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Application of QFD for Product and Process Improvement in Pakistani Organizations

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A)   APPLICATION OF QFD IN PAKISTANI ORGANIZATIONS

1.   *WHAT IS QFD*

Q FD is an effective methodology in product & process development in industries for both, customers and designers. This methodology helps to construct a system for assessing customers' and / or users' preference. QFD is a group work approach designed to ensure that everyone works together to give customers what they want. QFD helps improve quality of products, satisfy customer needs, shorten development times, and at the same time reduce costs. QFD changes the way people think. It bring quality into products by improving process quality.

2. HOW QFD HAS FARED INTERNATIONALLY

T he QFD was first adopted in Japan and there have been many QFD success stories. The companies such as Toyota, Mazda etc have achieved radical improvement in product design, development time, cost and efficiency.

QFD has established itself as a one of the important tool for customer satisfaction. The QFD has a universal acceptability with proven results and now has become very popular in almost every part of the world. Many Asian companies in Thailand, Malaysia etc have started this new management tools.

3. NECCASSITY OF QFD IN PAKISTAN

O ver the last few decades, the business environment in Pakistan has changed dramatically. Most businesses are no longer organized to compete effectively. The majorities of the Pakistani companies still organize around functional hierarchies and employ traditional approaches to managing processes, information and people. However as global competition intensifies, these 20th century paradigms are beginning to unravel. New, higher performing organizational models are now emerging that will transform the business world by the turn of the century.

Today many processes and organizations are complex systems that have to be designed in order to meet specific customer requirements to gain a competitive advantage. An additional approach is needed to increase the probability of success by capturing the voice of customer and integrating it in

the reengineering efforts. QFD is a perfect tool for capturing and organizing the customer expectations.

Most of companies in Pakistan do not have any concept of QFD. Only a few are in process of implementing QFD and are still in infancy stages. Many studies need to be done to make more awareness of QFD in the country.

Having been involved in teaching and implementing TQM in Pakistan. I am often asked about the awareness and applicability of QFD in Pakistani organizations. There is no local research available to answer such questions.

In view of above a strong need has been observed to study applicability of QFD concept in Pakistani organizations.

4. AIM OF THE PAPER

This study explains the awareness and applicability of QFD concept in Pakistani industries. Various steps also proposed to introduce QFD in Pakistan

Finally a case study from process industry i.e. Pakistan Tobacco Co. Ltd. will be presented. This case study provides evidence and supports the conclusion that QFD concept can be implemented in Pakistani organizations and very beneficial for product and process improvement.

5. METHODOLOGY

To conduct a research of 50 companies of medium size a questioner is designed to obtain information which can clearly illustrates the applicability of QFD concepts in the Pakistani organizations. Necessary data has been collected through questionnaires from companies & analyzed in the context of QFD approach. Medium size of organizations have been selected and after thorough explanation to them questioner have been collected and analyzed subsequently.

Following is the detail of companies:

No. of Companies	:	**50**
Size of Companies	:	**Medium**
Ownership	:	**70% Pvt. Ltd.** **30% Public Ltd.**
Average Life	:	**More than 10 years**
Avg. Nos. of employees	:	**300**

Following is the detail of questionnaire, which is self-explanatory:

A   CUSTOMERS ISSUES

A-1) IDENTIFICATION OF CUSTOMER

4   Can clearly identify who are customers (Internal & external).
3   Can identify only external customer.
2   Can identify customers up to some extent.
1   No proper identification of customers.

A-2) VOICE OF CUSTOMER

4   Have a complete system of obtaining, understanding and prioritizing voice of customer.
3   Obtaining VOC without proper understanding and prioritizing.
2   Obtaining VOC without any further action / understanding.
1   No understanding and concept of voice of customer.

A-3) CUSTOMER NEED ASSESMENT

4   Clearly understanding of customer's need and translating into requirement.
3   Customer needs translated into requirement up to certain extent.
2   Customer needs cannot properly translated into requirement.
1   No system / concept for obtaining customer needs.

A-4) VISIT TO CUSTOMER

4   Every one visit and used Gemba techniques.
3   Technical staff included in marketing survey.
2   Only visits by marketing staff.
1   Generally no visit to customer.

A-5) APPLICATION OF KANO MODEL

4   Fully understand changing needs of customer and application of Kano's model.
3   Fully understand changing needs of customer but no application concept of Kano's model.
2   Partially understand changing needs of customer but no application concept of Kano's model.
1   No concept of Kano's model.

