

Gunnar J. LÜHR, Marian G. C. BOSCH-REKVELDT, Mladen RADUJKOVIC

Key stakeholders' perspectives on the ideal partnering culture in construction projects

© Higher Education Press 2020

Abstract This paper examines the current state of project cultures in the German turnkey construction industry and the ideal project cultures in terms of partnering from the perspective of various key stakeholders (i.e., Investors, General Contractors, (Sub-)Contractors and Designers). To investigate the current and ideal cultures, data were gathered among the key stakeholders by means of a survey study with 72 respondents divided over 12 companies. The respondents rated the current and desired cultures by using the Organizational Culture Assessment Instrument, which belongs to the Competing Values Framework. The investigations show many similarities and differences between the stakeholder perspectives of the current and the idealized partnering project cultures. Mainly, the General Contractors desire more cooperative behaviors than the (Sub-)Contractors, and the Investors desire more pronounced flexibility than the General Contractors. All stakeholders desire a cultural change from highly competitive behaviors toward more cooperation. Changes in terms of clear procedures or more flexibility are only desired by the Designers. Defining both the current and an ideal partnering project culture enables academics and project managers to compare their actual project cultures to an ideal situation. With such an approach, academics and project managers could measure whether new tools or changes in resources affect their project cultures toward a partnering project culture.

Keywords project culture, organisational culture, partnering, construction culture, stakeholder perspectives, German

Received March 17, 2020; accepted July 20, 2020

Gunnar J. LÜHR (✉), Mladen RADUJKOVIC
Alma Mater Europaea ECM, 2000 Maribor, Slovenia
E-mail: Gunnar.Luhr@AlmaMater.si

Marian G. C. BOSCH-REKVELDT
Delft University of Technology, 2600 AA Delft, The Netherlands

1 Introduction

Scholars report frequently about poor project results in the construction industry in terms of cost overruns, time overruns, poor safety conditions and quality issues (Smiley et al., 2014; Sohi et al., 2016). The reasons for these poor results include different project objectives and according behaviors (Turner and Zolin, 2012). Thus, the simplified definition of “traditional criteria” for project success, such as “cost, schedule, technical performance as well as avoiding litigation, satisfying customer needs, and the overall results” (Larson, 1995), is inadequate (Turner and Zolin, 2012) and way too simple as the notion of project success is known to be subjective anyway (Koops et al., 2016).

Project parties' interests are often in direct conflict with those of others (Newcombe, 2003; Olander, 2007), and the singular focus on their respective interests has made collaborative relationships impossible (Akintan and Morledge, 2013). The industries' usual project culture is formed by these conditions and is often characterized by adversarial and distrustful relationships, antagonistic behaviors (Johnston and Lawrence, 1988; Ng et al., 2002; Beach et al., 2005; Foley and Macmillan, 2005), and escalating relationships (Eschenbruch, 2008). This is especially true in economic recessive times, during which the contractors face a high level of competition due to a low number of actual construction projects, and the investors have numerous choices for rivalling contractors. The appropriate competitive tendering processes often lead to unprofitable contracts for the contractors with trim margins. This stimulates a strategic focus on claims to still realize profitable projects rather than create partner-like project conditions (Hinze and Tracey, 1994; Barlow et al., 1997; Hatush and Skitmore, 1998; Winch, 2000; Eschenbruch, 2008).

Even though cooperation from the different stakeholders within one project is necessary to realize a project (Cheng et al., 2001; Cheung et al., 2003; Baiden et al., 2018; Chen

et al., 2019), the behaviors are especially characterized by attempts to protect the respective interests of the stakeholders, to avoid litigation, and to minimize their own risks instead of moving a common goal forward. Thus, organizations specialize in specific disciplines to gain deep knowledge about their niches, which enables them to gain advantage through this knowledge to avoid litigation (Winch, 2000). The different specialized organizations lead to multiple stakeholders within projects and, consequently, the necessity of managing, auditing, and controlling various parties. As a result, the construction project team involves various participants from different organizations with varying perceptions about what constitutes project success (Turner and Zolin, 2012; Davis, 2014).

Designers also focus on their own interests, and their way to avoid litigation is often to “over engineer” their designs to ensure that the contractors—with their opportunistic behaviors and their practical and specified knowledge for their special trade from the construction processes—cannot find weaknesses within the planning, which might lead to legal consequences for the designers. “Over-engineering” hereby means that the designs are not fully optimized, for example, using high safety margins to avoid technical issues due to unforeseen dependencies (Winch, 1989; 2000). This can result in an industrial culture that is characterized by opportunistic behavior, inefficiency in terms of time- and cost-overruns, low production rates, poor quality, and customer dissatisfaction (Eriksson et al., 2008).

As the economic situation changes, so does the availability of resources and the competition in an industry, and hence, the appropriate strategies. In time of economic booms, investors and general contractors tend to make their projects and themselves more attractive for qualified contractors and designers as their capacity is scarce. One way to do so is by “partnering” (Bayliss et al., 2004), with the aim of reducing energy on conflicts and spending effort in common value-adding activities. Partnering focuses on the relationships between stakeholders, with the aim of increasing the business value of all parties (Sochan, 2018) so as to reach the goal to make projects attractive for all parties instead of joining them with uneconomical conditions due to the lack of alternative projects. It “has been portrayed as both the saviour in the unhealthy construction industry and another trendy term to describe ‘common sense’ business relations” (Nyström, 2005). To implement partnering, paradigm and cultural changes are necessary (Larson, 1995; Ng et al., 2002; Cheung et al., 2003; Eriksson et al., 2008).

The desire for such cultural change is noticeable in the German construction industry within the past few years. The reason can be found in the continuous economic growth of the last decade (Federal Ministry for Economic Affairs and Energy, 2019) and the industry’s high

utilization. In this market condition, contractors can choose which works to accept; hence, clients are forced to portray themselves and their projects in a good light. Therefore, this study focuses on the German context.

Summarizing the above, the need for a cultural change seems evident. However, guidelines for the cultural elements that must be changed from the traditional toward the intended partnering culture to support the desired change are missing, including all key-stakeholder perspectives as they shape the individual project cultures in common. Thus, the current paper aims to develop this guidance by answering the following main research question: What are the key stakeholders’ perspectives of an ideal partnering culture and how do these compare to the current situation?

The rest of the paper is organized as follows. After presenting the research design in Section 2, the concept of “project culture” and its measurement are further explored in Section 3. In Section 4, the data and data analysis about the current project culture and the desired project culture in terms of partnering are presented from the perspectives of different stakeholders. Section 5 further explores the differences and similarities in perceptions of the stakeholders. Section 6 presents the discussion, and Section 7 concludes the work. Finally, Section 8 provides recommendations for further investigations.

2 Research design

To fulfill the cultural change from adversarial toward partnering, both cultures must first be defined. In this study, the current and the desired project culture are investigated in the context of the German turnkey construction industry. As partnering is an approach focused on forging cooperation among all parties toward the success of the projects (Black et al., 2000), the perspectives on project culture of different stakeholders should be included in this definition.

If the two cultures (current and idealized partnering) are defined, academics and project managers can measure and compare their actual project cultures in the context of the current and the idealized partnering project culture. One example would be investigated whether efforts to change project culture toward partnering are effective.

To answer the main question formulated in Section 1, this paper addresses the following research questions (RQs):

RQ1: How do the various key stakeholders consider the current project culture in the German turnkey construction industry?

