DOCUMENT RESUME

ED 365 882	CE 065 642

AUTHOR	Leigh, David
TITLE	Total Quality Management (TQM): Training Module on "Focus on Processes."
INSTITUTION	Temple Junior Coll., TX.
SPONS AGENCY	Texas State Higher Education Coordinating Board, Austin.
PUB DATE	1 Jun 93
NOTE	34p.; For related documents, see CE 065 638-646.
PUB TYPE	Guides - Classroom Use - Teaching Guides (For Teacher) (052)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Business Administration; Business Education; Course Content; Course Descriptions; *Formative Evaluation; High Schools; Improvement Programs; Job Training; Labor Force Development; Learning Activities; Learning Modules; Management Teams; *Organizational Development; Organizations (Groups); Participative Decision Making; *Quality Control; *Staff Development; Teaching Methods; Teamwork; Two Year Colleges; Units of Study; Work Environment
IDENTIFIERS	*Total Quality Management

ABSTRACT

This module for a 1-semester Total Quality Management (TQM) course for high school or community college students contains a brief overview of the definition of processes, a section on process flow diagrams, and a section on process management as well as a description of process variation. Examples are used throughout the module to make processes easier for students to understand. A bibliography lists six references. Handouts and transparency masters are included. (KC)

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TOTAL QUALITY MANAGEMENT (TQM):

TRAINING MODULE

ON

" FOCUS ON PROCESSES "

Prepared by

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TQM/Tech Prep
June 1, 1993

This project is supported by funds from the Carl D. Perkins Vocational and Applied Technology Education Act

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" FOCUSING ON PROCESSES "

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FOCUS ON PROCESSES

INTRODUCTION:

The module on Focus on Processes contains a brief overview of the definition of processes, a section on process flow diagrams and a section on process management as well as a description of process variation. Examples are used throughout this module to better describe processes and make it easier for the reader to understand.

The concept of processes is one of the key concepts within Total Quality Management. Continuous improvement is usually achieved by defining a process and improving that process. It is therefore very important that those people trying to understand Total Quality Management have a better understanding of processes and how they work. It is suggested the module on Focus on Processes be used in conjunction with one of the other Total Quality Management modules when teaching. The use of the Processes module with either Problem Solving or Continuous Improvement could be useful. It would also be useful to use the module on processes to introduce Statistical Process Control.

FOCUS ON PROCESSES

NARRATIVE:

It is very important the student understand the definition of a process and the basics of how a process works. A "process" is defined as, "an integration of people, material, methods and machines used to produce, with value added, output for customers." This definition comes from Arthur Tenner and Irving DeToro's book on Total Quality Management. On page 10 is a better description of a relationship between the workers, the suppliers and the customers within a process. Another concept that is important is that each process must have an owner and this owner is the one who is responsible for improving the process. This owner is critical in making process improvements, as will be described in the module on Continuous Improvement. An example is used throughout this module to better describe, to those using the module, the characteristics of processes. This example describes getting ready for school in the morning.

It is important to be able to describe a process, not only in words, but by also using the process flow diagram. The use of process flow diagrams is discussed on pages 14 through 18. Several examples of these diagrams are provided to help students better understand the process flow diagram's workings. Process flow diagrams are very useful in documenting a process, explaining the process to others and being able to compare different processes. The process flow diagram is also very helpful in identifying duplicate and/or unnecessary steps within a process. The use of the process flow diagram might be compared with the old adage, "a picture is worth a thousand words." I've found it extremely useful to show processes by means of process flow diagrams. I believe if a person understands a process, they will be able to document it in a process flow diagram, and by documenting it in a process flow diagram a person shows that they understand the process.

Reviewing the process flow diagram helps the person who is documenting the process to understand if there are steps missing, or if there is a true logical flow. It is not uncommon for processes to be missing several steps that are critical to their success.

The section on Process Management is used to give the student an opportunity to understand different ways of managing processes. The process oriented management style is one where there is involvement throughout the process and it is very much tailored after Total Quality Management principles of empowerment and leadership. This style of management, as described on the chart on page 21, shows that efforts to improve the process go on throughout the process, whereas the old "style" of result oriented management, where the results of the process are measured and then the improvements are made is just based on results. In practical application, it is much better to monitor the process throughout the different stages of the process to see where the problems are versus waiting for the final result. In waiting for the final result, often times you do not know what went wrong within the process. Again, the use of the process oriented management is much more productive and efficient than is waiting for the result oriented type management.

