



King Fahd University of Petroleum & Minerals

Department of Construction Engineering & Management

**CEM 515: Project Quality Management**

**Term Paper**

**“Benefits & Difficulties in implementing TQM in the  
Construction Industry”**

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# Outline

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- TQM
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- Benefits of TQM
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# INTRODUCTION

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The construction industry differs from the manufacturing industry where TQM has proven its effectiveness, in a way that makes the introduction of TQM more challenging

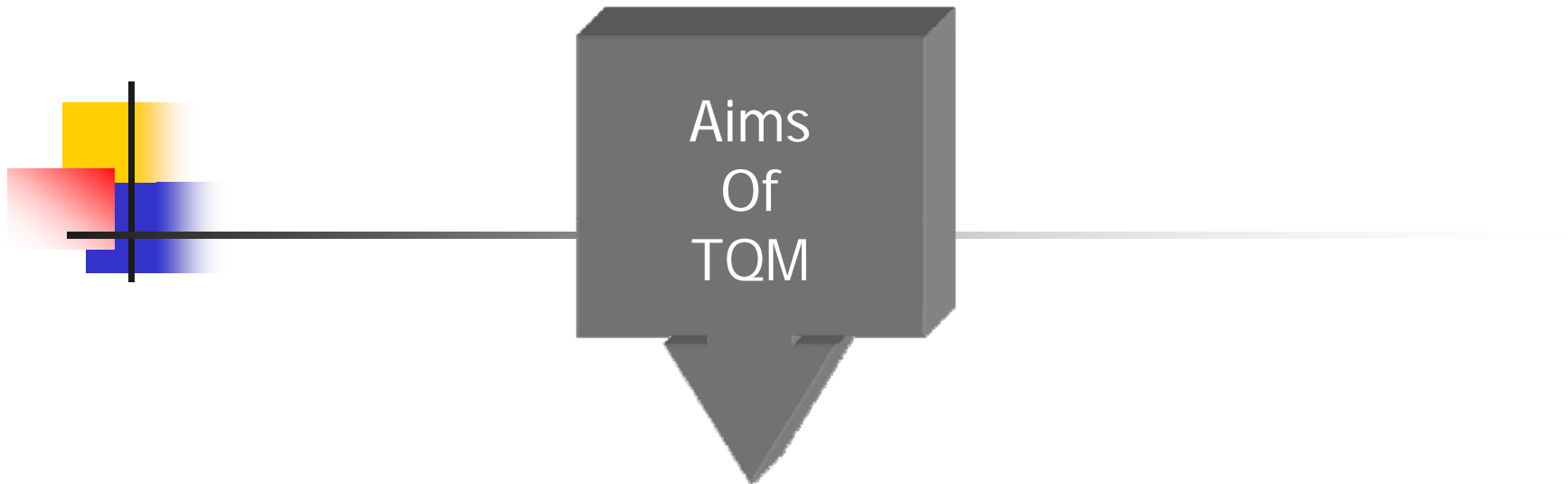
Some of the construction problems such as fluctuation of demand (non-steady state) create difficulties in TQM implementation and TQM could only help the organization to cope with such fluctuations



# TQM

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- The British Standards (BS4778) defines TQM as:
  - *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*
- The American Society for Quality (ASQ) defines TQM as:
  - *The management approach of an organization centered on quality, based on the participation of all of its members and aiming at long-term success through customer satisfaction and benefits to all members of the organization and to society*



