

Understanding the Impact of Project Management Knowledge and Education Implementing Development Projects Created and Executed By the Government

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Abstract: *Projects are activities taken up by organizations large and small, public and private, government and non-government to execute their near and future term goals. Project is defined as a set of tasks taken up to achieve a predefined end result within a predefined time, scope and budget. Our country has witnessed tremendous growth in infrastructure and industrial sector in the last two decades. The study aims to review the impact of any existing project management knowledge with the respondents and incremental value adds done over a period of time through the above methods. The complexity of projects has increased rapidly. Apart from the traditional triple constraints of scope, time and cost, there are new constraints in the form of quality, risk and procurement. There are several interweaving dependencies between different departments/divisions which also contribute to considerable strain on the project resources. Stakeholder management is not easy. Current educational framework does not provide for adequate skills either at the under-graduate or the post-graduate level to cater to the real-life needs of project management. The study will be able to promote the ideals of project management and help to inculcate a sense of ownership amongst all the project stakeholders for achieving the desired end result of the task at hand. Although, there is no single panacea for the problems faced on this count, yet, it is very important to highlight some of the causes, which if remedied, can lead to better project management in the government and non-government sector, and contribute to the nation's growth.*

I. Introduction

Project management has emerged as one of the most powerful methodologies used by organizations private and public to execute their strategic initiatives. There is not a single business or organization which has not come under the influence of project management in its life time. Moving away from traditional methods of running the business and achieving its objectives, organizations now focus on project based delivery of their goals. There is a huge need for project managers worldwide, what with the ratio of projects to project manager's running as one to hundred. Project management has touched everything on this planet - right from the construction of the pyramids to the latest space probes – it has put its stamp on all. Project management strategies can help address tighter budgets, demanding time constraints and fewer resources. Real-life project management methods and techniques position individuals as leaders and give the companies a competitive advantage.

Project is defined as 'a temporary endeavour undertaken to create a unique product, service or result'. It is temporary in nature but only to the extent that there is a defined start date and end date. It is not an ongoing effort and ceases when the objectives have been met. The team is disbanded upon project completion. It is unique in a way that the product or service is different in some way from other product or services of other projects.

The key factors which determine the success of a project are the support of the management and the higher authorities, realistic expectations on the goals, clear statement of requirements, proper documentation, public exposure on the attainable goals and the budgetary fund flows.

In the two decades our country has witnessed tremendous growth in terms of development projects like rural and urban housing, medical health and preventive care programs, poverty alleviation and slum development programs, employment guarantee schemes, water bodies rejuvenation and potable water supply projects, critical energy generation and transmission projects, waterways, ports and harbour development, national and state highways, new airports, flyovers and expressways, metro and monorail to mention a few. There are several projects of national and economic importance under the public private partnership model. The successful completion of these projects along with huge volumes of money invested in has only shown the several stakeholders involved about the importance of project management skill and education imparted to those who drive these projects.

1.1 Project Management Education

Jobs are becoming more complex and individuals need help mastering new skills. There are scores of individuals, young scholars who are joining the job market every day. Even an experienced project manager, using the latest cutting-edge knowledge needs to stay competitive. This goes to establish that whether the employee is an engineer, IT professional, work for the government or manage projects within the financial industry, project management credentials are now a de facto standard for many companies — and additional training can help gain profitable new project management skills.

Project management education can help individuals in many ways:

- To gain potential job promotions and feel more in control of their career, thereby increasing their earning and spending power.
- Learn how to effortlessly communicate timelines and achieve a higher level of commitment with team members across global boundaries, thereby helping to manage global teams effortlessly.
- Achieve a smooth, streamlined workflow; develop accurate project schedules, track resources and set project criteria.
- To meet timelines, track resources, deliver projects on time and keep projects within budget, thereby saving time and money resources for companies.

