



# **Managing Project Quality and Risks**

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# Quality Issue

- ✓ In 1987 William Cooper Procter (Grandson of founder of Procter & Gamble) told his employees  
“The first job we have is to turn out **quality merchandise** that consumers will buy & keep on buying. If we produce it **efficiently & economically**, we will earn a profit in which you will share.”
- ✓ Quality is the most significant factor in determining the long-term success or failure of an organization
  - ✓ No quality → no sales. No sales → no profit. No profit → no jobs
- ✓ High quality goods & services can give a business competitive edge
  - ✓ Reputation for high quality generates satisfied customers
  - ✓ Reward the organizations with continued patronage
  - ✓ Favorable word of mouth advertising
  - ✓ Often resulting in new customers

# জধ্যবস্থভৃত্ত নথঃবু

## ড উল্লেখনম ৬০% + সধশবঃ নথব

এযব ষরভব ডভ যব নথঃবু ধিং ডহ ধ ধাবৎধমব ৩-৫৪৬৯, বাবহ  
রভ যব ধিৎধহু ধিং ভড় ১০৬৯  
ইংডসবং বিব বু যথচ্ছ

## ড ২০০৬: ঠবু যরমযষু চৰক সউও ধিং ধচ্ছডুরুবুবক

## ড খৰৎঃ যেরহম যব ফৱক রং রহপ্বধারহম যব নথবু ডভ যব বসচুষডুবুব

## ড ডৱঃ নথব যেপযহৱপধষ সধহৱচ্ছধঃরডহ বেফ্পবক যব ষরভব ডভ নথঃবু ডভ লং ডাবং যব ধিৎধহু চৰৱডক ডভ ১০৬৯

## ড এযব সধশবঃ নথব ফড়চুবক ড ৪০%

# Quality Definition

- ✓ **Quality can be confusing concepts**
- ✓ **People view quality subjectively**
- ✓ **The meaning of quality continues to evolve**
- ✓ **Quality perception by managers of different firms**
  - ✓ **Perfection**
  - ✓ **Consistency**
  - ✓ **Eliminating waste**
  - ✓ **Speed of delivery**
  - ✓ **Compliance with policies and procedures**
  - ✓ **Providing a good, usable product**
  - ✓ **Doing it right first time**
  - ✓ **Delighting or pleasing customers**
  - ✓ **Total customer service and satisfaction**

# Quality Perspectives

- ✓ **Judgmental perspective**
  - ✓ Often used by consumers
  - ✓ Synonymous with superiority or excellence
  - ✓ Transcendent (to rise above or extend notably beyond ordinary level, Walter Shewhart, 1931)
  - ✓ Abstract, arbitrary & subjective (may vary considerably) & hence little practical value to managers
    - ✓ E.g., Ritz-Carlton Hotel, Lexus automobile
- ✓ **Product-based perspective**
  - ✓ Is a function of a specific, measurable variable & that differences in quality reflect differences in quantity of some product attribute
    - ✓ E.g., no of stitches per inch on a shirt or no of cylinders in an engine
  - ✓ Higher increasing amount of product characteristics are equivalent to higher quality
  - ✓ Quality is often mistakenly assumed to be related to price

# Quality Perspectives

## ✓ User-based perspective

- ✓ Quality is determined by customer wants/needs (Fitness for intended use)
- ✓ Individuals have different wants/needs, & hence, different quality standards
  - ✓ E.g., Both Cadillac CTS and smart car are fit for use, for different needs and different groups of customers

## ✓ Value-based perspective

- ✓ The relationship of usefulness or satisfaction to price (value)
- ✓ A quality product is one that is as useful as competing products but sold at a lower price, or
- ✓ One that offers greater usefulness at as comparable price
  - ✓ P & G (1990) instituted a concept called value pricing – offering a product at a “everyday” low prices in an attempt to counter the common consumer practice of buying whatever brand happens to be on special.

# Quality Perspectives

- ✓ **Manufacturing-based perspective**
  - ✓ desirable outcome of engineering and manufacturing practice, or conformance to specification
  - ✓ Specifications are targets and tolerances determined by designers of products & services
  - ✓ Targets are the ideal values for which production is to strive
  - ✓ Tolerances are specified because designers recognize that it is impossible to meet targets all of the time in manufacturing
    - ✓ E.g., Goods ( $0.236 \pm 0.003$  cm) or service ( $10:30 \pm 15$  min)
  - ✓ Conformance to specifications establishes consistency to goods and services, E,g., Coca-Cola
    - ✓ Quality is manufacturing a product that people can depend on every time they reach for it
    - ✓ with rigorous quality & packaging standards products will taste the same anywhere in the world

# Quality Perspectives

- ✓ **Integrating perspectives on quality**
  - ✓ Product quality should be important to all individuals throughout the value chain
  - ✓ Quality perception depends on one's position in the value chain (**Manufacturing perspective**)
    - ✓ E.g., designer, manufacturer, service provider, distributor, customer
  - ✓ Customer
    - ✓ the driving force for the production of goods & service
    - ✓ generally view quality either from **transcendent (judgmental)** or **product-based perspective**
  - ✓ Marketing
    - ✓ The products should meet customers needs
    - ✓ Business organizations' existences depend on meeting these needs (can be defined as quality products)
    - ✓ Marketing function should determine these needs
    - ✓ **User-based definition** is appropriate for marketing people

