

---

## GLOBALIZATION IMPACT ON PROJECT MANAGEMENT

**Aleksey I. Andreev**

*Lomonosov Moscow State University*

**Julia V. Zinkina**

*Russian Presidential Academy of National Economy and  
Public Administration; Lomonosov Moscow State University*

**Irina V. Petrovskaya**

*VTB bank Department*

*The paper sets an ambitious task of contributing to the sorting out of the multi-dimensional relations between the complex phenomenon of globalization and increasing projectification. Our particular aim is to understand how the impact of globalization is channeled to influence the organization of projects, criteria and factors of success, and challenges posed for project management. We find that a great part of this influence can be accounted for through increase in uncertainty and complexity (both of projects themselves and the environment they are implemented in) caused by globalization. While technological advances are definitely part of the influence, it goes much deeper and broader than that.*

**Keywords:** *globalization, projectification, project management, technological paradigms, uncertainty, complexity.*

### 1. Introduction

We live in a projectified society. The term coined in the mid-1990s has been gaining relevance ever since, as projects permeate not just economies, but nearly all spheres of human society. From the ‘traditional’ project-based industries, such as construction (serving the earliest examples of projects – Kozak-Holland 2010; Morris 2013; Chiu 2010), and later defense (with the US Department of Defense and ‘McNamara's Revolution’ widely recognized as the cradle of classic project management – Lenfle and Loch 2010; Morris 2013), projects as organizational form spilled over to other economic spheres, including the rather novel ones (notably IT and information systems), as well as the public sector (Crawford and Helm 2009; Godenhjelm, Lundin, and Sjoblom 2015), education (Austin *et al.* 2013) and scientific research (Fowler, Lindahl, and Sköld 2015), healthcare (Shirley 2020; Suhonen and Paasivaara 2011), media (Bouncken, Lekse, and Koch 2008). It is not uncommon to see people describing their non-work-related activities (hobbies, sports, studies and many other things) in ‘project’ terms (be it making paintings, working on some elaborate embroidery, going in for

learning to cook recipes from a specific cuisine, reaching a particular fitness or sports goal, *etc.*).

As regards the extent of projects in the developed economies, already in the 1992–1996 a massive panel survey of 3,500 European firms highlighted a marked increase in the use of projects in firm activity – up from 13 to 42 per cent over the course of just four years (Whittington *et al.* 1999). In 2004, a survey by PricewaterhouseCoopers provided new evidence supporting the trend – each of the 200 firms in the sample was engaged in some form of project activity, while a quarter of them had large (100+) project portfolios (Nieto-Rodriguez *et al.* 2004). Scranton (2014) used World Bank data for the estimate of about 22 per cent of world GDP in 2009 came from project-based activities, with some countries like India and China having much higher estimates (34 % and 45 % respectively). A more recent study of Germany, Norway and Iceland revealed that the shares of project work in total working hours reached as high as 34.7 %, 32.6 % and 27.7 % respectively in 2014–2017, with the majority of projects being internal and thus largely invisible to the customer (Schoper *et al.* 2018). With these figures taken into account, expressions like ‘projectification of everything’ (Jensen *et al.* 2016: 22), or statements on the omnipresence of projects and their becoming a human condition (Lundin *et al.* 2015; see also Lundin and Söderholm 1998; Hobday 1998, 2000; Cicmil and Hodgson 2006) do not sound as an exaggeration.

Increasing importance of projects and their spread into various spheres of economy, as well as into social and political activities, thus appears to be an established trend of the latest decades. It has been running simultaneous to a number of major changes in the life of humanity, of which globalization is likely among the first to come to mind. This raises a question of globalization impact on the essential features of projects and the sphere of project management.

## **2. Globalization, Technological Paradigms, and Project Management: Concept Evolution**

Globalization receives unabating attention not only from the research community, but from numerous decision-makers, state leaders, entrepreneurs, media and general public all over the world. Multi-dimensional as it is, this phenomenon invariably impacts nearly all spheres of human life, even though the extent and character of its influence can differ. Globalization has had a significant effect on global economy, global financial system, politics, statehood, society, *etc.* (Grinin 2011). There are different views regarding the history of globalization. Sometimes it is associated with the spread of PCs, the Internet, and the huge increase in global communications and other types of connection; another line of research puts globalization in the context of Macrohistory/Big History, tracing its start back to ancient times and viewing the recent surge of globalization as yet another stage in its long history which has seen both periods of high integration and periods of weakening ties between various parts of the world (Zinkina *et al.* 2019; Grinin 2011). Some researchers claim the most recent decades of globalization to be a fundamentally new phenomenon, others see it as an intensification of the previously existing trends and connections. However, regardless of the approach we take, it can hardly be disputed globalization has been closely interrelated with technological change.

