

Project Portfolio Selection in Indian Auto Component Industry: An Empirical Study

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Abstract

Project Portfolio Management (PPM) has a proven record of success in organizations. There is a growing set of literature focusing on the success criteria of PPM. These set of standards affect the PPM success and has an overall outcome on the business success in organizations. From the strategic perspective, project selection plays a substantial role. In the world of a dynamic market with colossal competition, taking up the wrong project will not only end up using resources but in the long run, it can be critical. Indian Auto Component Industry (IACI), due to varying demands and global competition, face the daunting task of survival in such a situation. The research paper is written on the empirical study and focusses on the effect of project selection in the portfolio on business success in IACI.

Keywords

Project Portfolio Management, Project selection, Indian Auto Component Industry, Business Success.

1. Introduction

In this highly competitive world with rapidly changing demand for the products, sustainability is a big question now for any organization. Those whose are following standard practices and adapt themselves to the changing internal and external factors, do not strive hard for success. PPM has evolved as one such way of managing multiple portfolios, programs, and projects efficiently. PPM is one of the most thought-provoking problems in contemporary business (Cooper et al., 1997, 2001, 2006). Firstly, it deals with future measures in an organization and the data gathered for the decisions is uncertain. Secondly, investments in project portfolio are at different phases of completion, so it is challenging to do the comparative analysis of the investments that are estimated. Thirdly, the organizational environment is very dynamic because of which the status of the portfolio keeps on changing, and new data or information is made available. Finally, resources constraints are majorly impacting the projects wherein insufficient funding for another project may take away the allotted resources for some other projects. In the world of globalization, new business practices are motivating organizations to reassess their competition level strategy. An organization's success mostly depends on its capability to grow globally. IACI caters to the need of the Indian automobile industry. The companies are nowadays facing tremendous problems due to rapid change in demands. Singh et al. (2007), carried out a survey of 75 Indian auto component manufacturers to mention challenges faced by the automobile sector. Looking at the tremendous growth potential and big market in India, many multinational auto companies have already established their businesses or are planning to do so. In such a situation, there is a fierce competition to survive in the market, not only to domestic companies but those who also collaborated with the multinational companies. Moreover, the auto component manufacturers feel the pressure of producing high-quality component at a lower cost, products with shorter lead time and customizing the products as per the requirement of Original Equipment Manufacturers (Singh et al., 2007; Jain et al., 2008; Scavarda et al., 2009). The companies need to implement new industry practices so that it will take care of the challenging tasks and also a restructuring of the IACI is required (D'Costa, 2004). Owing to such challenges, it has become essential for the IACI to increase its performance and competitiveness by considering more continuous improvement approaches and impactful business practices to take advantage of the increasing business opportunities. Moreover, to survive in the global cut-throat competitive automotive industry, developing and emerging economies must adopt and upgrade to world-class manufacturing practices and standards (Barnes and

Morris, 2008). Right from government policies to strategy Implementation, the companies do have lost their way, resulting in many shutdowns. PPM has a proven record in managing multiple portfolios or projects in a very efficient manner. Cooper et al., (1997, 2001, 2006) states that PPM helps an organization to focus on return on investment, apt balance of the portfolio and strategic alignment of the project portfolio keeping business objectives in mind. Firms should align a portfolio of projects with their strategic business objectives, uniting performances of its components to maximize the shareholders' worth whereas balancing resources and mitigating risks. The primary purpose or goal of the PPM is to identify, grade, prioritize, select and final approval of projects or programs. Ambiguity and instability are increasing, and the decisions taken by managers on project portfolio with minimum or no information resulting in a burden on resources and least outcome (Costantino, Di, & Nonino, 2015).

2. Literature Review

Cooper et al. (2007) state that in organizations, portfolio management is implemented to select a portfolio to achieve the following goals;

- To exploit and maximize project portfolio value.
- To pursue the right balance of the projects, to accomplish a stable and balanced portfolio.
- To create a strong association with the strategy.

PPM is considered to be the model for effective resource allocation, for the selection of those projects with the first potential that goes out to be tomorrow's new product winners. The flawless execution and implementation of the Project portfolio methodology are finally linked to sound innovation management practices. The time taken during the development of new or improved strategies, when the previous ones discarded, is said to be the most dangerous time for a company. The deviations or changes that are going to take place in the global market have no dominance; to endure in present day's demanding market-place desires unusual variations in the firm's services, products, company functions that conceptualize, produce, progress, then market something of value to the clientele. Projects, similar to the structure in plan and the application of a sound strategy, provide the ways to carry the possible changes in the processes and products (Cleland, 1999: p. 91).

Many companies have project portfolio selection and associated action of managing selected projects throughout their lifetime as the significant aspects. Similar to project management methods, which are so commonly practiced in many industries for the activities such as research and development (R & D) of the new products, implementing the new systems, also processes in manufacturing and information operations, and finally contracting engineering and the construction projects (Cooper, R, 1995). But there are regularly more projects available for the selection than that is undertaken within physical and financial constraints of the firm, so is done in making up the suitable project portfolio. The Project portfolio concept, shown in figure 1 which explains project portfolio as a collection of programs and projects and other work that are organized to facilitate the effective management of work and to encounter and meet strategic objectives of the business (Rajegopal,2007).