To achieve Customer Satisfaction & Cost Effectiveness

Focusing on process improvement, customer/supplier involvement & training



# TQM and Construction Industry

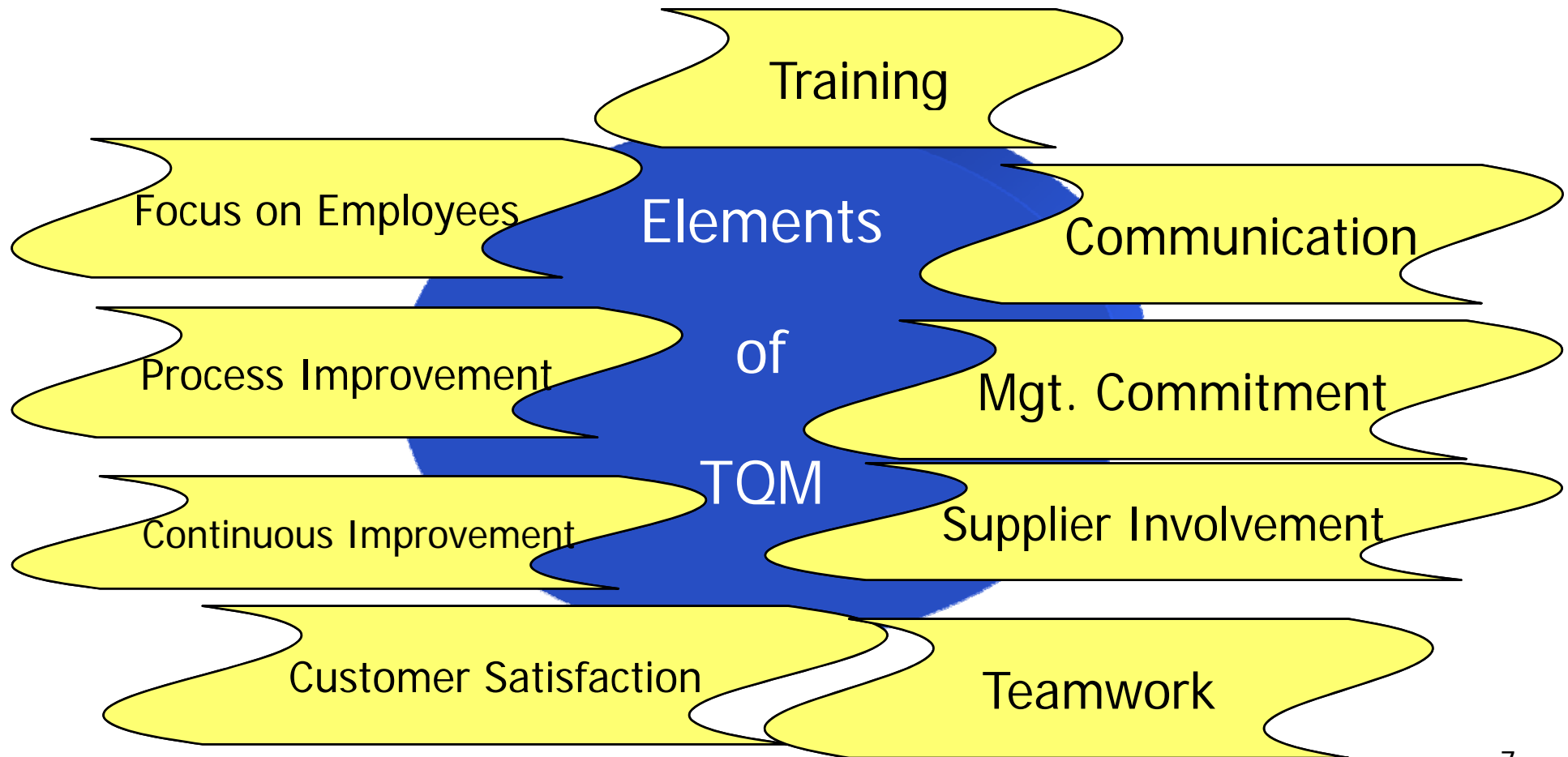
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- The construction industry has tended to confuse TQM and Quality Control (QC) and Quality Assurance (QA), believing that compliance with QA Standards is all that there is to the application of TQM on construction projects
- QA and QC are applied during project implementation while TQM is a strategic philosophy adopted by an organization and implemented on a continuous basis, even if the organization is waiting to perform a new project



# Elements of TQM

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# Training

- The training program must target everyone in the organization, since quality under TQM is everyone's responsibility
- All employees from top management to labor should understand the need for TQM, understand what TQM is and how it works and its payoff
- The training program should cover cause-and-effect analysis, team problem solving, interpersonal communication and interaction, rudimentary statistical methods, cost of quality measurement, and the collection and evaluation of quantitative information
- Training should be continuous





# Management Commitment and Leadership

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- Prior to management commitment, management should have a thorough understanding of TQM
- Once management is committed to TQM, it will provide the necessary resources of time and money to permit improvement
- Senior management, in the form of a Quality Steering Committee, might need to draft a vision statement and a mission statement
- They should cause changes and not continue to execute policy and cope with existing organizational systems.