RQ2: How does the ideal project culture for the German turnkey construction industry look like from the different key stakeholders’ perspectives if partnering is intended?

RQ3: Which characteristics of project culture should be

changed to improve it in the direction of the defined ideal project partnering culture?

RQ4: What are the differences between the stakeholder perspectives of the current and the desired partnering project culture?

The key stakeholders of construction projects are as follows: (1) Clients/Investors; (2) General Contractors; (3) Consultants (Doloi, 2013), such as Designers and Structural Engineers; and (4) (Sub-)Contractors (Hinze and Tracey, 1994). Three companies for each stakeholder group, all working in the German turnkey building construction industry, were invited to participate in this study. The stakeholder groups consisted of participants with different functions and hierarchies in order to evaluate their perceptions on projects. Participants were selected to include a mix of functions, such as blue collar workers, engineers, merchants and managing directors of the appropriate discipline. This diversity is so crucial as project culture is shaped by all project members, who belong to different parties and have different interests and functions. The research was organized in a workshop setting, during which we ensured that all key stakeholder groups were present, including different functions within these groups. A total of 12 workshops were held with 72 participants.

The participants were told that the focus of the research was on the cultural aspects of partnering. They were asked to quantify the characteristics of the current project culture and the desired culture in terms of partnering through the standardized questionnaire of the "Organizational Culture Assessment Instrument" (OCAI), which belonged to the "Competing Values Framework" (CVF) by Cameron and Quinn (2011), see the Appendix. The survey was translated into German, and few wording changes were carried out to adjust the survey for projects instead of corporate organizations.

The questionnaire consisted of six categories: (1) dominant characteristics, (2) organizational leadership, (3) management of employees, (4) organization glue, (5) strategic emphases, and (6) criteria of success. Each category consisted of four alternatives, each alternative being associated with one of the cultural quadrants. The participants had to divide 100 points over these four alternatives to label the extent as they perceived the current or the intended culture (Cameron and Quinn, 2011). A mean score was determined for each of the four quadrants, representing the accordance or desire with its features.

In terms of analysis, the mean scores for the current and desired culture per stakeholder group were calculated to answer RQ1 and RQ2. The Wilcoxon Signed Ranks test was performed in order to compare these two cultures and to answer RQ3 (Eid et al., 2017). Subsequently, statistically relevant differences between the stakeholder groups were investigated using the Kruskal–Wallis test and the pairwise comparison of the relevant stakeholder groups to answer RQ4.

3 Project culture and its measurement

Multiple definitions of "culture" exist, and one of the most common definitions is from Hofstede (1984), who stated that culture is "the collective programming of the mind which distinguishes the members of one group or society from those of others". This means that each culture is considered unique. This is for national groups as true as for single sub-cultures as project cultures in industries.

As a sub-culture, construction culture differs from other industry cultures because of a project's particularities, including its uniqueness, temporal limitation, and multi-disciplinary nature (IPMA, 2015), as well as the construction industries' special circumstances, such as site production, temporary multiorganization, and the intervention of regulatory authorities (Koskela, 1992). While other studies (Sandrk Nukic and Huemann, 2016) put single construction industry's cultures in national contexts and investigated their unique particularities in the national cultural context, the current paper focuses on cultures of individual projects within a single country. The reason for focusing on this aspect is that project cultures, similar to organizational cultures, are influenced by multiple cultural dimensions that are beyond national cultural characteristics (Karahanna et al., 2005) because of the many individual project members with multiple backgrounds. Thus, putting projects only in the national cultural contexts of their localization seems to be too simplistic. All individuals within an (project) organization influence one another and form a common culture through shared experiences (Cohen et al., 1995; Schein, 2017), but every individual is influenced by his/her respective cultural backgrounds and history (Cohen et al., 1995).

Some factors influencing the individual project members and, thus, the project culture are as follows: (1) areas of expertise (and the according sub-culture); (2) service time within their respective organizations; (3) experiences in projects, project work and various organizations; (4) service time within organizational units; (5) functions and hierarchical levels; (6) personal interests; (7) gender; (8) ethnical affiliations; and (9) regional, national, and sociocultural origins (Sackmann, 2009). Cultural diversities within teams can lead to either "a productive advantage or a problematic challenge" (Pitfield et al., 2015) due to different perspectives on the current tasks (Ochieng and Price, 2010) as well as variations in skills, beliefs, and experiences (Ranf, 2010).

Although there is no "right or wrong culture" (Cameron and Quinn, 2011), some cultural characteristics are more intended for specific situations than others. To be able to shape a culture toward an intended one, a greater understanding of the components determining that initial culture is required (Ballard and Howell, 1994). The most common framework (Ferreira, 2014) to measure and describe culture in an organizational context is the CVF.

The framework categorizes organizational culture in two dimensions. One dimension “differentiates effectiveness criteria that emphasize flexibility, discretion and dynamism from criteria that emphasize stability, order, and control”, whereas “the second dimension differentiates effectiveness criteria that emphasize an internal orientation, integration, and unity from criteria that emphasize an external orientation, differentiation, and rivalry” (Cameron and Quinn, 2011). Figure 1 shows the two dimensions and the four resulting quadrants. This layout can be described as a common circumplex model to describe cultures with their competing features (Strack, 2012).

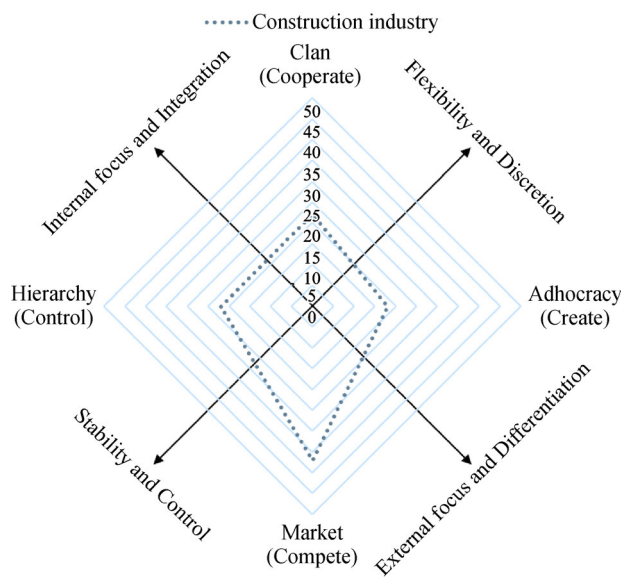


Fig. 1 The construction industry’s global culture (based on Cameron and Quinn (2011)).

The Clan (Cooperate) quadrant with flexible and internal focused characteristics represents a culture that is characterized by open and friendly conditions and the perception of family-like behaviors within the organization (Paro and Gerolamo, 2017). The relationships are characterized by employee empowerment and partner-like conditions between the involved persons (Cameron and Quinn, 2011). The opposite Market (Compete) quadrant, which has distinct stability and external focus, represents the focus on internal and external competitive advantage through economic market mechanisms and productivity. The general assumption in market pronounced cultures is that the environment is hostile instead of benign (Cameron and Quinn, 2011; Paro and Gerolamo, 2017). The Hierarchy (Control) quadrant, which has characteristics that are especially internally focused, stable, and controlled, represents cultures that are focused on efficiency through standardized and reliable conditions and

behaviors. The opposite Adhocracy (Create) quadrant represents cultures that especially “foster adaptivity, flexibility, and creativity if uncertainty, ambiguity, and information overload are typical”. These cultures are characterized by innovations, dynamic changes, and temporary decisions, while it is common for individuals to take risks.

