THE IMPACT OF ORGANIZATIONAL CHARACTERISTICS ON R&D PROJECTS PERFORMANCE IN HIGH-TECH COMPANY

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Abstract: In this study the impact of selected organizational characteristics on R&D projects performance were analyzed. The data for the empirical analysis come from a survey of 131 R&D projects across 53 high-tech business units. This study employs a configurational approach, using fuzzy set Qualitative Comparative Analysis (fs/QCA), to analyze the combination of structural differentiation, innovation strategy, cooperation with stakeholders, and project team autonomy with the performance of R&D projects. The results suggest that no single organizational characteristic is crucial to ensure the success of R&D projects but three causality paths lead to that outcome. Because of significant interdependencies, the main organizational characteristic contributing to the success of R&D projects in the high-tech company concern innovation strategy in connection with either cooperation with stakeholders or project team autonomy or structural differentiation.

Keywords: organizational characteristics, R&D projects, fuzzy-set Qualitative Comparative Analysis (fsQCA), high-tech organizations.

1. Introduction

The Project Management Body of Knowledge Guide (2013) defines a project as a temporary group endeavor that generates a unique product, service or result. The success of project management is the achievement of objectives dependent on budget, quality and methods for the scheduling and control of the project. Furthermore, there is still a debate among scientists and practitioners about the importance of studying the success factors of project (e.g. Ika et al. 2012; Mavi, and Standing, 2018). As project management success is measured using an array of different criteria, a multi-criteria decision making approach is appropriate as a method of evaluation. In reality, there are so many project management success factors it is difficult to identify the dependence relations between them.

The high-tech industries are characterized by a sustained rhythm of innovation, which is determined by dynamic and highly competitive markets and requires continuous increase of performance at the same or even reduced price. High-tech organizations often face challenges

as part of managing various types of R&D projects (Beckman, and Sinha, 2005). In R&D projects within high-tech industries, new products are designed, using not only established technologies, but also a substantial amount of new technologies. In fact, projects can include radical innovations that have revolutionary changes in technology and clear deviations from existing practices. According to several authors (e.g. Belso Martínez et al. 2013), a greater number of successful R&D projects leads to higher incomes for shareholders and higher learning for their employees. Linking innovation with project-based organizations in high-tech industries, this study demonstrates the effect of certain organizational characteristics on the success of the high-tech R&D projects.

This study uses fuzzy set Qualitative Comparative Analysis (fs/QCA), a set-theoretic approach with the ability to handle high degrees of complexity in how different causal conditions combine to bring about an outcome (Ragin, 2000, 2008). In the current research, this approach enables the study of organizational characteristics interdependently. Rather than estimating the average net effect of particular characteristics, the study assesses how multiple, alternative configurations of them explain R&D projects performance. These findings help complement some results in previous studies on R&D projects performance and shed light on the project's performance effects of selected organizational characteristics such as structural differentiation, innovation strategy, cooperation with stakeholders, project team autonomy.

The motivation for this study is twofold. First, prior literature tends to investigate the effect of the different organizational characteristics on the R&D projects performance in an isolated fashion, largely ignoring the fit between the characteristics and performance. One of the few studies on configurations of factors in relation to projects performance that could be identified through a literature review was research conducted by Dahlgren and Söderlund (2010) or Martínez, Molina-Morales, and Mas-Verdu (2013). Dahlgren and Söderlund (2010), by way of a multiple case study on four Scandinavian organizations, identified what type of projects performance is likely to be adopted under a combination of high vs. low project dependence and high vs. low project uncertainty. In turn linking innovation with project-based organizations, the study conducted by Belso Martínez, Molina-Morales, and Mas-Verdu (2013), demonstrates the effect of certain organizational characteristics in the success of innovation projects that a firm develops. The current paper builds on that research by examining how configurations of multiple organizational characteristics are related to the B&R projects performance. This constitutes the first contribution of the current paper. Secondly, studies of projects-based organizations in high-tech industries so far focus predominantly on performance management of projects or portfolios of projects but give little attention to performance management at the organization level. This study complements the earlier studies by applying organization theory to the study of project-based organizations in high-tech industries as called for recently by Miterev et al. (2017). In sum, the research question this paper answers is: What combinations of organizational characteristics are associated with the different R&D projects performance in high-tech organizations?

