



ASACB Interaction of Processes & Key Performance Indicators

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What is a Quality Management System

A QMS, or Quality Management System, for aerospace refers to a set of processes, policies, and procedures designed to ensure that aerospace products and services meet the necessary quality requirements and comply with applicable regulations and standards.

The aerospace industry places a strong emphasis on safety, reliability, and compliance, which makes a robust QMS crucial for the success and trustworthiness of aerospace organizations.



Key components of a QMS for aerospace typically include:

- 1. Quality Policy:** A statement outlining the organization's commitment to quality and customer satisfaction.
- 2. Quality Objectives:** Specific, measurable goals that the organization aims to achieve in terms of quality performance.
- 3. Documentation and Record Control:** Procedures for creating, maintaining, and controlling documents and records related to quality, including specifications, procedures, work instructions, and test reports.
- 4. Risk Management:** Processes to identify, assess, and mitigate risks associated with product quality, safety, and compliance.



Key components of a QMS for aerospace typically include:

5. **Configuration Management:** Procedures to control and document changes to product configurations throughout their lifecycle, ensuring traceability and preventing unauthorized modifications.
6. **Supplier Management:** Processes to select, evaluate, and monitor suppliers based on their ability to meet quality requirements and deliver conforming materials and components.
7. **Design and Development Controls:** Procedures to manage the design and development of aerospace products, including requirements management, design verification and validation, and configuration control.
8. **Nonconformance and Corrective Action:** Processes to identify, document, investigate, and resolve nonconformities and implement corrective actions to prevent recurrence.



Key components of a QMS for aerospace typically include:

9. Inspection and Testing: Procedures for inspecting and testing aerospace products at various stages of production to verify compliance with specifications and standards.

10. Training and Competence: Processes to ensure that personnel involved in critical activities receive adequate training and possess the necessary skills and knowledge to perform their tasks effectively.

11. Internal Audits: Regular assessments conducted by internal auditors to verify compliance with the QMS and identify areas for improvement.

12. Continuous Improvement: Practices to monitor key performance indicators, collect data, analyze trends, and implement actions to enhance the effectiveness and efficiency of the QMS.



What is a Key Process Indicator

Key Process Indicators (KPIs) for aerospace companies are ***quantitative measurements*** used to assess and evaluate the performance and effectiveness of various processes within the aerospace industry.

These indicators are typically aligned with the ***strategic goals and objectives*** of the company and provide valuable insights into the efficiency, quality, and overall health of critical processes.



Key Process Indicator Purpose

- 1. Performance Measurement:** KPIs allow aerospace companies to track and measure the performance of specific processes against predefined targets or benchmarks. By establishing meaningful metrics, organizations can objectively evaluate their progress and identify areas that require improvement. This enables them to make data-driven decisions to optimize operations and enhance performance.
- 2. Continuous Improvement:** KPIs serve as a tool for identifying opportunities for improvement within aerospace processes. By regularly **monitoring and analyzing** KPI data, companies can pinpoint areas of inefficiency or bottlenecks and take appropriate actions to optimize processes, reduce waste, and enhance productivity. This supports the pursuit of continuous improvement initiatives and helps drive operational excellence.



Key Process Indicator Purpose

3. **Goal Alignment:** KPIs help align the efforts of individuals, teams, and departments with the overall strategic objectives of the aerospace company. By establishing KPIs that are directly linked to the organization's goals, employees can better understand their roles and contributions towards achieving those objectives. This fosters a culture of accountability, collaboration, and alignment throughout the company.

4. **Decision Making:** KPIs provide decision-makers with reliable and timely data to support informed decision-making. By having access to real-time or periodic performance metrics, managers and executives can gain insights into the effectiveness and efficiency of different processes. This enables them to identify trends, patterns, and potential issues, allowing for proactive decision-making to address challenges and capitalize on opportunities.



Key Process Indicator Purpose

5. Benchmarking and Comparison: KPIs allow aerospace companies to compare their performance against industry benchmarks, best practices, or internal standards. This facilitates a better understanding of the company's relative position and performance within the industry. By identifying performance gaps and areas where they lag behind competitors or industry leaders, organizations can set realistic targets for improvement and strive to achieve higher levels of performance.

