

ASSESSMENT OF PROJECT MANAGEMENT MATURITY OF DEVELOPER'S ORGANISATION IN CONSTRUCTION INDUSTRY

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Abstract - In organization, maturity refers to a state that provides perfect condition to achieve organization's objectives. Project Management maturity provides a path and framework which enable firms to achieve excellence in project management. Project management maturity has direct impact on project performance. The principle goal of this study was to determine the level of maturity of developer's organizations of Dahod region in term of project management processes. This study began with the development of a project management maturity model and an analysis methodology to assess the maturity of the project management process. The project management maturity analysis methodology consists of multiple-choice questions that measure project management maturity and cover 13 knowledge areas. The maturity model and methodology were then applied by benchmarking 42 different developer's organizations. This assessment methodology provides solid and comparative studies on project management practices across industry and the companies. However, it is fair to say that many organizations, are uncertain, perplexed, and even misdirected about the status of current applications of project management. Moreover, the financial investment in project management tools, practices, and processes is often seen as quite difficult to justify. From the result of this study we can conclude that most of the works of developers is managed as a project, improving the developers "project management capability can significantly contribute to the overall improvement of developers" capability to deliver successful projects.

Key Words: developer, assessment, project management maturity, construction

1.INTRODUCTION

The development business assumes noteworthy job in the economy of creating nations. For instance, in many creating nations, significant development exercises represent about 80% of the all out capital resources, 10 % of their Gross domestic product, and over half of the riches put resources into fixed resources. Moreover, the industry gives high business opportunity, most likely next

after horticulture [(Ofori, 2006), (Jekale, 2004)]. In spite of the development business' huge commitment to the economy of creating nations and the basic job it plays in those countries" advancement, the presentation of the business despite everything remains commonly low.

As (Idoko, 2008) noted, "... numerous activities in creating nations experience extensive time and cost overwhelms, neglect to understand their proposed advantage or on the other hand even completely ended and surrendered previously or after their consummation ... " In addition, the improvement of the development industry in creating nations for the most part falls a long ways behind from different ventures in those nations and their partners in created countries. For the most part, as [(Ofori, 2006) and (Jekale, 2004)] finished up, "The development business in creating nations neglected to meet desires for governments, customers and society as a whole".

Until hardly any years prior, the idea of "development" was only here and there used to depict the condition of an association's adequacy at playing out specific assignments. Today, we discover this development idea being utilized progressively to outline coherent approaches to improve an association's administrations especially over the product business. Why has this advanced in this industry – why not in different zones? Also, for what reason is this important to the undertaking the executives calling? The response to both of these inquiries rests in the fundamental complexities that go into the fruitful finish of a project.

Task proprietors are continually making progress toward a harmony between force, obligation and control. They have the force that comes from power over its financial plan, yet are in the end mindful to their corporate sheets and CEOs official. They withstand the obligation regarding tremendous task worth billions of sum, alongside related business and reputational cost disappointment.

When the undertaking is picked, it is anything but difficult to dismiss the way toward assessing execution against the first business case, to clarify any learning and report budgetary data. Given the tremendous sums spent on development extends, the relative achievement or

disappointment of capital allocation and portfolio streamlining could in the long run decide the association's whole continuance.

By and large, an association's characterize objective is item improvement. The supposition that will be that an improved procedure will improve the item in some discernible way; costs may diminish or quality may rise. This suspicion association is fundamental to fruitful procedure improvement.

Basically, the advantages got from venture the executive's increment in relation to how well extend the board procedure are utilized. A first rate task will be finished on schedule, inside its affirmed financial plan. A top notch undertaking will convey higher item quality by dealing with an opportunity to plan and test the new item. It will give incredible fulfilment to its group, and it will meet (or surpass) the client's desires. In the present business condition, it is important that each undertaking is run in most proficient way conceivable. For a venture oriented business, it is similarly basic that all undertakings are overseen reliably, with the goal that advantages of top notch venture broaden corporate wide.

