

Article

Effects of Individual Client's Competencies on Construction Project Performance: Mediating Participation Attitude and Partnership

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Abstract: Within a construction project, the clients are categorized as private individuals, private companies, public institutions, etc. In this research, the private client is identified as a non-professional individual building owner and is involved in making decisions and solving problems for successful construction project performance. However, irrational decision-making and conflicts frequently occur with project delay and poor performance because the individual clients are normally non-professionals and lack the capacity to lead various stakeholders on the project. This study analyzes the effects of the project managerial competencies of the private individual clients on the construction performance. The client's competencies were defined as 'personal', 'social', and 'professional' factors, and participation attitude and partnership were used as the mediating factors. The offline survey was conducted with 241 building owners in South Korea. The result indicates that personal and professional competencies had a positive effect on project performance, whereas social competency did not have an effect. Personal competency had the greatest effect on participation attitude and partnership. Social and professional competencies had a positive effect on partnership, not participation attitude. Hence, this shows that the personal competencies of the building owner as the end user of the project related to cognition, planning, and decision-making are important for project success.

Keywords: individual client; construction project; competency; participation attitude; partnership



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1. Introduction

The global construction industry has experienced an increase in public–private partnerships (PPPs) and notable shifts in the construction environment, driven by project expansion, complexity, and specialization. According to [Global Industry Analysts, Inc. \(2019\)](#), the global construction project management market is witnessing growth at a compound annual growth rate (CAGR) of 12.7%. [Data Bridge Market Research \(2020\)](#) estimates that the global construction market will continue to grow at a CAGR of 8.70% from 2020 to 2027, reaching an estimated USD 2.73 billion in 2027. Especially, the small-scale building investment sector is experiencing steady growth in the Asian construction project market ([Lee and Jeon 2018](#); [Nikjow et al. 2021](#)). Despite the impacts of the COVID-19 pandemic, such as increasing interest rates and raw material prices, the new housing construction and real estate markets continue to be attractive for companies and individuals. For example, in South Korea, 90% of the buildings are less than 661 square meters (sqm), and 83.6% of these are privately owned ([Kim et al. 2021](#)). Although regional variations exist, the market for small-scale private construction projects for individual clients is anticipated to expand as the global implementation of systems to enhance standards for building client permits gains momentum ([Ogunnusi et al. 2021](#); [Evans and Farrell 2023](#)).

[Odusami \(2002\)](#) categorized project leaders into investors, developers, owners, and central and local governments, depending on the construction project's purpose. Investors and developers primarily undertake construction projects for renting out or selling facilities,

seeking economic benefits from development projects. However, building owners, in addition to renting out and selling, are involved in construction investments or undertake development projects for personal use of the building. Thus, individual clients are those who own or develop real estate projects, such as housing or commercial buildings. In construction project management, the importance of rational decision-making and effective, transparent process management cannot be overstated, given the variations in the design, work environment, construction timeline, and expenses depending on site conditions and requirements (bt Zakaria et al. 2015). However, as the majority of individual clients engaged in small-scale private construction projects lack professional expertise in the field, the projects are overseen by designers or builders, irrespective of the individual clients' competencies (Meng 2012). Consequently, challenges in construction projects arise as inadequate communication with non-professional building owners as project clients.

Previous studies (Chou and Yang 2012; Tran et al. 2017; Ha and Tran 2018; Dinis et al. 2020) have highlighted relationship management and communication between individual clients and project stakeholders, including designers, constructors, consultants, and administrators, as the most critical issues in construction projects. Belassi and Tukel (1996) pointed out that the professional expertise and experience of individuals overseeing construction projects influence project performance. Some literature (Chan and Chan 2004; Williams 2016) emphasizes that the leadership and competency of the project decision-makers play a decisive role in shaping project outcomes. Construction activities generally involve project clients, architects, architectural engineers, and builders (Rowlinson and McDermott 2005). Since the competency of individual clients may impact construction project performance, their competencies are collaboratively enhanced with the stakeholders involved in the construction project (Gunduz and Almuajebh 2020). The individual clients define the nature of the project and establish decision-making indicators along with architects and users throughout the process (Al-Hammad and Al-Hammad 1996).

However, unlike corporate construction projects, decision-making and performance responsibilities in private construction projects are entrusted to individual clients (Zavari and Afshar 2023). Therefore, the personality and communication methods of non-professional building owners significantly influence the course of the project (Assaf et al. 1995; Mayo and Issa 2012). Additionally, unprofessionalism or irrationality in project planning and processes may be highlighted by the personal preferences and decision-making characteristics of individual clients (Zhang et al. 2019). Individual clients in small-scale projects lack interest in professional project management (Olanipekun et al. 2017). Despite small-scale projects involving lower construction costs and time, their significance and management complexity should not be underestimated (Alaghbari et al. 2019; Ward et al. 2020). However, insufficient awareness of the contractor's responsibilities, mistrust in subcontractors, and limited insight as a project owner frequently contribute to unsatisfactory outcomes (Toole et al. 2017; Zalejska and Gunnelin 2019; Roda et al. 2020).

Consequently, there is a need for these private building owners to strengthen their professional knowledge, gather project information, make rational decisions, and enhance their project management competency to achieve satisfactory project performance. This study examines the impact of the competencies of individual clients on construction project performance with the mediating effects of participation attitude and partnership. This article is designed as the research background and necessity in the introduction of Section 1 and prior research and hypothesis development for an individual client's competency, participation attitude, partnership, and project performance through the theoretical background of Section 2. And in Section 3, research models and methods are presented, and in Section 4, analysis results are presented. And in Sections 5 and 6, the interpretation and implications of the research results are presented.

2. Literature Review and Hypothesis Development

2.1. Individual Client's Competency in Construction Projects

The CIOB ([Chartered Institute of Building 1995](#)) defined clients as individuals or organizations with the authority to commission construction projects, approve project plans, and bear the associated costs. Individual clients spearhead construction projects with their plans and budgets, aiming to maximize construction profits, like property rights ([Boyd and Chinyio 2008](#)). They are legal entities that actively lead (direct, manage, and control) construction as the actual individual clients ([Aliakbarlou et al. 2017](#)). It is expected that they play an active role by clearly communicating their needs and consistently participating in the project to ensure the fulfilment of their needs. This extends beyond the passive role of merely explaining their needs, covering costs, and not actively participating ([Siva and London 2011](#); [Aliakbarlou et al. 2018](#)).

Figure 1 exhibits the architectural design methodology. As [Feria and Amado \(2019\)](#) mentioned, once a project owner commissions an architectural engineering company, the company initiates the collection of pertinent information in the initiation phase, such as the construction purpose, location, and investment amount. Subsequently, the preparation phase follows, during which the client-requested information and data, including conditions aligning with the purpose, construction elements, site environment, and legal considerations, are provided. The proposal-making, evaluation, and action phases follow. Therefore, in this process, the client's decision plays the most significant role in a project ([Müller and Turner 2010](#); [Ryd 2014](#)). According to [Kilby \(1983\)](#), owners can be considered rational decision-makers who anticipate risks and manage the project. [Cant \(2009\)](#) emphasized that enhancing the management competency of individual clients in small-scale construction projects is essential.