In summary, the purpose of Key Process Indicators for aerospace companies is to provide measurable, objective, and actionable insights into the performance of critical processes. They enable organizations to monitor progress, drive continuous improvement, align efforts with strategic goals, support decision-making, and benchmark performance against industry standards. Ultimately, KPIs help drive operational excellence and enhance overall performance within the aerospace industry.



Identifying Key Processes

- **Critical to your business**
 - Without the process you could not provide the products or services offered per the clients requirements.
- **Measurable performance**
 - You decide what aspects to measure based on what your company needs from the process.
 - All Key processes should support your company wide objectives and goals.
- **Section 8 Processes**
 - Should be covered within a process – see next slide example AS9100



Identifying Key Processes

8.	OPERATION
8.1	Operational Planning and Control.....
8.1.1	Operational Risk Management
8.1.2	Configuration Management.....
8.1.3	Product Safety.....
8.1.4	Prevention of Counterfeit Parts
8.2	Requirements for Products and Services
8.2.1	Customer Communication.....
8.2.2	Determining the Requirements for Products and Services.....
8.2.3	Review of the Requirements for Products and Services
8.2.4	Changes to Requirements for Products and Services
8.3	Design and Development of Products and Services
8.3.1	General.....
8.3.2	Design and Development Planning.....
8.3.3	Design and Development Inputs
8.3.4	Design and Development Controls
8.3.5	Design and Development Outputs
8.3.6	Design and Development Changes
8.4	Control of Externally Provided Processes, Products, and Services
8.4.1	General.....
8.4.2	Type and Extent of Control
8.4.3	Information for External Providers
8.5	Production and Service Provision
8.5.1	Control of Production and Service Provision
8.5.2	Identification and Traceability
8.5.3	Property Belonging to Customers or External Providers
8.5.4	Preservation
8.5.5	Post-Delivery Activities.....
8.5.6	Control of Changes
8.6	Release of Products and Services
8.7	Control of Nonconforming Outputs



Key Processes for Section 8

Exercise 1



Now that we have identified the processes...

- What do we need the processes to achieve?

examples – **Sales and Purchasing**

Purchase Order Cycle Time (w/i xx hours) –

Track the time it takes from the initiation of a purchase order to its final receipt and payment. *This KPI measures the efficiency of the purchasing process, including requisition processing, supplier selection, and order fulfillment.*

Supplier Performance: (Quality/OTD) –

Evaluate supplier performance based on factors such as on-time delivery, quality, responsiveness, and adherence to service level agreements (SLAs). *This KPI helps identify reliable and high-performing suppliers.*



Now that we have identified the processes...

- What do we need the processes to achieve?

examples – **Warehouse Process**

Order Picking Accuracy: Accurate order picking is crucial for reducing errors and improving operational efficiency. Monitoring this KPI helps identify areas for improvement, such as enhancing picking processes, providing proper training, or implementing technology solutions like barcode scanners.

Inventory Accuracy: Accurate inventory records are essential for effective warehouse management. Monitoring this KPI helps identify discrepancies between physical and recorded stock levels, reducing the chances of stockouts, overstocks, and improving overall inventory control.



Now that we have identified the processes...

- What do we need the processes to achieve?

examples – **Distribution Process**

On-time Delivery: This KPI measures the percentage of deliveries that are completed within the agreed-upon timeframe. It is essential because it directly reflects customer satisfaction and service level performance. Achieving a high on-time delivery rate indicates reliability and helps build strong customer relationships.

Order Accuracy: This KPI measures the accuracy of order picking, packing, and shipping processes. It reflects the ability to process orders without errors, such as incorrect items, quantities, or shipping addresses. High order accuracy minimizes returns, replacements, and customer complaints, improving overall customer satisfaction.



Now that we have identified the processes...

- What do we need the processes to achieve?

examples – **Manufacturing Process**

Production Cycle Time: This KPI measures the time required to complete one production cycle, from start to finish. Monitoring production cycle time helps identify process inefficiencies, bottlenecks, and areas for improvement in production flow and resource allocation. Reducing cycle time leads to improved productivity, shorter lead times, and increased customer satisfaction.