Another concept of process management is identifying which processes are key to your customer and measuring these processes. Once this is done, the tools of continuous improvement can be used to make improvements on the processes in order to meet your customer's expectations. Samples of traditional processes versus the new Total Quality Management processes are given on pages 24 and 25. The first one shows a traditional school process, where teaching occurs and then testing. If the student passes the test they go to the next grade. If they fail the test, they then have failed the class and must repeat the course. The new Total Quality Management concept of education would be that students are taught the course until they are able to meet their competencies, then they would go on to the next grade. There would not be a pass/fail concept. This very much is in line with the old traditional manufacturing process versus the new Total Quality Management process. In the old traditional manufacturing process, a process step was completed and then the "part" or "service" was inspected. If it was good, it went on to the customer. If it was bad, it was rejected and repaired. The new Total Quality Management process has the "inspection" built right into the process step. Therefore, when it is completed, it just goes to the next step, or goes to the customer.

An important part of understanding processes is understanding process variation. Process variation is really the inevitable difference between different outputs of a process. There are two sources of variation. One of those is common causes and the second is special causes. Common causes are those that are always present within a process, where the random variation causes it to vary slightly. The special cause is a cause of variation that is intermittent and unpredictable. Special causes can be eliminated or reduced by using problem solving techniques. A good example of explaining process variation would be to measure when buses arrive at school. If they are expected to arrive at school promptly at 8:00 a.m. and their arrival times are measured in 15 minute increments, as shown on pages 32 and 33, the small amount of variation would occur when they arrive very close to 8:00 a.m., a larger variation would be where their arrival times have a much broader range of arrivals. To understand the difference between common cause and special cause, first look at those arrivals that are grouped very close to 8:00 a.m.: These variations are caused by common causes such as; heavy traffic, red lights and parents bringing students to school and interrupting traffic flow around the school building. Examples of special causes in the variation of arrival time are; a bus breaking down or a train wreck blocking a crossing. Both of these examples would cause lengthy delays. Again, these are special causes versus common causes.

The use of the example about the young lady getting ready for school in the morning helps explain process variation and also helps clarify special causes and common causes to a greater degree.

In summary, the understanding of processes is very important in the overall understanding of Total Quality Management. Breaking organizations and systems down into processes provides a means of taking measurements and then making continuous improvement.

" PROCESSES "

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PROCESSES

DEFINITION:

A process can be defined as the sequential integration of people materials, methods, and machines in an environment to produce value-added outputs for customers.

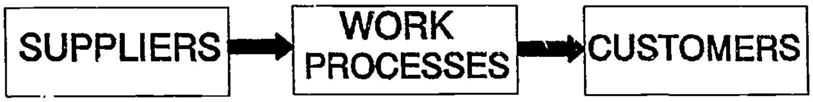
--Arthur Tenner and Irving DeToro, Total Quality Management.

PROCESSES

People involved in the operation and improvement of processes:

1.	**Customer:**	the people (or person) for whom the output (product or service) is being produced. Customers are the people who will use the output directly or who will take it as input into their work process.
2.	**Work Group:**	the people (or person) who work in the process to produce and deliver the desired output.
3.	**Supplier:**	the people (or person) who provide input to the work process. The people in the process are in fact the customers of the supplier.
4.	**Owner:**	the person who is responsible for the operation of the process **and** for its improvement.

PROCESSES



--Arthur Tenner and Irving DeToro, Total Quality Management

PROCESSES

EXAMPLES OF PROCESSES:

- Registering for class
- Processing a purchase order
- Getting ready to go to school/work in the morning
- Building a house
- Getting a driver's license
- Manufacturing a car
- Solving a problem
- Writing a term paper

PROCESSES

EXAMPLE:

"GETTING READY FOR SCHOOL IN THE MORNING"

In order to illustrate processes, the example of an eleventh grade girl preparing for school will be used. The process this young lady follows is not meant to be accurate, only representative of a possible process that might be followed.

