

Routledge Handbook of Collaboration in Construction

Edited by Sina Moradi, Kalle Kähkönen, Lauri Koskela,
Ole Jonny Klakegg and Kirsi Aaltonen

ROUTLEDGE HANDBOOK OF COLLABORATION IN CONSTRUCTION

This innovative Handbook aims to look at the logic, various dimensions, and implications of collaboration in construction. It opens with a conceptualization of collaboration and its accompanying terms (i.e., cooperation and coordination) and continues with chapters in Part I which discuss the theoretical grounds of collaboration between individuals and organizations from the viewpoints of an impressive variety of relevant disciplines including organizational science; anthropology; law; economics; design; and production.

This is followed by discussions of the essence and value of collaboration in construction in Part II through explaining the role of collaborative project delivery methods and their benefits in advancing collaboration, describing the competency profile of project managers for collaborative construction, explaining key drivers and barriers of collaboration in construction, and explaining practices as well as challenges of measuring collaboration in construction.

Then, in Part III, case projects are employed to explain the benefits of collaboration in different levels of team, project, and business, to discuss the role and impact of collaboration on site and bridging the divide between construction and facility management, to discuss the role of digitalization in facilitating and advancing collaboration, to explain collaboration in decision making, to present examples of collaborative visual management, and to outline the implications of stakeholders' early involvement and collaboration for project success. Finally, consideration is given to the future of collaboration in construction to conclude the book.

This Handbook is key reading for a broad ranging audience within the fields of construction, project, infrastructure and engineering management, organisational science, economics, and business management.



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INTRODUCTION

Lauri Koskela and Kalle Kähkönen

The need for collaboration in construction

Current construction has many dimensions: at least technical, social, human, ecological, political and financial. The complexity of construction is thus plain. It is evident that this complexity is continuously growing. It is also well-known that there are many long-lasting problems in construction, some of which may have accentuated along with the growing complexity. It is widely acknowledged that tackling the overall complexity successfully requires the engagement of numerous public and private stakeholders, and their effective collaboration: bringing experts together and facilitating their joint work for the benefit of the client.

The complexity of construction is driven by the growing load of different expectations, requirements and changed conditions. The fundamental cause behind this is the high systemic complexity of the built environment sector. The built environment sector, with its building and renovation projects, can be understood as a highly complex system of systems (SoS). This SoS is composed of numerous different systems (and their sub-systems), which all together are interdependent and continuously interacting with each other in a dynamic manner. The systems are present at different levels of operations, and they comprise technological, ecological, social and economic dimensions, among others. There are various systems everywhere in the sector, and they are behaving, or guiding behavior, in a purposeful or purposive manner to desirable directions and goals. Systems can be natural systems, designed physical systems, designed abstract systems, human activity systems or transcendental systems (Checkland 1999). Examples: structural systems, construction classification system, regulations, standard contracts, professional classification, partnerships and networked operations, local and company practices, project organization and team.

The overall complexity of the built environment SoS can be portrayed via its spheres and realms of ingredients forming arenas for various systems (Moffatt and Kohler 2008). Five different spheres have been identified that present general-level systems influencing construction: Economic sphere, Sustainability Sphere, Life-cycle sphere, Social sphere and Political and regulatory sphere. Five different realms have been identified that present sector specific systems influencing construction: Realm of client operations, Realm of products, Realm of industry standards, Realm of stakeholders and Realm of decision making and problem solving. These spheres and realms are sources for different systems that can be classified as permanent or temporary ones. For example,

