*Original article*

# EMPIRICAL INVESTIGATION OF INTERFACE MANAGEMENT AND ITS SWAY IN THE CONSTRUCTION PROJECT - EVIDENCE FROM INDIA

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**Abstract:** Management practices play a key role in mega projects, and the complexity of large-scale construction processes increases because of their multidisciplinary design, which can be minimized with the help of interface management. The current study aims to analyze the interface factors of construction projects, such as construction material, labor, financial, equipment, and contract condition interfaces, towards the construction project performance - such as impact on cost, time, quality, and customer satisfaction. The study's target demographic was everyone in the building projects, both directly and indirectly, such as engineers, architects, contractors, subcontractors, constructors, and promoters in select cities of Tamil Nadu. A total of 81 samples were collected and analyzed using the Smart PLS Model. It is concluded that having an interface management team in the construction drives the team towards their goals and maintains standards of the project's design and quality with an R square value of 0.495.

**Keywords:** Interface management; Material; Labour; Financial interface; Equipment; Contract condition; Customer satisfaction.

## 1. INTRODUCTION

On-time delivery and on-budget delivery of construction projects have been a top priority in construction management (Flyvbjerg, 2014). Numerous challenges, such as inflation, impractical expectations or goals, and increasing complexities at the time of execution, are faced in all construction projects, particularly in mega projects. Prieto (2015) has opined that Interface Management (IM) will reduce misalignment, issues, and conflicts in huge mega projects. Effective IM will clarify the plans, objectives, roles, operating procedures, and responsibilities in managing the construction project (Shokri et al., 2011).

Management practice plays a key role in mega projects, and the complexity of large-scale construction processes increases because of its multidisciplinary design, which can be minimized with the help of interface management (Lin, 2015; Mahmoudi Sari, 2023; Razkenari et al., 2020). The process of defining, managing, and conveying the information required for unrelated items to co-function is known as interface management. Defining project roles and responsibilities is the traditional method of managing project interfaces (Chinowsky et al., 2011a). Without effective interface interventions, the project would negatively impact cost, time quality, and customer satisfaction (Chen et al., 2008).

The interface is the point of interaction between two or more aspects of a project. Risk management is a mechanism in which resource and earnings risks are identified, analyzed, and managed. This could come from various sources, such as unstable economic scenarios, legitimate obligations, strategic management



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issues, and natural disasters. The risk could be managed, reduced, shared, transferred, or accepted, but cannot be avoided. Interface management mainly focuses on optimizing time and cost with increased quality and customer satisfaction in the construction process by identifying more inter-facial points (Chen et al., 2008; Miles & Ballard, 2002).

Interface management collects more information about the risks and critical activities associated with ongoing construction projects through a questionnaire. It analyzes the collected data using a suitable framework for effective project management. The fractured nature of the construction project makes it difficult to put multidisciplinary teams, materials, processes, budgets, and timetables together for a given period. When the project size is large, the number of stakeholders will increase, leading to increased complexity in the project. For each facility, building components need to be created for information such as design data, schedule data, etc., even though they are identical. Moreover, stakeholders have a particular know-how or technology framework incompatible. So among stakeholders, data, and technology, the interface develops and facilitates effectiveness (Al-Hammad, 2000)

It is essential to understand the importance of interface management practices to manage the construct performance outcome among different stakeholders and enhance effectiveness. Interface management is vital in construction projects to ensure the seamless interaction and coordination between various stakeholders involved in the project for multiple reasons, as follows.

- Interface management helps to handle the complexity and ensures that different dimensions of work are in harmony.
- It also facilitates reducing potential conflicts or issues in the project, reducing the risk of delays, cost overruns, and rework.
- It helps maintain the project's quality and integrity by ensuring the required standards and specifications.
- Interface management promotes clear and transparent communication among different project stakeholders, fostering collaboration and reducing misunderstandings.
- It addresses all issues proactively, which ensures compliance resource efficiency and avoids cost overrun.

