Global Journal of Management and Business Research
Volume 11 Issue 7 Version 1.0 July 2011
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Print ISSN: 0975-5853

Assessment of Internal Factors Effects on Optimum Application of Production Cycle

By Morteza Ramazani, Hossien Rafiei Atani

Abstracts - Production cycle is considered as the heart of manufacturing firms and has special relationship with all internal sections (units) in which other units have duty to satisfy hardware and software needs of production cycle in order to optimum application. So this research tries to assess the effect of internal factors on optimum application of Production cycle. Research method is descriptive-survey and also application one in which researcher has used six hypotheses to satisfy research goals in this study T-test has been utilized to assess the effects of internal factors. Also in order to examine the uniformity of internal factors effect, Friedman test has been utilized in this research and in order to compare the uniformity of internal factors effect based on firm size Kruskal-Wallis test has been used in this study in which researcher has provided some recommendations to improve the relation between internal units and production cycle.

Keywords : *Internal Factors, Production Cycle, manufacturing firms, Zanjan Province.*

GJMBR-A Classification : *JEL Code: L23*

Strictly as per the compliance and regulations of:

Assessment of Internal Factors Effects on Optimum Application of Production Cycle

(Case Study of Manufacturing Firms in Zanjan Province)

Morteza Ramazani[α], Koshrouz Oji[Ω], Hossien Rafiei Atani[β]

Abstract - Production cycle is considered as the heart of manufacturing firms and has special relationship with all internal departments in which other departments have duty to satisfy hardware and software needs of production cycle in order to optimum application. So this research tries to assess the effect of internal factors on optimum application of Production cycle. Research method is descriptive-survey and also application one in which researcher has used six hypotheses to satisfy research goals in this study T-test has been utilized to assess the effects of internal factors. Also in order to examine the uniformity of internal factors effect, Friedman test has been utilized in this research and in order to compare the uniformity of internal factors effect based on firm size Kruskal-Wallis test has been used in this study in which researcher has provided some recommendations to improve the relation between internal departments and production cycle.

Keywords : *Internal Factors, Production Cycle, manufacturing firms, Zanjan Province*

I. Introduction

This is the period of excessive and unpredictable changes. Today in not the same as yesterday and then tomorrow will be so different from today. Therefore it is very dangerous to follow today's strategies. It is necessary for developing countries to revise their strategies and trade policies because any failure to utilize new update strategies will weaken their competitive position (Kotler, zool). Internal environment has great importance in strategies utilization. The identification of weak and strength points by firms will help them to select strategies which increase their success and stability in competitive environments in long term. Regarding different parts of a firm and their dependence on each other to satisfy hardware and software sources, dominant consideration in this study is focused to assess the effects of internal factors on optimum application of production cycle. Since the production cycle is the beating heart of manufacturing firms, it is very necessary to fulfill hardware and software needs of this section. For example, marketing unit helps the production cycle by exact identification of the market needs (requirements). In this study researcher tries to answer this question: How extent internal factors can help production cycle to achieve its goals? Researcher has classified manufacturing firm into seven sections as follow based on organizational chart:

1) Management department
2) Office department
3) Accounting department
4) Production cycle
5) Marketing department
6) Quality management department
7) Research and development department

a) About Zanjan Province

Zanjan (Persian: زنجان; Azerbaijani: زنجان) is one of the thirty provinces of Iran. Located in the North West of Iran, its capital is Zanjan city. Zanjan province with an area of 36,400 km² has a mostly rural, population of 964,601 (2006).[2] The province lies 330 km northwest of Tehran, connected to it via a freeway. Zanjan also has an incredible cave called katale khor. It is near the Sultaniyeh.

Agriculture and industry: Agriculture is the principal occupation, and crops include rice, corn (maize), oilseeds, fruits, and potatoes. Poultry, cattle, and sheep are raised. In the region Zanjan is also famous for its seedless grapes. Manufactures include bricks, cement, milled rice, and carpets. Chromium, lead, and copper are mined. In the scientific world the Zanjan name is famous for IASBS, one of the most productive research centers of the country. Zanjan is also known for its beautiful handcrafts such as knives, traditional sandals called charoogh and malileh. Malileh is a handcraft made with silver wires. Zanjanian artists make many things like various decorative dishes and their special covers as well as silver jewelry. In ancient times, Zanjan was known for its stainless and sharp knives. But this tradition is gradually becoming extinct by introduction of Chinese knives to the market which are cheaper and better made than these primitive industries. Many villagers today are traditional carpet weavers. This is perhaps Zanjan's most popular handcraft.

The province economy is benefiting from the geographical location which is connecting central part of Iran to the north western provinces. The Railway and

Author α : Young Researchers Club, Zanjan Branch, Islamic Azad University, Zanjan, Iran .E-mail: Mortezaramazani@ymail.com
Author Ω : MBA Student, University of Applied Science and Technology, Industrial Management, Ardabil Branch, Ardabil, Iran.
Author β : Accounting Student, University of Applied Science and Technology, Semnan Branch, Semnan, Iran E-mail: hossienrafieiatan@ymail.com

highway that connects Iran's capital city Tehran to Tabriz and Turkey is passing through Zanjan Province.