Utilization digitalization extremely benefits construction developments in several aspects. As a Pandemic COVID-19 is principally spreading in our country so, now the work place is going to be digitalized, more or less 40-50 percentage of work is allot to employ as a part of work from home so in upcoming decade the use of Digitalization will impact a construction industry work, such as Structural work, Clash detection, Architect work, Earned value management, Building information Modelling. Furthermore, to utilize digitalization for monitoring at construction site and save the time and resources such as engine oil and save the planet from pollution.

1.1 Project management maturity model

In the mid-1980's, the Product Building Foundation at Carnegie Mellon College distributed a structure expected to enable the administration to evaluate which programming contractual workers would be best equipped for conveying complex programming ventures. This Capacity Development Model depended on an appraisal of the standard practices an organization kept up while taking a shot at programming ventures. The model has since been adjusted to fit a wide scope of enterprises and capacities, and there are various development models that have been created throughout the years. One of these, the Task The board Development Model, intently lines up with the first model, yet centers explicitly around the appraisal of undertaking the executive's abilities.

The sources of the idea of a task the board project management model, is lost in the fogs of time. With the

proof of task the executive's abilities as far back as the hour of the structure of the Pyramids and the Incomparable Mass of China and other extraordinary marvels of the world, it is very sensible to assume that there could have been an early model to delineate advancement of creating venture the executive's aptitudes. All things considered, for an old undertaking supervisor the cost of disappointment came high.

In later occasions the idea of a venture the board development model has advanced significantly from the product business. There is the need to comprehend and gauge numerous factors, oversee incredible unpredictability, acquire reliable outcomes and accomplish severe conveyance focuses inside spending plan.

1.2 Various project management maturity model

Here is the rundown of maturity models which have been grown so far by various associations and people. This list of maturity models incorporates;

1. The Capability Maturity Model Integration (CMMI), developed by the Software Engineering Institute, Carnegie Mellon University.
2. Organizational Project management Maturity Model (OPM3) by Project Management Institute.
3. Project Portfolio Management Maturity Model by PM solutions.
4. Project Management Maturity Model by PM solutions.
5. Project Management Maturity Model by KRL solutions.
6. Cerner Project Management Maturity Model by International Institute for Learning(IIL) H. Kerzner
7. Project, Program, ortfolio Management Maturity Model by Office of Government Commerce.(OGC)
8. Project & Project Management for Enterprise Innovation by Project Management Association of Japan (PMJAI)
9. Maturity Increments in Controlled Environments by PRINCE2 Foundation.

1.3 Need for study

To deal with these changing perspectives require maturity. And maturity to manufacture positive and powerful working air.

1.4 Objective

- To study the maturity of developer's organization in construction industry.
- To improve the maturity level and to propose mature model of the betterment of project.

1.5 Scope of work

Research was done on the different developer's organizations of Dahod region. Scope of the research was divided into three categories based on the annual turnover of the organization which were 5cr to 20cr, 20cr to 50cr and above 50cr.

1.6 Research methodology

1.6.1 Literature Review

Literature review was done by referring various reference books, surveys, research papers, PMBoK, Construction journals and expert opinion and interaction.

1.5.2 Data Collection

Data collection was carried out by conducting with the developers and also by a questionnaire survey.

1.5.3 Data Analysis

Data analysis was done from the collected data by using tool such as MS Excel. The data analysis includes the assessment of developer's organization on the base of questionnaire.

2. LITERATURE REVIEW

Literature review has been done by referring various research papers and by gathering all the information required from those research papers. Conclusions of these referred research papers are relevant to this report. Brief content of literatures is given below.

3. DATA COLLECTION

3.1 General

This chapter describes the background to the quantitative data collection exercise, and presents the main steps taken for the collection of data required for the study whereas the methodology chapter describes the steps taken in designing the questionnaire, this section provides in account of the execution of the methodology. The questionnaire is shown in Appendix.