# Quality Perspectives

## ✓ Integrating perspectives on quality (Cont.)

### ✓ Design

- ✓ The manufacturer must translate customer requirements into detailed product & process (a sequence of activities that is intended to achieve some results) specifications
- ✓ This is the role of R & D, product design, & engineering
- ✓ Product specifications address size, form, finish, taste, dimensions, tolerances, materials, operational characteristics, & safety features
- ✓ Process specifications indicate the types of equipment, tools, & facilities
- ✓ Product designer must balance performance & cost to meet marketing objectives
- ✓ Value-based definition is most useful at this stage

# Quality Perspectives

## ✓ Integrating perspectives on quality (Cont.)

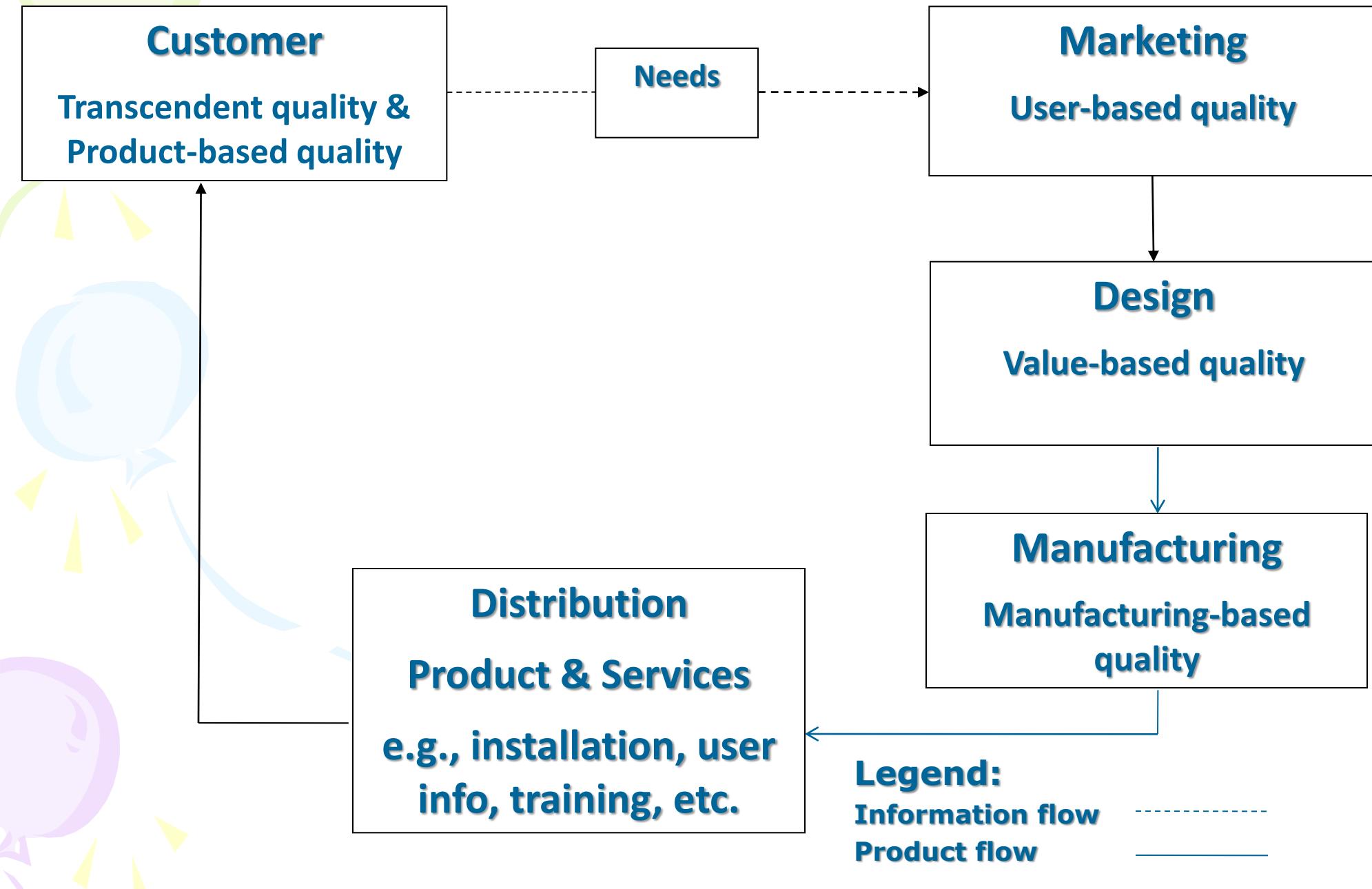
### ✓ Manufacturing

- ✓ Variation can or would occur during manufacturing
  - ✓ Machine settings can fall out of adjustment
  - ✓ Machine Calibration
  - ✓ Operators' & assemblers' mistake
  - ✓ Defective materials
- ✓ Manufacturing function is responsible for adherence to design specifications (conformance to specifications)
- ✓ Thus manufacturing-based definition is most useful at this stage

### ✓ Distribution

- ✓ Products need to be moved from the plant, through wholesale & retail outlets, to customers
- ✓ The customer may need various services: Installation, User information, Special training
- ✓ Such services are part of the product & cannot be ignored in quality management

# Quality perspectives in the Value Chain



# **Customer-driven quality**

**ANSI & ASQC (1978)**

**The totality of features & characteristics of a product or service that bears on its ability to satisfy given needs (also known as Fitness for use)**

- ✓ Draws heavily on product- & user-based approaches
- ✓ Driven by the need to contribute value to customers
  - ✓ Influence satisfaction and preference

**Progressive Organizations (1990s)**

- ✓ A simpler, yet powerful, customer-driven definition

**Quality is Meeting or Exceeding Customer Expectations**

# Meaning of Quality: Consumer's Perspective

- **Fitness for use**
  - **how well product or service does what it is supposed to**
- **Quality of design**
  - **designing quality characteristics into a product or service**
- **A Mercedes & a Ford are equally “fit for use,” but with different design dimensions**