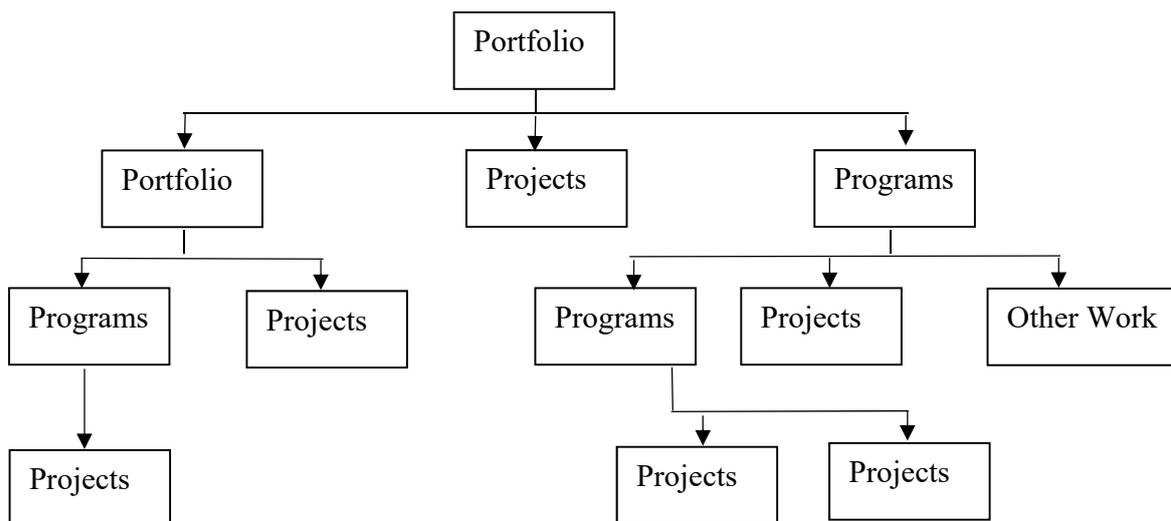


Fig 1. Project portfolio substructure (PMI,2006)

Cooper et al. (2001) wanted to learn about the levels of support of the senior management to portfolio management, the most usual methods implemented along with their popularity and what differs the best firms from the worst. Cooper et al. (2007) have also investigated why some firms are successful at the product innovation and identify portfolio management and the resource allocation as among the four primary performance drivers. These drivers depict a diamond, which at its center placed a business's new product performance.

Firms that wish to be competitive, by selection of the appropriate projects, must consequently use techniques and the procedures for a portfolio selection which supported on the most critical project measures, but these methods will not utilize if they could not be understood readily by the managerial decision makers. Even though there is no dearth of techniques for a project assessment or evaluation in the selection of projects, there is a comprehensive lack of a framework for establishing methods.

Some significant conclusions are taken after the analysis of the project and the program management in relation with PPM. The projects within a program share the common objective, and the projects in portfolio share the same set of the resources (Blomquist & Müller, 2006). Gardiner (2005) suggests that in case of a conflict (e.g., in the selection of projects within the limited budget, or resources like workforce, or technology, etc.) it is the dominant role of a program manager to prioritize the projects which ensure the best complete results for a company. In a company, PPM is on a top level compared to project management.

Table 1: Effects of non-implementation of PPM practices in organizations (Source: Moustafaev, 2011)

<i>No PPM</i>	<i>Short-term effect</i>	<i>Long-term effect</i>
No strategic fit project selection standards. There is a reluctance to cancel projects; Too many projects in line.	There is a Nonalignment of projects with the firm's strategy. Resources thinly spread; Too many projects	The resources misused on improper projects. More time to market; Quality declines. Increase in failure rates.
Difficulty in go/kill choices.	There is a great number of trivial projects; Important projects starving to get funds.	Less number of high performing projects.
Projects selected on emotion, Absence of difficult project selection techniques; politics.	Badly chosen plans.	High chances of project failures.

Table 1 gave the effects of not implementing proper PPM practices within an organization. There is a blurred understanding of what PPM is. Some business units claim that PPM is in full stride; others show attention in the discipline, yielding that they do not know sufficient about it; others mention PPM as just another method of project management with a new tag to what has been practiced for many years, specifically project management.

2.1 Project Portfolio Selection

PPM has developed a fundamental way for firms to manage their product development competently and effectively (e.g., Cooper et al., 1997b). Amid the critical matters, projects that are nominated and maintained in line with strategy and resources distributed to projects with optimization of the complete project portfolio in mind gives the best results. (e.g., Archer and Ghasemzadeh, 1999a, b; Arto and Dietrich, 2004; Arto et al., 2003). At times, a lot of research consideration has been on the techniques and tools for portfolio assessment and ranking (Henriksen and Traynor, 1999; Ringuest and Graves, 1999) portfolio-based product growth process management (Cooper et al., 1997a, b, 2002), and resource management (Hendriks et al., 1999). Holistic approach in PPM frameworks also have been developed (Archer and Ghasemzadeh, Cooper et al., 2001; Dye and Pennypacker, 1999) and shows that PPM could well see as an all-encompassing system and method for managing product development. Successful companies have revealed to have a systematic approach to their portfolio assessment, decision making and resource distributions (Cooper et al., 1997, 2002; Fricke and Shenhar, 2000), and some revisions show explicit positive relations between some systematic methods of PPM and designated measures of presentation (Arto et al., 2004; Fricke and Shenhar, 2000; Müller et al., 2008). Factors explaining PPM performance is still inadequate, and more research is needed to test all aspects (Martinsuo, 2013). PPM developed into global standards (PMI, 2008) as well as practical tool books (Cooper et al., 2001) that are likely to help firms form and implement their PPM. Firms also have adopted PPM