The process she follows each morning is listed below:

1. Wake up
2. Turn off alarm
3. Shower and wash hair
4. Dry hair
5. Apply makeup
6. Select clothes to wear
7. Dress
8. Make up bed
9. Talk with parents
10. Eat breakfast
11. Brush teeth
12. Leave the house

Again, this is a simplified process that will be used later during the section on process flow diagrams and process variation to demonstrate both of those concepts.

" PROCESS FLOW DIAGRAMS "

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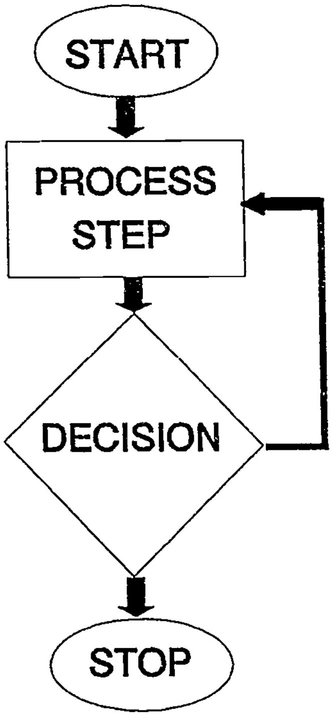
PROCESS FLOW DIAGRAMS

A process flow diagram or "flowchart" is a pictorial representation showing all of the steps of a process. Flowcharts provide excellent documentation of a process and can be a useful tool for examining how various steps in a process are related to each other.

Flowcharting uses easily recognizable symbols to represent the type of processing performed.

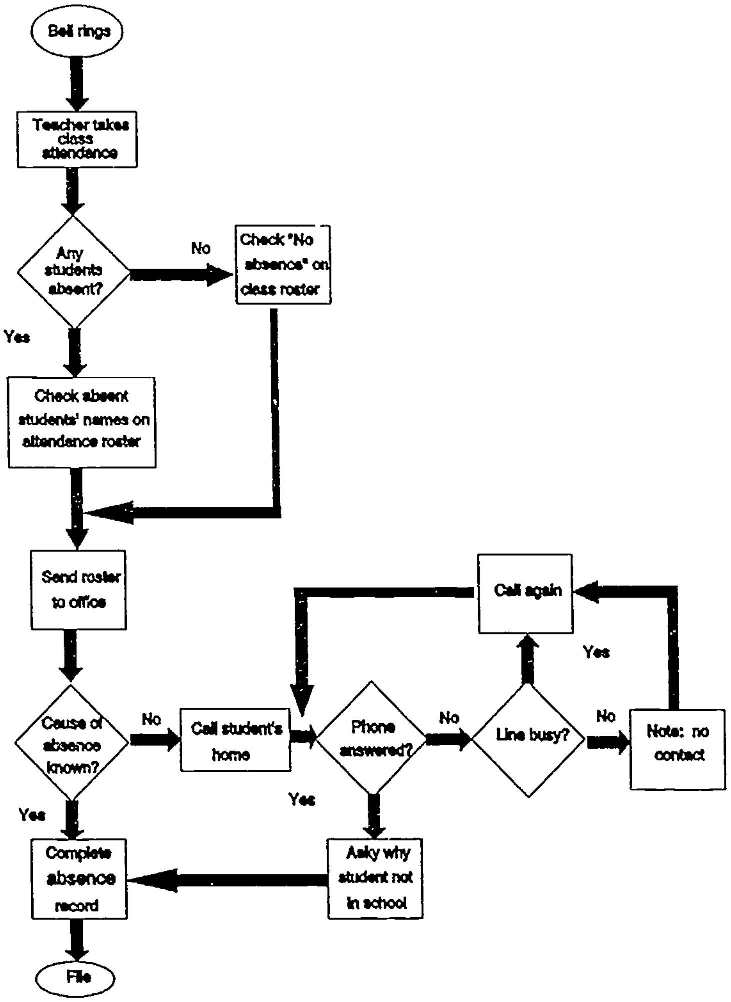


The process flow diagram is drawn from the top of the page to the bottom of the page with arrows signifying process sequence or flow.