First Pass Yield (FPY): FPY measures the percentage of products that pass through the manufacturing process without the need for rework or repair. Monitoring FPY helps identify process issues, quality problems, and areas for improvement. A high FPY indicates a well-controlled manufacturing process, reduces rework costs, and improves product quality.



Now that we have identified the processes...

- What do we need the processes to achieve?

examples – **Design and Development Process**

Time to Market: Measure the time it takes from the initial concept or idea to the launch of the final product or service. This KPI helps assess the efficiency of the design and development process in bringing new offerings to market quickly.

Design Quality: Evaluate the quality of the design work produced, considering factors such as adherence to specifications, creativity, innovation, and usability. This KPI helps ensure that the design team delivers high-quality and user-centric solutions.

Customer Satisfaction: Measure customer satisfaction with the design and development outputs, which can be assessed through surveys, feedback, or user testing. This KPI indicates how well the design team meets customer needs and expectations.

Ineffective KPIs



Misaligned Goals: If the KPIs are not properly aligned with the organization's overall goals and objectives, they can lead to a disconnect between what is being measured and what truly matters. This can result in a lack of focus on the critical areas that drive success.

Distorted Incentives: Ineffective KPIs can create unintended consequences by incentivizing behaviors that are not in the best interest of the organization. Employees may prioritize achieving the KPI targets at the expense of other important aspects, such as quality, long-term sustainability, or customer satisfaction.

Gaming the System: In some cases, ineffective KPIs can be manipulated or "gamed" by individuals or teams to artificially inflate their performance metrics. This can undermine the accuracy and reliability of the KPIs, leading to misleading information and misguided actions.

Demotivation and Disengagement: Poorly chosen or poorly communicated KPIs can demotivate employees if they feel that the KPIs are unrealistic, unfair, or not within their control. This can lead to reduced engagement, decreased morale, and ultimately lower productivity.

Ineffective KPIs

It is essential for organizations to involve employees in the development and review of KPIs to ensure their buy-in and alignment with their roles and aspirations.



- Frustration
- Lack of Direction
- Disengagement
- Gaming the numbers
- Lack of Recognition



Building a Process Interaction Diagram

Building a process interaction diagram is valuable because it brings clarity, facilitates process analysis, supports collaboration, and enables continuous process improvement. It is an effective tool for understanding, documenting, and optimizing processes within an organization.

- Visualizes the Process
- Identifies Bottlenecks and Inefficiencies
- Supports Process Documentation
- Facilitates Process Analysis and Improvement
- Supports Change Management:



Is an IOP Required?

Section 4.4.1 states:

The organization shall **determine the processes** needed for the quality management system and their application throughout the organization, and shall:

- a. **determine the inputs required and the outputs** expected from these processes;
- b. **determine the sequence and interaction** of these processes;
- c. determine and apply the criteria and methods (including monitoring, measurements and related performance indicators) needed to ensure the effective operation and control of these processes;

Be sure to include **all processes**, support, management, QMS etc.



Interaction of Processes

An interaction is a visual illustration of the flow of processes and how they interact.