Gibb (1999) categorized interfaces into three distinct types: physical, contractual, and organizational. These primary process factors play a significant role in facilitating the transition between various site work and the engagement of stakeholders in the complex construction of mega projects. The increasing fragmentation within the industry has elevated interface management as a critical and imperative subject, underscoring the need for additional research and in-depth exploration.

## 2. PREVIOUS LITERATURE

Interface management is “the administration of shared boundaries between persons, systems, equipment, or concepts”, according to the experts. “Communication, coordination, and responsibility management across a shared border between two interdependent organizations, stages, or physical things” are the other two definitions for interface management. “Resolving conflicts frequently between individuals, departments, and disciplines rather than inside the project team.” (Al-Hammad, 2000) The poor practice of interface management can lead to inter-facial problems in design mistakes, mismatched components, performance deficiencies of systems, teamwork difficulties, and disputes with construction. Interface management has now become a critical field of project management. Interfaces, joints, and ties between various elements or components of the building cause more issues than any rest. During design, production, and construction, there are difficulties and consequences in the life of the building. This is particularly frequent when building the exterior of the building. (Chinowsky et al., 2011a)
(Siao et al., 2011) have discussed the development of construction interface information management. This research provides an approach to the Construction Interface Matrix (CIM) to represent the problem-related interface details for project participants. This approach helps project members and administrators collect available

information directly to manage interfaces without any data support efficiently.

Interface management is important in construction, including technological design, overall design, logistics, external factors, and human relationships. Failure to take interfaces into account or fix them can lead to severe problems with a project, whether during or after construction, inevitably adding to the project costs (Falk & Miller, 1992; Shen et al., 2017).

Projects suffer from schedule and cost-related risks, leading to preconstruction, execution, and post-construction disputes. Deliver recommendations to the project manager about risk assessment methodology and risk response strategy. It can be handled by adding existing provisions to the contract (Subramanyan et al., 2012). Focuses on Engineering-Procurement-Construction (EPC), which emphasizes high efficiency and integrative solutions. This suggests that Trust, openness, and communication play an important role in the interface of EPC projects and depicts their multilateral relationships (Shen et al., 2018).

Information-sharing platforms and database management systems are used to develop the IT sector with interface management tools like BIM and ACONEX (Keerthanaa & Shanmugapriya, 2017a). It clarifies the relationship between Interface Management with Lean construction and agile project management. Advances complex connections among team members then arranges and facilitates assets, time, and climate for development exercises and upgrades interface normalization for segments or sub-systems ((Luan et al., 2022) and suggests improvements in cost analysis. They discussed implementation and facing problems during the test and the methodology of receiving feedback (Fung, 2015a). The interface is the region formed when two phases (systems) are in contact, through which the interface properties of one phase transfer to the other (Eray, Sanchez, et al., 2019; McCarney et al., 2022; Wong & Zhang, 2013).

The construction material interface considers issues like lack of quality, slow delivery, change in material and specification, and damage. Construction material interfaces have been considered vital to the project's outcome. The productive site management and cost efficiency to a maximum of seventy percent is based on material interface management (Huo et al., 2020a; Patel & Vyas, 2011). Quality and quantity of material available are crucial for the timely completion of construction, and it was concluded that fifty-five percent of the overall cost estimate depends on the materials and equipment management (Tedla & Patel, 2018). The equipment interface is caused by equipment in construction to the other phases. This can be insufficient/shortage, low efficiency and productivity, equipment failures and lack of spare parts, equipment allocation, or lack of spare parts.

