

# How to Improve Your Production: Part I

John Kyriazoglou




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# **How to Improve Your Production: Part I**

Effectively managing your Production Function to  
improve your Business Operations



How to Improve Your Production: Part I: Effectively managing your Production Function to improve your Business Operations

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# Preface

‘Thus, from the many things the one is created, and when the one is created, many more things come to life, without this life to be remaining constant. This continued cycle never ends, and in this way, what remains constant in the circle of existence, is this cycle itself’.

Empedocles (c. 490–430 B.C.), ancient Greek philosopher

**THE FIRST TWO DECADES** of the 21<sup>st</sup> century has brought upon all of us an array of very perplexed issues and problems at all levels: Personal, national and corporate.

1. Personal level: Starvation of over 1 billion people spanning several continents; geometric increase in depression, suicide, unhappiness and other malevolent forms of behavior in people across the world; more and more split families and abandoned children, etc.
2. National level: A series of continuing world financial crises, both globally and in specific economies, currencies and countries; regional wars and conflicts; increased terrorism and other asymmetric threats; organized crime operations across many countries; parallel and informal economies; ecological disasters along with deforestation and pollution, etc.
3. Corporate level: New technical developments for production processes; increased frauds, terrorism and other asymmetric threats; new corporate insider and outsider financial, operational and cyber threats; new corporate governance, compliance, accountability and reporting regimes, etc.

All of these are, by their own nature, very difficult to manage and resolve to any level of satisfaction.

In addition to these, at the level of the production function of corporations we are faced with a tough, dynamic, resource-tight and uncertain economy.

*How can we handle, organize, manage and control these effectively and efficiently, at the level of companies?*

My consulting experience and other research evidence have taught me that strong, efficient, effective and high-performing **Business Management Controls** are required. In other books and articles I have written before I deal with the greater topics of both business controls (in a general sense for companies) and for the IT function (in particular).

This book ‘**How to Improve Your Production**’ expands on the particular issue of improving your Production Controls for your business enterprise.

**THE APPROACH I use in this book is the following:**

1. **First** I define what production means while providing examples of a general business model and various production functions
2. **Next** I present in five chapters the various types of production controls deemed necessary for running an effective production process and produce high-quality goods and services.
3. I conclude this book (**Chapter 7: Conclusion and Final Recommendations**) by describing how best to implement production policies and procedures and offering two recommendations (Production Soft Controls Action Plan, Production Assurance, Review and Improvement Plan) to review and improve your production function.
4. **Last**, in Part 2, I present examples of various methodologies, policies, procedures, audit programs and checklists with the purpose of supporting and improving the whole production process.



# 1 Defining the Production System

## 1.1 Purpose of Production

*What is the purpose of production?*

The purpose of existence and mission of any bona fide business entity (private companies, public administration functions, non-profit organizations, professional societies, etc.) usually include:

1. The production of goods and services,
2. The delivery of goods and services to customers along with the required support to enable good use of what is delivered,
3. The overhead functions (corporate administration, human resource management, financial management, IT systems, security of plants, offices, data, systems, and other resources, research, quality management, risk assessment, etc.), whose aim is to support the good execution of production, and
4. The provision of benefits to both society and economy.

*Where did production start?* We are taught that Industrial Revolution started in the 18<sup>th</sup> and 19<sup>th</sup> Centuries and brought the concepts of mass production and its benefits to our civilization. But I would like to note that rudimentary production lines for creating pottery, the transportation means of the ancient Greek trade, and textile processing for making clothes was evidenced in ancient Greece<sup>1</sup>.

My favorite story how it all began is the ancient Greek story of Prometheus Bound.

*'In this mythic tale we are told how the primitive creatures that were created to be human at first had no knowledge, skills, or culture of any kind and so they lived in caves, in the dark, in constant fear for their lives. Zeus, the tyrannical king of the gods, decided to destroy them, but Prometheus, a demigod (son of the Titan Iapetus) whose name meant forethought (Greek, from promethes 'thinking before', from pro=before and 'methos', related to mathein=to learn), out of his 'humanity-loving character' gave them two powerful, life-enhancing, gifts: fire, which symbolises all knowledge, skills, technology, arts, and science, and 'blind hope' or 'optimism'. The two went together – with fire, humans could be optimistic; with optimism, they could use fire constructively to improve their living conditions'.*

The meaning of this old tale is that knowledge, methods, tools, and energy gave us the capability to produce goods to our benefit; and this in turn gave us hope to further improve our lot.