frameworks, including the use of project assessment and decision criteria (Martinsuo et al., 2013), project assessment and control routines (e.g., Müller et al., 2008), and other means to ratify their PPM (Teller et al., 2012).

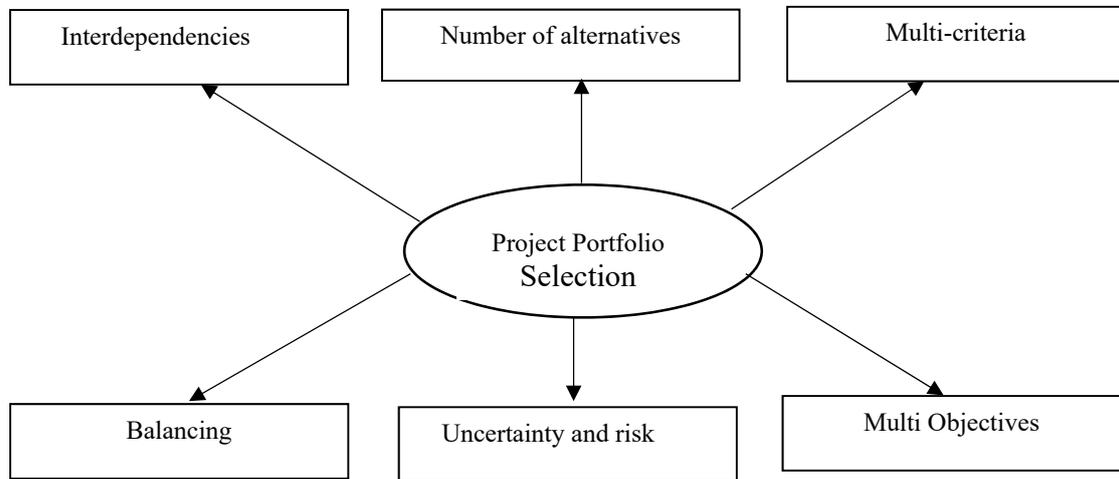


Fig 2. Project Portfolio selection problems (Adapted from Elbok et al.,2017)

Strategic planning process further leads to multiple objectives and goals to be achieved in different time horizons. The project selection methods are mainly dominated by statistical methods and mathematical modeling (Elbok et al.,2017). Archer and Ghasemzadeh (1999) considered a single objective function to solve multiple objectives and noted that linear programming, AHP, and weighted scoring are possible methods for project value determination. It seems that, though the PPM frameworks and their well-intended portfolio evaluation and investment optimizations during portfolio selection and planning, PPM models, are critiqued (Henriksen and Traynor, 1999), attention managers give to portfolio activities is inadequate (Elonen and Arto, 2003), and working with multiple projects overloads the employees (Zika-Viktorsson et al., 2006). Many companies have project portfolio selection and associated action of managing selected projects throughout their lifetime as the significant aspects (Cooper, 1993). But there are regularly more projects available for the selection than that can be undertaken within physical and financial constraints of the firm, so the choice must be made in making up the suitable project portfolio. There is no scarcity of techniques for project evaluation in portfolio selection but still, there is a lack of a framework for establishing methods rationally in the simple process. Presently, many firms have four most significant problems such as too many running projects, almost double at times what a company should have; too many wrong projects selected that will not add value to the company; projects are not related to the strategic goals of a company (Rasiha Delilbasic, 2012). Portfolio management practices found that they support managerial decisions towards product development and accelerate improvements in processes. The only point where the project is located to be inconclusive was the ranking criteria for the projects. It shows that it becomes objectively feasible to theoretically rank projects using incomplete constraints without seeing what the outcome is (Paulo Augusto et al.2013). It further raises a question about the seriousness of project selection in the portfolio in IACI and leads to a hypothesis:

H_0 : There is no positive effect of project selection on business success in IACI.

H_A : There is a positive effect of project selection on business success in IACI.

