/standards/aa1000-accountability-principles/>
- Banishashemi, S., Hosseini, M. R., Golizadeh, H., & Sankaran, S. (2017). Critical success factors (CSFs) for integration of sustainability into construction project management practices in developing countries. *International Journal of Project Management*, 35(6), 1103–1119. <https://doi.org/10.1016/j.ijproman.2017.01.014>
- Brown, B. J., Hanson, M. E., Liverman, D. M., & Merideth, R. W. (1987). Global sustainability: Toward definition. *Environmental Management*, 11(6), 713–719. <https://doi.org/10.1007/BF01867238>
- Doskocil, R., & Smolikova, L. (2012). Knowledge management as a support of project management. In *Proceeding of International conference on Knowledge for Market Use – Significance of Knowledge at the Current Phase of Economic Cycle Olomouc*, 6-7.9.2012 (pp. 40–48).
- Cagnin, C. H., Loveridge, D., & Butler, J. (2005). Business sustainability maturity model. In *Proceeding of Business Strategy and the Environment Conference* (pp. 4–6).
- Carboni, J. (2015). *New IPMA Competence Baseline Supports Sustainability!* <https://blog.greenprojectmanagement.org/index.php/2015/10/13/new-ipma-competence-baseline-supports-sustainability/>
- Carboni, J., Duncan, W., Gonzalez, M., Milsom, P., & Young, M. (2018). *Sustainable Project Management: The GPM Reference Guide* (2nd ed.). GPM Global.
- Carvalho, M. M., & Rabechini, R. (2017). Can project sustainability management impact project success? An empirical study applying a contingent approach. *International Journal of Project Management*, 35(6), 1120–1132. <https://doi.org/10.1016/j.ijproman.2017.02.018>
- Ebbesen, J. B., & Hope, A. (2013). Re-imagining the iron triangle: embedding sustainability into project constraints. *PM World Journal*, 2(3), 1–13.
- European Commission. (2020). *The European Green Deal*. https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF
- GPM. (2019). *The GPM P5™ Standard for Sustainability in Project Management GPM Global Version 2.0* (2nd ed.). GPM Global.
- GPM. (2009). *The GPM® Organizational Model for Sustainable Organizations, Portfolios, Programs, and Projects*. <https://www.greenprojectmanagement.org/services/the-psm3-assessment>
- GRI. (2016). *GRI: 2016*. <https://www.globalreporting.org/standards/gri-standards-download-center/?g=e10f8b5a-6775-40da-afbf-4b3cdc1df635>
- Henderson, K., & Loreau, M. (2023). A model of Sustainable Development Goals: Challenges and opportunities in promoting human well-being and environmental sustainability. *Ecological Modeling*, 475, 110164. <https://doi.org/10.1016/j.ecolmodel.2022.110164>
- Hynds, E. J., Brandt, V., Burek, S., Jager, W., Knox, P., Parker, J. P., Schwartz, L., Taylor, J., & Zietlow, M. A. (2014). Maturity Model for Sustainability in New Product Development. *Research-Technology Management*, 57(1), 50–57. <https://doi.org/10.5437/08956308X5701143>
- Hwang, B. G., & Ng, W. J. (2013). Project management knowledge and skills for green construction: Overcoming challenges. *International journal of project management*, 31(2), 272–284. <https://doi.org/10.1016/j.ijproman.2012.05.004>
- International Project Management Association. (2020). *IPMA Standards*. <https://www.ipma.world/individuals/standard/>
- Iqbal, S. (2016). *Organizational Maturity – Managing Programs Better. Program Management: A Life Cycle Approach*. CRC Press.
- ISO. (2010). *ISO 26 000:2010 Guidance on social responsibility*. <https://www.iso.org/obp/ui/#iso:std:iso:26000:ed-1:v1:en>
- Keating, M. (1993). *The Earth Summit's Agenda for Change*. Centre for our Common Future.
- Kostalova, J., Bednarikova, M., & Patak, M. (2018). The Required Competencies of Project Managers in Metallurgical Companies in the Czech Republic. *Metalurgija*, 57(1-2), 131–134.
- Kostalova, J., & McGrath, J. (2021). Sustainability in Project Management: Two sides of the same coin or poles apart? *Hradec Economic Days 2021*, 11(1), 401–411. <https://doi.org/10.36689/uhk/hed/2021-01-041>
- Kostalova, J., & Tetrevovala, L. (2018). Verification of Project Management Methods and Tools Oriented Maturity Model. *Revista de Gestão e Projetos Journal of Business and Projects*, 9(1), 1–23.