Following this introduction, Part 2 of this paper presents the theoretical framework, Part 3 describes the research method, Part 4 presents research findings and Part 5 contains the conclusions and discussion.

2. Theoretical background

The literature reveals a rich tradition of studies on contingency factors affecting projects performance in traditional, non projects-based organizations. The prior reviews conducted by Chenhall (2007) and Otley (2016) identify in essence the same contingency factors and include technology, strategy, organizational structure and size, and cooperation with partners, customers, and suppliers. The literature shows that there exists a lack of analysis about the impact of organizational characteristics on the performance of R&D projects. To maintain connectivity and consistency with previously derived evidence, the author of this research worked upon the studies of Chandrasekaran et al. (2015), Langfield-Smith (2006) and Ganter and Hecker (2014), Fiss (2011) regarding selection and definitions of organizational characteristics influencing the performance of R&D projects. On the basis of these considerations, the following Hypothesis was made: structural differentiation, innovation strategy, degree of cooperation with stakeholders and project team autonomy effect performance of R&D projects in a high-tech company. The section below elaborates on each of the characteristics and their association with projects performance as found in prior research.

In R&D settings, structural differentiation and ability to maintain separate reporting structures, metrics, and processes for different types of R&D projects are among the most important organizational characteristics (Chandrasekaran et al. 2012). Structural differentiation helps create the so-called pragmatic boundaries between R&D projects, helping them to coexist in the same environment (Gilbert, 2005). As indicated by research conducted by Chandrasekaran et al. (2015), project team members from innovative projects confirm that structural diversification within their business units helped them progress better in their projects. They proved that using structural differentiation based on the extent of change can be effective in managing innovation R&D projects in high-tech organizations.

The second organizational characteristic in this study captures the organizational attitude and behavior towards innovation and differentiates between explorative and exploitative innovation strategies of projects-based organizations. Explorative strategy is characterized by risk taking, search, variation, testing, discovery, flexibility and innovation in order to pursue innovations for new clients or markets (Jansen et al. 2006). On the other hand, exploitative strategy includes refinement, efficiency, selection, production, execution and implementation building on existing knowledge and needs of existing clients (Jansen et al. 2006). March (1991) argued for a fundamental trade-off between the exploration and exploitation strategies.

Distinguishing between exploration versus exploitation can have important implications for the ease of learning and, hence, the degree to which firms can build and leverage external experience for greater performance in subsequent R&D projects. Exploitation relies on making current processes and outputs more efficient though establishing routine, formalization, centralized authority, and standardized responses to environmental issues (Jansen et al., 2006). In contrast, Simons (1987) finds that high performing prospectors represent explorative strategy with radical innovations and are designed to meet the needs of emerging customers or markets. This ambiguity is in line with Langfield-Smith's (2006) literature review results. Literature strongly links exploitative and explorative innovation orientation to projects performance (Hoand, and Rothaermel, 2010; Jansen et al., 2006).

Another significant research variable under study is the cooperation with different stakeholders participating in a project as partners, customers, suppliers, etc. Stakeholders can be defined as an individual or a group of individuals, who are influenced by or able to influence a project. The strong cooperation with stakeholders is necessary for project success, since a project can be considered a temporary organization of stakeholders pursuing an aim together (Jepsen, Eskerod, 2009). In this regard, Belderbos et al. (2004) examined and demonstrated the significant impact of various types of cooperation shared in research and development for an increase in the value added per employee and the increase in sales of new products on the market. Their results show that cooperation with suppliers and partners has a significant impact on the increase of added value per employee and projects performance.

R&D projects can also benefit from different levels of team autonomy (Stewart 2006). As shown by the results of research carried out by Hoegl et al. (2004) and Lewis et al. (2002), team autonomy can benefit radical innovation projects that have higher uncertainties. According to Lewis et al. (2002), the high level of team autonomy gives teams the freedom to challenge existing ideas and solve complex problems related to product design. Increased autonomy increases the freedom of project teams to develop their own methods to achieve project objectives because they can design and implement solutions without authorization from senior management. By building trust and mutual understanding among project team members, the structure of tasks becomes more effective at higher levels of uncertainty. Consequently, high innovation projects can benefit from higher levels of team autonomy (Hoegl, et al. 2004).