History : Zanjan city was a major ciry in pre-historicAzerbaijan. The name of Azerbaijan derives from Atropates, an Iranian satrap of Media under the Achaemenid empire, who later was reinstated as the satrap of Media under Alexander of Macedonia. The original etymology of this name is thought to have its roots in the ancient Zoroastrianism, namely, in Avestan Frawardin Yasht ("Hymn to the Guardian Angels"), there is a mentioning of: âterepâtahe ashaonô fravashîm ýazamaide, which literally translates from Old Persian as "we worship the Fravashi of the holy Atare-pata". Atropates ruled over the region of present-day Iranian Azerbaijan.

In Ptolemy's Geography, the city is referred to as Aganzana. It is said that the Sassanid king Ardashir I of Persia, reconstructed the city and called it Shahin but later it was renamed to Zangan, of which the present name is the arabicized form of. In past times Zanjan's name was Khamseh, which means "province with five tribes".

II. Literature Review

Depending on the product being manufactured, a company will employ one of the following production methods: Continuous processing creates a homogeneous product through a continuous series of standard procedures. Cement and petrochemicals are produced by this manufacturing method. Typically, under this approach firms attempt to maintain finished goods inventory at levels needed to meet expected sales demand. The sales forecast in conjunction with information on current inventory levels triggers this process.

Batch processing produces discrete groups (batches) of product. Each item in the batch is similar, requiring the same raw materials and operations. To justify the cost of setting up and retooling for each batch run, the number of items in the batch is usually large. This is the most common method of production. It is used to manufacture such products as automobiles, household appliances, and computers. The triggering mechanism for this process is the need to maintain fin fished goods inventory levels in accordance with projected sales requirements

Make-to-order processing involves the fabrication of discrete products in accordance with customer specifications. This process is initiated by sales order: rather than depleted inventory levels.

The actual procedures that make up the production system will vary with manufacturing method in use. The following discussion will focus on the processing system. This system determines in advance the exact quantity and of input materials, as well as the physical operations required to produce each batch.

a) Physical Reorganization Of The Production Facilities

Traditional manufacturing processes tend to evolve in piecemeal fashion over years into snake-like sequences of activities. Products move back and forth across shop floors, and upstairs and downstairs through different activities. Figure 1 shows a traditional factory layout. The inefficiencies inherent in the layout of traditional plants add handling costs, conversion time, and even inventories to the manufacturing process. Furthermore, because production activities are usually organized along functional lines, there is a tendency for parochialism among employees. This "us versus them" mentality is contrary to the team attitude and creates bottlenecks in the process.

A flexible manufacturing system is a much-simplified process. Figure 2 illustrates this idea. The flexible production system is organized into flows Computer-controlled machines, robots, and manual tasks that constitute the flow activities are grouped together physically into factory units called cells. This arrangement shortens the physical distances between the activities, thus reducing setup processing time, handling costs, and inventories in the flow.

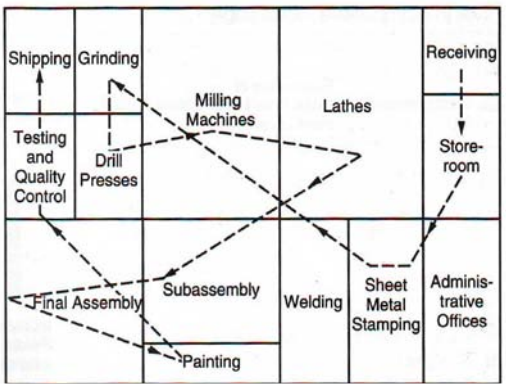
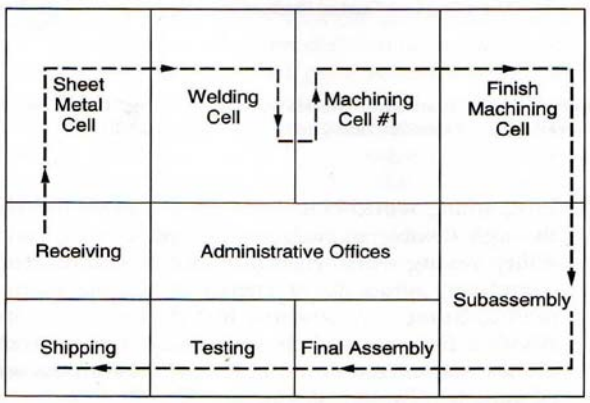


Fig.1. The Traditional Factory Layout

Fig.2. Flexible Production System



b) Research and Developing

Understanding the intricate relationships between market structure and propensity for R&D, the origins and evolution of inter-firm heterogeneity within a

given industry, and the forces behind entry and exit, is broadly viewed as one of the most pervasive challenges of industrial organization. Accordingly, several rich and largely independent strings of theoretical literature have attempted to shed light on these complex issues, the two most important of which are arguably those dealing with R&D and market structure, and industry dynamics. The former strand, in its dominant form, as represented e.g. by Brander and Spencer (1983) and d'Aspremont, and Jacquemin (1988).

