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Institutional Competence Factors Affecting Multiple Project Management Success: The Case of Nepalese Construction Industry

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Abstract

Thousands of projects in Nepal are found chronically mismanaged and marred by excessive delay. Despite giving top priority in budget, policy and procedures, national pride projects are also running at snail's pace and most of them are encountering cost and time overrun. Implementation delays in public sector projects seem to be common feature and poor site management by contractors due to their excessive overload is causing project delay indicating to the possibility of multiple project management failure due to lack of certain institutional competences. This study is, hence, aimed at examining the relationship between Key Institutional Competence Factors (KICFs) of Governance Competence (GC), Management Competence (MC), Organizational Alignment Competence (OAC), Resource Competence (RC), People's Competence (PC) and perceived Multiple Project Management Success (MPMS) in Nepalese construction industry. Empirical research method was used; data were collected from 402 Class A, B and C categories of construction companies registered in Nepal using Closed-Ended-Questionnaire. Respondents were selected using stratified random sampling technique. All data were analysed using SPSS version 20 and AMOS version 21. Factor analysis, Cronbach's Alpha reliability test, Confirmatory Factory Analysis were conducted; Construct Reliability, Convergent Validity and Divergent Validity were established. Structural Equation Model was developed and Model fit was obtained for the Path Model using AMOS before examining the relationship between predictor variables and criterion variable. Findings revealed the significant positive relationship between GC, MC, OAC dimensions of KICF with MPMS. However, contrary to the expectation of the researcher, RC and PC dimensions of KICF did not show significant relationship with MPMS. The findings of this study are expected to add new dimensions to Multiple Project Management Body of Knowledge (MPMBoK).

Keywords: Multiple Project Management (MPM), Key Institutional Competence Factors (KICFs), Governance Competence (GC), Management Competence (MC), Organizational Alignment Competence (OAC), Resource Competence (RC), People's Competence (PC), Multiple Project Management Success (MPMS), Multiple Project Management Body of Knowledge (MPMBoK), Nepalese Construction Companies

Introduction

The Construction companies face many challenges while executing a project within predefined budget and within stipulated time period. It is more difficult to execute multiple projects simultaneously. The challenge lies in arranging working capital, managing resources, managing complexity of the projects, facing domestic and international competition; controlling costs and managing inter project dependences (Cristóbal et al., 2018). Construction companies in Nepal are in developing stage technically, managerially and institutionally and are unaware of need of acquisition of capabilities (Kasula et al., 2017). An estimated total of 1625 of Class A, B and C categories of contractors are registered in Nepal (Construction Business Promotion Section, 2020). National pride projects are running at snail's pace with financial progress of only 7.6% in (2015-2016) (National Planning Commission, 2016). Progress of these national pride projects improved to mere 16% on and average in (2018-2019) (The Rising Nepal, 2019). However, despite giving top priority in budget, policy and procedures, about 85 per cent of these national pride projects are encountering cost and time overrun (The Rising Nepal, 2021). Furthermore, the competence level of the Nepalese contractors needs uplifting as there is lack of required competences in construction companies, consultants and service providers (National Planning Commission, 2018, p. 38). More than 1032 projects in Nepal are being chronically mismanaged and marred by excessive delays (Gorkhapatra National Daily of Nepal, 2019). Instead of improvement in the trend, number of sick projects now have been increased to 2772 for which extension of completion time period is being sought by the Federation of Contractor's Association of Nepal - an umbrella association of Nepalese construction entrepreneurs as on February, 2021 (Khabarhub, 2021). Furthermore, there is a tendency of Nepalese contractors to haphazardly acquire more and more projects thereby leading them towards great financial risks (Federation of Contractor's Association of Nepal, 2018). Consequently, contractors blacklisted for non-performance have been increased to 60 in 2017 from 6 in 2008 (Public Procurement Monitoring Office, 2017) which stands more than 200 as on August, 2020 (Public Procurement Monitoring Office, 2020). Another burning issue related to Nepalese construction industry is that the implementation delays in public sector projects seem to be common feature in Nepal and poor site management and supervision by contractors due to large number of projects in hand is one of the major causes of project delay (Suwal & Shrestha, 2016) indicating to the possibility of multiple project management failure due to lack of certain institutional competences. Additionally, poor portfolio management and contractor's excessive overload have been identified as the two main causes (amongst other causes) of delay of motorable bridge construction projects in Nepal (Timilsina et al., 2020) again indicating to the mismanagement of multiple projects and project overload leading to project delays thereby degrading the organizational performance. Though studies on project manager's competency (Moradi & Kähkönen, 2020; Attakora-Amaniampong, 2016; Magano et al., 2020; Moradi et al., 2020; Chen et al., 2019) are plenty, studies on multiple project management competences are rare (AlMaian & Qammaz, 2019; Pheng et al., 2016). It has been observed that construction companies that take up projects from multiple project management perspective rather than singular leads to better efficiency and better resource utilization (Patanakul, 2015). Hence, the study of construction companies with respect to the institutional competences for the realization of desired objectives (International Project Management Association, 2015) which includes integration of resources, structures, human resources, processes and cultures in the projects to achieve desired objectives and to maintain

continuous institutional improvement (International Project Management Association, 2016) is highly essential.

Hence, this study related to the various institutional competences essential for achieving Multiple Project Management Success (MPMS) in Nepalese construction industry by developing research framework and empirical testing is the need of the hour as determined in the following research objectives:

1. To identify the relationship between the Governance Competence (GC) dimension of Key Institutional Competence Factors (KICF) and Multiple Project Management Success (MPMS) in the Nepalese construction industry.
2. To evaluate the relationship between the Management Competence (MC) dimension of Key Institutional Competence Factors (KICF) and Multiple Project Management Success (MPMS) in the Nepalese construction industry.
3. To examine the relationship between the Organizational Alignment Competence (OAC) dimension of Key Institutional Competence Factors (KICF) and Multiple Project Management Success (MPMS) in the Nepalese construction industry.
4. To evaluate the relationship between the Resource Competence (RC) dimension of Key Institutional Competence Factors (KICF) and Multiple Project Management Success (MPMS) in the Nepalese construction industry.
5. To identify the relationship between the People's Competence (PC) dimension of Key Institutional Competence Factors (KICF) and Multiple Project Management Success (MPMS) in the Nepalese construction industry.

