INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, IT & MANAGEMENT

IJRCM

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal - Included in the International Serial Directories

Indexed & Listed at:

Ulrich's Periodicals Directory ©, ProQuest, U.S.A., EBSCO Publishing, U.S.A., Index Copernicus Publishers Panel, Poland,

Open J-Gage, India [link of the same is duly available at Inflibnet of University Grants Commission (U.G.C.)]

as well as in Cabell's Directories of Publishing Opportunities, U.S.A.

Circulated all over the world & Google has verified that scholars of more than Hundred & Twenty One countries/territories are visiting our journal on regular basis.

Ground Floor, Building No. 1041-C-1, Devi Bhawan Bazar, JAGADHRI – 135 003, Yamunanagar, Haryana, INDIA

www.ijrcm.org.in

CONTENTS

CALL FOR MANUSCRIPTS

We invite unpublished novel, original, empirical and high quality research work pertaining to recent developments & practices in the area of Computer, Business, Finance, Marketing, Human Resource Management, General Management, Banking, Insurance, Corporate Governance and emerging paradigms in allied subjects like Accounting Education; Accounting Information Systems; Accounting Theory & Practice; Auditing; Behavioral Accounting; Behavioral Economics; Corporate Finance; Cost Accounting; Econometrics; Economic Development; Economic History; Financial Institutions & Markets; Financial Services; Fiscal Policy; Government & Non Profit Accounting; Industrial Organization; International Economics & Trade; International Finance; Macro Economics; Micro Economics; Monetary Policy; Portfolio & Security Analysis; Public Policy Economics; Real Estate; Regional Economics; Tax Accounting; Advertising & Promotion Management; Business Education; Management Information Systems (MIS); Business Law, Public Responsibility & Ethics; Communication; Direct Marketing; E-Commerce; Global Business; Health Care Administration; Labor Relations & Human Resource Management; Marketing Research; Marketing Theory & Applications; Non-Profit Organizations; Office Administration/Management; Operations Research/Statistics; Organizational Behavior & Theory; Organizational Development; Production/Operations; Public Administration; Purchasing/Materials Management; Retailing; Sales/Selling; Services; Small Business Entrepreneurship; Strategic Management Policy; Technology/Innovation; Tourism, Hospitality & Leisure; Transportation/Physical Distribution; Algorithms; Artificial Intelligence; Compilers & Translation; Computer Aided Design (CAD); Computer Aided Manufacturing; Computer Graphics; Computer Organization & Architecture; Database Structures & Systems; Digital Logic; Discrete Structures; Internet; Management Information Systems; Modeling & Simulation; Multimedia; Neural Systems/Neural Networks; Numerical Analysis/Scientific Computing; Object Oriented Programming; Operating Systems; Programming Languages; Robotics; Symbolic & Formal Logic and Web Design. The above mentioned tracks are only indicative, and not exhaustive.

Anybody can submit the soft copy of his/her manuscript **anytime** in M.S. Word format after preparing the same as per our submission guidelines duly available on our website under the heading guidelines for submission, at the email addresses: infoijrcm@gmail.com or info@ijrcm.org.in.

GUIDELINES FOR SUBMISSION OF MANUSCRIPT

1. **COVERING LETTER FOR SUBMISSION:**

DATED: _____

THE EDITOR
IJRCM

Subject: **SUBMISSION OF MANUSCRIPT IN THE AREA OF _____.**

(e.g. Finance/Marketing/HRM/General Management/Economics/Psychology/Law/Computer/IT/Engineering/Mathematics/other, please specify)

DEAR SIR/MADAM

Please find my submission of manuscript entitled '_____' for possible publication in your journals.

I hereby affirm that the contents of this manuscript are original. Furthermore, it has neither been published elsewhere in any language fully or partly, nor is it under review for publication elsewhere.

I affirm that all the author (s) have seen and agreed to the submitted version of the manuscript and their inclusion of name (s) as co-author (s).

Also, if my/our manuscript is accepted, I/We agree to comply with the formalities as given on the website of the journal & you are free to publish our contribution in any of your journals.