A-6) CUSTOMER SEGMENTATION

4   Fully understand and know customer needs (from regime / segment etc)
3   Partially understand and know customer needs (from regime / segment etc)
2   Customer segmentation is done but no further action
1   No proper segmentation of customers.

A-7) PROFESSIONALISM

4   Top management is highly cooperative, with efforts to guide all employees to meet customer requirements.
3   Top management is highly cooperative, but employees are less cooperative.
2   Cooperates only when significant merits are foreseen.
1   No cooperation.

A-8) QUALITY CONSCIOUSNESS

4   Organization/System involving top management established.
3   Responsible personnel designated, and share of roles clarified.
2   Organization/System established. Operation has problems.
1   No organization/system established.

A-9) MANAGEMENT COMPETENCE

4   With world and domestic economies in mind, they have corporate policy and medium and long-term policies, they lead the company toward goals. Well informed of the industry situations.
3   Having managerial policy, they manage the company in accordance with an annual plan.
2   Directors/Managers each fulfills assigned functions only.
1   They have no managerial policies.

B   COMPETITIVE ISSUES

B-1) PRODUCT ASSESMENT

4   Fully know strength and weakness of our and competitive products from customer's point of view.
3   Our and competitors self-product assessment.
2   Only self-product assessment based on self-evaluation (No customer's point of view)
1   No knowledge of our & competitors product from customer's point of view

B-2) MARKET SHARE

4   Constantly analyzing market share and taking measures accordingly.
3   Calculating market share regularly but no special measures have been taken.
2   Analysis of market share on need basis.
1   No concept / knowledge of market share.

B-3) BENCH MARKING

4   Bench marking practices are fully implemented constantly for products and process improvement
3   Bench marking practices implemented as per need.
2   Concept of bench marking but no implementation.
1   No concept of bench marking.

C   TECHNOLOGY

C-1)   DESIGN DELAYS

4   Fully understand different needs of the market and no design related delays when introducing new products.
3   Partially understand different needs of the market and some time design related delays when introducing new products.
2   No delay in introducing new products but true needs of market are not incorporated.
1   Customer needs are not incorporated in product specification and delay in introduction of new products.

C-2)   CUSTOMER NEEDS INTO PRODUCT SPECIFICATION

4   Have a mechanism for incorporating customer need into product and it is regularly practiced
3   Have a mechanism for incorporating customer need into product but not fully implemented
2   No formal mechanism for incorporating customer need and based on need basis
1   No mechanism / system to incorporate customer needs into product specification.

C-3)   SUPPLIER EXPERIENCE / EXPERTISE

4   Getting supplier expertise in designing and manufacturing phases..
3   Involving supplier only in design.
2   Involving supplier only in production.
1   No concept to use supplier expertise.

C-4)   DESIGN

4   Products are technology leaders not follower and new features excel both functionality and usability.
3   Products are technology leaders.
2   New features incorporated without assessing customer needs.
1   Products are follower.

D   PROJECT

D-1)   PROJECT MANAGEMENT

4   Completed all projects on time with regular monitoring
3   Some time completed projects on time with good monitoring
2   Project completed on time with some extent without proper monitoring system.
1   Most of the time projects are not completed on time.

D-2)   FREQUENT CHANGES IN SPECIFICATION

4   No changes in specification during project due to good planning and involvement of all concerned.
3   Some changes in specification during project
2   some changes in specification and without involvement of all concerned
1   Frequent changes in specification leads to longer time than plan.

D-3) CROSS FINCTIONAL TEAMS

4   Cross functional teams formulated and fully used..
3   Cross functional teams formulated but not effectively used.
2   Only specific department is used for task.
1   No concept of cross-functional teams.

E   PROCESS ISSUES

E-1) CLARITY OF PRODUCT SPECIFICATION

4   Marketing delivered a complete product specification and customer needs are thoroughly communicated in the organization.

3   Marketing delivered a complete product specification but customer needs are not thoroughly communicated in the organization.
2   Product specification generally not clear and known in the organizations.
1   Product specification delivered but not clear & comprehended.

E-2) CONCURRENT ENGINEERING

4   Product development process is totally integrated from planning, designing to manufacturing and servicing and properly implemented the concept of concurrent engineering.
3   Product development process is totally integrated from planning, designing to manufacturing and servicing and implemented the concept of concurrent engineering up to certain extent.
2   Concept is available but not implemented.
1   No concept of concurrent engineering.