The financial interface **is** caused mostly by management, which affects the other phases. This can be a problem with financial claims, the funding process, the late release of budgets or funds, or the global financial crisis. Financial interfaces include strategic planning processes for fund management in construction projects (Fung,2015a). Financial interfaces and intervention strategies are vital before and during the construction project from the perspective of cost ascertainment control and the type, time, and nature of fund mobilization (Burtonshaw-Gunn, 2017). Furthermore, future expenditure and revenue planning are also essential to avoid delays in construction projects (Kolhatkar & Dutta, 2013). The Labour interface is caused mostly by working resources in the other phases. This can be low productivity, unqualified/inexperienced workers, discipline problems, labor accidents, and injuries. Ensuring continuous supply with quality skills is an important interface that overcomes delays and productive, targeted performance (Kadir et al., 2005)

The contract condition and project outcome depend upon the interface management interventions because of delays, performance mismatch, design errors, plan execution, coordination difficulties, and stakeholder conflict (Ahn et al., 2017; Chen et al., 2007). The coordination and better communication between various stakeholders, such as engineers, project managers, and contractors, will enable perfect positive contract conditions and transform domain knowledge and skill based on customer expectations (Eray, Haas, et al., 2019; Hmidah et al., 2022; Keerthanaa & Shanmugapriya, 2017a).

When any new project arrives, the construction project teams are deployed accordingly. The team's main goal is to showcase their desirability of project performance through collaborative and cooperative teamwork. For successful completion, construction companies must promote, measure, and evaluate interfaces in a project. Many interfacial points in the construction project must be identified prior and rectified or have an alternative dispute resolution. To achieve a proper outcome in the construction project, the interface management must manage cost, time, quality, and customer satisfaction (Chan et al., 2005; Ekung & Lashinde, 2018).

The current study aims to analyze the inter-facial factors that determine the Interfaces of construction projects, such as construction material interface, labor interface, financial interface, equipment interface, and contract condition, and the construction project performance impact viz-Cost overrun, time overrun, quality and customer satisfaction.

The previous literature clearly states the importance of interfaces in performance of the construction projects. The research gap identified for the current study is how effective interface management practices are of utmost importance in construction projects, where the intricate nature of large-scale construction processes is exacerbated by their multidisciplinary design are studied from the perspective of Engineers, architects, contractors, subcontractors, constructors, and promoters in select cities of Tamil Nadu.

Figure 1 shows the conceptual mapping of the study that highlights the independent and dependent variables chosen for the study that determine the performance of the construction projects from the perspectives of an effective construction team.

***Research question:***

***Do inter-facial management factors influence construction project performance?***

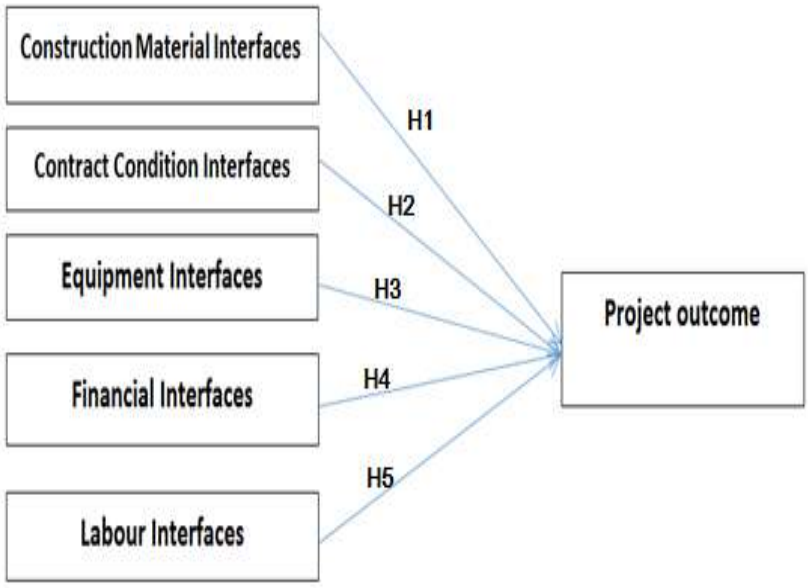


**Figure 1:** Conceptual research model

## 3. METHOD

Primary and secondary data can be collected using the research questionnaire/survey instruments. The study's target demographic was made up of everyone who was involved in the building projects, both directly and indirectly. The data has been collected from Engineers, architects, contractors, subcontractors, constructors, and promoters in select cities of Tamil Nadu viz Tiruchirappalli, Coimbatore, Chennai, and Madurai. A total of 81 samples were collected and analyzed using the Smart PLS tool. The following hypothesis

was formulated in accordance with the discussions to understand the influence of various interfaces on the project outcome.