2.2 Business Success in the purview of PPM

When talking about risk management in project portfolios, is observed that literature generally acknowledges only a single project positively (De Bakker et al., 2011). It also indicates that its rarely been found to consider managing risks in project portfolios. (Sanchez et al., 2009). However, there are some case studies, and research at the conceptual level done on risk management in project portfolios (Olsson, 2008; Sanchez et al., 2009). The only issue where the project is found to be inconclusive was the ranking criteria for the projects. It shows that objectively feasible to theoretically rank projects using incomplete constraints without seeing what the outcome is. The PPM objectives well recognized in the literature: the balance of the portfolio, maximization of the portfolio value, and linking projects to strategic goals (Cooper et al., 2001; Elonen and Arto, 2003). The success of the project portfolio, in any organization, includes the following dimensions;

(i) strategic fit, (ii) portfolio balance, (iii) project success (iv) product success, (v) economic success, and (vi) preparing for the future. (Cooper et al. ,2001; Martinsuo and Lehtonen, 2007; Meskendahl, 2010; and Müller et al., 2008).

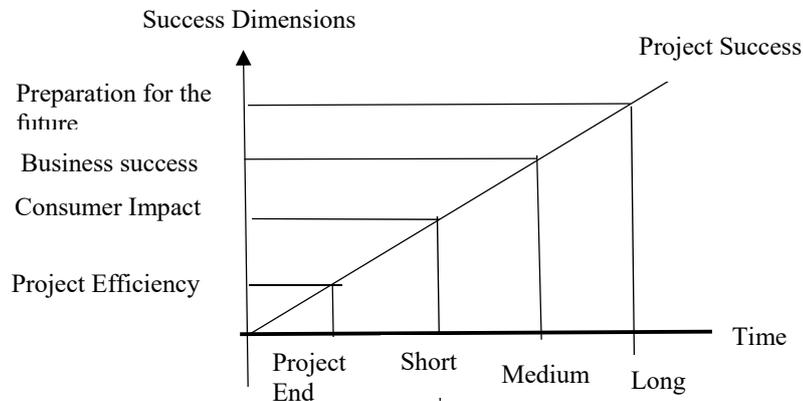


Fig 3. Success dimensions versus term. Adapted from Shenhar et al. (2001)

Balancing project portfolios is considered to be a time-bound concept of the projects (long vs. short-term projects) or the use of technologies (mature vs. new). Preparing for the future considers the long-term aspects and reflects the skill to grab chances that ascend after the projects have been carried to an end (Shenhar et al., 2001). Lastly, economic success talks about the short-term economic aspects at the company level, including complete market success and commercial success of the organization or business unit as shown in fig 2. (Shenhar et al., 2001; Meskendahl, 2010).

Table 2: Different dimensions of the success of projects, according to Shenhar et al. (2001)

Dimensions of success	Measures / used variables
Project Efficiency	Meets Budgets. Meets Budgets.
Consumer Impact	Meets customer needs. Complies with technical specifications. Contributes to functional performance. Resolves customer issues. Used by the customer. Adds to customer satisfaction.
Business success	Creates or increases market share. Enhances Commercial success.
Preparing for the future	Creates a new market. Creates a new technology. Creates a new product line.

Many researchers nowadays are focusing on effective management and portfolio success with its impact on business success. (Unger et al.,2012) Talks about the proper timing about deciding for project termination and its effect that takes place positively on the effectiveness of the entire portfolio and accomplishing strategic alignment. The success factors in portfolio management are linked to quality management regarding information, resource, and coordination (Jonas et al.,2013). The attributes of PPM effectiveness defined with a qualitative approach. (Patanakul,2015). Projects are carried out to execute the firm's strategy (Morris,2009). Moreover, linking projects with the firm's strategy to ensure business success (Dietrich and Lehtonen,2005).

2.3 An overview of Indian Auto Component Industry (IACI)

The auto industry in India includes automobile manufacturers and auto component manufacturers. The industry is a significant driver to enhance the Indian economy. The sector, over the years, has established the competence of manufacturing all components essential to produce vehicles. It is achieved from the high levels of indigenization/localization accomplished in the automobile industry as well as the parts developed for the entirely Indian made vehicles. Now, the auto component industry has the holistic capability to manufacture the entire range of auto-components like engine parts, drive, transmission parts, suspension & braking parts, electricals, body and chassis parts, equipment, etc. Engine and drive transmission parts together contribute about 50 percent of the auto component industry production. Engine parts, which constitute 31 percent of the production which mainly includes pistons, engine valves, carburetors, fuel injection systems, camshafts, crankshafts, and cooling systems. The IACI is comprising of Tier 1, Tier 2 and Tier 3 companies. A Tier 1 auto-component manufacturer are the members of the ACMA. ACMA is an apex body of auto component industry in India. The IACI classified as organized and unorganized players. The organized sector caters essentially to OEMs and some extent in after-market dealing in the manufacture of high value-added precision engineering components. The unorganized players are mainly providing to replacement market or aftermarket coping in lower value components. This industry classification (more technically) in a three-tier structure is as follows:

- Tier 1 is involved in Integrated systems and critical enablers to OEMs, and manufacture multiple auto components,
- Tier 2 supply auto components to Tier 1 suppliers and finally
- Tier 3 use traditional method of manufacturing (negligible IT systems) involved in raw material and single component manufacturers to Tier 2.