NAME OF CORRESPONDING AUTHOR:
Designation:
Affiliation with full address, contact numbers & Pin Code:
Residential address with Pin Code:
Mobile Number (s):
Landline Number (s):
E-mail Address:
Alternate E-mail Address:

NOTES:

a) The whole manuscript is required to be in ***ONE MS WORD FILE*** only (pdf. version is liable to be rejected without any consideration), which will start from the covering letter, inside the manuscript.
b) The sender is required to mention the following in the **SUBJECT COLUMN** of the mail:
New Manuscript for Review in the area of (Finance/Marketing/HRM/General Management/Economics/Psychology/Law/Computer/IT/ Engineering/Mathematics/other, please specify)
c) There is no need to give any text in the body of mail, except the cases where the author wishes to give any specific message w.r.t. to the manuscript.
d) The total size of the file containing the manuscript is required to be below **500 KB**.
e) Abstract alone will not be considered for review, and the author is required to submit the complete manuscript in the first instance.
f) The journal gives acknowledgement w.r.t. the receipt of every email and in case of non-receipt of acknowledgment from the journal, w.r.t. the submission of manuscript, within two days of submission, the corresponding author is required to demand for the same by sending separate mail to the journal.

2. **MANUSCRIPT TITLE:** The title of the paper should be in a 12 point Calibri Font. It should be bold typed, centered and fully capitalised.

3. **AUTHOR NAME (S) & AFFILIATIONS:** The author (s) **full name**, **designation**, **affiliation** (s), **address**, **mobile/landline numbers**, and **email/alternate email address** should be in italic & 11-point Calibri Font. It must be centered underneath the title.

4. **ABSTRACT:** Abstract should be in fully italicized text, not exceeding 250 words. The abstract must be informative and explain the background, aims, methods, results & conclusion in a single para. Abbreviations must be mentioned in full.

5. **KEYWORDS:** Abstract must be followed by a list of keywords, subject to the maximum of five. These should be arranged in alphabetic order separated by commas and full stops at the end.

6. **MANUSCRIPT:** Manuscript must be in ***BRITISH ENGLISH*** prepared on a standard A4 size ***PORTRAIT SETTING PAPER***. It must be prepared on a single space and single column with 1" margin set for top, bottom, left and right. It should be typed in 8 point Calibri Font with page numbers at the bottom and centre of every page. It should be free from grammatical, spelling and punctuation errors and must be thoroughly edited.

7. **HEADINGS:** All the headings should be in a 10 point Calibri Font. These must be bold-faced, aligned left and fully capitalised. Leave a blank line before each heading.

8. **SUB-HEADINGS:** All the sub-headings should be in a 8 point Calibri Font. These must be bold-faced, aligned left and fully capitalised.

9. **MAIN TEXT:** The main text should follow the following sequence:

INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

ACKNOWLEDGMENTS

REFERENCES

APPENDIX/ANNEXURE

It should be in a 8 point Calibri Font, single spaced and justified. The manuscript should preferably not exceed ***5000 WORDS***.

10. **FIGURES &TABLES:** These should be simple, centered, separately numbered & self explained, and **titles must be above the table/figure**. **Sources of data should be mentioned below the table/figure**. It should be ensured that the tables/figures are referred to from the main text.

11. **EQUATIONS:** These should be consecutively numbered in parentheses, horizontally centered with equation number placed at the right.

12. **REFERENCES:** The list of all references should be alphabetically arranged. The author (s) should mention only the actually utilised references in the preparation of manuscript and they are supposed to follow **Harvard Style of Referencing**. The author (s) are supposed to follow the references as per the following:

- All works cited in the text (including sources for tables and figures) should be listed alphabetically.
- Use (**ed.**) for one editor, and (**ed.s)** for multiple editors.
- When listing two or more works by one author, use --- (20xx), such as after Kohl (1997), use --- (2001), etc, in chronologically ascending order.
- Indicate (opening and closing) page numbers for articles in journals and for chapters in books.
- The title of books and journals should be in italics. Double quotation marks are used for titles of journal articles, book chapters, dissertations, reports, working papers, unpublished material, etc.
- For titles in a language other than English, provide an English translation in parentheses.
- The location of endnotes within the text should be indicated by superscript numbers.

PLEASE USE THE FOLLOWING FOR STYLE AND PUNCTUATION IN REFERENCES:

BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

ONLINE RESOURCES

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

WEBSITE

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

PRODUCT DEVELOPMENT STRATEGIES FOR ROCKET MOTOR DEVELOPMENT - A STUDY ON COST AND TIME COMPRESSION STRATEGIES

A. LAXMI
ASST. PROFESSOR
DEPARTMENT OF MANAGEMENT
SHANTHA INSTITUTE OF PG COLLEGE
HUZURABAD

SURESH CHANDRA.CH
RESEARCH SCHOLAR
DEPARTMENT OF COMMERCE & MANAGEMENT
KAKATIYA UNIVERSITY
WARANGAL

ABSTRACT

The product development has significance influence on the value of the finished product. Inadequate project planning and evaluation prior to product development compels the project to work with many bottlenecks, which have adverse impact on customer satisfaction when the product is delivered to the users. The product development strategies which involve the different levels of flexibility in project planning, for achieving, saving in project cost and time frame. The present paper focuses on the emerging trends in DRDO India and its cost and time compression strategies in the development of rocket Motor Development. The study further investigates on the opinions of the product development teams working with different levels of flexibility in pre-project planning, for achieving savings in project cost and time frame.