Literature Review

Multiple Project management (MPM) is the practice of executing multiple projects concurrently with a shared resource pool (Jerbrant, 2014), with the aim of maximizing the contribution of individual projects to the total organizational wellbeing subject to bottlenecks within and outside the organization by increasing the project value, synchronizing the portfolio and positioning it with total organizational strategy (Moustafaev, 2017). The project-based organizations (PBOs) need to define processes, methods and tools for selecting, initiating, prioritizing projects, monitoring, controlling and reporting progress in managing multiple projects (International Project Management Association, 2016).

Some of the prior studies in MPM context that tried to address multiple project management competencies are related to PPMC (Project Portfolio Management Competency) (Butt, 2018), PBO (Project Based Organization) competencies (Fedida & Missonier, 2015), project capabilities (Hermano & Martín-Cruz, 2020) development of which is the key for achieving PBO success through multiple project implementation. PBOs cannot achieve these developments only through temporary organizing like in single project management structure (Bakker et al., 2016) and hence need to explore KICFs required for achieving MPMS. According to ISO17024, Institutional Competence is a fundamental organizational capability consisting of a set of skills, cultures, knowledge, and experience which provides basis for organizational strengths required to achieve strategic objectives and sustainable growth by enabling integration of resources, structures, people, processes and cultures in the projects. The attributes of institutional capability consist of multi-dimensional capabilities related to contextual, managerial, technological, strategic, cultural, structural and resource related capabilities. Organizational mission, vision and strategy should be aligned with the Institutional Competences in effectively executing multiple projects and achieving results and

to maintain continuous institutional improvement (International Project Management Association, 2016).

International Project Management Association (IPMA) has identified such Key Institutional Competence Factors (KICF) in multiple project management context as: Governance Competence (GC), Management Competence (MC), Organizational Alignment Competence (OAC), Resource Competence (RC) and People's Competence (PC) (International Project Management Association, 2016). Due to space limitations, this study shall purposefully adopt only former three competences as explained below-

Governance Competence (GC)

Multiple Project governance is the principles, policies and procedures by which a project portfolio is directed to meet strategic objectives (International Organization for Standardization, 2018). GC is extensively familiar to be among the most critical factors for delivering projects effectively and realizing benefits. Nevertheless, project governance literature is fragmented and, in spite of previous works by researchers in the field, there is still a lack of agreement on the definition of project governance and its fundamental constituents. Additionally, though project governance takes the key position to ascertain the alignment of projects with organizational strategic objectives, the guiding principles for how project governance can empower organizational strategy enactment through projects is a vital still under-researched area in the literature (Musawir et al., 2020). Within the project setting, governance is referred as a multi-level phenomenon and incorporates the governance of the parent organization, any contractors or suppliers and the project, and the association between them (Sankaran et al., 2018).

Project governance embraces policies, processes and organizational entities that are responsible for defining roles and responsibilities, coordinating the relationship with the stakeholders and defining the decision hierarchy in projects so that they fulfill their objectives (Cruz & Araujo, 2021). It can be broadly defined as the management of project management (Too & Weaver, 2013) as cited by (Musawir et al., 2020). It is imperative to investigate how governance of projects – the method in which a single, permanent organization recognizes, generates and later yields value through multiple projects (Riis et al., 2019) as effective project governance improves project success (Musawir et al., 2017). GC is the first key Institutional Competence considered essential to achieve MPMS in this study.

Management Competence (MC)

MC is another key Institutional Competence considered essential to achieve MPMS in this study. MC is more than simple set of skills and knowledge; it is the capability to address complicated requirements which necessitates mobilization of psychological resources as well (Sufian & Morgani, 2015). According to IPMA OCB, MC is responsible for organization's management system. It is supported by teamwork and effective communication. IPMA has stated three dimensions of MC namely: i) Project Management, ii) Programme Management and iii) Portfolio Management as explained below (International Project Management Association, 2016). First one is a prerequisite for successful management of individual projects for which there should be established project management standard supported by guidelines and regulations to suit specific project requirements which should ultimately support continual improvement (International Project Management Association, 2016) and this project management competence necessitates capability to ascertain clearly defined deliverables with time, cost, quality as success measurement criteria thereby controlling

schedules, budgets and product specifications (Jiang et al., 2018). Programme Management competence requires predefined Standard Operating Procedure like tools, methods and processes not only to achieve predefined objectives but also to obtain strategic benefits thereby fulfilling organization's mission, vision and strategy supported by guidelines and regulations to use leading towards continual improvement (International Project Management Association, 2016). In spite of concentrating on creating a specific deliverable, program management concentrates on organizational readjusting for strategic objectives, which provides programs a role in the organizational context to perform as a vehicle for change management and for implementing an organization's strategy (Partington et al., 2005) as cited in (Jiang et al., 2018). Similarly, Project Portfolio Management (PPM) comprises complex processes that involve identifying, prioritizing, approving, managing and controlling the component projects and programs and the related risks, resources and priorities (Project Management Institute, 2017). It is becoming a key competence for companies handling numerous projects simultaneously (WerneckBarbosa & Rodrigues, 2020). Hence, it is imperative to study MC dimension because previous study also has empirically established that the organizational high performances are associated with the multiple project management competences (Katunina, 2018).

Organizational Alignment Competence (OAC)

OAC is the third key Institutional Competence considered essential to achieve MPMS in this study. Strategic alignment is the linkage of project portfolio objectives and components with strategy (International Organization for Standardization, 2018). The present-day executives understand that their organizations should be aligned with their organizational strategies, organizational capabilities, available resources, and management systems in order to attain the organizational objectives; the challenge, however, is that they try to emphasize on one of these areas to the marginalization of the others, but what really important for achieving objectives is how they all synergize collectively (Trevor & Varcoe, 2017). Similarly, for the success of projects and for future sustainability, projects should be aligned with the organizational strategy; organizational strategy should be aligned with the developing external environment and any market competition; projects should have proper alignment with the main stakeholder's interests and expectations and should achieve balance among them; there should be balance among risks, opportunities and expected gains also; this competence ensures proper alignment of major organizational components with components of management of project and project portfolios (Calabrese, 2016). There are three main dimensions of OAC namely: (i) Process Alignment, (ii) Structural Alignment and (iii) Cultural Alignment (International Project Management Association, 2016).