Getting back to the 21<sup>st</sup> Century, I would like to note that the production function in any business entity, on the same vein, does not exist on its own and not for itself. It is part and parcel of the business enterprise itself.

## 1.2 General Business Operating Model

*How does production relate to the overall business?*

In my various consulting assignments related to production in various companies, and to make things easier and more understandable, I have used the following general business operating model to show where production fits in.

A general business operating model, conceptualized as '**C<sup>1</sup>P<sup>4</sup> Model (C one, four Ps)**' and applicable to all types of companies (small, medium and large) will have five business model dimensions: C<sup>1</sup>P<sup>4</sup> Model (C one, four Ps), 'C<sup>1</sup>' for customers, 'P<sup>1</sup>' for people, 'P<sup>2</sup>' for property, 'P<sup>3</sup>' for production and 'P<sup>4</sup>' for performance, as noted in Figure 1.

<b>First Business Model Dimension – C<sup>1</sup>: CUSTOMERS</b> All activities related to identifying, selling, and delivering products and services and in managing and servicing your customers
<b>Second Business Model Dimension – P<sup>1</sup>: PERSONNEL</b> All activities related to hiring, utilizing, managing and handling your employees
<b>Third Business Model Dimension – P<sup>2</sup>: PROPERTY</b> All activities related to managing and protecting your assets (money, other financial assets, buildings, plants, machinery, furniture, computers, information systems, knowledge repositories, patents, etc.)
<b>Fourth Business Model Dimension – P<sup>3</sup>: PRODUCTION</b> All activities related to producing high quality products and optimizing your production processes, as well as delivering the best quality in services to your customers.
<b>Fifth Business Model Dimension – P<sup>4</sup>: PERFORMANCE</b> All activities related to measuring, monitoring and improving the performance of your company

**Figure 1:** General Business Operating Model

This model tells us that we should put our customers in the top of our priority list as a business. We only exist for them and society, in the final analysis. This does not mean a business should not produce profits but these should be the outcome of excellent products and services, and not the other way around.

*For more information about how to create your business model, see Appendix 3 in Part 2 of this book.*

### 1.3 Production Functional Definition

The activities related to producing high quality products and services (shown in the fourth business model dimension above) are realized by two distinct components:

1. Organization of the production function or unit (described in the next chapter).
2. Production systems.

Production systems, according to production managers relate to managing the 'five M's: men, machines, methods, materials, and money.

A working definition of a Production System according to the IPORS Model (extension of the classical IPO Model) that I have found useful is:

A production system consists of:

1. Input (I): A set of raw materials, semi-finished goods, sub-assemblies, parts, ideas, information, data, knowledge, etc.
2. Processing (P): The use of several methods, techniques, systems and tools and a well-defined set of step-by-step sequence of activities or course of action (with definite start and end points) that must be followed in the same order to correctly perform a task.
3. Output (O): A pre-determined number of finished goods and services that provide value to customers and society.
4. Resources (R): The required managers, staff, industrial and knowledge engineers and other workers, land, plants, tools, equipment, supplies, IT systems, etc., to execute the production process and produce the pre-defined goods or services.
5. Storage (S): The location (or locations) where raw inputs or finished or semi-finished goods are placed for possible use at a later point in time or to be shipped to customers.

There are four common types of basic production systems: the batch system, the continuous system, the project system and the craft system.

**Batch system:** In the batch system, general-purpose equipment and methods are used to produce small quantities of output (goods or services) with specifications that vary greatly from one batch to the next.

Examples are: Manufacturing of specialized machine tools or heavy-duty construction equipment; specialty chemicals; processed food products; and the system for processing claims in a large insurance company.

**Continuous system:** In this system (also called continuous assembly or mass production system), items to be processed flow through a series of steps or sequential operations which are common to most other products being processed.

