

TOPIK 2

PENDAHULUAN: *Manajemen Kualitas & Perkembangannya*

PERKEMBANGAN MANAJEMEN/PENGENDALIAN KUALITAS

PERIODE	KARAKTERISTIK	KETERANGAN
~ Akhir 1920s	Pengendalian Kualitas (PK oleh pekerja (merangkap pemilik & inspektur)	Fokus pada aktivitas PK. Metode/konsep2 yang berkembang:
1920s	PK oleh supervisor PK oleh petugas khusus (QC inspector)	<ul style="list-style-type: none"> • <i>Consumer's/producer's risks</i> • <i>Probability of acceptance</i> • <i>Operating characteristics (OC) curve</i>
1930s	Penerapan <i>Acceptance Sampling Techniques</i>	<ul style="list-style-type: none"> • <i>LTPD (Lot Tolerance Percent Defect)</i>
1940s	<i>Statistical Quality Control</i>	<ul style="list-style-type: none"> • Metode sampling: double, multi-level, sequential, continuous
1950s	Pengembangan standar PK	<ul style="list-style-type: none"> • <i>Sampling by attribute</i> • <i>Cusum chart, etc.</i>

PERIODE	KARAKTERISTIK	KETERANGAN
1960s	<ul style="list-style-type: none"> Total Quality Control (PK tidak hanya di lantai produksi) Zero Defect (ZD) Quality Circle (QC) 	Konsep ZD & QC: Employee motivation & involvement program
1970s	<i>Organization-wide QC</i> <i>Quality System</i> <i>Quality Costs</i> <i>Taguchi Method</i>	Ide: untuk dapat menghasilkan kualitas produk yang baik secara ekonomis tidak dapat hanya dilakukan pengecekan defects.
1980s	Slogan-slogan	Quality Costs mencakup seluruh fasa dalam daur hidup produk: <ul style="list-style-type: none"> <i>Product planning</i> <i>Product design</i> <i>Production process design</i> <i>On-line production process control</i> <i>Market development</i> <i>Packaging</i> <i>Maintenance</i> <i>Product service</i>

PERIODE	KARAKTERISTIK	KETERANGAN
New Trend	<p>Product Design Assurance: PK pada desain produk (& pengaruhnya pada kualitas produk)</p> <p>Procurement Quality Assurance: PK pada suplai bahan baku</p> <p>Production Quality Control: Mencakup seluruh aktivitas produksi yang mendukung kualitas produk</p> <p>Product Quality Audit: Evaluasi program PK organisasi (dari sisi konsumen) Bertujuan memberi manajemen pandangan konsumen mengenai produk yang dipasarkan</p> <p>Pengembangan Standar Internasional</p>	Ide: <ul style="list-style-type: none"> Merancang kualitas sistem yang tinggi Secara ekonomis, kualitas perlu dirancang ke dalam proses produksi

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PARADIGMA KUALITAS

FOCUS:

- A: Product & product performance relative to customer demands;
- B: Production rate;
- C: More attention on production processes;
- D: Involvement of customers & suppliers;
- E: Socio-technical counterpart to custom-craft paradigm

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A. CUSTOM-CRAFT QUALITY PARADIGM

Each product unit is designed and built exactly the way our customer wants it.

Requirements:
Skilled crafts-person
Basic hand tools
Demand for unique product

Performance	++++
Cost	+
Timeliness	+

Production focus:
Process: ++
Production rate: +

B. MASS PRODUCTION & SORTING QUALITY PARADIGM

Products are designed and built, then customers are generated.

Requirements:
Interchangeable parts
Factory power
Unskilled labor pool
Large customer pool
Hard-selling

Performance	++
Cost	++
Timeliness	+++

Production focus:
Process: +
Production rate: ++++

C. STATISTICAL QUALITY CONTROL PARADIGM

Products are designed and built, statistical process control and statistical sampling are used, then customers are generated.