***H1: The construction material interfaces will have a strong positive relationship in determining the construction project outcome***

***H2: The contract condition interfaces will have a strong positive effect in determining the construction project outcome***

***H3: The equipment interfaces will have a strong positive relationship in determining the construction project outcome***

***H4: The financial interfaces will have a strong positive relationship in determining the construction project outcome***

***H5: The labor interfaces will have a strong positive effect in determining the construction project outcome***

The research methodology process followed for the current study is shown in the framework in Figure 2.

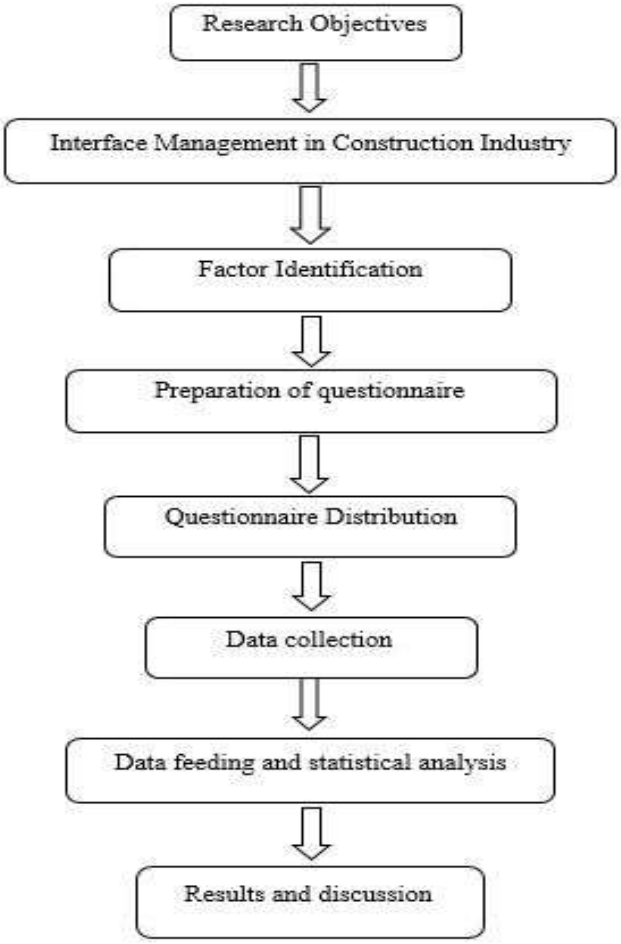


**Figure 2:** Research methodology framework

The Structural Equation Model, the second-generation statistical method called PLS (Partial Least Square) (Hair Jr et al., 2021a), has been advocated in the current research to comprehend the relationship between antecedents of interface management and the construction project outcome (Falk & Miller, 1992).

## 4. ANALYSIS

### 4.1 Descriptive analysis

The study's target demographic encompassed individuals directly and indirectly involved in the building projects. Data was gathered from a diverse group, including engineers, architects, contractors, subcontractors, builders, and project promoters in specific

cities within Tamil Nadu. It is found from the survey data reveals that 88.9% of the participants fall within the 20-30 age group, while 8.6% are in the 30-40 age range. Only 1.2% of the respondents belong to the 40-50 age category, and another 1.2% are aged 50 and above. The data shows that 81.5% of the respondents possess less than five years of experience, while 13.6% have between 5 and 15 years of experience. Only 1.2% of the respondents have 15 to 25 years of experience, and 3.7% have 25 years or more of experience. It is evident that 69.1% of the respondents undergo a residential project, 16.6% undergo a commercial project and 17.3% undergo an industrial project. It's apparent that 16% of the respondents have a budget of less than 15 lakhs, 15.6% have a budget between 15 and 50 lakhs, and 33.3% have a budget exceeding 50 lakhs.