Figure 1 shows the construction industry culture’s average level and its particularities in the CVF, respectively, based on research in five different continents, dominantly the United States of America. As this source does not give the detailed numbers for the scores, they are visually extracted for discussion in this paper (Table 1). The findings confirm that the industry’s culture is currently especially characterized by the competitive characteristics of the Market quadrant. This ranking goes along with the described culture with its focus on high competition. The opposite Clan quadrant shows medium waged scores. It can be argued that this represents the certain proportion of cooperation, which is necessary to fulfill the own tasks in cooperation with the other parties, in order to realize the construction project. The Hierarchy quadrant also shows medium waged scores, whereas the opposite Adhocracy scores are the fewest pronounced of all quadrants. This distribution can be explained through the clear (technical) rules and processes on construction sites, which leave little room for creative and spontaneous behaviors.

Table 1 The construction industry’s global culture (results of the OCAI from Cameron and Quinn (2011))

	Clan	Adhocracy	Market	Hierarchy
Construction industry’s global culture	22	18	37	23

The global construction industry’s culture, as presented in Fig. 1, will be used as reference point in our study of project culture of the German construction industry.

4 Research results

Table 2 shows the mean scores of the project culture dimensions from each stakeholder group. These are visualized in Figs. 2–6 and described in detail in the following to answer RQ1 and RQ2. The global construction industry culture (Fig. 1) is also presented in these figures to enable a comparison among the global culture, the current German project culture, and the desired partnering culture. The quality of the data are investigated first, followed by an explanation of the data per stakeholder group.

To investigate the distributions of the data and to decide which further tests are appropriate, the Shapiro–Wilk test was conducted for all cultural dimensions and stakeholder

Table 2 Mean scores of the project culture dimensions from the perspectives of the key stakeholders

	Is-Clan	Is-Adhocracy	Is-Market	Is-Hierarchy	Should-Clan	Should-Adhocracy	Should-Market	Should-Hierarchy
Investor (Fig. 2)	19.0	19.7	36.2	25.1	30.4	23.4	21.4	24.8
General Contractor (Fig. 3)	20.4	16.5	34.8	28.3	35.4	17.2	17.8	29.7
(Sub-)Contractor (Fig. 4)	16.1	18.1	35.9	29.9	28.6	19.6	23.3	28.5
Designer (Fig. 5)	19.8	15.3	32.8	32.2	30.5	22.4	20.1	27.0
Entire stakeholders (Fig. 6)	18.8	17.3	34.9	29.0	31.2	20.5	20.7	27.6

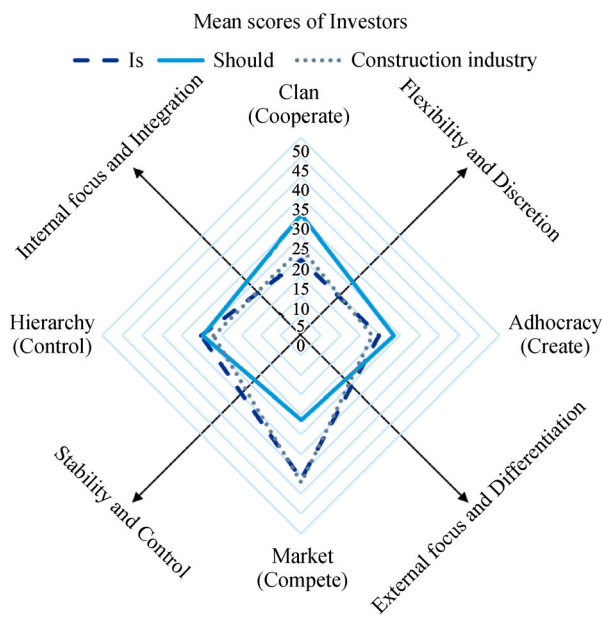


Fig. 2 Visualization of the mean scores of the stakeholder group of Investors.

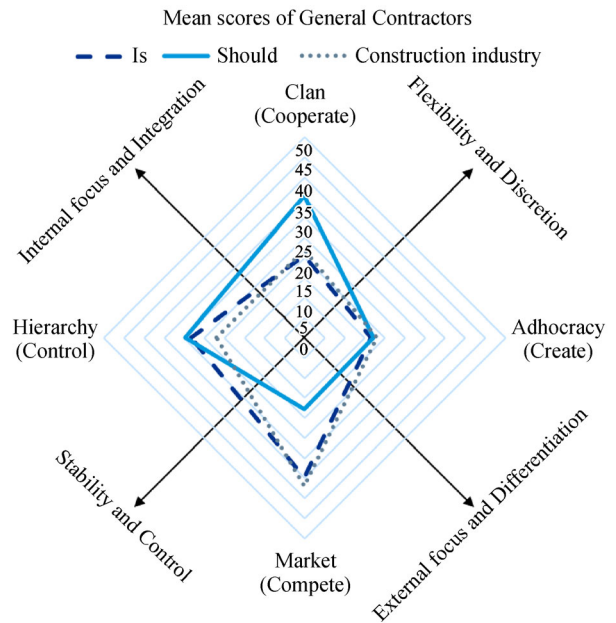


Fig. 3 Visualization of the mean scores of the stakeholder group of General Contractors.

groups (Table 3). The results indicate that the data are not normally distributed in all categories, and this condition influences the subsequent analyses, i.e., it implies the use of the Wilcoxon Signed Ranks test and the Kruskal–Wallis test (Eid et al., 2017).

Furthermore, Cameron and Quinn (2011) suggested checking the reliability through Cronbach's alpha coefficients to examine the correlation between the different items (Eid et al., 2017). The Cronbach's alpha score should

be at least 0.7 (Field, 2018) to confirm that the multiple items are measuring the same characteristics. Table 4 shows the coefficients of the Cronbach's alpha test from the determined survey with relatively low numbers as outcomes for some categories. Earlier studies that used the OCAI showed mixed results: Some reported Cronbach's alpha scores above 0.7 (Quinn and Spreitzer, 1991; Cameron and Quinn, 2011; Sandrk Nukic and Huemann, 2016), others calculated similar Cronbach's alpha scores as

Table 3 Results of the Shapiro–Wilk test of normality

	Is-Clan	Is-Adhocracy	Is-Market	Is-Hierarchy	Should-Clan	Should-Adhocracy	Should-Market	Should-Hierarchy
Investor	0.165	0.697	0.639	0.197	0.095	0.422	0.651	0.080
General Contractor	0.882	0.589	0.054	0.752	0.780	0.610	0.377	0.104
(Sub-)Contractor	0.261	0.232	0.512	0.882	0.008*	0.243	0.439	0.368
Designer	0.048*	0.530	0.571	0.725	0.023*	0.071	0.575	0.656
Entire sample	0.033*	0.715	0.418	0.077	0.031*	0.458	0.160	0.057

Note: * indicates non-normal distribution, significant at the 0.05 level.