PROCESS FLOW DIAGRAMS

An example from The Memory Jogger for Education for attendance monitoring is shown below:

Flowchart--Operations Example
Attendance Monitoring



Bell rings
Teacher takes class attendance
Any students absent?
No
Check "No absence" on class roster
Yes
Check absent students' names on attendance roster
Send roster to office
Call again
Yes
Cause of absence known?
No
Call student's home
Phone answered?
No
Line busy?
No
Note: no contact
Yes
Yes
Complete absence record
Asky why student not in school
File

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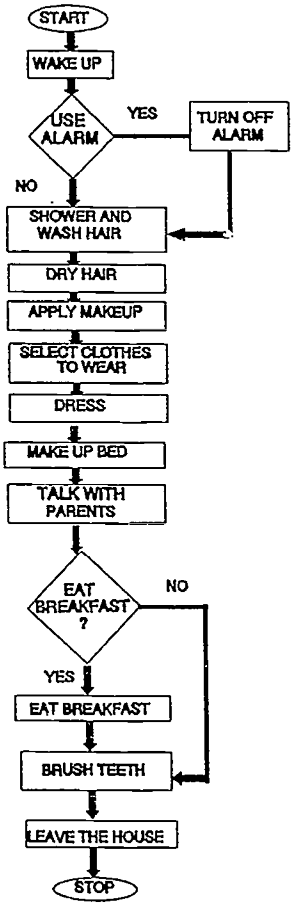
PROCESS FLOW DIAGRAMS

The process "getting ready for school in the morning" is depicted below: (note that decisions have been added to the original process as defined earlier)


START
WAKE UP
USE ALARM
YES
TURN OFF ALARM
NO
SHOWER AND WASH HAIR
DRY HAIR
APPLY MAKEUP
SELECT CLOTHES TO WEAR
DRESS
MAKE UP BED
TALK WITH PARENTS
EAT BREAKFAST ?
NO
YES
EAT BREAKFAST
BRUSH TEETH
LEAVE THE HOUSE
STOP

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PROCESS FLOW DIAGRAMS

BENEFITS:

1. Excellent documentation of process
2. Useful tool in explaining process to others
3. Useful tool for comparing different processes
4. Helpful in identifying duplicate or unnecessary steps of the process

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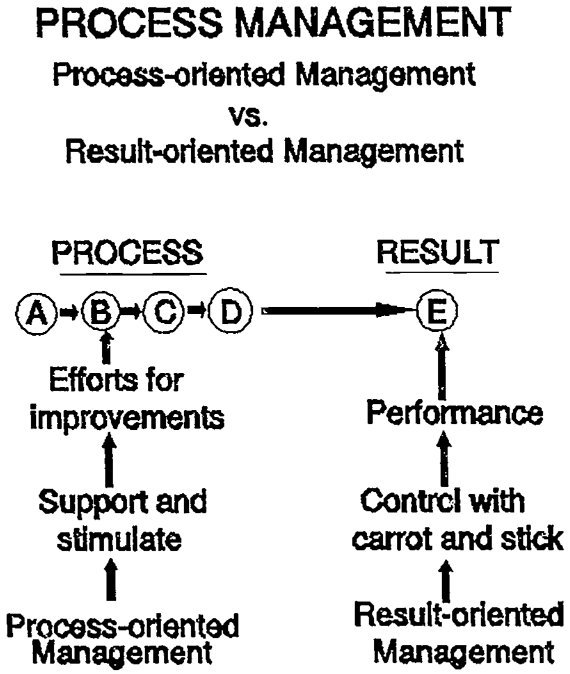
PROCESS MANAGEMENT

DEFINITION:

Process-oriented management is a style of management that is also people oriented in contrast to one that is oriented solely toward results. In process-oriented management, a manager must support and stimulate efforts to improve the way employees do their jobs. Such a style of management calls for a long-term outlook and usually requires behavioral change.