**Table:1** Friedman's test

| **Material Interfaces** | **Mean** | **Rank** | **Financial Interfaces** | **Mean** | **Rank** |
|---|---|---|---|---|---|
| Lack of quality | 3.741 | 1 | Problem of process of financial claim | 3.679 | 2 |
| Slow delivery | 3.235 | 3 | Funding process | 3.630 | 3 |
| Changes in material and specifications | 3.654 | 2 | Late release of budgets/funds | 3.420 | 4 |
| Damage | 2.9259 | 4 | Global financial crisis | 3.716 | 1 |
| **Labor Interfaces** | **Mean** | **Rank** | **Equipment Interfaces** | **Mean** | **Rank** |
| Low productivity | 3.185 | 3 | Insufficient or shortage | 3.333 | 3 |
| Unqualified/inexperienced workers | 3.444 | 1 | Low efficiency and productivity | 3.494 | 2 |
| Discipline problems | 3.284 | 2 | Failures of equipment and lack of spare parts | 3.568 | 1 |
| Labor accidents and injuries | 2.605 | 4 | Equipment allocation or mobilization | 3.123 | 4 |
| **Contract condition Interfaces** | **Mean** | **Rank** | **Outcome due to Interface Management** | **Mean** | **Rank** |
| Absence of alternate dispute resolution | 3.593 | 4 | Cost overrun | 3.185 | 4 |
| Mistakes and ambiguities | 3.383 | 3 | Time overrun | 3.580 | 2 |
| Insufficient details | 3.652 | 1 | Quality | 3.481 | 3 |
| Lack of clear understanding | 3.617 | 2 | Customer satisfaction | 3.988 | 1 |

From Table 1, it is understood that lack of quality ranked first (3.741), changes in material and specification ranked second (3.654), slow delivery of material ranked third (3.235), and damage of material ranked fourth (2.9259) in Friedman's test. It is understood that the global financial crisis is ranked first (3.716), the problem of the process of monetary claim is ranked second (3.679), the funding process is ranked third (3.630), and the late release of budgets/funds is ranked fourth (3.420) in Friedman's test. It is understood that unqualified or inexperienced workers are ranked first (3.444), discipline problems are ranked second (3.284), low productivity is ranked third (3.185), and labor accidents and injuries are ranked fourth (2.605) in Friedman's test. It is understood that failures of equipment and lack of spare parts are ranked first (3.568), low efficiency and productivity are ranked second (3.494), insufficient or shortage is ranked third (3.333), and equipment allocation or mobilization is ranked fourth (2.605) in Friedman's test. It is concluded that insufficient details in the contract document are ranked first (3.652), lack of clear understanding in the contract document is ranked second (3.317), Mistakes and ambiguities in the contract document are ranked third (3.383), and absence of alternate dispute resolution is ranked fourth (2.605) in Friedman's test. It is concluded that customer

satisfaction is ranked first (3.988), time overrun is ranked second (3.580), quality is ranked third (3.481), and cost overrun is ranked fourth (3.185) in Friedman's test.

A descriptive model was developed to understand the impact of interface management in the construction sector. The model was developed using Smart PLS model 3.0 (Hair Jr et al., 2021b). The developed model is a co-variance-based model used to study the complex relationship in the construction project interfaces. The PLS model has been used to estimate various latent variables and structural paths. It also expedited the test of the complexities of multiple interfaces such as Construction Materials, Contract Conditions, Equipment, Financial, and Labour Interfaces, which impacted the construction outcomes in various aspects like Cost overrun, time overrun, Quality, and Customer satisfaction through structural path model.