Requirements:
Interchangeable parts
Factory power
Unskilled labor pool
Large customer pool
Hard-selling
Statistical methods

Performance	++
Cost	+++
Timeliness	+++

Production focus:
Process: ++
Production rate: ++++

D. TQM PARADIGM

Potential customers tell us what to design and build. Using proactive and reactive quality strategies and tools we deliver a product the customers want.

Requirements:
Interchangeable parts
Factory power
Statistical methods
Empowered employees
Supplier partnerships
Customer relationships

Performance	++++
Cost	++++
Timeliness	++++

Production focus:
Process: ++++
Production rate: ++++

E. TECHNO-CRAFT QUALITY PARADIGM

Each unit is designed and built exactly the way our customer wants it built.

Requirements:
Interchangeable parts
Factory power
Statistical methods
Empowered employees
Supplier partnerships
Customer relationships
Computer aided design
Computer aided manufacturing

Performance	++++
Cost	++++
Timeliness	++++

Production focus:
Process: ++++
Production rate: +++

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EVOLUSI SISTEM MANAJEMEN KUALITAS

Catatan:
A = Inspeksi
B = Pengendalian Kualitas
C = Sistem Penjamin Kualitas
D = Manajemen Kualitas Terpadu

MANAJEMEN KUALITAS TERPADU/ TOTAL (1970 ~)

- Kebijakan kualitas
- Keterlibatan pemasok & konsumen
- Keterlibatan semua operasi
- Manajemen operasi
- Pengukuran performansi
- Teamwork
- Keterlibatan pekerja

SISTEM PENJAMIN KUALITAS (1970 ~)

- Pengembangan sistem kualitas
- Perencanaan kualitas lanjut
- Manual kualitas terpadu
- Ongkos kualitas
- Keterlibatan operasi non produksi
- Analisis sebab-akibat
- Pengendalian proses statistik

PENGENDALIAN KUALITAS (1940 ~)

- Pengembangan manual kualitas
- Data performansi proses
- Inspeksi mandiri
- Pengujian produk
- Perencanaan kualitas dasar
- Penerapan statistika dasar

INSPEKSI (1920 ~)

- Tindakan penyelamatan
- Sorting, klasifikasi
- Tindakan koreksi
- Identifikasi sumber ketidaksesuaian

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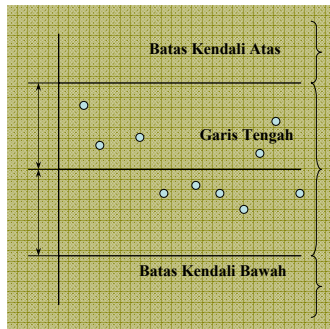
TOKOH KUALITAS (1)

WALTER A. SHEWHART: STATISTIKA DLM PENGENDALIAN KUALITAS

ASPEK KUALITAS:

- Kualitas Obyektif: kualitas produk merupakan realitas obyektif tentang produk, independen dari keberadaan manusia.
- Kualitas Subyektif: kualitas produk relatif berdasarkan persepsi, perasaan dan sense konsumen

Pioneer and visionary of *modern quality control* (peta-peta kendali)



Variasi tak-alamiah, disebabkan oleh sebab-sebab khusus di luar proses, seperti material, pekerja, peralatan, dll.

Variasi alamiah, terkandung dalam proses & disebabkan oleh sebab-sebab umum (ada selama proses tidak diubah; tanggung jawab: manajemen).