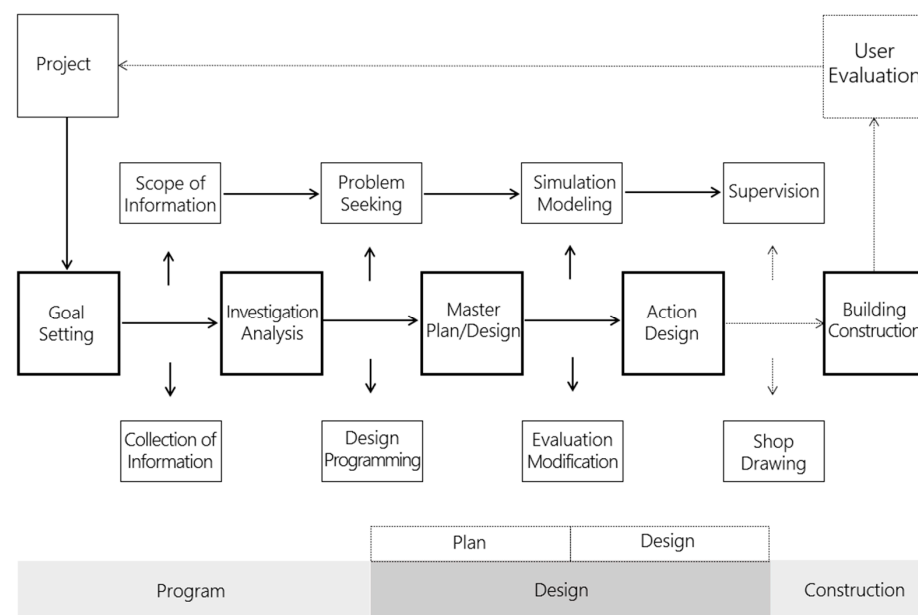


Figure 1. Architectural design process (Sources: [Feria and Amado 2019](#); [Müller and Turner 2010](#); [Ryd 2014](#)).

In construction projects, individual clients set strategic objectives, which may be pursued by individuals or organizations, encompassing economic benefits or public interests, and articulate the requirements of the building ([Kometa et al. 1995](#); [Alvesson et al. 2009](#); [Fernando et al. 2020](#)). Project participants, including designers and builders, proceed to construct the building based on the decisions made by the client ([Shalleck 1993](#); [Chan and Kumaraswamy 1996](#)). Therefore, it is imperative to furnish accurate and specific information about the building in the planning phase to attain the established strategic objectives ([Levander et al. 2011](#); [Savickas 2013](#)).

To furnish appropriate information to project participants, construction project owners leverage their experience, information related to similar construction projects, and the knowledge gained from general duties, such as human resources, finance, and business management (Kometa et al. 1996). Therefore, as a project leader and decision-maker, the individual client requires the competency to successfully lead projects. Baum et al. (2001) defined competency as the personal characteristics, such as knowledge, skills, and abilities, necessary to perform specific jobs. According to Chandler and Jansen (1992), entrepreneurial competency enhances productivity, and successful entrepreneurs with high productivity possess a high level of technical and functional education, along with technical capabilities and expertise in the relevant field. From a business management perspective, Chinyio et al. (1998) conceptualized competency as knowledge, skills, and abilities that result in effective and outstanding performance in a specific job. Therefore, individual clients possess the general abilities to successfully fulfil their role as entrepreneurs and project leaders, encompassing various characteristics, such as experience, training, education, a family background, personality traits, skills, and knowledge (Blayse and Manley 2004).

Similarly, Le Deist and Winterton (2005) and Shavelson (2010) emphasized the importance of 'personal', 'social', and 'professional' competencies. Personal competency refers to work performance skills that individual clients have when conducting construction projects, including leadership, analysis, cognition, investment, planning, and decision-making skills (Levander et al. 2011; Havenvid et al. 2016). It can be subdivided into conceptual competencies, such as analytical and conceptual thinking, which are valued as cognitive approaches (Hoffmann 1999; Navarro et al. 2010; Winkler et al. 2021). Moreover, it is interpreted as achievement competency in which an individual attempts to understand their sense of purpose in certain situations, tasks, problems, or opportunities through the process involved in construction projects.

Social competency refers to actively making use of external resources, such as importing management resources that are lacking internally and receiving technical support from external partners (Siva and London 2011; Meng 2012; Del Prette and Del Prette 2021). Construction projects often involve multiple subcontractors in each process and require close cooperation depending on the process. The clients need the competency to choose subcontractors and form networks for mutual communication between subcontractor groups and know construction-related administrative tasks (Al-Hammad and Al-Hammad 1996).

Professional competency refers to the ability to understand the details of construction projects, control them in accordance with the environment and variables, and derive specific strategies to complete the project (Jurik and Cowgill 2005; Harzallah et al. 2005; Williams 2016). Owing to the fact that construction projects encompass a range of specialized companies and complex processes marked by high uncertainty and numerous factors, individual clients, responsible for formulating strategies for construction projects through comprehensive insight, need to possess strategic competency (Aritua et al. 2009; Awuzie et al. (2018).

2.2. Competency, Participation Attitude, and Partnership

Through engagement in the ordering process, individual clients can acquire relevant data, such as approaches adopted in similar projects or considerations related to bidding and contracts (Kometa et al. 1996). To achieve business objectives, such as reducing costs, increasing profits, eliminating non-economic factors, improving productivity and efficiency, and dominating the market (Anyanwu 2013), individual clients reflect on their strategies, operating experience, and feedback results in the proposal (Josephson and Hammarlund 1999). Furthermore, they determine the project scope and special agreements to decide on the successful bidder who meets the bidding requirements (Chan et al. 2004). Individual clients are tasked with assessing proposed solutions and ensuring compliance with business needs to select feasible proposals and supervise project participants to ensure that the implementation stays within defined constraints (Kolltveit and Grønhaug 2004).

The responsibility for the outcomes of a construction project lies with both the project participants, such as designers and builders, and the client, who is the decision-maker (Oyewobi and Ogunsemi 2010). Inadequate role performance poses a risk for projects and results in increased construction costs and prolonged project timelines. Therefore, if a gap exists between the plan and performance, individual clients direct the project participants to implement measures derived from root cause analysis (Harris et al. 2007). Furthermore, they act as supervisors, considering the constrained construction period and the potentially hazardous work environment (Mia 1999; Thompson 1991; Bryde and Robinson 2005).

Therefore, Carvalho and Rabechini Junior (2015) argued that individual clients present their needs and purposes of construction projects and voluntarily participate in the projects to obtain the desired results. Building clients participating in construction projects influence the projects as decision-makers by directing, managing, and controlling the projects. Uncertainties that occur during the execution of the project, such as decision-making, consultations, civil complaints, administrative procedures, changes in the external environment, and price increases, should be addressed through mutual communication with stakeholders (Bryde and Robinson 2005; Müller and Turner 2010). Eventually, individual clients must actively participate in the project. However, as much as participating in the project, efforts to actively communicate with project partners and build trust relationships are required. This is because partners' cooperation and support are paramount to successfully lead building projects that require a variety of knowledge and information. It is also necessary to reflect the opinions of professional partners in decision-making.

Active project participation is related to competency, which is gained by utilizing and integrating resources, such as knowledge, skills, experiences, and values, acquired by individuals throughout their lives. Personal competency can be maximized by performance when it matches the competency required to execute projects (Acikara et al. 2017). Therefore, building clients' competencies play a pivotal role in the management of construction projects, as projects can succeed when multi-dimensional competency is manifested as a positive attitude toward project participation (Begum et al. 2009). Moreover, individuals possessing a high competency level exhibit confidence and a positive attitude toward their work (Kim et al. 2015). Metochi (2002) argued that a higher personal competency level leads to higher work performance abilities, affecting work commitment and attitudes. Therefore, this study proposes the following hypotheses regarding private construction projects:

- H1.** *The personal competency of a building client has a positive effect on participation attitude.*
- H2.** *The social competency of a building client has a positive effect on participation attitude.*
- H3.** *The professional competency of a building client has a positive effect on participation attitude.*

Furthermore, unlike other general project activities, construction projects involve a process in which subjects produce objects constituting a systematic cooperative relationship (Williams 2016). To achieve the goals, smooth communication and partnership between multiple subcontractors regarding the work type, processes, and construction period are important. Such collaborations offer technological, financial, and strategic advantages over traditional marketplace transactions or vertical integration (Chan et al. 2004). Joint decision-making and partnership between participants for operational and strategic collaboration are crucial in construction projects (Gray 2007). Partnership is an act of striving to maximize mutual interests through cooperation, rather than one-way assistance to attain partners' shared goals (Johnson and Raven 1996). A partnership can be defined as jointly carrying out a company's core activities from an entrepreneurial perspective in collaboration with a partner (El Ansari et al. 2010).