# Communication

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- Good communication will result in eliminating fear
- Fear makes employees reluctant to voice their opinions or question policies, procedures, and decisions
- The employees should also know the use and the importance of the work he/she produces
- One effective strategy might be open lines of communication that allow direct access for any employee, at any level, to contact upper management regarding an idea for improvement or a particular concern



# Teamwork

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- TQM recognizes that the team approach should not be limited to the internal organization's team, but it should cover vendors and external customers under its umbrella
- The major responsibility of a quality team is to identify the areas of improvement and the reasons for the problem
- After this, team should select a specific goal for improvement
- The solutions to overcome the cause of the problem should then be implemented
- Once the solution proves its effectiveness a new standard should be developed and continuously tracked



# Customer Satisfaction

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- The first step in achieving customer satisfaction is to define the customer's needs and wants and then translate these needs and wants into standards
- the organization must adopt an information gathering program that measures the level of customer satisfaction
- Customer satisfaction can be achieved by implementing the following steps:
  - Make the customer (internal and external) aware of the organization's quality management initiative.
  - Determine customer expectations.
  - Measure the customer's degree of satisfaction.
  - Take action to improve satisfaction



# Continuous Improvement

- Total Quality Management is often termed a journey, not a destination
- Deming's "plan-do-check-act" (PDCA) cycle is a systematic procedure for improving methods and procedures by focusing on correcting and preventing defects
- Avoiding defects is usually less costly than the typical approach of attempting after the fact to determine defects
- Continuous improvement entails focusing on processes so that they can be changed to be more efficient
- The degree of success can be determined by comparing the progress against certain criteria



# Process Improvement

- In some literature, process improvement is referred to as statistical methods or Statistical Process Control (SPC)
- The quality improvement team should consist of a representative from each area that might be involved in a process
- The team has to identify and separate causes of quality problems and propose solutions
- The proposed solutions should then be screened and the best solution should be selected for implementation
- Several tools can be used by the quality improvement team to assist it in studying processes. These tools include histograms, cause-and-effect diagrams, check sheets, Pareto diagrams, graphs



# Focus on Employees (Empowerment)

- TQM views employee satisfaction as an essential factor in improving the contribution of each employee.
- TQM considers the employees as internal customers with whom the company exchanges information and services
- As a result, each employee should try to satisfy his or her internal customers.
- Management should make the working environment open, so honest comments can be made without fear of punishment.
- management should encourage suggestions and a procedure should be developed for taking action on suggestions



# Supplier Involvement

- TQM pays attention to the suppliers or vendors of an organization
- Maintaining close and long-term relationships with suppliers results in achieving the best economy and quality
- Maintaining a close relationship with the suppliers help them to have a good understanding and a feel for their customers' requirements
- Deming emphasized the importance of maintaining special relations with suppliers
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- Deming stresses this and states:
  - *End the practice of awarding business on the basis of price tag alone. Instead, minimize total cost by working with a single supplier."*





# Benefits of TQM

consistency

Reduced production time

Reduction in the quantity of goods  
damaged in transit

Reduced delivery time

Improvement in customer perceptions  
of the organization

Customer Satisfaction

Increase in sale

Decrease in costs

# The Difficulties in Implementing TQM

Fundamental organizational culture change

Inadequate knowledge and information about TQM

Doubts of employees about management's intentions

Failure of management to maintain interest and commitment over a long period of time

Difficulty in measuring the effectiveness of TQM

Poor internal communication

Difficulty in assessing customer expectations and satisfaction

Failure to have some means of monitoring and managing the overall progress of the TQM implementation.

failing to involve suppliers & subcontractors

# TQM Implementation

Identify the degree of commitment and area of key interest, and list the long-term changes required

Define the objective of TQM

Identify resources available and develop understanding of the organizational system with the quality system

Specify top management commitment through quality policies, procedures and processes

Design action plans

Develop strategies for implementation.