TOKOH KUALITAS (2)

KAORU ISHIKAWA: PENGENDALIAN & PERBAIKAN KUALITAS

KUALITAS:

- "True": pandangan konsumen tentang performansi produk
- "Substitute": pandangan produsen tentang performansi produk dalam bahasa teknis produsen

KEPUASAN KONSUMEN:

Kesesuaian antara "true and substitute quality"

LANGKAH-LANGKAH:

1. Memahami karakteristik "true quality";
2. Menentukan metoda untuk mengukur & menguji karakteristik "true quality";
3. Menemukan karakteristik pengganti & mempunyai pemahaman yang benar tentang hubungan antara "True Q" and "Substitute Q"

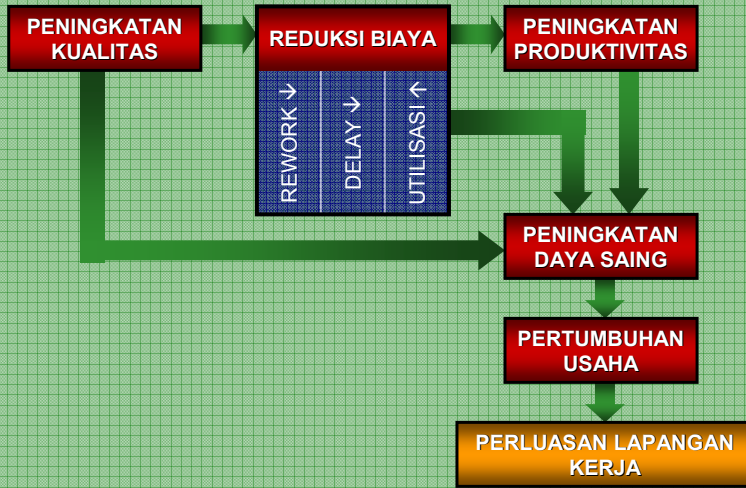
7 QC Tools:

Cause & effect diagram, Stratifikasi, Check Sheet, Histogram, Scatter Diagram, Pareto, Peta-2 Kendali

TOKOH KUALITAS (3)

W. EDWARD DEMING: MANAJEMEN KUALITAS

RANTAI REAKSI:



TOKOH KUALITAS (4)

JOSEPH M. JURAN: TRILOGI KUALITAS

TRILOGI MANAJEMEN KUALITAS:



Penjamin kualitas & pengendalian kualitas.

PENJAMIN KUALITAS (Quality Assurance)

- Cara untuk menjamin kualitas dalam produk sehingga konsumen dapat membelinya dengan keyakinan dan menggunakannya dalam kurun waktu tertentu dengan keyakinan & kepuasan (Ishikawa);
- Semua tindakan terencana & sistematis yang diperlukan untuk memberikan keyakinan cukup bahwa suatu produk atau jasa akan memenuhi tingkat kualitas tertentu (JIS Z 8101).

PENGENDALIAN KUALITAS (Quality Control)

- Teknik operasional & aktivitas untuk menjaga kualitas produk atau jasa yang akan memuaskan kebutuhan tertentu (ANSI Z1.7 1971);
- TQC: sistem efektif untuk mengintegrasikan upaya pengembangan kualitas, penjaminan kualitas, dan perbaikan kualitas dari berbagai kelompok dalam organisasi sehingga memungkinkan pemasaran, rekayasa, produksi, dan layanan pada tingkat minimum untuk memuaskan kebutuhan konsumen (*customer satisfaction*) secara penuh.

TOKOH KUALITAS (4)

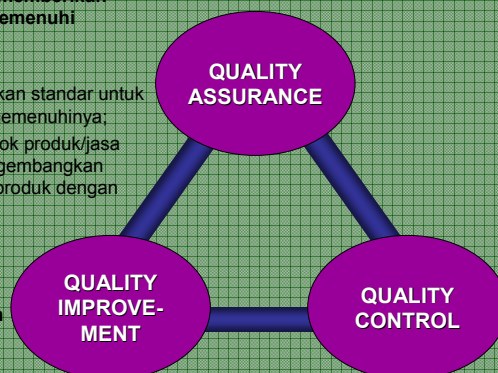
TRILOGI MANAJEMEN KUALITAS

- Semua tindakan sistematis untuk memberikan kepercayaan bahwa suatu entiti memenuhi persyaratan kualitas.

