SERVICES SCIENCE AND SERVICE OPERATIONAL MANAGEMENT

UNIT 03

LECTURE 06

Unit-3 Service Quality Dimensions

3.6	Quality and Productivity Improvement Process
3.7	Quality Tools
3.8	Benchmarking
3.9	Improvement Programs

Virupakshan K

+91-9840847872 | VIRU@KART.LA

21MGH402T SERVICES SCIENCE AND SERVICE OPERATIONS MANAGEMENT
SYLLABUS

Unit-1 - Service – Definition	***9 Hour***
Characteristics, Stages of economic development, Role of services in economy, Experience economy, Service science, Service dominant logic, Service systems, Service operations, Open system view of service operations, Service package, Strategic service vision, Competitive service strategies, Strategic analysis, Sustainability in services, Competitive role of information in services	
Unit-2 - New Service Development	***9 Hour***
Innovation in services, Service blueprinting, Service process design, Service system design, Service facility design and layout, Strategic location considerations, Service process analysis, Service encounter triad - Service organization, Contact personnel and Customer, Service profit chain, Technology in service encounter	
Unit-3 - Service Quality Dimensions	***9 Hour***
Measuring service quality – SERVQUAL gap model, walk through audit, Service quality by design, achieving service quality, Quality and productivity improvement process, Quality tools, Benchmarking, Improvement programs	
Unit-4 - Strategies	***9 Hour***
Strategies for managing service demand and service capacity, Forecasting service demand, Forecasting models – Subjective models, Causal models and Time-series models, Yield management and its application, Queuing systems, Essential features of queuing systems	
Unit-5 - Managing Service Projects	***9 Hour***
Characteristics of project, Project management – Principles, Process, and Building team, Selecting the project manager, Roles and responsibilities of project manager, Techniques for project management – PERT, CPM and Gantt charts, Monitoring project performance, Globalization of services, Global service strategies, Domestic growth and expansion strategies, Franchising	

SSSOM Syllabus

Unit-1 Service – Definition

1.1	Characteristics
1.2	Stages of Economic Development
1.3	Role of Services in Economy
1.4	Experience Economy
1.5	Service Science
1.6	Service Dominant Logic
1.7	Service Systems
1.8	Service Operations
1.9	Open System View of Service Operations
1.1	Service Package
1.11	Strategic Service Vision
1.12	Competitive Service Strategies
1.13	Strategic Analysis
1.14	Sustainability in Services
1.15	Competitive Role of Information in Services

Unit-2 New Service Development

2.1	Innovation in Services
2.2	Service Blueprinting
2.3	Service Process Design
2.4	Service System Design
2.5	Service Facility Design and Layout
2.6	Strategic Location Considerations
2.7	Service Process Analysis
2.8	Service Encounter Triad – Service Organization, Contact Personnel and Customer
2.9	Service Profit Chain
2.10	Technology in Service Encounter

Unit-3 Service Quality Dimensions

3.1	Measuring Service Quality
3.2	SERVQUAL Gap Model
3.3	Walk Through Audit
3.4	Service Quality by Design
3.5	Achieving Service Quality
3.6	Quality and Productivity Improvement Process
3.7	Quality Tools
3.8	Benchmarking
3.9	Improvement Programs

Unit-4 Strategies

4.1	Strategies for Managing Service Demand and Service Capacity
4.2	Forecasting Service Demand
4.3	Forecasting Models – Subjective Models
4.4	Forecasting Models – Causal Models
4.5	Forecasting Models – Time-Series Models
4.6	Yield Management and its Application
4.7	Queuing Systems
4.8	Essential Features of Queuing Systems

Unit-5 Managing Service Projects

5.1	Characteristics of Project
5.2	Project Management – Principles, Process and Building Team
5.3	Selecting the Project Manager
5.4	Roles and Responsibilities of Project Manager
5.5	Techniques for Project Management – PERT
5.6	Techniques for Project Management – CPM
5.7	Techniques for Project Management – Gantt Charts
5.8	Monitoring Project Performance
5.9	Globalization of Services
5.1	Global Service Strategies
5.11	Domestic Growth and Expansion Strategies
5.12	Franchising

Lecture 06 Topics

Unit-1 Service – Definition

1.1	Characteristics
1.2	Stages of Economic Development
1.3	Role of Services in Economy
1.4	Experience Economy
1.5	Service Science
1.6	Service Dominant Logic
1.7	Service Systems
1.8	Service Operations
1.9	Open System View of Service Operations
1.1	Service Package
1.11	Strategic Service Vision
1.12	Competitive Service Strategies
1.13	Strategic Analysis
1.14	Sustainability in Services
1.15	Competitive Role of Information in Services

Unit-2 New Service Development

2.1	Innovation in Services
2.2	Service Blueprinting
2.3	Service Process Design
2.4	Service S
2.5	Service F
2.6	Strategic
2.7	Service P
2.8	Service E Organizat Custome
2.9	Service Profit Chain
2.10	Technology in Service Encounter

Unit-3 Service Quality Dimensions

3.1	Measuring Service Quality
3.2	SERVQUAL Gap Model
3.3	Walk Through Audit
3.4	Service Quality by Design
3.5	Achieving Service Quality
3.6	Quality and Productivity Improvement Process
3.7	Quality Tools
3.8	Benchmarking
3.9	Improvement Programs

Unit-4 Strategies

4.1	Strategies for Managing Service Demand and Service Capacity
4.2	Forecasting Service Demand
4.3	Forecasting Models – Subjective Models

3.6	Quality and Productivity Improvement Process
3.7	Quality Tools
3.8	Benchmarking
3.9	Improvement Programs

Unit-5 Managing Service Projects

5.1	Characteristics of Project
5.2	Project Management – Principles, Process and Building Team
5.3	Selecting the Project Manager
5.4	Roles and Responsibilities of Project Manager
5.5	Techniques for Project Management – PERT
5.6	Techniques for Project Management – CPM
5.7	Techniques for Project Management – Gantt Charts
5.8	Monitoring Project Performance
5.9	Globalization of Services
5.1	Global Service Strategies
5.11	Domestic Growth and Expansion Strategies
5.12	Franchising

3.6 Quality and Productivity Improvement Process

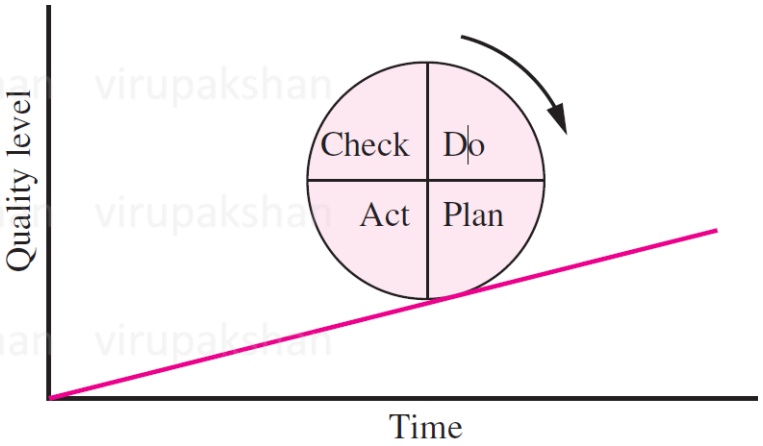
1. Foundations of Continuous Improvement

- Continuous improvement is based on the teachings and philosophy of **W. Edwards Deming**.
- Deming's teachings consisted of **three principles**:
  1. **Customer satisfaction.**
  2. **Management by facts.**
  3. **Respect for people.**

2. Plan-Do-Check-Act (PDCA) Cycle

Deming's approach, represented by a wheel, consists of **4 steps**:

1. **plan**, select and analyze the problem;
2. **do**, implement the solution;
3. **check** the results of the change; and
4. **act** to standardize the solution and reflect on the learning.



3.6.1 Quality and Productivity Improvement Process

The foundations of **Deming's teachings** consisted of **three principles**:

1. Customer satisfaction. Focusing on satisfying customers' needs should be paramount in workers' minds. This requires an attitude of putting the customer first and a belief that this principle is the object of one's work.

2. Management by facts. To encourage scientific thinking, objective data must be collected and presented to management for decision making. This approach requires formal data gathering and statistical analysis of the data by the quality improvement teams.

3. Respect for people. A companywide quality-improvement program assumes that all employees have a capacity for self-motivation and for creative thought. Employees are given support, and their ideas are solicited in an environment of mutual respect.