Alignment of processes required to manage projects with the processes of both external and internal stakeholders is necessary to ensure effective and efficient achievement of projects' targeted performances through coordination of processes among relevant internal and external stakeholders with the support of collaboration and effective communication (International Project Management Association, 2016). Structural alignment offers integration of implementation of strategy, processing of organizational information, and adaptation of organizational structures thereby widening the narrow focus of methodological approaches (Kaiser et al., 2015). Individual projects are generally accomplished by a temporary organizational structure whereas a permanent organization structure manages the project portfolios. Such organizational structures should be in sync with appropriate internal and external stakeholders; with process, strategy, functional management and

project management (Miterev et al., 2016). Likewise, it has been established that organizational culture influences the differing perceptions of identification of importance of knowledge types to be shared or accumulated, identification of the conditions the knowledge is to be shared or accumulated and up to what magnitude the knowledge is to be shared or accumulated (Wei & Miraglia, 2017). So, it is essential to balance the relationship between organizational cultural elements at corporate level and that at lower levels of organization. Alignment of organizational culture with the overall organizational objectives is very essential for the success of projects in any PBOs (Calabrese, 2016) as project management in any PBOs is strongly influenced by both national and organizational cultural factors (Mainga, 2017).

Resource Competence (RC)

RC is the fourth key Institutional Competence considered essential to achieve MPMS in this study which deals with the overall organizational corporate objectives related to availability of resources and their optimum utilization (International Project Management Association, 2016). Resources are the energy of any business operation and a business organization has to integrate and apply the relevant resources for better business performance and to keep the competitive advantages (Huang et al., 2019). Resources as the elements owned or controlled by an organization, including tangible resources like land, machinery, equipment, building, funds and intangible resources like brand name, goodwill, intellectual property, marketing network, and business secrecy (Yang, 2017) as cited in (Huang et al., 2019). According to Resource based View Theory of the firm, the organizational resources are the principal factors of its competitive advantage. These resources comprise: financial (cash, capital, etc.); physical/technological (land, buildings, plant, etc.); organizational (culture, reputation, relations, etc.); human (people, experience, expertise, etc.); intellectual (knowledge and ideas); and social (relationships, networks, and connections) (Rumelt, 1984; Wernerfelt, 1984; Barney, 1991) as cited in (Goh & Loosemore, 2016).

Resources of the organization affects the strategy drafting and executing processes and can buffer internal and external pressure of the organization enabling the policy adjustment (Huang et al., 2019). Resources should be acquired, leveraged, and bundled to boost organizational performance which is attained only when organizations manage their resources effectively (Sirmon & Hitt, 2003; Sirmon et al. 2007) as cited in (Rehman et al., 2019).

Resource unconstrained multiple project environment leads to underutilization of the resources whereas resource constrained multiple project scheduling approaches are closer to the actual construction projects environment and there is great need of the later since many PBOs work with limited resources in hand which when shared among various projects leads to the efficient utilization of resources (Kannimuthu et al., 2017). PBOs keep minimal resources such as financial resources, know-how, materials, energy, equipment, labor and non-renewable materials and multiple project environment adds further complexity since resources have to be shared among projects. Similarly, constrained resource environment leads to effective utilization of resources and suggested systematic centralized decision-making model to deal with complex environment with larger size multiple projects (Kannimuthu et al., 2017).

In present competitive business setting, the survival and growth of any construction company basically is based on its ability of proper management of resources. Ineffective resource management increases the operational expenses or even escalates the financial and scheduling difficulties. Components of resources in construction projects are generally human

resource, machineries, materials, money, and know-how. Undoubtedly, the efficient resource management is the basis to the efficient management of any project (Tran & Hoang, 2014). Hence, study of such highly important competence i.e. RC which has significant influence on MPMS is highly imperative.

People Competence (PC)

PC is the fifth and last key Institutional Competence considered essential to achieve MPMS in this study. Organizational Competence Baseline (OCB) Standard conceptualized by International Project Management Association (IPMA) defines PC as the organizational ability to identify and make available the right people with the right competences for the projects to meet the organizational mission, vision and strategy. For the success of any PBO, proper multiple project management and management of human resource is very important. Without proper coordination of projects and human resources, organizational success is impossible. There is vital relationship between multiple project management and human resource management because projects are executed by humans. PC deals with the overall corporate objectives and anticipations of competences of the people including teamwork, effective communication, performance and appreciation (International Project Management Association, 2016).

Top managers should possess competence to develop operational competences at project level and dynamic competences at portfolio level to achieve multiple project management effectiveness (Hermano & Martín-Cruz, 2016). Dynamic capability perspective is related to the required competencies to counter dynamically to rapid ever changing and emerging technologies, market dynamics, and elusive competitive situation (Davies & Brady, 2015). Recent literature review reveals that the dynamic capabilities are classified into following three categories - (i) regular sensing and forecasting of opportunities and threats in the market, (ii) planning of resources and required competencies to capture the opportunities and (iii) regular reconfiguring of resource bundle aligning with emerging competitive environment (Felin & Powell, 2016; Breznik & Lahovnik, 2016).

Multiple Project Management Success (MPMS)

MPMS is the achievement of desired objectives to the fullest while executing multiples of projects concurrently by any organization (Putri & Hadla, 2015). Successful multiple project management makes sure that projects and programmes remain aligned with business goals throughout their execution, and ensuring the right mix of projects at all times (Lock & Wagner, 2019). This involves ensuring continuous management oversight, regular communication and coordination, constant course correction to minimize project drift, and redirecting projects when business objectives change to maintain alignment.