- Dicapai melalui:

- ✓ Pengujian produk/jasa berdasarkan standar untuk membangun kapabilitas untuk memenuhinya;
- ✓ Mengevaluasi organisasi pemasok produk/jasa berdasarkan standar untuk mengembangkan kapabilitas untuk memproduksi produk dengan standar tertentu.

Tindakan yang diambil dalam organisasi untuk meningkatkan efektivitas & proses untuk memberikan nilai tambah pada organisasi & konsumen



- Teknik & aktivitas operasional yang digunakan untuk memenuhi persyaratan kualitas;
- Proses untuk menjaga standar melalui proses seleksi, pengukuran & koreksi kerja

TOKOH KUALITAS (5)

PHILIP B. CROSBY: ZERO DEFECT

FILOSOFI CROSBY:

- ▶ Kualitas didefinisikan sebagai konformasi terhadap;
- ▶ Sistem untuk menjaga kualitas: prevention (*Off-line Quality Control*);
- ▶ Standar performansi: bebas cacat (zero defect);
- ▶ Pengukuran kualitas: harga dari ketidaksesuaian.

TOKOH KUALITAS (6)

ARMAND V. FEIGENBAUM: TQC

TQC (Total Quality Control) = Konsep horizontal lintas divisi fungsional organisasi



GENICHI TAGUCHI: QUALITY ENGINEERING

PENDEKATAN TAGUCHI:

- ▶ **Engineering approach:** mencapai nilai target dengan variasi (noise) performansi produk yang minimum dalam lingkungan konsumen.
- ▶ **Tools:** teori & teknik optimasi, *experimentasi design*.
- ▶ **Tiga jenis 'noise':**
 1. **External Noise:** variabel dalam lingkungan atau kondisi penggunaan yang mengganggu fungsi produk (contoh: temperatur, kelembaban, dan debu);
 2. **Deterioration Noise** atau **Internal Noise:** perubahan yang terjadi akibat dari penggunaan atau penyimpanan;
 3. **Unit-to-unit Noise:** perbedaan antar produk yang dibuat dengan spesifikasi tertentu.
- ▶ **Tujuan:** minimasi noise melalui on-line QC (selama produksi) & off-line QC (sebelum & setelah produksi) untuk meminimumkan kerugian masyarakat.
- ▶ **Tiga level desain:**
 1. **Desain sistem (primer):** desain fungsional dengan fokus pada teknologi dan arsitektur produk yang relevan;
 2. **Desain parameter (sekunder):** cara untuk mereduksi biaya dan sekaligus meningkatkan performansi tanpa menghilangkan penyebab variasi.
 3. **Desain toleransi (tersier):** cara untuk mereduksi variasi dengan mengendalikan penyebab variasi tetapi tanpa meningkatkan biaya.

SHIGEO SHINGO: PRODUCTIVITY IMPROVEMENT – SMED

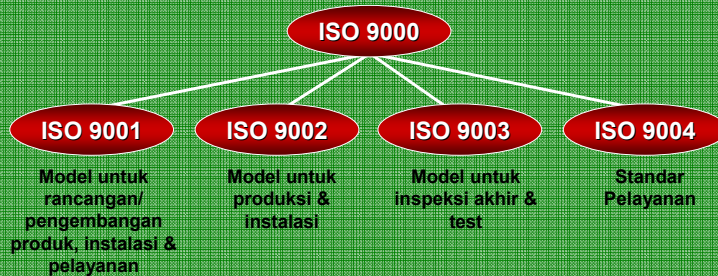
- ▶ **Pendekatan untuk mencapai Zero Defect:** *poka-yoke (mistake proofing) system* untuk mengeliminasi defect.
- ▶ Mistake-proofing system concept: human- or machine-sensor based series of 100% source inspection, *self-check*, or successive checks to detect abnormalities when or as they occur and to correct them on the current unit of production as well as systemwide.
- ▶ Prinsip dasar Shingo Zero QC System:
 - ▶ Gunakan inspeksi sumber
 - ▶ Selalu melakukan inspeksi 100%
 - ▶ Minimasi waktu untuk melakukan tindakan koreksi pada saat abnormalitas muncul;

