

# Advancement In Project Management Maturity Model In Construction Firm For Vadodara City

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## Abstract:

The increasing competition in the construction Industry makes more challenging issues for identifying the practices followed in the construction sites in the developing countries. A company's only option for enhancing its Project Management prowess is to use a maturity model. The goal of this study is to provide a framework for real estate projects to evaluate the "Maturity Level of Construction Projects" in the leading Gujarati smart city. Eleven factors were considered while designing the questionnaire; ten were culled from the literature, one was provided by an expert, and two were derived from actual building site procedures. We used the Rank Sum Method, the Probability Method, and some Statistical Tools to compile the feedback of key qualitative stakeholders including the Owner, the Project Management Consultants, the Project Manager, and the Contractors, and draw our conclusions. Vadodara, a city in Gujarat, was given a 5-stage Maturity Assessment framework (Initial, Controlled, Managed, Specified, Optimized).

By administering a questionnaire, a Maturity Framework might be constructed. When applied to a building site, the generated model reveals information on the site's level of maturity, while the questionnaire provides a detailed description of best methods for bringing an immature site up to speed.

**Keywords:** Construction site, Rank Sum Method, Probability Method and Statistical Tools.

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## 1. Introduction

To a significant extent, a growing nation's economy relies on the building trades. The construction sector includes both the real estate and the urban planning sectors. Included in the real estate category are dwellings, workplaces, stores, hotels, and amusement parks. Many projects in our country come across extensive time and cost overruns, leading to the ultimate failure of the project.

The construction projects need an appropriate way to process in which they are monitored in every step. Despite of the availability of various Project management tools viz. M.S Projects, Primavera etc. the projects are not delivered in estimated time and cost. To overcome all the drawback of the organization it is necessary to adopt the project management maturity model (PMMM) for project-based management. It includes the management of projects, programs and portfolios. There are various maturity models (MM) already developed by various researchers, which they have applied and found constructive changes in project handling.

To a large extent, studies have shown that PMMa has a positive effect on project success. The notion of project management maturity models will be used in this thesis work to develop a model for assessing the level of preparedness of construction companies in Vadodara.

Up to some level by all organizations project management is being included as one of the finest ways for developing and which delivers better-quality items, administrations, and hierarchical interaction changes. It has been a persistent exertion of scientists and experts to search for ways of creating and further develop associations PM capacity so associations might have the option to profit from project the executives.

## 2. Literature Review

**Jana et al. (2018)** developed an accessible PMMM to evaluate the progress of the project manager based on an evaluation of the methods and tools used by the project manager and project board throughout each stage of the project's life cycle, with emphasis on the most common types of activities carried out. They reasoned that with this information, savvy board members of different organisations may draw conclusions and take appropriate action about related strategic planning methods and tools.

**Patel et al. (2016)** A total of 10 key aspects of project management were gleaned from the literature research, and an additional 4 were gleaned via site interviews and the pilot survey.

**Maria et al. (2014)** expanded PMMMs' use to push them forward as a corporate foundation. They found that PMMMs were the most effective instruments for enhancing the organization's performance in terms of its core business.

**Backlund et al. (2014)** carried out a limited industry assessment, focusing on the Swedish mining conglomerate LKAB as a case study for hydropower, construction, and civil engineering more generally. Due to the low frequency with which they encountered project management maturity assessments, they determined that Sweden needed a dedicated office whose only purpose would be to conduct such analyses.

**Jehan Zeb et al. (2013)** city and district municipalities differed significantly in their level of maturity with respect to both their work procedures and their interactions with one another. They arrived to the conclusion that tasks performed earlier in the sequence had more definition and respect than those performed later.

**Cheng Siew et al. (2013)** developed a sustainable building maturity model that promotes a more refined understanding of the field's practises. They arrived at the conclusion that their suggested maturity model might be utilised as a yardstick to evaluate the success of a project aimed at fostering more environmentally friendly building practises.

**Pretorius et al. (2012)** discovered a positive correlation between the PMBOK's knowledge domains and successful project completion. They determined that project outcomes are directly related to key functions such as scope, time, cost, and quality management.

**Naomi Brookes et al. (2009)** highlighted a variety of PMMM variants, and evaluated the state of the art in PMMMs. Organizations were found to employ PMMM on a regular, but not constant, basis, according to their findings. They wrapped off by pointing out the lack of conclusive evidence between project maturity and maturity levels.

**Mitchell et al. (2008)** case studies from Australia, New Zealand, and the US using the Organizational Project Management Maturity Model (OPM3) were analysed to determine the value of maturity assessments. They arrived at the conclusion that there are benefits for businesses in conducting maturity evaluations.