3.6.2. Q Quality and Productivity Improvement Process

Q. Briefly explain the 4 steps in PDCA Cycle. Draw a graph for Time vs Quality level with Deming's wheel.

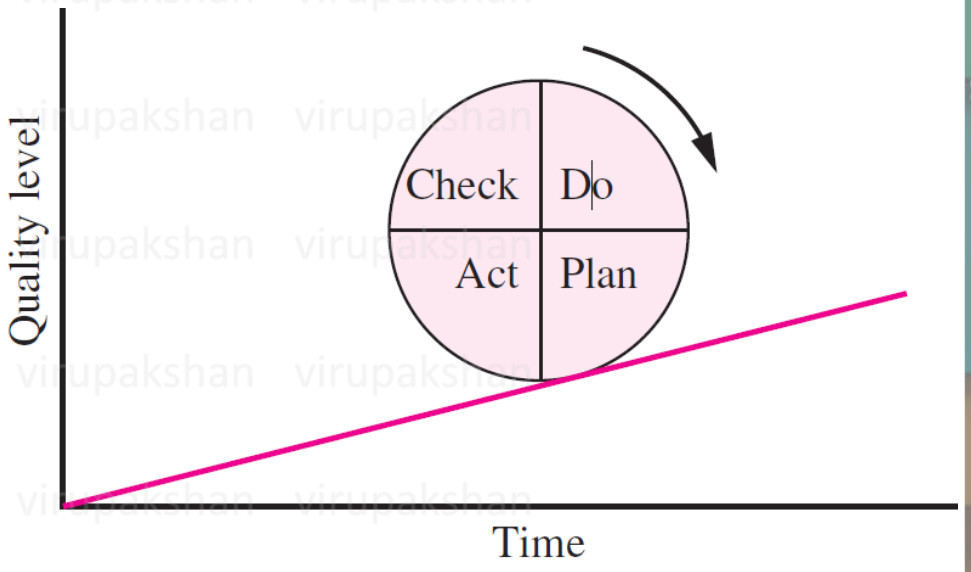
Answer:

a) Plan-Do-Check-Act (PDCA) Cycle STEPS:

Deming's approach, represented by a wheel, consists of 4 steps:

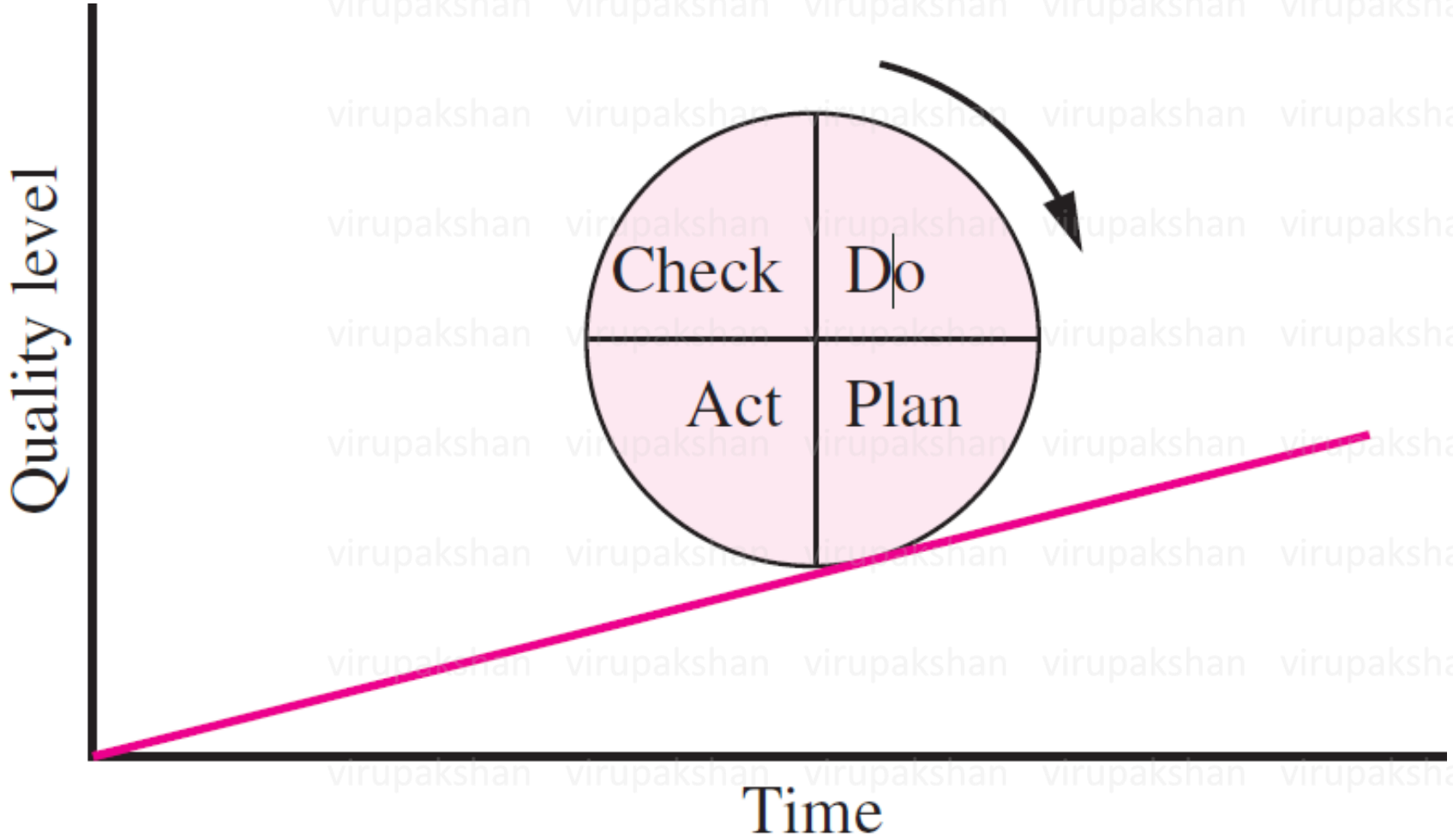
1) **Plan**, select and analyze the problem;
2) **Do**, implement the solution;
3) **Check** the results of the change; and
4) **Act** to standardize the solution and reflect on the learning.

b. Deming's WHEEL:



3.6.2. Q Quality and Productivity Improvement Process

b. Deming's WHEEL:



3.7.Q Question

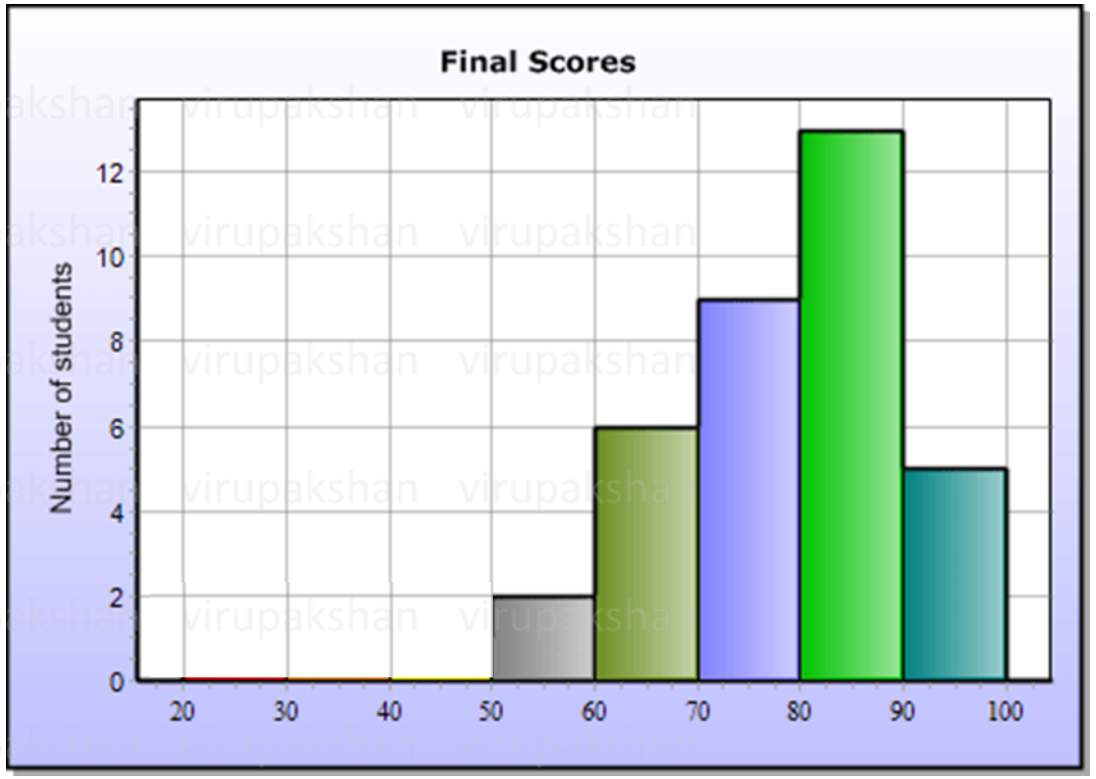
Q. List any 3 Quality Tools used in continuous improvement process & Draw a sample graph for one of them.