3.2 Questionnaire Design and Content

Established on the review of the literature connected to the assessment of project management maturity, interview experts who have understanding with the topic at changed levels and the investigator capability, all the material that could help in accomplishing the study intentions were collected, reviewed and formalized to be appropriate for the revision survey and after several stages of suggesting, accessing, improving band studying executed by the researcher with the superintendent, a survey was industrialized with closed demands.

The questionnaire design comprised of two units to accomplish the goal of the research follows;

1. First section was limited to basic information about respondents and their organizations details
2. Second section was limited to collection of project management processes and the significant actions that form it for all the organizations.

First section contains some basic questions aiming at organization's name, year of establishment and their contact details.

Second section was divided into thirteen point questionnaire related to project management areas and their processes as,

1. PROJECT HUMAN RESOURCE MANAGEMENT
2. PROJECT PROCUREMENT MANAGEMENT
3. PROJECT COST MANAGEMENT
4. PROJECT TIME MANAGEMENT
5. PROJECT QUALITY MANAGEMENT
6. PROJECT RISK MANAGEMENT
7. PROJECT SAFETY MANAGEMENT
8. PROJECT SCOPE MANAGEMENT
9. PROJECT COMMUNICATION MANAGEMENT
10. PROJECT DOCUMENTATION MANAGEMENT
11. PROJECT FINANCE MANAGEMENT
12. PROJECT MATERIAL MANAGEMENT
13. PROJECT EQUIPMENT MANAGEMENT

3.3 Sample Size Determination

Selection can be defined as the process of selecting descriptive units of a population for the education in the study analysis. The independent of the selection is to provide an applied means of assisting the data gathering and processing the modules of the investigation to be approved about with ensuring that the sample provides a good demonstration of the people. A sample is a small quantity of a population designated for scrutiny and analysis. The sample was selected haphazardly from the population. The percent of valid respondents to NO. Of circulated questionnaires is shown in table.

Table -1: percentage of valid respondents

Number of distributed questionnaire	Number of responders	Number of valid responders	Percent of valid responders to No. of distributed questionnaires
60	42	42	70%

3.4 Data Measurement

For measuring the questionnaire process, the respondents were necessary to rate these processes on a four points as follows:

Table -2: Maturity Level of OPM3

SCALE	DESCRIPTION
1	Not implemented
2	Partially implemented
3	Often implemented, not consistently
4	Fully implemented, consistently

3.5 OPM3 Maturity Levels

OPM3 has defined five maturity levels for performing maturity assessment of Project. Description of maturity levels for OPM3 is explained below:

Level 1: None - no such practice exist

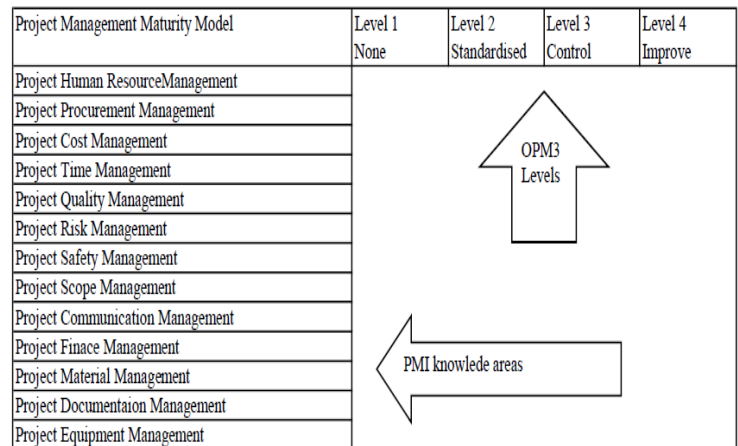
Level 2: Standardize process of doing projects have been doing project have been communicated within organization. This practice is not used by all the projects but only few. Level 3: Control - measured process is corrected for poor application of the standardized practice. Upper and lower limits are established and process is analyzed.