E-3) FOCUS ON CUSTOMER NEEDS

4   Processes fully focused on customer needs.
3   Have a concept of translating customer needs into process but partially implemented
2   Have a concept of translating customer needs into process but not implemented.
1   No importance of customer needs.

E-4) COMMUNICATION

4   The company's executives including general managers, etc. regularly visits/inspect the plant and attend shop floor meetings.
3   Daily shop floor meeting is held enabling good communication between various departments/sections.
2   Organizational chart is available. No concept of daily shop floor meetings.
1   No formal organizational chart is available.

F   PRODUCTION ISSUES

F-1)   CONFORMANCE TO SPECIFICATION

4   Build exactly as per specification.
3   Build some how as per specification with less repair.
2   Conformance to specification with lot of repair / re work.
1   Generally conformance to specification is not followed.

F-2)   REPAIR / REWORK STATUS

4   Built in quality concept and almost no repair / re work
3   Built in quality concept with some repair / re work
2   Very high re-work / repair with known status.
1   No status of re-work / repair

F-3)   CONTROL AND GUIDANCE OF SUB-SUPPLIER

4   Guidance planned. System for periodic guidance established and successfully implemented.
3   No specific guidance system established. Staff visits each sub supplier for guidance, and checks its production process,
2   Guidance provided only occasionally, but quality status grasped to the same extent as when guidance is provided periodically.
1   No guidance activities performed. No selection criteria.

F-4)   CONTINUOUS IMPROVEMENT

4   Concept is clear by all and implemented completely.
3   Concept is there and implemented partially.
2   Concept to known to few people but not in use in the organization.
1   No concept of continues improvement.

F-5)   QUALITY STATUS

4   Product is re-known for quality.
3   Product generally found ok however, not re-known for quality.
2   No special characteristic of product.
1   Product is not re-known for quality.

F-6)   COST CONSCIOUSNESS

4   Cost competitiveness is high enough to make the company a production center.
3   Initially set goals achieved and there is an advantage of cost concept.
2   Initially set goals achieved, but there is no concept of cost merit even on job site basis.
1   No cost reduction concepts and awareness of cost merits.

EVALUATION SUMMARY

NAME OF COMPANY	:	_____	EVALUATION DATE
ADDRESS	:	_____	
PERSON TO CONTACT	:	_____	
ESTABLISHED	:	_____	

			CURRENT	TARGET
A	**CUSTOMER ISSUE**			
	A-1	IDENTIFICATION OF CUSTOMER		
	A-2	VOICE OF CUSTOMER		
	A-3	CUSTOMER NEED ASSESMENT		
	A-4	VISIT TO CUSTOMER		
	A-5	APPLICATION OF KANO MODEL		
	A-6	CUSTOMER SEGMENTATION		
	A-7	PROFESSIONALISM		
	A-8	QUALITY CONSCIOUSNESS		
	A-9	MANAGEMENT COMPETANCE		
		TOTAL - A		

			CURRENT	TARGET
B	**COMPETETIVE ISSUE**			
	B-1	PRODUCT ASSESMENT		
	B-2	MARKET SHARE		
	B-3	BENCH MARKING		
		TOTAL - B		

			CURRENT	TARGET
C	**TECHNOLOGY**			
	C-1	DESIGN DELAY		
	C-2	CUSTOMER NEED INTO PRODUCT SPECIFICATION		
	C-3	SUPPLIER EXPERIENCE / EXPERTIES		
	C-4	DESIGN		
		TOTAL - C		

D	PROJECT	D-1	PROJECT MANAGEMENT		
		D-2	FREQUENT CHANGE IN SPECIFICATION		
		D-3	CROSS-FUNCTIONAL TEAM		
			TOTAL - D		

E	PROCESS ISSUES	E-1	CLARITY OF PRODUCT SPECIFICATION		
		E-2	CONCURRENT ENGINEERING		
		E-3	FOCUS ON CUSTOMER NEEDS		
		E-4	COMMUNICATION		
			TOTAL - E		

F	PRODUCTION ISSUES	F-1	CONFORMANCE TO SPECIFICATION		
		F-2	REPAIR / REWORK STATUS		
		F-3	CONTROL & GUIDANCE OF SUB-SUPPLIER		
		F-4	CONTINOUS IMPROVEMENT		
		F-4	QUALITY STATUS		
		F-5	COST CONSCIOUSNESS		
			TOTAL - F		