**Zhai et al. (2007)** developed a theoretical PM3 for construction projects by fusing elements of the PMMM and PM3. According to their findings, the goal of bringing PM3 to the construction industry is to acquaint the sector with a new management approach that will improve construction management standards and the standards of the whole construction company.

Kam et al. (2002) elucidated the complexities of RBV and how they relate to project management. They determined that there is no sustained competitive advantage created by MMs, but that there is a temporary one.

Ibbs et al. (2000) consisted of 8 PM knowledge areas and 6 PM stages. Construction, telecommunications, IT, and manufacturing were among the sectors represented. In the end, they determined that their approach for analysing PM was generalizable to various sectors and businesses.

### 3. Data Collection

#### ➤ Stakeholder Details

Three types of stakeholders are targeted:

- 1) Project Manager/Consultant
- 2) Owner
- 3) Contractor

#### ➤ Firm Selection

The selected population includes the qualitative real estate construction firms of Vadodara city of Gujarat. The firms' details were collected from the Confederation of Real Estate Developers Association of India (CREDIA) Gujarat, Builders Association directory and from 99 Corporates website.

### 4. Methodology

The study's primary objective was to assess the extent to which real estate development in the Gujarati city of Vadodara makes use of the processes, methods, and instruments covered by the Project Management knowledge areas in the PMBOK.

Two basic approaches for conducting research are shown in Table 1.

Table: 1: Research Approaches

Research Approaches	
Quantitative Approach	Qualitative Approach
Inferential Approach	Group Interview

Experimental Approach	Projective Techniques
Simulation Approach	Depth Interview

### ➤ RESEARCH PROCESS

The following figure explains the process of research of this study.

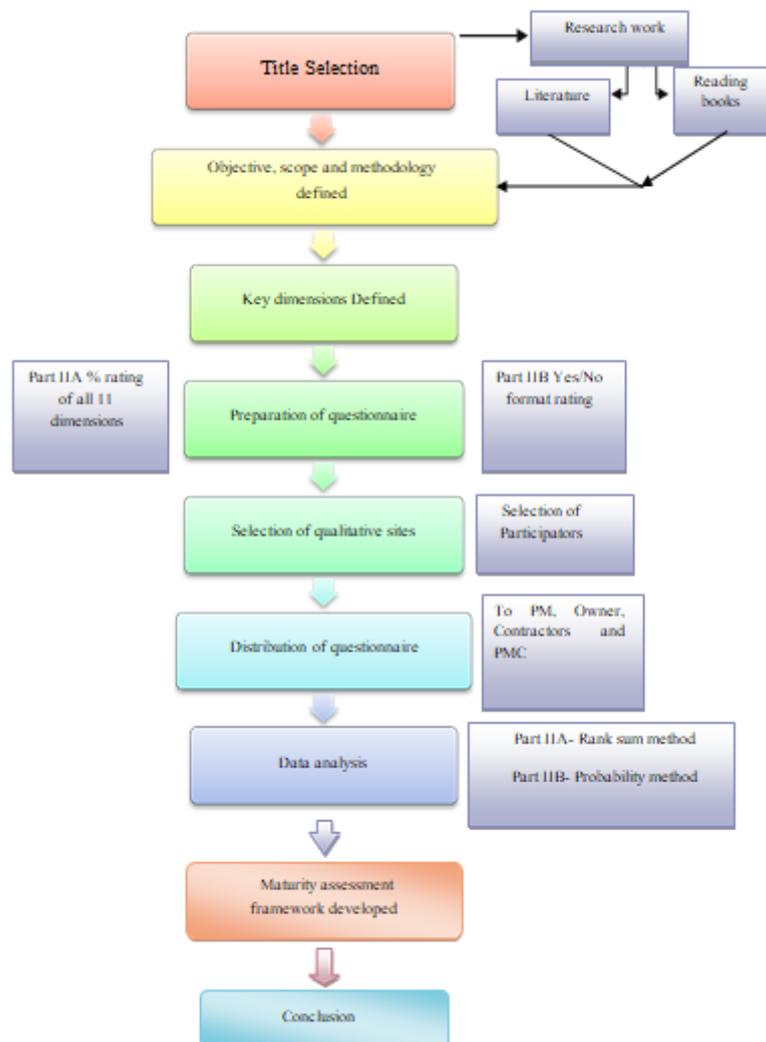


Figure 1: Process of research

Data analysis for this research was done by three methods. The rank sum technique was used to evaluate the data from the Part IIA questionnaire. The responder has rated the significance of each of the eleven aspects of their work experience on a scale from 5 (least significant) to 1 (most significant). The relevance and impact of parameters determining construction project

maturity was determined using the Mean Score approach. The following mathematical example demonstrates how the respondents' ratings were converted to real scores:

$$\text{Rank sum (S)} = \sum_n W \dots\dots\dots \text{Equation 1}$$

$$\text{Mean Score (ms)} = \sum_n W/N \dots\dots\dots \text{Equation 2}$$

(Where  $S$  = Rank sum,  $\Sigma$  = summation,  $n$  = the highest attainable rating,  $W$  = corresponding weight of rank category,  $N$  = total number of respondents,  $ms$  = Mean score).