Answer:

a) LIST OF QUALITY TOOLS:

1. **Check Sheet**
2. **Run Chart**
3. **Histogram**
4. Pareto Chart
5. Flowchart
6. Cause-and-Effect Diagram
7. Scatter Diagram
8. Control Chart

b) HISTOGRAM GRAPH - SAMPLE:



HISTOGRAM OF STUDENT MARKS

X-Axis : Percentage Scored by Students

Y-Axis: Number of Students

3.7.0 Quality Tools

The philosophy of continuous improvement is captured in the **plan-do-check-act (PDCA)** cycle proposed by **Deming**.

Most commonly used **Quality tools** for analysis and problem solving are:

1. Check Sheet
2. Run Chart
3. Histogram
4. Pareto Chart
5. Flowchart
6. Cause-and-Effect Diagram
7. Scatter Diagram
8. Control Chart

FIGURE 8.2
Excel Check Sheet

Month	Problem Area				
	Lost Luggage	Departure Delay	Mechanical	Overbooked	Other
January	1	2	3	3	1
February	3	3	0	1	0
March	2	5	3	2	3
April	5	4	4	0	2
May	4	7	2	3	0
June	3	8	1	1	1
July	6	6	3	0	2
August	7	9	0	3	0
September	4	7	3	0	2
October	3	11	2	3	0
November	2	10	1	0	0
December	4	12	2	0	1
Total	44	84	24	16	12

FIGURE 8.3
Run Chart of Departure Delays

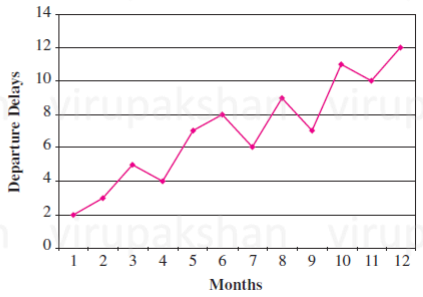


FIGURE 8.4 Histogram of Lost Luggage

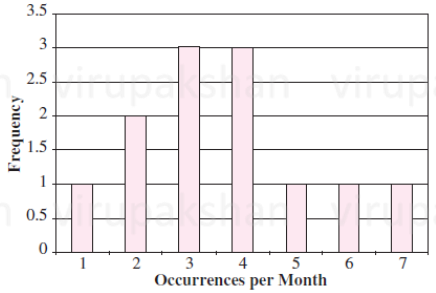


FIGURE 8.5 Pareto Chart

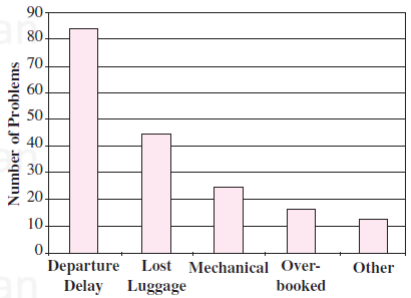
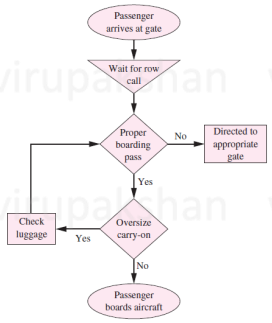


FIGURE 8.6
Flowchart at Departure Gate



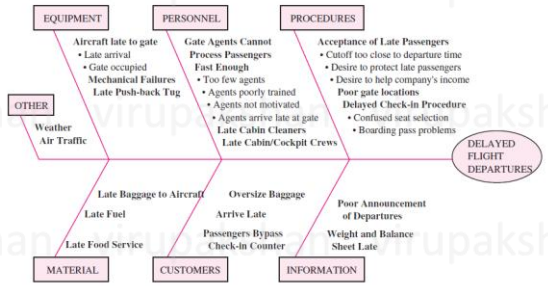


FIGURE 8.8 Scatter Diagram

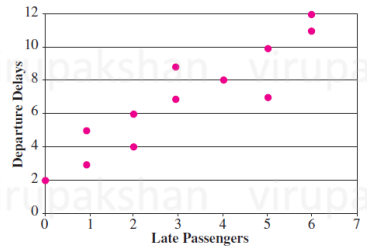
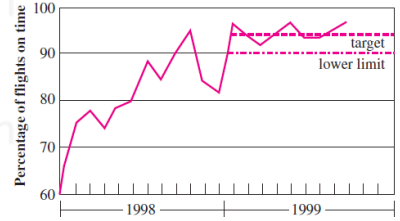


FIGURE 8.9 Control Chart of Midway Departure Delays



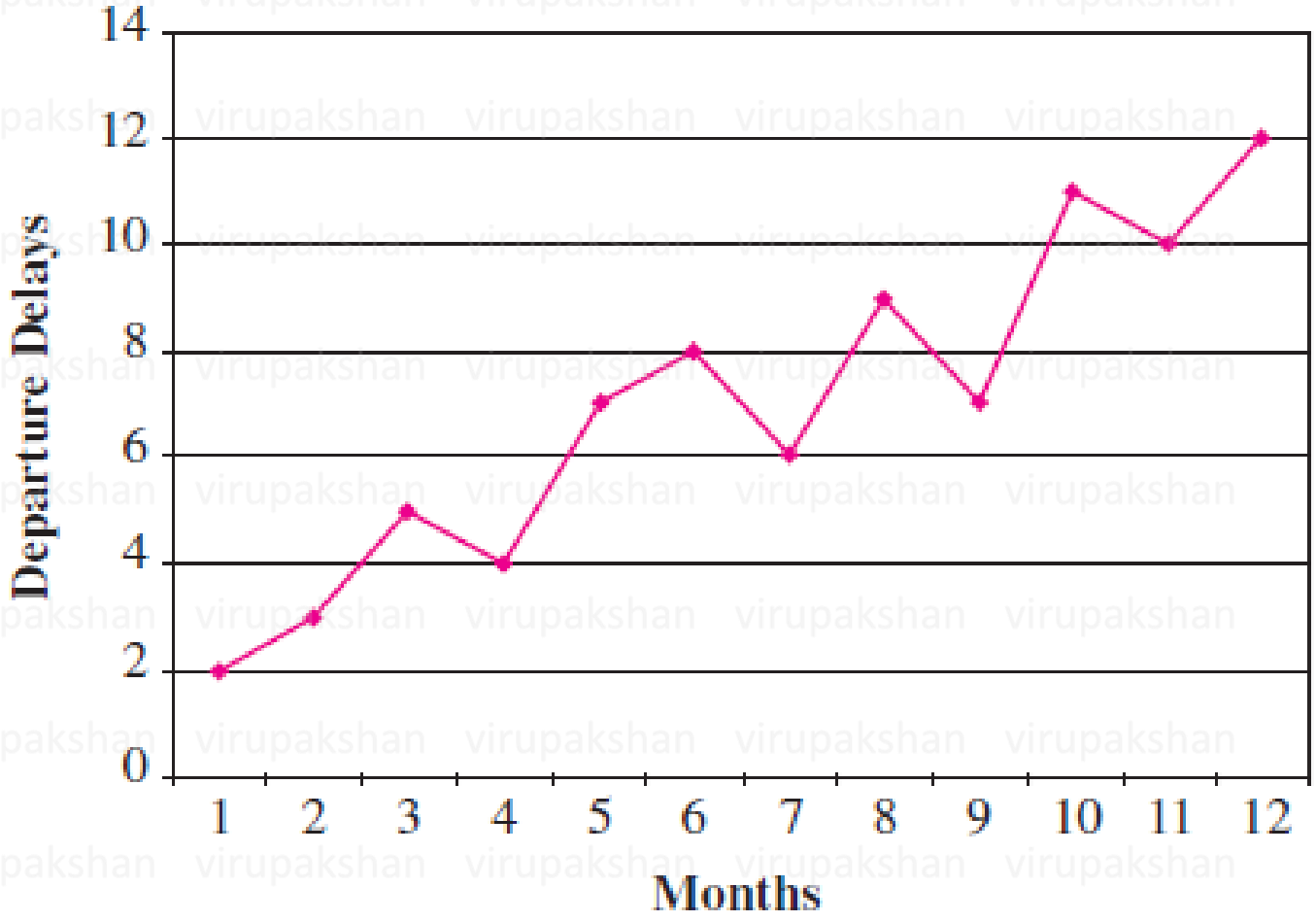
3.7.1 QUALITY TOOLS: CHECK SHEET

	Problem Area				
Month	Lost Luggage	Departure Delay	Mechanical	Overbooked	Other
January	1	2	3	3	1
February	3	3	0	1	0
March	2	5	3	2	3
April	5	4	4	0	2
May	4	7	2	3	0
June	3	8	1	1	1
July	6	6	3	0	2
August	7	9	0	3	0
September	4	7	3	0	2
October	3	11	2	3	0
November	2	10	1	0	0
December	4	12	2	0	1
Total	44	84	24	16	12