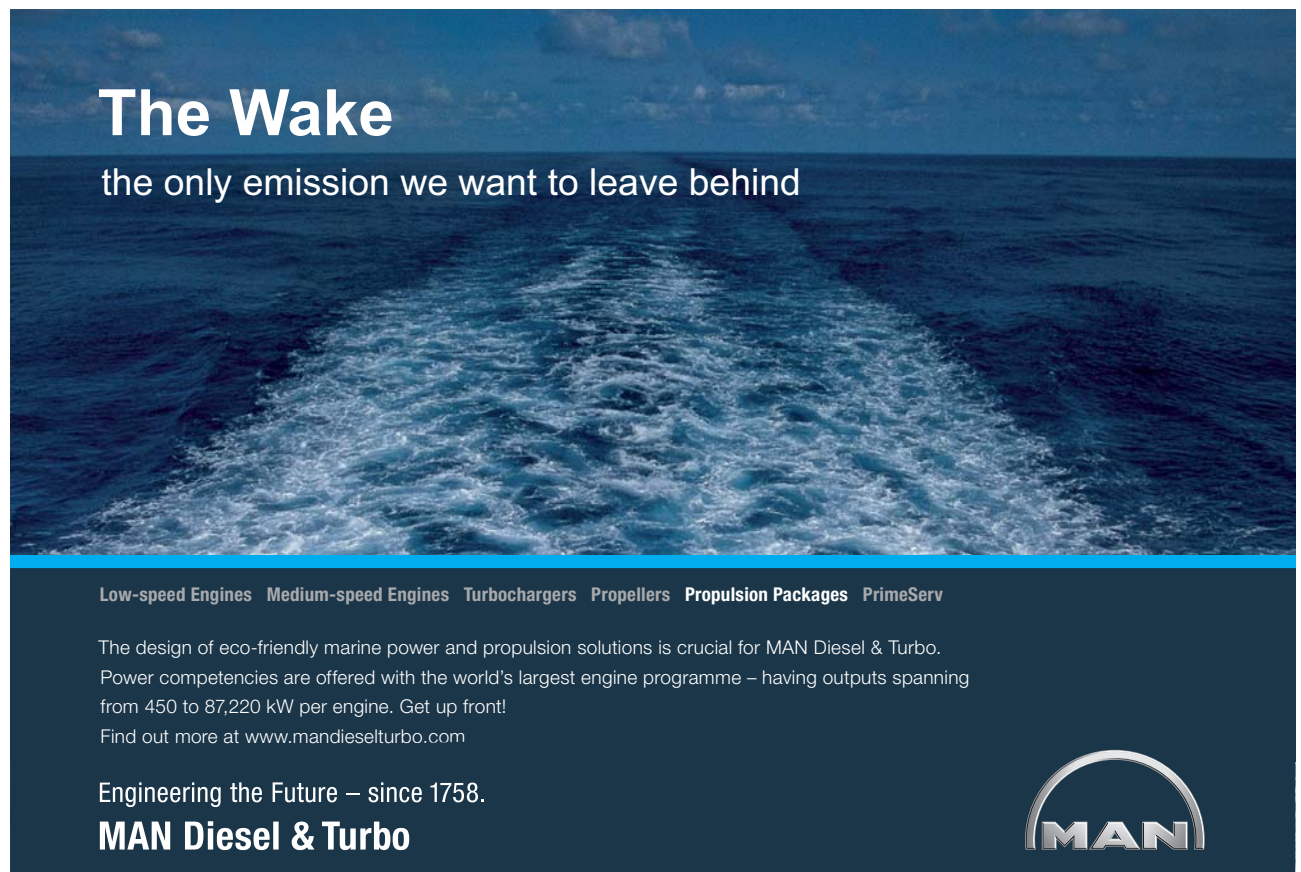
Examples are: Systems for assembling automobile engines, automobiles, televisions, washing machines, and personal computers.

**Project system:** In this type of production system inputs, resources and methods are only applied once to produce the required product. Examples are: A product prototype; a building; a ship.

**Craft system:** This type of production system also called craft production, defines the process of manufacturing by hand with or without the aid of tools, is also beyond the scope. The term **craft production** refers to a manufacturing technique applied in the hobbies of handicraft, pottery, hand-made cars, etc.

A full analysis of their features and other operational characteristics is beyond the scope of this book.