Level 4: Improve - Continuous improvement of process becomes a practice for outcome of Best Practice standard.

3.6 Maturity Model

The model used in this assessment was organizational project management maturity model but it is redrawn based on the recent

PMBOK by using the thirteen areas (PMI, 2013) and four level maturity of OPM3 project management maturity model as shown in figure below. The key component of four level maturity models was used as criteria to evaluate each component of knowledge areas based on the data result from the conducted survey.



4. DATA ANALYSIS

4.1 General

In this chapter, the results of the questionnaires are obtained and deliberated. The chapter demonstrates and converses the features of the study population, present project management process. The collected data was analyzed by Frequency analysis method.

4.2 Company Establishment Year

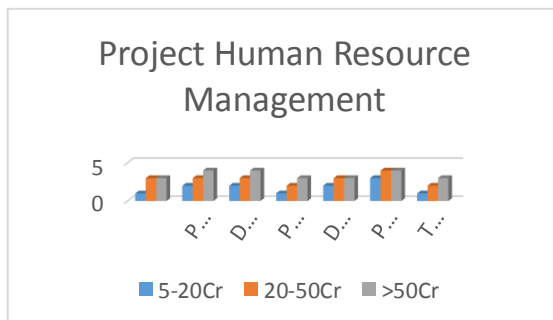
Company Establishment Year	Frequency	Percentage
1997 or before	9	21.42%
1997-2012	19	45.23%
After 2013	14	33.35%
Total	42	100%

4.3 Annual Turnover of Organizations

Annual Turn-Over	Frequency	Percentage
5cr - 20cr	16	38.09%
20cr- 50cr	19	45.23%
>50cr	7	16.66%
Total	42	100%

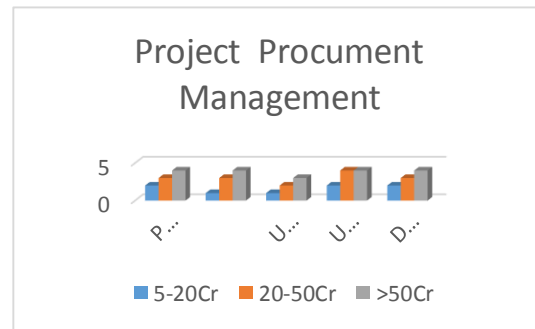
4.4 Assessment of Project Human Resource Management Process

Project human resource management is the process that manages, organize the whole project team. It is the process that includes; Acquire project team, develop human resource plan, develop and manage the project team. The below graph is represents the maturity of developers in project human resource management.



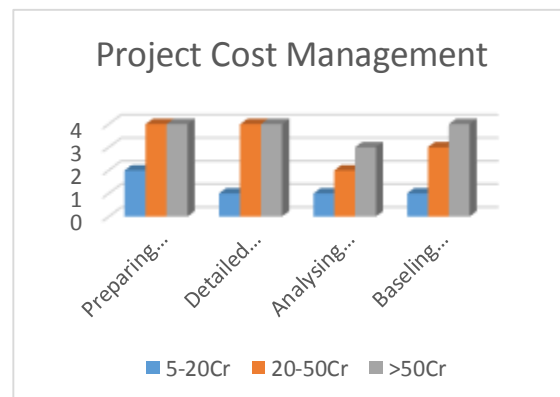
4.5 Assessment of Project Procurement Management Process

Project procurement management is the process that includes the process of purchase or acquire products and services. Procurement management includes the contract management issued by Buyer or a contractor. From the developer perspective it is mainly concern with the contractor and supplier or buyer, purchase management and administering the contract that it entered with the client. Graph 2 represents the maturity of developer in project procurement management.