KEYWORDS

Cost and Time Compression, Defence Research & Development Organisation (DRDO), Pre-project, Rocket Motor.

INTRODUCTION

The present global environment has created huge challenges to industrial manufacturers such as fluctuating market conditions, aggressive competition, pricing pressures and rising costs for the raw materials. The highly differentiated products to market cost – effectively and with in compressed time frames are some of the other challenges for the manufacturers. The product development has achieved significance importance in the bringing the quality by standardizing and reusing proven components and assemblies. The present study will evaluate the cost and time compression strategies for rocket development at DRDO, Jagdalpur.

CONCEPTUAL OVERVIEW OF COST AND TIME

The cost and time has close relation. The project's time of completion and its cost has a relationship. For some types of costs, the relationship is in direct proportion; for other types, there is a direct trade-off. Because of these two types of costs, there is an optimal project pace for minimal cost. By understanding the time-cost relationship, one is better able to predict the impact of schedule change on project cost.

COMPRESSION

Compressing or crashing the project schedule refers to the acceleration of the project activities in order to complete the project sooner. The time required to complete a project is determined by the critical path, so to compress a project schedule to focus on critical path activities.

A procedure for determining the optimal project time is to determine the normal completion time for each critical path activity and a crash time. The crash time is the shortest time in which an activity can be completed. The direct costs then are calculated for the normal and crash times of each activity.

PRODUCT DEVELOPMENT STRATEGIES

Product development strategies help in the process of designing, creating and marketing an idea or product. The product can either be one that is new to the market place or one that is new to the particular company, or, an existing product that has been improved. All product development goes through a similar planning process.

BRIEF REVIEW ON ROCKET MOTOR PRODUCT

Rocket is a mechanism or a device or an engine by means of which required payload is delivered to the destination. The forward force to the rocket is imparted by the reaction to momentum of ejected matter called "Propellant" which is castled inside the rocket chamber. Hence, the propellant can be defined as the energy generating material contained inside the rocket motor, which undergoes combustion at a desired rate, producing low molecular weight gas molecular. These molecules are ejected out of the nozzle at high velocity and the reaction enforce imparts forward motion to the rocket motor.

Rocket Motor is work horse for any Missile. Rocket is a device or an engine by means of which required payload is delivered to the destination. Rocket Motor is the energy generating system. Product development process is generally based on product idea and concept evolved before project decision. Missile and rocket Motor development started in India as early as 1963. After 20 years of technology growth, in 1983 the Missile development required for armed forces was taken up. This includes the critical technology development, product development, manufacturing process development identification of production agencies, establishment of critical production facilities, technology transfer and finally production.

NEED FOR THE STUDY

The need for this research study is that the product developed by the study shall meet the quantity and mass production requirements with reference to the time schedules and automation systems that are state-of-art in nature. Compression or crashing the project schedule helps for the acceleration of the project activities in order to complete the project sooner. The procedure for determining the optimal project time is to determine the normal completion. This study supports all the strategies in the development of the product and problems in setting up, cost and time related concerns. The study further helps the different managerial grade persons to understand the importance of time and cost compression strategies.

REVIEW OF LITERATURE

The select review on the literature survey is given below.

Namita singh and Alok Saklani (2001), in their study "Flexible project planning as a key success strategy for product Development for Dynamic Market Environment" presented that the product development process is generally based on product idea and concept evolved before project decision. The study revealed that well-defined product concept, and proper planning will give fruitful results in production process.

Bruce Pollack-Johnson and Matthew. J. Liberatore (2001), in their study "Incorporating quality considerations into Project time/Cost tradeoff analysis and decision making" explained about the existing models and methods of project scheduling implicitly assumes uniform quality when evaluating time/cost tradeoffs, but do not model quality explicitly.

B.J. Zirger and Janet L. Hartley (2001), have studied "The effect of Acceleration Techniques on Product Development time". In this study they explained about bringing new products to the market place faster has become a strategic imperative in many markets, especially high technology industries. Much attention has focused on techniques purported to bring products to the market, more quickly, but little empirical research has been conducted to validate these techniques.