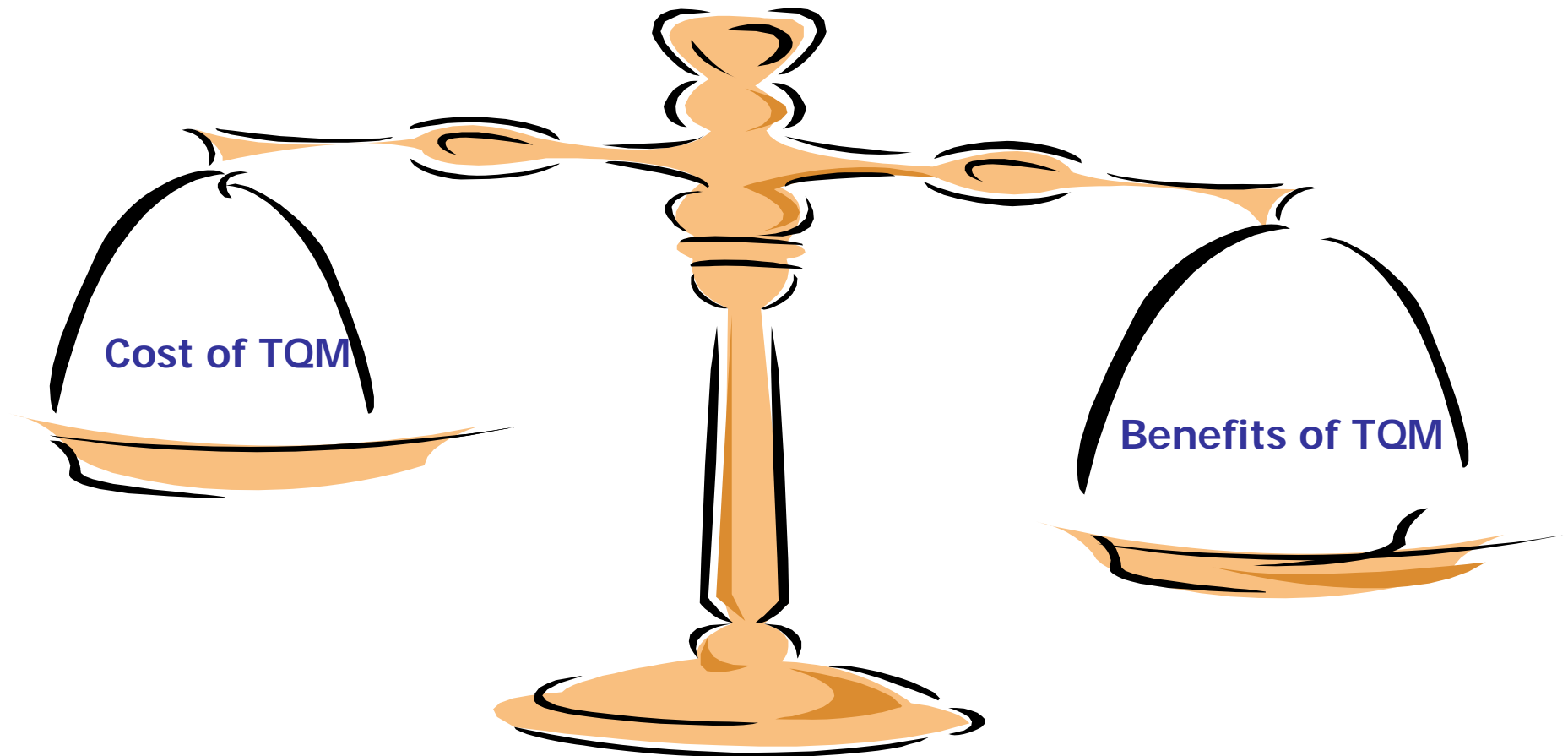
Implement & Monitor

Measure benefits



# The Cost of TQM

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# The Cost of TQM

Higher quality means higher cost

An enhancement in quality requires investment in terms of labor, materials, design and other resources. The additional benefits from improved quality do not compensate for the additional expenses

The cost of improving quality is less than the resulting savings

the saving resulting from less rework, scrap, and other direct expense related to defects is the drive for continuous improvement of process

Quality costs are those incurred in excess of those that would have been incurred if the product had been built

Costs include the indirect (hidden cost) costs such as lost customers, lost market share, and many hidden costs and opportunities, which are not identified by cost accounting systems



# TQM and Measurement

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To be able to attain and sustain reasonable objectives

To justify the use of resources

To provide standards for establishing comparisons

To determine priority areas that requires improvement

To identify quality problems

# TQM Measurement in Construction Industry

Concentrate on the measurement of laborers' productivity since it is a labor-intensive industry

Other measures could be developed to measure the rework and the effect of the training on minimizing the rework, the effect of improvement in inventory and materials handling and equipment operation

Criteria for selecting measurement:

Progress

Continuous  
Improvement

Forecasting



# TQM Measurement in Construction Industry

Benchmarking is one of the tools which may be used for obtaining quality improvement in TQM