- Kwak, Y. H., Sadatsafavi, H., Walewski, J., & Williams, N. L. (2015). Evolution of project based organization: A case study. *International Journal of Project Management*, 33(8), 1652–1664. <https://doi.org/10.1016/j.ijproman.2015.05.004>

- Langston, C., & Ghanbaripour, A. N. (2016). A Management Maturity Model (MMM) for project-based organisational performance assessment. *Construction Economics and Building*, 16(4), 68–85. <https://doi.org/10.5130/AJCEB.v16i4.5028>
- Lin, H., Zeng, S., Ma, H., Zeng, R., & Tam, V. W. T. (2017). An indicator system for evaluating megaproject social responsibility. *International Project Management Journal*, 35, 1415–1425. <https://doi.org/10.1016/j.ijproman.2017.04.009>
- Martens, M. L., & Carvalho, M. M. (2016). The challenge of introducing sustainability into project management function: multiple-case studies. *Journal of Cleaner Production*, 117, 29–40. <https://doi.org/10.1016/j.jclepro.2015.12.039>
- McGrath, J., & Kostalova, J. (2020). Project management trends 2020+. In *Hradec Economic Days 2020* (pp. 534–542). <https://doi.org/10.36689/uhk/hed/2020-01-061>
- Meza-Ruiz, I. D., Rocha-Lona, L., Soto-Flores, M. R., Garza-Reyes, J. A., Kumar, V., & Lopez-Torres, G. C. (2017). Measuring Business Sustainability Maturity-levels and Best Practices. *Procedia Manufacturing*, 11, 751–759. <https://doi.org/10.1016/j.promfg.2017.07.176>
- OECD. (2011). *OECD Guidelines for Multinational Enterprises*. OECD Publishing. <https://doi.org/10.1787/9789264115415-en>
- Ofori, D., F., & Deffor, E. W. (2013). Assessing Project Management Maturity in Africa: A Ghanaian Perspective. *International Journal of Business Administration*, 4(6), 41–61, <https://doi.org/10.5430/ijba.v4n6p41>
- Project Management Institute. (2021). *A Guide to the Project Management Body of Knowledge (PMBOK® Guide) – Seventh Edition and The Standard for Project Management (7th ed.)*. Newton Square: PMI
- PRINCE2 (2022). *PRINCE2 Methodology*. <https://www.prince2.com/eur/prince2-methodology>
- Silvius, A. J. G., & Schipper, R. (2015). Developing a maturity model for assessing sustainable project management. *Journal of Modern Project Management*, 3(1), 16–27.
- Silvius, G., Schipper, R., Planko, J., Brink, J., & Köhler A. (2012). *Sustainability in Project Management*. Farnham: Gower Publishing Limited.
- Social Accountability International. (2014). *Social Accountability 8000: International standard. (SA8000: 2014)*. <https://sa-intl.org/resources/sa8000-standard/>
- Sokovic, M., Pavletic, D., & Pipan, K. (2010). Quality improvement methodologies - PDCA cycle, RADAR matrix, DMAIC and DFSS. *Journal of Achievements in Materials and Manufacturing Engineering*, 43.
- Spalek, S. (2015). Establishing a conceptual model for assessing project management maturity in industrial companies. *International Journal of Industrial Engineering*, 22(2), 301–313. <https://doi.org/10.23055/ijietap.2015.22.2.691>
- Taraba, P. (2018). Application of project management methods in the Czech Republic. In *Proceeding of 22nd International Conference on Circuits, Systems, Communications and Computers (CSCC 2018)*, 210, No. 02028, <https://doi.org/10.1051/mateconf/201821002028>
- UN Global Compact. (2014). *Guide to Corporate Sustainability*. https://www.unglobalcompact.org/docs/publications/UN_Global_Compact_Guide_to_Corporate_Sustainability.pdf
- Vrchota, J., Řehoř, P., Maříková, & Pech, M. (2021). Critical Success Factors of the Project Management in Relation to Industry 4.0 for Sustainability of Projects. *Sustainability*, 13(1), 281. <https://doi.org/10.3390/su13010281>
- Waseen, N., & Kota, S. (2017). Sustainability Definitions-An Analysis. In *Proceeding of ICORD 2017* (Vol. 66, pp. 361–371). https://doi.org/10.1007/978-981-10-3521-0_31
- Watkin, K. (1999). Sustainability: Definition nightmare. *Forestry Chronicle*, 75(3), 329–329.