	AVERAGE		

6. <u>RESULT</u>

R esults indicate that almost 95% companies do not have any idea of QFD. Following is the summary of QFD awareness/

| Companies having a knowledge QFD | = | 20% |
No. of companies implementing QFD	=	5%
No. of companies implementing QFD	=	25%
Companies with no knowledge	=	80%

So the results clearly tell us that very few i.e. 5% companies are implementing QFD in Pakistan. This is be caused benefits are still., not known to companies.
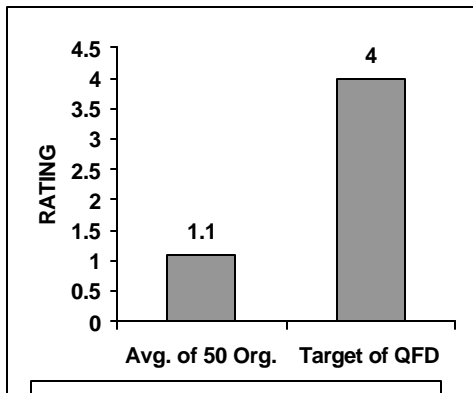
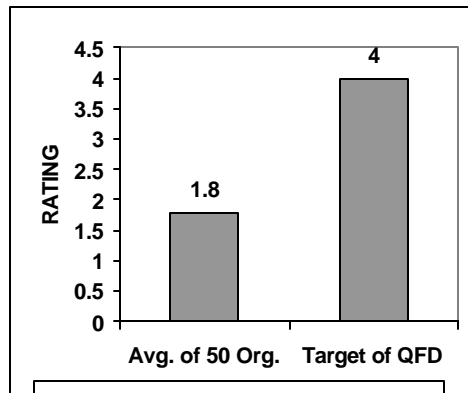In addition to the above following six major areas of QFD assessed the through questioners.
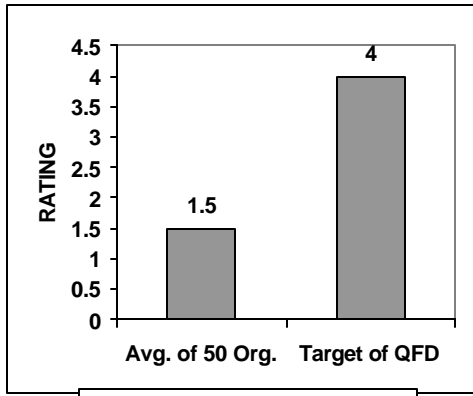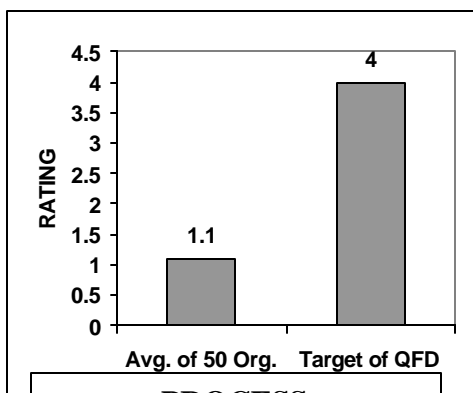
CUSTOMER
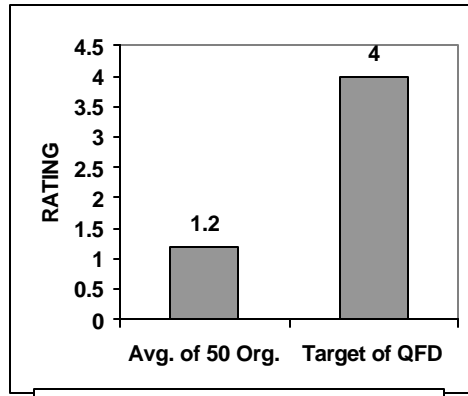
COMPETITORS ISSUES