Process-oriented Management vs. Result-oriented Managment:



PROCESS MANAGEMENT

Process-oriented Management
vs.
Result-oriented Management

PROCESS
RESULT
A
B
C
D
E
Efforts for improvements
Support and stimulate
Process-oriented Management
Performance
Control with carrot and stick
Result-oriented Management

—Masaaki Imai, Kaizen

--Masaaki Imai, Kaizen

PROCESS MANAGEMENT

1. Identify Key Processes Impacting on Success of the Organization
2. Assign Ownership
3. Plan Approach to Define and Document Process
4. Measure Performance of the Process Against Customers' Expectations
5. Control Process to Assure Predicable Performance
6. Improve Capability to Meet Customers' Expectations
7. Optimize Efficiency and Productivity

-- Arthur Tenner and Irving DeToro, Total Quality Management

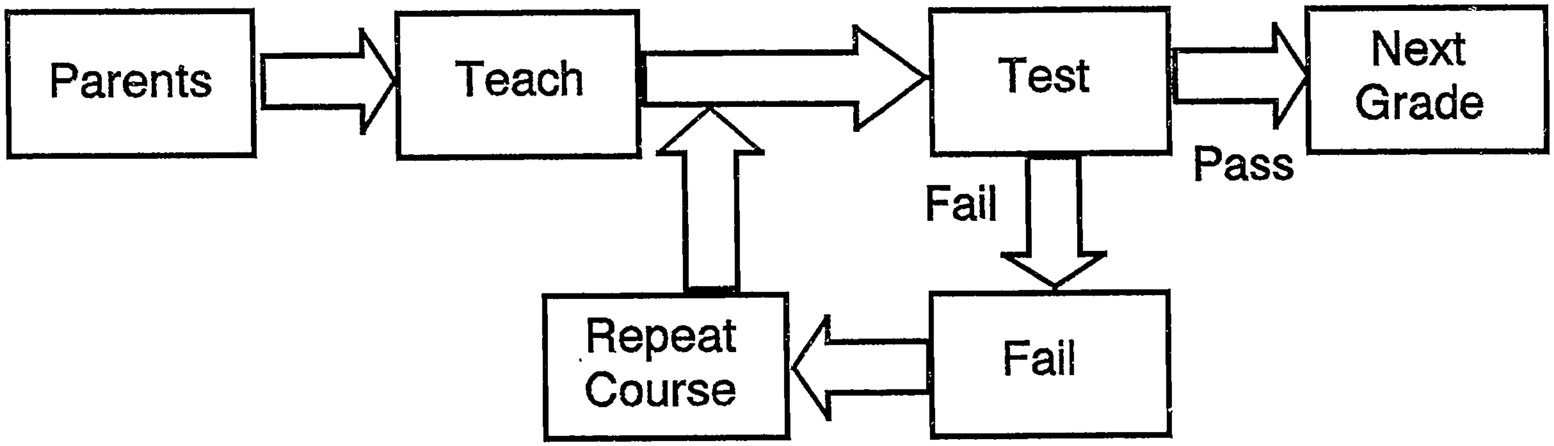
PROCESS MANAGEMENT

IDENTIFYING KEY PROCESSES:

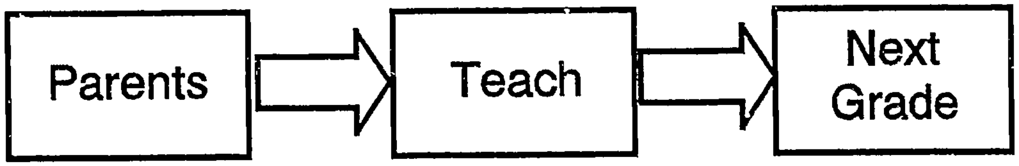
1. Which products and services are most important to the customers?
2. What are the processes that produce these products and services?
3. What are the key ingredients that stimulate action in the organization, and what are the processes that convert these stimuli to outputs?
4. Which processes have the highest visibility with customers?
5. Which processes have the greatest impact on customer-driven performance standards?
6. Which processes do performance data or common sense suggest have the greatest potential for improvement?