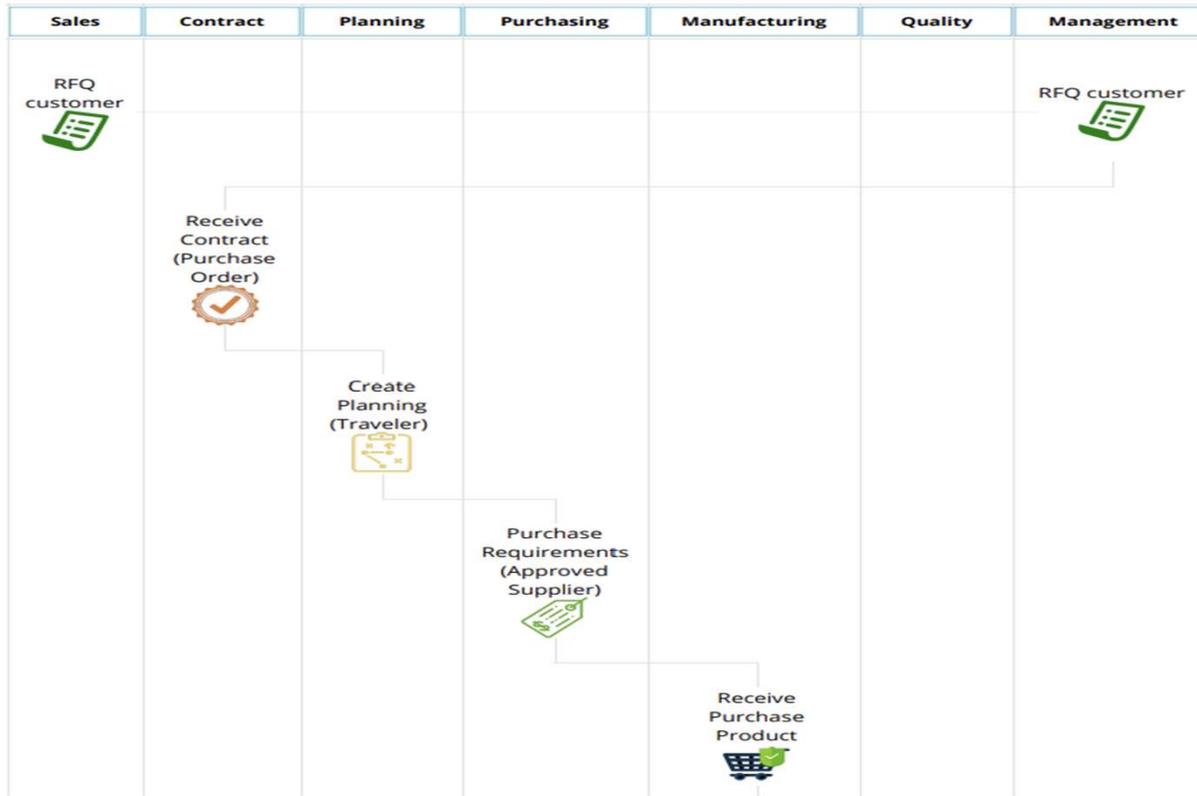
The illustration will include all processes; Key (core) processes, support processes and the inputs and outputs.

The illustration is not a swimlane or an excel with processes across the top and processes down the side. This does not show interaction.