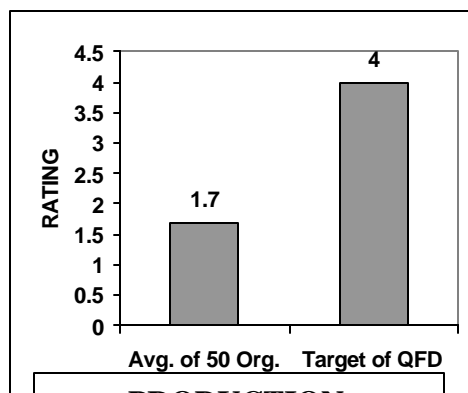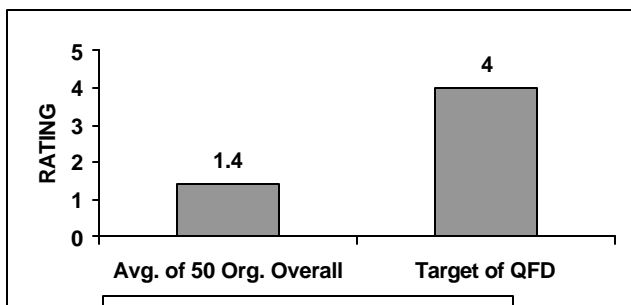

TECHNOLOGY

PROJECT

PROCESS

PRODUCTION

Overall Results

Overall results clearly shows the gaps, which require immediate attention.

OVERALL RESULTS

Over all

Following is the summary of overall results.

Sr. #	Six Major Areas of QFD	Average
1	Customer Issues	1.5
2	Competitors Issues	1.2
3	Technology	1.1
4	Project	1.8
5	Process	1.1
6	Production	1.7
	Overall Average	1.4

7. KEY ISSUES

Each company have its own problem however following are generalized key issues.

- Short term business plans due to uncertainly in the region.
- Limited technical know how specially on the new management tools such as QFD, DOE, Six Sigma etc.
- Resistance from management to adopt modern tools.
- Limited support and knowledge from developed countries.
- No regards for the voice of customer
- Failed to strategize priorities
- Segmental product development and many functions work independently.
- Loss of information due to unstructured and unavailability of document
- Lack of teamwork
- Individual and / or functions working for self-objectives
- Only focused on conformance to specification.
- No concept for design quality into the product.

8. PROPOSED STEPS TO INTRODUCE QFD IN PAKISTAN

The concept of QFD is relatively new in Pakistan, and due to recent expansion in the private sector in Pakistan it is hoped that there will be an increase in demand for this management system.

A) QFD CONCEPT IN BUSINESS EDUCATION:

QFD concept to be incorporated in "TQM" course offered by leading universities of the country such as Hamdard, IBA and Preston etc.

B) PUBLICATION OF BOOK:

Book publications for more and more awareness & understanding

C) QFD IMPLEMENTATION PROGRAM FOR PAKISTANI ORGANIZATIONS:

Implementing QFD is like bringing a change in an organization. It is necessary to study the culture of the organization and employee moral. In order to do so a well-programmed research methodology is required to get the required information.

QFD is an approach, which can help improve quality, satisfy customer needs, shorten development times, and at the same time reduce costs. However any technique has its own limitations when implemented.

QFD process is costly and difficult. It requires a much longer view into the future to achieve payback. Without top management support, all attempts at QFD implementation could go for naught. Top management commitment is key when implementing QFD broadly because of the implications involved with organization, budgets and timing of project deliverables.

QFD awareness seminar for the top management is essential and the purpose of the seminar is to convey proper understanding of QFD to the top management and to condition their minds for the implementation of the program. Also it should be made clear to the top management what is required from them and how much important is their cooperation in this regard. In large organizations it is feasible to start QFD program only in pilot factories. At this stage these pilot areas.

To ensure the success of the QFD process, extensive training to be provided to employees of organizations. The training will focus on the role of each person within the process, team working skills and project management skills. The focused training specially aimed at changing attitude and shifting the individuals' focus from the departments to the customer requirements.

D) NATIONAL SYMPOSIUM ON QFD:

QFD symposium with the help of reputable universities for creating more and more awareness is recommended.

E) FORMATION OF COUNCIL / COMMITTEE:

Formation of council / committee for QFD promotion and awareness Pakistan is also recommended.

AUTHOR'S SYNOPSIS

Tariq Ahmed Khan is a Mechanical Engineer with Master of Business Administration and has more than 14 years of experience in the field of Production, Prod. Engineering and parts localization in automobile and related automobile vendor industries. Have a vast experience of Japanese Management, and its implementation in Pakistan. Author of "Japanese Management" and presented paper on QFD in "The first national symposium on QFD" organised by Dokuz Eylul University in Turkey.