Individual processes may take an extended period to complete if communication for decision-making is not seamless (Cheng et al. 2000). Moreover, problems caused by insufficient understanding may lead to legal action. Therefore, regardless of the building client's planning, management, and coordination capabilities and the service provider's

competence, they cannot produce the best results without acknowledging each other's roles (Bresnen and Marshall 2000). Partnerships are established through collaborative decision-making and strategic cooperation at the operational level (Dinis et al. 2020).

Therefore, the partnership between building clients and stakeholders has a significant impact on construction project performance. Meng (2012) argued that social competency positively affects work collaboration. An individual's expertise in project implementation has a critical impact on project performance, requiring the persuasion of various stakeholders. In addition, the personal characteristics of project leaders affect collaboration with partners (Black et al. 2000). Therefore, this study proposes the following hypotheses regarding private construction projects:

H4. *The personal competency of a building client has a positive effect on partnership.*

H5. *The social competency of a building client has a positive effect on partnership.*

H6. *The professional competency of a building client has a positive effect on partnership.*

2.3. Participation Attitude, Partnership, and Project Performance

The success of a construction project can be understood as delivering the necessary expectations to partners and achieving the planned objectives (Silva et al. 2016; Han et al. 2012). Therefore, performance can be defined as satisfaction with the outcome, depending on the perceptions and desires of building clients and partners (Takim and Adnan 2008; Chandr et al. 2012). Short-term project performance is mostly regarded as partner satisfaction (Wang and Huang 2006; Garbharran et al. 2012). Project performance has a direct or indirect effect on partner satisfaction, and perspectives, such as the client's satisfaction and profitability, are important (Tabish and Jha 2012; Alzahrani and Emsley 2013). Phua and Rowlinson (2004) highlighted intercultural awareness as a factor in satisfaction evaluation for the performance and quality of construction projects. Behavioral factors, such as communication, in project performance evaluation have been presented (Zanjirchi and Moradi 2012). Babu (2015) emphasized partners' types and roles in the project process.

In particular, Black et al. (2000) emphasized contract-based partnering, which can be carried out in an efficient and close relationship, and in a trusting atmosphere with the project partners. Construction project contracts are divided into fixed-price contracts in which costs are paid in batches according to the terms of the contract, cost-plus contracts with a guaranteed maximum price and bonus contracts, time and material contracts when the scope of the project is not clear, and unit price contracts that allow owners to demand a specific quantity and price for a unit product (Matthews et al. 1996; Marzouk and Enaba 2019; Shash and Habash 2020). The partnership in construction projects varies depending on the type of contract, so appropriate collaborative management under the contract should be considered.

Moreover, the appropriate contract, which is signed with partners according to the size and nature of the construction project, directly affects project performance to reduce risk factors, thereby improving quality, reducing construction costs, and for safe construction. Project performance is a key indicator for evaluating the success of a construction project (Cheng et al. 2012; Demirkesen and Ozorhon 2007). The performance of a construction project is classified into objective aspects, such as the construction time, construction speed, schedule changes, unit cost, change in final cost, net present value, and environmental impact measurement scores, as well as subjective aspects, such as quality, functionality, client satisfaction, design satisfaction, and construction satisfaction (Chan et al. 2004).

In general, criteria, such as 'within the time limit', 'within budget', and 'within specifications' have commonly been utilized to measure the performance of construction project management (Assaad et al. 2020). However, overall project performance, including the time, cost, and quality, as well as target performance according to risk, conflict, and claim

management, are utilized as the evaluation factors. Other performance indicators exist depending on the stages in the project life cycle (Kerzner 2017; Davis 2014). Gunduz and Almuajebh (2020) argued that strategic considerations can be utilized to measure project performance, such as potential future cooperation and capability improvement.

Accordingly, the participation attitude and partnership of building customers can have a direct impact on project performance. The project performance is to complete the building according to the target cost and quality level through planned systematic activities (Cheng et al. 2000; Ackara et al. 2017; Challender and Whitaker 2019). Therefore, construction projects can achieve the targeted outcomes through the selection of suitable partners, contract management, process operation, and efficient mutual cooperation with partners (Babu and Sudhakar 2016; Gade and Opoku 2020). In these backgrounds, this study proposes the following hypotheses for private individual construction projects:

H7. *The participation attitude of a building client has a positive effect on project performance.*

H8. *The partnership of a building client has a positive effect on project performance.*

3. Method

3.1. Research Model

This study empirically analyzed the effect of building clients' competencies on the success of construction projects. Competency was classified into personal, social, and professional aspects. These competencies served as the independent variables, while building clients' participation attitude and partnership acted as the mediating variables. Project performance was the dependent variable. The research model, as exhibited in Figure 2, was designed by considering the structural equation-based path analysis of these variables.

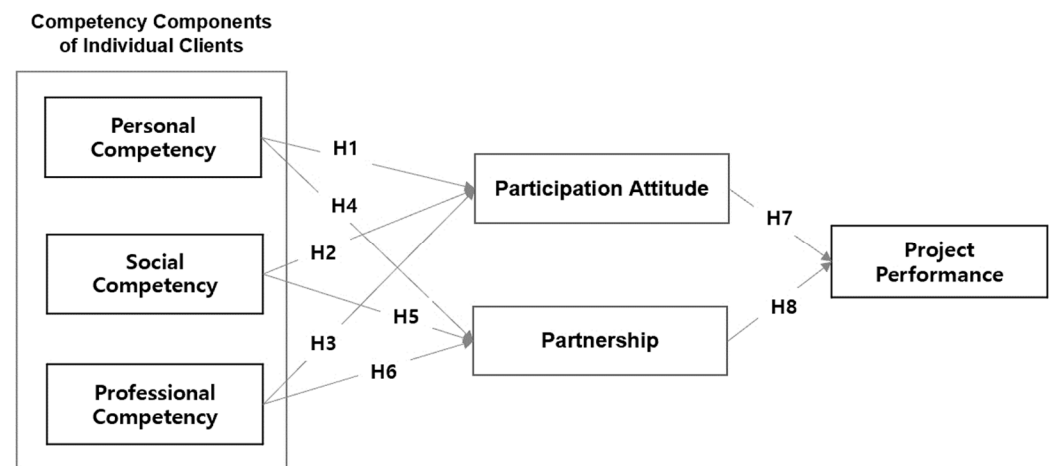


Figure 2. Research model.

3.2. Measurement Tools and Data Collection

A survey was conducted by utilizing tools based on previous studies (Table 1). The constructs were defined as operational variables in alignment with the study's purpose and hypotheses. Consistent with Meng (2012), competency was defined as personal characteristics, encompassing knowledge, skills, and abilities, necessary for effectively leading a project as a decision-maker.

Table 1. Variable definitions and measurement items.