# Implications of Quality

- Customers
- Processes
- Employees
- Materials



# Quality Control

- **Setting benchmarks**
- **Appraising conformance**
- **Acting when necessary**
- **Planning for improvements**

# Consequence of poor quality

- **Lower productivity**
- **Loss of productive time**
- **Loss of material**
- **Loss of business**
- **Liability**

# Improving Products & Services

- **Dissatisfiers:** those needs that are expected in a product or service, such as a compact disc player, air conditioner, & required safety features in an automobile. Such items generally are not stated by customers but are assumed as given. If they are not given, the customer is dissatisfied.
- **Satisfiers:** needs that customer say they want, such as a TV in a car. Fulfilling these needs creates satisfaction.
- **Delighters/Exciters:** new or innovative features that customers do not expect. When first introduced, antilock brakes (ABS) and air bags were examples of exciters.

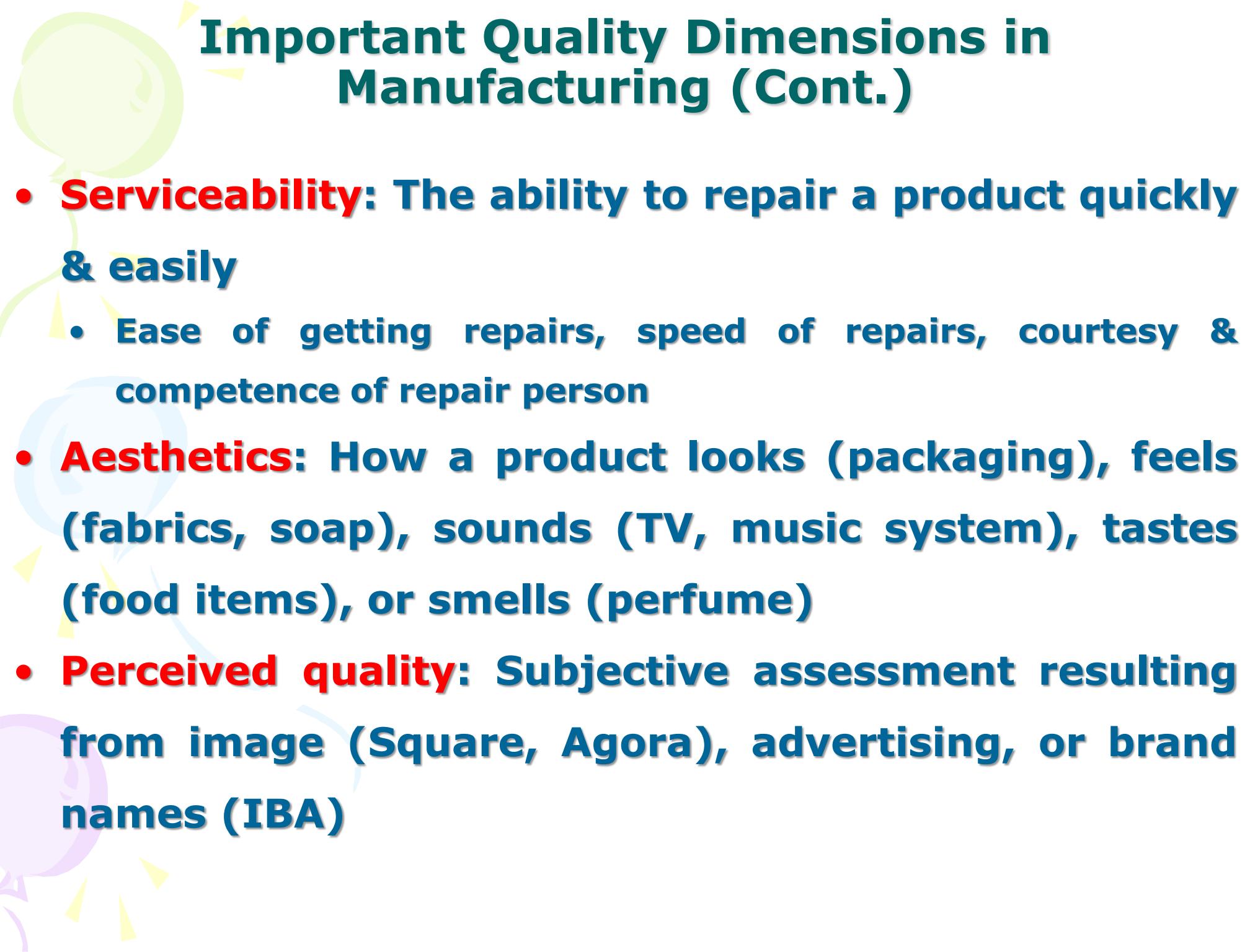
**Note:**

- **Satisfiers** are easy to determine (through routine marketing research).
- Special effort is required to elicit customer perceptions about **Dissatisfiers & Delighters/ Exciters**.
- Overtime **Delighters/Exciters** become **Satisfiers** as customers become used to them & eventually **Satisfiers** become **Dissatisfiers** (if they are not provided).