Their common control aspects are, however, within the scope of this book and we will therefore deal with these accordingly.




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To get a better idea of what production systems are, you can see the following three examples of production systems presented next.

**Example 1: IT Payroll System**

The production function of an IT system for payroll according to the IPORS model consists of:

1. Input (I): The payroll data flowing into the system from outside.
2. Processing (P): The use of computer software in a well-defined set of step-by-step sequence of activities to produce the payroll for the employees of the company.
3. Output (O): The payroll reports and processed data stored in computerized files.
4. Resources (R): The IT staff (programmers, analysts, operators, user-support, data base administrators, etc.) and the end-user personnel feeding and running the system.
5. Storage (S): The hardware and data base servers and storage facilities where raw and processed payroll data are maintained safely.

**Example 2: Car Factory**

Input: Steel, engines, parts

Processing: Fabrication and assembly of cars

Output: High quality cars

Resources: Workers, tools, equipment, supplies, IT systems

Storage: Automobile warehousing facilities

**Example 3: Hospital**

Input: Patients

Processing: Health care

Output: Healthy people

Resources: MDs, nurses, medical supplies, equipment, IT systems

Storage: Hospital facilities

All these must be managed and controlled appropriately so that the desired goods and services are produced in a cost-benefit manner.

To conclude: Production controls are designed to manage the activities of production processes of organizations. A production system uses resources to transform inputs into some desired output.

## 1.4 Business Controls

*How are all these organized, managed and controlled?*

Usually, the management of companies, as representatives of shareholders or society (in case of public organizations), craft and implement effective business controls to organize, manage, control and run their companies and organizations. These business controls relate to all areas of a typical company or organization: legal incorporation issues, corporate governance, risk, administration, strategy, finance, IT, sales, production, etc.

**Control** is one of the managerial functions like planning, organizing, staffing and directing. It is an important function because it helps to check the errors and to take the corrective action so that deviation from standards are minimized and stated goals of the organization are achieved in desired manner. According to modern concepts, control is a foreseeing action whereas earlier concept of control was used only when errors were detected. **Control** means “to check, verify, regulate”. Control in management means setting standards, measuring actual performance and taking corrective action.

In other books and articles I have written before<sup>2</sup> deal with the greater topics of both business controls (in a general sense for companies) and for the IT function (in particular). This book expands on the particular issue of production controls for your business organization.

The following are deemed to be the most crucial controls in managing better the whole production function and its critical components:

1. Production management controls (chapter 2)
2. Production Policies and Procedures (chapter 3),
3. Manufacturing Process Controls (chapter 4),
4. Standardization and Quality Management Procedures (chapter 5), and
5. Performance Management Controls (chapter 6).

**In conclusion**, when you think of the production system aspects identified in this chapter (purpose of production, how production fits into your business operating model, the IPORS Model for production, etc.) and what they may mean to you and your business, consider the following quotation by the noted American IT Guru and Apple Co-Founder, Steven Jobs:

‘You can’t just ask customers what they want and then try to give that to them. By the time you get it built, they’ll want something new.’

**Recommendation 1:** Define a well-structured production system. Ensure that it is aligned to your corporate vision, brand-name and business operating style.



## 2 Production Management Controls

### 2.1 Purpose of production management controls

Production management controls are designed to enable and facilitate the organizing and management aspects of the whole production function of your organization.

More specifically these are concerned with issues related to:

Issue (1) Establishing your production function;