Factors	Measurement Items	References
Personal Competency	<ul style="list-style-type: none"> - I boldly invest time and resources in new things. - I actively take action when necessary for performing work. - I am skilled at making plans and analyzing things. 	Hoffmann (1999); Navarro et al. (2010); Winkler et al. (2021)
Social Competency	<ul style="list-style-type: none"> - I have the ability to assign appropriate tasks to my partner. - I can build a network for cooperation between subcontractors. - I am well aware of the work details of related administrative agencies for project completion. 	Siva and London (2011); Meng (2012); Del Prette and Del Prette (2021)
Professional Competency	<ul style="list-style-type: none"> - I think that learning about architecture is important for constructing a building. - I tend to search for related information for constructing a building. - I use strategic thinking to solve problems. 	Jurik and Cowgill (2005); Williams (2016); Awuzie et al. (2018)
Participation Attitude	<ul style="list-style-type: none"> - I actively express my opinions to the architectural engineering company. - I actively suggest ideas. - I make efforts to control and manage the project. 	Metochi (2002); Begum et al. (2009); Acikara et al. (2017)
Partnership	<ul style="list-style-type: none"> - I predict and solve problems through joint planning with the subcontractors. - I handle work in cooperation with the subcontractors. - As the leader, I exchange high-level information with the subcontractors. 	Meng (2012); Black et al. (2000)
Project Performance	<ul style="list-style-type: none"> - As a leader, the design is at a satisfactory level. - The completed building has a design value. - The building was constructed following safety standards. - The building was constructed following the design and quality control. - The process proceeded appropriately according to the process plan. 	Chan et al. (2004); Cheng et al. (2012); Demirkesen and Ozorhon (2007)

In accordance with Shavelson (2010), personal competency encompasses work performance related to analysis, cognition, investment, planning, and decision-making. Social competency pertains to relationship competency with partners and project stakeholders, encompassing the ability to act appropriately and responsibly in a cooperative community context. Professional competency denotes the level of expertise in the field, encompassing field-specific or methodological competency, indicative of the ability to proficiently address tasks and problems utilizing specialized field-specific knowledge and skills. Participation attitude, serving as the mediating variable, pertains to the active participation attitude of individual clients toward problem-solving. Partnership refers to the behavior and willingness to cooperate for communication and strategic collaborations. Project performance, the dependent variable, relates to the quality of building completion and overall satisfaction as assessed by individual clients from a subjective perspective.

These variables were assessed by utilizing 20 survey items developed for this study. Personal, social, and professional competencies were gauged through nine items. Participation attitude and partnership were measured by utilizing each three items, following the approach of the related literature. Performance was measured by utilizing five items. However one item finally was deemed insignificant and was excluded from professional competency and project performance. Demographic characteristics and descriptive statistics were examined, and an exploratory factor analysis was conducted. Data were analyzed by utilizing SPSS 24.0. AMOS 25.0 was employed for confirmatory factor analysis, involving structural equation modeling, model validation, and path analysis.

3.3. Demographic Information of Data

The offline survey was administered to building clients with prior experience in overseeing a construction project through a design office in Seoul or the Gyeonggi area. The scope of the construction project in this study targeted individual customer-led designs and

small projects collaborating with contractors that had not collaborated with professional construction consulting firms on private orders for use or lease purposes. The survey spanned 23 days, from 10 May to 2 June 2023. A total of 270 questionnaires were collected. After excluding 29 questionnaires with incomplete responses, 241 questionnaires were considered for the final analysis. The participant characteristics are summarized in Table 2.

Table 2. Demographic information of survey participants.

	Section	Frequency	Ratio (%)
Gender	Male	168	67.5
	Female	81	32.5
Age	20~29	2	0.80
	30~39	15	6.10
	40~49	40	16.1
	50~59	88	35.3
	60's and above	104	41.7
Education	High School	4	1.60
	Junior College	61	24.5
	University	131	52.6
	Master's and Doctorate	53	21.3
Occupation	Office worker	56	22.5
	Self-employed	79	31.7
	Professional specialist	55	22.1
	Unemployed	59	23.7
Major	Major in Architecture	47	18.9
	Others	202	81.1
Construction project experiences	1 time	149	59.8
	2–4 times	70	28.2
	5 or more times	30	12.0
Construction project scale (average of the projects)	Less than 100 m ²	40	16.1
	100 m ² –199 m ²	132	53.0
	200 m ² –299 m ²	30	12.0
	300 m ² or higher	47	18.9
Construction project cost (average of the projects)	Less than US\$7700	116	46.5
	US\$7700–22,000	70	28.2
	US\$23,000–37,000	19	7.60
	US\$38,000 or more	44	17.7

4. Results

4.1. Results of Reliability and Validity Analysis

As exhibited in Table 3, the reliability and convergent validity of the measurement model were acceptable. The factor loadings ranged from 0.702 to 0.958, all exceeding 0.5 and meeting the acceptable threshold. The internal reliability was significant, with a composite reliability ranging from 0.741 to 0.904. The average variance extracted (AVE) ranged from 0.599 to 0.825, surpassing 0.5 and indicating acceptability. Furthermore, the Cronbach's α ranged from 0.765 to 0.903, affirming the convergent validity. The goodness-of-fit analysis of the structural equation model indicated that the fit indices were statistically significant.

Table 3. Results of reliability and convergent validity test.

Variables	Measurement Questions	Standard Loading	Standard Error	T Value (p)	CR	AVE	Cronbach α
Personal Competency	PC1	0.813					
	PC2	0.871	0.072	12.244 ***	0.817	0.709	0.828
	PC3	0.802	0.065	10.372 ***			
Social Competency	SC1	0.798					
	SC2	0.702	0.102	9.203 ***	0.739	0.599	0.765
	SC3	0.787	0.097	9.683 ***			
Professional Competency	PFC1	0.856					
	PFC2	0.958	0.054	19.196 ***	0.904	0.825	0.900
Participation Attitude	WB1	0.802					
	WB2	0.892	0.07	16.455 ***	0.904	0.702	0.903
	WB3	0.913	0.069	16.953 ***			
Partnership	PT1	0.832					
	PT2	0.836	0.068	15.905 ***	0.883	0.715	0.880
	PT3	0.868	0.074	16.87 ***			
Project Performance	PP1	0.848					
	PP2	0.873	0.055	17.44 ***			
	PP3	0.869	0.054	17.323 ***	0.902	0.698	0.899
	PP4	0.745	0.069	13.648 ***			

Measurement model fit: χ^2 (df) = 265.721; χ^2 /degree of freedom = 2.46; root mean square (RMS) = 0.049; goodness-of-fit index (GFI) = 0.89; adjusted goodness-of-fit index (AGFI) = 0.845; normal fit index (NFI) = 0.923; Tucker Lewis index (TLI) = 0.94; comparative fit index (CFI) = 0.952; root mean square error of approximation (RMSEA) = 0.077. *** $p < 0.001$.

As exhibited in Table 4, the square root of the AVE of each latent variable was greater than the correlation coefficients between the latent variables, confirming discriminant validity.

Table 4. Correlation matrix and AVE.

	AVE	PC	SC	PFC	PA	PT	PP
Personal competency (PC)	0.709	0.842					
Social competency (SC)	0.599	0.580 **	0.774				
Professional competency (PFC)	0.825	0.698 **	0.525 **	0.908			
Participation attitude (PA)	0.702	0.594 **	0.457 **	0.618 **	0.838		
Partnership (PT)	0.715	0.713 ***	0.572 **	0.721 **	0.658 ***	0.846	
Project performance (PP)	0.698	0.613 **	0.493 **	0.555 **	0.562 **	0.750 **	0.835

Note: ** $p < 0.01$; *** $p < 0.001$. The square root of AVE is shown in bold letters.

4.2. Results of Structural Equation Model Analysis

As a result of analyzing the fit of the structural model, as suggested in Table 5, χ^2 (p) was 265.721 and the χ^2 /degree of freedom was 2.46. The GFI (Goodness-of-Fit-Index) was 0.899, and NFI (Normal Fit Index) was 0.923. The RMS (Root Mean Square Respective) was 0.049, the AGFI (Adjusted Goodness-of-Fit-Index) was 0.845, and the RMSEA (Root Mean Square Error of Approximation) was 0.077, indicating that the fit of the model was also significant. Although not affected by the sample, CFI, which represents the explanatory power of the model, was 0.952, and TLI, which judges the explanatory power of the structural model, was 0.940, indicating that the basic model was suitable.