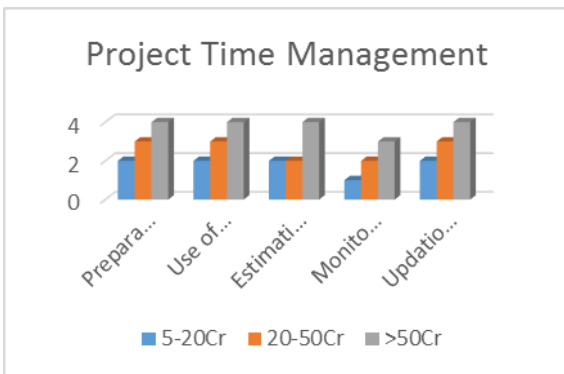
4.6 Assessment of Project Cost Management Process

Project cost management process includes the process involved in estimating, budgeting and controlling various costs. So the project can be completed within the approved budget. It also includes the management of direct and indirect costs.



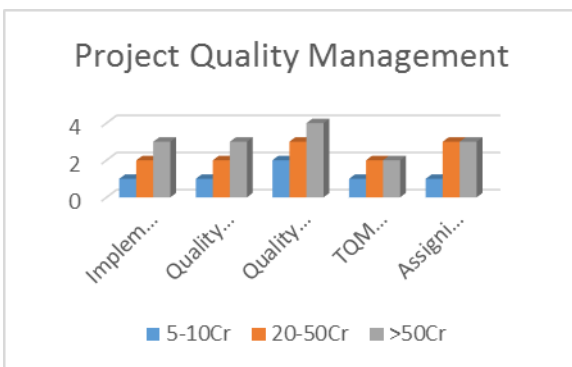
4.7 Assessment of Project Time Management Process

Project time management includes the process required that make sure timely completion of a project. Project time management in PMBOK involves estimation of duration for the activities, estimation of project duration, Project scheduling, controlling and monitoring of project scheduling, project curve monitoring.



4.8 Assessment of Project Quality Management Process

Project quality management is the process of activities like determining the quality policies, objectives and responsibilities so project achieves the desire quality. It includes plan quality, Perform quality assurance and performs quality control.



4.9 Assessment of Project Risk Management Process

Project risk management comprise the process of conducting risk management planning, identification, analysis, response planning, monitoring and controlling of project risk. The main objective of the risk management is to minimize the risks involved in the whole project.



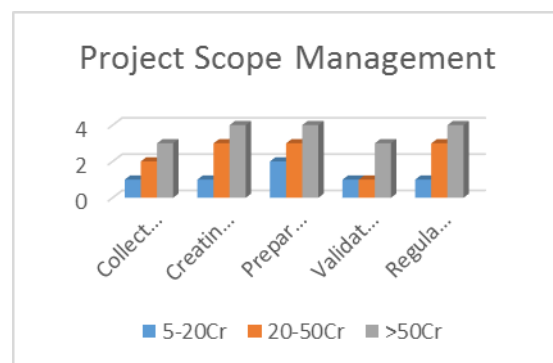
4.10 Assessment of Project Safety Management Process

Project safety management comprises the process of activities of organization that determines safety policy, safety planning, objective and dividing responsibilities. It includes the planning of safety, performing safety assurance and performs safety control.