Tzvi Raz, Aaron j. Shenhar and Dov Dvir (2007), have studied "risk management, project success, and technological uncertainty". In their study they stated that in time of increased competition and globalization, project success becomes even more critical to business performance, and yet many projects still delays, overruns, and even failure. In their paper, they presented the results of a n empirical study devoted to this project success.

OBJECTIVES OF THE STUDY

The present study will focus on the following objectives.

1. To study the profile of DRDO rocket Motor India with special reference to DRDO Jagdalpur.
2. To analyze the Time-cost compression approaches used for the DRDO, Jagdalpur unit.
3. To analyze the perceptions of employees of DRDO on the product development/cost & time compression
4. To conclude and suggest based on the analysis of the study.

PROFILE OF DRDO, JAGDALPUR

Defence Research & Development Organisation (DRDO) established in 1958. The estimated budget is of US $1.18 billion in 2006. It has got a network of 5t2 laboratories, arranged under 10 technical directorates. Around 500 scientists and about 250000 other scientific, technical and support personnel are working for DRDO. At present DRDO is headed by Dr.V.K. Saraswat, SA to RM, Secretary, Department of Defence R & D and supported by 7 chief controllers. DRDO is working for the project which includes:

- LCA – Light combat Aircraft
- UAV – Unmanned Aerial vehicle
- EW - Electronic Warfare Gadgets
- Radars
- Tanks and Armored Vehicles
- Small arms, artillery systems and ammunitions
- Torpedoes
- Sonars
- Missiles IGMDP
- Brahmos – Privatization

DRDO Research & Development Organization is engaged in developing indigenous knowledge and technology to look after the needs of defense forces of India. It is well known that almost all the areas of technology development are interdisciplinary in nature for which specialists belong to different specialties like engineering, Physics, chemistry, Biology and their sub-specialties need to interact in a constructive and cohesive manner. DRDO, Jagdalpur has achieved a remarkable success in developing Rocket Motors in India. The Central Government of India is conducting various developmental programmes to cater to the needs of Defence and research studies, that are playing a vital role in recognition of the nation in the world scenario with its all round performance. In the present scenario, the name of any nation will be highlighted with its domestic technology in research and Defence activities. Both of these fields are directly linked with the rocket motors. There is also one more institutions in India that is involved in product ion of rocket motors for space applications. Hence, the present paper focuses on the examination of cost and time compression strategies in Product Development at DRDO, Jagdalpur.

DRDO Jagdalpur unit develops the Rocket Motors of Various capacities at SF Complex, Jagdalpur. At Jagdalpur, the following facilities are used to carryout the processing and statistic testing of solid rocket motors. They are:

1. Pre process facilities
2. Process facilities (mixing, casting and premix storage, quality control laboratory)
3. Post process facilities
4. Transit storage facility
5. BEM motor processing facility
6. CAD Center
7. Static Test Facility

TIME –COST COMPRESSION APPROACHES USED IN DRDO, JAGDALPUR

Compression or crashing the project schedule refers to the acceleration of the project activities in order to complete the project sooner. The procedure for determining the optimal project time is to determine the normal completion

There are 7 alternative approaches used for time-cost compression for DRDO, Jagdalpur unit. They are:

APPROACH – I

In this approach, generally work 'expands' to fill-up al the time avail for it. Available work always covers the working time leading to no scope for other works. Open-ended time approach consumes little more time than what is absolutely necessary. If targets are not clear then work is delayed an activities are taken lightly. Time compression is a work culture or a mind-set for targeting each and every activity for minimizing the time taken to complete the activity, as per the required quality standard without cutting corners.

Here the proper planning plays important role to ensure the apt completion of activity and related activities so that delays are minimized.

APPROACH 2

It covers advance pre-project planning, work execution, project review, monitoring & coordination, leadership & motivation, and also re-engineering of work systems/procedures/policies. Check list for each of above activities helps to review the status and take the corrective action in advance. It is similar to zero-based budgeting approach, and aims at examining every activity/requirement and attempting to minimize the time involved. Working on each activity and completing in time helps in controlling the project as planned. It is a 'holistic management' approach, employing many best practices. Here the proved practices and systems that have given returns in terms of project execution prove to be time compression strategy.

APPROACH 3

Like six sigma approach for zero-defect policy, it is also based on zero-tolerance regarding 'time wastages' or consuming more time. Each activity planned shall be completed within the specified period so that as a whole for bunch of activities the time wasted is within tolerance. Like 'six-sigma, I is also based on organization wise re-engineering of mind-se, work culture, and redesign of work processes & procedures.