-- Arthur Tenner and Irving DeToro, Total Quality Management

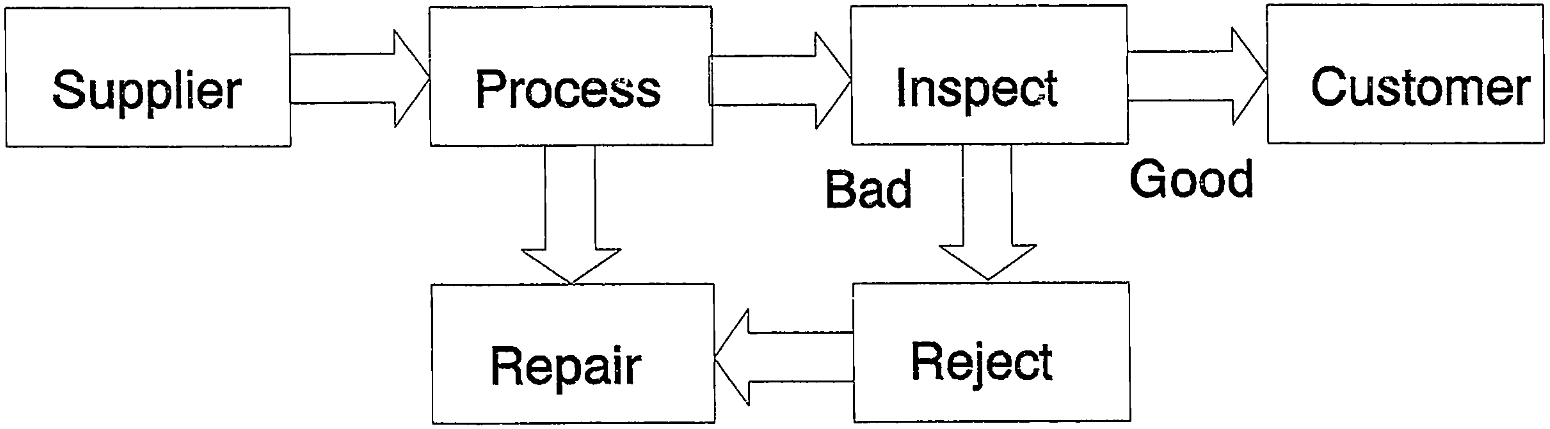
Traditional School Process


Parents
Teach
Test
Pass
Next Grade
Fail
Fail
Repeat Course

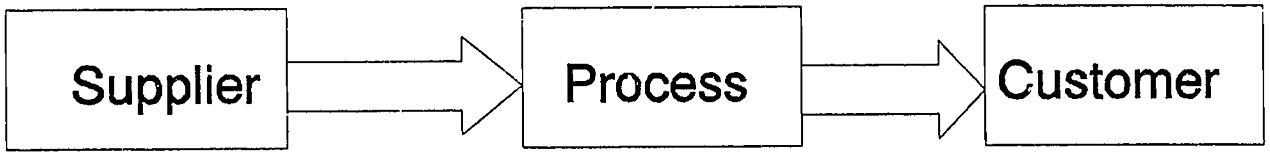
TQM School Process


Parents
Teach
Next Grade

Traditional Manufacturing Process


Supplier
Process
Inspect
Customer
Bad
Good
Repair
Reject

TQM Manufacturing Process


Supplier
Process
Customer

PROCESS MANAGEMENT

MAJOR REASONS FOR FAILURE TO IMPROVE BUSINESS PROCESSES:

1. The failure to identify key processes and assign ownership.

2. The failure to apply a **robust** improvement approach that builds an understanding of fundamental root causes of problems.

3. The failure to measure the right things.

-- Arthur Tenner and Irving DeToro, Total Quality Management

PROCESS MANAGEMENT

" THE OWNER OF ANY PROCESS IS THE PERSON AT THE LOWEST LEVEL, IN THE ORGANIZATION, WHO HAS THE AUTHORITY TO IMPLEMENT CHANGES AND WHO IS RESPONSIBLE FOR THE CONSEQUENCES OF THESE CHANGES. "

-- Arthur Tenner and Irving DeToro, Total Quality Management

" ALL ORGANIZATIONS ARE PERFECTLY DESIGNED TO GET THE RESULTS THEY GET --- IF YOU DON'T LIKE THE RESULTS YOU'RE GETTING, LOOK AT THE ORGANIZATION'S DESIGN!!! "

-- David Hanna, High Performance Organizations

" MOST QUALITY PROGRAMS FAIL FOR ONE OF TWO REASONS: THEY HAVE SYSTEM WITHOUT PASSION, OR PASSION WITHOUT SYSTEM. "

-- Tom Peters

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PROCESS VARIATION

DEFINITIONS:

Variation

Variation is the inevitable difference among individual outputs of a process. The sources of variation can be grouped into two major classes: common causes and special causes.

Common Cause

Common cause is a source of variation that is always present; it is part of the random variation inherent in the process itself. Its original can usually be traced to an element of the system that only changing the process can correct.