In some cases, OEMs themselves are in Tier1 group because of the criticality of the component (where there is zero tolerance), (Bhasker et al. ,2013, ACMA Report 2015). Considering infrastructural issues in the automobile industry, the automotive companies find it difficult to supply components just-in-time (it is progressively leading the manufacturing norm for existence in the OEM segment) to the OEMs except they maintain a few weeks or months of raw material, work in progress and inventory of finished goods (Haritha Saranga, 2009). The Indian automobile industry divided into clusters as shown in figure 3. Most of the auto component firms are situated in these clusters.

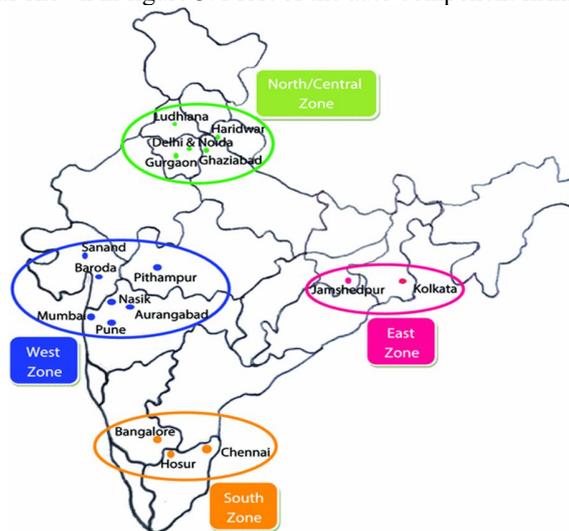


Fig 4: Automobile clusters in India (source www.ibef.com)

The four main auto clusters in India are;

- MPNA (Mumbai-Pune-Nashik- Aurangabad) – West zone.
- DGF (Delhi – Gurgaon – Faridabad) – North zone.
- KJ (Kolkata – Jamshedpur) – East zone.
- CBH (Chennai – Bangalore – Hosur) – South Zone.

3. Research Questions

PPM techniques are the tools and policies used in successful organizations for allocating resources among project portfolios that lead to the overall development and achievement of the firm (Cooper et al., 2001, Levine, 2005). This research paper talks about the significance of project selection in the portfolio in IACI and its influence on the business success of a firm. Furthermore, relating the successful products with project selection in PPM is not possible. The products that are launched not more than three years old in the market are considered for the research. This study targets to investigate the following research query.

Does Project selection in the portfolio, impacts on the business success of an organization in IACI?

4. Research Methodology

This research paper explores the relationship between project selection in PPM and business success in the purview of IACI. The first stage deals with exploratory research with a chosen method as a literature review. Exploration directed towards reviewing all relevant information about PPM from a strategic and operational perspective. Moreover, it also included collecting information about the IACI. The constructs, that are used in the conceptual model also carried for the development of a research instrument. The first stage completed by preparing the sampling method for collecting the data. Stage II dealt with data collection in three steps – pre-test, pilot study and main study (survey). The pre-test and pilot study was carried out before the main study to confirm optimal research measures. The results produced from these two activities were used to improve measurement items used in the questionnaire. The main study included the circulation of survey questionnaires to the respondents. The research protocol was the same as that used in the pilot study. The required number of samples derived from the requirement for executing structural equation modeling and was based on the type of sampling method used. In Stage III, the data collected were analyzed using statistical techniques.

The total number of responses was 387, but due to some incomplete responses the final number of responses are 356 and are taken forward for data analysis.

5. Data Analysis

The data for the research is collected and then analyzed to find out the demographic details of the respondents. For carrying out the study, SPSS 23.0 used. The respondents in the study were senior managers, Deputy General Managers, plant managers, line managers, and those managers with experience varying from 1 – 20 yrs. The study helps us in understanding the background of the respondent and indirectly gives an idea of the relevance of the research carried out.

5.1 Data Screening and Preparation

Before analyzing the data, it was screened and checked for missing values, outliers, linearity, normality and multicollinearity. These steps were carried out to ensure the success of the model estimation (Kline,2005). The data collected were scrutinized using SPSS, a statistical tool. SPSS is an extensively used in social science for statistical analysis also practiced by survey companies, market researchers, health researchers, government, education researchers, marketing organizations, data miners, and many others.

5.2 Demographic Details

The details collected were classified into the three tiers to which they belong, work experience, employee size of the company, turnover of the company, sectors of IACI and the department in the organizations.

5.2.1 Category (Tiers) of IACI

The data collected is analyzed and divided into three tiers. Table 3 shows the frequency of the respondents for the given survey.

Table 3: Category (Tiers) of IACI

	Frequency	Percent
Tier I	149	41.9
Tier II	126	35.4
Tier III	81	22.8
Total	356	100.0

Table 3 shows that from 356 valid responses collected, 41.9 percent were from Tier I, 35.4 percent from Tier II, and 22.8 percent from Tier III are there. The total responses collected indicates that there are more than 3/4th respondents belong to Tier I and Tier II companies.

5.2.2 Work Experience of the respondents

The data collected was also analyzed for finding out the work experience of the respondents of IACI. Table 4 shows the frequency and percentage of the work experience of the respondents in IACI.