According to Burton and Obel (2004, p. 18), “the fit among the patterns of relevant contextual, structural and strategic factors will yield better performance.” From this perspective, the fit of organizational characteristics namely structural differentiation, innovation strategy, explorative and exploitative strategy, degree of cooperation with stakeholders and project team autonomy can impact the R&D project performance.

3. Methods and data

To investigate the connection between combinations of contextual conditions, organizational characteristics and R&D projects performance, this paper applies fuzzy set Qualitative Comparative Analysis (fs/QSA), which is particularly suitable for comparing a small number of cases (10-40) regarding many variables (conditions) (4-7) (Rihoux, and Ragin, 2009). Fs/QCA aims to find subsets of cases within the data set that have the same causal conditions (organizational characteristics), leading to the same outcome (R&D projects performance). Fs/QCA is considered to be the most appropriate method for this study, because: (1) it enables exploration of configurations of conditions (pathways) that in conjunction lead to a particular outcome (e.g. R&D projects performance); (2) it allows for equi-finality, i.e., multiple causal pathways that lead to the same outcome of interest; (3) it differentiates between sufficient conditions (a single condition sufficient to predict an outcome), necessary conditions (a condition that must be included in every potential pathway to a given outcome); and INUS conditions (conditions that are part of one of the possible pathways to an outcome). Respectively, fs/QCA offers the unique opportunity to identify configurations of conditions, which are difficult to identify by means of other methods.

The data came from a survey of 131 R&D projects across 53 high-tech business units in Poland. Data collection took place between January 2018 and January 2019 and formed a part of a larger study investigating innovation and international issues goals in high-tech organizations. The author conducted in-house surveys in firms and face-to-face interviews with Senior Manager, Project Leader, and Project Team Members. If an interviewee could not understand or was not willing to answer certain questions during the in-house survey, the investigator gave explanations to avoid incomplete answers. The survey included questions such as decision-making styles, business unit performance, structural differentiation, strategy, and other demographics (size, R&D investments etc.). The survey instruments were pretested at the four business units and involved all 15 R&D projects described in the qualitative study. The pretest assessed three main characteristics of the survey: timing (average time for a respondent to complete the survey), clarity (are there any ambiguous measurement items and concepts in the survey?), and content validity (does each question makes sense and is it appropriate?). Precise understanding of the cases in relation to the results of the survey is crucial in fs/QCA (Rihoux, and Ragin, 2009), because it enables the researcher to develop comparative expertise, checking each case and interpreting the outcomes of the analysis. Given between-case comparison rather than within-case analysis was the aim of this research, conducting few interviews per case complemented with additional secondary data, is a common data collection strategy for QCA-studies.

All measures stem from established scales in the projects management literature. Drawing on established measurement scales is necessary as improper measurement may result in questionable findings and potentially unwarranted conclusions. R&D projects can have objectives and need to take a holistic assessment of performance (Gerwin, and Barrowman, 2002). B&R projects performance is measured using a seven-point Likert scale, which captures the success of a project relative to its objectives across the following two dimensions: adherence to schedule and adherence to budget (Chandrasekaran, et al. 2015). This performance was computed by averaging the score on these items. The project leaders were the informants to these measures. The strategy was measured using a scale that considered the degree of explorative and exploitative strategic orientation of the organization. The questionnaire used was developed by Jansen et al. (2006) and included three items on a seven-point Likert scale. The degree of cooperation with stakeholders, variable reflecting the company cooperation with other firms, partners, suppliers, and clients – stakeholders was based on the four items on a seven-point Likert scale adopted by Bourne (2005). The team autonomy measures the extent to which project teams were given control over project planning, project objectives, personnel selection, performance evaluations of the team, and task assignments. High scores indicate a high degree of team autonomy. The five items for this scale are adapted from Chandrasekaran et al. (2015).