Table 5. Results of hypothesis test.

Hypothesis (Path)		Path Coefficient	SRW ¹	t Value	Support (Y/N)
H1	Personal competency → Participation attitude	0.778	0.204	3.821 ***	Accepted
H2	Social competency → Participation attitude	−0.003	0.134	−0.020	Rejected
H3	Professional competency → Participation attitude	0.140	0.118	1.191 **	Accepted
H4	Personal competency → Partnership	0.599	0.141	4.259 ***	Accepted
H5	Social competency → Partnership	0.098	0.091	1.076 *	Accepted
H6	Professional competency → Partnership	0.201	0.082	2.457 **	Accepted
H7	Participation attitude → Project performance	0.091	0.062	1.472 *	Accepted
H8	Partnership → Project performance	1.138	0.092	2.388 ***	Accepted

Structural model fit: $\chi^2(df) = 265.721$; $\chi^2/\text{degree of freedom} = 2.46$; RMS = 0.049; GFI = 0.899; AGFI = 0.845; NFI = 0.923; TLI = 0.940; CFI = 0.952; RMSEA = 0.077. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. ¹ Standardized Regression Weights. Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

One of a total of eight hypotheses was rejected as a result of conducting hypothesis verification through path analysis of the structural equation model. It was found that the architect's personal competency factor had a (3.821, $p < 0.001$) effect on the participation attitude, and the hypothesis that was adopted as the personal competency had a positive effect on the architect partnership factor as (4.259, $p < 0.001$). It was found that social competency had a positive effect on the partnership factor (1.076, $p < 0.05$), but the participation attitude did not. The hypothesis was adopted as professional competency had a positive effect on all of the participation attitude (1.191, $p < 0.01$) and partnership (2.457, $p < 0.01$). It was found that the architect's participation attitude (1.472, $p < 0.05$) and the partnership (2.388, $p < 0.001$) on the project performance all had an effect.

4.3. Results of the Direct, Indirect, and Total Effects Analysis

The bootstrap analysis revealed direct, indirect, and mediating effects (see Table 6). Both personal and professional competencies exhibited a significant positive effect on project performance, mediated by the participation attitude and partnership. These findings suggest that bolstering the personal and professional competencies of building clients could lead to an enhancement in project performance. Nevertheless, social competency did not have a direct effect on the participation attitude and functioned as a partial mediating variable in the relationships between exogenous and endogenous variables.

Table 6. Total effect, direct effect, and indirect effect.

Hypothesis (Path)	Direct Effect	Indirect Effect	Total Effect
Personal competency → Participation attitude	0.121 ***	-	0.121
Personal competency → Partnership	0.209 ***	-	0.209
Personal competency → Participation attitude → Project performance	0.238 ***	0.208 ***	0.446
Personal competency → Partnership → Project performance	0.121 **	0.103 ***	0.224
Social competency → Participation attitude	0.154	-	0.154
Social competency → Partnership	0.138 **	-	0.138
Social competency → Participation attitude → Project performance	0.025	0.043	0.068
Social competency → Partnership → Project performance	0.076 *	0.132 *	0.208
Professional competency → Participation attitude	0.248 ***	-	0.248
Professional competency → Partnership	0.267 **	-	0.267
Professional competency → Participation attitude → Project performance	0.232 **	0.157 **	0.389
Professional competency → Partnership → Project performance	0.178 **	0.299 **	0.477
Participation attitude → Project performance	0.197 ***	-	0.197
Partnership → Project performance	0.298 ***	-	0.298

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

5. Discussion

The successful performances in construction projects hinge on the creative input of designers, engineering prowess of builders, and clear goals, commitment, and trusted cooperation of clients. In this regard, the role of the client, especially the competency and participation attitudes of individual clients in small-scale construction projects, is of importance. This study delves into the relationships between the personal, social, and professional competencies of individual clients in construction projects and project performance, examining the mediating roles of their participation attitude and partnership.

The following insights were derived from the analysis results. First, social competency did not affect participation attitude, contrary to the findings in previous studies emphasizing the positive influence of social competency on enthusiasm and work commitment. However, social competency in this study primarily affected partnership, highlighting its significance in forming relationships with stakeholders. These results suggest that the social competency required in relationships with stakeholders significantly impacts partnership formation. In addition, personal competency affected project participation more than social competency as a result of personal commitment and choice. Thus, clients' project responsibility and interest are strengthened, and the importance of participation is emphasized to encourage and prioritize active participation over communication or relationships with partners.

Second, personal competencies, such as investment, planning, analysis, work judgment, and execution ability, were more important than social competencies, such as the ability to identify external companies and administrative details, or professional competencies, such as knowledge and information about buildings and construction processes. In general, individual clients are not architecture professionals and often do not possess the relevant knowledge required. However, as [Odusami \(2002\)](#) mentioned, the client's decision-making, experience, and problem-solving skills significantly impact seamless project progress and performance. If individual clients neglect their responsibility to formulate detailed plans concerning funding, project utilization, expectations, and post-management oversight, it often leads to delays in the process and the emergence of diverse issues, such as financial challenges. Therefore, individual clients should strive to improve their personal capabilities and lead their projects successfully as much as they communicate with other professionals and subcontractors and manage their partnerships.

Finally, the participation attitude and partnership of individual clients may affect project performance, with the partnership being more significant. They proactively express their perspectives and exert management efforts to ensure success. However, this study's results demonstrated that joint planning and interaction with partners were important, which was in line with the findings of previous studies ([Metochi 2002](#); [Harris et al. 2007](#); [Kim et al. 2015](#)). In particular, partnerships are important in construction projects as they are conducted in collaboration with several stakeholders, as [Black et al. \(2000\)](#) suggested. Therefore, individual clients recognize their role as team members with several partners and endeavor to guide projects successfully, rather than emphasizing their position as clients who offer instructions during the project.

6. Conclusions

6.1. Research Implications

Unprofessionalism and erroneous decisions of individual clients at construction sites cause problems and result in unsatisfactory performance. However, previous studies have focused on large-scale construction projects, and research on small-scale projects, particularly those led by individual clients, is scarce. Therefore, this study examined the relationship between project performance and individual clients' competencies.

The findings revealed the necessity of changing the perceptions of clients and increasing their sense of responsibility. As individual clients lack professional expertise, they exhibit passivity or subjectivity when it comes to assuming responsibilities and decision-making

in construction projects. Although such an attitude has a negative impact on performance during the project, they believe that the design or construction company must be responsible for project performance. Therefore, awareness should be spread regarding individual clients' needs to assume responsibility for project performance rationally and objectively through active participation. This would improve work efficiency and create a rational work environment for all stakeholders.

Second, the promotion of education for individual clients is necessary. The construction industry emphasizes practical education, such as construction and project management, while lacking project governance education, such as business administration, risk management, decision-making, and communication. Knowledge and information regarding private and small-scale construction projects is insufficiently shared, and an environment to obtain professional project governance education does not exist. However, as the real estate market for private investors and developers expands, an environment for private and small-scale construction projects is created, accompanied by appropriate education. This would promote an understanding of the construction industry and increase learning opportunities for private construction projects.

Third, government and public support services are provided to increase information access and expand networks to allow individual clients to enhance their competency. Non-professionals study architecture or depend on designers and architects for construction projects. Individual clients have the competency to successfully lead construction projects. However, limitations exist in accessing information and forming cooperation systems to acquire individual competency. Therefore, support for individual clients, such as information and personal consulting services, would facilitate the stable development of construction projects, including new construction, extension, remodeling, rebuilding, and the relocation of projects.