Rank Sum Answer		
Dimension	Mean Score	Rank
Quality	4.6842	1
Cost	4.5263	2
Time	4.4737	3
Scope	4.4211	4
Risk	4.3684	5
Human Resource	4.3158	6
Integration	4.2632	7
Communication	4.2105	8
Procurement	4.1579	9
Stakeholder	4.1053	10
Waste	4.0000	11

### Probability Method

The questionnaire's probability evaluation for Part IIB has been completed

Probability Answer		
Dimension	Mean Score	Rank
Human Resource	0.7344	1
Integration	0.6960	2
Waste	0.6726	3
Risk	0.6709	4

Cost	0.6695	5
Quality	0.6589	6
Stakeholder	0.6398	7
Time	0.6292	8
Scope	0.6271	9
Procurement	0.6175	10
Communication	0.5945	11

### STATISTICAL TOOL

Then for establishing relationship between both the questionnaires "Statistical Method" has been used.

$$A = \sum (N1 * N2) / F \dots \dots \dots \text{Equation 3}$$

(Where A= Statistical solution, N1 = the answer for one method, N2 = the answer for another method, F=the factor which has been considered)

### 5. Maturity Model For Vadodara City

Vadodara Maturity Model					
Dimensions	Level-5	Level-4 (Vadodara)	Level-3	Level-2	Level-1
Communication	4.2105	2.5032	1.8526	0.8421	0.3930
Cost	4.5263	3.0304	2.7158	1.5519	0.5173
Human Resource	4.3158	3.1693	3.2172	1.0986	0.4708
Integration	4.2632	2.9671	2.4267	1.2462	0.4591
Procurement	4.1579	2.5673	2.9937	1.4968	0.4989
Quality	4.6842	3.2689	2.9354	1.2491	0.4996
Risk	4.3684	2.9308	2.2099	0.8223	0.4111
Scope	4.4211	2.7725	2.7705	1.1789	0.4716
Stakeholder	4.1053	2.6267	2.1895	0.9579	0.4105
Time	4.4737	2.8148	2.6842	0.9586	0.4474
Waste	4.0000	2.6904	1.4154	0.8615	0.3692
Overall	4.3206	2.8326	2.4919	1.1149	0.4499

## 6. Conclusion

This study aimed to assess the level of development (maturity) of project management procedures and practises in Vadodara's Real Estate construction sector. based on the views of Project Manager, Project Management Consultant, Contractors and Owners. 11 dimensions reserved under considerations for Maturity assessment as stated in literature and from PMBOK. The following conclusion can be drawn from the research.

- 1) The rank sum method analysis stated that the 1<sup>st</sup> rank of Quality area in Vadodara.
- 2) The overall maturity of Vadodara is found 2.8326.
- 3) The Vadodara city was not properly applying the advanced practice and tools as the Maturity is below Optimized Level which is (the Highest Level of Maturity) represented as Level 5. the Vadodara city is falling in between the 3<sup>rd</sup> and 5<sup>th</sup> level that is Defined level (4th level).

Therefore, with this research work an effort has been made to develop a baseline maturity framework with the help of which we can evaluate the ongoing construction projects and their progress. This may also provide scope of rectification for coming/future projects.

## Recommendation

From this research study following recommendation are given to increase the maturity level of the Real Estate developers building construction.

Training should be given to all the employees for improving their PM knowledge and practice capacity. The management of all resources, estimated risks and changes can knowingly increase the performance of various projects via improved planning and use of the resources. The periodic assessment of the organization let them know their improvements and success efforts for their projects from which they can make changes in their project planning or other practices. So periodically the assessment should be done within the organization.

## Future Scope

In this study, the Real Estate construction organization are considered which incorporates private and business kinds of ventures for research reason. This work can be additionally

stretched out for the Infrastructural Projects. The maturity assessment of the different kinds of class of Contractors can be evaluated working in Infrastructural projects.

Here only 11 knowledge areas are used for assessment of maturity for Vadodara city. It is possible to integrate other knowledge domains, such as equipment management and materials management, in order to determine their respective procedures and practises.

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