The concept of technological paradigms, closely related to the concept of long economic cycles / Kondratieff waves (1922), was developed in the works of Carlota Perez

(2002), Richard R. Nelson (2008), Nick von Tunzelmann (von Tunzelmann *et al.* 2008), Leonid Grinin and Andrey Korotayev (Akaev *et al.* 2012; Grinin L., Grinin A., Korotayev 2017; Grinin, Korotayev 2016). The K-waves are considered to have emerged in the economy with the Industrial Revolution, which fundamentally changed the means of production. Each new cycle would be started by a number of breakthrough technologies forming a new technological paradigm (the spread of these technologies allows the emergence of new spheres of production, thus causing an economic upswing). Their impact on globalization differs from one technology to the other; it was shown, for example, that the ‘golden age’ of the nineteenth-century globalization was largely related to the technological breakthroughs forming the essence of the second technological paradigm, such as the telegraph, railways and steamships, which allowed for a rocketing increase in the speed and volume of communications over distance, most notably between Europe and Americas (Zinkina *et al.* 2019).

The fifth technological paradigm, which, according to researchers, is currently completing its final stage, is based on technological breakthroughs in microelectronics (invention and worldwide spread of personal computers), information technologies (the Internet, email, social networks, instant messengers, *etc.*) and various software that have created new industries and changed the already existing ones. These technologies allowed for a dramatic increase in the world connectivity, which formed the essence of the most recent decades of globalization. In addition, the fifth technological paradigm witnessed the development and massive use of cyber-physical systems, that is, systems encompassing complex interconnections of computing devices, physical objects, people and physical environments. One would naturally expect such profound changes to have had reflection in the nature of projects and project management. To understand them better, let us take a brief look at the history of project management and classic style of project management developed in the twentieth century.

Historians of project management believe that the first projects emerged in construction. The largest and best-known examples would include Egyptian pyramids, Mesopotamian temples, the Great Chinese Wall (to name a few), but these ‘mega-projects’ co-existed with smaller ones needed in everyday life such as construction of temples, roads, bridges, and irrigation systems (Kozak-Holland 2010; Chiu 2010; Morris 2013). The Hammurabi code of laws includes a clause setting legal responsibility for the architect and construction workers if their building collapsed (Chiu 2010: 170). The construction of Egyptian pyramids involved such basic project management practices as keeping accounts of materials, labor resources, and money spent. For a long time in history, project organization was mostly applied for the tasks of constructing buildings and infrastructure (Hall 2012; Garel 2013).

The first turning point in the history of project management was likely associated with the Industrial Revolution. As the range of projects increased, so did the complexity of management technologies; the hierarchy of ‘general contractor – contractor – sub-contractors’ is widely established, the sphere of responsibility is defined for each level in this hierarchy, control for the project timing and the quality of the result is getting formalized (Chiu 2010: 201). Railways, mining, petrochemicals, medicine, cargo transportation, banking were all actively developing using the form of projects, although formal positions and roles of project manager, chief project engineer, project coordinator were only just beginning to appear (Morris 2013: 19). At the same time, the first

transnational corporations appeared which had to develop the first tools for trans-border project management, heavily relying on the most advanced transport and communication technologies of the time (Wilkins 1988).