3.7.2 QUALITY TOOLS: RUN CHART

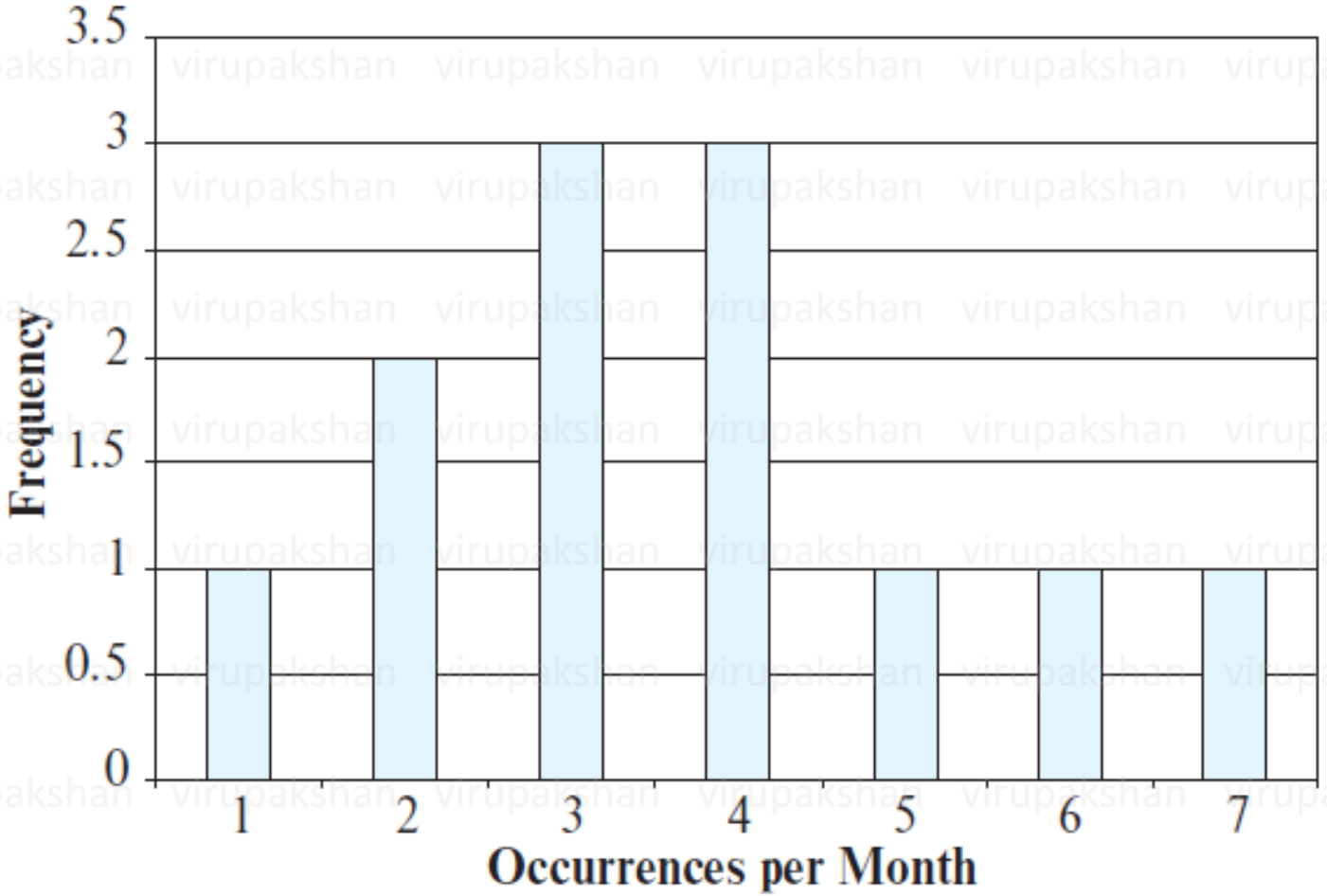
FIGURE 8.3

Run Chart of Departure Delays



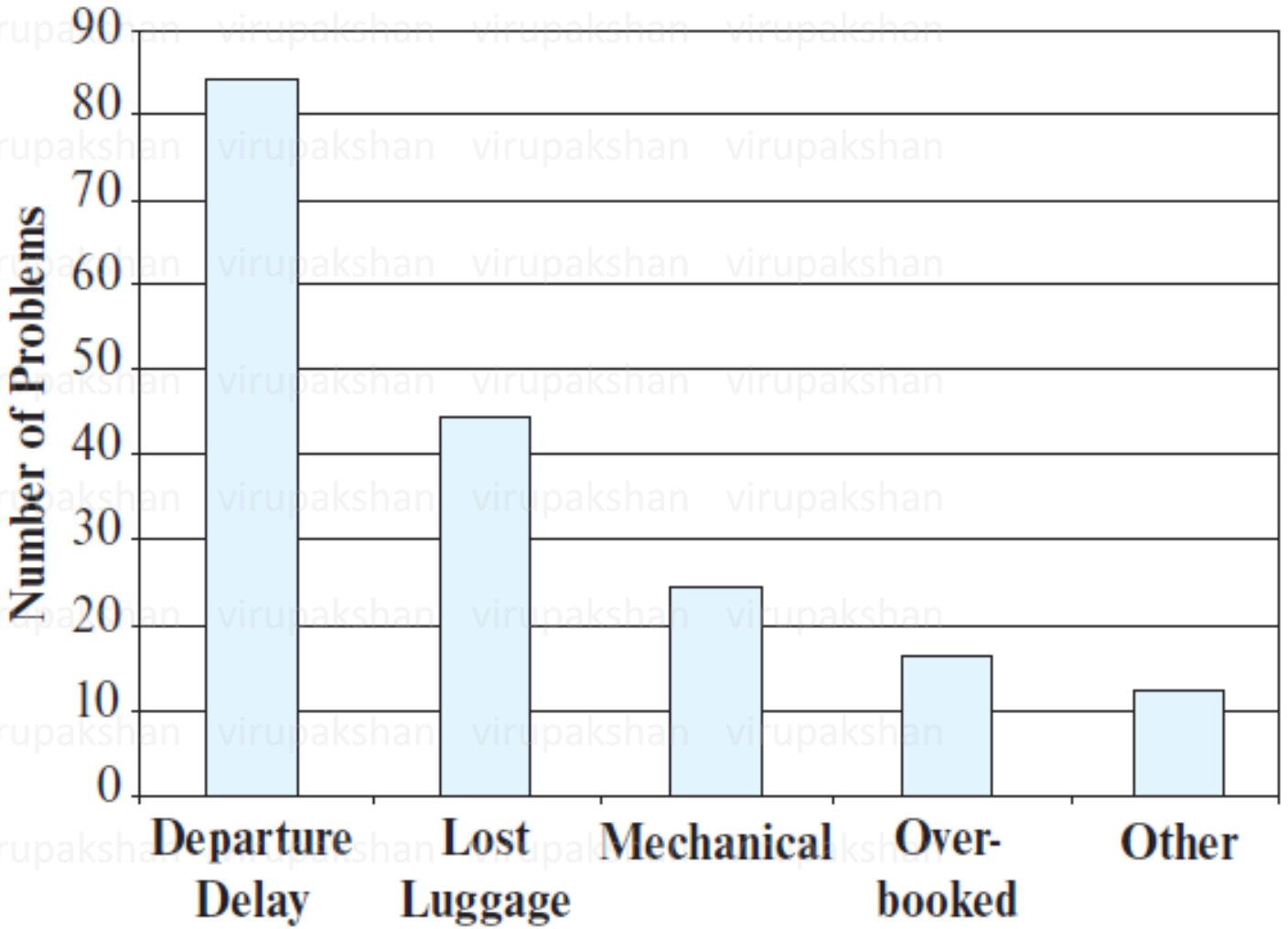
3.7.3 QUALITY TOOLS: HISTOGRAM

FIGURE 7.4 Histogram of Lost Luggage



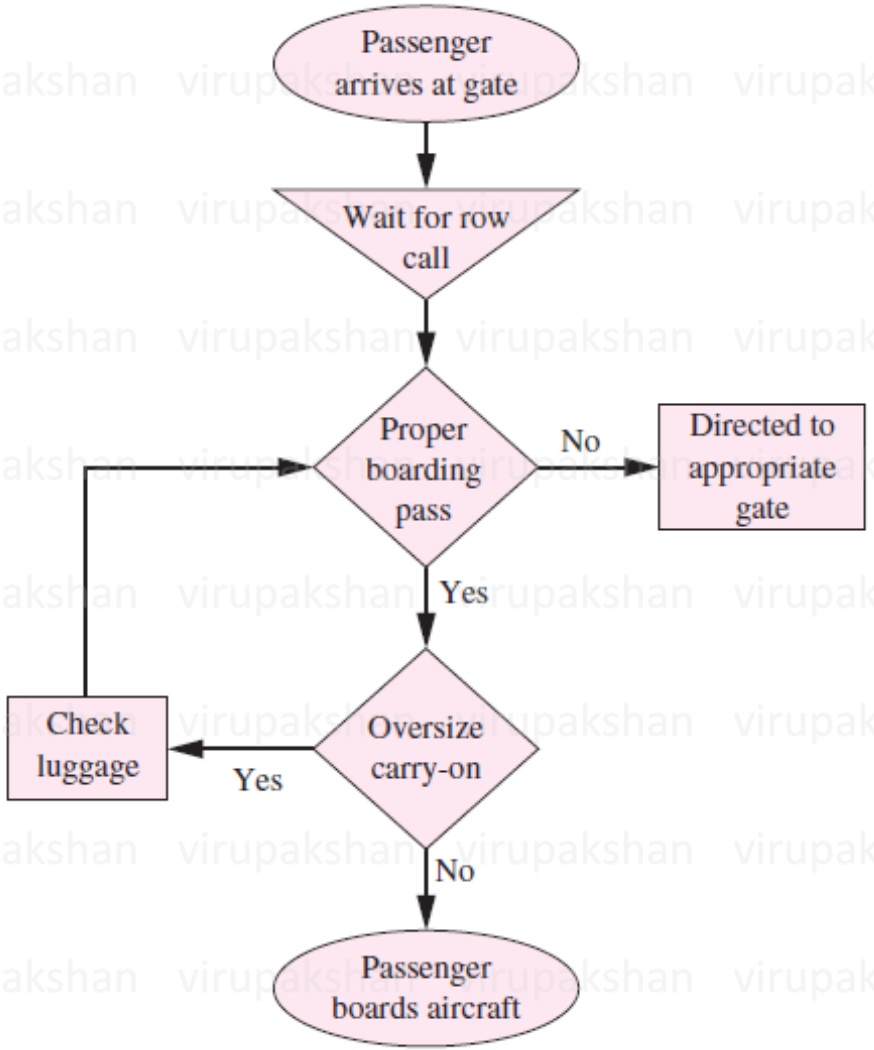
3.7.4 QUALITY TOOLS: PARETO CHART