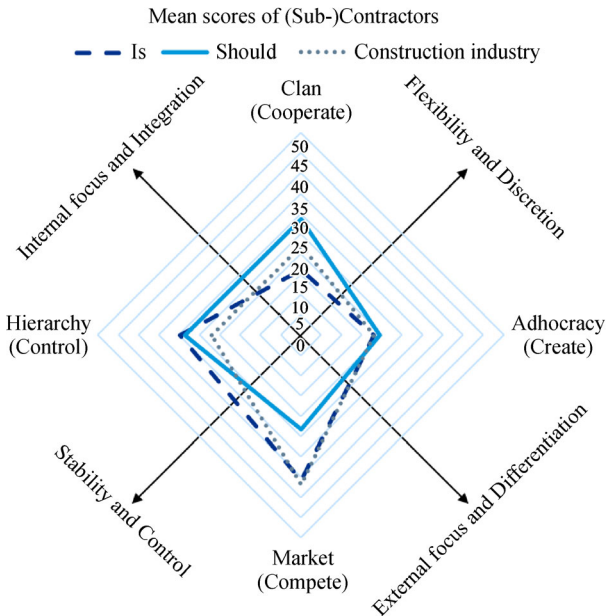


Fig. 4 Visualization of the mean scores of the stakeholder group of (Sub-)Contractors.

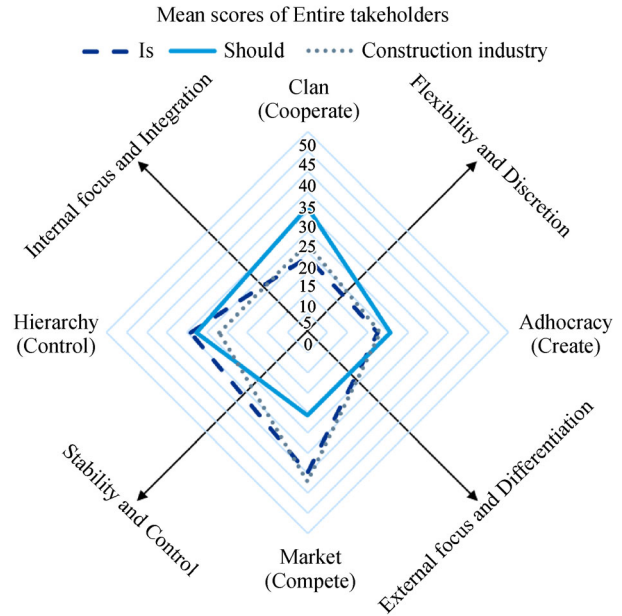


Fig. 6 Visualization of the mean scores of all the stakeholders.

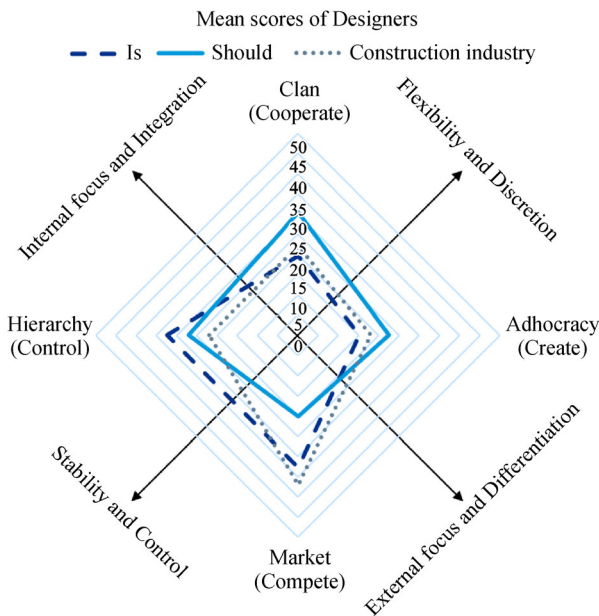


Fig. 5 Visualization of the mean scores of the stakeholder group of Designers.

those in our study (Helfrich et al., 2007; Strack, 2012). According to Strack (2012), these low scores arise from the limited number of questions of the OCAI and the simplicity of the CVF through the classification of the two dimensions and four quadrants without any sub-scales. The author argued that many other frameworks to measure

and describe culture as interpersonal circumplex models use eight axes, which leads to more precise outcomes and, consequently, more reliable surveys.

Nevertheless, Strack (2012) concluded that CVF, even with low Cronbach's alpha scores, is a practical tool due to its simplicity, applicability, and transparency with a focus on describing organizational culture, especially for identifying, describing and analyzing discrepancies and conflicting interests between stakeholders. Given that the CVF well-matches the motivation of this paper, focusing on a comparison of the stakeholders' perspectives of generalized projects and idealized partnering projects, we continued the investigations despite the low Cronbach's alpha scores for some categories.

The Wilcoxon Signed Ranks test was performed to investigate the significant differences between current and ideal project cultures, using combined data from all stakeholder groups. Table 5 shows the results: A significant score implies a significant difference. These results are discussed per stakeholder group in the subsequent sections.

4.1 Current and desired project cultures for Investors

The Investors rate the current German project culture in a very similar way to the global study conducted by Cameron and Quinn (2011), see Fig. 2. From their perspective, the current project culture is especially focused on competition and their own interests. This is represented by the high scores of the Market quadrant, whereas the low scores of the Clan quadrant represent a certain necessary degree of cooperation, but not

Table 4 Cronbach's alpha coefficients for various quadrants

	Is-Clan	Is-Adhocracy	Is-Market	Is-Hierarchy	Should-Clan	Should-Adhocracy	Should-Market	Should-Hierarchy
Cronbach's alpha	0.76	0.46	0.74	0.56	0.72	0.66	0.67	0.62

Table 5 Results of the Wilcoxon Signed Ranks test to investigate the differences between Is and Should cultures for various stakeholder groups

	Is-Clan vs. Should-Clan	Is-Adhoc. vs. Should-Adhoc.	Is-Market vs. Should-Market	Is-Hierarchy vs. Should-Hierarchy
Investor	0.000*	0.078	0.001*	0.265
General Contractor	0.001*	0.623	0.003*	0.538
(Sub-)Contractor	0.000*	0.765	0.000*	0.337
Designer	0.003*	0.003*	0.001*	0.044*
Entire sample	0.000*	0.001*	0.000*	0.090

Note: * significant at the 0.05 level.

distinctively. The scores of the Hierarchy quadrant are higher than those of the Adhocracy quadrant, and both assessments ("Is" and "Should") are very similar to the numbers of the global study, representing a culture that is focused more on clear standards and processes and less on spontaneous and creative decisions.

The Investors define the intended partnering project culture as especially characterized by features from the Clan quadrant, with balanced features on the axis between the Adhocracy and the Hierarchy quadrants and the least characteristics from the Market quadrant. Thus, they define it as cooperative with levelled behaviors between clear roles and processes, spontaneity and creativity, and competing aspects—to a limited extent.

The results of the Wilcoxon Signed Ranks test for this stakeholder group (Table 5) show that there are no cultural changes on the Hierarchy-Adhocracy axis required; however, changes on the Market-Clan axis in the direction of the Clan quadrant are necessary if partnering is intended. Furthermore, there is a desire for more cooperation and less competition within the projects.

4.2 Current and desired project cultures for General Contractors

The General Contractors rate the current project culture in a similar way as the global study, as shown in Fig. 3, which only differs in terms of the Hierarchy scores. The General Contractors rate Hierarchy as more pronounced than the global study did. Accordingly, they perceive that their projects are characterized by more structure and standardized behaviors than the global study describes the industry.

The intended partnering culture is strongly pronounced by the features from the Clan quadrant and with few features from the Market quadrant. The shape of the intended culture on this axis is more pronounced toward the Clan quadrant than that of all other stakeholder groups.