Researchers differ in their opinions on the emergence of modern project management. Sometimes it attributed to the 'taylorism' at the very beginning of the twentieth century. More frequently, the Gantt Chart of 1910 is recalled, which formally set one of the 'golden triad' of modern project management indicators – timing (concentrating on the timing of project tasks and sub-tasks and how long they took to be completed). Both approaches were frequently used before the World War II, which saw a surge in the number of projects and their variety. The most controversial case of the time was the Manhattan project. Some see it as the cradle of classic project management where its principles of organization, planning, and control were developed (Shenhar and Dvir 2007). Others emphasize that the principles underlying the greatest part of Manhattan project (trial-and-error, parallel trials) got excluded from classical project management, and its very essence contradicted these principles (Lenfle and Loch 2010). The very term of 'project management' appeared after the War, in 1952–53, in the USA Air Force, followed by a formal position of project manager, the concept of project office and other important concepts (Morris 2013). Classical project management was to a large extent developed in the course of two military projects, Atlas and Polaris (the latter is more known for the development of PERT tool for network calendar planning), and then got widely accepted through the so-called 'McNamara Revolution'. While at his post of the Secretary of Defense, Robert McNamara transformed the processes of analysis, planning, decision-making and project management. First, the phased approach has become the main project management model for the Department of Defense and the newly created NASA. In the evaluation procedures, special attention was paid to the stages of developing the concept and determining the project contract. This was supported by the proliferation of management tools such as PERT. Secondly, starting from 1963, the Department of Defense moved from cost-recovery contracts (plus a flat-rate fee) to fixed-price contracts, which increased the responsibility of contractors to achieve the goals of the project while strictly sticking to the pre-planned budget. This helped consolidate project planning and control as key elements of project management. The two key assumptions that underlie the phased approach can be identified as follows: (1) project management is focused exclusively on implementing the decisions, not making or discussing them; (2) uncertainty management and control are feasible. Thus, classical project management was limited to the effective implementation of routine initiatives and tasks, being cut off from the two main areas of management inherent in the Manhattan project – strategy development and strategic search (Lenfle and Loch 2010).

### 3. Data and Methods

The last decades witnessed a growing failure rate in projects, varying from one sphere to another but particularly high in the new spheres, such as IT/IS, where in the mid-1990s more than a half of projects failed to meet at least one success criteria of the 'golden triad' of classic project management (time, budget, and scope), and about one-third were considered complete failures (Ewusi-Mensah and Przasnyski 1997). Projects would frequently overrun their schedules, require additional financial resources, get cancelled before completion or survive to be completed but fail to produce a good/se-

rice popular with customers. These issues caught the attention of a number of researchers trying to understand and conceptualize the reasons behind the project failures and to transfer this knowledge into methodological improvements aimed at fixing the most commonly experienced problems. We review this literature to reveal the most frequently mentioned mismatches between the classical project management and modern projects. We then proceed to analyze the role of globalization in the emergence of these mismatches. We use areas of project management knowledge developed in the Guide to the Project Management Body of Knowledge developed by Project Management Institution in order to classify the channels of globalization impact on project management.

#### 4. Impact of Globalization on Project Management

Globalization has been influencing project management through a large number of channels. In order to classify and organize this variety, let us follow the structure proposed in the Guide to the Project Management Body of Knowledge (PMBOK Guide) developed by Project Management Institution. This classification includes the following categories: project environment; project leadership; managing project integration; managing project scope; managing project time; managing project cost; managing project quality; managing human resources of the project; managing project communications; managing project risk; managing project procurement; and managing project stakeholders. Below we will list the channels of globalization impact on project management structured according to these categories. The list does not claim to be comprehensive and only contains the most notable effects of globalization on the corresponding areas of project management.

- project environment – globalization exerts a huge impact upon the environment where the projects are carried out, first and foremost, by increasing its volatility and penetrability to external shocks. A vivid example from rather recent past can be presented here, namely, the global financial and economic crisis of 2008–2009. What started as mortgage market crisis in the USA quickly evolved into a full-scale global economic recession, causing a slowdown, or a temporary halt, or even a cancellation in numerous projects worldwide. The impact of the global crisis was of such scale that these slowdowns and cancellations frequently could not be averted or mitigated by regular project management. Globalization-driven environmental shocks to project management can come in a variety of forms, such as global financial and economic crises (as in the example viewed above), commodity price spikes, sudden sociopolitical shocks and destabilizations (including ones caused by external influence), changes in the international political arena, technological breakthroughs made in other countries *etc.*

- project leadership – much depends on the educational and professional background of the leader, including their involvement in the global sphere of knowledge related to the project managed, as well as the presence or absence of international connections which could ease communications with foreign colleagues, knowledge of foreign competitors and their experience, access to international funding *etc.*; ‘globalized’ leaders may have a number of important advantages here;

- managing project integration involves project planning, project knowledge management, monitoring, and integrated change control; at this stage it is important for project managers to take into account the possible impact of globalization upon the project scope, time, and cost – see below. Integrated change control is related to monitoring

potential risks and reacting properly if one or several of the risks become practically relevant – see below ‘managing project risk’; international laws and regulations applied to global projects must be well understood in order to effectively manage the relationship of the professional practices to governments and political conditions as well as build key relationship to global government decision-makers;