It is important to emphasize that the final scores of cases on contingency factors and organizational characteristics, are not based only on the above items, but also significantly on in-depth interview and analysis of secondary data that have occurred and enabled validation and motivation of case scores. The case score motivations enabled relative comparison of scores between R&D projects performance, which revealed a few small inconsistencies between initial scores and motivations, e.g., same motivations for slightly distinct scores. Corresponding to the fs/QCA approach for case score validation by means of qualitative data (Rihoux and Ragin, 2009), these inconsistencies were adjusted.

The fs/QCA approach uses Boolean logic to analyze the relationships between cases (viewed as multiple combinations of different contingency factors) and the result. Therefore, fs/QCA is especially well suited for identifying different configurations leading to better performance, because the method identifies how membership of cases is applicable in causal conditions (i.e., selected organizational characteristics) is linked to membership in the outcome variable (i.e., success in R&D projects performance). Fs/QCA is conducted in several stages (Ganter, and Hecker, 2014). In the first stage, a Truth Table is developed. Secondly, the number of rows in the Truth Table is reduced. Determining the necessary conditions enables one to distinguish the cases that lead to the outcome. In opposition, cases where the outcome is not present are irrelevant, and are thus absent when testing propositions. Thirdly, after a review of the Truth Table, an algorithm that simplifies combinations and minimizes solutions is used. The cutoff value was set to 0.8, both in line with the theory (Rihoux, and Ragin, 2009), and with the distribution of consistency scores as observed in the Truth Table. This enabled

simplification of all the combinations of conditions into shorter and more parsimonious combinations of conditions (Rihoux, and Ragin, 2009). As shown in the Results section, no single condition was found to be sufficient on its own to predict an outcome, only INUS conditions that are part of sufficient pathways to a result. The next step is to analyze whether causal conditions belong to the core or to the peripheral configurations (parsimonious and intermediate solutions). The parsimonious solution involves all simplifying assumptions, regardless of whether they include easy or difficult counterfactuals. The intermediate solution involves simplifying assumptions by including easy counterfactuals. Core conditions are part of both parsimonious and intermediate solutions. Parsimonious solutions exclude peripheral conditions, which only appear in the intermediate solution.

For use of fs/QCA, the original scales first must be calibrated into set membership values (indicating the degree of membership in a set) in the range from 0 to 1. To arrive at continuous set membership values (in the range between 0 and 1), the log odds method described by Ragin (2008) is applied. As indicated in the literature (Ragin, 2008; Woodside, 2013), three anchor points were used to perform this calibration: the 5%-percentile, the median, and the 95%-percentile of a variable. The extreme points define full non-membership/full membership in a set, while the median is the crossover point indicating that a case is neither in nor out of a set (Ragin, 2008). All analyses used the fs/QCA 2.5 software package.

4. Research findings

This section presents the results from the analysis, explaining which conditions lead firms to the result (i.e., success in R&D project performance). The first step is to examine the conditions necessary for the result. A necessity test was executed to examine whether there is a single condition in all configurations to success in R&D projects performance. A condition is necessary when its consistency is above 0.9 (Ragin, 2008), which indicates the degree to which a condition is present in all cases with the same outcome. In this study no necessary conditions were found. The Fs/QCA method enables analyzing combinations of conditions (causal configurations) between structural differentiation, innovation strategy, cooperation with stakeholders and project team autonomy. By using the calibrated values (indicating degree of set membership) for organizational characteristics and for R&D projects performance, the consistency of all configurations of the organizational characteristics with a membership in the success in projects performance set was estimated. Table 1 shows each configuration's consistency and the resulting test against the consistency threshold of 0.74 (Woodside, 2013). Filled circles indicate above-threshold levels of the respective condition. Empty circles indicate below-threshold levels. Blank cells indicate ‘don't care’ conditions.

Table 1.
Configuration explaining organizational characteristics for success in R&D projects performance

Solutions	Casual conditions					Raw coverage	Unique coverage	Consistency	Solution coverage	Solution consistency
	SD	EXR IS	EXI IS	CSH	PTA					
Solution term 1	⊖	●	⊖	●		0.48	0,37	0,87	0,66	0,84
Solution term 2		●	⊖		●	0,33	0,24	0,86		
Solution term 3	●	⊖	●			0,25	0,19	0,75		

Note. Filled circles indicate above-threshold levels of the respective condition. Empty circles indicate below-threshold levels. Blank cells indicate 'don't care' conditions.SD – structural differentiation, EXR IS – explorative innovation strategy; EXI IS – exploitative innovation strategy, CSH – cooperation with stakeholders, PTA - project team autonomy.