Project Management education for government officers focus on

- Exposure to concepts of professional project management and its adoption worldwide.
- Exposure to the various tools and techniques available to a project manager to perform their duties effectively and efficiently.
- Achieving a middle ground on the application of professional project management techniques to those methods and processes followed in government while executing developmental projects.

Project Management educators can also help create an individual professional development plan to match career goals of the trainees. The consultants can analyze the progress of the trainee's career to help achieve further advancement. Specialized project management training provides the trainees with the ability to decide which project management tools and techniques to use given the status, climate and environment of the project.

Projects are activities taken up by organizations large and small, public and private, government and non-government to execute their business strategies. Projects are a defined set of tasks taken up to achieve a predefined end result within a predefined time, scope and budget. These are also known as the triple constraints.

1.2 Role of Project Management in success of the business

In today's global marketplace, corporate inefficiencies run high without trained project managers. Failed projects, such as IT, pharmaceutical, and financial initiatives cost corporations and government agencies large sums of money. In a research conducted it was established that:

- Twenty six percent of all projects are cancelled before completion.
- Seventy four percent of all projects finish over budget and/or late.

Training the employees in project management best practices increases the overall organizational effectiveness, helping companies to make more money with less hassle. Trained project managers increase the company's successes and revenues thereby increasing business performance.

The benefits can be summarized as:

- Higher profit margins and on-time project delivery. Trained project managers maximize the company's ROI, bringing projects in on time and within budget.
- Project managers recruit highly skilled employees who work quickly and accurately in today's global environment and can manage more projects, in more places and more efficiently.
- Employees who receive project management training quickly recognize organizational challenges and develop streamlined systems that maximize efficiencies.
- Effective and optimum management of the scarce resources yields higher returns on capital invested for such purpose.
- High quality delivery leads to greater customer satisfaction and sustenance of profits.

1.3 Role of Project Management in the Developmental Programs of the Government

Government projects normally start with the identification of requirement and an engineering assessment. This assessment also consists of an approximate cost estimate, preliminary feasibility report and the line drawings, wherever applicable. Once this assessment is completed the administrative approval is sought. At this point, the review is done with respect to the initial feasibility and the government then sanctions the project. One of the most important document is prepared herein called the Detailed Project Report. This forms the backbone of the project and acts as the guiding light. It is similar to the project charter used normally to initiate a project. Upon the confirmation of the detailed project report, the technical sanction is granted to the project and work can now commence on the project. The data published by the Ministry of Statistics and Programme Implementation puts the government spending on public projects during the 10th Plan at Rs.8,87,794 crores and during the 11th Plan at Rs.14,36,559 crores. Private contribution was Rs.1,75,203 crores and Rs.6,91,591 crores respectively. A report of the Secretariat for Infrastructure, Planning Commission, as on 31st March 2011, estimates the value of contracts awarded in the PPP model at Rs.9,87,260 crores of which works worth Rs.58,307 crores are in the pipeline of under implementation in the State of Karnataka.

From the reports published by the Ministry of Statistics and Programme Implementation for the month of January 2014, out of 722 projects (all costing Rs.150 crores and above), 3 projects are ahead of schedule and 129 projects are delayed. Of the balance, 331 projects do not have fixed dates for go live while 23 projects were sanctioned without any commissioning date but later the dates were finalized. Out of the delayed projects, 38 projects are costing Rs.1000 crore and above. The total original cost of the 722 projects was around Rs.900150 crores but this has been subsequently revised to Rs. 1080739 implying a cost overrun of 20.1%. The expenditure incurred on these projects till January 2014 was Rs.513989 which is 47.6% of the revised cost of the projects.

Figure 1 All Sectors All Projects Source: 339th Flash report on Central Sector Projects January 2014 published by the Ministry of Statistics and Programme Implementation.