**N.B.: (concepts suggested by Japanese Professor Noriaki Kano)**

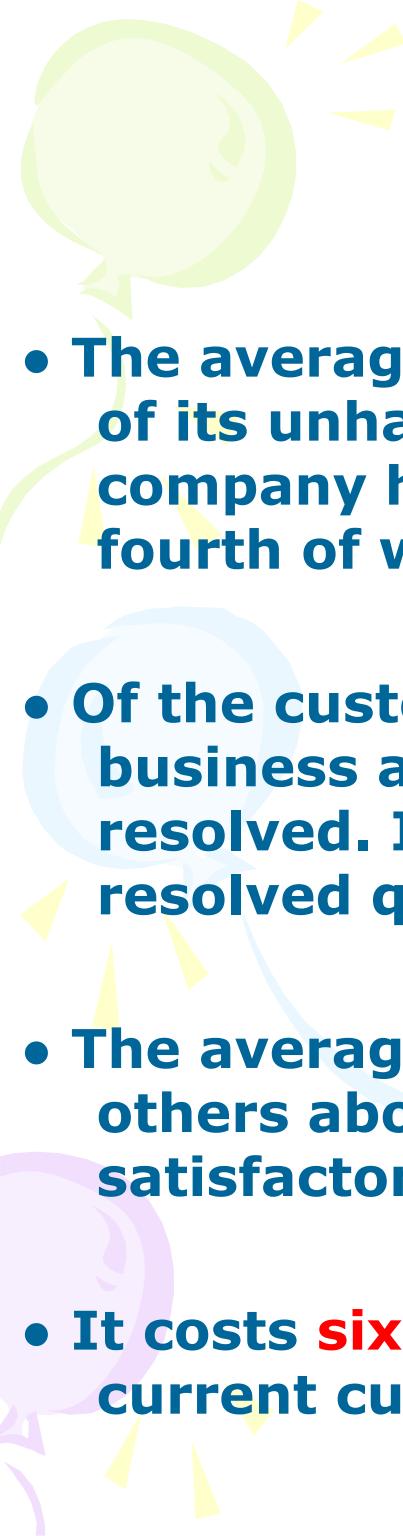
# Important Quality Dimensions in Manufacturing

- **Performance:** A product's primary operating characteristics
  - how well a car is handled or its gas mileage
- **Features:** The "bells and whistles" of a product. "Extra" items added to basic features
  - a built-in navigation system (GPS) or a leather interior in a car
- **Reliability:** The probability of a product's surviving over a specified period of time under stated condition of use
  - a TV will work without repair normally for about seven years
- **Conformance:** The degree to which physical & performance characteristics of a product match pre-established standards
- **Durability:** The amount of use one gets from a product before it physically deteriorates or until replacement is preferable



# Important Quality Dimensions in Manufacturing (Cont.)

- **Serviceability:** The ability to repair a product quickly & easily
  - Ease of getting repairs, speed of repairs, courtesy & competence of repair person
- **Aesthetics:** How a product looks (packaging), feels (fabrics, soap), sounds (TV, music system), tastes (food items), or smells (perfume)
- **Perceived quality:** Subjective assessment resulting from image (Square, Agora), advertising, or brand names (IBA)



# Quality in Services

## Statistics from a variety of studies

- The average company never hears from **more than 90 percent** of its unhappy customers. For every complaint it receives, the company has at least 25 customers with problems, about one-fourth of which are serious.
- Of the customers who make a complaint, more than half will do business again with that organization if their complaint is resolved. If the customer feels that the complaint was resolved quickly, this figure jumps to about 95 percent.
- The average customer who has had a problem will tell 9 or 10 others about it. Customers who have complaints resolved satisfactorily will only tell about 5 others.
- It costs **six times more** to get new customer than to keep a current customer.

# Important Quality Dimensions in service

- **Time:** How much time must a customer wait?
- **Timeliness:** Will a service be performed when promised/on time?
- **Completeness:** Are all items in the order included?
  - Is everything customer asked for provided?
  - Is a mail order from a catalogue company complete when delivered?
- **Courtesy:** Do front- line employees greet each customer cheerfully?
- **Consistency:** Are service delivered in the same fashion for every customer, and every time for the same customer?

# Important Quality Dimensions in service

- **Accessibility & Convenience:** Is the service easy to obtain?
  - Does a service representative answer your calls quickly?
- **Accuracy:** Is the service performed right the first time?
  - Is your bank or credit card statement correct every month?
- **Responsiveness:** Can service personnel react quickly & resolve unexpected problems?
  - How well does the company react to unusual situations?
  - How well is a telephone call answered?