ISO 9000

ISO 9000:1994: STANDARD FOR QUALITY ASSURANCE SYSTEM

ISO 9000:

- Kumpulan standar internasional untuk sistem kualitas;
- Memspesifikasikan kebutuhan dan rekomendasi untuk perancangan dan evaluasi sistem manajemen;
- **Tujuan:** untuk mencapai, menjaga dan memperbaiki kualitas secara ekonomis;
- **Struktur:**



ISO 9000:1994

KOMPONEN:

1. Management Responsibility	11. Inspection, Measuring & Test Equipment
2. Quality System	12. Inspection & Test Status
3. Contract Review	13. Control of non conforming product
4. Design Control	14. Corrective & Prevention Actions
5. Document & Data Control	15. Handling, Storage, Packaging, Preservation & Delivery
6. Purchasing	16. Control of Quality Records
7. Customer Supplied Product	17. Internal Quality Audits
8. Product Identification & Traceability	18. Training
9. Process Control	19. Servicing
10. Inspection & Testing	20. Statistical Techniques

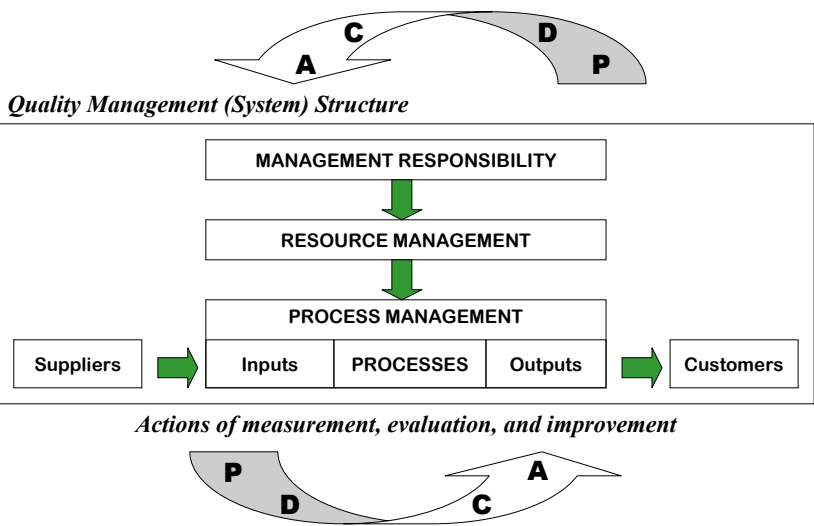
ISO 9000:2000: PROMOTING CONTINUOUS IMPROVEMENT

ISO 9000:

- ISO 9000: a set of quality management standards.
- Tujuan: to facilitate international trade by providing a single set of standards that people everywhere would recognize and respect.
- Struktur: 9001:2000
 - ✓ Has 5 sections
 - ✓ More compatible to ISO 14000
- Dasar: 8 prinsip manajemen kualitas

1. Focus on your customers
2. Provide leadership
3. Involve your people
4. Use a process approach
5. Take a systems approach
6. Encourage continual improvement
7. Get the facts before you decide
8. Work with your suppliers

ISO 9000:2000: A PROCESS BASED APPROACH



8 PRINSIP MANAJEMEN KUALITAS (1)

NO	PRINCIPLE	EXPLANATION
1.	Focus on your customers	Organizations rely on customers. Therefore: <ul style="list-style-type: none"> ✓ Organizations must understand customer needs. ✓ Organizations must meet customer requirements. ✓ Organizations must exceed customer expectations.
2.	Provide leadership	Organizations rely on leaders. Therefore: <ul style="list-style-type: none"> ✓ Leaders must establish a unity of purpose and set the direction the organization should take. ✓ Leaders must create an environment that encourages people to achieve the organization's objectives.
3.	Involve your people	Organizations rely on people. Therefore: <ul style="list-style-type: none"> ✓ Organizations must encourage the involvement of people at all levels. ✓ Organizations must help people to develop and use their abilities.
4.	Use a process approach	Organizations are more efficient and when they use a process approach. Therefore: <ul style="list-style-type: none"> ✓ Organizations must use a process approach to manage activities and related resources.