Pareto chart presents problems in a bar graph by their relative frequency in descending order.



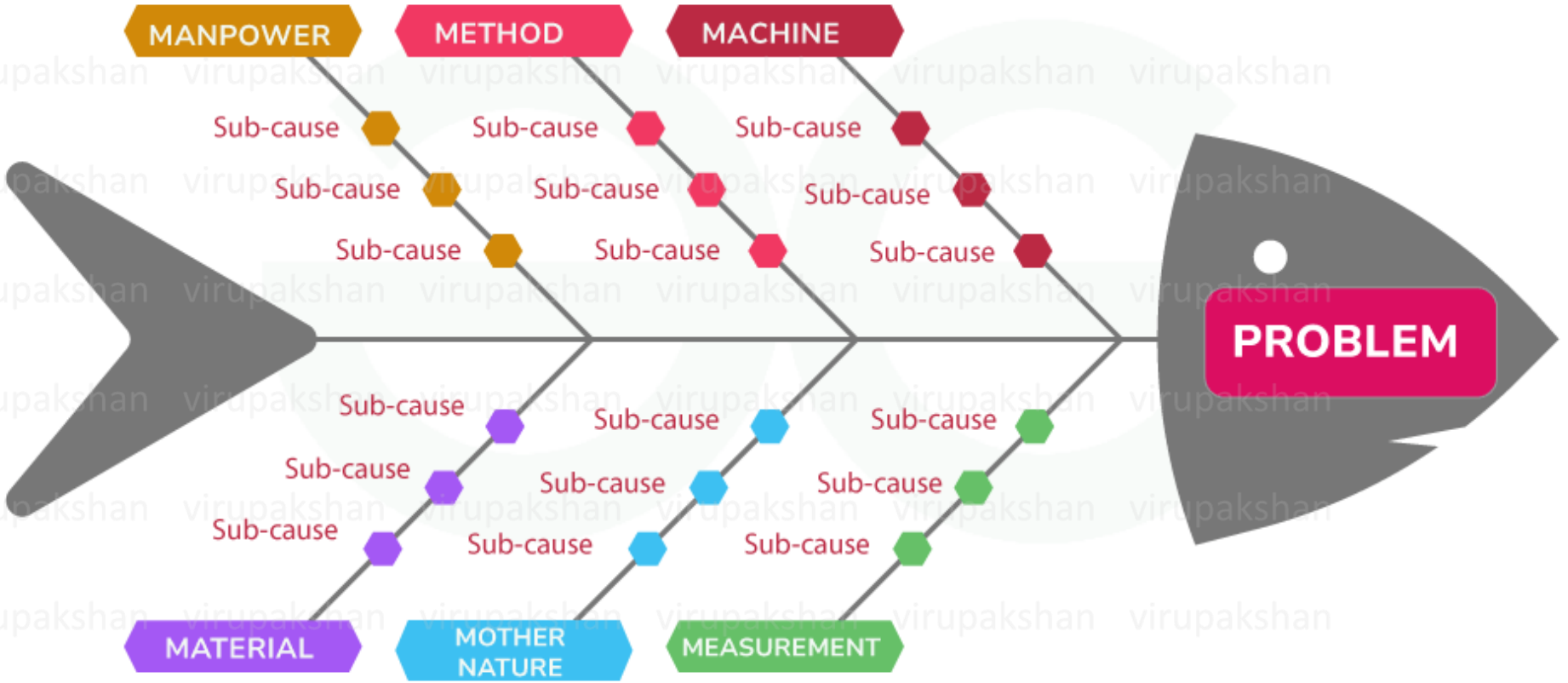
3.7.5 QUALITY TOOLS: FLOW CHART

FIGURE 8.6
Flowchart at Departure Gate



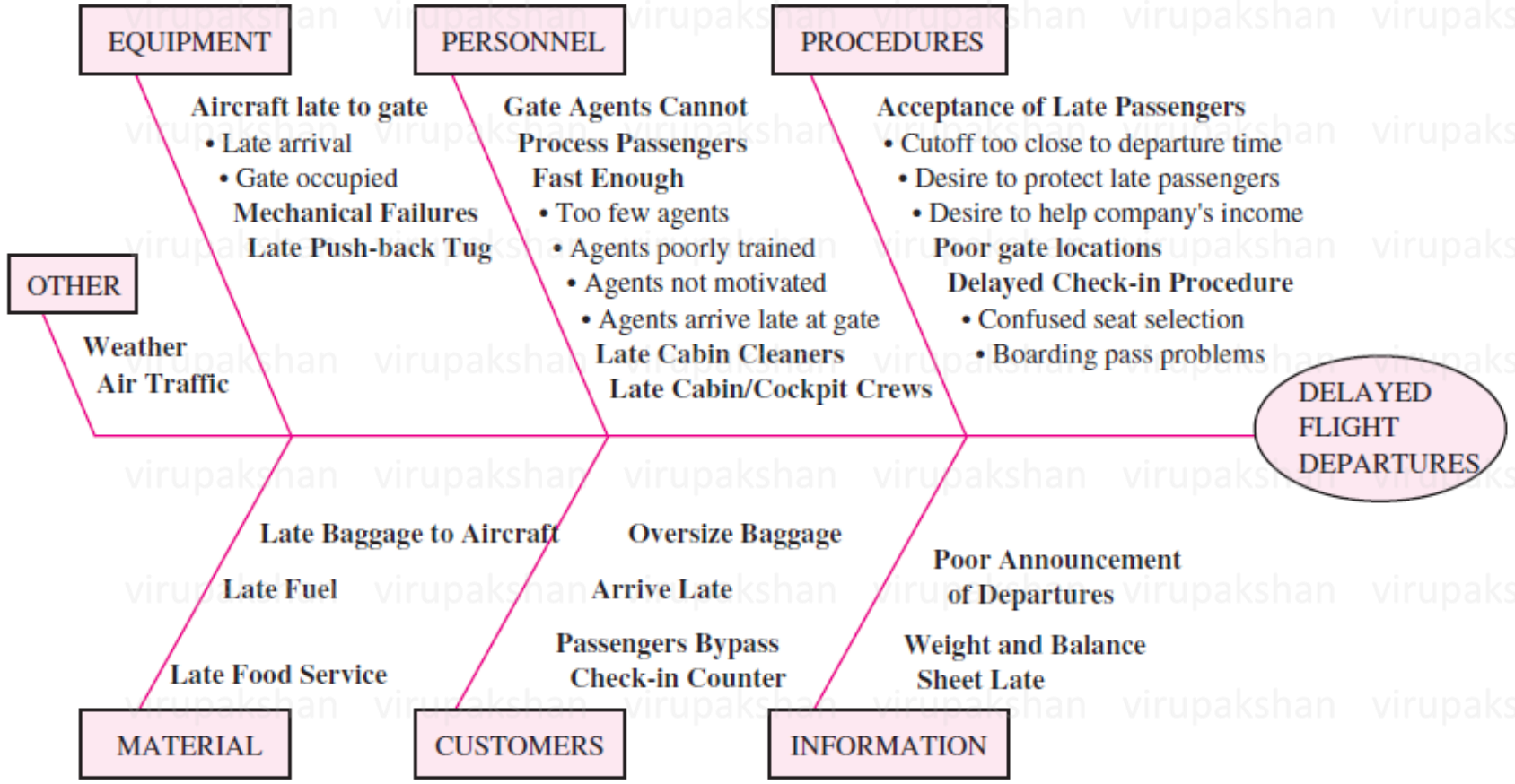
3.7.6A QUALITY TOOLS: Cause-and-Effect Diagram