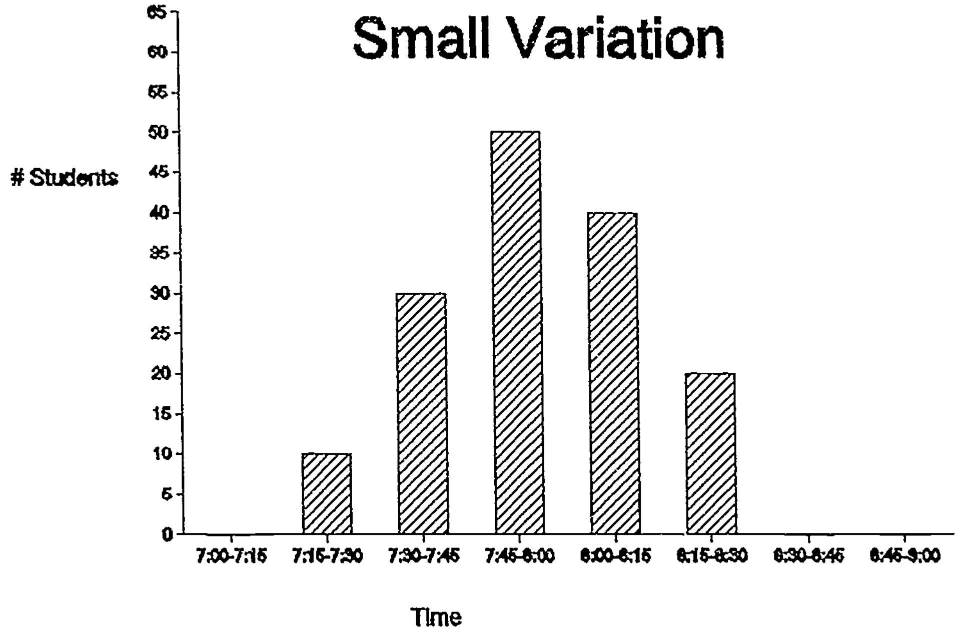
Special Cause

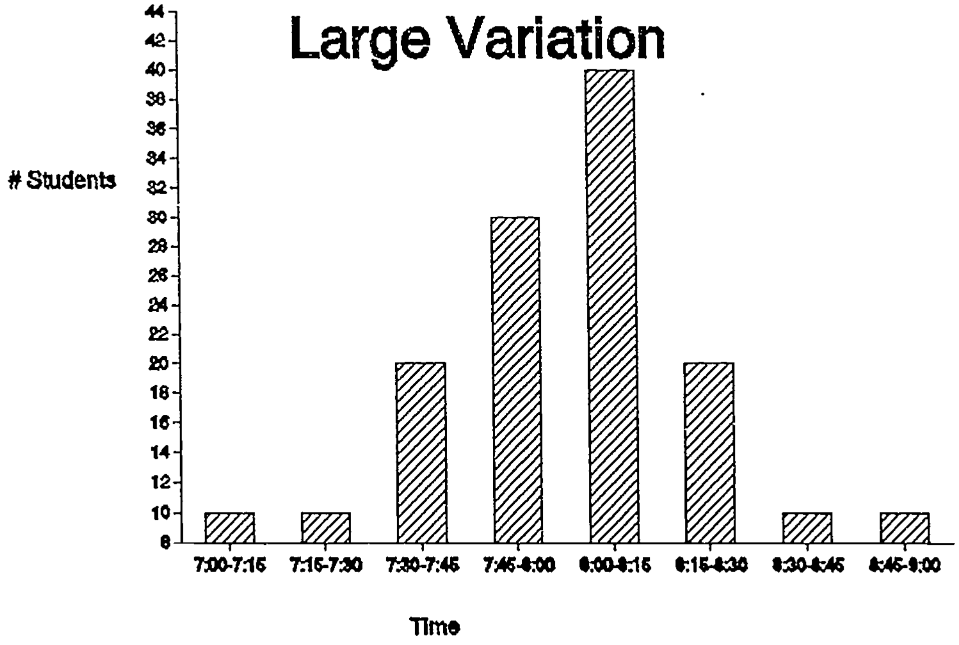
Special cause, also known as an assignable cause, is a source of variation that is intermittent, unpredictable, unstable. Special causes can be eliminated or reduced by the use of problem solving techniques.