## 5. EVALUATION OF MEASUREMENT MODELS

**Table 2:** Results summary for reflective measurement models

| Interface Management Factors | Factor Loading | Cronbach Alpha | Composite Reliability | Average Variance Extracted (AVE) |
|---|---|---|---|---|
| Construction Material Interfaces | 0.787 | 0.834 | 0.89 | 0.672 |
| | 0.704 | | | |
| | 0.792 | | | |
| Contract Condition Interfaces | 0.884 | 0.723 | 0.83 | 0.621 |
| | 0.782 | | | |
| | 0.686 | | | |
| Equipment Interfaces | 0.837 | 0.707 | 0.736 | 0.499 |
| | 0.531 | | | |
| | 0.872 | | | |
| Financial Interfaces | 0.534 | 0.707 | 0.809 | 0.596 |
| | 0.872 | | | |
| Labour Interfaces | 0.756 | 0.723 | 0.842 | 0.641 |
| | 0.841 | | | |
| | 0.803 | | | |
| Project outcome | 0.888 | 0.701 | 0.81 | 0.526 |
| | 0.501 | | | |
| | 0.763 | | | |
| | 0.715 | | | |

The measurement model determines the reliability and validity of the model and understands the relationship between various latent variables, such as construction interfaces and the outcome. The validation of the model is shown in Table 2, which contains factors loadings, Cronbach Alpha, which confirms the internal consistency, composite Reliability, which ensues the construct validity, and the Average Variance Extracted, which ensures the convergent validity of the latent variables construction interfaces.

The study considers the factors of interface management that determine and from Table 2, it is confirmed that all the values of Cronbach Alpha and Composite Reliability (CR) are above the threshold value of 0.7 (Huo et al., 2020b; Barbera et al., 2020). It is also confirmed that the distinct individual construct that measures the effect of Interface Management is also greater than 0.70 (Hair Jr et al., 2021b). Thus, the survey tool used for measuring the influence of Interface Management is reliable. The Average Variance Extracted (AVE) and Discriminant validity shown in Table 2 are also above 0.5, ensuring that the construct and all the items are reliable (Hair Jr et al., 2021b).

**Table 3:** Discriminant validity

| | IM Factors | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 1 | Financial Interfaces | **0.772** | | | | | |
| 2 | Equipment Interfaces | 0.486 | **0.699** | | | | |
| 3 | Contract Condition Interfaces | 0.213 | 0.526 | **0.788** | | | |
| 4 | Labour Interfaces | 0.407 | 0.615 | 0.255 | **0.801** | | |
| 5 | Construction Material Interfaces | 0.017 | 0.12 | 0.052 | 0.115 | **0.820** | |
| 6 | Project outcome | 0.428 | 0.649 | 0.518 | 0.462 | 0.13 | **0.725** |

From Table 3, the Discriminant Validity of the indicators is calculated, which are (Fornell & Larcker, 1981a) criteria of the model based on the cross-loadings indicators with the highest factorial contents for the construction material interfaces (0.820) and labor Interfaces (0.801). It is based on the square roots of the AVE, compared with the correlations of the Interface Management constructs.

From the structural model in Figure 3, it is evident that five variables of interface management focus on the construction project outcome and have the value of $R^2$ as 0.495. It is also apparent that a strong positive relationship is found between the labor interfaces (0.368), financial interfaces (0.363), and material interfaces (0.264) and the project outcome. It demonstrates that labor, financial, and material management interfaces impact the construction project outcome and are considered the primary interventions. Equipment interfaces (0.154) influence the construction project's outcome less than labor, economic, and material interfaces. The coefficient of determination $R^2$ is 0.495 for the project outcome endogenous latent variable. This confirms that the five latent variables Construction Material, Contract Conditions, Equipment, Financial, and Labour Interfaces moderately explain the 49.5% of the variance in the construction project outcome.