- managing project scope – project scope should be defined taking into account the global sphere of knowledge related to the project managed; on the one hand, globalization of knowledge makes it easier to plan the scope of the project as a lot of details can be clarified through previous experience and some potential pitfalls can be avoided, both for deterministic and non-deterministic projects; on the other hand, it makes it more difficult, as a large amount of knowledge needs to be taken into account for project success; thus, high-qualified human resources are necessary. For non-deterministic projects, globalization of knowledge is of particular importance, as it serves for defining the project goal itself and the project can be carried out ‘standing on the shoulders of the giants’;

- managing project time – this aspect used to be much more transparent at the project planning phase in the epoch of classical project management and can be affected by a multiplicity of various factors in the epoch of globalization (see ‘project environment’); project overruns are currently typical and have been so for a while, reaching 50 per cent – 200 per cent of the planned project time (Morris and Hough 1987: 7; Reichelt and Lyneis 1999); we presume that this is due to uncertainty and complexity rising with globalization – see below Section 5;

- managing project cost – on the one hand, globalization presents some opportunities to carry out projects at smaller costs, for example, economizing on human resources through outsourcing tasks to different countries with cheaper labor force, or saving on the cost of materials by gaining access to information on cheaper producers and reaching out to these very producers through modern information technologies; on the other hand, globalization makes projects vulnerable to commodity price shocks and, generally speaking, to all the global economic and financial volatility, including crisis phenomena; moreover, increased price awareness of customers' needs to be taken into account when defining the costs of project and the price of project output;

- managing project quality – global quality standards regarding the output of the project need to be taken into account for project success; globalization increases international competition for project output quality;

Significantly lower wages in developing countries make global resources a valuable means to reduce cost for IT service vendors. However, the integration of global resources is a challenge for organizations pursuing successful project implementation in order to survive in the marketplace. IT service offerings are delivered as projects for which multinational project teams are built using global resources. These teams need to be managed appropriately to ensure successful project delivery ... the impact of culture on the management of global resources <needs to be taken into account along with> cultural frameworks that need to be in place to allow for efficient global service delivery (Eberlein 2008: 28).

- managing human resources of the project – one of the prominent challenges posed by globalization for project managers is managing virtual project teams consisting of outsourced members; advantages stemming from globalization here include ‘access to a wider pool of talent, potential cost reductions by cheaper labor in developing countries, the enforcement of internal competition and possible quality improvements. External advantages for customers are follow-the-sun development and extended service times’ (Eberlein 2008: 29; Gurung and Prater 2006). More challenging aspects also stemming from globalization include the need to address significant cultural heterogeneity within the virtual teams, which tends to rise with the increase in the number of sites involved. Mismanagement of cultural differences and intercultural miscommunications can possibly lead to project failure.

- managing project communications – this aspect could be understood in two aspects, namely communication as literal technically enabled interaction and communication as transmission of messages. For the first aspect, project communications are largely sustained with ICT technologies of the fifth Kondratieff cycle underlying the most recent wave of globalization; globalization increases the importance of communication among the members of the project team situated at different places, quite often remote from each other. For the second aspect, it is not the physical distance between the team members that matters, but rather cultural distance. Indeed, project members may belong to different organizational cultures and different cultures in general, and same notions may have different implications for them, and same questions may retrieve very different answers (Shulgin *et al.* 2017). Failure to take into account intercultural differences may lead to miscommunications and eventual project failure.

- managing project risk – project risk management in a globalizing society turns out to be a much more versatile task than classical project management ever implied. This largely has to deal with the two key notions of uncertainty and complexity – uncertainty relates to the external conditions wherein the project is carried out, while complexity relates both to the external environment and to the structure of a project itself, as well as the integration of project into the environment (see Section 5 below). Risks are generally reflected in project time (project failure due to untimely delivery of intermediate or final results), project costs (failure due to overrunning the budget), and project scope (partial or full incompleteness of the project). Causes of the risks are multiple and a huge number of them are related to globalization, be it financial (sudden limitation or abrupt ending of financial resources due to global price hikes or global financial dynamics or economic shocks), technological (global appearance of new technologies that make technologies used in the project of the very goal of the project obsolete), cultural (managing successful intercultural communication within a multi-cultural project team, or securing successful communication with multi-cultural society of consumers), political (accommodating for global geopolitical changes affecting the project course and landscape), legal (accommodating for international legal provisions affecting the project course and landscape) *etc.*

- managing project procurement – global procurement knowledge and skills are needed; global procurement is influenced by price fluctuations at global commodity markets, as well as dealing with international laws;

- managing project stakeholders – one of the challenges posed here by globalization is the necessity to manage the interests of stakeholders probably belonging to dif-

ferent cultures (same as with project human resources). Advantages here again include the possibility to build on a richer variety of cultures and knowledge; however, mismanagement of cultural differences and intercultural miscommunications can possibly lead to project failure.