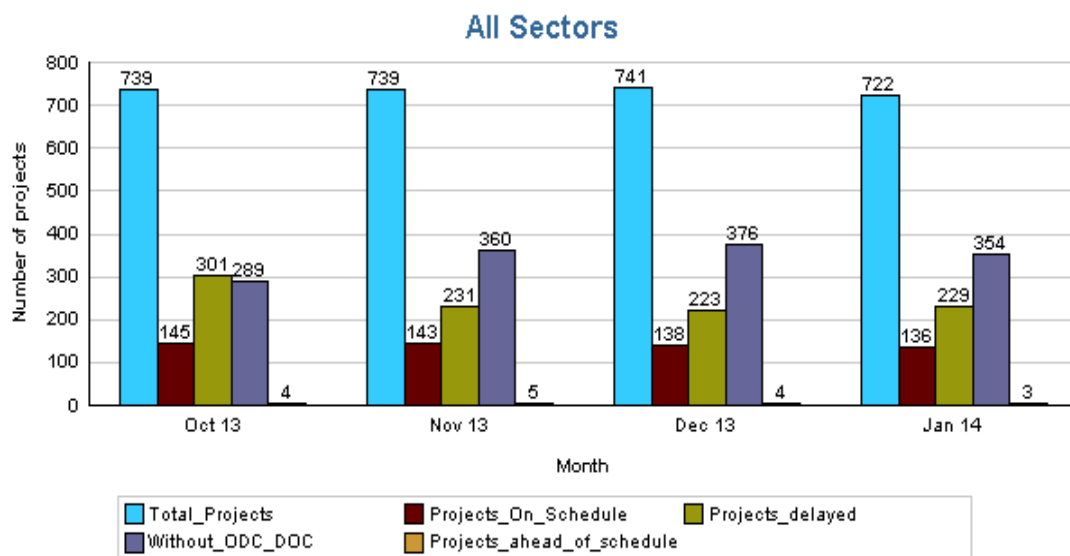


Figure 2 Breakup of Delayed Projects (Monthwise) Source: 339th Flash report on Central Sector Projects January 2014 published by the Ministry of Statistics and Programme Implementation

Break-up of 229 Delayed projects in January 2014

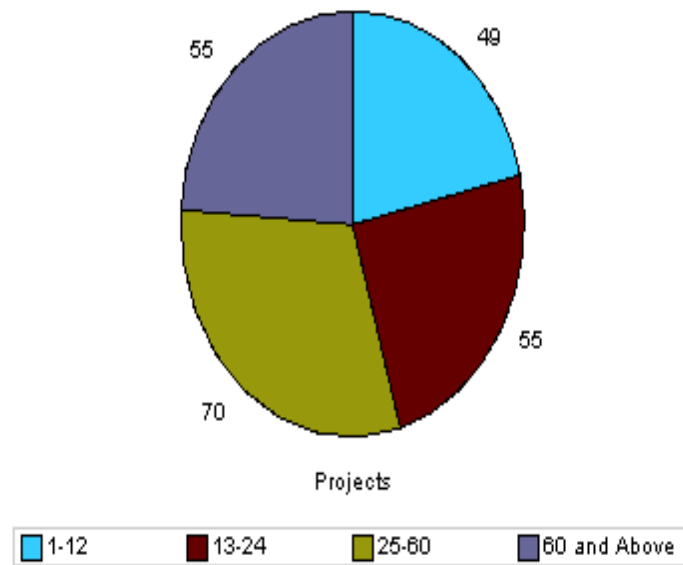
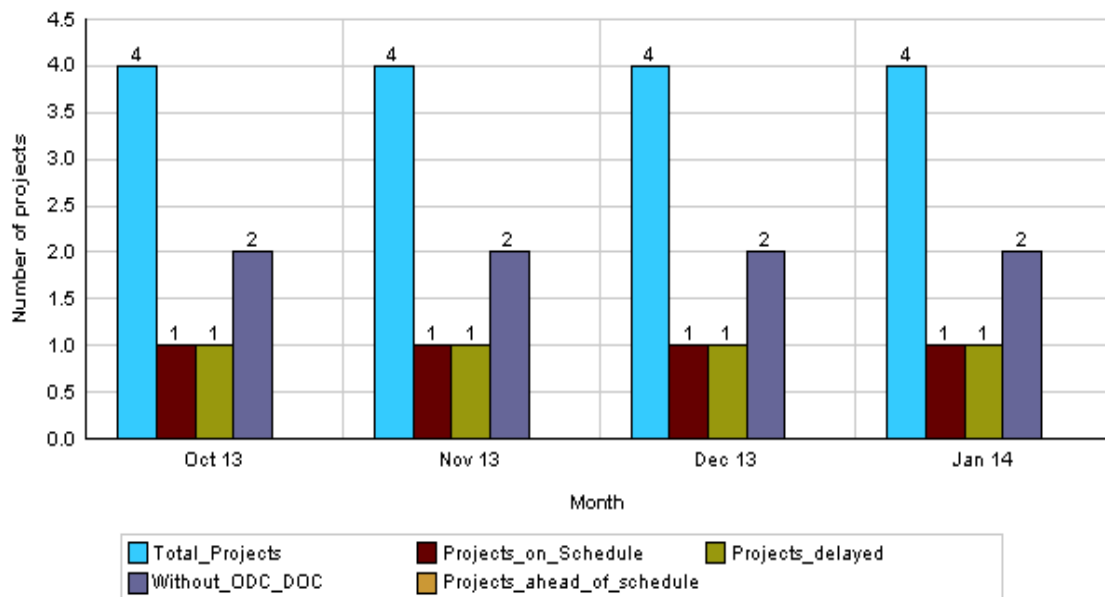