c) The nature of the R&D activities

In order to define the nature of the R&D, the tasks of the R&D function are to be identified. Traditionally, R&D has been seen as a series of stages mirroring the progress of a certain technological programme (research, development, engineering etc.). Research works in different fields of study help to view it from a different perspective. Hedlund (1986) states that strategy can be seen as`` action patterns over time, of which there are two intertwined aspects": there are programmes of experimentation, the primary aim of which is to seek opportunities, and programmes of exploitation seeking the effective use of given resources. Key characteristics of experimentation programmes are a continuous search for new techno-organizational solutions, and a learning process aimed at enhancing the firm's knowledge base. Exploitation programmes aim to create value through current activities, and to innovate by exploiting the skills embedded in a firm's human resources and technical systems. Therefore, whereas exploitation programmes seek to identify and use the potential of the current paradigm, experimentation programmes aim to identify and define the future paradigm. In turn, technological activities have to fulfill two major tasks: the exploitation of the resources and knowledge base available to compete in the short term (exploitation programmes), and the development of a knowledge base that helps to sustain competition in the long term (experimentation programmes). This distinction is central to our analysis. Recently Coombs (1996) has stated that R&D has two major articulations: the investment mode, in which activities are concerned with the development of the firm's technological capabilities, and the harvesting mode in which the R&D function participates with the other functions to the market-driven exploitation of specific artifacts and services for customers. He also underlines that the characteristics of technology associated to the two ways of employing R&D activities change.

d) Quality Management Systems

The quality management (QM) movement started in Japan during the 1950s. During the 1980s it became increasingly popular in the United States and Europe most likely as a result of the success of Japanese firms in a number of global markets (Lawler, 1994). During the 1990s, QM is fast becoming one of the main issues in many organizations and is usually referred to as total quality management (TQM). A report, based on a survey of Fortune 1000 companies, concluded that 76% of the companies implemented TQM programs (Lawler et al., 1995). TQM is a management philosophy embracing all activities through which the needs and expectations of the customer and the community and the objectives of the organization are satisfied in the most efficient and cost effective way by maximizing the potential of all employees in a continuing drive for improvement (BS.4778: Part 2, 1991). The three main principles of TQM are customer focus, continuous improvement, and teamwork (Dean & Bown, 1994). People are the key element in achieving these principles (Kanji et al., 1995). TQM pushed the development and the enormous spread of the ISO 9000 quality standards. Adopting these standards enable an organization to demonstrate to its customers that its processes are both capable and under control, and there is effective control over procedures and systems (Dale, 1994). For many organizations attaining ISO 9000 certification is a necessity in order to survive (Meegan & Taylor, 1997). Both ISO 9000 and TQM focus on quality, but ISO 9000 lacks the participative decision-making (PDM) and the continuous improvement principles, two basic principles of TQM. The present study attempts to examine the contribution of these two variables within the QM context.

The scholarly published material on quality programs is rather limited (Shani & Rogberg, 1994). Most of the research on TQM has been performed from the manager's point of view. Research on employee responses is scarce. The present study attempts to fill in the gap by focusing on the employees and their responses. Specifically, the study attempts to tease apart PDM from the quality effort and estimate the impact of this component on employee improvement effort. The following sections briefly review the major topics of importance to the study.

Properly implemented, formal quality management systems provide a vehicle for achieving quality (i.e. conformance to established requirements). As defined by ANSI, a quality system is “the organizational structure, responsibilities, procedures, processes, and resources for implementing quality management” (Arnold, 1994). Quality management refers to the set of quality activities involved in producing a product, process, or service, and encompasses prevention and appraisal (Burati et al., 1992). It is “a management discipline concerned with preventing problems from occurring by creating the attitudes and controls that make prevention possible” (Crosby, 1979). Quality activities include the determination of the quality policy, objectives, and responsibilities and implementing them through quality planning, quality control, quality assurance, and quality improvement, within the quality system (ASQC, 1997).

Service meets established requirements (AASHTO, 1995, cited in Weigel et al., 1996). Quality assurance (QA) refers to the activities performed to provide adequate confidence that a product or service will meet established requirements (AASHTO, 1995, cited in Weigel et al., 1996). ISO 9000 series standards furnish conceptual guidelines with which to structure and implement the elements of a quality system (Arnold, 1994). They provide guidance on quality management, and present models for quality assurance by fostering the structure through which to implement the total quality management (TQM) business philosophy (Arnold, 1994). TQM means thinking about quality as a system approach using all functions of the enterprise as a process, and integrating them at all levels (Omachonu and Ross, 1994). This management approach is geared towards engaging the entire organization in a system, for the purpose of satisfying customers through continuous improvement (Drummond, 1992). Quality is a product of the system, thus the system must be designed to guarantee that requirements will be met. Figure 4 displays the system approach to quality management for achieving quality.

In construction, achieving conformance to established requirements consists of a series of quality management activities during the various phases of a project. In the design phase, quality requirements for the end products and/or their performance are specified to meet the user's needs. Depending on whether the specifications are method-type, end-result or performance-related, construction methods and materials are specified by the owner's agent, or defined later by the contractor, to permit achievement of these requirements, and quality management procedures are developed to ensure compliance with the specifications. During construction, nonconformance in terms of end products (the finished state of the constructed product), output products of activities (the states through which the end-product passes during its construction), and/or in-process characteristics may be detected. Appropriate actions must then be taken to rectify nonconforming situations and, if possible, diagnosis and elimination of the reasons causing nonconformance, in order to avoid similar situations during the remainder of the project and on future projects (Battikha and Russell, 1998).