Thus, especially cooperative behaviors are intended. On the Hierarchy-Adhocracy axis, the General Contractors prefer more features from the Hierarchy quadrant with clear processes and responsibilities and less creativity and unpredictability. From the Wilcoxon Signed Ranks test (Table 5), it has been shown that the General Contractors do not exhibit any motivation to change project cultures on this axis, but prefer cultural changes on the Clan-Market quadrant axis in the direction of the Clan quadrant.

4.3 Current and desired project cultures for (Sub-)Contractors

The (Sub-)Contractors perceive the current project culture in terms of the features from the Market and the Adhocracy quadrants in a very similar way as the global study, as shown in Fig. 4. In terms of the features from the Hierarchy quadrant, their perception is that the projects are more characterized by clear processes and standards. In terms of cooperative behaviors, represented by the Clan quadrant, their perception is that these features are less pronounced than those described in the global study.

Their definition of an ideal partnering culture is especially pronounced by the features from the Clan and the Hierarchy quadrants. So, they intend a culture that is characterized by cooperation, clear procedures, and strict planning. The (Sub-)Contractors show a desire for medium waged behaviors from the Market quadrant, thus an appreciable sense for competition, and only some characteristics like flexibility from the Adhocracy quadrant.

The (Sub-)Contractors do not consider to change the cultural aspects on the Hierarchy and Adhocracy axis to improve the culture in a partner-like way, as shown in the results of the Wilcoxon Signed Ranks test in Table 5; while as the other stakeholder groups, they consider the Clan-Market axis as the necessary direction for a cultural change.

4.4 Current and desired project cultures for Designers

The Designers perceive the current project culture as much more characterized by features from the Hierarchy quadrant than the global study did, as shown in Fig. 5. Matching this evaluation, they see only few peculiarities from the opposite Adhocracy quadrant in the current project culture. They perceive the features from the Clan quadrant to be almost similar pronounced as those in the global study, whereas they perceive less characteristics from the Market quadrant.

Their definition of the ideal partnering culture is especially characterized by features from the Clan and the Hierarchy quadrant, showing medium waged scores in the Adhocracy quadrants and moderate pronounced features from the Market quadrant. Thus, the ideal partnering culture, according to the Designers, is characterized by clear procedures, cooperative behaviors, a certain focus on the market, and space for creativity.

Accordingly, the Designers desire two cultural shifts from the current project culture toward a partnering culture. First, as the other stakeholders, from features of the Market quadrant toward features of the Clan quadrant; and second, a cultural shift on the Hierarchy-Adhocracy axis toward more spontaneous decisions and creativity. This is reflected in the results of the Wilcoxon Signed Ranks test shown in Table 5.

4.5 Current and desired project cultures for all stakeholder groups

The mean scores of the CVF for the current and ideal cultures based on the entire sample are shown in Fig. 6. The perceptions about the current project culture show that the Market and Adhocracy scores are very similar to those of the global study. This confirms that the current culture is focused especially on high competition and the stakeholders' respective interests (Eschenbruch, 2008), but less on creativity or spontaneous decisions. The current study's participants rank the Hierarchy features higher than that in the global study. This means that they perceive a culture that is more characterized by formalisms, standards, and clear procedures compared to the global evaluations of Cameron and Quinn (2011). The scores of the Clan characteristics indicate that the participants perceive even less cooperation in the German project culture than the global study did.

The mean scores for the desired culture in terms of partnering show that it is especially characterized by

cooperative features from the Clan quadrant. Moreover, the features from the Hierarchy quadrant are more pronounced, indicating a desire for clear tasks and responsibilities. The scores from the Adhocracy and Market quadrant are less pronounced. Hence, spontaneity and creativity as well as competing behaviors are only little desired.

Based on the results per stakeholder group, agreement seems clear about a desired cultural shift from Market to Clan. In comparison, less clear agreement is seen in the findings of the Hierarchy-Adhocracy quadrants. Including the entire sample, the results of the Wilcoxon Signed Ranks test (Table 5) show that the Hierarchy quadrant is the only one that does not require a change to shift the project culture toward partnering. The biggest necessary shift is from the Market quadrant toward the Clan quadrant. In terms of the characteristics from the Adhocracy quadrant, there should be a minor cultural shift toward greater flexibility and creativity.

5 Further exploring stakeholder groups' perceptions and interpretation

As shown, differences exist between the stakeholders regarding the perception of the current project culture in the German construction industry and the idea of an ideal partnering project culture. To compare the perceptions of the stakeholder groups, the Kruskal–Wallis tests were performed. Table 6 shows statistical relevant differences between the quadrants (1) Is-Adhocracy, (2) Should-Clan and (3) Should-Adhocracy. It also shows that the valuations of the other quadrants can be interpreted as similar from the perspectives of all stakeholder groups. To investigate which stakeholder groups differ at each of the three statistically differing quadrants, pairwise comparisons of the various stakeholder groups were conducted.

5.1 Adhocracy quadrant—current culture

Table 7 shows that the perceptions regarding the current features of the Adhocracy quadrant differ between the Designers and the Investors. In particular, the Investors evaluate the current project culture with more pronounced features from the Adhocracy quadrant than the Designers.

Thus, the Investors perceive the current project cultures as a spontaneous and creative environment, whereas the Designers perceive the opposite. It could be argued that

Table 6 Results from the Kruskal–Wallis tests

	Is-Clan	Is-Adhocracy	Is-Market	Is-Hierarchy	Should-Clan	Should-Adhocracy	Should-Market	Should-Hierarchy
Kruskal–Wallis H	3.473	8.172	3.209	7.410	7.946	11.28	6.391	3.522
Asymp. sig.	0.324	0.043*	0.360	0.060	0.047*	0.010*	0.094	0.318

Note: * significant at the 0.05 level.

Table 7 Pairwise comparison of the stakeholder perceptions of the Is-Adhocracy scores

Sample1 – Sample 2	Test statistic	Std. error	Std. test statistic	Sig.	Adj. sig ^a
Designer – General Contractor	4.861	6.969	0.698	0.485	1.000
Designer – (Sub-)Contractor	10.856	6.793	1.598	0.110	0.660
Designer – Investor	19.462	7.184	2.709	0.007	0.040
General Contractor – (Sub-)Contractor	-5.994	6.793	-0.882	0.378	1.000
General Contractor – Investor	14.601	7.184	2.032	0.042	0.253
(Sub-)Contractor – Investor	8.606	7.013	1.227	0.220	1.000

Notes: Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same; asymptotic significances (2-sided tests) are displayed; and the significance level is 0.05. ^a Significance values have been adjusted by the Bonferroni correction for multiple tests.

Investors are often responsible for design changes during all project phases. This is because they have to deal with uncertain and changing customer demands, which can lead to necessary design and planning changes. As they are in the lead, they have the freedom to direct changes and define the final project. Due to this freedom, they experience flexibility. All other parties have to deal with these changes and decisions, which does not allow the pursuit of their “own” creativity and freedom of decision. Especially, the Designers are confronted with this situation and often have to realize the arrangements precisely as prescribed without becoming involved in the decision-making processes.

5.2 Adhocracy quadrant — desired culture

Table 8 shows that the perceptions regarding the desired features of the Adhocracy quadrant differ between the General Contractors and the Investors. In particular, the

General Contractors show a lower desire for features from the Adhocracy quadrant than the Investors.