APPROACH 4

In-depth understanding of customers' requirements & preferences are done in this approach. Extensive competitors' analysis, technology 0trend analysis, managing environmental dynamics, core-technology groups, outsourcing are the key considerations in this approach.

APPROACH 5

Encouraging risk-taking & innovation, empowerment & decentralization, use of cross-functional product teams, tough project0review, forward look monitoring & coordination, incentives for early completion, design for quality, design for manufacture , real-time transfer of technology and proper documentation at all stages are the key strategies in this approach.

APPROACH 6

Flexibility in design & technology, flexibility in product development processes, watch environmental dynamics, design & establish proper knowledge networks among various teams are the key considerations in this approach.

APPROACH 7

Using technology enabled tools, techniques and systems, product design with a mark-up on the users requirements, high degree of interaction with users through-out the project work, adopting quality systems, using effective inter-team & internal team communication, optimizing the work0stress and creating happy teams, effective diversity management and enforcing accountability for timeliness are the key strategies applied in this approach.

APPROACH 8

This particular approach is used for optimum process sequencing for smooth transition from product development to production of rocket motor. Production planning and preparations were conducted throughout development phase to identify production requirements and to resolve difficulties before production begins to achieve quality product. Unique Technology Transfer mechanism is also another key strategy of this approach.

ANALYSIS OF THE STUDY

The detailed analysis on the opinion of the sample respondents are given below.

A). **SAMPLE OF THE STUDY**

The research study has been conducted on the select sample respondents working in DRDO, Jagdalpur. The size of 200 is selected from the various levels in DRDO, Jagdalpur. The details are as follows.

TABLE NO. 1

Department	Administrative	Personal	Finance	Technical	Production	Total
Top Management	8 (20.0)	2(5.0)	10(25.0)	12(30.0)	8(20.0)	40(100.0)
Middle Management	12(20)	4(6.7)	10(16.7)	26(43.3)	8(26.6)	60(100.0)
Lower Management	24(24.0)	-	22(22.0)	34(34.0)	20(20.0)	100 (100.0)
Total	**44(22.0)**	**6(3.0)**	**42(21.0)**	**72(36.0)**	**72(18.0)**	**200(100.0)**

Source: Field Survey

From the sample study, it is to observe that majority of the respondents are from the Technical and Production Departments. And the Lower Management respondents are more compared to the other levels selected fro the research study.

B). ANALYSIS ON THE OPINION OF SAMPLE RESPONDENTS

I). OPINION ON "VISIBILITY ON THE TOTAL DESIGNED COST DETERMINES THE PRODUCT COST AND TIME CONSTRAINTS"

TABLE NO. 2

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	8(20.0)	10(16.7)	Q4(14.0)	32(16.0)
2	Rarely True	8(20.0)	16(26.7)	28*28.0)	52(26.0)
3	Sometimes true	10(25.0)	10(16.7)	18(18.0)	38(19.0)
4	Mostly True	4(10.0)	16(26.7)	16(16.0)	36(18.0)
5	Almost always True	10(25.0)	8(13.3)	24(24.0)	42(21.0)
	Total	40(100.0)	60(100.0)	100(100.0)	200(100.0)

Source: Field Survey

The table analyzes the response of the sample employees working in top, medium and low management levels regarding the visibility on the total designed cost determine the product cost and time constraints. Among the employees, majority group opined the statement is almost always true (25.0%), mostly true (10.0%) and some times true (25.0%). From the total employees in the middle management, 26.7% felt the statement is mostly true, 13.3% said almost always true and 16.7 % opined sometimes true. Out of the lower management sample employees 24% opined almost always true, 16% said mostly true and 18% said some times true about the statement.

II). OPINION ON "VISIBILITY ON THE TOTAL DESIGNED COST DETERMINE THE PRODUCT COST AND TIME CONSTRAINTS"

TABLE NO. 3

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	4 (20.0)	10(16.7)	14(14.0)	32(16.0)
2	Rarely True	8(20.0)	16(26.7)	28(28.0)	52(26.0)
3	Sometimes true	10 (25.0)	10(16.7)	18(18.0)	38(19.0)
4	Mostly True	4(10.0)	16(26.7)	16(16.0)	36(18.0)
5	Almost always True	10(25.0)	8(13.3)	24(24.0)	42(21.0)
	Total	40(100.0)	60(100.0)	100(100.0)	200(100.0)

Source: Field Survey

The table analyses the response of the sample employees working in top, medium and low management levels regarding the visibility on the total designed cost determine the product cost and time constraints. Along the total employees working in top management, majority group opined the statement is almost always true (25.0%), mostly true (10.0%) and some times true (25.0%). From the total employees in the middle management, 26.7% felt the statement is mostly true, 13.3% said almost always true and 16.7% opined sometimes true. Out of the lower management sample employees, 24% opined almost always true, 16% said mostly true and 18% said some times true about the statement.