For the interpretation of the results it is important to note that both the intermediate solution, most often used in fsQCA, and the parsimonious solution, which identifies the 'core conditions', are presented. In addition, the consistency and coverage for individual solution terms (pathways) and the overall solution (total set of pathways) are shown. Raw coverage refers to the total percentage of cases with the associated outcome that is represented by a solution term. For example, 48% of the cases that represented success in R&D projects performance are represented by solution term 1 in table 1. Unique coverage refers to the percentage of cases that is only represented by the relevant solution term and not simultaneously by another solution term, i.e. cases that fit to solution term 1 but not to solution term 2 or 3. Consistency refers to the percentage of cases of a solution term that result in the associated outcome. For example, 85% of the cases fit to solution term 1 in table 1. For the individual solution terms, the consistency of the explained result is respectively 87%, 86% and 75% while the overall solution consistency of the combinations of paths to success of B&R project performance is 84%. The overall coverage of 66% indicates that the three solution terms jointly cover 66% of the cases.

The first configurations, solution term 1 (table 1), shows that a sufficient condition for success in R&D projects performance is the combination of presence an explorative innovation strategy and a high degree of cooperation with stakeholders and absence of structural differentiation and exploitative innovation strategy. The second configuration, solution term 2 combines presence of explorative innovation strategy and high level of project team autonomy with absence of exploitative innovation strategy. The third configuration, solution term 3 indicates that presence of exploitative innovation strategy connection with structural differentiation and absence of explorative innovation strategy is associated with success in R&D projects performance. It is worth emphasizing that the explorative innovation strategy leads to success B&R projects performance when combined with the presence of a high degree

of cooperation with stakeholders (solution term 1) or with the presence of project team autonomy (solution term 2). Summarizing, all analyzed conditions to be INUS conditions for success in R&D projects performance. In other words, rather than having an individual effect, these conditions are part of sufficient configurations leading to the success in R&D projects performance.

5. Conclusions and discussion

This study aimed to answer the question what combinations of organizational characteristics contingency factors are associated with success in R&D projects performance in high-tech organizations. Results of Qualitative Comparative Analysis on 131 R&D projects across 53 high-tech business units revealed three configurations of conditions. Two configurations, namely solution term 1 and solution term 2 contained explorative innovation strategy. Organizations with explorative strategies flexibly take advantage of opportunities in the environment; have high exploration objectives of introducing new products and processes, which benefits from high levels of autonomy (Dent, 1990). Such organizations, as indicated and confirmed by research, are supported either through a high degree of cooperation with stakeholders (solution term 1) or a high level of project team autonomy (solution term 2). Both of these combinations are sufficient to achieve success in R&D projects performance. This study confirms that investing in collaboration with stakeholders can ensure the success of a project. Cooperative relationships with stakeholders have a significant effect on the growth of added value (Belderbos et al., 2004), but this cooperation should appear together with other variables such as presence an explorative innovation strategy and absence of structural differentiation. This configuration can improve firm performance through the optimal performance of firms' R&D projects, and can guide the management board towards the establishment of strategic relationships with stakeholders that meet certain criteria to ensure the operational and strategic objectives of the firm.

Moreover a high exploration objective in projects creates a complex task environment characterized by technological uncertainties and scheduling pressures (Sethi et al. 2012). Under these conditions earlier research shows that tensions can be overwhelming if the team members do not have an explicit control over task assignments, team member roles, and day-to-day objectives (Chandrasekaran et al. 2012). In these situations, higher levels of autonomy within the team help them to better navigate the development efforts and manage trade-offs between creativity and efficiency. This argument is also supported by studies on agile software development that argue for higher levels of team autonomy when managing the trade-offs between dual objectives of changing customer requirements and shorter time-to-delivery (Vidgen, and Wang, 2009).