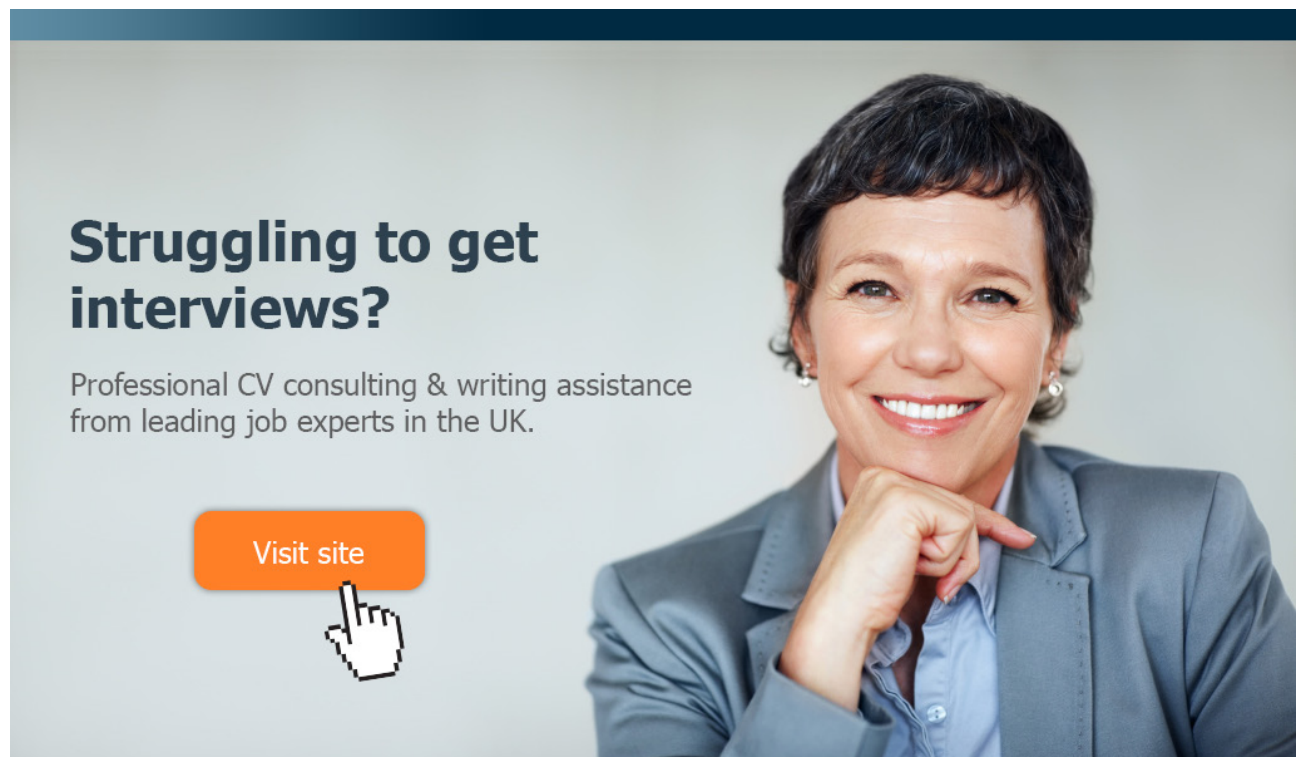
Issue (2) Selecting and appointing production human resources; and

Issue (3) Crafting and executing your production policies and procedures.

The first two are noted next. The third item is detailed in chapter 3.

#### **Issue 1: Establishing the production function of your business**

Establishing the production function of your company includes the following three actions.



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**Action 1:** Establish your company's production mission and goals.

This is achieved after the corporate vision, mission and business goals are established and communicated to all parties. Your corporate mission, vision, beliefs and core values shape the culture and the philosophy of the production function of the organization, and ultimately lead to a set of general strategic performance goals and specific production objectives.

**Action 2:** Develop a strategy and structure for your production function. This is achieved in the following seven steps:

**Step 1:** In the first step you collect and understand your customer demands, as customer requirements and expectations drive and show the way your company responds with products and services to local, national, and global market opportunities.

**Step 2:** In the second step you formulate and implement your production and services strategy (see example later), as the strategic process of your company provides the specific business objectives to meet your customer demands, needs and expectations and achieve the desired performance goals.

**An example of a Production and Services Strategy** is shown in Figure 2.

'Our company's (Company XXXAB (a fictitious entity)) production and services strategy concentrating on the following central themes by which our company will provide high quality products and services to our customers. These themes are:

Central Theme 1: Treat every customer in a friendly, polite and helpful way,

Central Theme 2: Provide our products and services at the highest quality and at the minimum cost, both for the customer and the company,

Central Theme 3: Price the offered products and services in a competitive manner,

Central Theme 4: Provide a variety of service-delivery mechanisms to suit customer needs and expectations.'