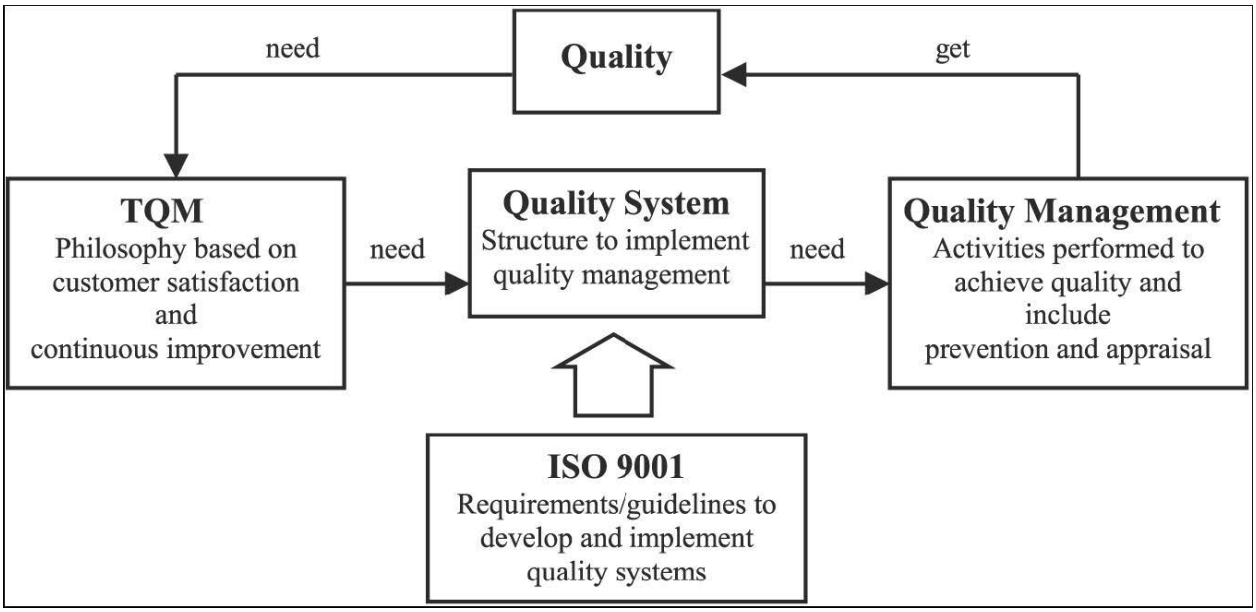


Fig.3. System Approach to Quality Management

e) Accounting and production Cycle

The production cycle is a recurring set of business activities and related data processing operations associated with the manufacture of products. Information flows to the production cycle from other cycles, e.g.:The revenue cycle provides information on customer orders and sales forecasts for use in planning production and inventory levels. The expenditure cycle provides information about raw materials acquisitions and overhead costs. The human resources/payroll cycle provides information about labor costs and availability. Information flows to the production cycle from other cycles, e.g.: The revenue cycle provides information on customer orders and sales forecasts for use in planning production and inventory levels. The expenditure cycle provides information about raw materials acquisitions and overhead costs. The human resources/payroll cycle provides information about labor costs and availability. Decisions that must be made in the production cycle include:

f) The objectives of cost accounting

To provide information for planning, controlling, and evaluating the performance of production operations; to provide accurate cost data about products for use in pricing and product mix decisions; and to collect and process information used to calculate inventory and COGS values for the financial statements.

g) Production planning and control systems

Section 2 described the developments in the USA, Europe and Japan which were shown to be different, which has had an important impact on the organisation of production and production control in these parts of the world. Together with a historical overview and review of production planning and control systems, the development of 'pull' control systems for make-to-order production environments was discussed in detail. Kanban, ConWIP, and Polca 'pull' systems were discussed and compared. The review concludes that the developments in 'pull' system design focuses upon adapting well-known 'pull' mechanisms to different situations. The differences between the three systems relate to the characteristics of different production environments. The developments also place new demands on the type of IT support needed to implement these systems successfully in practice (Jan Riezebos and etc 2009).

h) Next generation manufacturers and IT

The agenda of IT functions for next generation manufacturers is likely to become dominated by the requirements for corporate transformation. Many management problems are likely to feature on the IT agenda. The search for synergy across, as well as within, companies is likely to be of a higher priority. As more manufacturers become networked to embrace customers and suppliers, compatibility of systems is likely to become a more significant issue. According to Hum and Sim (1994), competition, technological advancement and the ever-changing consumers' needs have led to a constant evolution of competitive strategies. In this evolution, three components of IT have emerged as the tools for achieving sustainable competitive advantage. These are: Internet-based e-business; knowledge management systems; and enterprise integration using ERP systems. In this part of the paper, we present a model that shows the role of information technology in NGM. The model is a revised version of Yusuf's agile manufacturing model. The new model describes how time, quality and costs are central to the value adding in next generation manufacturing. It also specifies risks (external and internal) as a critical set of factors to the performance of next generation manufacturing.