The General Contractors and the Investors have varying perceptions about the importance of the features from the Adhocracy quadrant (like flexibility and creativity), where the Investors desire a higher expression of these features than the General Contractors do. This might be rooted in their specific roles in the project. The Investors' desire for late changes in the turnkey business often rooted in their uncertainty about which client will rent the premises. This goes along which demands they have. In comparison, the General Contractors desire clear designs to manage the actual construction processes, in order to avoid continuous planning and design changes that may affect their schedule.

5.3 Clan quadrant — desired culture

Table 9 shows that the perceptions regarding the desired

Table 8 Pairwise comparison of the stakeholder perceptions of the Should-Adhocracy scores

Sample1 – Sample 2	Test statistic	Std. error	Std. test statistic	Sig.	Adj. sig ^a
General Contractor – (Sub-)Contractor	-6.150	6.792	-0.905	0.365	1.000
General Contractor – Designer	-18.222	6.968	-2.615	0.009	0.054
General Contractor – Investor	20.188	7.183	2.810	0.005	0.030
(Sub-)Contractor – Designer	-12.072	6.792	-1.777	0.076	0.453
(Sub-)Contractor – Investor	14.038	7.012	2.002	0.045	0.272
Designer – Investor	1.965	7.183	0.274	0.784	1.000

Notes: Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same; asymptotic significances (2-sided tests) are displayed; and the significance level is 0.05. ^a Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table 9 Pairwise comparison of the stakeholder perceptions of the Should-Clan scores

Sample1 – Sample 2	Test statistic	Std. error	Std. test statistic	Sig.	Adj. sig ^a
(Sub-)Contractor – Designer	-6.214	6.795	-0.914	0.360	1.000
(Sub-)Contractor – Investor	9.263	7.015	1.320	0.187	1.000
(Sub-)Contractor – General Contractor	18.853	6.795	2.775	0.006	0.033
Designer – Investor	3.049	7.186	0.424	0.671	1.000
Designer – General Contractor	12.639	6.971	1.813	0.070	0.419
Investor – General Contractor	-9.590	7.186	-1.335	0.182	1.000

Notes: Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same; asymptotic significances (2-sided tests) are displayed; and the significance level is 0.05. ^a Significance values have been adjusted by the Bonferroni correction for multiple tests.

features of the Clan quadrant in terms of partnering differ between the (Sub-)Contractors and the General Contractors. The (Sub-)Contractors rate this quadrant lower than the General Contractors do, in spite of it is the highest ranked score from the (Sub-)Contractors. Thus, from their perspective, other cultural characteristics—especially the features that belong to the Hierarchy quadrant—are important for a partnering project culture.

The (Sub-)Contractors judge the cultural features of the Clan quadrant not as crucial as the General Contractors do. The General Contractors want to focus more on cooperation within projects, whereas the (Sub-)Contractors desire a more balanced project culture. It could be argued that the General Contractors' long-term role within the projects (i.e., to manage the different interests of the stakeholders) could be the main reason for their focus on the cooperation aspects, whereas the (Sub-)Contractors often have to deal with multiple projects. Therefore, they also have to deal with external aspects, which in turn, leads to a more balanced desired culture in terms of the four quadrants.

6 Discussion

The Investors confirm the result of the global study from Cameron and Quinn (2011), which describes the construction industry's culture as especially pronounced by the competitive features from the Market quadrant. In comparison, the features from the other three quadrants are less pronounced. All other stakeholder groups see the features from the Hierarchy quadrant (like clear standards and procedures) as more pronounced than those reported by the global study. The (Sub-)Contractors' perception of the current culture differs in terms of cooperative behaviors, which they perceive as less pronounced than the global study or the other stakeholder groups do.

The Investors define an ideal partnering culture as especially pronounced by cooperative features from the Clan quadrant with few competitive characteristics from the Market quadrant. Moreover, they outline the necessary features of clearness and flexibility as balanced. Among all the stakeholder groups, the General Contractors' definition of a partnering culture is most pronounced by cooperative features from the Hierarchy quadrant. Competing behaviors and flexibility are only slightly distinct. Furthermore, the (Sub-)Contractors define a culture with highly pronounced features from the Clan and Hierarchy quadrants as necessary. What is striking is that they have the biggest desire for competitive features. It is concluded that the reason could be their service on multiple projects. From their point of view, the creative and flexible features from the Adhocracy quadrant must be least pronounced. Furthermore, the Designers define the ideal partnering culture as especially characterized by features from the Clan quadrant, followed by features from the Hierarchy quadrant. Furthermore, from their point of view, the

features from the Adhocracy and the Market quadrants are almost medium waged.

Taking the mean scores from all participants, the ideal partnering culture would be characterized by cooperative and clear features from the Clan and Hierarchy quadrants, whereas competitive and flexible behavior are only medium distinct.

All stakeholders, except the Designers, do not see significant cultural changes of other quadrants than the Market and Clan quadrants to improve projects in terms of partnering. Thus, the current distribution between the cultural features of the Adhocracy and Hierarchy quadrants seems appropriate for all stakeholders except the Designers. The Designers wish for a cultural shift from the features of the Hierarchy quadrant toward the Adhocracy quadrant, that is, from clear standards and processes toward more creativity and spontaneous decisions. The reason for this shift might be their perception of the current culture, which they considered as extraordinarily inflexible. Their non-inclusion in decision-making processes about changes, but the confrontation with determined modifications from the Investors might also play a role. If changes are agreed between Investors and their Clients, Designers must often find solutions for these new agreements without flexibility. The Designers' scores of the desired culture on the Hierarchy-Adhocracy axis are comparable to the other stakeholders; hence, the desire for the change is especially rooted in their perception of the current culture, and not of the desired culture.

Only the Investors and Designers differ in their perceptions of the current culture, and only about the features from the Adhocracy quadrant. The Designers see these features as only slightly pronounced, while the Investors perceive it in an opposite manner. It has been presumed that this is rooted in the different roles of these groups, especially for Investors who have to deal continuously with planning changes due to their customer's demands. However, the Designers do not share this perception but consider the features of the Adhocracy quadrant as only slightly pronounced.

Observing an intended partnering culture, there are different perceptions between the General Contractors and the Investors, where the General Contractors view the features of the Adhocracy quadrant to be not as important as the Investors do. This evaluation was also traced back to their specific roles, that is, the General Contractors desired for clear planning to manage the various construction processes, whereas the Investors desired for flexibility due to changing customer demands. Regarding the desired features of the Clan quadrant, the perceptions differ between the General Contractors and the (Sub-)Contractors. The General Contractors perceive more pronounced features, that is, more partner-like conditions, than the (Sub-)Contractors do. Such different desires might be rooted in the General Contractors' focus on single project and the (Sub-)Contractors' need to manage multiple

projects with shorter time ranges. Accordingly, the (Sub-) Contractors have a bigger desire to watch the current market situations and their own needs instead of a single project's necessities.

The limitations of the current study include the chosen of the measurement framework, OCAI. The Cronbach's alpha coefficients have shown that CVF's advantage, its simplicity, can lead to issues with the survey's inner test consistency. This however could be disregarded to investigate the different stakeholder perspectives and to define a concept of an idealized culture. Future research could focus on investigating real project cultures, requiring additional research methods to gain deeper knowledge about the cultures and motivations for behaviors. Another limitation of this study is that it is limited to the German turnkey construction industry. As a culture is always influenced by its history, future studies could investigate how industrial niches, national culture environments, or economic situations may influence the specific cultures.