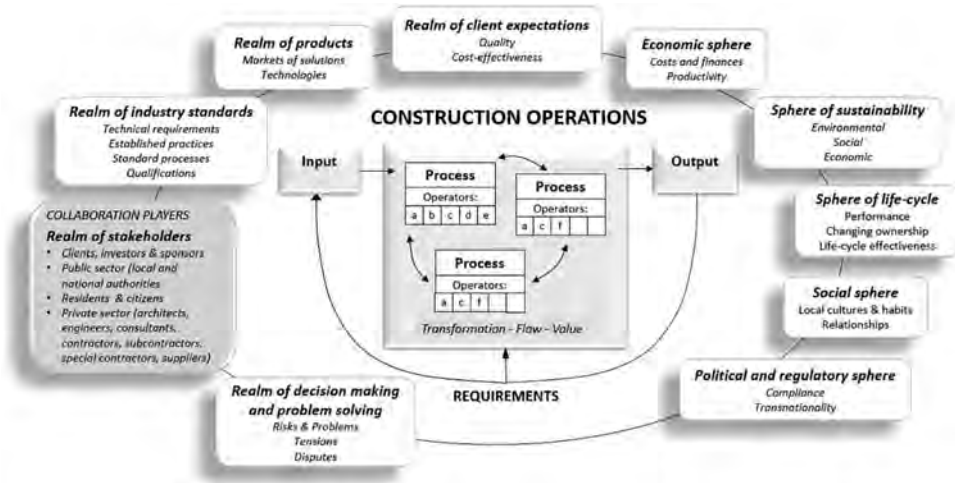


Figure 0.1 Construction operations outlined as a complex system of systems (SoS) where, metaphorically, everything interacts with everything.

the regulatory framework and related public and private decision making at different levels have created a complex sphere where a variety of agendas, their objectives and priorities are blurring the overall picture and targeted harmonized results can be very difficult to reach (CPR 2011; Shiva and Eastman 2013). The spheres and realms are thus also origins for different requirements addressing construction projects directly or indirectly (Figure 0.1).

This systems thinking model is important for understanding complexities and challenges of different operations in the construction sector. Rather than applying systems thinking locally, it needs to be used as an all-embracing operational approach for reaching design solutions and construction deliverables that comply with various requirements but also avoid local optimization. Otherwise, the trap of siloed operations, productivity problems, low predictability, quality problems, tensions and conflicts remain.

Challenging complexities are nowadays present in most construction projects, from standard small projects to major ones. Adopting collaborative practices and leveraging modern technologies are crucial for successfully addressing these challenges. This is now to be called here “Collaboration in construction”. Collaboration in construction can happen and is supposed to happen at different levels throughout the construction project lifecycle.

Why a handbook for collaboration in construction?

The overall understanding of collaboration in construction is still deficient. It is possible and even easy to recall certain instances of collaboration practices and related research. Examples of those are teamwork, relational contracting, special delivery models (partnering, alliance, lean project delivery) and general partnership development. Research, development and innovation that have taken place around these instances have provided valuable outcomes. The industrial/practitioner community has been remarkably active in creating and adopting collaborative solutions. However, rather than focusing locally on specific instances, it is necessary to see possibilities and promises of collaboration more broadly, as part of an arising transformational trend for the construction

sector. In this light, collaboration in construction, from a practical perspective, needs to be realized not only at the task and team level but also at the project and construction business level.

The transformation of construction operations towards more collaborative practices is a multidimensional challenge. The legacy of historically existing practices is heavy, and it is causing inertia for any kind of developments. The new professionals equipped with a profound understanding of collaboration are the ones to be the change makers. This handbook is serving professionals, academics and students wishing to contribute to such a transformation.

What is *Routledge Handbook of Collaboration in Construction*?

The explained changes and developments in the industry make it imperative to revisit different aspects of collaboration in a comprehensive manner and to present state-of-the-art knowledge and practices. Thus, this book aims to look at the logic, various dimensions and implications of collaboration in construction. The handbook is composed of three parts. The first part, *Collaboration in Theory: Explaining Collaboration Between Individuals and Organizations from the Viewpoints of Relevant Disciplines*, describes how different academic disciplines currently explain collaboration. The second part, *Collaboration in Construction: Discussing Essence and Value of Collaboration in Construction*, provides an account on generic principles and methods for collaboration in construction. The third part, *Construction Collaboration in Practice: Discussing the Benefits of Collaboration in Case Projects*, offers cases of recently implemented collaborations.

Who is this handbook for and what is in it and how to use it?

As already mentioned, this book targets professionals, academic scholars and students. Reflective practitioners among consultants, designers, engineers and project managers in the field of construction can find inspiration, principles and practical tools for collaboration. Academic scholars can find materials for teaching and insights helping to direct their future studies. Students will gain state-of-the-art knowledge on collaborative construction.

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