# Meaning of Quality: Producer's Perspective

- **Quality of Conformance**

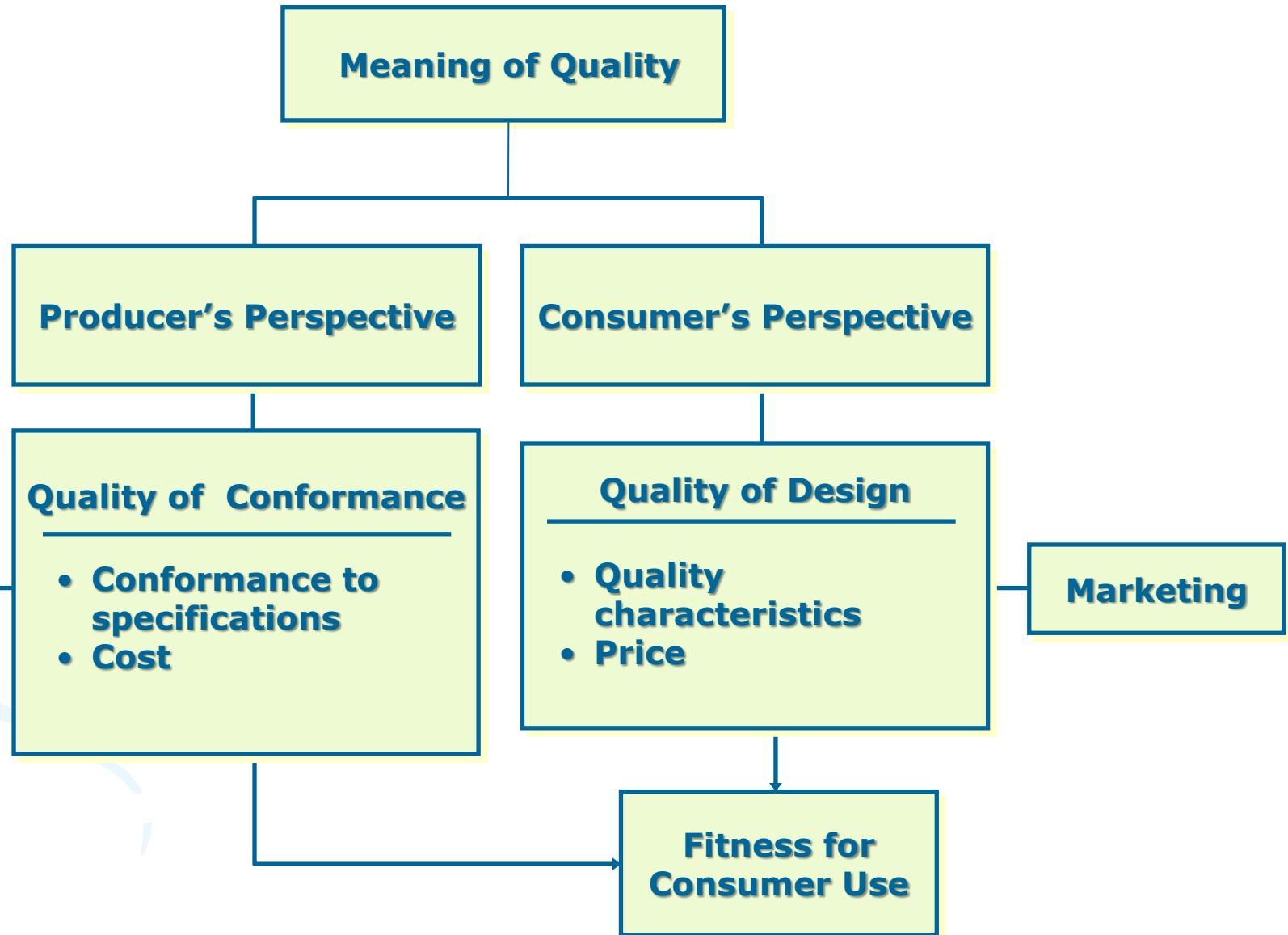
- Making sure a product or service is produced according to design
  - if new tires do not conform to specifications, they wobble
  - if a hotel room is not clean when a guest checks in, the hotel is not functioning according to specifications of its design



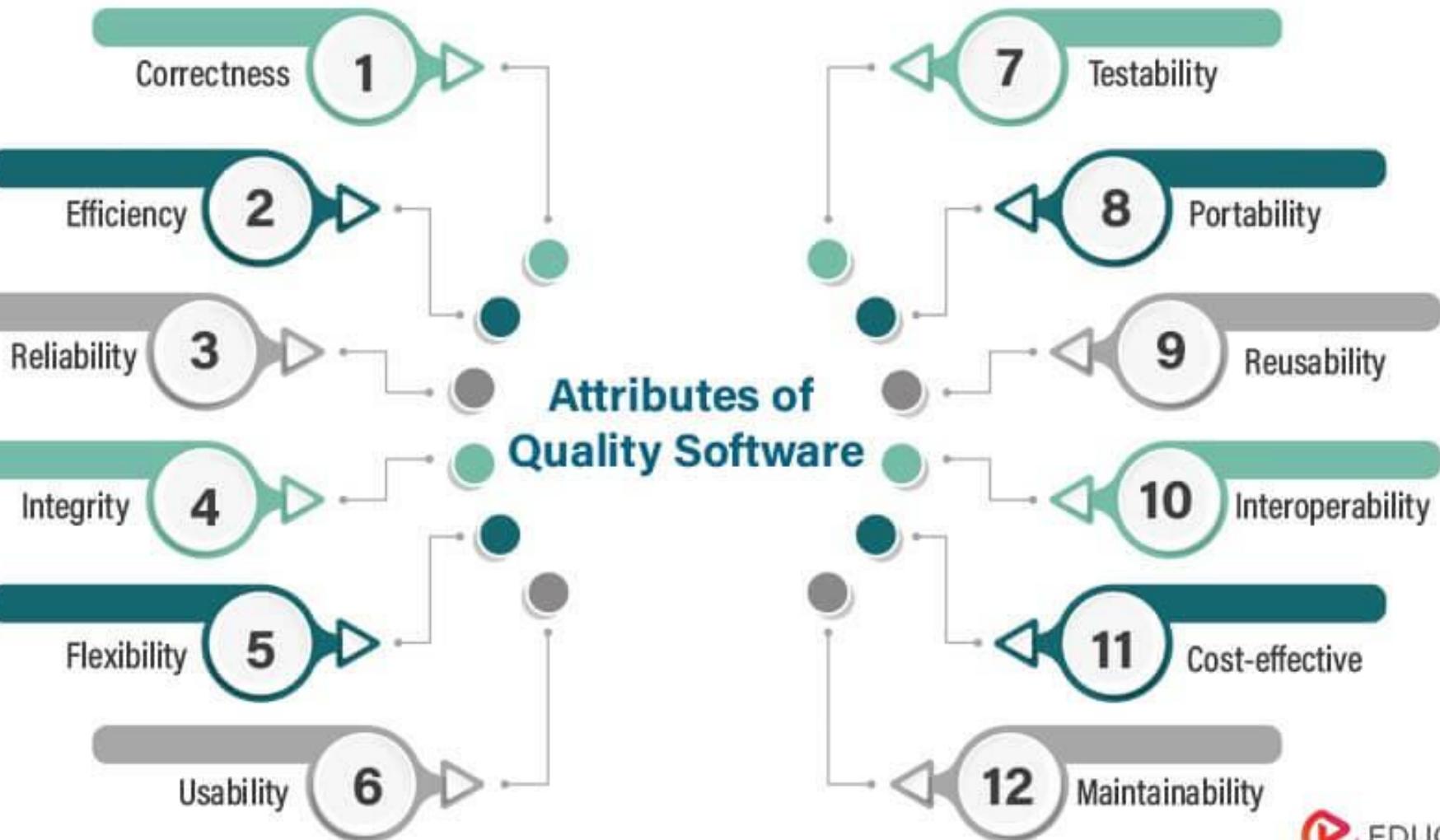
# Meaning of Quality: A Final Perspective