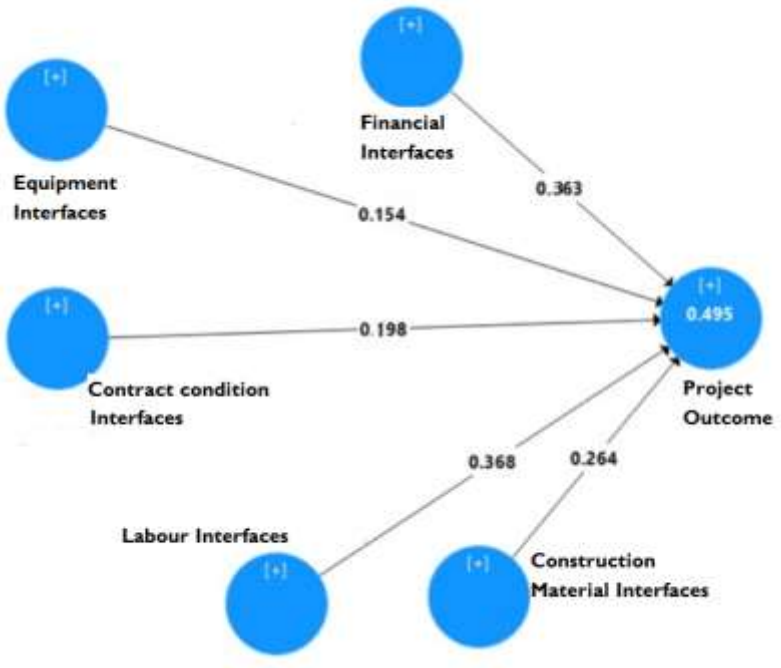


**Figure 3:** PLS Structural model for the interface management and construction project success

The hypothesized path relationship (shown in the table between labor interfaces (H4), Equipment Interfaces (H2), and financial interfaces (H1) and the project outcome are statistically significant. Contract Condition Interfaces and Construction Material Interfaces and the project outcome are not statistically

significant. (significant at 90% only; t value=1.64)

From the structural model, let us analyze the impact of various path coefficients of construction interfaces. Among the exogenous variables, it is found that financial interfaces(0.363) and labor interfaces (0.368) strongly impact project outcomes.

A comprehensive universal Goodness of Fit (GoF) measure is used to evaluate the global rationale of the PLS model. The GoF can be measured with the square root of R square and AVE, and the below-mentioned formula calculates it.

$$Gof = \sqrt{(\overline{R^2} \times \overline{AVE})}$$

Based on the average of R square and AVE, the GoF value was 0.510 for the current study, and when the deal is compared with standard values, it is considered very high (Wetzels et al., 2009). The GoF values above 0.36 are considered large, and less than 0.1 is small. The results concluded that the study through the PLS Model has good universal acceptability and validity. After understanding the relationship through path coefficients in the structural model, a bootstrap analysis is done to test the statistical significance of the path estimates concerning hypothesis testing.

**Table 4:** Structural model and hypothesis testing

| Factors | Path Coefficient | T Statistics | P value | Result |
|---|---|---|---|---|
| Financial Interfaces-> project outcome (H1) | 0.363 | 1.954 | 0.051 | Accepted@ 95% |
| Equipment Interfaces-> project outcome(H2) | 0.154 | 1.985 | 0.053 | Accepted @ 95% |
| Contract Condition Interfaces-> project outcome(H3) | 0.198 | 1.887 | 0.102 | Accepted @ 90% |
| Labour Interfaces-> project outcome(H4) | 0.368 | 3.244 | 0.013 | Accepted @ 99% |
| Construction Material Interfaces-> project outcome(H5) | 0.264 | 1.858 | 0.103 | Accepted @ 90% |

From Table 4, it is confirmed that the current study proposes five hypotheses to examine the effectiveness of construction project outcome cost, time, quality, and customer satisfaction from the perspectives of interface management interventions, except contract condition interfaces and construction material interfaces. The evaluation criteria followed in the study to test the proposed hypothesis was done by using t critical values. The t-critical values significantly and statistically evaluated the formulated hypothesis.

Hypothesis H1 explored an excellent, significant positive relationship between ***the financial interfaces and the outcome of the construction project. (***β=0.363; p < 0.05). Thus, Hypothesis H1 was supported at 95 percent confidence level.

Hypothesis H2 explored a significant positive relationship between the ***Equipment Interfaces and the construction project outcome*** (β=0.154; p < 0.05). Thus, Hypothesis H2 was supported at 95 percent confidence level.

Hypothesis H3 showed a significant positive relationship between ***the Contract Condition Interfaces and the outcome of the construction project. (***β=0.198; p < 0.10). Thus, Hypothesis H3 was supported at 90 percent confidence level.