Configuration three, solution term 3 (table 1), indicates that structural differentiation and exploitative innovation strategy to maintain their market position albeit through controlled innovation are sufficient conditions for success in R&D projects performance. This structural differentiation in combination with an exploitative strategy implies that the management does not need to be very proactive in developing radically new products, but does need to excel in delivering the products with superior customer service. These results confirm that using structural differentiation can be effective in managing innovation, R&D projects in high-tech organizations. For example, project team members working on R&D projects often enjoy the "required freedom and flexibility" when working on complex tasks as there is minimal pressure to speed up their development activities (Jansen et al. 2009a). Lack of structural differentiation in these settings may shift preference toward incremental innovation, since these projects have fast and predictable results when compared to radical innovation projects (Girotra et al. 2007). As a result, structural differentiation can have an enabling positive effect on R&D project performance conditional if properly understood.

This study examines organizational characteristics that affect R&D projects' performance. The analysis uses fs/QCA to identify combinations of causes that lead to success in R&D projects' performance for high-tech organizations in Poland. An explorative innovation strategy supported either through a high degree of cooperation with stakeholders or high levels of project team autonomy have an important effect on the success of R&D projects. Furthermore, this study also demonstrates the effect of an exploitative innovation strategy together with structural differentiation in the ultimate success of the R&D projects. The main effect of this study for practitioners is that practitioners can clearly identify the key aspects to success in launching, planning, and development of an R&D project. In the early stages of the R&D project, such a skill can help organizations choose a strategy, structure, identify partners, and determine the degree of cooperation with them and adopt the appropriate level of autonomy of project teams.

This research has certain limitations, which may create opportunities for future investigations. The analysis conducted in this paper was based on a relatively small number of cases, and the knowledge of cases was more limited than in some other case study methods. Therefore, conducting more interviews in one case can contribute to a better understanding of the success of R&D projects. The conducted research concerns only the performance of R&D projects in high-tech organizations. Research can be extended for various types of projects (consulting, engineering) for various business sectors, and even comparing the same organizations in different European regions. Furthermore cases in the research setting of this study did not vary in terms of national culture, structure or different types of business organizations. Future research is needed to investigate whether these factors (in configurations) play a role in the R&D projects performance.

While the results of this study are based on 53 cases and replication research is probably needed, it is important to emphasize the unique potential of fs/QCA as a research method. This method enables testing configurations of conditions in relation to a specific outcome (e.g. success of projects performance), in a way that is not possible by means of a linear additive approach. In cases where the interaction of the variables included in the study is mutually significant fs/QCA offers more accurate predictions of the outcome relative to the linear additive approach.

References

1. Beckman, S., and Sinha, K.K. (2005). Conducting academic research with an industry focus: Production and operations management in the high tech industry. *Production and Operations Management, 14(2),* 115-124.
2. Belderbos, R., Carree, M., and Lokshin, B. (2004). Cooperative R&D and firm performance. *Research Policy, 33*, 1477-1492.
3. Belso Martínez, J.A., Molina-Morales, F.X., and Mas-Verdu, F. (2013). Perceived usefulness of innovation programs for high-tech and low-tech firms. *Management Decision, 51(6),* 1190-1206.
4. Bourne, L. (2005). *Project relationship management and the stakeholder circle*^{TM}, RMIT University.
5. Burton, R., Obel, B. (2004). *Strategic organizational diagnosis and design: the dynamics of fit*. Norwell, MA: Kluwer Academic Press.
6. Chandrasekaran, A., Linderman, K., and Schroeder, R.G. (2012). Antecedents to ambidexterity competency in high-technology organizations. *Journal of Operations Management, 30(1-2),* 134-151.
7. Chandrasekaran, A., Linderman, K., and Schroeder, R. (2015). The Role of Project and Organizational Context in Managing High-tech R&D Projects. *Production and Operations Management*, *24(4),* 560-586.
8. Dahlgren, J., Söderlund, J. (2010). Modes and mechanisms of control in multiproject organizations: the R&D case. *International Journal of Technology Management, 50,* 1-22.
9. Dent, J.F. (1990). Strategy, organization and control: some possibilities for accounting research. *Accounting, Organization and Society*, *15(1-2),* 3-25.
10. Fiss, P.C. (2011). Building better causal theories: A fuzzy set approach to typologies in organizational research. *Academy of Management Journal, 54(2),* 393-420.
11. Ganter, A., and Hecker, A. (2014). Configurational paths to organizational innovation: Qualitative comparative analyses of antecedents and contingencies. *Journal of Business Research, 67,* 1285-1292.