- **Consumer's & producer's perspectives depend on each other**
- **Consumer's perspective: PRICE**
- **Producer's perspective: COST**
- **Consumer's view must dominate**

# Meaning of Quality



# Software quality



# Software Quality Assurance (SQA)

Boosts  
customers'  
confidence



Ensures products  
to keep improving



**Software  
Quality Assurance**



Leads to more  
long-term profit

Gives consistent  
results

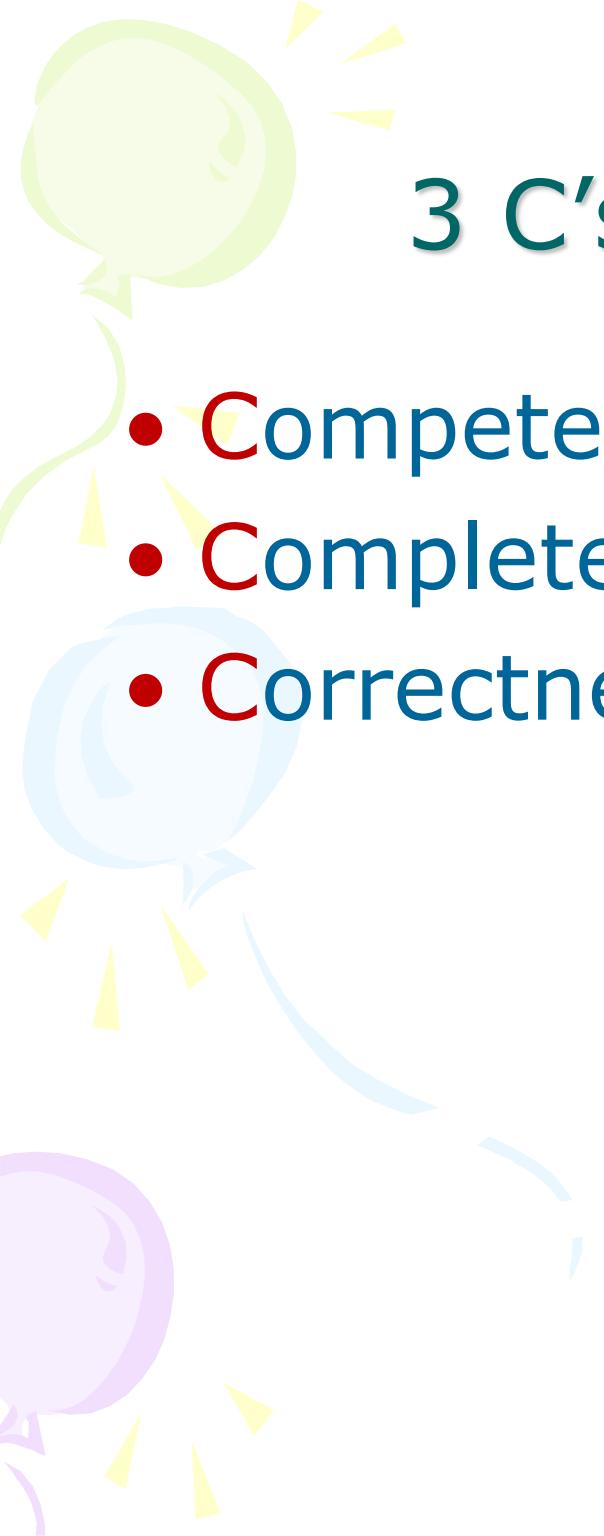


Saves companies  
time and money



# Software Quality Assurance (SQA)





# 3 C's of Software Quality

- Competency
- Completeness
- Correctness

# 15 Strategies to Improve Software Quality

## 1. Test Early

- Testing aims to catch defects early during the design phase so they don't snowball and grow into bigger issues later.
- Testing early also reduces the money spent on bug fixes.

## 2. Implement Cross Browser Testing

- Cross browser testing checks if the software runs seamlessly across different web browsers, screen sizes, and mobile apps.

# 15 Strategies to Improve Software Quality

## 3. Test on Multiple Devices

- Windows and Mac are the two most popular operating systems used for testing purposes, and web browsers such as Chrome, Safari, Opera, and Firefox cover most of the users.

## 4. Optimize Automation Testing

- According to a [2020-21 World Quality Report](#), automation testing tools can save time, enhance coverage, minimize human errors, and improve testing capabilities.
- Some popular approaches are smoke testing, [regression testing](#), [cross-device and cross-browser testing](#), and load testing.