III). OPINION ON "DESIGN ENGINEERS CAN EVALUATE THE IMPACT OF DESIGN CHANGES ON DIRECT MATERIALS COSTS, ENGINEERING DESIGN COSTS AND MANUFACTURING COSTS

TABLE NO. 4

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	-	-	2(2.0)	2(1.0)
2	Rarely True	8(20.0)	6(10.0)	12(12.0)	26(13.0)
3	Sometimes true	2(5.0)	6(10.0)	10(10.0)	18*9.0)
4	Mostly True	-	22(36.7)	34(34.0)	56(28.0)
5	Almost always True	30(75.0)	26(43.3)	42(42.0)	98(49.0)
	Total	**40(100.0)**	**60(100.0)**	**100(100.0)**	**200(100.0)**

Source: Field Survey

The responses of the sample employees working in top, medium and low management levels on the statement that design engineers can evaluate the impact of design changes on direct materials costs, engineering design costs and manufacturing costs. Regarding the total employees working in top management, majority group (75.0%) opined that direct materials costs, engineering design costs and manufacturing costs mostly evaluated by design engineers is true. From the total employees in the middle management, 43.35 said the above statement is almost always true, 36.7% said mostly true and 10% observed sometimes true. In the lower management sample employees, 42% said almost always true, 34% said mostly true and 10% said some times true regarding the statement.

IV). OPINION ON "COST REDUCTION IDEAS THAT WOULD BOOST PROFITS, CT LOSSES AND IMPROVE PRODUCTIVITY FOR MANUFACTURING UNITS"

TABLE NO. 5

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	8(20.0)	10(16.7)	20(20.0)	38(19.0)
2	Rarely True	6(15.0)	20(33.3)	20(20.0)	46(23.0)
3	Sometimes true	2(5.0)	10(16.7)	18(18.0)	30(15.0)
4	Mostly True	12(30.0)	16(26.7)	24(24.0)	52(26.0)
5	Almost always True	12(30.0)	4(6.7)	18(18.0)	34(17.0)
	Total	**40(100.0)**	**60(100.0)**	**100(100.0)**	**200(100.0)**

Source: Field Survey

The table explains the opinion of the sample employees working in top, medium and low management levels on the cost reduction ideas would boost profits, cut losses and improve productivity for manufacturing units. From the total employees working in top management, 30.0% each group said the statement is mostly true and almost always true. Out of the total employees in the middle management, 6.7% said almost always true, 26.7 % said mostly true and 16.7% said some times true regarding the above statement. Among the lower management sample employees, 24% opined the statement is mostly true, 18% said almost always true and 18% said some times true.

V). OPINION ON "PRODUCT DEVELOPMENT TEAMS WORKING WITH DIFFERENT LEVELS OF FLEXIBILITY IN PRE-PROJECT PLANNING TO ACHIEVE SAVINGS IN PROJECT COST AND TIME FRAME"

TABLE NO. 6

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	4(10.0)	4(6.7)	10(10.0)	18(9.0)
2	Rarely True	2(5.0)	4(6.7)	14(14.0)	20(10.0)
3	Sometimes true	2(5.0)	8(13.3)	8(8.0)	18(9.0)
4	Mostly True	26(65.0)	38(63.3)	56(56.0)	120(60.0)
5	Almost always True	6(15.0)	6(10.0)	12(12.0)	24(12.0
	Total	**40(100.0)**	**60(100.0)**	**100(100.0)**	**200(100.0)**

Source: Field Survey

The response on the statement 'Product development teams working with different levels of flexibility in pre-project planning to achieve savings in project cost and timeframe' by the sample respondents working in the above three levels of management is presented in the above table. Among the total employees working in top management majority group (65.0%) openly said the statement is mostly true followed by almost always true(15.0%). Regarding the employees in the middle management also more than sixty percent (63.3%) opined the statement is mostly true, 10.0% said almost always true and 13.3% said sometimes true. Moreover, in the lower management sample employees, 56% said mostly true, 12% said almost always true and 8% said sometimes true regarding the statement.