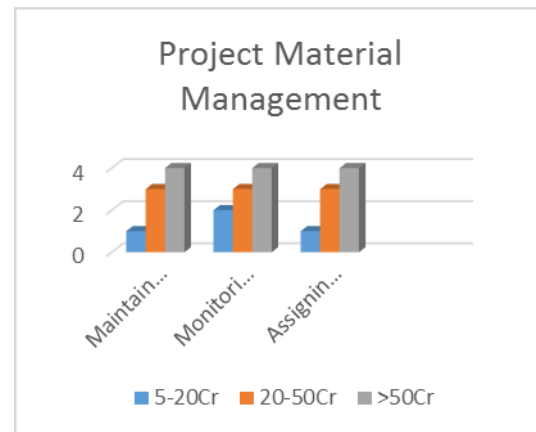
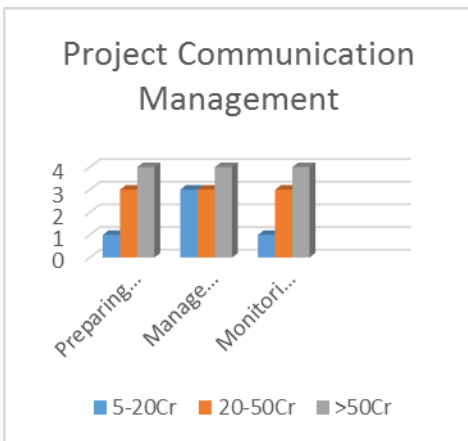
4.11 Assessment of Project Scope Management Process

Project scope management comprises the process of dividing the appropriate project work, defining of features and function of the project, gathering the information which requires to start the project. It also involves the features of the product that will meet the client requirements.



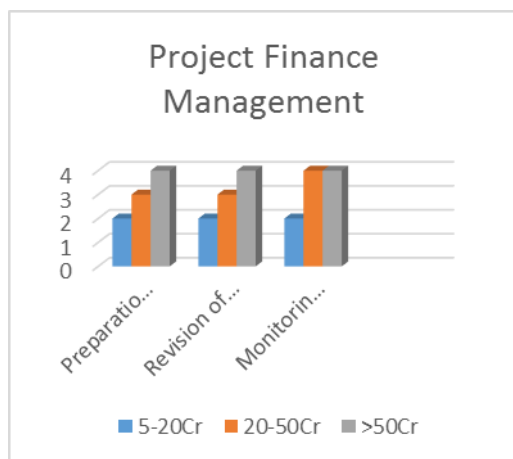
4.12 Assessment of Project Communication Management Process

Project communication management includes the process of planning and executing the verbal, written, face to face interactions. Also the planning and maintaining the communication channel in organization and with all stakeholders of projects.



4.13 Assessment of Project Finance Management Process

Project Financial Management comprise the process of planning, budgeting, accounting, financial reporting, internal control, auditing, procurement, disbursement and the physical performance of the project to managing project resources properly and achieving all the project's objectives.

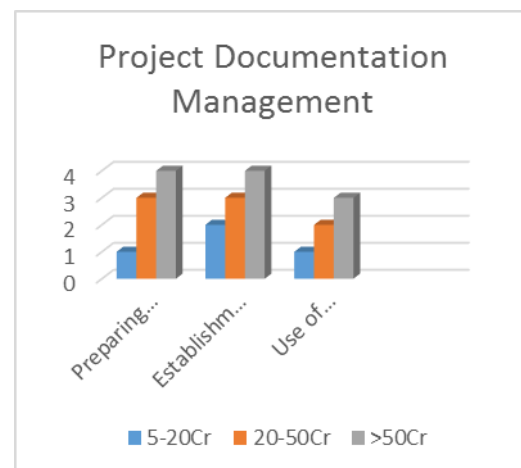


4.14 Assessment of Project Material Management Process

Project material management includes the process of maintaining and monitoring the stock registers of material, storage of material, transportation of material, waste management of the material.

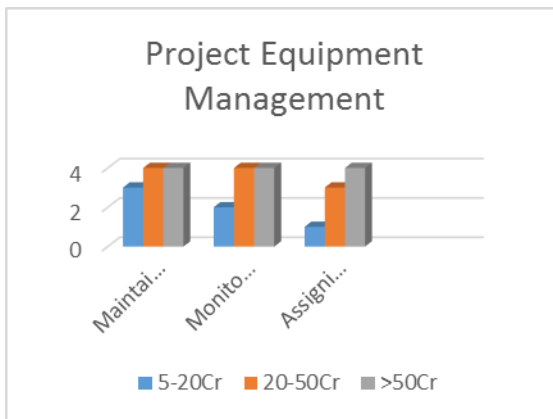
4.15 Assessment of Project Documentation Management Process

Project documentation management includes the process of preparing organizational document structure, standard documentation process in organization and use standard reference system among the organization.