Figure 3 Urban Development Projects Source: 339th Flash report on Central Sector Projects January 2014 published by the Ministry of Statistics and Programme Implementation



This study aims to develop and test the relationship between project management education and various dimensions of project and program implementation of developmental projects sponsored, created and executed by the government. The study posits that project management knowledge is quintessential to the three main aspects of any project – communication, execution and completion. Achieving completion and closure of these developmental projects is important from a governance perspective and for achieving economic and social welfare. Awareness of modern project and program management techniques and methodologies is also relevant from a perspective of creating a vast pool of project managers who can execute programs of any size and complexity, while understanding and acknowledging the need for fiscal discipline and use of optimum resources at all times.

II. Scope of the study

Traditional project management is based on the phased approach and sequence of activities to be completed within a certain time period. The five phases of the project are as classified as:

1. Initiating
2. Planning
3. Executing
4. Monitoring and Controlling
5. Closing

The typical brick and mortar projects rely on the pre-planning, conceptual and schematic design, development and construction, testing and administration and finally operationalizing the result. The software development projects operate on the waterfall model concept which entails one phase after another namely – analysis, design, build, test and implement. One of the key concepts in the waterfall methodology is the progressive elaboration of planning. In the initial stages not all information is available and clear – however as the project progresses the deliverables resulting from preceding activities help in executing the successor activities. In the recent years, agile methodology is also being extensively used to execute application development and maintenance projects. One of the main reasons for the emergence of the agile methodology is shortened go to market time frame of businesses, uneven global demand cycles, vagaries of the markets and unstable political scenarios. Businesses have had to re-strategize their vision and missions to cater to an ever disruptive market and supply chain cycles. Governments are no less affected by the changes in the economic situations either domestic or foreign. Short fall in supply of critical raw materials, technological changes, unavailability of skilled resources to execute infrastructure and welfare development programs have delivered a double whammy to the government.

The need of the hour is to have the best possible human resources to execute the development programs and projects in the given timeframe and within the budget sanctioned. Skilled professionals can only deliver this when they have adequate knowledge of the latest methodologies and best practices prevalent in the field of project management. Project Management knowledge not only comprises of knowledge related to the task i.e the domain knowledge but also the knowledge on communication, risk management and mitigation, human resource management, procurement management and ensuring quality of the deliverables.