The model also identifies information technology as a prerequisite to successful next generation manufacturing. Recent advances in information technology and, in particular, Internet technology, knowledge based systems and enterprise resources planning (ERP) systems make it essential that information technology be used to reduce risks and improve value adding activities. These three technologies are well suited to provide to next generation manufacturers opportunities to reap huge benefits that might include: increase in productivity, ability to command a price premium, increase in market share, and increases customer loyalty. These benefits are influenced by the ability of next generation manufacturers to use IT to enhance the value adding activities and to minimize the risks involved in manufacturing. This important role of IT is supported by the findings of Hum and Sim (1994). They suggested that managerial reorientation to new priorities should recognize the importance of information technologies, its impact on managerial and organizational strategies, and more importantly, its impact on creating and managing the future learning organization. Accordingly, the proper use of these technologies would enhance the ability of the NGM to become time-based competitors.

The development of the Internet-based e-business has emerged as a fast growing trend in business. According to Mougayar (1997), the use of Internet based electronic-business has quickly become essential for companies. Next generation manufacturers' key strategies are likely to include the implementation of Internet-based e-business in their operations. Adopting inter-company trade over the Internet can cut costs, reduce order-processing time, and improve information flow (Cronin, 1996). For most next generation manufacturers, the rise in trade over the Internet also coincides with a marked decrease in telephone and facsimile use, allowing salespeople to concentrate on pro-actively managing customers' accounts rather than serving as information givers and order takers.

The Internet and its application tools have led to a global business information infrastructure, which now rivals the conventional telephone systems in size, coverage and popularity. As the commercial use of the Internet grows, it is becoming increasingly recognized that this is a very different business environment from its physical counterpart. Common ways of exploiting the Internet as a business tool include marketing and information distribution, electronic mail for inter-company communication, and provision of services and products. Rayport and Sviokla (1995) also suggested that next generation manufacturers could use the Internet to gain access to marketplaces (or ``markets paces''), which might otherwise be inaccessible.

The role of e-business in next generation manufacturing is to improve the business processes and hence improve the efficiency and competitiveness of the organization. Therefore using e-business could lead to enhancing the operational and strategic

decisions, reducing rework, standardizing many operational practices, increasing cross functional team effort as well as ensuring concurrent engineering in the processes of developing products and services.

Gide (1999) studied the success factors for the implementation of e-commerce and was able to identify the following ten critical success factors (CSF) for the implementation of e-commerce in manufacturing:

- Management commitment and support for e-commerce.
- Organizational and management objectives for e-commerce.
- Communication between users and e-commerce department.
- E-commerce system security and reliability.
- E-commerce department's service function.
- Integrating e-commerce into existing business functions.
- Change management for e-commerce system implementation.
- Appropriate e-commerce system applications.
- User participation and satisfaction for e-commerce implementation.
- Technological competence for e-commerce implementation.

III. Research Hypothesis

1- Accounting department affects the optimum application of production cycle.
2- Management department affects the optimum application of production cycle.
3- Research and Development department affects the optimum application of production cycle.
4- Quality management department affects optimum application of production cycle.
5- Marketing department affects optimum application of production cycle.
6- Office department affects optimum application of production cycle.

IV. Research Methodology

To achieve the goal of this research a questionnaire with Likret five option scales was provided and sent to 100 production firms (Small, Medium and Large firms). Of all only 85 questionnaires were received and became a basis for researcher to make conclusion. In order to analyze the collected information research has utilized Descriptive-deductive statistics. In descriptive statistics the number of examined firms and their human resources (firm size) and in deductive statistics T-test has been utilized to assess the effect of each variable and Friedman test to measure the conformity of research variables importance and Kruskal-Wallis test to examine the effects of firm size on research independent variables have been used in this research.

a) T-Test

Based on uni-sample T-test, all research hypotheses have been tested. In this test we considered the theoretical and practical comparison.The theoretical mean is the average of the codes 3 pacified to the options of any question in which this average value is equal to 3. If the observed mean is meaningful less than theoretical mean, then the test formula as follow:

$$t = \frac{\bar{X} - \mu_0}{S_{\bar{x}}}$$

Where $\bar{X}$ is Sample - Mean $S_{\bar{X}}$ the Standard Error of $\bar{X}$ which measured as $S_{\bar{X}} = \frac{S}{\sqrt{n}}$

b) Friedman Test

This test used to compare group based on their mean degrees and determine that F these groups are obtained from one society or not? The scale in this test must, at least, be in grade. This test is the non parametric corresponding type of Friedman test and typically is used instead of F in grade scales and replaces it. There is some homomorphism of variances which is considered less in the grade scales.

c) Pearson Correlation Test

This test means the determination of statistical fool correlation to define the type and degree of a quantitative variable with other quantitative variable (with other one). The coefficient of correlation is one of the standards used to determine correlation. The coefficient of correlation indicates the intensity of the relation and also the type of velation (direct and reverse). This coefficient varies between 1 and -1 mean while it is equal zero if there is not any relation between two variables Pearson correlation coefficient (r) is formulated as follow:

$$\boldsymbol{r = \frac{\sum xy - \overline{nxy}}{\sqrt{\sum x^2 \sqrt{\sum y^2 - ny^{-2}}}}}$$

d) Kruskal-Wallis Test

In statistics, the Kruskal–Wallis one-way analysis of variance by ranks (named after William Kruskal and W. Allen Wallis) is a non-parametric method for testing equality of population medians among groups. It is identical to a one-way analysis of variance with the data replaced by their ranks. It is an extension of the Mann–Whitney U test to 3 or more groups. Since it is a non-parametric method, the Kruskal–Wallis test does not assume a normal population, unlike the analogous one-way analysis of variance. However, the test does assume an identically-shaped and scaled distribution for each group, except for any difference in medians.