6.2. Research Limitations and Future Plans

This study has the limitations as follows. This study was conducted in the metropolitan area of South Korea. Therefore, caution should be exercised when applying the findings to a broader context. Further research should be conducted using random sampling throughout South Korea. Moreover, the competency of individual clients should be comparatively analyzed by country and region by expanding the research scope to different countries and continents. Client competency was defined based on previous studies. However, as previous studies have focused on large-scale corporate projects, the competency variables of individual clients may differ. Future qualitative research should therefore evaluate factors affecting project performance, focusing on individual clients. Specifically, as the personal dispositions and traits of individual clients are significant, future research should also examine individual characteristics.

In this study, individual clients were assumed to be non-experts leading small building projects and subjects with relatively little knowledge and information. However, as the environment of the times has changed, individuals can quickly acquire different knowledge and information through digital platform channels and receive online-based consulting or advice. Therefore, since this study did not reflect this changed personal customer environment, future studies will need to consider these issues and redefine the capabilities of individual clients.

Finally, construction projects have different characteristics depending on the project phase and management systems. However, this study investigated performance with respect to project completion without considering the progress of various phases. Therefore, further research should examine the relationship between individual clients and project performance by considering different phases with respect to the roles and extent of participation for individual clients.

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References

- Acikara, Turgut, Aynur Kazaz, and Serdar Ulubeyli. 2017. Evaluations of construction project participants' attitudes toward quality management in Turkey. *Procedia Engineering* 196: 203–10. [\[CrossRef\]](#)
- Alaghbari, Wael, Abubaker Al-Sakkaf, and Basel Sultan. 2019. Factors affecting construction labour productivity in Yemen. *International Journal of Construction Management* 19: 79–91. [\[CrossRef\]](#)
- Al-Hammad, Abdul-Mohsen, and Ibrahim Al-Hammad. 1996. Interface problems between building owners and designers. *Journal of Performance of Constructed Facilities* 10: 123–26. [\[CrossRef\]](#)
- Aliakbarlou, Sadegh, Suzanne Wilkinson, and Seosamh Benedict Costello. 2017. Exploring construction client values and qualities: Are these two distinct concepts in construction studies? *Built Environment Project and Asset Management* 7: 234–52. [\[CrossRef\]](#)
- Aliakbarlou, Sadegh, Suzanne Wilkinson, and Seosamh Costello. 2018. Rethinking client value within construction contracting services. *International Journal of Managing Projects in Business* 11: 1007–25. [\[CrossRef\]](#)
- Alvesson, Mats, Dan Kärreman, Andrew Sturdy, and Karen Handley. 2009. Unpacking the client (s): Constructions, positions and client–consultant dynamics. *Scandinavian Journal of Management* 25: 253–63. [\[CrossRef\]](#)
- Alzahrani, Jaman, and Margaret Emsley. 2013. The impact of contractors' attributes on construction project success: A post construction evaluation. *International Journal of Project Management* 31: 313–22. [\[CrossRef\]](#)
- Anyanwu, Columbus Ikechukwu. 2013. The role of building construction project team members in building projects delivery. *Journal of Business and Management* 14: 30–34. [\[CrossRef\]](#)
- Aritua, Bernard, Nigel J. Smith, and Denise Bower. 2009. Construction client multi-projects—A complex adaptive systems perspective. *International Journal of Project Management* 27: 72–79. [\[CrossRef\]](#)
- Assaad, Rayan, Islam El-Adaway, and Ibrahim Abotaleb. 2020. Predicting project performance in the construction industry. *Journal of Construction Engineering and Management* 146: 04020030. [\[CrossRef\]](#)
- Assaf, Sadi A., Mohammed Al-Khalil, and Muhammad Al-Hazmi. 1995. Causes of delay in large building construction projects. *Journal of Management in Engineering* 11: 45–50. [\[CrossRef\]](#)
- Awuzie, Bankole, Fady Farag, and Peter McDermott. 2018. Achieving social value through construction frameworks: The effect of client attributes. *Proceedings of the Institution of Civil Engineers-Management, Procurement and Law* 171: 25–31. [\[CrossRef\]](#)
- Babu, Nipin Joseph. 2015. Factors affecting success of construction project. *IOSR Journal of Mechanical and Civil Engineering* 12: 2320–34.
- Babu, Sumesh Sudheer, and B. Sudhakar. 2016. Construction project management during economic crisis. *International Journal of Management* 7: 370–81.
- Baum, Robert, Edwin Locke, and Ken Smith. 2001. A multidimensional model of venture growth. *Academy of Management Journal* 44: 292–303. [\[CrossRef\]](#)
- Begum, Rawshan Ara, Chamhuri Siwar, Joy Jacqueline Pereira, and Abdul Hamid Jaafar. 2009. Attitude and behavioral factors in waste management in the construction industry of Malaysia. *Resources, Conservation and Recycling* 53: 321–28. [\[CrossRef\]](#)
- Belassi, Walid, and Oya Iemeli Tukul. 1996. A new framework for determining critical success/failure factors in projects. *International Journal of Project Management* 14: 141–51. [\[CrossRef\]](#)
- Black,Carolynn, Akintola Akintoye, and Eamon Fitzgerald. 2000. An analysis of success factors and benefits of partnering in construction. *International Journal of Project Management* 18: 423–34. [\[CrossRef\]](#)
- Blayse, Aletha, and Karen Manley. 2004. Key influences on construction innovation. *Construction Innovation* 4: 143–54. [\[CrossRef\]](#)
- Boyd, David, and Ezekiel Chinyio. 2008. *Understanding the Construction Client*. New York: John Wiley & Sons.
- Bresnen, Mike, and Nick Marshall. 2000. Partnering in construction: A critical review of issues, problems and dilemmas. *Construction Management & Economics* 18: 229–37.
- Bryde, David James, and Lynne Robinson. 2005. Client versus contractor perspectives on project success criteria. *International Journal of Project Management* 23: 622–29. [\[CrossRef\]](#)
- bt Zakaria, Intan Bayani, Mohamad Redhuan, Bin Mohamed, Nadira bt Ahzahar, and Siti Zubaidah bt Hashim. 2015. A study on leadership skills of project manager for a successful construction project. *International Academic Research Journal of Social Science* 1: 89–94.