VI). OPINION ON "TO GAIN COMPETITIVE ADVANTAGE, IT IS REQUIRED TO DELIVER HIGHLY QUALITY PRODUCT AT LOWER COST AND WITHIN COMMITTED TIME FRAME"

TABLE NO. 7

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	2(5.0)	6(10.0)	10(10.0)	18(9.0)
2	Rarely True	14(35.0)	4(6.7)	22(22.0)	40(20.0)
3	Sometimes true	4(10.0)	12(20.0)	14(14.0)	30(15.0)
4	Mostly True	14(35.0)	30(50.0)	42(42.0)	86(43.0)
5	Almost always True	6(15.0)	8(13.3)	12(12.0)	26(13.0)
	Total	**40(100.0)**	**60(100.0)**	**100(100.0)**	**200(100.0)**

Source: Field Survey

The table analyses the opinion of the total employees working top, middle and lower management regarding the statement 'to gain competitive advantage, it is required to deliver high quality product at lower cost and within committed time frame'. From the total employees working in top management, a major group (35.0%) expressed the statement is mostly true followed by almost always true (15.0%) and some times true (10.0%). Among the total employees in the middle management, fifty percent opined the statement is mostly true, 13.0% said almost always true and 20% said some times true. Out of the lower management sample employees, 42% felt the statement is mostly true, 14% said sometimes true and 12% said almost always true.

VII). OPINION ON "TIME PLAYS A SIGNIFICANT ROLE IN PRODUCTION MANAGEMENT"

TABLE NO. 8

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	2(5.0)	6(10.0)	2(2.0)	10(5.0)
2	Rarely True	2(5.0)	2(3.3)	12(12.0)	16(8.0)
3	Sometimes true	8(20.0)	4(6.7)	12(12.0)	24(2.0)
4	Mostly True	20(50.0)	32(53.3)	60(60.0)	112(56.0)
5	Almost always True	8(20.0)	16(26.7)	14(14.0)	38(19.0)
	Total	**40(100.0)**	**60(100.0)**	**100(100.0)**	**200(100.0)**

Source: Field Survey

The response of the sample employees working in top , medium and low management levels on the significant role played by the time in production management. Out of the total employees' work-in in top management, fifty percent opined that time plays a significant role in production management is mostly true and from the remaining 20% each said almost always true and some times true. In the middle management level, 53.3% of the employees responded time plays a significant role in production management is mostly true and from the remaining 26.7% agreed it is almost always true. From lower management sample employees, sixty percent felt the statement is mostly true, 14% said almost always true and 12% said some times true.

VIII). OPINION ON "COST AND TIME INTERLINKED WITH EACH OTHER. IF ONE INCREASES, OTHER DECREASE IN PLANNED MANAGEMENT"

TABLE NO.9

S.No.	Variables	Top management	Middle Management	Lower Management	Total
1	Not at all True	6(15.0)	10(16.7)	10(10.0)	26(13.0)
2	Rarely True	6(15.0)	10(16.7)	18(18.0)	34(17.0)
3	Sometimes true	10(25.0)	10(16.7)	24(24.0)	44(22.0)
4	Mostly True	2(5.0)	10(16.7)	26(26.0)	38(19.0)
5	Almost always True	8(40.0)	10(33.2)	22(22.0)	29(29.0)
	Total	**40(100.0)**	**60(100.0)**	**100(100.0)**	**200(100.0)**

Source: Field Survey

The table explains about the opinion on the linkage between cost and time in planned management by the employees working in top, middle and lower management. Out of the total employees in the top management level, majority group (40%) responded almost always true that there is a relation between cost and time in planned management, and from the remaining 255 said some times true and 5% said mostly true. Regarding the total employees in the middle management, 33.2% felt the statement is almost always true and 16.7% each said sometimes true and mostly true. Regarding the lower management sample employees, 26% said mostly true, 24% said some times true and 22% expressed that the statement is almost always true.

CONCLUSIONS

Product development strategy provides the framework to orient a company's development projects as well as its development process. To develop a good product development strategy, the company must determine its primary strategic orientation. From the sample survey and analysis on various questions pertaining to time and cost compression strategies, the following conclusions are made.