Cause-and-effect analysis a process using a chart shaped like a **fishbone** to discover the root cause of a service quality problem



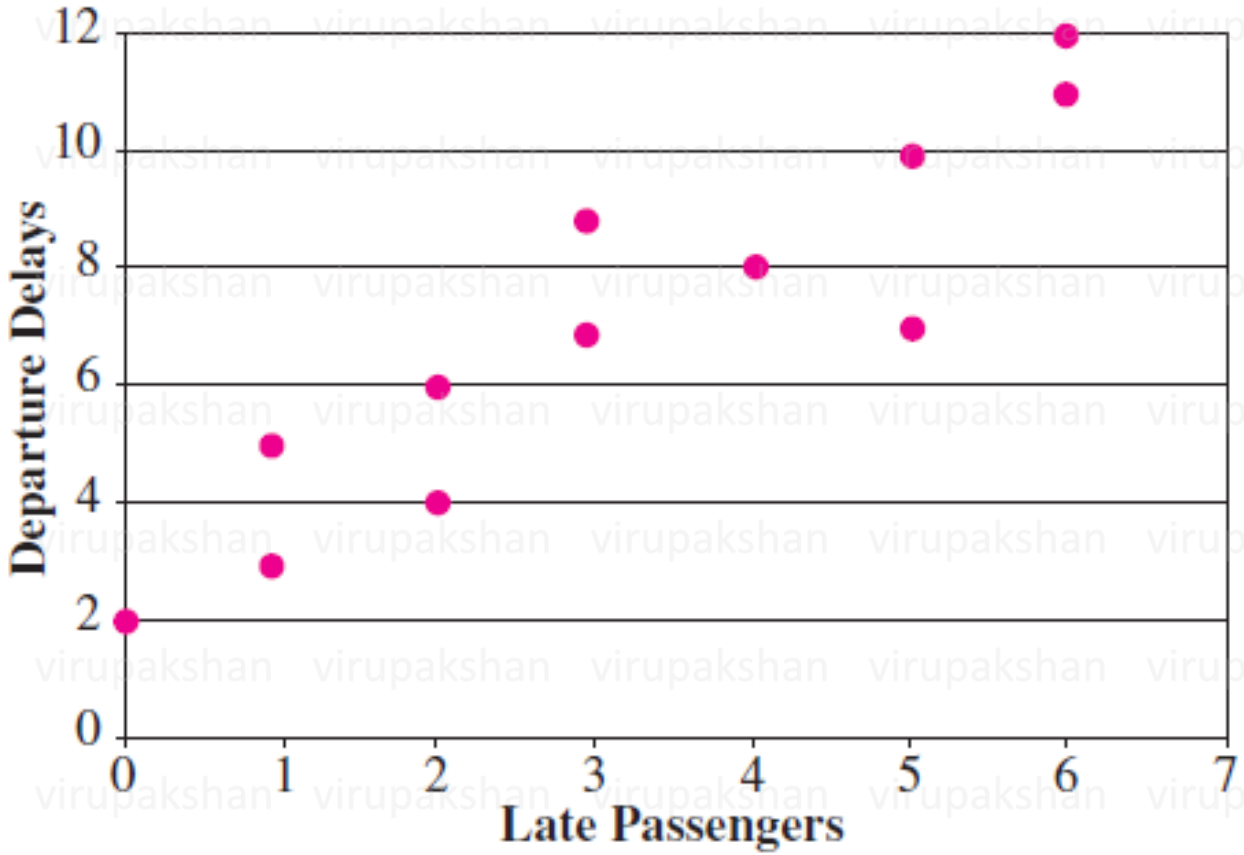
3.7.6B QUALITY TOOLS: Cause-and-Effect Diagram

Cause-and-effect analysis a process using a chart shaped like a **fishbone** to discover the root cause of a service quality problem



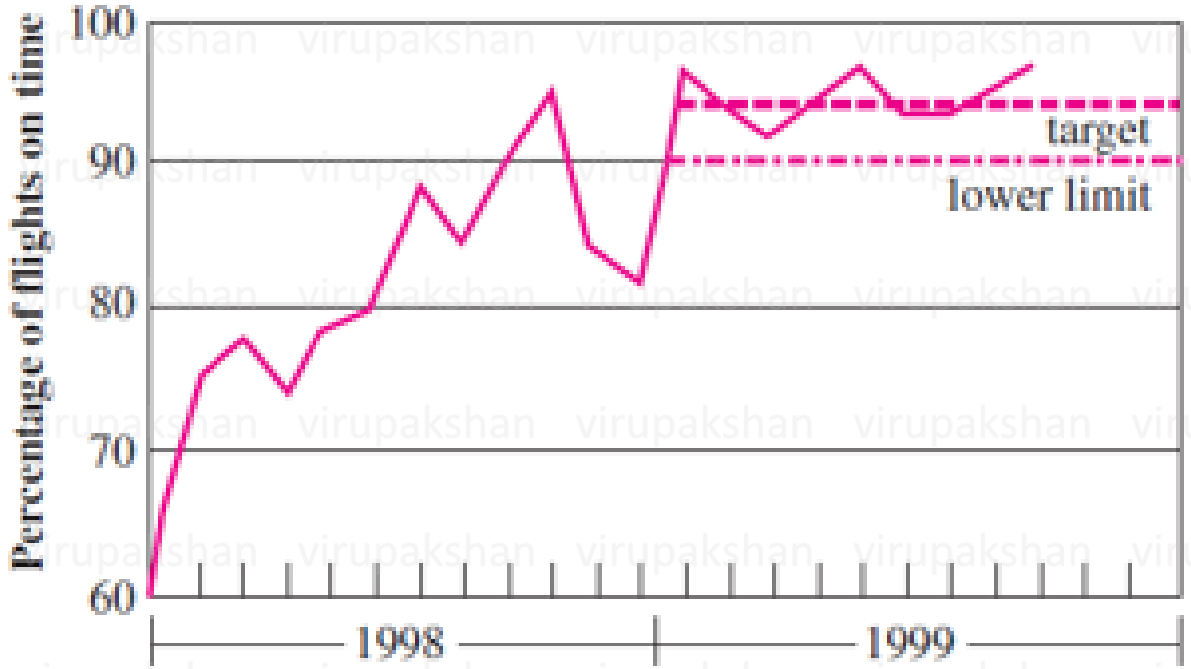
3.7.7 QUALITY TOOLS: Scatter Diagram

FIGURE 8.8 Scatter Diagram



3.7.8 QUALITY TOOLS: Control Chart

FIGURE 8.9 Control Chart of Midway Departure Delays



3.7. QUALITY TOOLS

The philosophy of continuous improvement is captured in the **plan-do-check-act (PDCA)** cycle proposed by **Deming**.

Most commonly used **Quality tools** for analysis and problem solving are:

1. Check Sheet
2. Run Chart
3. Histogram
4. Pareto Chart
5. Flowchart
6. Cause-and-Effect Diagram
7. Scatter Diagram
8. Control Chart

FIGURE 8.2
Excel Check Sheet

Month	Problem Area				
	Lost Luggage	Departure Delay	Mechanical	Overbooked	Other
January	1	2	3	3	1
February	3	3	0	1	0
March	2	5	3	2	3
April	5	4	4	0	2
May	4	7	2	3	0
June	3	8	1	1	1
July	6	6	3	0	2
August	7	9	0	3	0
September	4	7	3	0	2
October	3	11	2	3	0
November	2	10	1	0	0
December	4	12	2	0	1
Total	44	84	24	16	12

FIGURE 8.3
Run Chart of Departure Delays

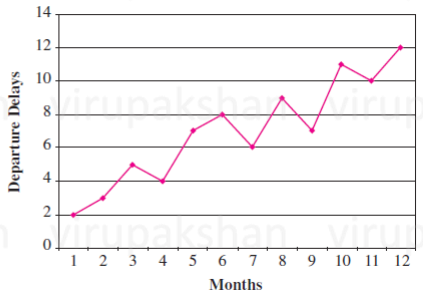


FIGURE 8.4 Histogram of Lost Luggage

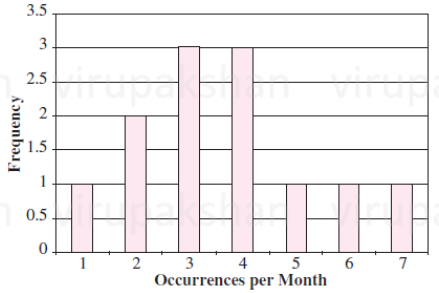


FIGURE 8.5 Pareto Chart

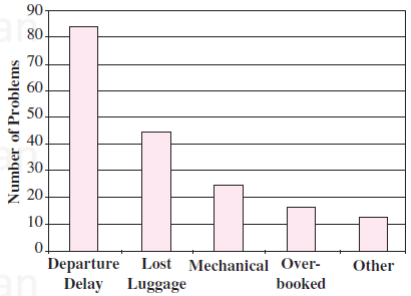
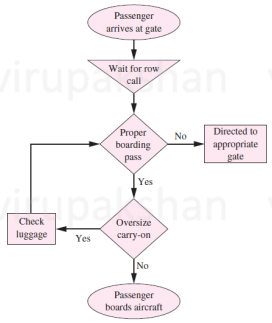