It should be discussed whether "one" ideal partnering culture, such as that presented in Fig. 6, exists or if there would be ideal partnering cultures for different project phases and different stakeholder groups. One could argue that early project phases with limited knowledge about the details better fit creative and spontaneous characteristics from the Adhocracy quadrant than the opposite clear structured features from the Hierarchy quadrant. The opposite could be true during the construction phases, wherein design changes can lead to the known issues at construction projects (Olawale and Sun, 2010). Thus, one approach for further research could be to investigate not a general project culture, but specific cultures with specific stakeholder groups involved in different project phases.

7 Conclusions

The aim of this paper was to investigate the current project culture in the German turnkey market and the ideal project culture in terms of partnering, and which cultural characteristics must be changed to move from the current project culture toward an ideal partnering project culture, under the perceptions of various stakeholder groups. To measure the current culture and to define a partnering culture from the respective stakeholder perspectives, the

OCAI was conducted and data were gathered from 72 participants.

This paper showed which cultural features the different stakeholders perceive at usual construction projects and what cultural characteristics they desire in terms of partnering. The investigations show that there are many similarities and differences between the stakeholders' perspectives in terms of the current and the idealized partnering project cultures. The General Contractors desire more cooperative behaviors than the (Sub-)Contractors do, and the Investors desire more pronounced flexibility than the General Contractors do. All stakeholders desire a cultural change from highly competitive behaviors toward more cooperation. Changes in terms of clear procedures or more flexibility are only desired by the Designers, particularly toward more flexible behaviors.

8 Recommendations

Academics and project managers can use the OCAI and CVF to measure their current project cultures and to investigate whether their project cultures are already similar with the partnering culture or in which direction they could develop. The findings of this paper, especially the defined target project culture, could be used in further studies to investigate how project cultures can be developed toward more ideal partner-like conditions. Possible project management approaches for this change include (1) workshops that introduce the concept of partnering, (2) regular review meetings with the use of a questionnaire to measure the status of partnering, (3) social activities like team events that can be used to maintain the team spirit, (4) the introduction of a newsletter that can help celebrate successes and raise the awareness about partnering, and (5) the implementation of an incentive scheme for shared risk elements and savings to facilitate the implementation of partnering (Bayliss et al., 2004). Furthermore, Lean Construction approaches could lead to such a desired culture and should be investigated in this direction. Especially, the Last Planner System involves all stakeholders in active, regular, and integrative planning processes (VDI, 2019), which can lead to collaborative (Fernandez-Solis et al., 2013) and trust-based relationships (Mossman, 2015) and could accordingly be appropriate to shape the intended partnering culture.

Appendix

Table A1 The Organizational Culture Assessment Instrument (OCAI), slightly adjusted for project organizations

	Usual project culture	Idealized partnering project culture
1. Dominant characteristics		
The project organization is a very personal place. It is like an extended family. People seem to share a lot of themselves		

	<i>(Continued)</i>	
	Usual project culture	Idealized partnering project culture
The project organization is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks		
The project organization is very results-oriented. A major concern is with getting the job done. People are very competitive and achievement-oriented		
The project organization is a very controlled and structured place. Formal procedures generally govern what people do		
	Σ	100
		100
2. Organizational leadership		
The leadership in the project organization is generally considered to exemplify mentoring, facilitating, or nurturing		
The leadership in the project organization is generally considered to exemplify entrepreneurship, innovating, or risk taking		
The leadership in the project organization is generally considered to exemplify an aggressive, results-oriented, and no-nonsense focus		
The leadership in the project organization is generally considered to exemplify coordinating, organizing, or smooth-running efficiency		
	Σ	100
		100
3. Management of employees		
The management style in the project organization is characterized by teamwork, consensus, and participation		
The management style in the project organization is characterized by individual risk-taking, innovation, freedom, and uniqueness		
The management style in the project organization is characterized by hard-driving competitiveness, high demands, and achievement		
The management style in the project organization is characterized by security of employment, conformity, predictability, and stability in relationships		
	Σ	100
		100
4. Organizational glue		
The glue that holds the project organization together consists of loyalty and mutual trust. Commitment to this organization runs high		
The glue that holds the project organization together is commitment to innovation and development. There is an emphasis on being on the cutting edge		
The glue that holds the project organization together is the emphasis on achievement and goal accomplishment. Aggressiveness and winning are common themes		
The glue that holds the project organization together consists of formal rules and policies. Maintaining a smooth-running organization is important		
	Σ	100
		100
5. Strategic emphases		
The project organization emphasizes human development. High trust, openness, and participation persists		
The project organization emphasizes acquiring new resources and creating new challenges. Trying new things and prospecting for opportunities are valued		
The project organization emphasizes competitive actions and achievement. Hitting stretch targets and winning in the marketplace are dominant		
The project organization emphasizes permanence and stability. Efficiency, control and smooth operations are important		
	Σ	100
		100
6. Criteria of success		
The project organization defines success on the basis of the development of human resources, teamwork, employee commitment, and concern for people		

(Continued)

	Usual project culture	Idealized partnering project culture
The project organization defines success on the basis of having the most unique or the newest products. It is a product leader and innovator		
The project organization defines success on the basis of winning in the marketplace and outpacing the competition. Competitive market leadership is key		
The project organization defines success on the basis of efficiency. Dependable delivery, smooth scheduling, and low cost production are critical		
	Σ	100
	100	100