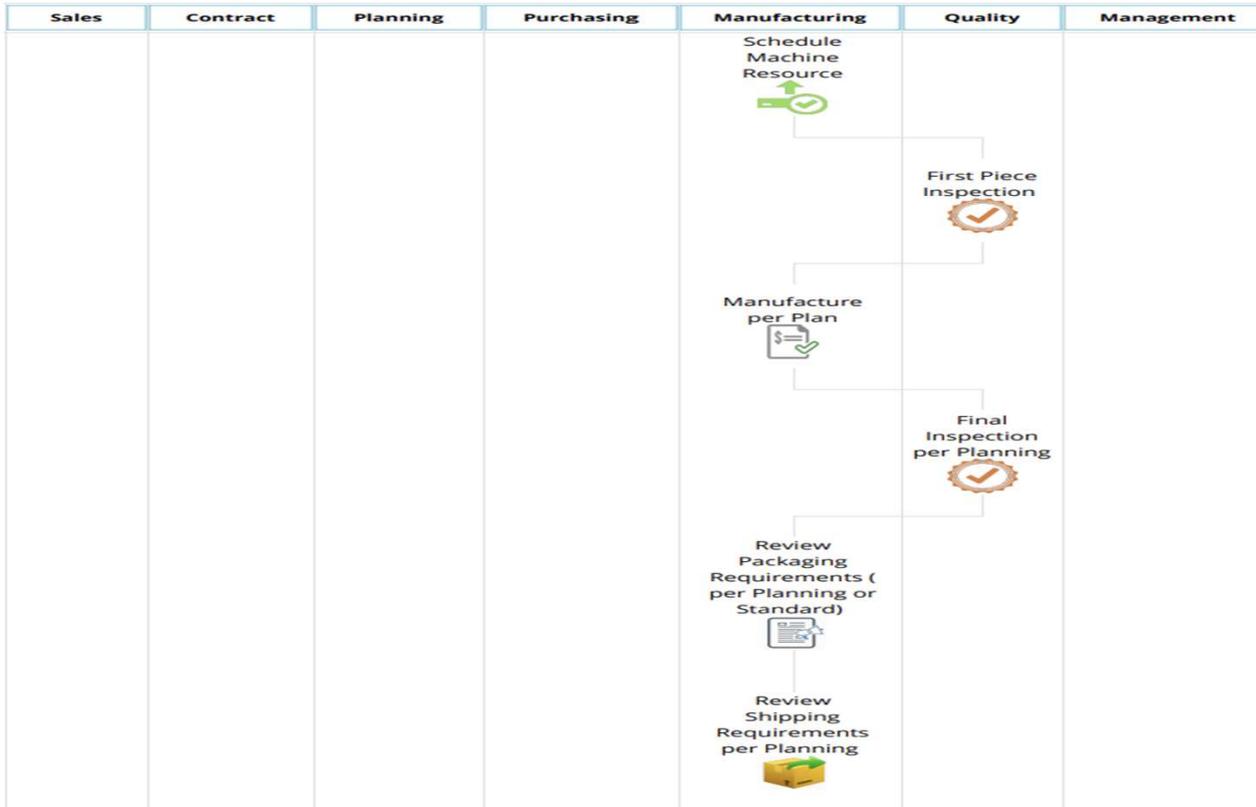
Interaction of Processes



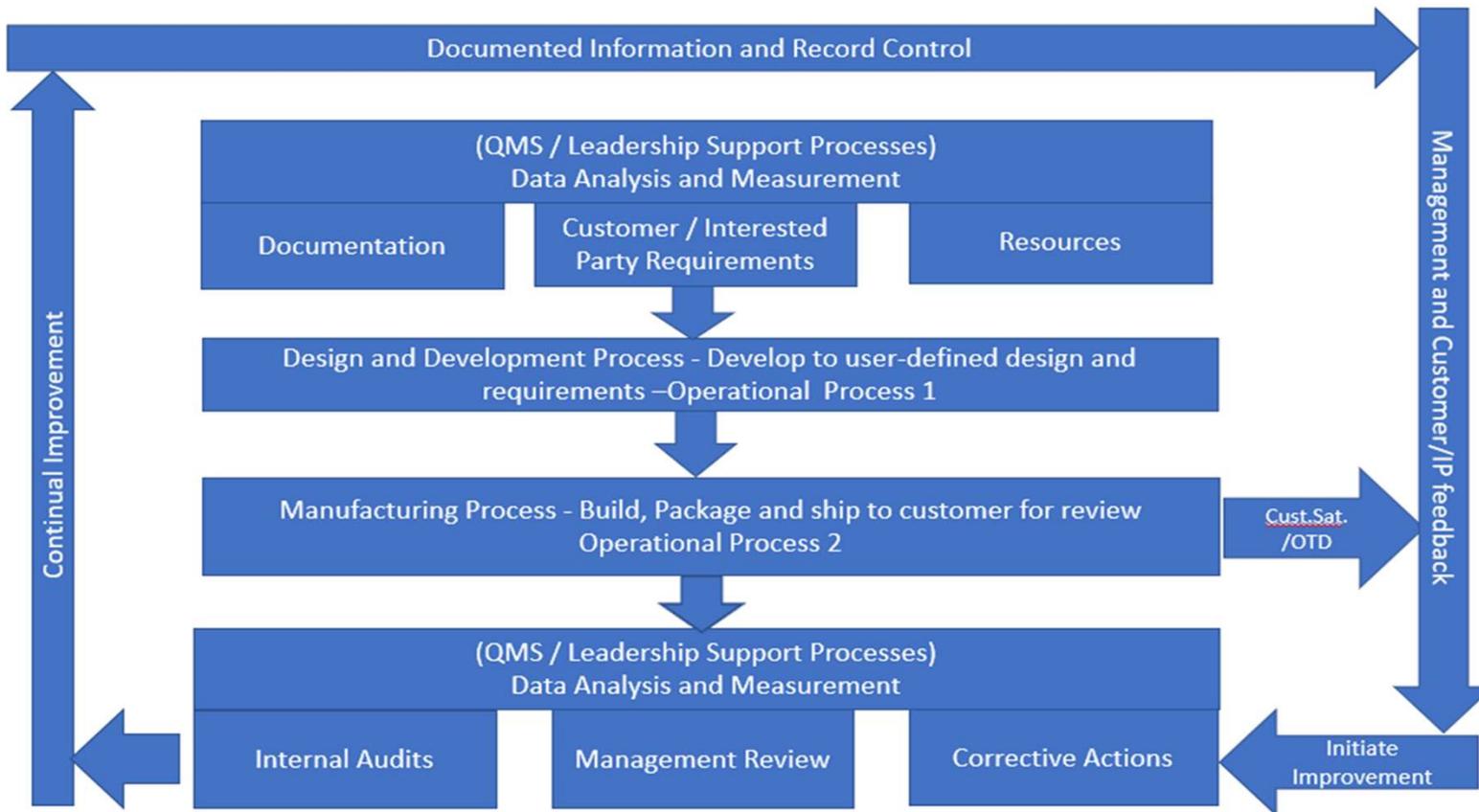
Overview



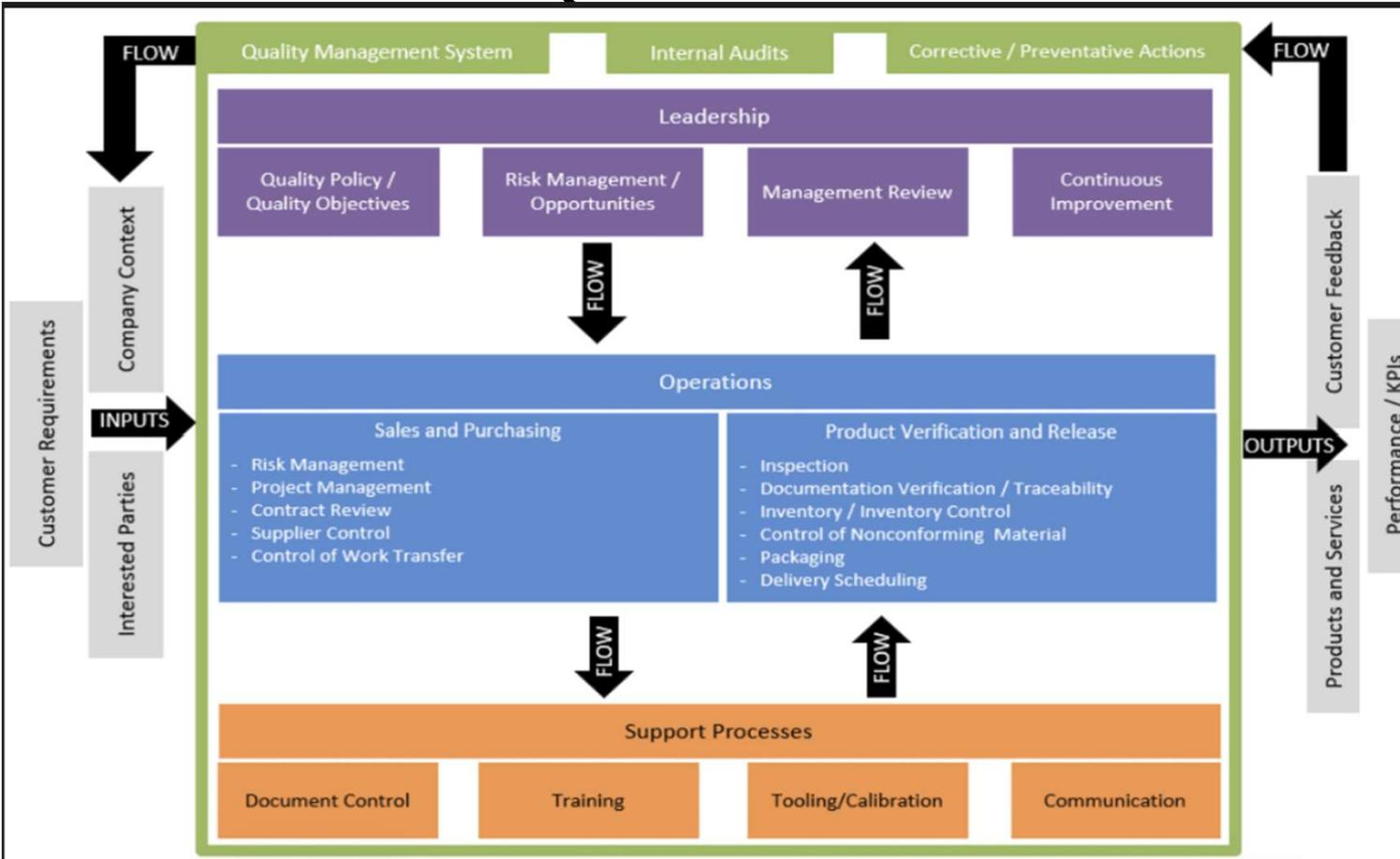
Interaction of Processes



IOP Good Examples



IOP Good Examples