The scope of the study includes the various aspects of project management education namely traditional educational trainings, facilitation programs, expert mentoring etc. The study aims to review the impact of any existing project management knowledge with the respondents and incremental value additions done over a period of time through trainings, facilitations and mentoring imparted to them. The respondents covered will be government officers of the rank of Assistant Engineer and Superintending Engineer ranks in the offices of the Public Works Department of the Karnataka State and working in Urban Bengaluru, who can provide adequate information and share results of such educational inputs and trainings. The study will review the impact of the education on the execution methodology and the project management processes.

Project management trainings comprise of a predefined set of hours imparted to students of project management by registered education providers who are accredited by the Project Management Institute, USA. The important aspects covered in these trainings around the Guide to the PMBOK and its major contents about the ten knowledge areas.

Project management facilitation programs are conducted internally in several organizations depending on the need and upskill requirements of the staff. The course content covers customized aspects of knowledge to be rendered to the participants to enable them to perform better in their existing roles as project managers, project coordinators and project leaders.

Project management mentoring is also an integral part of organizations attempt to coach and mentor new and budding project managers who need to be aligned with the overall management methodologies of the organization and understand the business objectives and strategies to deliver first class service to the customer.

III. Statement of problem

Project management education, at present, is not considered as an important management subject in any university level program in India. Although the subject is taught as part of the curriculum of technical courses or management courses, yet the full scope of a project manager's skillset is not clearly available to the student community in general. As per the UGC report on 'Higher Education in India at a glance, June 2013', about 20 million graduates roll out of 700 universities and 35000 affiliated colleges in the country in the year 2013. A significant number of the graduates are unemployable due to outdated learning, no comparative balance between theory and practice, heavy focus on examination and marks oriented attitude, and finally incorrect career matching with respect to the individual's interests and aptitude. Although, the technical courses do equip the graduates with skills to carry out the basic deliveries related to their work, yet these are domain specific and do not necessarily delve into the realm of managing small projects within their organization. The hiring in the

government sector is purely on the basis of the Public Service Commission examinations and ability of the individual to shine through the interview process. There are some other factors also which determine the entry of graduates and diploma holders into the government sector – but these are not in scope of this study. The most important aspect therefore revolves around the ability of the individual to understand the deliverable from the program or project he or she is associated with and ensuring successful completion of the same. Basic level project management topics are taught at the graduation level which include topics like CPM/PERT, project planning and scheduling etc. However, the more scientific and intricate aspects of the ten knowledge areas as prescribed by the Project Management Institute, USA are not focused in depth. This is in contrast to the various International agencies and organizations which collaborate and work with their Indian counterparts – most of the employees in such foreign bodies are well-versed with the overall project management concepts and latest technical aspects surrounding project management education. The contrast in the knowledge hampers the overall progress of the program or project and smooth delivery.

IV. Review of literature

The purpose of literature review is to place the study in context by reviewing the relevant literature on project management methodologies and relevant education especially in the Indian scenario. A comparative analysis of Indian project management education with international education can be taken up on a specific country basis. Detailed study of the various works available on the project management processes and methodologies will help in defining the gap in the Indian scenario vis-à-vis the current best practices across the globe. The Guide to the PMBOK (Project Management Body of Knowledge) 5th edition from the Project Management Institute, USA is one of the guiding beacons for this study. Detailed study of the literature will also help in finalizing the research methodology for the study and help construct the conceptual framework. One of the presentations published by the PMIEF (PMI Education Foundation) – “The 21st Century Skills Map – Project Management for Learning Skills Map”, April 2014 categorizes the skills needed by young graduates as below:

Life Skills	Career Skills	Learning Skills
PROJECT METHODS Project Definition Project and Learning Goals Learning Project Type End Results Driving Question, Problem, Issue, Perspective Completion Date Needed Resources Evaluation Methods Project Risks	PROJECT METHODS Project Definition Project and Learning Goals Learning Project Type End Results Driving Question, Problem, Issue, Perspective Completion Date Needed Resources Evaluation Methods Project Risks Team Agreement Team Roles Team Member Profiles Communication Methods Decision-making Methods Disagreement Resolution Methods Change Management WorkPlan Project Deadlines Project Tasks Task Owners Resources Needed Time Schedules Check-in Meetings WorkPlan Progress Quality of Work Communication Effectiveness	PROJECT METHODS Knowledge Areas Scope Time Cost Quality Teamwork Communications Risk Resources Integration

	Evaluations End Results Learning Outcomes Project Methods	
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V. Theory of Project Management

The Project Management Institute, USA prescribes the project management practice in its Guide to the PMBOK (Project Management Body Of Knowledge) 5th edition, 2013. However, planning with an approach of management-as-organizing brings forth the concept of human activity as inherently situated (Johnston and Brennan 1996). Hence, planning should also focus on structuring the environment to contribute to purposeful acting.

With respect to the execution of managerial tasks, and the language/action perspective there is a theory, originated by Winograd and Flores (1986), which conceptualizes two-way communication and commitment, instead of the mere one-way communication of the classical communication theory.

And perhaps the most important scientific experimentation model of control of Shewhart (Shewhart and Deming 1939) points its focus to find the cause of defect and deviations and to act on those causes, instead of only changing the performance level in order to achieve a predetermined result in case of that deviation. This model goes on to add the aspect of control to the overall project management learning.

The Theory of Planning states the findings of Ballard (1999) which demonstrate the link between the pull system and the end results of the project.

The theory of project management relies on project network planning but these have been acknowledged to be inept in practice. (Fondahl, 1980).

Goldratt in 1997 came out with the Critical Chain Project Management and the Theory of Constraints (TOC). He has come out strongly in favour of project and feeder time buffers to accommodate effective management of the buffer time and not let it go waste at the end of the project. Normally, all the buffer time is kept at the end of the project and does not get utilized appropriately thus leading to better control, and controllable lead times. TOC also advocates the staggered release of deliverables in order to avoid any multi-tasking and missed due dates.

VI. Objectives of the study

1. To gain an overview of the project management practice in the government sector with special reference to the development projects
2. To gain an understanding of the level of project management education among the project managers and coordinators of development projects
3. To study the gaps within the existing training modules and the global best practices in the development sector
4. To assess the training needs and ways to meet the needs by effectively employing the tools available
5. To make suggestions to all stakeholders on the basis of findings and conclusions.

VII. Limitations of the study

This study will be undertaken in Urban Bengaluru and with specific focus on the development projects being managed by the government officers/project officers in Bengaluru. Urban Bengaluru has been chosen for the study with the intent of understanding the impact of the available knowledge infrastructure to the respondents and the application of the same in the day to day work. Bengaluru is the Information Technology Hub or the Silicon Valley of India. There is a large community of Information Technology professionals who are trained in Project Management concepts by the numerous project management consultants, coaches and trainers and registered education partners of the Project Management Institute, USA. The universe of the study will be all the government officers of the rank Assistant Engineers and Superintending Engineers in the public works department of the government of Karnataka. The sample will be used from the above for this study.

The limitations of this study are enumerated below:

1. Sample size – The sample size may not represent the universe of the data. Reasonable size will be used to derive the relationships and infer the results.
2. Lack of availability of reliable data – The interviews conducted may not reveal the actual learning conditions of the project managers/officers. Questionnaires will be used to address this limitation to a reasonable extent wherever possible.

3. Lack of prior research studies on this topic – Based on initial preliminary review there are very minimal sources available to develop this topic further. Any specific information related to the topic will be put to test before being used as supporting for this research.
4. Measure used to collect the data – Use of questionnaires and interviews may not be entirely comprehensive to collect subjective data on learning experiences and application of learning on the actual work. In depth study may need to be taken up as part of training evaluations and performance management of the respective respondents to assess the same.