V. Analysis

a) Research Validity and Reliability

A good test must contain some suitable features such as Objectivity, Execution Simplicity, Practicability, Comment Simplicity, Validity, and Reliability. Considering the above mentioned features, we focus more on Validity and Reliability here.Dealing with Reliability researcher has utilized Cronbach's Alpha and based on table 1 the measured value of Cronbach's Alpha done by Spss softwares equal to 0.76 which is more than 0.7; therefore the test is considerably valid in the view of its reliability. In Validity examination, 10 questionnaires were sent to subjects and after a week the same questionnaires were sent again to be answered. This research shows the uniformity of the answers during a week which indicates the questionnaires Validity.

Table No.1 Reliability Statistics	
Cronbach's Alpha	N of items
0.760	43

b) Firm size

In this research the size of studied firms is defined based firms human resources numbers, meanwhile table 2 shows firms classification frequency and their frequency percents.

Table No.2 Frequency of Firms Size			
Firm size		Frequency	Percent
Small	>10	19	22.4
Middle	10 to 50	22	25.9
Large	50 to 150	24	28.2
Very Large	More than 150	20	23.5
Total		85	100

c) Testing of Hypothesis

In order to test all hypotheses, Validation and Rejection hypothesis have been applied as following:

H0: $\mu > 3$

H1: $\mu \leq 3$

d) Testing of first hypothesis

Considering the statistical value T, -0.123 (Df) 84 and sig=0.902, the assumption of H0 is rejected in the level of more than 5% and H1 is valid in the meaningfulness level of 5% (Table N.3).therefore we can conclude that the Development and Research unit has no considerable effect on optimum application of production cycle.

e) Testing of second hypothesis

Considering the statistical value T, 0.421, (Df) 84 and sig=0.675 H0 is rejected in the level of more than 5% and H1 is valid in the meaningfulness level of 5% (Table N.3). So we can say that the accounting unit has no considerable effect on optimum application of production cycle.

f) Testing of third hypothesis

Considering the statistical value T, 6.408, (Df) 84, sig= 0.00 H0 is valid in the level of less than 5%, H1 is rejected in the meaningfulness level of 5% (Table N.3). So we can say that the Marketing unit has considerable effect on optimum application of production cycle.

Table No.3					
Description Hypothesis	Test Value = 3				
	T	Df	Sig. (2-tailed)	Mean Difference	Result
First Hypothesis	-0.123	84	0.902	-.00784	Reject
Second Hypothesis	0.421	84	0.675	.03529	Reject
Third Hypothesis	6.408	84	0.000	.28235	Accept
Fourth Hypothesis	-1.910	84	0.060	-.10588	Reject
Fifth Hypothesis	2.526	84	0.013	.14118	Accept
Sixth Hypothesis	3.826	84	0.000	.25490	Accept

g) Testing of fourth hypothesis

Considering the statistical value T -1.910, (Df) 84 and sig=0.060 H0 is valid in the level of less than 5%, H1 is rejected in the meaningfulness level of 5% (Table N.3). So we can say that the Office unit has no considerable effect on optimum application of production cycle.

h) Testing of fifth hypothesis

Considering the statistical value T, 2.526 (Df) 84, sig= 0.060 H0 is valid in the level of less than 5%, H1 is rejected in the meaningfulness level of 5% (Table N.3). So we can say that the Management unit has considerable effect on optimum application of production cycle.

i) Testing of sixth hypothesis

Considering the statistical value T, 3.826, Df 84, sig=0.000 H0 is valid in the level of less than 5%, H1 is rejected in the meaningfulness level of 5% (Table N.3). So we can say that the Management unit has considerable effect on optimum application of production cycle.

j) Research independent variables Uniformity Testing

In order to prioritize and define the importance rate of each research independent variables (internal factors) Friedman test has been utilized in this research. This test states that if there is a factor more important than others among Preventive Factors or all of them are uniform in importance. Researcher has utilized following hypothesis (rejection-validation) in his testing as follow:

H0: Research independent variables (internal factors) have uniform importance in view of their effectiveness.

H1: Research independent variables (external factors) have not uniform importance in view of their effectiveness.

Considering the value in Table 3, P-value = 0.000 and Df=5 and statistic value of chi-square=50.09 we can conclude that the assumption of H0 is valid in meaningful level of %5, while H1 is rejected, in other words research independent variables (internal factors) have uniform importance in view of their effectiveness and classification order of independent variables is shown in Table 4.

Table No.4 Friedman test statistics

N	85
Chi-Square	50.090
Df	5
P-value	.000

Table No.5 Mean Ranking of Variables

Independent Variable Descriptive	Marketing Dep	Quality management Dep	Management Dep	R&D Dep	Accounting Dep	Official Dep
Mean Rank	4.32	3.96	3.62	3.19	3.08	2.77

k) Firm size and research independent variables

In this paper, in order to examine the effect of firm size on research independent variables (internal factors) Kruskal-Wallis test has been utilized by researcher. Table 5 shows the number and also the mean of each independent variable ranks based on firms size.