# 15 Strategies to Improve Software Quality

## 5. Use Quality Controls from the Beginning

- A structured approach effectively improves test processes and cuts maintenance costs

## 6. Leverage Continuous Delivery (CD) and Continuous Integration (CI)

- CI-CD requires engineers to integrate changes and improvements to every step of the software development lifecycle.
- **Continuous Delivery** focuses on releasing changes to customers interactively, while **continuous integration** makes code more dependable by integrating modifications to a product multiple times daily.

# 15 Strategies to Improve Software Quality

## 7. Have Clear Communication

- Clear communication with all team members is a must
- Having consistent KPIs throughout the project and conveying accurate test reports helps in communicating
- Everybody should be aligned when setting testing requirements and sharing feedback

## 8. Create a Risk Registry

- A project risk register is also called a risk log, and it is used to identify, track, and analyze potential risks.

# 15 Strategies to Improve Software Quality

## 8. Create a Risk Registry

Examples of risks logged include:

- Legal compliance and regulatory risks
- Data security and breach risks
- Unforeseen events such as natural disasters, physical break-ins, and theft
- Supply chain disruptions

A risk register comprises the following elements:

- Identification number (for risks)
- Brief description and overview of each risk
- Risk categories (both internal and external)
- Probability
- Impact and Rating
- Risk analysis approach and specification
- Action plan
- Names of individuals responsible for overseeing, managing, or mitigating risks



# Risk Register

Project name: Common project risks

| ID | Date raised  | Risk description   | Likelihood of the risk occurring | Impact if the risk occurs | Severity Rating based on impact & likelihood. | Owner Person who will manage the risk. | Mitigating action Actions to mitigate the risk e.g. reduce the likelihood.   |
|----|--------------|--|----------------------------------|---------------------------|---|--|--|
| 1  | [enter date] | Project purpose and need is not well-defined.            | Medium                           | High                      | High  | Project Sponsor                        | Complete a business case if not already provided and ensure purpose is well defined on Project Charter and PID.        |
| 2  | [enter date] | Project design and deliverable definition is incomplete. | Low                              | High                      | High  | Project Sponsor                        | Define the scope in detail via design workshops with input from subject matter experts.                                |
| 3  | [enter date] | Project schedule is not clearly defined or understood    | Low                              | Medium                    | Medium  | Project Manager                        | Hold scheduling workshops with the project team so they understand the plan and likelihood fo missed tasks is reduced. |

# 15 Strategies to Improve Software Quality

## 9. Document Your Project Requirements

- Good documentation defines the scope of the project, milestones, deliverables, and technical specifications, thus ensuring you meet deadlines and stay on track.

## 10. Think Outside the Box

- Promoting innovation and thinking outside the box should be a no-brainer.
- People crave “different,” and you will stand out if you build a unique product that others cannot replicate. To improve software quality, think about what you stand for.

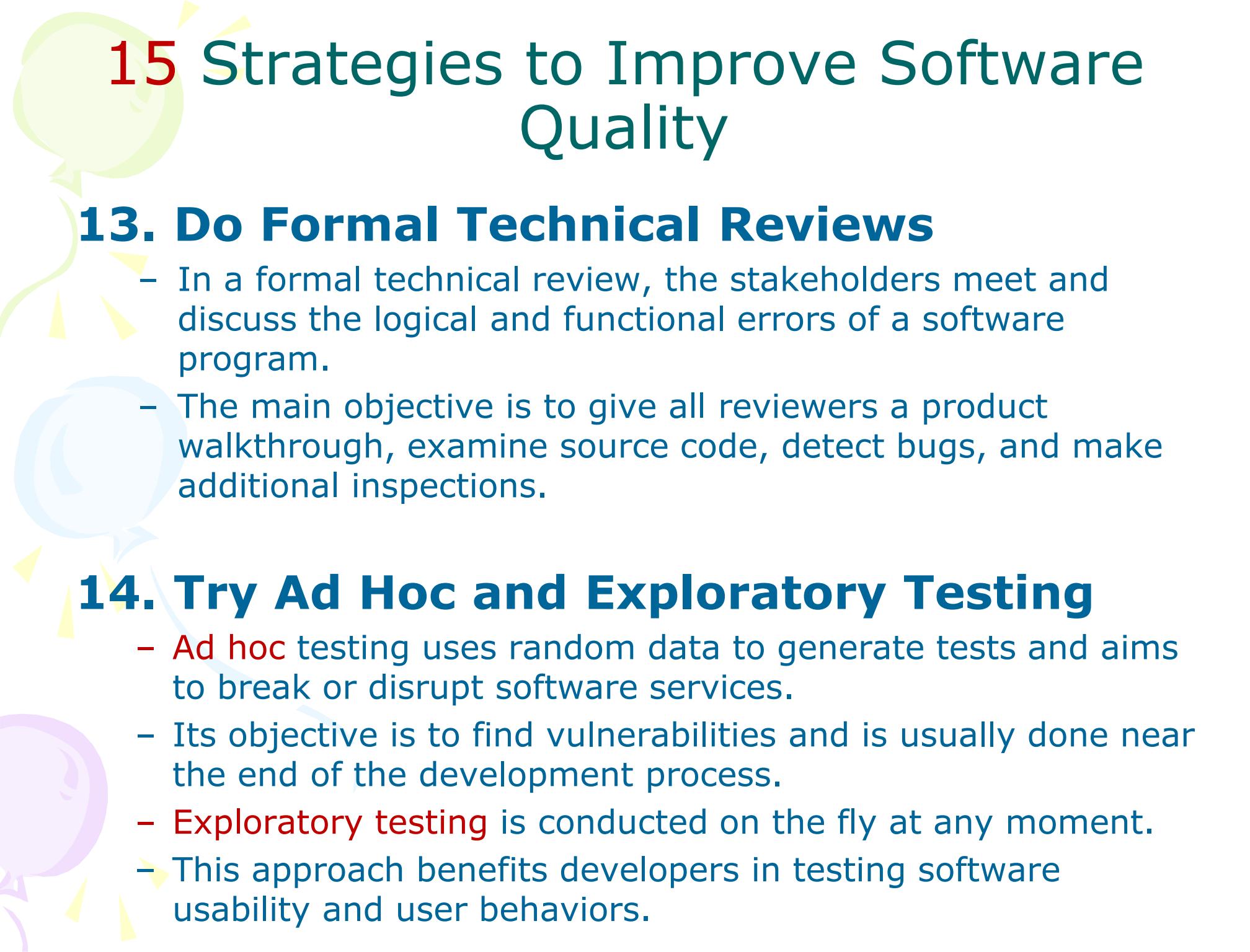
# 15 Strategies to Improve Software Quality