PROCESS VARIATION

Graphical Representation:

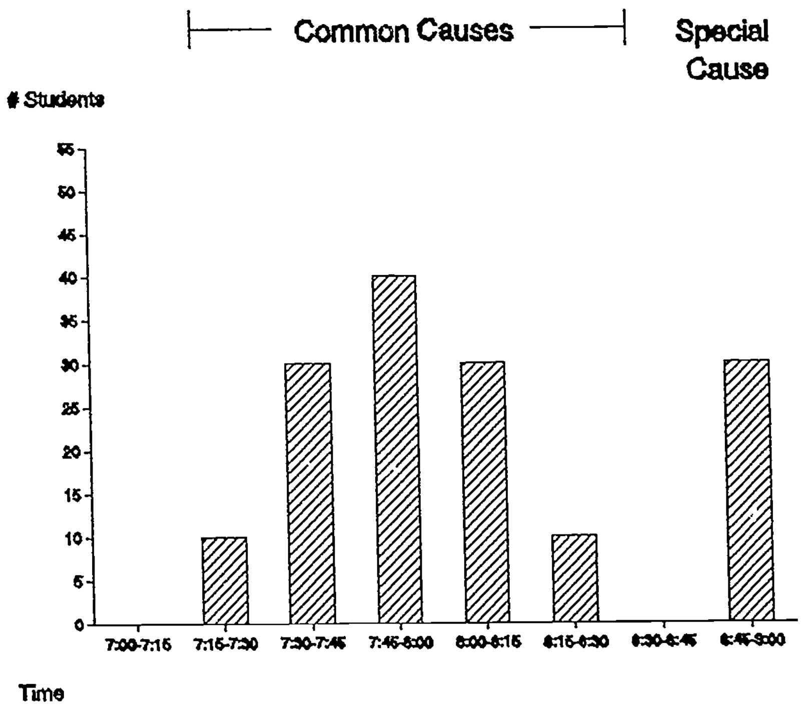
Example: "Arrival Time at School"





PROCESS VARIATION

Common and Special Causes:



Examples of Common Causes:

1. Traffic in town
2. Time parents go to work
3. Only one street into school causes congestion

Examples of Special Causes:

1. Bus broke down
2. Train wreck blocked crossing

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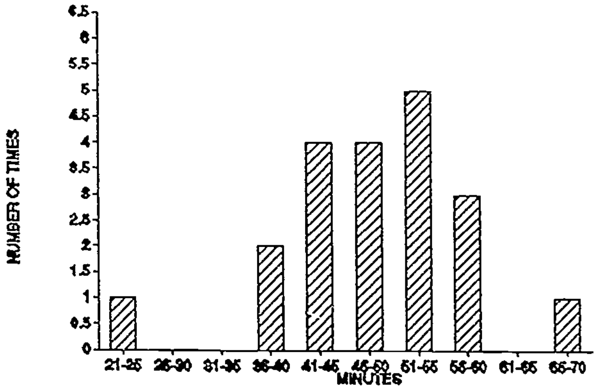
PROCESS VARIATION

Example: "Getting Ready for School in the Morning"

A student decided to keep records of how long it was taking her to get ready to go to school. She wanted to sleep later, but was afraid she might be tardy. For one month (22 days), she measured the time from when the alarm went off until she left the house. She recorded her times in five minute increments.



After looking at the data, she determined that her common causes of variation caused her to take from 36-60 minutes. She attributed these common causes to:

1. Her hair style for a particular day.
2. How much time she spent selecting clothes to wear.
3. Whether or not she ate breakfast.
4. What she ate for breakfast.
5. How much time she spent talking with her parents.

She looked at the two days (21-25 minutes) and (66-70 minutes) and remembered the special causes for those days. They were:

1. She forgot to set her alarm, thus waking up late one morning and having to rush to get to school on time.
2. She left her hair dryer at a friends house one weekend and had to wait for her mother to finish before she could borrow her's.

She decided to eliminate the first special cause by putting a reminder next to her light switch. Her solution for her second special cause was that she would get dressed and eat first if she had to wait on the hair dryer again.

FOCUS ON PROCESSES

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