VIII. Research Methodology

Qualitative and quantitative methodology will help to understand the various facets of the project management education currently being applied during the execution of development projects. It will help to get a deeper understanding of the problem of the issues being faced by the executors of the projects when faced with dynamic and ever changing situations – both domestic and global.

8.1 Qualitative Analysis

Qualitative research will be conducted using the following tools:

1. Interviews with government officers
2. Interviews with project management education providers
3. Interviews with professors of management
4. Documentary sources like books and newsletters

In depth review of the training material available with the various governmental agencies will help in identifying the current gaps in the project management education. Project management is viewed more as an additional skill than a core skill and hence there are no direct theories based on the subject of project management. It is essentially a culmination of several management theories put together, which are put to use in ensuring the successful completion of the task.

8.2 Quantitative Analysis

Data and Methodological Triangulation will be used to check and establish the validity in the studies. For the purpose of this research data triangulation method will be used. This will help in validating the different sources of information. The project health metrics is a good indicator of the performance of the various resources on the project and is a good data input for the study.

Methodological triangulation involves the use of multiple qualitative and/or quantitative methods to study the issue. If the conclusions from each method are the same, then the validity is established. The researcher will use interviewing, questionnaires and document analysis to compile to the results.

Ethnographic research allows us to regard and represent the actors as creators as well as executors of their own meanings. The very way in which they tell us about what they do tells the researcher a great deal about what is meaningful for and in the research. It adds richness and texture to the experience of conducting research.

7.3 Tools of Data Collection and Analysis

Population	Planned no. of interactions	Method/Approach	
State Govt – Assistant Engineers	At least 30	Indepth interviews and questionnaires	Review of training materials
State Govt – Superintending Engineers	Atleast 30	Indepth interviews and questionnaires	Review of training materials

8.4 Analytical framework

1. Mean, Mode, Percentage Distribution, Frequency Distribution
2. 10 point rating scale for perception
3. Factor rating scale
4. Pie Charts
5. Bar Charts
6. Horizontal and Vertical Line Charts

IX. Sources of data

Primary - The study will present the findings of the research undertaken for identifying the extent and nature of project management education and best practices in the development projects being managed and led by government officers of the rank Assistant Engineer and Superintending Engineer in the government offices of the State and Centre in Urban Bengaluru. Primary data will be collected through interviews and questionnaires and interactions with the relevant population.

Secondary – 1) Data collected from the websites of the Karnataka and Central government. 2) Data collected from the website of the Ministry of Statistics and Programme Implementation

X. Conclusion

The researcher believes that the study will help bring about the following awareness in the powers that be on the quality of project management education among those managing the development projects:

1. Level of project management education
2. Usage of good and best practices prevalent in contemporary project management
3. Usage of superior project management methodologies
4. Effective management of resources at hand by the project manager
5. Controlling communications and dispersal of information to the relevant stakeholders
6. Mitigating risks in time and ensuring successful project deliveries

The study in effect will also contribute to the overall project management discipline by throwing light on the impact of project management education in successfully managing development projects in developing countries. The study will be able to promote the ideals of project management and help to inculcate a sense of ownership amongst all the project stakeholders for achieving the desired end result of the task at hand. The study will highlight the gaps in the skillsets of the project officers vis-à-vis the contemporary project management practices followed in the non-government sector. The study will help to ascertain the need for initiating a well balanced curriculum at the graduation level to include concepts of contemporary project management. The study aims to achieve a holistic understanding of the lacunae in the project management education which is being imparted at the higher education level. The study will definitely help in answering some questions around the quality of higher education and the under-employability of the technical graduates coming out of the universities.

Although there is no single panacea for the problems faced on this count, yet, it is very important to highlight some of the causes, which if remedied, can lead to better project managers both in the public and private sector who can contribute to the nation's growth.

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