## 11. Incorporate Employee Training

- Tools, technologies, and techniques evolve, and it's important to stay on track with the latest trends.
- Employee training instills an awareness of what to look out for in leading software products.

## 12. Create a Quality Management Plan

- A quality management plan (document)
  - outlines software quality expectations
  - defines roles and responsibilities
  - supports project managers and
  - organizes tasks to ensure that software development matches customer requirements and expectations



# 15 Strategies to Improve Software Quality

## 13. Do Formal Technical Reviews

- In a formal technical review, the stakeholders meet and discuss the logical and functional errors of a software program.
- The main objective is to give all reviewers a product walkthrough, examine source code, detect bugs, and make additional inspections.

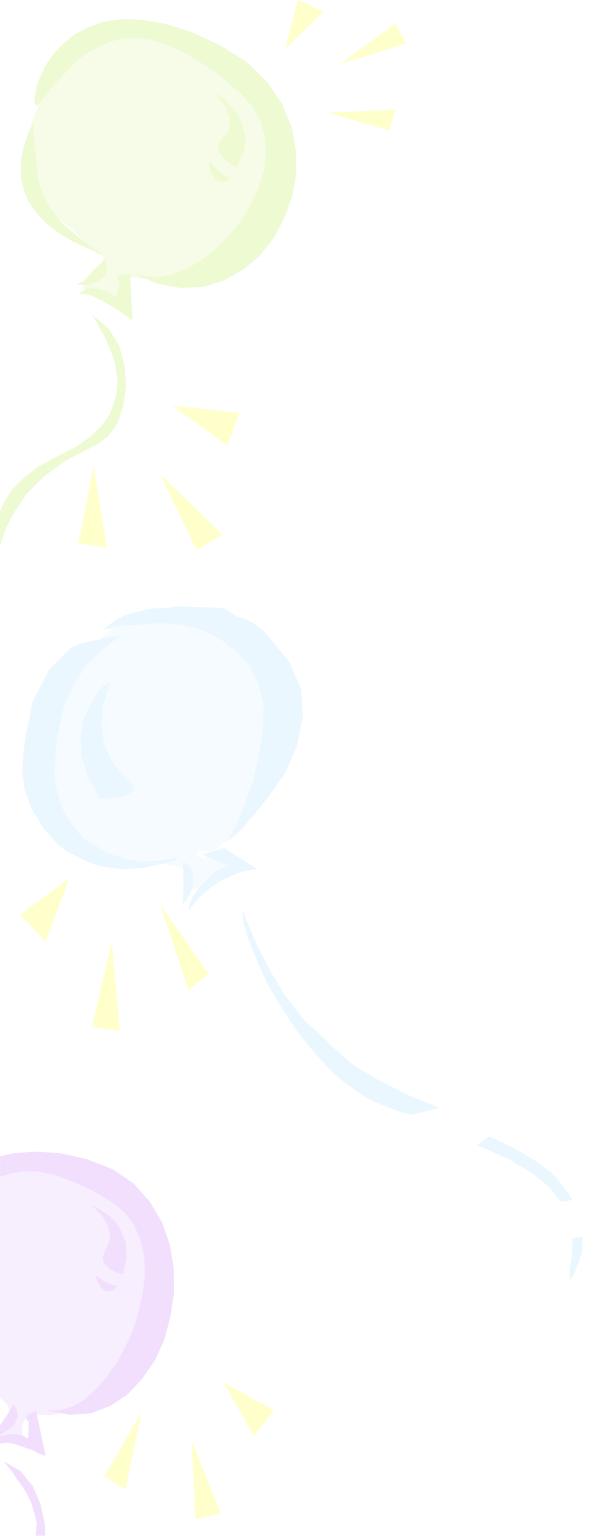
## 14. Try Ad Hoc and Exploratory Testing

- Ad hoc testing uses random data to generate tests and aims to break or disrupt software services.
- Its objective is to find vulnerabilities and is usually done near the end of the development process.
- Exploratory testing is conducted on the fly at any moment.
- This approach benefits developers in testing software usability and user behaviors.

# 15 Strategies to Improve Software Quality

## 15. Produce Bug Reports

- A good bug report can make software testing and improvement highly effective.
- It includes all possible scenarios, and use-cases and describes behaviors exhibited while testing new features.
- You can add screenshots of failure exceptions in the report, list all possible solutions, and a bug summary.



**Thank you!**