From the case study of four various US companies that were the market leaders in their respective markets representing multiple project management (MPM) practices, researcher has defined MPMS as the organizational ability to (i) develop a project portfolio aligned with the organizational strategic vision, remains flexible to the internal and external alterations, and comprises projects with greater probable return, and (ii) administer the portfolio to stimulate project reflectivity, clarity in decision making, and predictability of project delivery (Patanakul, 2015, p. 1093).Though the complication of multiple project management is widely recognized in the specialized literature, there is no any comprehensive model developed to evaluate the MPMS (Alexandrova, 2016). Various authors have mentioned following attributes for the measurement of MPMS:

i) 'Strategic fit'
ii) 'Portfolio Balance'
iii) 'Average of single project success'
iv) 'Preparing for the Future'

These four dimensions of Multiple Project Management Success (MPMS) are explained briefly below:

Achievement of Strategic Fit

Strategic fit includes the degree to which the organizational business strategies are consistently reflected by the objectives of their project portfolio and the strategic fit of the project portfolio is the business strategy that is reflected in the sum of all projects (Putri & Hadla, 2015). In other words, strategic fit is a success indicator that incorporates the degree to which individual projects reflect the organizational business strategy and aligns it with the available resource in terms of people, time and fund (Teller et al., 2014). The strategic fit focusses on the fit between the organization's business strategy and its internal process; empowers an organization to reap benefits from its specific competitive situation; articulates the extent to which an organization is aligning its resources and competences with the prospects in the external environment (Moses & Ekwutosi, 2018). 'Strategic fit' as an indicator of measuring MPMS has been stated also by various other scholars (Ghasemi et al., 2018; Biscola et al., 2017; Kester et al., 2014; Teller & Kock, 2013; Patanakul, 2015; Putri & Hadla, 2015; Alblooshi, 2018). In this context, 'Strategic Fit' has been considered a very important attribute to measure the MPMS in this study.

Achievement of Portfolio Balance

Balancing of the portfolio along a long range of dimensions like balance of technology used, application areas and project risks (Teller et al., 2014; Jonas et al., 2013) balancing of market and the value of the project, balance of resource utilization during the project execution, regular generation of cash flow, schedule duration balance and balance between technology complexities etc. are necessary to provide the best value to the enterprise (Putri & Hadla, 2015). Portfolio balance represents the impact of a project to the total variety of the portfolio (Jerbrant & Gustavsson, 2013) and an extremely balanced portfolio comprises projects with differing grades of risk and different time horizons (McNally et al., 2013) as cited in (Behrens & Patzelt, 2016). 'Portfolio balance' as an indicator of measuring success of management of multiple projects have also been mentioned by various other authors (Ghasemi et al., 2018; Biscola et al., 2017; Kester et al., 2014; Teller & Kock, 2013; Patanakul, 2015; Putri & Hadla, 2015; Alblooshi, 2018). In this context, 'Portfolio Balance' has been considered another vital attribute to measure the MPMS in present study.

Achievement of Average Project Success

The first frequently used criterion is the success of each single project inside the portfolio. The average project success refers to the conventional features such as time, quality and budget but also expands this aspect to consumer requirements and market (Biscola et al., 2017). 'Average project success' as an indicator of measuring Multiple Project Management Success has been mentioned by different authors (Biscola et al., 2017; Teller & Kock, 2013; Patanakul, 2015; Putri & Hadla, 2015; Alblooshi, 2018). In this context, 'Average Project Success' has been considered a very important attribute to measure the MPMS in present study.

Preparing for the Future

This aspect has been described by various authors as 'future potential' emphasizing the possibility of development of new technology and new process as a result of MPMS (Joslin & Müller, 2016). Preparing for the future addresses the organizational readiness for the organizational future challenge like the development of new or improved products, development of new market areas, establishment of new processes and new expertise (Putri & Hadla, 2015). 'Preparing for the future' may also refer to the enhancement of new business, technologies, procedures, skills and competences, and the competences to deal with the external market or technological vulnerabilities (Meskendahl, 2010) as cited in (Oosthuizen, 2017) and it also refers to the indirect benefits and prospects from projects that are attained long after completing the projects, such as lessons learned in project execution and the creation of new technologies or new markets (Jonas, 2010) as cited in (Oosthuizen, 2017). 'Preparedness of future' as an indicator of measuring Multiple Project Management Success (MPMS) has been mentioned by different authors (Teller & Kock, 2013; Patanakul, 2015; Putri & Hadla, 2015; Alblooshi, 2018). In this context, 'Preparing for the Future' has been considered a very important attribute to measure the MPMS in present study.

Conceptual Framework

The conceptual framework of this study illustrating the relationship between KICF and MPMS is presented in figure 1 below:

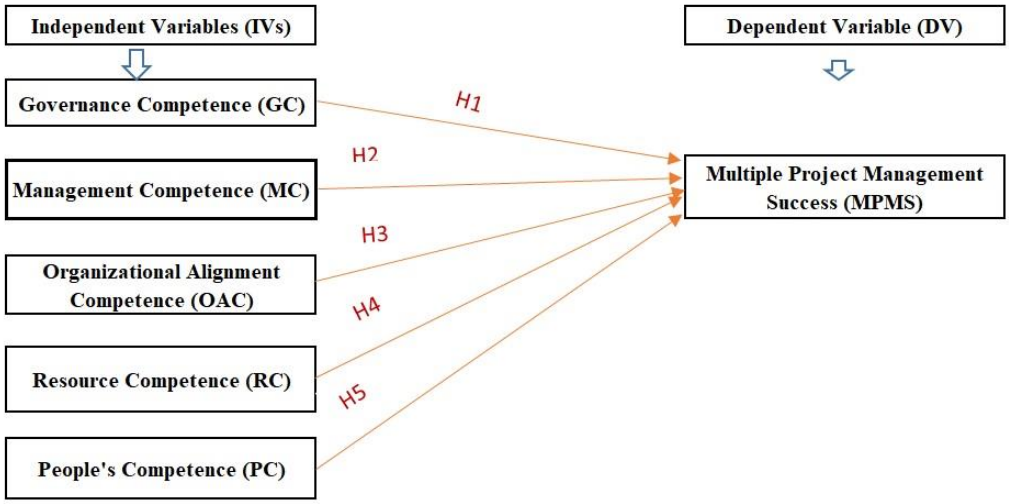

Figure 1: Conceptual framework on 'Institutional Competence Factors affecting Multiple Project Management Success in Nepalese Construction Industry'

Hypotheses

H1: Governance Competence (GC) has significant positive relationship with Multiple Project Management Success (MPMS) in Nepalese construction industry.