- Cant, Robyn. 2009. Constructions of competence within dietetics: Trust, professionalism and communications with individual clients. *Nutrition & Dietetics* 66: 113–18.
- Carvalho, Marly Monteiro De, and Roque Rabechini Junior. 2015. Impact of risk management on project performance: The importance of soft skills. *International Journal of Production Research* 53: 321–40. [CrossRef]
- Challender, Jason, and Russell Whitaker. 2019. *The Client Role in Successful Construction Projects*. New York: Routledge.
- Chan, Albert, and Ada Chan. 2004. Key performance indicators for measuring construction success. *Benchmarking: An International Journal* 11: 203–21. [CrossRef]
- Chan, Albert, David Scott, and Ada Chan. 2004. Factors affecting the success of a construction project. *Journal of Construction Engineering and Management* 130: 153–55. [CrossRef]
- Chan, Daniel, and Mohan Kumaraswamy. 1996. An evaluation of construction time performance in the building industry. *Building and Environment* 31: 569–78. [CrossRef]
- Chandler, Gaylen, and Erik Jansen. 1992. The founder's self-assessed competence and venture performance. *Journal of Business Venturing* 7: 223–36. [CrossRef]
- Chandr, Herry Pintardi, I. Wiguna, and Peter Koming. 2012. Model of stakeholder influence on project success: Finding from construction project in East Java. *International Journal of Academic Research* 4: 41–45.
- Chartered Institute of Building (CIOB). 1995. Chartered institute of building, and chartered institute of building. The chartered institute of building. In *The Chartered Institute of Building Handbook and List of Members*. London: CIOB, pp. 27–52.
- Cheng, Eddie, Heng Li, and Peter Love. 2000. Establishment of critical success factors for construction partnering. *Journal of Management in Engineering* 16: 84–92. [CrossRef]
- Cheng, Eddie, Neal Ryan, and Stephen Kelly. 2012. Exploring the perceived influence of safety management practices on project performance in the construction industry. *Safety Science* 50: 363–69. [CrossRef]
- Chinyio, Ezekiel, Paul Olomolaiye, Simon Kometa, and Frank Harris. 1998. A needs-based methodology for classifying construction clients and selecting contractors. *Construction Management & Economics* 16: 91–98.
- Chou, Jui-Sheng, and Jung-Ghun Yang. 2012. Project management knowledge and effects on construction project outcomes: An empirical study. *Project Management Journal* 43: 47–67. [CrossRef]
- Data Bridge Market Research. 2020. Available online: <https://www.databridgemarketresearch.com/reports/global-building-and-construction-sheets-market> (accessed on 23 April 2023).
- Davis, Kate. 2014. Different stakeholder groups and their perceptions of project success. *International Journal of Project Management* 32: 189–201. [CrossRef]
- Del Prette, Zilda, and Almir Del Prette. 2021. *Social Competence and Social Skills*. London: Springer.
- Demirkesen, Sevilay, and Beliz Ozorhon. 2017. Measuring project management performance: Case of construction industry. *Engineering Management Journal* 29: 258–77. [CrossRef]
- Dinis, Fabio Matoseiro, Luís Sanhudo, João Poças Martins, and Nuno M.M. Ramos. 2020. Improving project communication in the architecture, engineering and construction industry: Coupling virtual reality and laser scanning. *Journal of Building Engineering* 30: 101287. [CrossRef]
- El Ansari, Walid, Reza Oskrochi, and Ceri J. Phillips. 2010. One size fits all partnerships? What explains community partnership leadership skills? *Health Promotion Practice* 11: 501–14. [CrossRef]
- Evans, Martin, and Peter Farrell. 2023. A strategic framework managing challenges of integrating lean construction and integrated project delivery on construction megaprojects, towards global integrated delivery transformative initiatives in multinational organisations. *Journal of Engineering, Design and Technology* 21: 376–416. [CrossRef]
- Feria, Margarida, and Miguel Amado. 2019. Architectural design: Sustainability in the decision-making process. *Buildings* 9: 135. [CrossRef]
- Fernando, Sam, Kriengsak Panuwatwanich, and David Thorpe. 2020. Analyzing client-led innovation enablers in Australian construction projects. *International Journal of Managing Projects in Business* 13: 388–408. [CrossRef]
- Gade, Anne Nørkjær, and Alex Opoku. 2020. Challenges for implementing the sustainable development goals in the danish construction industry: Building owners' perspective. Paper presented at ARCOM 2020-Association of Researchers in Construction Management, 36th Annual Conference 2020-Proceedings, Online, September 7–8; London: ARCOM, Association of Researchers in Construction Management.
- Garbharran, Hari, Jeevarathnam Govender, and Thulani Msani. 2012. Critical success factors influencing project success in the construction industry. *Acta Structilia* 19: 90–108.
- Global Industry Analysts, Inc. 2019. Available online: <https://www.strategyr.com/market-report-construction-management-software-forecasts-global-industry-analysts-inc.asp> (accessed on 23 April 2023).
- Gray, Barbara. 2007. The process of partnership construction: Anticipating obstacles and enhancing the likelihood of successful partnerships for sustainable development. In *Partnerships, Governance and Sustainable Development*. Reflections on Theory and Practice. Massachusetts: Edward Elgar Publishing, pp. 27–41.
- Gunduz, Murat, and Mohammed Almuajebh. 2020. Critical success factors for sustainable construction project management. *Sustainability* 12: 1990. [CrossRef]
- Ha, Thi Phuong Thao, and Manh Dung Tran. 2018. Review of impacts of leadership competence of project managers on construction project success. *International Journal of Emerging Trends in Social Sciences* 4: 15–25. [CrossRef]

- Han, Wai Soon, Aminah Md. Yusof, Syuhaida Ismail, and Ng Choon Aun. 2012. Reviewing the notions of construction project success. *International Journal of Business and Management* 7: 90–101.
- Harris, Michael, Shanan Gibson, and Sherrill Taylor. 2007. Examining the impact of small business institute participation on entrepreneurial attitudes. *Journal of Small Business Strategy* 18: 57–76.
- Harzallah, Mounira, Giuseppe Berio, and François Vernadat. 2005. Analysis and modeling of individual competencies: Toward better management of human resources. *IEEE Transactions on Systems, Man, and Cybernetics-Part A: Systems and Humans* 36: 187–207. [\[CrossRef\]](#)
- Havenvid, Malena Ingemansson, Kajsa Hulthén, Åse Linné, and Viktoria Sundquist. 2016. Renewal in construction projects: Tracing effects of client requirements. *Construction Management and Economics* 34: 790–807. [\[CrossRef\]](#)
- Hoffmann, Terrence. 1999. The meanings of competency. *Journal of European Industrial Training* 23: 275–86. [\[CrossRef\]](#)
- Johnson, Jean, and Peter Raven. 1996. Relationship quality, satisfaction and performance in export marketing channels. *Journal of Marketing Channels* 5: 19–48. [\[CrossRef\]](#)
- Josephson, Per-Erik, and Yngve Hammarlund. 1999. The causes and costs of defects in construction: A study of seven building projects. *Automation in Construction* 8: 681–87. [\[CrossRef\]](#)
- Jurik, Nancy, and Julie Cowgill. 2005. The construction of client identities in a post-welfare social service program: The double bind of microenterprise development. In *Deserving and Entitled: Social Constructions and Public Policy*. New York: State University of New York Press, pp. 173–96.
- Kerzner, Harold. 2017. *Project Management: A systems Approach to Planning, Scheduling, and Controlling*. Hoboken: John Wiley & Sons.
- Kilby, Peter. 1983. An entrepreneurial problem. *The American Economic Review* 73: 107–11.
- Kim, Daejin, Joonho Ko, and Yujin Park. 2015. Factors affecting electric vehicle sharing program participants' attitudes about car ownership and program participation. *Transportation Research Part D: Transport and Environment* 36: 96–106. [\[CrossRef\]](#)
- Kim, Sungchul, Minjin Kong, Jinwoo Choi, Seungwoo Han, Hoyoung Baek, and Taehoon Hong. 2021. Feasibility analysis of COVID-19 response guidelines at construction sites in South Korea using CYCLONE in terms of cost and time. *Journal of Management in Engineering* 37: 04021048. [\[CrossRef\]](#)
- Kolltveit, Bjørn Johs, and Kjell Grønhaug. 2004. The importance of the early phase: The case of construction and building projects. *International Journal of Project Management* 22: 545–51. [\[CrossRef\]](#)
- Kometa, Simon, Paul Olomolaiye, and Frank Harris. 1995. An evaluation of clients' needs and responsibilities in the construction process. *Engineering, Construction and Architectural Management* 2: 57–76. [\[CrossRef\]](#)
- Kometa, Simon, Paul O. Olomolaiye, and Frank Harris. 1996. A review of client-generated risks to project consultants. *International Journal of Project Management* 14: 273–79. [\[CrossRef\]](#)
- Le Deist, Françoise Delamare, and Jonathan Winterton. 2005. What is competence? *Human Resource Development International* 8: 27–46. [\[CrossRef\]](#)
- Lee, Suk-Won, and Jae-Keun Jeon. 2018. Dynamic relationships between mega projects and official development assistance: Case of South Korean infrastructure construction projects in ASEAN's developing countries. *Sustainability* 10: 4491. [\[CrossRef\]](#)
- Levander, Erika, Susanne Engström, Ylva Sardén, and Lars Stehn. 2011. Construction clients' ability to manage uncertainty and equivocality. *Construction Management and Economics* 29: 753–64. [\[CrossRef\]](#)
- Marzouk, Mohamed, and Mohamed Enaba. 2019. Text analytics to analyze and monitor construction project contract and correspondence. *Automation in Construction* 98: 265–74. [\[CrossRef\]](#)
- Matthews, Jason, Alan Tyler, and Antony Thorpe. 1996. Pre-construction project partnering: Developing the process. *Engineering, Construction and Architectural Management* 3: 117–31. [\[CrossRef\]](#)
- Mayo, Giel, and Raja Issa. 2012. BIM use and requirements among building owners. *Computing in Civil Engineering*. Virginia, USA: American Society of Civil Engineers Publishing, pp. 349–356. [\[CrossRef\]](#)
- Meng, Xianhai. 2012. The effect of relationship management on project performance in construction. *International Journal of Project Management* 30: 188–98. [\[CrossRef\]](#)
- Metochi, Melvina. 2002. The influence of leadership and member attitudes in understanding the nature of union participation. *British Journal of Industrial Relations* 40: 87–111. [\[CrossRef\]](#)
- Mia, Lokman. 1999. Managerial attitude, motivation and the effectiveness of budget participation. *Accounting, Organizations and Society* 13: 465–75. [\[CrossRef\]](#)
- Müller, Ralf, and Rodney Turner. 2010. Leadership competency profiles of successful project managers. *International Journal of Project Management* 28: 437–48. [\[CrossRef\]](#)
- Navarro, María Luisa Avargues, Mercedes Borda Mas, and Ana María López Jiménez. 2010. Working conditions, burnout and stress symptoms in university professors: Validating a structural model of the mediating effect of perceived personal competence. *The Spanish Journal of Psychology* 13: 284–96. [\[CrossRef\]](#)
- Nikjow, Mohammad Ajmal, Li Liang, Xijing Qi, and Samad Sepasgozar. 2021. Engineering procurement construction in the context of belt and road infrastructure projects in west Asia: A SWOT analysis. *Journal of Risk and Financial Management* 14: 92. [\[CrossRef\]](#)
- Oodusami, Koleola Tunwase. 2002. Perceptions of construction professionals concerning important skills of effective project leaders. *Journal of Management in Engineering* 18: 61–67. [\[CrossRef\]](#)