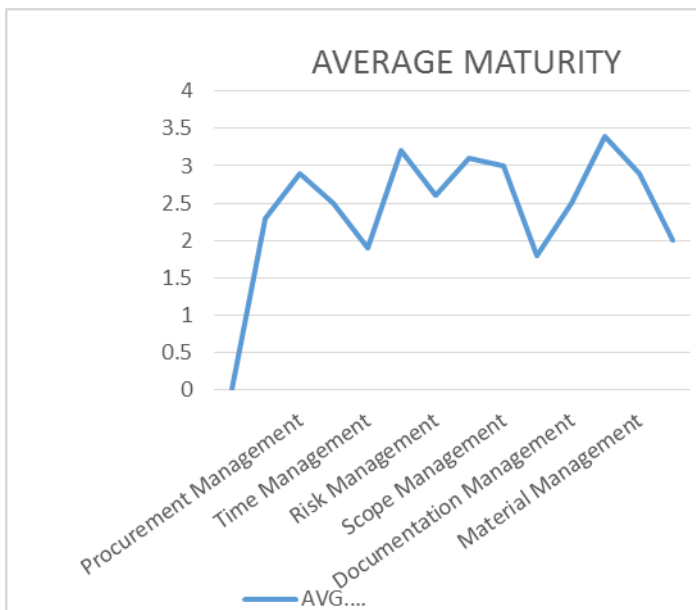
4.16 Assessment of Project Equipment Management Process

Project equipment management comprise the process of maintain and monitoring the equipment register of company, maintain equipment register for individual project and the regular maintains planning for all equipment's of organization.



4.17 Average Project Management Maturity of Organizations

From the data analysis, the average project management maturity of developer's organization of Dahod region is shown in graph 14.



5. Conclusion

5.1 Generalized Conclusion

In construction industry project management maturity is not only change with the region or country but it changes with organization to organization. But it is scene that the maturity of organization in management increases with the time. With experience of different condition and different stages of organization maturity is increase with this experience. The study of maturity of organization helps any organization to improve their project management practice.

5.2 Research Specific Conclusion

The main objective of the research was to assess the project management maturity of developer's organizations in construction industry of dahod region. The survey questions were formed as, "How the project management executed and at what level of maturity the projects are organized in developer's organization?"

In the survey it is concluded that average project management maturity of organization is changes with organizations based on their establishment and annual turnover. The organization is divided in 5-20cr, 20-50cr and >50cr. The overall maturity of organizations is at level 2, which shows that the organizations are not fully aware of the importance of project management process which should be implemented in the projects.

The average maturity of organizations with having annual turn-over of 5-20cr is at low level, mainly in safety management, material management, communication management and in equipment management needs to be improve.

The average maturity of organizations with having annual turn-over of 20-50cr is also needs to be improve, mainly in Documentation management and in Human resource management needs to be improve.

The average maturity of organizations with having annual turn-over of >50cr is at organized level, which shows that organizations are aware of the importance of project management process but project management process is not fully implemented which needs to be implemented.

So for the achieving higher project management maturity organization should provide basic training to their employees like capacity building. Organizations also developed their own department in organization like value engineering department and research & development department.

From this conclusion we can conclude that if they follow all the features of the project management maturity than organization can achieves higher maturity level.

5.3 Recommendation

- Organizations should arrange different training programs on regular basis for their employees.
- Organization should have to maintain and monitor their communication channel.
- Most organizations don't focus on safety management but they should have to focus on safety also.

- Organization can also appoints a team which focuses on their business development plan and polices.

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