Below we will try to summarize the challenges posed by globalization for various areas of project management and changes brought to project management by globalizing environment.

## 5. Research and Discussion

One of the fundamental differences between classical project management and modern projects lies in the sphere of planning and the extent of pre-determination. As mentioned above, classical project management would imply that uncertainty management and control are feasible; thus, it was well suited for projects with clearly pre-defined goals and methods and a detailed pre-defined plan, realized in rather stable environment that was unlikely to require any changes to initial project features in the course of its implementation. However, with modern projects one would rather expect this not to be the case. In this line of thought, Hall (2012) distinguishes between deterministic and non-deterministic projects (the ones with and without a detailed and exact outline of the project goal preceding the start of the project).

Another important point touches on dealing with innovations in methods. Planning is one of the pillars of classical project management and, indeed, a cornerstone of phased approach, as the manager basically controlled that project implementation strictly followed the initially developed plan. This approach is suitable for projects where technologies and environment are unlikely to experience significant changes in the course of project implementation. However, it will hardly be efficient in rapidly changing spheres, especially ones close to the technological frontier, such as IT/IS, biotechnology, some branches of medicine and pharmaceutical industry, *etc.* Here, sticking to the initial plan and refusing any changes in it may lead to overlooking important technological innovations emerging during the project implementation; this, in turn, may make the project results obsolete and unable to stand competition in the market – sometimes before they are even fully obtained.

Let us view another closely related point, namely, the technological uncertainty. Classical project management and modern project are nearly opposite in their stance in relation to uncertainty. The first implies that there is little to no uncertainty, which makes project activities and schedule easy to plan; the latter frequently exist in very high degrees of uncertainty, to the point that methods of the projects are very vaguely understood by the time it starts, or turn out to be non-existent yet (look at the development of a new pharmaceutical formula for a drug that would cure a previously incurable disease or condition). This is where classical project management is reasonably set aside in favor of parallel trial and trial-and-error approaches, which were so important in Manhattan project (see above). In terms of project goals, classical management is set to work with a clearly outlined goal, where scope and specifications are clearly known before the beginning; a parallel trial and trial-and-error work are better for a goal which has yet to be specified in the course of the project, as initial knowledge is insufficient for its detailed outline because it is innovative in its kind and cannot build upon similar results of earlier projects. As Lenfle and Loch (2010) put it, in such projects the details

of goal description can be seen as hypotheses that need to be tested and supported/rejected by trials in the course of the project.

Related to uncertainty, but in no way equal to it is the concept of complexity. Albert Hirschman (1967) was among the first researchers to view projects as systems. In this view, the complexity of the project is coming not from its size and the numbers of parts, but rather from the necessity to develop methods for coordinating these parts into a single whole. In modern research, a number of approaches have been developed to the problem of classifying projects depending on their levels of complexity (and, of course, conceptually defining these levels). Hobday (1998, 2000) specifies four levels of complexity, from extremely complex to simple projects (depending on such variables as the number of parts and components, complexity of systemic architecture, range and depth of required knowledge and skills, as well as variability of required materials and information). He notes that technical progress and new industrial requirements significantly widened the functional capacity, spread, and productivity of complex industrial products and systems, and projects aimed at their creation are increasing in complexity. Similar logic leads Shenhar and Dvir (2007) to single out three types of projects: simple (assembly of systemic parts), systemic (creation of systems), and massive (creation of metasystems).