Effectiveness

Efficiency

Productivity

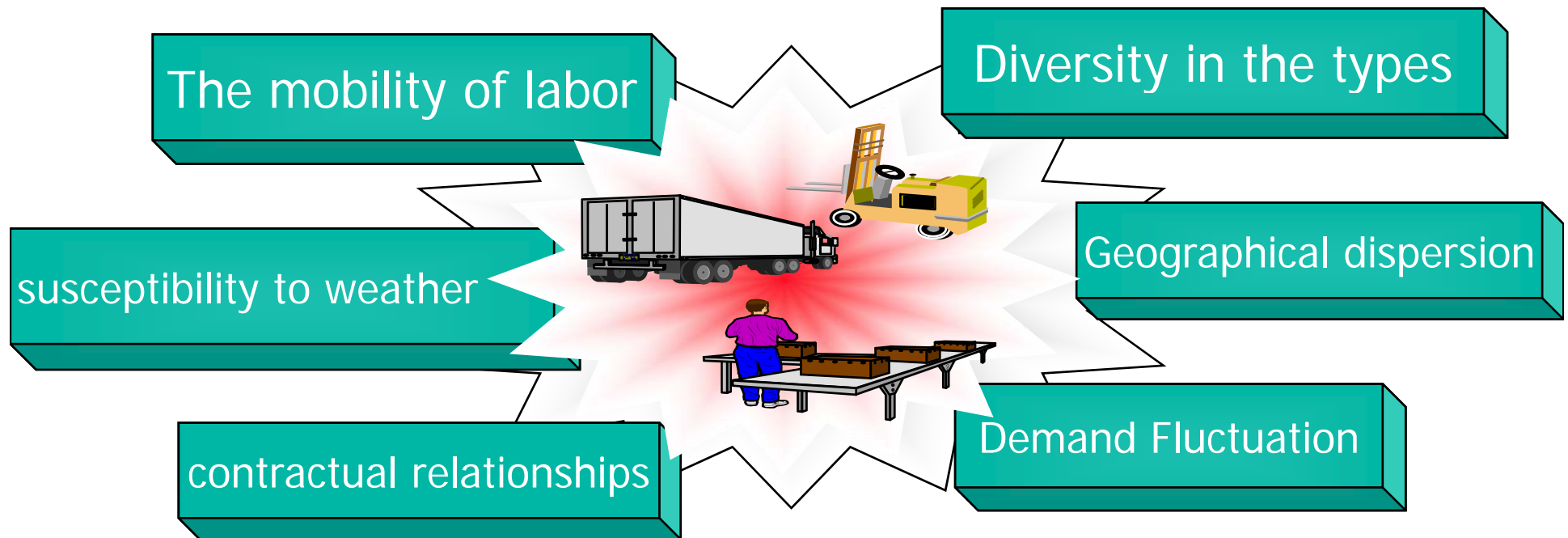
Quality

Improvement



# TQM and the Construction Industry

Thesis



# Difficulties of TQM Implementation in the Construction Industry

**You can't apply industrial management solutions to construction, because of the unique nature of the construction industry**

**You can't do statistical analysis of construction processes, because they are unique and non-repetitive**

**You can't invest in training at the job level, because individual employments short-term, the people have no company loyalty and the environment is too difficult**

**You can't spend money on management programs, because there is too much competition and the margins won't allow it**



# Partnership in the Construction Industry

## Contractor

Reduced costs related to potential claims and litigation

Lower risk of cost overruns and delays

Financial success through innovative construction methods

## Benefits Of Implementing Partnership

## Owner

Reduction in claims and improved conflict resolution strategies

Reduced cost overruns and delays

Increased opportunity for innovation



# Challenge of the Saudi Construction Industry

- Fluctuation of demand for construction
- Foreign competition and the illegal conduct of many foreign companies apparently thought necessary to survive in the Saudi market
- The existing debts and accumulated interest of Saudi market
- The difficult procedures for transferring expatriate labor sponsorship for various professions between construction firms
- There is no agency dedicated to consider the solve contractors' problems
- There are no funds dedicated to finance Saudi contractors, other than from commercial banks, as is the case with other non-petroleum sectors
- Non-compliance of foreign companies performing some construction projects in the Kingdom with the government rules which require foreign companies to subcontract 30% of their business to local contractors
- The unsuitability of the existing Saudi contractor classification system for the present situation which needs due reconsideration
- The lack of clarity of the language used in contracts



# Challenge of the Saudi Construction Industry

**Insufficient experience of management at all levels**

**Delays in payments**

**Poor labor productivity**

**The autocratic characteristics of the management**

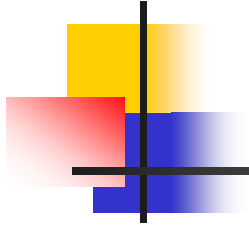
**Poor estimating**



# Summary

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- Interest of TQM increased during periods of financial difficulty
- TQM implementation is an extremely lengthy process
- The perception of TQM changes as the organization goes through the TQM Journey



THANK YOU