H2: Management Competence (MC) has significant positive relationship with Multiple Project Management Success (MPMS) in Nepalese construction industry.

H3: Organizational Alignment Competence (OAC) has significant positive relationship with Multiple Project Management Success (MPMS) in Nepalese construction industry.

H4: Resource Competence (RC) has significant positive relationship with Multiple Project Management Success (MPMS) in Nepalese construction industry.

H5: People's Competence (PC) has significant positive relationship with Multiple Project Management Success (MPMS) in Nepalese construction industry.

Research Methodology

Grounding on positivism research philosophy, this study proposes quantitative research methodology with deductive approach. It is the cross-sectional study of 1625 numbers of Class A, B and C categories of construction companies registered with government of Nepal. Respondents were selected using stratified random sampling technique and data was collected using closed ended questionnaire with 5-point Likert scale through online platform. 402 valid responses were further analysed using SPSS version 20 and AMOS version 21 software. Before conducting full scale study, pilot study was conducted as described below-

Firstly, content validity was evaluated applying the content validity Ratio (CVR) using Lawshe (1975)'s method (Zamanzadeh, et al., 2015) based on the responses from 5 numbers of content expert raters (Angwal et al., 2019; Yassir et al., 2017).

Secondly, a pilot study was conducted wherein validated questionnaires were distributed and responses were received from 36 numbers of respondents selected using convenience sampling method as explained by (Courvoisier et al., 2014) fulfilling the proper representation of population strata of class A, B and C categories of contractors registered in Nepal.

Thirdly, collected data was analysed using SPSS version 20 and AMOS version 21 and found further testable as the Cronbach's alpha (α) coefficient of reliability was above 0.7 for all variables demonstrating trustworthiness of data collected from the pilot study (Pallant, 2013).

Fourthly, factor analysis was conducted to verify construct validity utilizing Principal Component Analysis (PCA) with Verimax rotation method. In the pilot study, KMO and Barlett's Sphericity test was used to analyze if the items were appropriate for **factor analysis**. The KMO values of all the variables and their attributes were higher than 0.5 and the effect of Barlett's sphericity test was significant for all of them indicating the scale validity. Also, the cumulative variance indicated strong construct validity of the scale. Component matrix results of factor analysis also confirm that all the questionnaire items should be retained. It confirms the high reliability and validity of the instrument confirming the suitability for further study.

Findings

Table 1:Demographic characteristics of the respondents

Characteristics		Frequency	Percent (%)	Characteristics		Frequency	Percent (%)
Gender				**Organizational Age (Years)**			
	Male	398	99.0		Upto 5	6	1.5
	Female	4	1.0		6-10	82	20.4
Respondent's Age Groups (Years)					11-15	103	25.6
	Under 25	2	0.5		16-20	128	31.8
	26-35	42	10.4		Above 21	83	20.6
	36-45	109	27.1	**Organizational Construction Experience (Years)**			
	46-55	122	30.3		Upto 5	9	2.2
	56 and above	127	31.6		6-10	106	26.4
Education Qualification					11-15	100	24.9
	PhD	2	0.5		16-20	125	31.1
	Master's degree	56	13.9		Above 21	62	15.4
	Bachelor's degree	122	30.3	**Contractor Category**			
	Graduate in engg.	11	2.7		Class A	80	19.9
	Diploma in Engg.	27	6.7		Class B	69	17.2
	Any other	178	44.3		Class C	253	62.9
	Engg. Post Graduate	6	1.5	**Projects In Hand (Nos)**			
Designation					Upto 5	96	23.9
	Chairman	78	19.4		6-10	83	20.6
	CEO	19	4.7		11-15	32	8.0
	Managing Director	196	48.8		16-20	32	8.0
	Director	38	9.5		Above 21	159	39.6
	General Manager	20	5.0				
	Project Manager	39	9.7				
	Any other	12	3.0				

The above table 1 indicates the respondent's demographic profile. A sample of 402 respondents was used for getting the study outcomes.

As seen in the table 1 above, among the 402 respondents, 99% of respondents were male and 1% of respondents were female indicating that dominance of male in construction sector in Nepal. Age group 36-45 constituted around 27.1% of respondents; 46-55 constituted 30.3%; 56 and above constituted 31.6% of the respondents; 26-35 constituted 10.4% and age group below 25 years constituted 0.5%. Likewise, Respondent's educational qualification showed

dismal presence of PhD holders (0.5%) followed by Engineering post graduates (1.5%); Bachelor's degree holders showed strong presence with 30.3% followed by Master's degree holders with 13.9%. Moreover, general literate to intermediate level study constituted around 44.3% of the respondents. Respondents were 19.4% chairman, 4.7% CEOs, 9.5% directors, 5% General Managers, 9.7% Project managers, 48.8% (highest) Managing directors and 3% (lowest) did not specify designation. Around 31.8% of respondent's organization were having 16-20 years of organizational age, 25.6% of 11-15 years, 20.6% of above 21 years, 20.4% of 6-10 years and only 1.5% of upto 5 years of age. Importantly, around 31.1% respondent's organization were having 16-20 years of experience, 6.4% of 6-10 years, 24.9% of 11-15 years, 15.4% of above 21 years and only 2.2% of upto 5 years of construction experience indicating that the information collected from these well experienced construction companies can be very relevant, informative and very close to the reality. Total of 80, 69 and 253 numbers i.e. 19.9%, 17.2% and 62.9% of Class A, B and C categories of contractors respectively responded which were very near to the required strata of population i.e. 18.83%, 15.75% and 65.42% Class A, B and C respectively confirming neither over representation nor under representation of population in the responses. Most importantly, 39.6% respondent contractors were having more than 21 multiple projects in hand, 23.9% were having less than 5 projects, 20.6% were having 6-10 projects, 8% each were having 11-15 and 16-20 multiple projects in hand demonstrating that the construction companies were loaded with multiple projects at a time. In view of above, data thus collected and results should be more representative of multiple project management environment.