8 PRINSIP MANAJEMEN KUALITAS (2)

NO	PRINCIPLE	EXPLANATION
5.	Take a systems approach	Organizations are more efficient and effective when they use a systems approach. Therefore: <ul style="list-style-type: none"> ✓ Organizations must identify interrelated processes and treat them as a system. ✓ Organizations must use a systems approach to manage their interrelated processes.
6.	Encourage continual improvement	Organizations are more efficient and effective when they continually try to improve. Therefore: <ul style="list-style-type: none"> ✓ Organizations must make a permanent commitment to continually improve their overall performance.
7.	Get the facts before you decide	Organizations perform better when their decisions are based on facts. Therefore: <ul style="list-style-type: none"> ✓ Organizations must base decisions on the analysis of factual information and data.
8.	Work with your suppliers	Organizations depend on their suppliers to help them create value. Therefore: <ul style="list-style-type: none"> ✓ Organizations must maintain a mutually beneficial relationship with their suppliers.

ISO 9000:2000

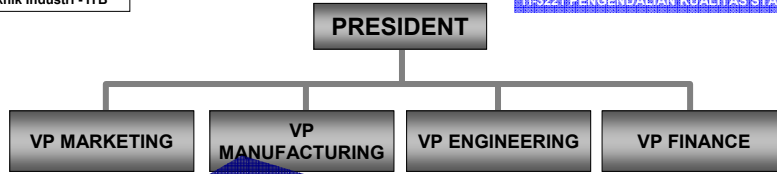
Pendekatan: *a process approach to quality management.*

- ✓ A quality management system can be thought of as a single large *process* that uses many *inputs* to generate many *outputs*.
- ✓ It is made up of at least 21 processes (22 if you recognize that the Quality Management System as a whole is also a process).
- ✓ 21 processes:

1. <i>Quality Management Process</i>	11. <i>Customer Communications Process</i>
2. <i>Resource Management Process</i>	12. <i>Internal Communications Process</i>
3. <i>Regulatory Research Process</i>	13. <i>Document Control Process</i>
4. <i>Market Research Process</i>	14. <i>Record Keeping Process</i>
5. <i>Product Design Process</i>	15. <i>Planning Process</i>
6. <i>Purchasing Process</i>	16. <i>Training Process</i>
7. <i>Production Process</i>	17. <i>Internal Audit Process</i>
8. <i>Service Provision Process</i>	18. <i>Management Review Process</i>
9. <i>Product Protection Process</i>	19. <i>Monitoring and Measuring Process</i>
10. <i>Customer Needs Assessment Process</i>	20. <i>Nonconformance Management Process</i>
	21. <i>Continual Improvement Process</i>

ISO 14000

- **ISO 9000:**
 - ✓ Kumpulan standar yang menyajikan model uniform untuk sistem manajemen lingkungan;
 - ✓ Model "continuous improvement"
- **Famili ISO 14000:**
 - ✓ ISO 14001 : Spesifikasi untuk sistem manajemen lingkungan
 - ✓ ISO 14010 – 14015 : Audit lingkungan dan aktivitas terkait
 - ✓ ISO 14020 – 14024 : Environmental Labelity
 - ✓ ISO Guide 64 : Spesifikasi produk
- **Cakupan:**
 - ✓ Komitmen dan kebijakan
 - ✓ Perencanaan
 - ✓ Implementasi & operasi
 - ✓ Pengukuran & evaluasi
 - ✓ Review & perbaikan



ASESMEN
TEKNOLOGI

Contoh Sistem Manufaktur:
Taiyo Electronics Ltd., Japan
SISTEM PERAKITAN I (Insertion)