However, these approaches limit project complexity to the internal features of the projects. To take into account complexity generated by external factors, we can turn to TOE approach comprising technical, organizational, and environmental complexity. Technical complexity was largely described above; organizational complexity deals with resource availability and human factors, while environmental complexity looks at project location, market conditions *etc.* (Bosch-Rekvelde *et al.* 2011). Another noteworthy approach is to distinguish between structural and dynamic complexity. The importance of accounting for structural complexity in project management was first noted by Baccarini (1996), who sub-divided it into organizational and technological complexity. Somewhat later, Williams (1999) pointed at complexity caused by uncertainty in project methods and project goals. Brady and Davies (2014) used the structural-dynamic dichotomy to generalize the existing knowledge on complexity types and their implications for project management. Structural complexity includes hierarchy of systems and interdependencies of project components, system integration, and interactions between team members. Foreseen and unforeseen uncertainty, innovations, market changes are subsumed under dynamic complexity. In other words, structural complexity, according to Brady and Davies, is related to the interactions within the project, while dynamic complexity is engendered in the interactions between the project and its environment. A somewhat different approach is taken by Geraldi, Maylor, and Williams (2011), who differentiate between not two but five types of complexity: structural (technological and organizational), uncertainty-related (goals, methods), time-related, dynamic, and sociopolitical (legal issues, security issues, ethical issues *etc.*).

As for the impact of globalization on projects and project management, which is frequently viewed through the prism of particular changes posing new challenges for the managers (such as the development of outsourcing supported by the ICT innovations of the fifth technological paradigm and their spread into developing countries with

cheaper labor force), it can be proved to be much more fundamental when the issues of uncertainty and complexity are taken into account.

## 6. Conclusion

Thus, in terms of uncertainty, globalization has clearly been making the environment where the projects are realized more uncertain in various aspects. As regards internal uncertainty (arising in the interactions within the project), one can single out an increase in technological uncertainty, which makes it harder to define project methods and goals before its start. However, it is far from being the only effect of globalization on project management. An increase in organizational uncertainty can also largely be attributed to globalization (with newly arising challenges of managing multinational teams, outsourced tasks, *etc.*). An even greater increase can be observed in the uncertainty of the environment and various external conditions under which a project is being realized. Thus, globalization has boosted the extent of market interconnection for the majority of goods and services. Interconnection brings with it increasing vulnerability to global crises; this was clearly visible during the 2008–2009 global financial and economic crisis, when the repercussions of what started as a downfall of the USA mortgage banking were eventually felt in almost all countries of the world. Moreover, interconnection makes national markets very sensitive to price fluctuations in global markets, and this sensitivity, in turn, may influence national sociopolitical stability – not to touch on the more obvious matter of global perspective increasing competition in the markets, which also makes it harder to set a truly competitive project goal, manage the project efficiently, and obtain a successful and competitive result. If a project is implemented on a multi-national scale, its complexity is likely to reach a whole next level, as project managers are to simultaneously take into account the changes in legal sphere, political leanings, sociopolitical stability, investment climate, markets, and numerous other aspects in a number of countries.

Even a rather simple assembly-type project will have its complexity increase due to growing uncertainty in the growing number of aspects – goals (how do we make our goal competitive?), time (will the product/service still be relevant by the time the project is complete?), methods (what are the best technologies, knowledge, skills to be used in the development of the product/service, and are they existent yet? are they likely to change while the project is implemented?), relevance (is the result likely to become obsolete due to fast technological progress, even if the best knowledge in this particular sphere is used?), and numerous external conditions in markets, potential customers, technological development, law, sociopolitical stability, *etc.* These factors increase both the uncertainty and complexity of contemporary projects and appear to be two main factors channeling globalization's impact on projects and project management.

Project management was still in the cradle during the 'golden epoch' of early globalization in the late nineteenth century and up to World War I. Classical project management took several decades for its tenets to be properly developed, but its spread was to a large extent provided by new technologies of the fourth technological paradigm – namely, the first generation of large-scale computer-system architectures (mainframe computers). The newest surge of globalization, to which many researchers, practitioners, and members of general public attribute the term and concept of globalization itself, has been heavily relying on the ICT technologies of the fifth technological paradigm,

which greatly increased the degree of global interconnectedness and brought about fundamental changes in many spheres of economy – project management being no exception. The ‘golden triad’ of success measurement in classical project management (time-budget-scope) has largely lost its relevance to project success. On the one hand, more projects tend to break at least one condition of the triad – still, their results may be deemed successful. On the other hand, strict sticking to the initial schedule, budgeting, and scope is no guarantee of success for the result of the project. We show that this is to a great extent related to the changes brought about by globalization, which can be mostly subsumed under increasing uncertainty and complexity. While rapid technological changes and moving technological frontiers definitely contribute to both, they are not exclusively responsible for the whole increase in uncertainty and complexity, as numerous other aspects both within the projects and outside (in the environment where the projects are implemented) have become more uncertain and more complex, and things are not going back to the simpler way of life.