1. The analysis on "visibility on the total designed cost determine the product cost and time constraints" revealed that the top, middle and low management levels, majority of the employees positively responded towards the visibility on the total designed cost determine the product cost and time constraints, where middle management employees comparatively less than others.
2. The analysis on "visibility on the total designed cost determine the product cost and time constraints" revealed that in top , middle and low management levels, majority of the employees positively responded towards the visibility on the total designed cost determine the product cost and time constraints, where middle management employees comparatively less than others.
3. The analysis on "Design engineers can evaluate the impact of design changes on direct materials costs, engineering design costs and manufacturing costs" revealed that most of the employees in all the three management levels agreed that design engineers can evaluate the impact of design changes on direct materials costs, engineering design costs and manufacturing costs.
4. The analysis on "Cost reduction ideas that would boost profits, ct losses and improve productivity for manufacturing units" concluded that in the top management majority group of employees opined that the cost reduction ideas that would boost profits, cut losses and improve productivity for manufacturing units is mostly true and almost always true, where as in middle and lower management level employees not totally agreed with this.
5. The analysis on "Product development teams working with different levels of flexibility in pre-project planning to achieve savings in project cost and time frame" concluded that most of the employees under top, middle and lower management levels positively responded that the product development teams working with different levels of flexibility in pre-project planning to achieve savings in project cost and timeframe.
6. The analysis on "to gain competitive advantage, it is required to deliver highly quality product at lower cost and within committed time frame" concluded that a dominant group of employees in the top, middle and lower management levels more positive towards the statement "to gain competitive advantage, it is required to deliver high quality product at lower cost and within committed time frame'.
7. The analysis on "Time plays a significant role in production management" revealed that in almost all the management levels, majority of the employees felt time plays a significant role in production management is true.
8. The analysis on "Cost and time interlinked with each other. If one increases, other decrease in planned management" revealed that most of the employees in top, middle and lower management levels felt true regarding cost and time interlinked with each other. If one increase, other decrease in planned management.

REFERENCES

1. Rajendra Singh, "Introduction to basic manufacturing processes and workshop technology", First Edition, New Age International (P) Ltd., New Delhi.
2. A.N. Sarkar (2009), "Enhancing Global Competitiveness: Advantage India", I.K. International Publishing House Pvt.Ltd., New Delhi.
3. Lary Richman, "Improving your project management skills", 2nd Edition, special Issue from AMA, USA.
4. James P. Lewis, "Project planning scheduling & Control", Tata McGraw Hill Edition, New Delhi.

RESEARCH PAPERS

5. Namita Singh and Alok Saklani, (2001), "Flexible project planning as a key success strategy for product Development for Dynamic Environment" , report submitted to Ministry of Science & Technology, Government of India, New Delhi.
6. [1] Bruce Pollack-Johnson and Matthew. J. Liberatore (2001), "Incorporating quality considerations into project time/cost tradeoff analysis and decision making", Journal of Operations Management, Vol.19,pp.287-336.
7. [1] B.J. Zirger and Janet L. Hartley(2001), "The Effect of Acceleration Techniques on Product Development Time", working paper (04.07) submitted to Technische University, The Netherlands.

8. Tzvi Raz, Aaron J. Shenhar and Dov Dvir (2007), "Risk management, project success, and technological uncertainty", research paper published in Engineering Management, Vol.43, Issue 2 pp:143-152.

WEBSITES

9. www.google.com
10. www.drdo.nic.in
11. www.googlebooksearch.com
12. www.irfc.org

REQUEST FOR FEEDBACK

Dear Readers

At the very outset, International Journal of Research in Commerce, IT and Management (IJRCM) acknowledges & appreciates your efforts in showing interest in our present issue under your kind perusal.

I would like to request you to supply your critical comments and suggestions about the material published in this issue as well as on the journal as a whole, on our E-mails i.e. **infoijrcm@gmail.com** or **info@ijrcm.org.in** for further improvements in the interest of research.

If you have any queries please feel free to contact us on our E-mail **infoijrcm@gmail.com**.

I am sure that your feedback and deliberations would make future issues better – a result of our joint effort.

Looking forward an appropriate consideration.

With sincere regards

Thanking you profoundly

Academically yours

Sd/-

Co-ordinator

ABOUT THE JOURNAL

In this age of Commerce, Economics, Computer, I.T. & Management and cut throat competition, a group of intellectuals felt the need to have some platform, where young and budding managers and academicians could express their views and discuss the problems among their peers. This journal was conceived with this noble intention in view. This journal has been introduced to give an opportunity for expressing refined and innovative ideas in this field. It is our humble endeavour to provide a springboard to the upcoming specialists and give a chance to know about the latest in the sphere of research and knowledge. We have taken a small step and we hope that with the active co-operation of like-minded scholars, we shall be able to serve the society with our humble efforts.

Our Other Journals