Table 4: Work Experience of the respondents

	Frequency	Percent
< 5 YRS	58	16.3
5 -10 YRS	229	64.3
11 – 15 YRS	59	16.6
>15 YRS	10	2.8
TOTAL	356	100

The above table shows that the maximum respondents are in the range of 5-10 yrs. Work experience. The percent of respondents having work experience less than five years is 16.3, in between 5 -10 yrs. is 64.3, in between 11 – 15 years is 16.6 and more than 15 years is 2.8. The respondents are from the top level, middle level, and entry level management. Some of the organizations have people with more than ten years of experience in the top level of management. Respondents with 5 -10 yrs. of experience play an essential role in the middle management where they form a bridge between strategy and implementation from PPM perspective.

5.2.3 Annual Turnover the companies of Respondents

This section of data analysis shows the annual turnover of the companies of the respondents in IACI. Table 10 indicates the yearly turnover of the companies of the respondents in IACI.

Table 5: Annual turnover of the companies of respondents

	Frequency	Percent	Valid percent
50 – 100 Cr	154	43.3	43.3
101 – 500 Cr	108	30.3	30.3
501 – 1000 Cr	94	26.4	26.4
Total	356	100	100

The above table shows that 43.3 percent of respondents are in the range of 50 – 100 Cr, 30.3 in 101 – 500 Cr, 26.4 in 501 – 1000 Cr annual turnover of the companies. According to the literature (Cooper, 2001), well-established companies, do have a positive approach towards PPM. Moreover, research carried out in the organizations in the USA, points out that the large organization does have standard practices followed on a regular basis.

5.2.4 Respondents belonging to different sectors of IACI

The PPM study is in Indian Context. The Indian auto component industry spreads in various locations across India. These locations are generally called the clusters where the Indian automobile companies have set up their manufacturing units. Auto component companies also have set up their units in these clusters to cater to the needs of manufacturing companies. The collection of responses from the respondents are from these companies only. Table 6 shows the percentage of respondents from the different sectors in India.

Table 6: Respondents from different sectors of IACI

	Frequency	Percent
MPNA (Mumbai-Pune-Nashik- Aurangabad)	158	44.4
DGF (Delhi – Gurgaon – Faridabad)	59	16.6
KJ (Kolkata – Jamshedpur)	36	10.1
CBH (Chennai – Bangalore – Hosur)	103	28.9
Total	356	100.0

The above table shows that 44.4 percent belong to MPNA (Mumbai -Pune-Nasik-Aurangabad), 16.6 from DGF (Delhi – Gurgaon – Faridabad), 10.1 from KJ (Kolkata – Jamshedpur) and 28.9 from CBH (Chennai – Bangalore – Hosur). Most of the auto component manufacturing units are situated in these clusters (Fig 4.4).

5.2.5 Respondents from different department of companies

The data collected from various departments of the companies. Table 7 shows the percentage of respondents from different departments in companies of IACI.

Table 7: Respondents from different departments in companies of IACI

	Frequency	Percent
Design & Engineering	55	15.5
Finance	38	10.7
Production	146	41.0
Supply Chain	35	9.9
Quality Assurance/ Quality Control	18	5.0
Sales & Marketing	46	12.9
Others	18	5.0
Total	356	100.0

The above table shows, the majority of the respondents are from the production Department, i.e., 41 percent. These respondents are from various levels of the management which contributed to the research.

6. Results and Findings

The descriptive statistic is summarizing the features of collected data. It provides simple summaries of the sample and also about the observations made.

Based on the data collected, the mean and standard deviation is calculated as shown:

Table 8: Mean and standard deviation of Project selection in Portfolio

S. No	Project selection components	Mean	S. D
1.	The company understands the importance of project selection	3.76	0.76
2.	Proper Project selection is beneficial for a robust competitive presence of the firm in the market	3.52	0.79
3.	The company uses standard practices for project selection	3.46	0.88
4.	We have a stringent mechanism of project selection for the portfolio	4.00	0.73
5.	The firm studies all the constraints required for project selection	3.80	0.58
6.	There is a clarity in the company on the selection of projects	3.70	0.53
7.	The senior management puts an impact on project selection	3.90	0.55
8.	Our firm follows different approaches of selection for project portfolio	3.95	0.83
9.	The financial methods (NPV, IRR, etc.) are the most dominant method in project selection.	4.39	0.72
10.	Risk management is an integral part of project selection.	3.94	0.67
11.	The management practices different techniques of balancing the project portfolio	3.63	0.58
12.	Apart from Standard methods, our company also has some signature(own) methods of project selection	3.48	0.78

From table 8, it is clear that majority of the respondents do agree that project selection is a crucial aspect in PPM and choice of right projects will undoubtedly increase the probability of business success. Concerning with the objective

of the research is to analyze the influence of project selection on the business success of the organization in IACI, regression analysis was carried out. The hypotheses derived from the model were tested. The following table shows the result of the hypothesis testing:

Table 9: Hypothesis test results

Null Hypotheses	Spearman Coeff.	P value	significance
Project portfolio selection does not positively affect the Business success of an organization in IACI.	0.774	0.028	REJECTED

Above results show that project selection does have a positive impact on the business success of an organization of IACI. Due to the dynamic nature of the businesses and to sustain in the cutthroat competition, there are high chances that the organizations may pull in the projects without actually worrying about the resources at the strategic level. Moreover, the organizations having less turnover might go for the projects which may account for financial benefits rather than balancing the given portfolio of projects. The practice of PPM in its real-life context is slightly messier and less rational than the decision-process centered frameworks (Martinsuo, 2013).