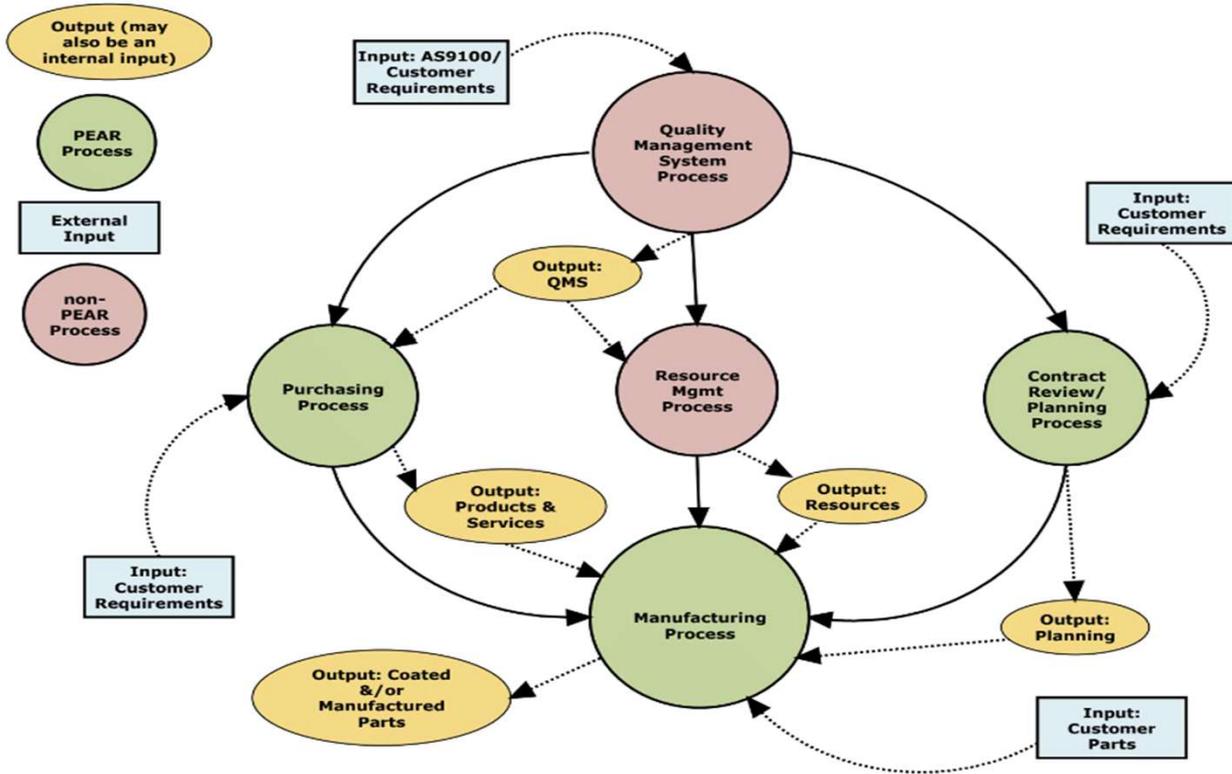


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IOP Good Examples



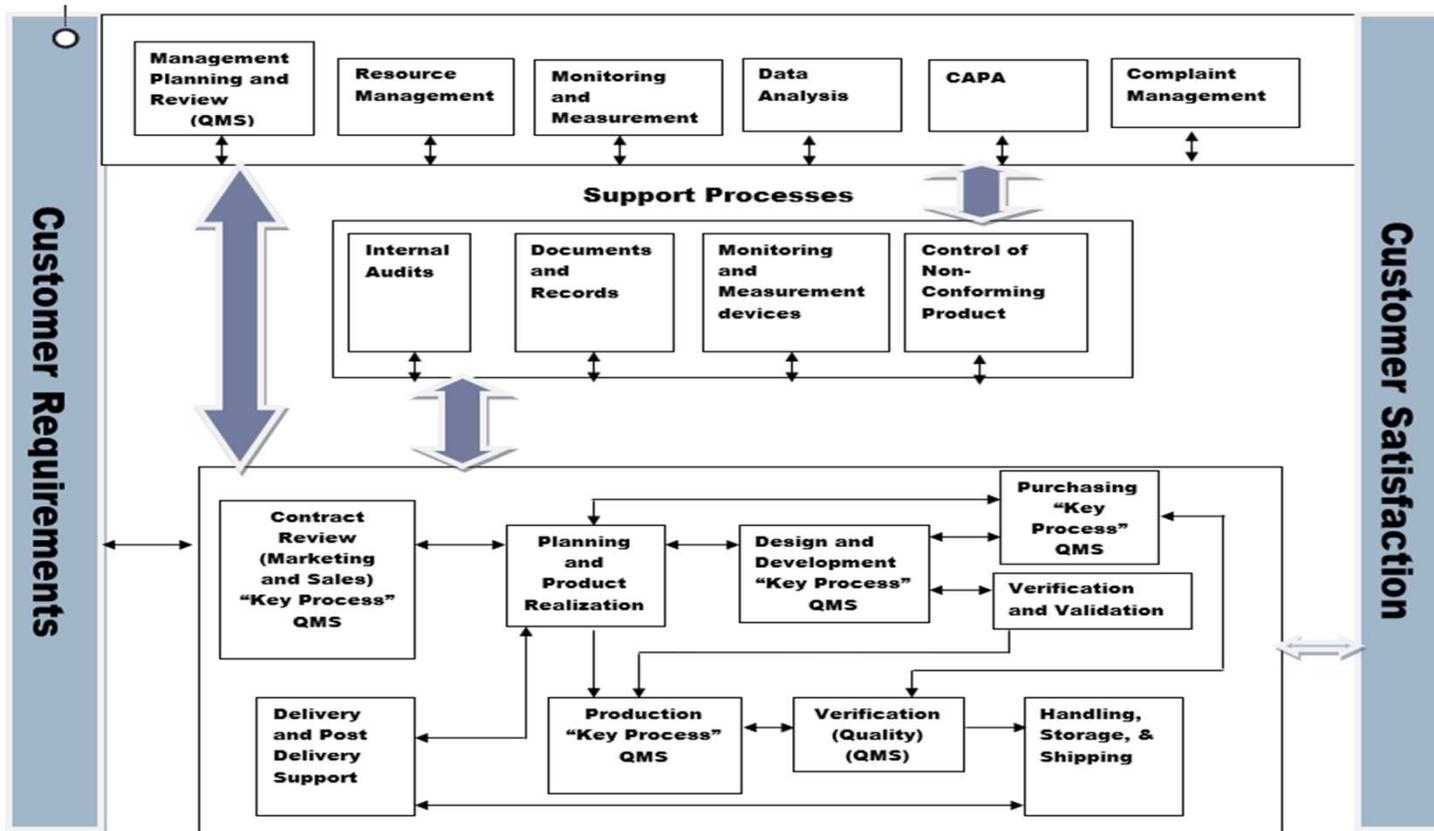
Appendix A: General Sequence and Interaction of Processes



IOP Good Examples



Process Interaction Flowchart





Summary – Benefits of Defining Processes

Defining your processes positively impacts profitability by increasing efficiency

- optimizing resource utilization,
- improving quality control,
- reducing costs,
- ensuring consistency,
- managing risks, and
- facilitating continuous improvement.

By systematically managing and refining your processes, you can drive profitability and achieve sustainable business growth.