Hypothesis H4 showed a significant positive relationship between the ***Labour Interfaces and the outcome of the construction project***. (β=0.368; p < 0.01).Thus, Hypothesis H4 was supported at 99 percent confidence level.

Hypothesis H5 showed a significant positive relationship between ***the Construction Material Interfaces and the outcome of the construction project. (***β=0.264; p < 0.10). Thus, Hypothesis H5 was supported at 90 percent confidence level.

## 6. DISCUSSIONS AND CONCLUSIONS

The current study has used the structured questionnaire from the past literature, and it was found that the questionnaire tool has good validity, reliability, and global fit. The second-generation Smart PLS-SEM model verified the validity using various tests like convergent validity, CR &AVE (Hair Jr et al., 2021a). The results also concluded that there was good discriminant validity (Fornell & Larcker, 1981b; Ringle et al., 2015), and confirmed that the factors of the research tool are not closely related.

Friedman's test results confirmed that lack of quality (3.741), financial crisis (3.716), unqualified or inexperienced workers (3.444), failures of equipment and lack of spare parts (3.568), insufficient details in contract documents (3.652), the important factors in various interface interventions viz. construction material interface, financial interface, labor interface, equipment interface, and contract condition interfaces which has a greater impact on the outcome of customer satisfaction is ranked first (3.988)

The structural model results concluded that the factors determining interface management have an R square value of 0.495.This is an important conclusion for the construction industry of India. So, it is concluded that the study has a good model fit.

The current study confirmed that personality influences financial attitude, which is explained by the R square value (0.547), and the results are also approved by the previous studies (Collins et al., 2010). The structural model also confirmed that the personality of the individual has a more significant influence (R square value=0.536) towards the risk propensity and varied individual investment decisions accordingly with divergent thinking of saving and choice of investment product (Fellows & Liu, 2012)

The application of the study has more extensive use for project managers, engineers, and builders for developing various interfaces and interventions. Future research can be extended with variables of different demographics, cultures, and innovative technology and its influence on risk propensity.

Construction projects are becoming more complicated and large size. Construction projects involve stakeholders with different priorities, working styles, and cultures. The current study concluded that labor interfaces with the highest path coefficient (0.368) are crucial because they ensure cost efficiency and enhance customer satisfaction. Financial interfaces (0.363) have the second highest path coefficient in the study, ensuring customer satisfaction from time and quality perspectives. However, the study confirms that interface management is crucial to the construction project's success. It also ensures the linkages between different stakeholders' objectives and the project outcome from cost, time, and quality perspectives. So, the current study provides that effective interface management facilitates effectiveness in project outcomes at different project life cycles. The conclusion of the study confirmed the number of previous studies emphasizing that the implementation of interface management would have a greater impact and superior performance with respect to cost, time, quality, and customer satisfaction (Chen et al., 2007; Malla & Delhi, 2022).

Several studies emphasized that implementing IM at the early stages of the project will result in higher performance in terms of scope, time, and schedule (Chen et al., 2007; Malla & Delhi, 2022).

Change in technology, consumer choices & expectation, competition, and uncertain business environment makes the construction sector more complex. Moreover, it involves numerous stakeholders with different goals & objectives, projects in other geographic locations, diverse work cultures, and life cycles. It concludes that an appropriate interface management system could make proper alignment.

The study fundamentally concluded that cost overrun, time overrun, quality, and customer satisfaction are the essential factors influencing construction performance through interface management interventions (Shokri et al.,2016). Therefore, construction projects have become requisite in building and maintaining a well-organized construction team with varied groups and subgroups that assign tasks accordingly and are interdependent, promoting synergy. One of the limitations of this research

is its geographical focus, which is restricted to Tamil Nadu. It is concluded that having an interface management team in the construction unit drives the team towards attaining their goals and maintaining standards of the project's design and quality requirements. Additionally, this research has the potential to offer valuable managerial insights by significantly contributing to the literature on interface management. It also highlights the relevance of this research for practicing engineers and project managers, which has greater implications for the construction project performance outcomes.

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