References

- Akintan O A, Morledge R (2013). Improving the collaboration between main contractors and subcontractors within traditional construction procurement. *Journal of Construction Engineering*, 281236
- Baiden B K, Agyekum K, Atuahene B T (2018). Client-contractor relations on construction projects in Ghana. *International Journal of Project Organisation and Management*, 10(4): 333–351
- Ballard G, Howell G (1994). Implementing lean construction: Stabilizing work flow. In: 2nd Annual Conference of the International Group for Lean Construction. Santiago
- Barlow J, Cohen M, Jashapara A, Simpson Y (1997). *Towards Positive Partnering: Revealing the Realities in the Construction Industry*. Bristol: Policy Press
- Bayliss R, Cheung S O, Suen H C H, Wong S P (2004). Effective partnering tools in construction: A case study on MTRC TKE contract 604 in Hong Kong. *International Journal of Project Management*, 22(3): 253–263
- Beach R, Webster M, Campbell K M (2005). An evaluation of partnership development in the construction industry. *International Journal of Project Management*, 23(8): 611–621
- Black C, Akintoye A, Fitzgerald E (2000). An analysis of success factors and benefits of partnering in construction. *International Journal of Project Management*, 18(6): 423–434
- Cameron K S, Quinn R E (2011). *Diagnosing and Changing Organizational Culture—Based on the Competing Values Framework*. 3rd ed. San Francisco: Jossey-Bass
- Chen W T, Merrett H C, Lu S T, Mortis L (2019). Analysis of key failure factors in construction partnering—A case study of Taiwan. *Sustainability*, 11(14): 3994
- Cheng E W L, Li H, Love P E D, Irani Z (2001). Network communication in the construction industry. *Corporate Communications*, 6(2): 61–70
- Cheung S O, Ng T S T, Wong S P, Suen H C H (2003). Behavioral aspects in construction partnering. *International Journal of Project Management*, 21(5): 333–343
- Cohen A R, Fink S L, Gadon H, Willits R D (1995). *Effective Behavior in Organizations: Cases, Concepts, and Student Experiences*. 6th ed. Burr Ridge, IL: Irwin Professional Publishing
- Davis K (2014). Different stakeholder groups and their perceptions of project success. *International Journal of Project Management*, 32(2): 189–201
- Doloi H (2013). Cost overruns and failure in project management: Understanding the roles of key stakeholders in construction projects. *Journal of Construction Engineering and Management*, 139(3): 267–279
- Eid M, Gollwitzer M, Schmitt M (2017). *Statistics and Research Methods*. Weinheim, Basel: Beltz Verlag (in Germany)
- Eriksson P E, Nilsson T, Atkin B (2008). Client perceptions of barriers to partnering. *Engineering, Construction, and Architectural Management*, 15(6): 527–539
- Eschenbruch K (2008). Partnering as a management approach—definition and conceptual classification. In: Eschenbruch K, Racky P, eds. *Partnering in the Construction and Real Estate Industry—Project Management and Contractual Standards in Germany*. Düsseldorf, Kassel: Verlag W. Kohlhammer, 1–3 (in Germany)
- Federal Ministry for Economic Affairs and Energy (2019). Economic situation and cyclical development. Available at: bmwi.de/Redaktion/EN/Dossier/economic-development.html
- Fernandez-Solis J L, Porwal V, Lavy S, Shafaat A, Rybkowski Z K, Son K, Lagoo N (2013). Survey of motivations, benefits, and implementation challenges of Last Planner System users. *Journal of Construction Engineering and Management*, 139(4): 354–360
- Ferreira A I (2014). Competing Values Framework and its impact on the intellectual capital dimensions: Evidence from different Portuguese organizational sectors. *Knowledge Management Research and Practice*, 12(1): 86–96
- Field A (2018). *Discovering Statistics Using IBM SPSS Statistics*. London: Sage Publications
- Foley J, Macmillan S (2005). Patterns of interaction in construction team meetings. *CoDesign*, 1(1): 19–37
- Hatush Z, Skitmore M (1998). Contractor selection using multicriteria utility theory: An additive model. *Building and Environment*, 33(2–3): 105–115
- Helfrich C D, Li Y F, Mohr D C, Meterko M, Sales A E (2007). Assessing an organizational culture instrument based on the Competing Values Framework: Exploratory and confirmatory factor analyses. *Implementation Science*, 2(1): 13
- Hinze J, Tracey A (1994). The contractor–subcontractor relationship: The subcontractor's view. *Journal of Construction Engineering and Management*, 120(2): 274–287
- Hofstede G (1984). Cultural dimensions in management and planning. *Asia Pacific Journal of Management*, 1(2): 81–99
- International Project Management Association (IPMA) (2015). *Individual Competence Baseline for Project, Programme & Portfolio Management*. Zurich
- Johnston R, Lawrence P R (1988). Beyond vertical integration—the rise of the value-adding partnership. *Harvard Business Review*,

- 1988-07-01
- Karahanna E, Evaristo J R, Srite M (2005). Levels of culture and individual behavior: An investigative perspective. *Journal of Global Information Management*, 13(2): 1–20
- Koops L, Bosch-Rekvelde M G C, Coman L, Hertogh M, Bakker H (2016). Identifying perspectives of public project managers on project success: Comparing viewpoints of managers from five countries in North-West Europe. *International Journal of Project Management*, 34(5): 874–889
- Koskela L (1992). Application of the new production philosophy to construction, CIFE Technical Report #72. Stanford: Center for Integrated Facility Engineering (CIFE), Stanford University
- Larson E (1995). Project partnering: Results of study of 280 construction projects. *Journal of Management in Engineering*, 11(2): 30–35
- Mossman A (2015). Last Planner—5 + 1 crucial & collaborative conversations for predictable design & construction delivery. The Change Business Ltd.
- Newcombe R (2003). From client to project stakeholders: A stakeholder mapping approach. *Construction Management and Economics*, 21(8): 841–848
- Ng S T, Rose T M, Mak M, Chen S E (2002). Problematic issues associated with project partnering—The contractor perspective. *International Journal of Project Management*, 20(6): 437–449
- Nyström J (2005). The definition of partnering as a Wittgenstein family—resemblance concept. *Construction Management and Economics*, 23(5): 473–481
- Ochieng E G, Price A D F (2010). Managing cross-cultural communication in multicultural construction project teams: The case of Kenya and UK. *International Journal of Project Management*, 28(5): 449–460
- Olander S (2007). Stakeholder impact analysis in construction project management. *Construction Management and Economics*, 25(3): 277–287
- Olawale Y A, Sun M (2010). Cost and time control of construction projects: Inhibiting factors and mitigating measures in practice. *Construction Management and Economics*, 28(5): 509–526
- Paro P E P, Gerolamo M C (2017). Organizational culture for lean programs. *Journal of Organizational Change Management*, 30(4): 584–598
- Pitfield L E, MacLellan A M, Kelloway E K (2015). Multicultural diversity and communication in the project context. In: Chiochio F, Kelloway E K, Hobbs B, eds. *The Psychology and Management of Project Teams: An Interdisciplinary Perspective*. Oxford: Oxford University Press
- Quinn R E, Spreitzer G M (1991). The psychometrics of the competing values instrument and an analysis of the impact of organizational culture on quality of life. In: Woodman R W, Pasmore W A, eds. *Research in Organizational Change and Development*, vol. 5. Greenwich: JAI Press, 115–142
- Ranf D E (2010). Cultural differences in project management. *Annales Universitatis Apulensis: Series Oeconomica*, 12(2): 657–662
- Sackmann S A (2009). Cultural dynamics in project work. In: Dorn K H, Engstler M, Fitzsimons C J, Kerber G, Wagenhals K, Wagner R, eds. *Projects as Cultural Experience*. dpunkt-Verlag, 1–16 (in Germany)
- Sandrak Nukic I, Huemann M (2016). Organizational culture of the Croatian construction industry. *Engineering, Construction, and Architectural Management*, 23(2): 237–260
- Schein E H (2017). *Organizational Culture and Leadership*. 5th ed. Hoboken, NJ: Jossey-Bass
- Smiley J P, Fernie S, Dainty A (2014). Understanding construction reform discourses. *Construction Management and Economics*, 32(7–8): 804–815
- Sochan M (2018). *The Art of Strategic Partnering: Dancing with the Elephants*. Gilroy: NAK Publishing
- Sohi A J, Hertogh M, Bosch-Rekvelde M G C, Blom R (2016). Does lean & agile project management help coping with project complexity? *Procedia: Social and Behavioral Sciences*, 226: 252–259
- Strack M (2012). Organizational culture in the Competing Values Framework: Measuring characteristics in the OCAI's German adaptation. *Journal of Business and Media Psychology*, 3: 30–41 (in Germany)
- Turner R, Zolin R (2012). Forecasting success on large projects: Developing reliable scales to predict multiple perspectives by multiple stakeholders over multiple time frames. *Project Management Journal*, 43(5): 87–99
- Verein Deutscher Ingenieure (VDI) (2019). VDI 2553—Lean Construction. Available at: vdi.de/richtlinien/details
- Winch G M (1989). The construction firm and the construction project: A transaction cost approach. *Construction Management and Economics*, 7(4): 331–345
- Winch G M (2000). Institutional reform in British construction: Partnering and private finance. *Building Research and Information*, 28(2): 141–155