### REFERENCES

- Akaev, A. A., Grinberg, R. S., Grinin, L. E., Korotayev, A. V., and Malkov, S. Yu. (eds.), 2012. *Kondratieff Waves. Aspects and Perspectives*. Volgograd: Uchitel. *Original in Russian* (Акаев А. А., Гринберг Р. С., Гринин Л. Е., Коротаев А. В., Малков С. Ю. (отв. ред.), *Кондратьевские волны: аспекты и перспективы: ежегодник*. Волгоград: Учитель).
- Austin, C., Browne, W., Haas, B., Kenyatta, E., and Zulueta, S. 2013. Application of Project Management in Higher Education. *Journal of Economic Development, Management, IT, Finance & Marketing* 5 (2): 75–99.
- Baccarini, D. 1996. The Concept of Project Complexity: A review. *International Journal of Project Management* 14 (4): 201–204.
- Bosch-Rekvelde, M., Jongkind, Y., Mooi, H., Bakker, H., and Verbraeck, A. 2011. Grasping Project Complexity in Large Engineering Projects: The TOE (technical, organizational and environmental) Framework. *International Journal of Project Management* 29 (6): 728–739.
- Bouncken, R. B., Lekse, W. J., and Koch, M. 2008. Project Management Capabilities in the New Media Industry. *Journal of Media Business Studies* 5 (1): 67–93.
- Brady, T., and Davies, A. 2014. Managing Structural and Dynamic Complexity: A Tale of Two Projects. *Project Management Journal* 45 (4): 21–38.
- Chiu, Y. C. 2010. *An Introduction to the History of Project Management: From the Earliest Times to AD 1900*. Delft: Eburon Academic Publishers.
- Cicmil S., and Hodgson, D. 2006. New Possibilities for Project Management Theory. *Project Management Journal Research Quarterly* 37 (3): 111–122.
- Crawford, L. H., and Helm, J. 2009. Government and Governance: The Value of Project Management in the Public Sector. *Project Management Journal* 40 (1): 73–87.
- Eberlein, M. 2008. Culture as a Critical Success Factor for Successful Global Project Management in Multi-National IT Service Projects. *Journal of Information Technology Management* 19 (3): 27–42.
- Ewusi-Mensah, K., and Przasnyski, Z. H. 1997. Critical Issues in Abandoned IS Development Projects. *Communications of the Association for Computing Machinery* 40 (9): 74–80.

- Fowler, N., Lindahl, M., and Sköld, D. 2015. The Projectification of University Research: A Study of Resistance and Accommodation of Project Management Tools & Techniques. *International Journal of Managing Projects in Business/Emerald* 8 (1): 9–32.
- Garel, G. 2013. A History of Project Management Models: From Pre-models to the Standard Models. *International Journal of Project Management* 31 (5): 663–669.
- Geraldi, J., Maylor, H., and Williams, T. 2011. Now, Let's Make it Really Complex (Complicated): A Systematic Review of the Complexities of Projects. *International Journal of Operations & Production Management* 31 (9): 966–990.
- Godenhjelm, S., Lundin, R. A., and Sjöblom, S. 2015. Projectification in the Public Sector – the Case of the European Union. *International Journal of Managing Projects in Business* 8 (2): 324–348.
- Grinin, L. 2011. *Macrohstory and Globalization*. Volgograd: 'Uchitel' Publishing House.
- Grinin, L. E., Grinin, A. L., and Korotayev, A. 2017. Forthcoming Kondratieff Wave, Cybernetic Revolution, and Global Ageing. *Technological Forecasting and Social Change* 115: 52–68.
- Grinin, L., and Korotayev, A. 2016. Global Population Ageing, the sixth Kondratieff Wave, and the Global Financial System. *Journal of Globalization Studies* 7 (2): 11–31.
- Gurung, A., and Prater, E. 2006. A Research Framework for the Impact of Cultural Differences on IT Outsourcing. *Journal of Global Information Technology Management* 9 (1): 24–43.
- Hall, N. G. 2012. Project Management: Recent Developments and Research Opportunities. *Journal of Systems Science and Systems Engineering* 21 (2): 129–143.
- Hirschman, A. O. 1967. *Development Projects Observed*. Washington, DC: The Brookings Institution.
- Hobday, M. 1998. Product Complexity, Innovation and Industrial Organization. *Research Policy* 26: 689–710.
- Hobday, M. 2000. The Project-Based Organization: An Ideal Form for Managing Complex Products and Systems? *Research Policy* 27: 871–893.
- Jensen, A., Thuesen, C., and Geraldi, J. 2016. The Projectification of Everything: Projects as a Human Condition. *Project Management Journal* 47 (3): 21–34.
- Kozak-Holland, M. 2010. *The History of Project Management: Project Management across 4,500 Years*. Multimedia Publications.
- Lenfle, S., and Loch, C. 2010. Lost Roots: How Project Management Came to Emphasize Control over Flexibility and Novelty. *California Management Review* 53 (1): 32–55.
- Lundin, R., and Söderholm, A. 1998. Conceptualizing a Project Society – Discussion of an Eco-Institutional Approach to a Theory on Temporary Organizations. In Lundin, R., Midler, C. (eds.), *Projects as Arenas for Renewal and Learning Processes* (pp. 13–24). Dordrecht: Kluwer Academic Publishers.
- Lundin, R. A., Arvidsson, N., Brady, T., Ekstedt, E., Midler, C., and Sydow, J. 2015. *Managing and Working in Project Society*. Cambridge, England: Cambridge University Press.
- Morris, P. and Hough, G. 1987. *The Anatomy of Major Projects*. New York: Wiley.
- Morris, P. W. G. 2013. *Reconstructing Project Management*. Oxford: John Wiley & Sons.