7. Conclusion

To build an optimal project portfolio in a competitive business environment is a significant concern for every organization. The method of generating a good portfolio mix of components with excellent potential, with many constraints, is complicated and knowledge consuming. This complexity is mainly because of the numerous dimensions in decision making. The decision maker has to deal with multiple criteria, multiple objectives, uncertainty and risk, interdependencies between different components, and balancing effectively with varied goals of the organization. Mostly the decision is regularly made by top managers with dissimilar perspectives that need alignment of the projects across the portfolio building stages. Considering the increased competition in the market, there is a much broader scope of possible strategic directions that need the active participation of top-level management, which helps in navigating for both long and short-term strategy. It suggests that a commitment, both regarding actions and time, is desired. This also indicates that the management involved in operational aspects has to be supported with a proper project methodology on individual project level and also on a portfolio of projects. Project selection is indeed an essential phase in PPM. The results show that there is a good understanding of project selection is there in the organizations of IACI. But this can be only one side of the coin. A strategy should be accompanied with an in-depth plan of implementation of it. Without the effective implementation of the strategy, the probability of business success is reduced.

References

- ACMA – Annual Report (2014-15)
- Archer, N.P. and Ghasemzadeh, F., An integrated framework for project portfolio selection. *International Journal of Project Management*, 17(4): 207-216, 1999.
- Artto K.A. and Elonen S., Problems in managing internal development projects in multi-project environments. *International Journal of Project Management* 21 (6): 395–402,2003.
- Artto, K. & Dietrich, P., Strategic Business Management Through Multiple Projects. In Morris, P.W.G. & Pinto, J.K. (eds.). *The Wiley Guide to Managing Projects*, Hoboken, NJ: Wiley,2004.
- Barnes, J. and Morris, M., Staying alive in the global automotive industry: what can develop economies learn from South Africa about linking into global automotive value chains. *The European Journal of Development Research*, Vol. 20 No. 1, pp. 31-55.,2008.
- Blomquist, T. and Müller, R., Middle Managers in Program and PPM: Practices, Roles and Responsibilities, *PMI Publications*, USA.2006.
- Cleland, D.I., ‘The Strategic context of projects. In Project Management: Strategic Design and Implementation. Third Edition. New York: McGraw-Hill, pp. 91-117,1999.
- Cooper, J.R., A multidimensional approach to the adoption of innovation. *Management Decision* 36(8): 493-502,1998.
- Cooper, R.G, S.J Edgett and E.J. Kleinschmidt, Portfolio management for new product development: results of an industry practices study. *R&D Management Journal* 31(4): 361-380,2001.
- Cooper, R.G. &Kleinschmidt, E.J., Benchmarking firms- new product performance and practices. *Engineering Management Review* 23(3): 112-120,1995.