Convergent Validity and Construct Reliability using Confirmatory Factor Analysis (CFA)

The CFA is more or less precondition for Measurement Model in which both the number of factor loadings and their respective indicators are clearly defined (Byrne, 2016). In order to examine convergent validity and construct reliability, CFA was conducted. Convergent validity among item measures was evaluated using Average Variance Extracted (AVE) by assessing factor loading of the individual items in which a high factor loading of >/=0.5 of each construct indicated a high convergent validity of that particular construct and any construct below that were cut off from the latent variable (Hair et al., 2019). Construction Reliability (CR) was computed from the squared sum of factor loading $(\sum\lambda)^2$ for each construct and the sum of Measurement Error (ME) for a construct.

Confirmatory Factor Analysis

Table 2:Assessment of Measurement Model

Construct	Sub-constructs	Items	Factor Loading >/=0.5	AVE >/=0.5	CR>/=0.7	R-Square
Governance Competence (GC)		B1.1	.82	0.695	0.941	
		B1.4	.80			
		B1.5	.85			
		B1.6	.83			
		B1.7	.88			
		B1.8	.84			
		B1.9	.82			
Management Competence (MC)		B2.2	.87	0.783	0.962	
		B2.4	.88			
		B2.6	.91			
		B2.7	.86			

		B2.9	.88			
		B2.10	.88			
		B2.12	.90			
Organizational Alignment Competence (OAC)		B3.1	.86	0.824	0.974	
		B3.4	.90			
		B3.5	.91			
		B3.6	.92			
		B3.7	.94			
		B3.8	.92			
		B3.9	.92			
		B3.12	.89			
Resource Competence (RC)		B4.1	.73	0.690	0.930	
		B4.3	.76			
		B4.8	.87			
		B4.9	.90			
		B4.11	.85			
		B4.12	.85			
People's Competence (PC)		B5.2	.92	0.841	0.970	
		B5.4	.94			
		B5.5	.91			
		B5.7	.94			
		B5.8	.90			
		B5.9	.89			
Multiple Project Management Success (MPMS)	MPMS1	C.a.1	.79	0.692	0.940	1.000
		C.a.2	.78			
		C.a.3	.78			
		C.a.4	.90			
		C.a.5	.88			
		C.a.6	.87			
		C.a.7	.87			
	MPMS2	C.c.1	.75	0.646	0.901	
		C.c.2	.78			
		C.d.1	.89			
		C.d.2	.80			
		C.d.3	.80			

Note: AVE=Average Variance Extracted; CR=Construct Reliability

Above table 2 confirms that AVE value of every variable is above 0.50 and the value of CR and Cronbachá Alpha is above 0.7 and the value of factor loadings is above 0.60 which are the accepted range. Here, MPMS is demonstrated by large effect (1.000 or 100%) with independent variables. Overall, the proposed study model is best fit with study objectives and hypotheses.

Testing of Discriminant Validity: Fornell-Larcker Criteria

Testing of Discriminant Validity (DV) was done using the Average Variance Extracted (AVE) analysis (Zait & Bertea, 2011) to see if the square root of every AVE value related to each latent construct is much higher than any correlation among any pair of latent constructs. Table 3 below demonstrates the correlation matrix of the relationship between all constructs by illustrating the square root of AVE (on the diagonal) and Correlations (on the Off-Diagonal) between variables for comparison between the square root of AVEs and Correlations.

Table 3: Discriminant Validity

	CR	AVE	MPMS1	MPMS2
GC	0.941	0.694		
MC	0.962	0.783		
OAC	0.974	0.824		
RC	0.930	0.690		
PC	0.970	0.842		
MPMS1	0.940	0.693	**0.832**	
MPMS2	0.901	0.646	0.585	**0.804**

Thus, AVEs of the following variables GC (.694), MC (.783), OAC (.824), RC (.690), PC (.842), MPMS1 (.693) and MPMSs (.646) are greater than 0.5. Hence, there convergent validity criterion is qualified. The square roots of AVE of MPMS1 (.832) and MPMS2 (.804) are greater than the correlation coefficient between MPMS1 and MPMS 2. Hence, discriminant validity is satisfied based on (Hair et al., 2019) criterion.

Structural Equation Modelling

Figure 2 below shows the structural equation modelling for exogenous variable of GC, LC, OAC, RC, PC and their interactions with endogenous variable – MPMS, including latent constructs. The analysis of Structural Equation Modelling using AMOS version 21 shown in figure 2 below illustrates the following goodness-of-fit indices: p=.000, Chi-square (X2)=3720.797, DF=1614, Relative X2 (X2/DF)=2.305, AGFI=.720, GFI=.744, CFI=.928, IFI=.928, NFI=.880, TLI=.923, RMSEA=.057. From these goodness-of-fit indices, the researcher resolved that the Measurement Model fits the data because if any of 3 to 4 of the goodness-of-fit indices meets the requirement, then the model is suitable as measurement model or structural model (Hair et al., 2019).

Moreover, the Structural Model also indicated that, 100% of variances in the endogenous construct i.e. MPMS was explained by the predictor variables entered into the Structural Equation Modelling.