12. Gerwin, D., and Barrowman, N. J. (2002). An evaluation of research on integrated product development. *Management Science, 48(7),* 938-953.
13. Gilbert, C. 2005. Unbundling the structure of inertia: Resources versus routine rigidity. *Academy of Management Journal, 48(5),* 741-763.
14. Hoand, H., and Rothaermel, F. (2010). Leveraging internal and external experience: exploration, exploitation, and R&D project performance. *Strategic management Journal*, *31,* 734-758.
15. Hoegl, M., Weinkauf, K., and Gemuenden, H.G. (2004). Interteam coordination, project commitment, and teamwork in mutliteam R&D projects: A longitudinal study. *Organization Science, 15(1),* 38-55.
16. Ika, L., Diallo, A., and Thuillier, D. (2012). Critical success factors for world bank projects: An empirical investigation. *International Journal of Project Management, 30(1),* 105-116.
17. Jansen, J.P., Van den Bosch, F.A.J., and Volberda, H.W. (2006). Exploratory innovation, exploitative innovation, and performance: effects of organizational antecedents and environmental moderators. *Management Science, 52(11),* 1661-1674.
18. Jepsen, A.L., and Eskerod, P. (2009). Stakeholder analysis in projects: Challenges in using current guidelines in the real world. *International Journal of Projects Management*, *27(4),* 335-343.
19. Langfield-Smith, K. (2006). A review of quantitative research in management control systems and strategy. In C.S. Chapman, A.G. Hopwood, M.D. Shield (Eds.), *Handbooks of Management Accounting Research, 2,* 753-783.
20. Lewis, M.W., Welsh, M.A., Dehler, G.E., and Green, S.G. (2002). Product development tensions: Exploring contrasting styles of project management. *Academy of Management Journal, 45(3),* 546-564.
21. March, J.G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2 (special issue: Organizational learning),* 71-87.
22. Mavi, R.K., and Standing, C. (2018). Critical success factors of sustainable project management in construction: A fuzzy DEMATEL-ANP approach. *Journal of Cleaner Production, 194*, 751-765.
23. Miterev, M., Turner, J.R., and Mancini, M. (2017). The organization design perspective on the project-based organization: a structured review. *International Journal of Managing Projects in Business*, *10(3),* 527-549.
24. Project Management Institute, PMI, (2013). *A Guide to the Project Management Body of Knowledge (PMBOK Guide).* United States, PA.
25. Ragin, C.C. (2000). *Fuzzy set social science*. Chicago: University of Chicago Press.
26. Ragin, C.C. (2006). Set relations in social research: Evaluating their consistency and coverage. *Political Analysis*, *14(3),* 291-310.
27. Ragin, C.C. (2008). *Redesigning social inquiry: Fuzzy sets and beyond*. Chicago: University of Chicago Press.

28. Rihoux, B., Ragin, C.C. (2009). *Configurational comparitive methods: qualitative comparative analysis (QCA) and related techniques*. Thousand Oaks, CA: SAGE Publications, Inc.
29. Sethi, R., Iqbal, Z., Sethi, A. (2012). Developing new-to-the firm products: The role of micropolitical strategies. *Journal of Marketing, 76(2),* 99-115.
30. Simons, R. (1987). Accounting control systems and business strategy: an empirical analysis. *Accounting, Organizations and Society, 12(4),* 357-374.
31. Stewart, G.L. (2006). A meta-analytic review of relationships between team design features and team performance. *Journal of Management, 32(1),* 29-54.
32. Vidgen, R., Wang, X. (2009). Coevolving systems and the organization of agile software development. *Information Systems Research, 20(3),* 329-354.
33. Woodside, A.G. (2013). Moving beyond multiple regression analysis to algorithms: Calling for adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory, *Journal of Business Research, 66(4),* 463-472.