- Cooper, R.G., S.J. Edgett and E.J. Kleinschmidt., Portfolio management in new product development: lessons from the leaders – Parts I & II. *Research Technology Management*, 40(5): 16-28 and 40(6) 43-52,1997.
- Cooper, R.G., S.J. Edgett and E.J. Kleinschmidt., New product portfolio management: practices and performance. *Journal of Product Innovation Management*16(4):333-351.1999.
- Cooper, R.G., S.J. Edgett and E.J. Kleinschmidt, New problems, new solutions: making portfolio management more effective. *Research Technology Management*,2000
- D’Costa, A.P., Flexible practices for mass production goals: economic governance in the Indian automobile industry. *Industrial and Corporate Change*, Vol. 13 No. 2, pp. 335-367,2004.
- Dietrich, Perttu & Lehtonen, Päivi. Successful Management of Strategic Intentions through Multiple Projects— Reflections from an Empirical Study. *International Journal of Project Management*. 23. 386-391,2005.
- Dye, L D, and Pennypacker, J S (Eds.), PPM: Selecting and prioritizing projects for competitive advantage, Havertown, PA, *Centre for Business Practices*,1999.
- Elbok et.al (2017). Towards an effective project portfolio selection process. *International Conference on Industrial Engineering and Operations Management*, Rabat, Morocco,2017.
- Engwall, Mats & Jerbrant, Anna, The Resource Allocation Syndrome: The Prime Challenge of Multi-Project Management. *International Journal of Project Management*. 21. 403-409. 10.1016/S0263-7863(02)00113-8,2003.
- Francesco Constantino et al., Project selection in project portfolio management: An artificial neural network model based on critical success factors. *International Journal of Project Management*,2015.
- Gardiner, P. and Gallo, M., Triggers for a flexible approach to project management within UK financial services. *International Journal of Project Management* 25(5): 446–456.2007.
- Haritha Saranga , The Indian auto component industry - Estimation of operational efficiency and its determinants using DEA. *European Journal of Operational Research*,2009.
- Hendriks et. Al ,Human resource allocation in a multi-project R& D Environment, resource capacity allocation, and project portfolio planning in practice. *International Journal of Project Management*,1999.
- Henriksen, Anne & Jensen Traynor, Ann., A practical R&D project-selection scoring tool. *Engineering Management*. IEEE Transactions on. 46. 158 - 170. 10.1109/17.759144,1999.
- Jain, R., Rathore, A.P.S. and Yadav, O.P., The propagation of benchmarking concepts in the Indian manufacturing industry. *Benchmarking: An International Journal*, Vol. 15 No. 1, pp. 101-117,2008.
- Jonas, D., Empowering project portfolio managers: How management involvement impacts PPM performance. *International Journal of Project Management*, 28(8), 818–831,2010.
- Kline, R. B. ,Principles and Practice of Structural Equation Modeling (2nd ed.). New York: Guilford,2005.
- Levine, H.A., PPM: A Practical Guide to Selecting Projects, Managing Portfolios, and Maximizing Benefits. *Pfeiffer Wiley, U.K. Management*, 31(6), 830–846,2005.
- Martinsuo, M and Lehtonen, P, Role of single-project management in achieving portfolio management efficiency. *International Journal of Project Management*, 25 (1), 56-65,2007.
- Martinsuo, M, PPM in practice and in context. *International Journal of Project Management*, 31,2013.
- Meskendahl, Sascha, The Influence of Business Strategy on PPM and its Success – A Conceptual Framework. *International Journal of Project Management*. 28. 807-817,2010.
- Moustafaev, J., Delivering Exceptional Project Results: A Practical Guide to Project Selection, Scoping, Estimation, and Management. Fort Lauderdale: J. Ross Publishing, pp.209-224,2010.
- Muller, R, and Blomquist, T, Governance of program and portfolio management: Middle managers’ practices in successful organizations. *PMI Research Conference*, Montreal, July 16-19,2006.
- Olsson, Rolf , In Search of Opportunity Management: Is the Risk Management Process Enough. *International Journal of Project Management - International Journal of Project Management*. 25. 745-752,2007.
- Patanakul, P., Key attributes of effectiveness in managing project portfolio”, *International Journal of Project Management*, Vol.33, No.5, pp.1084–97,2015.
- Paulo Augusto Cauchick Miguel and Andre Segismundo, An analysis of portfolio management in new product development: a case study in a truck company,2006.
- Petro, Yacoub & Gardiner, Paul., An investigation of the influence of organizational design on project portfolio success, effectiveness and business efficiency for project-based organizations. *International Journal of Project Management*. 33,2015.
- Project Management Institute, Inc, The standard for Portfolio Management, ISBN 13: 978-1-930699-90-8, ISBN 10: 1-930699-90-5,2006,2006.
- PMI, A Guide to the Project Management Body Knowledge (PMBOK Guide). (4th Edition). Project Management Institute, PA,2008.

- Rajegopal, PPM: Leading the Corporate Vision. Macmillan Publishing,2007.
- Rasiha Delilbasic, PPM: A Case Study at Transportation Industry, KTH, Sweden,2012.
- Reyck et al., The impact of PPM on Information technology Projects. *International Journal of Project Management*,2005.
- Rozita Petrinska-Labudovikj, PPM in theory and practice by *MEST Journal*,2014.
- Ringuest, Jeffrey & B. Graves, Samuel & H. Case, Randolph. (1999). Formulating R&D Portfolios that Account for Risk. *Research-Technology Management*. 42. 40-43,1999.
- Sanchez, H., Robert, B., Bourgault, M., Pellerin, R., Risk management applied to projects, programs, and portfolios, *International Journal of Managing Projects in Business*. 2 (1), 14–35,2009.
- Santos.B.L., Selecting Information system projects: Problems, solutions, and challenges. *IEEE, System Sciences Conference*, Hawaii,1989.
- Scavarda, L.F., Schaffer, J., Scavarda, A.J., Reia, A.C. and Schleich, H., Product variety: an auto industry analysis and a benchmarking study. *Benchmarking: An International Journal*, Vol. 16 No. 3, pp. 387-400,2009.
- Shenhar, A.J., Dvir, D., Levy, O., Maltz, A.C., Project success: a multidimensional strategic concept. *Long Range Planning* 34 (6), 699–725,2001.
- Singh, R.K., Garg, S.K. and Deshmukh, G.S., Strategy development for competitiveness: a study on Indian auto component sector. *International Journal of Productivity and Performance Management*, Vol. 56 No. 4, pp. 285-304,2007.
- Teller, J., Unger, B., Kock, A., Gemünden, H.G., Formalization of project portfolio management: the moderating role of project portfolio complexity. *International Journal of Project Management* 30 (5), 596–607,2012.
- Unger, et al.,The three roles of a PPM office: Their impact on portfolio management execution and success. *International Journal of Project Management* ,2012.
- Velury Vijay Bhasker., Indian Auto Component Industry: A Decade of Growth and Way Forward. *Research Journal of Management Sciences* Vol. **2(3)**, 19-27, 2013.
- Zika-Viktorsson, Annika & Sundström, Per & Engwall, Mats., Project overload: An exploratory study of work and management in multi-project settings. *International Journal of Project Management*. 24. 385-394,2006.

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