Table No.6			
Descriptive Independent Variables	Firm size	N	Mean Rank
R&D Dep	Small	19	53.66
	Medium	22	31.34
	Large	24	40.63
	Very large	20	48.55
Accounting Dep	Small	19	54.34
	Medium	22	32.80
	Large	24	35.90
	Very large	20	51.98
Marketing Dep	Small	19	41.13
	Medium	22	42.84
	Large	24	35.63
	Very large	20	53.80
Official Dep	Small	19	33.87
	Medium	22	42.43
	Large	24	41.04
	Very large	20	54.65
Management Dep	Small	19	41.16
	Medium	22	54.95
	Large	24	43.58
	Very large	20	30.90
Quality Management Dep	Small	19	41.47
	Medium	22	36.73
	Large	24	39.71
	Very large	20	55.30

Table No.7 the Results of Kruskal-Wallis Test						
Independent Variables Descriptive	R&D Dep	Accounting Dep	Marketing Dep	Official Dep	Management Dep	Quality Dep
Chi-Square	10.287	12.594	6.264	7.322	16.253	7.751
Df	3	3	3	3	3	3
P-value	0.016	0.006	0.099	0.062	0.001	0.051
Asymp.sig	Difference is meaningful	Difference is meaningful	Difference is not meaningful	Difference is not meaningful	Difference is meaningful	Difference is not meaningful

Considering the values, sig, in table N.7 we can conclude that the firm size significantly affects the variables of research and development unit, accounting unit and management unit but has no effect on variables of marketing unit, office unit and measurement control unit.

VI. Results and Research Findings

This paper tries to present the result of a survey research obtained from some active manufacturing firms which are classified as Small, Medium, Large and Very large.The results obtained from T-test show the effects of marketing unit, management unit and quality management on optimum application of production cycle but Research and Development unit, accounting unit, and office unit have no effects on these variables. This result demonstrates that the units of marketing, management, and duality management have been succeed to make a good relationship with production cycle and fulfill all its demands and requirements. In other words, these units have satisfied all software needs of production cycle, but the units of Research and Development , accounting and office have not been succeed to do their duties in this area.The results obtained from Friedman test state that all six research independent variables have uniform importance to effect the production cycle. The results of Kruskal-Wallis test show the uniform effects of Research and Development, accounting, and management units between firms with different sizes, while marketing office and quality managements have not uniform effects.

The result of Kruskal-Wallis test shows the effect of all variables except to variable N.4 (management related problems).

In general we can state that the competition between firms in world markets have been more complicated and complex than the past and customers have many options to purchase their favorite goods. Nowadays high acceleration in technology development has brought more production and similar services about and provided customers with more purchase options. In this situation firms can survive and continue their performance to manufacture production which not only have good quality and competitive efficiency but have less firm cost to maintain and increase their market share and make their considered profit.

VII. Conclusion

Considering the importance of the subject matter and regarding the results obtained from research data some recommendation are listed as follow:

1- The main goal of the Research and Development unit is to provide required conditions in order to maintain and develop the technology efficiency of the organizational groups. Therefore it is recommended that the Iranian firms must try to benefit from expert association of the Research and Development unit and utilize new methods.
2- It is necessary to apply some supportive policies in order to transfer research findings from research centers to manufacturing firms.
3- Regarding the importance of firms accounting information systems and their roles in optimum application of production cycle it is necessary for the firms to update their accounting information systems based on new technologies.
4- Firms must replace traditional and individualized methods by cooperative methods and multi-skilled personnel in order to increase the quality and minimize the firm cost.

VIII. Acknowledgment

Researcher obligates himself to gratify Zanjan Islamic Azad University's research section for their sincere supports.

References Références Referencias

1. AASHTO (1995), YACHT Quality Assurance Guide Specification, YACHT Joint Construction/Materials Quality Assurance Task Force 6/21/95 ed., American Association of Highway and Transportation Officials, Washington, DC.
2. Albrecth,W. D., & Richardson, F. M. (1990,Winterr). Income smoothing by economy sector. Journal of Business Finance and Accounting, 17(5), 713−730.
3. Arnold, K.L. (1994), The Manager's Guide to ISO 9000, The Free Press, New York, NY. (The) Asphalt Institute (1989), The Asphalt Handbook, Manual Series No. 4 (MS-4), The Asphalt Institute, Lexington, KY.
4. ASQC (1997), Interpretive Guidelines for the Application of ANSI/ISO/ASQC Q9001-1994 or Q9002-1994 for Owner's, Designer's, and Constructor's Quality Management Systems, ASQC Quality Press, Milwaukee, WI.Battikha, M.G. and Russell, A.D. (1998), "Construction quality management – present and future", Canadian Journal of Civil Engineering, Vol. 25 No. 3, pp. 401-11.
5. Brander, J., Spencer, B., 1983. Strategic commitment with R&D: the symmetric case. Bell Journal of Economics 14, 225–235.
6. BS.4778: Part 2. (1991). Quality vocabulary: quality concepts and related definitions. London: British Standards Institution.
7. Burati, J.L. Jr, Farrington, J.J. and Ledbetter, W.B. (1992), "Causes of quality deviations in design and construction", Journal of Construction Engineering and Management, Vol. 118 No. 1, pp. 34-49.
8. Burbridge, J.L., Falster, P., Riis, J.O., Svendsen, O.M. (1987), "Integration in manufacturing", Computers in Industry, Vol. 9 No.4, pp.297-305.