FIGURE 8.6
Flowchart at Departure Gate



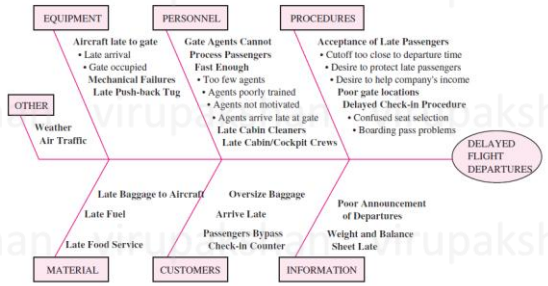


FIGURE 8.8 Scatter Diagram

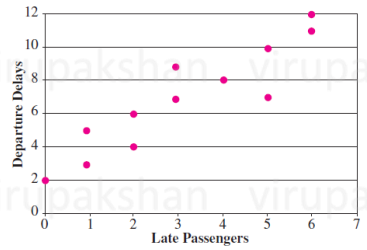
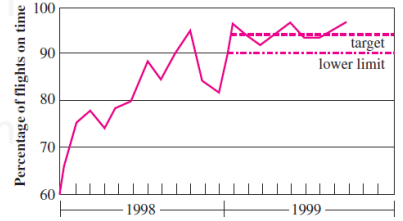


FIGURE 8.9 Control Chart of Midway Departure Delays



3.8 Benchmarking

The measure of the quality of a firm's performance can be made by comparison with the performance of other companies known for being "best in class," which is a process known as **benchmarking**.

For example, Singapore Airlines has a reputation for outstanding cabin service and FedEx for consistent overnight delivery.

The benchmarking process involves five steps:

(1) select a critical process that needs improvement;
(2) identify an organization that excels in the process;
(3) contact the benchmark firm, make a visit, and study the process;
(4) analyze the findings; and
(5) improve your process accordingly

3.9 Improvement Programs

1. Deming's 14-Point Program
2. ISO 9001
3. Six Sigma
4. Lean Service

3.9.1a Improvement Programs: Deming's 14-Point Program

1 Create constancy of purpose
- Focus on long-term improvement of products and services rather than short-term profits.

2 Adopt the new philosophy
- Accept that quality is everyone's responsibility and embrace continuous improvement.

3 Cease dependence on inspection
- Build quality into the process instead of relying on final inspection to detect defects.

4 End the practice of awarding business on price alone
- Select suppliers based on quality, reliability, and long-term relationships rather than the lowest price.

5 Improve constantly and forever
- Continuously improve every process involved in planning, production, and service.

6 Institute training on the job
- Provide employees with proper education and skill development to perform their work effectively.

7 Institute leadership
- Managers should coach, guide, and support employees instead of merely supervising them.

8. Drive out fear
- Create an environment where employees feel safe to express ideas, ask questions, and report problems.

8.Break down barriers between departments
- Encourage teamwork and collaboration across different functions within the organization.

8.Eliminate slogans, exhortations, and targets for the workforce

•Remove unrealistic demands and motivational slogans that do not address the root causes of quality problems.

11.Eliminate numerical quotas and management by objectives

•Focus on improving processes rather than emphasizing production quotas or arbitrary performance targets.

12.Remove barriers that rob people of pride in workmanship

•Provide employees with the tools, resources, and authority needed to produce quality work.

13.Institute a vigorous program of education and self-improvement

•Encourage lifelong learning and continuous professional development for all employees.

14.Put everyone to work to accomplish the transformation

•Make continuous quality improvement the responsibility of every person in the organization.

3.9.1b Improvement Programs: Deming's 14-Point Program

Point	Key Idea
1	Constancy of purpose
2	Adopt new philosophy
3	Build quality into processes
4	Choose suppliers based on quality
5	Continuous improvement
6	Employee training
7	Leadership, not supervision
8	Remove fear
9	Teamwork across departments
10	Remove slogans
11	Eliminate quotas
12	Enable pride in workmanship
13	Education and self-improvement
14	Everyone participates in quality improvement

Mnemonic for Remembering the 14 Points

"CAPE CILT BERPET"

3.9.2 Improvement Programs: ISO 9001

The ISO 9001 series of **quality management system standards** has become a de facto requirement for doing business in many industries, despite the fact that it is a voluntary standard.

Documentation of processes and consistent performance are the key features of ISO standards. ISO 9001 seeks to achieve this by requiring that **businesses implement a three-component cycle**:

1. **Planning**. Activities affecting quality must be planned to ensure that goals, authority, and responsibility are both defined and understood.
2. **Control**. Activities affecting quality must be controlled to ensure that specified requirements at all levels are met, problems are anticipated and averted, and corrective actions are planned and carried out.
3. **Documentation**. Activities affecting quality must be documented to ensure an understanding of quality objectives and methods, smooth interaction within the organization, feedback for the planning cycle, and to serve as objective evidence of quality system performance.

3.9.3a Improvement Programs: Six Sigma

Six Sigma is a **data-driven quality management methodology** used to improve processes by identifying and eliminating defects, reducing variation, and increasing customer satisfaction. It aims to make processes highly consistent and efficient.

- **Developed by:** Motorola in 1986
- **Popularized by:** General Electric under the leadership of Jack Welch
- **Goal:** Reduce defects to **3.4 defects per million opportunities (DPMO)**.
- **Focus:** Continuous improvement based on facts, statistics, and customer requirements.

Six Sigma projects generally follow the **DMAIC** cycle.

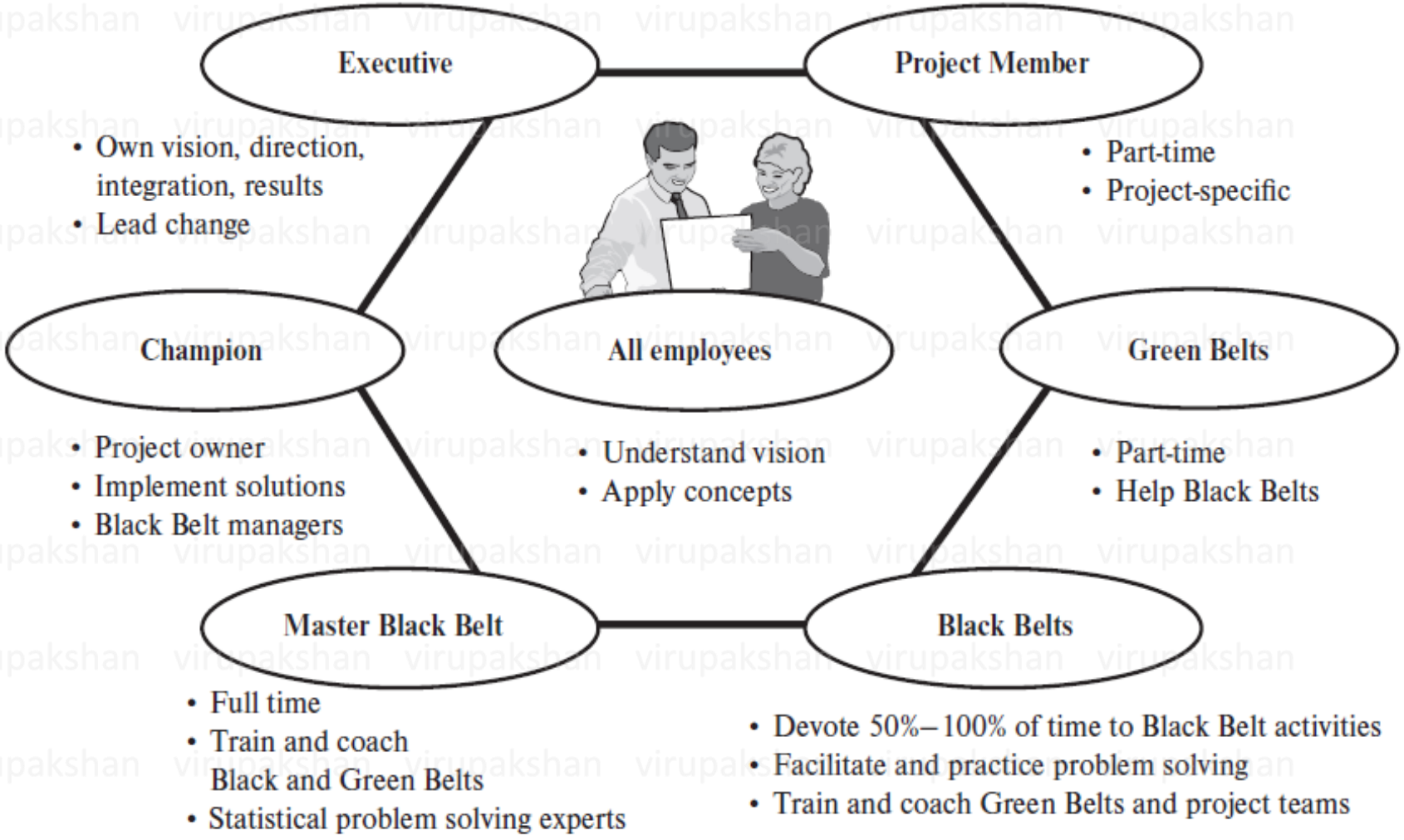
3.9.3b Improvement Programs: Six Sigma

Six Sigma projects generally follow the **DMAIC** cycle.