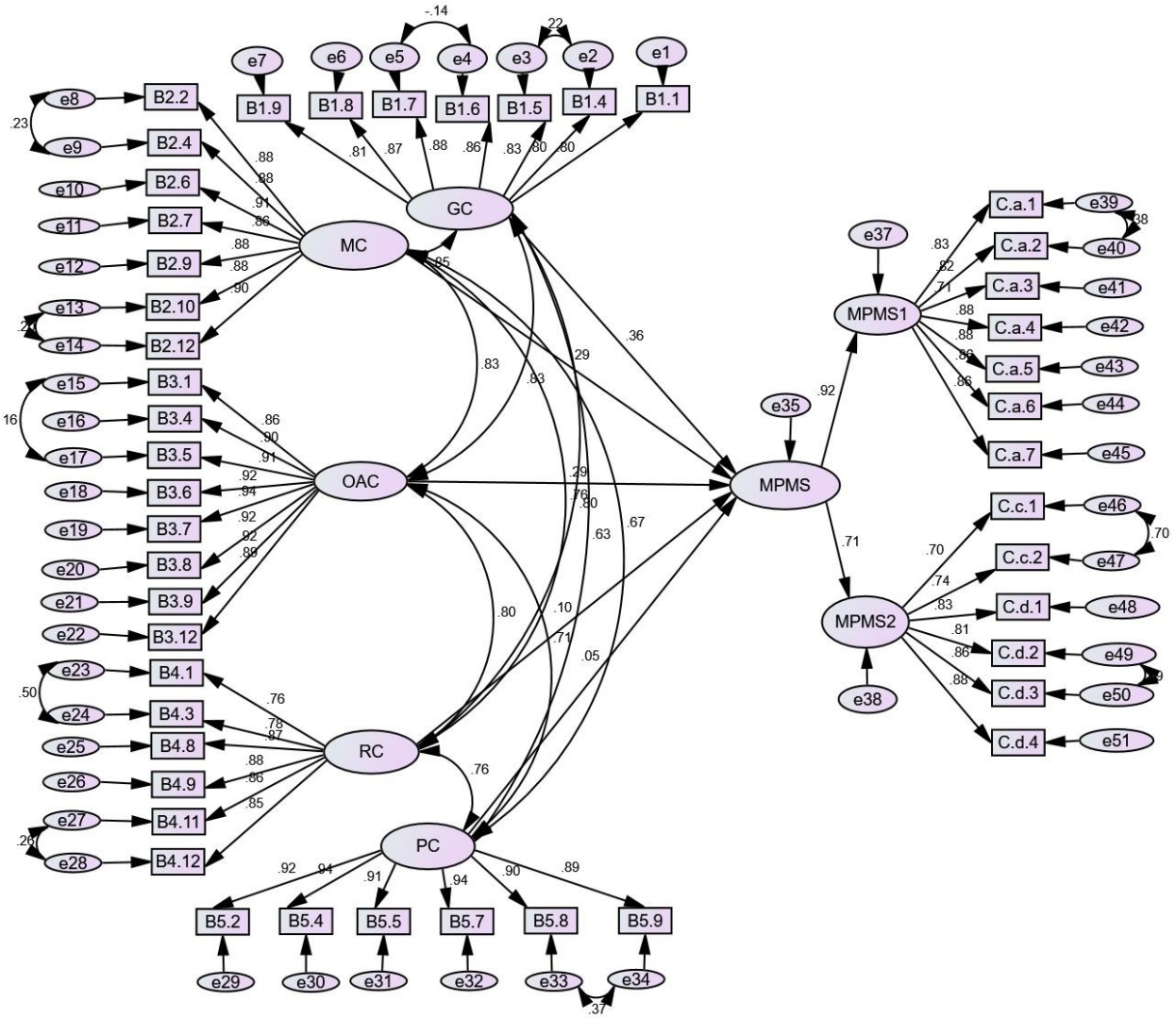

Figure 2: Structural Model to predict the relationships between KICF and MPMS

Hypotheses Testing Results of Direct Relationship among variables

The analysis of Structural Equation Model in table 4 below displays the outcomes of the hypothesis testing using SEM and illustrates standardized path coefficients are consistent with the hypotheses by indicating the significant relationships between predictors and criteria variables. The following results are relating to the five direct hypotheses taken sequentially as follows:

Table 4
Unstandardized and Standardized regression weights in the hypothesized path model

Hypothesis Number	Construct	Relationship	Construct	B	β	S.E.	C.R.	P	Remarks
H1	MPMS	<---	GC	.149	.166	.065	2.272	.023	Supported
H2	MPMS	<---	MC	.107	.143	.045	2.343	.019	Supported
H3	MPMS	<---	OAC	.115	.137	.050	2.319	.020	Supported
H4	MPMS	<---	RC	.081	.080	.056	1.440	.150	Not Supported
H5	MPMS	<---	PC	.014	.018	.032	.451	.652	Not Supported

Note: GC - Governance Competence, MC – Management Competence, OAC – Organizational Alignment Competence, RC – Resource Competence, PC - People's Competence, MPMS – Multiple Project Management Success, B = Unstandardized regression weight, S.E. – Standard Error, β = Standardized regression weight, S.E. – Standard Error, C.R. – Critical Ratio, p – Significant p.

Firstly, the researchers hypothesize a positive and significant relationship between Governance Competence (GC) and Multiple Project Management Success (MPMS) (Hypothesis H1). According to Table 4 above, the first dimension of KICF – Governance Competence (GC) has a direct significant effect on Multiple Project Management Success (MPMS). Thus, Structural Model indicates that GC is a significant predictor of MPMS (β = .166, CR = 2.272, p = .023 which is p <.05). Therefore, H1 is supported. This also means, GC significantly contributes to MPMS.

Secondly, the researchers hypothesize that there is a positive and significant relationship between another dimension of KICF – Management Competence (MC) and Multiple Project Management Success (MPMS) (Hypothesis H2). As seen in table 4 above, a positive and significant relationship is found between MC and MPMS. Thus, Structural Model indicates that MC is a significant predictor of MPMS (β = .143, CR = 2.343, p = .019 which is p <.05). Therefore, H2 is supported. This also means, MC significantly contributes to MPMS.

Thirdly, researchers hypothesize that there is a positive and significant relationship between Organizational Alignment Competence (OAC) and Multiple Project Management Success (MPMS) in the Nepalese construction industry (Hypothesis H3). As evident in table 4 above, a positive and significant relationship is found between OAC and MPMS. Thus, Structural Model indicates that OAC is a significant predictor of MPMS (β = .137, CR = 2.319, p = .020 which is p <.05). Therefore, H3 is supported. This also means, OAC significantly contributes to MPMS.

Fourthly, researchers hypothesize that there is a positive and significant relationship between Resource Competence (RC) and Multiple Project Management Success (MPMS) in the Nepalese construction industry (Hypothesis H3). As evident in table 4 above, a positive and significant relationship is not found between RC and MPMS. Thus, Structural Model indicates that RC is not a significant predictor of MPMS (β = .080, CR = 1.440, p = .150 which is p >.05).