- Nelson, R. R. 2008. Factors Affecting the Power of Technological Paradigms. *Industrial and Corporate Change* 17 (3): 485–497.
- Nieto-Rodriguez, A., Manager, A. S., Evrard, D., and Partner, A. 2004. *Boosting Business Performance through Programme and Project Management*. London, England: PwC.
- Perez, C. 2002. *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages*. Cheltenham: Edward Elgar.
- Reichelt, K., and Lyneis, J. 1999. The Dynamics of Project Performance: Benchmarking the Drivers of Cost and Schedule Overrun. *European Management Journal* 17 (2): 135–150.
- Schofer, Y. G., Wald, A., Ingason, H. T., and Fridgeirsson, T. V. 2018. Projectification in Western Economies: A Comparative Study of Germany, Norway and Iceland. *International Journal of Project Management* 36 (1): 71–82.
- Scranton, P. 2014. Projects as a Focus for Historical Analysis: Surveying the Landscape. *History and Technology* 30 (4): 354–373.
- Shenhar, A. J., and Dvir, D. 2007. *Reinventing Project Management: The Diamond Approach to Successful Growth and Innovation*. Boston, MA: Harvard Business Review Press.
- Shirley, D. 2020. *Project Management for Healthcare*. 2<sup>nd</sup> ed. Boca Raton: CRC Press.
- Shulgin, S., Zinkina, J., Korotayev, A., and Andreev, A. 2017. Neighbors in Values: A New Dataset of Cultural Distances between Countries Based on Individuals' Values, and its Application to the Study of Global Trade. *Research in International Business and Finance* 42: 966–985.
- Suhonen, M., and Paasivaara, L. 2011. Nurse Managers' Challenges in Project Management. *Journal of Nursing Management* 19 (8): 1028–1036.
- Von Tunzelmann, N., Malerba, F., Nightingale, P., and Metcalfe, S. 2008. Technological Paradigms: Past, Present and Future. *Industrial and Corporate Change* 17 (3): 467–484.
- Whittington, R., Pettigrew, A., Peck, S., Fenton, E., and Conyon, M. 1999. Change and Complementarities in the New Competitive Landscape: A European Panel Study, 1992–1996. *Organization Science* 10 (5): 583–600.
- Wilkins, M. 1988. European and North American Multinationals, 1870–1914: Comparisons and Contrasts. *Business History* 30: 8–45.
- Williams, T. M. 1999. The Need for New Paradigms of Complex Projects. *International Journal of Project Management* 17 (5): 269–273.
- Zinkina, J., Christian, D., Grinin, L., Ilyin, I., Andreev, A., Aleshkovski, I., Shulgin, S., and Korotayev, A. 2019. *A Big History of Globalization*. Cham: Springer.