Phase	Purpose
D – Define	Define the problem and customer requirements.
M – Measure	Collect data and measure current performance.
A – Analyze	Identify the root causes of defects.
I – Improve	Implement solutions to remove defects.
C – Control	Monitor the process to maintain improvements.

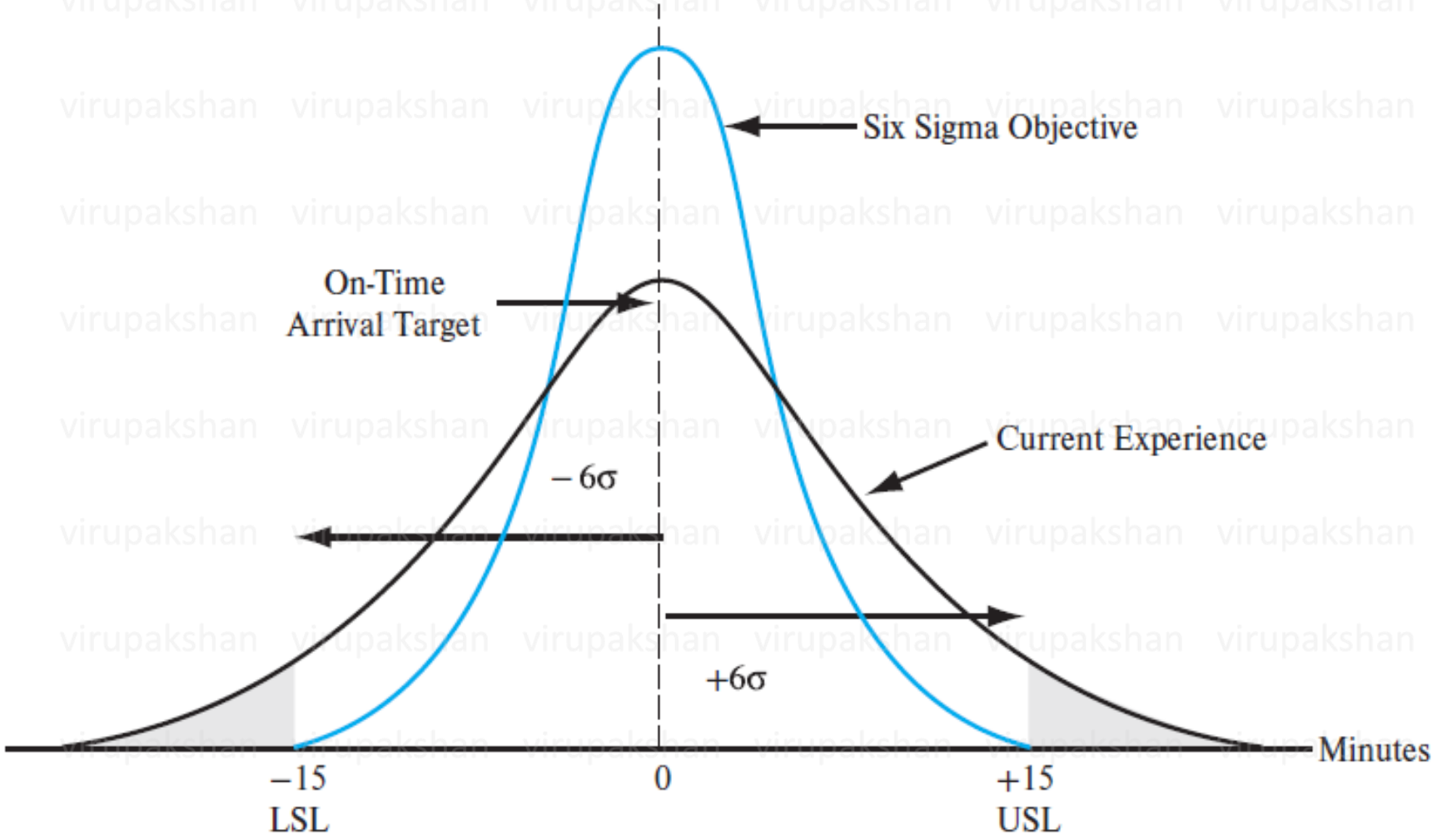
3.9.3c Improvement Programs: Six Sigma

Six Sigma Organization Roles and Responsibilities



3.9.3d Improvement Programs: Six Sigma

Distribution of On-Time Arrivals of an Airline



3.9.3e Improvement Programs: Six Sigma

Advantages of Six Sigma

- Improves product and service quality.
- Reduces defects and process variation.
- Lowers production costs.
- Increases customer satisfaction.
- Improves productivity and efficiency.
- Supports data-driven decision-making.

Limitations

- Requires extensive data collection.
- Training and implementation can be expensive.
- Projects may take considerable time.
- Less suitable for very small organizations with limited resources.

3.9.4 Improvement Programs: Lean Service

Lean Service is an extension of lean principles pioneered by the Toyota Production System (TPS) with a focus on *waste elimination, continuous flow, and customer demand pull*, and is referred to in manufacturing as Just-in-Time production.
The objective of a Lean Service process is a continuous rapid flow of value-adding activities to satisfy customer needs.

The lean philosophy has three guiding principles:

1. **Satisfy the needs of the customer** by performing only those activities that add value in the eyes of the customer.
2. **Define the "value stream"** by flowcharting the process to identify both value-added and non-value-added activities.
3. **Eliminate waste**. Waste in the value stream is any activity for which the customer is not willing to pay.

Lecture 06 Topics

Unit-1 Service – Definition

1.1	Characteristics
1.2	Stages of Economic Development
1.3	Role of Services in Economy
1.4	Experience Economy
1.5	Service Science
1.6	Service Dominant Logic
1.7	Service Systems
1.8	Service Operations
1.9	Open System View of Service Operations
1.1	Service Package
1.11	Strategic Service Vision
1.12	Competitive Service Strategies
1.13	Strategic Analysis
1.14	Sustainability in Services
1.15	Competitive Role of Information in Services

Unit-2 New Service Development

2.1	Innovation in Services
2.2	Service Blueprinting
2.3	Service Process Design
2.4	Service S
2.5	Service F
2.6	Strategic
2.7	Service P
2.8	Service E Organizat Custome
2.9	Service Profit Chain
2.10	Technology in Service Encounter

Unit-3 Service Quality Dimensions

3.1	Measuring Service Quality
3.2	SERVQUAL Gap Model
3.3	Walk Through Audit
3.4	Service Quality by Design
3.5	Achieving Service Quality
3.6	Quality and Productivity Improvement Process
3.7	Quality Tools
3.8	Benchmarking
3.9	Improvement Programs

Unit-4 Strategies

4.1	Strategies for Managing Service Demand and Service Capacity
4.2	Forecasting Service Demand
4.3	Forecasting Models – Subjective Models

3.6	Quality and Productivity Improvement Process
3.7	Quality Tools
3.8	Benchmarking
3.9	Improvement Programs

Unit-5 Managing Service Projects

5.1	Characteristics of Project
5.2	Project Management – Principles, Process and Building Team
5.3	Selecting the Project Manager
5.4	Roles and Responsibilities of Project Manager
5.5	Techniques for Project Management – PERT
5.6	Techniques for Project Management – CPM
5.7	Techniques for Project Management – Gantt Charts
5.8	Monitoring Project Performance
5.9	Globalization of Services
5.1	Global Service Strategies
5.11	Domestic Growth and Expansion Strategies
5.12	Franchising

SERVICES SCIENCE AND SERVICE OPERATIONAL MANAGEMENT

UNIT 03 **LECTURE 06**

Doubts?

THANK YOU!

Virupakshan K

+91-9840847872 | VIRU@KART.LA