9. Chiesa and Masella, 1996, "Searching for an effective measure of R&D performance" Management Decision, 34/7 49–57.
10. Coombs, R. (1996), ``Core competencies and the strategic management of R&D", R&D Management, Vol. 26 No. 4, pp. 345-55.
11. Cooper, R.B., Zmud, R.W. (1990), "Information technology-implementation research: a technological dilution approach", Management Science, Vol. 36 No.1, pp.123-39.
12. Cronin, M.J. (1996), The Internet Strategy Handbook: Lessons from the New Frontier of Business, Harvard Business Press, Vol. Boston, MA..
13. Crosby, P.B. (1979), Quality is Free: The Art of Making Quality Certain, McGraw-Hill Book Company, New York, NY.
14. Dale, B. G. (1994). Managing quality (2nd ed.). Hertfordshire: Prentice-Hall Europe (Chapter 15).
15. Dam, A., Riis, J.O., Thorsteinsson, U. (1994), Integrated Productivity Development
16. d'Aspremont,, C., Jacquemin, A., 1988. Cooperative and noncooperative R&D in duopoly with spillovers. American Economic Review 78, 1133–1137 Erratum, American Economic Review, 80, 641-642.
17. Dean, J. W., & Bown, D. E. (1994). Management theory and total quality: improving research and practice through theory development. Academy of Management Review, 19 (3), 392±418.
18. Drejer, A. (2000), "Integrating product and technology development", European Journal of Innovation Management, Vol. 3 pp.125-36.
19. Drummond, H. (1992), The Quality Movement: What Total Quality Management is All About, Kogan Page/Nichols Publishing, London/East Brunswick, NJ.
20. Gide, E., Soliman, F. (1998), "Framework for the Internet-based e-commerce in manufacturing and business operations", Proceedings of 4th International Conference on Networking Entities: NETIES '98: Networking for the Millennium, Leeds, pp.66-72..
21. Hammer, M. (1990), "Reengineering work: don't automate, obliterate", Harvard Business Review, pp.64-76.
22. Hansen, P.H.K. (1992), "Managing integration in manufacturing systems", Proceedings from the 7th IPS Research Seminar, pp.224-31.
23. Hedlund, G. (1986), ``The hypermodern MNC ± a heterarchy?", Human Resource Management, Vol. 25, Spring.
24. Hum, S.H., Sim, H.H. (1994), "Time-based competition: literature review and implications for modelling", International Journal of Operations & Production Management, Vol. 16 No.1, pp.75 90..-
25. Jan Riezebos a,*, Warse Klingenberg a, Christian Hicks, 2009," Lean Production and information technology: Connection or contradiction?", Computers in Industry.
26. Kanji, G. K., Kristensen, K., & Dahlgaard, J. J. (1995). Quality motivation. Total Quality Management, 6 (4), 427±434.
27. Lawler, E. E. (1994). Total quality management and employee involvement: are they compatible? Academy of Management Executive, 8 (1), 68±76.
28. Lawler, E. E., Mohrman, S. A., & Ledford, G. E. (1995). Creating high performance organizations: practices and results of employee involvement and total quality management in Fortune 1000 companies. San Francisco, CA: Jossey-Bass Publishers.
29. Lee, B. B., & Choi, B. (2002). Company size, auditor type, and earnings management. Journal of Forensic Accounting, III, 27−50.
30. Meegan, S. T., & Taylor, W. A. (1997). Factors influencing a successful transition from ISO 9000 to TQM. International Journal of Quality and Reliability Management, 14 (2), 100±117.
31. Michaelson, S. E., James, J. W., & Charles, W. (1995). A market based analysis of income smoothing. Journal of Business Finance and Accounting, 8(4), 1179−1195.
32. Moses, D. O. (1987). Income smoothing and incentives: Empirical using accounting changes. The Accounting Review, LXII(2), 259−377.
33. Mougayar, W. (1997), Opening Digital Markets: Advanced Strategies for Internet-Driven Commerce, CYBER Management Publications, Toronto., .
34. Omachonu, V.K. and Ross, J.E. (1994), Principles of Total Quality, St Lucie Press, St Lucie, FL. Parti, E.W. (1996), "Issues in pursuing quality in faculty program development", Journal of Architectural Engineering, Vol. 2 No. 1, pp. 32-40.
35. Rayport, J.F., Sviokla, J.J. (1995), "Exploiting the virtual value chain", Harvard Business Review, Vol. 73 No.6, pp.75-85.
36. Riis, J.O. (1992), "Integration and manufacturing strategy", Computer in Industry, Vol. 4 pp.34-41.
37. Shani, A. B., & Rogberg, M. (1994). Quality, strategy and structural configuration. Journal of Organizational Change Management, 7 (2), 15±30.
38. Weigel, J.J. Jr, Cominsky, R.J. and Moulthrop, J.S. (1996), "Design and implementation of a dynamic quality management system for HMA: a case study", in Decker, D.S. (Ed.), Quality Management of Hot Mix Asphalt, STP 1229, ASTM, West Conshohocken, PA, pp. 46-55.

This page is intentionally left blank