Therefore, H4 is not supported. This also means, RC does not significantly contribute to MPMS.

Lastly, researchers hypothesize that there is a positive and significant relationship between People's Competence (PC) and Multiple Project Management Success (MPMS) in the Nepalese construction industry (Hypothesis H3). As evident in table 4 above, a positive and significant relationship is not found between PC and MPMS. Thus, Structural Model indicates that PC is not a significant predictor of MPMS (β = .018, CR = 0.451, p = .652 which is p >.05). Therefore, H5 is not supported. This also means, PC does not significantly contribute to MPMS.

Summary of Study Findings

The findings of the study established significant positive correlation among all study variables. As far as the direct contribution of KICF dimensions of GC, MC and OAC on the rest of the study variables is concerned, results have revealed positive significant contribution on MPMS. It means that the more the construction companies are well aware about KICF dimensions of GC, MC, OAC, RC and PC, it is more likely that there will be simultaneous successful execution of multiple projects. Reverse is also true. Hence, this study offers support for the supposition that the KICF dimensions (GC, MC and OAC) can enhance MPMS.

In relation to the research objectives, hypotheses H1, H2, H3, H4 and H5 were formulated for each KICF dimensions: GC, MC, OAC, RC and PC respectively, to provide an answer to the question based on path analysis. The hypotheses: H1, H2, H3, H4 and H5 postulate that there are significant positive relationships of the five dimensions of KICF (i.e. GC, MC, OAC, RC and PC) on MPMS.

The results actually discovered that there are significant positive relationships among all KICF dimensions (GC, MC, OAC, RC and MC) and MPMS (r=.766 for GC; .810 for MC; and .832 for OAC, .784 for RC and .709 for PC with p<.05 for all). Obviously, this type of relationship has always been positively associated to MPMS. These results are also consistent to what have been suggested by (Hermano & Martín-Cruz, 2020).

In terms of direct contribution / influence made by the KCF dimensions (GC, PC, OAC, RC and PC) on MPMS, three GC, MC and OAC dimensions were significantly contributing to MPMS (β=.166, CR=2.272, p=.023 which is <.05 for GC; β=.1643 CR=2.343, p=.019 which is <.05 for MC; β=.137, CR=2.319, p=.020 which is <.05 for OAC) that is H1, H2 and H3 were supported. However, contrary to the expectations of the researchers, RC and PC dimensions did not show significant positive relationship with MPMS (β=.080, CR=1.440, p=.150 which is >.05 for RC; β=.018, CR=.451, p=.652 which is >.05 for PC). This result shows that the construction companies lack Resource Competence and People's Competence abilities due to lack of training programs that improve their awareness of the importance of RC and PC when dealing with their resources and people. It may also indicate that there is a need to activate the management rewards system to promote resource competence and people's competence planning.

Conclusion

The findings of the study revealed that there is significant positive relationship between KICF dimensions of GC, MC and OAC and MPMS. However, contrary to the expectations of researchers, RC and PC dimensions of KICF did not show significant positive relationship with MPMS, both were having insignificant contribution. The reason for RC and PC's insignificant contribution is due to institutional unfamiliarity in using RC and PC dimensions for the

achievement of MPMS and OL. That is why commonly there is implementation delays in public sector projects in Nepal and poor site management and supervision by contractors due to large number of projects in hand is one of the major causes of project delay (Suwal & Shrestha, 2016) indicating to the possibility of multiple project management failure due to lack of certain institutional competences.

Empirically, the study results have mostly revealed a successful integration among the KICF dimensions (GC, MC and OAC) and MPMS in Nepalese construction industry. Hence, this study offers support for the supposition that the KICF dimensions (GC, MC and OAC) can work to enhance MPMS as established by Butt, (2018) i.e. development of Project Portfolio Management Capability (PPMC) or Institutional Competences should take place through 'economics of repetition' and 'economics of recombination' (Lobo & Whyte, 2017) and is the key for achieving PBO success through multiple project implementation (Hermano & Martín-Cruz, 2020). PBOs cannot achieve these developments only through temporary organizing like in project management structure (Bakker et al., 2016) and hence need to explore KICFs required for achieving MPMS through multiple project management perspective.

Limitations and Recommendations for Future Studies

It is recommended that the construction companiens of Nepal should have a detailed procedural list of Key Institutional Competence Factors (KICF) evaluation, Organizational Learning attributes, Multiple Project Management Success (MPMS) dimensions which can be used as feedback indicators for competence assessment methods in construction companies to enable OL leading to MPMS.

There are following limitations concerning the matter of generalization of the study findings: **First**, competence of the construction companies to acquire the projects profitably was not taken into account for this study. In Nepalese context, deliberate low bidding has significant role on time delays, cost overrun and quality degradation in projects (Bista & Dahal, 2018) because awarding the projects to the lowest bidders (without reasonable profit margin) is the major reason behind lingering construction projects and failure in meeting quality standards in Nepal (Shrestha, 2014). Hence, future studies could be conducted considering 'profitable acquisition of projects' as another institutional competence dimension. **Second**, the study was designed to collect responses only from Class A, B and C categories of Nepalese contractors excluding Class D, the population of which stands 10,740 as on 2020. For the better generalization of this study in the context of Nepal, it is recommended to conduct similar study including Class D categories of contractors as well in future. **Third**, as the data were collected online using Google Form and as the respondents were allowed to participate at will, it is possible that the survey results might be biased towards respondents who were willing to take the survey. Although, a test for non-response biases was performed, it is likely to have some biases. **Fourth**, the findings of this study are limited to Nepalese construction companies and cannot be completely applied to international construction companies anywhere in the world because it reflects specifically Nepalese construction companies' institutional competences and organizational learning in multiple project management success scenario. The researcher suggests that similar study may be conducted in construction industry in any other country for the overall generalization of the study. **Lastly**, information collected using closed-ended questionnaire in this study might not be very much reliable because if the respondent misinterprets a question or gives improper response, very little could be done to rephrase the question for further clarification like in interview technique. Hence, future studies could be conducted using other research methodologies like

qualitative and/or mixed method study in Nepal or in any other country including opinions of academicians and consultants as well for the comparison, verification and generalization of this study findings.

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