- Ogunnusi, Mercy, Mercy Ogunnusi, Temitope Omotayo, Mansur Hamma-Adama, Bankole Osita Awuzie, and Temitope Egbelakin. 2021. Lessons learned from the impact of COVID-19 on the global construction industry. *Journal of Engineering, Design and Technology* 20: 299–320. [\[CrossRef\]](#)
- Olanipekun, Ayokunle Olubunmi, Albert Chan, Bo Xia, and Ernest Effah Ameyaw. 2017. Indicators of owner commitment for successful delivery of green building projects. *Ecological Indicators* 72: 268–77. [\[CrossRef\]](#)
- Oyewobi, Luqman Oyekunle, and Deji Rufus Ogunsemi. 2010. Factors influencing reworks occurrence in construction: A study of selected building projects in Nigeria. *Journal of Building Performance* 1: 1–20.
- Phua, Florence, and Steve Rowlinson. 2004. How important is cooperation to construction project success? A grounded empirical quantification. *Engineering, Construction and Architectural Management* 11: 45–54. [\[CrossRef\]](#)
- Roda, Irene, Marco Macchi, and Saverio Albanese. Building a Total Cost of Ownership model to support manufacturing asset lifecycle management. *Production Planning & Control* 31: 19–37.
- Rowlinson, Steve, and Peter McDermott. 2005. *Procurement Systems: A Guide to Best Practice in Construction*. London: Routledge, pp. 27–53.
- Ryd, Nina. 2014. Construction clients challenges—emphasizing early stages. *Procedia-Social and Behavioral Sciences* 119: 134–41. [\[CrossRef\]](#)
- Savickas, Mark. 2013. Career construction theory and practice. *Career Development and Counseling: Putting Theory and Research to Work* 2: 144–80.
- Shalleck, Ann. 1993. Constructions of the client within legal education. *Stanford Law Review* 45: 1731–53. [\[CrossRef\]](#)
- Shash, Ali Ali, and Salah Ibrahim Habash. 2020. Construction Contract Conversion: An Approach to Resolve Disputes. *Journal of Engineering, Project & Production Management* 10: 162–69.
- Shavelson, Richard. 2010. On the measurement of competency. *Empirical Research in Vocational Education and Training* 2: 41–63. [\[CrossRef\]](#)
- Silva, Susil Kumara, B. N. F. Warnakulasooriya, and Bhadra Arachchige. 2016. Criteria for construction project success: A literature review. Paper presented at 13th International Conference on Business Management (ICBM), Colombo, Sri Lanka, December 8.
- Siva, Jessica Pooi Sun, and Kerry London. 2011. Investigating the role of client learning for successful architect–client relationships on private single dwelling projects. *Architectural Engineering and Design Management* 7: 177–89. [\[CrossRef\]](#)
- Tabish, Syed Zafar Shahid, and Kumar Neeraj Jha. 2012. Success traits for a construction project. *Journal of Construction Engineering and Management* 138: 1131–38. [\[CrossRef\]](#)
- Takim, Roshana, and Hamimah Adnan. 2008. Analysis of effectiveness measures of construction project success in Malaysia. *Asian Social Science* 4: 74–91. [\[CrossRef\]](#)
- Thompson, Peter. 1991. The client role in project management. *International Journal of Project Management* 9: 90–92. [\[CrossRef\]](#)
- Toole, Michael, John Gambatese, and Deborah Abowitz. 2017. Owners’ role in facilitating prevention through design. *Journal of Professional Issues in Engineering Education and Practice* 143: 04016012. [\[CrossRef\]](#)
- Tran, Dai Q., Long Duy Nguyen, and Allen Faught. 2017. Examination of communication processes in design-build project delivery in building construction. *Engineering, Construction and Architectural Management* 24: 1319–36. [\[CrossRef\]](#)
- Wang, Xiaojin, and Jing Huang. 2006. The relationships between key stakeholders’ project performance and project success: Perceptions of Chinese construction supervising engineers. *International Journal of Project Management* 24: 253–60. [\[CrossRef\]](#)
- Ward, Ella, Song Yang, Jenni Romaniuk, and Virginia Beal. 2020. Building a unique brand identity: Measuring the relative ownership potential of brand identity element types. *Journal of Brand Management* 27: 393–407. [\[CrossRef\]](#)
- Williams, Terry. 2016. Identifying success factors in construction projects: A case study. *Project Management Journal* 47: 97–112. [\[CrossRef\]](#)
- Winkler, Rainer, Matthias Söllner, and Jan Marco Leimeister. 2021. Enhancing problem-solving skills with smart personal assistant technology. *Computers & Education* 165: 104148.
- Zalejska, Jonsson Agnieszka, and Rosane Hungria Gunnelin. 2019. Defects in newly constructed residential buildings: Owners’ perspective. *International Journal of Building Pathology and Adaptation* 37: 163–85. [\[CrossRef\]](#)
- Zanjirchi, Seyed Mahmod, and Mehrdad Moradi. 2012. Construction project success analysis from stakeholders’ theory perspective. *African Journal of Business Management* 6: 5218.
- Zavari, Masoud, and Mohammad Reza Afshar. 2023. The role of site manager transformational leadership in the construction project success. *International Journal of Building Pathology and Adaptation* 41: 1067–85. [\[CrossRef\]](#)
- Zhang, Jingxiao, Hui Li, Ayokunle Olubunmi Olanipekun, and Li Bai. 2019. A successful delivery process of green buildings: The project owners’ view, motivation and commitment. *Renewable Energy* 138: 651–58. [\[CrossRef\]](#)

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