**Figure 2:** Production and Services Strategy for 'XXX'

**Step 3:** In the third step you identify, obtain and allocate resources and funds to complete the addition of the new initiatives to the current operation of your organization to improve its performance;

**Step 4:** This step of Action 2 pertains to your production budget. A production budget is a schedule showing planned production in units which must be made by your production or manufacturing unit during a specific period to satisfy your expected demand for sales and the planned finished goods inventory.

**Step 5:** In this step of Action 2 you execute initiatives to enable and improve your production. New initiatives provide new information to successfully meet the new production challenges and test the production and business strategy of your company.

**Step 6:** In this step of Action 2 you design, develop and implement a production and manufacturing records system to ensure you're your company complies with all relevant national, international and industry regulations.

**Step 7:** In this last step of **Action 2** (Develop a strategy and structure for your production function) you ensure the security of your production as frauds and thefts are a major source of inventory and product discrepancies. This means that you must take several actions to do this. *For an example of what actions to take, see Appendix 1 ('Plant and Inventory Security plan') in Part 2 of this book.*

Further to the above and to complete your establishing the production function of your business you need a production methodology to drive and enable you to do things the right way.

**Action 3:** Design and implement the production system to suit your specific business purposes. You may use a Production Management Methodology for this purpose. This is necessary to control scope, cost, schedule and quality of every production project undertaken by your company.

This **production management methodology** should detail for **each product** what is required to produce it effectively and efficiently. It should have phases for:

1. Definition and design of each product,
2. Organizing and designing the production processes and lines (assembly lines) for the specific product or products of your company,
3. Obtaining inputs, resources and other tools and methods,
4. Managing production risks and quality,
5. Establishing all organizational functions related to production and defining their scope (see example for the Purchasing Function below); and appointing the management production team (production manager, purchasing officer, warehouse manager, engineers, staff, etc.) and officer responsible for each product,
6. Designing the production or manufacturing fabrication formula and testing it on a prototype,

7. Executing the processes for creating each product and collecting performance data during the production process,
8. Tracking the production of each product,
9. Setting up the performance management and measurement system (see Chapter 6: Performance Management Controls) and reviewing the performance of the production for the specific product, and
10. Closing out the production project for the product going out of production.

**Establishing the purchasing function** (see phase 5 of Action 3 above) is the job of the board of directors of the company or organization. This entails the following:

1. Describing the strategic objectives of the purchasing process
2. Planning, designing, ratifying the purchasing procedure
3. Setting up a budget for purchasing
4. Instituting the proposal evaluation criteria, the management controls and budget approval level
5. Setting the scope of the purchasing process and what issues it will pertain to: purchase of raw materials, ready-made systems, equipment, services, computer, hardware, networking, cabling installations, etc., contracting for system development services, maintenance for systems and hardware, outsourcing and offshoring operations and services, retiring of software and equipment, etc.

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**To execute all these successfully, however, you need staff and policies (detailed in the next chapter).**

These staff should have specific duties, responsibilities and roles, as presented next.

### **Issue 2: Selecting and appointing production human resources**

Selecting and appointing the required human resources to implement the production function of your company is handled at two levels: The senior executives deal with management appointments and each production-related manager deals with his team members. In both cases the corporate human resources function is heavily and seriously involved in the complete selection, hiring, and appointing process according to the company standards and policies.

**The following production-related management positions are deemed the most crucial for the production function of any company.**

## **2.2 Production manager**

This is the first crucial production-related management position for your company.

The duties, role and responsibilities of a typical production manager, in general terms, are:

1. To manage, control and co-ordinate the production activities of the production function (manufacturing plant, department, unit, etc.).
2. To plan and develop production systems and procedures to improve the operating quality of production activities and the efficiency of the department.
3. To supervise production staff in accordance with company policies and procedures.
4. To hire, train, support and coach the employees of the production function.
5. To review the performance of each staff member as well as the whole production function.
6. To report to top management and the board (as required) both the usual production output, as well as the ad hoc problems and issues related to all production aspects (staff, processing, systems, security, etc.).
7. To ensure that emergency procedures are designed and tested on a periodic basis for the complete production facility and staff.

*The duties of other crucial production-related management positions for your company, such as: Industrial engineer, Procurement/Purchasing Manager, Production quality officer, Warehouse Manager, Health and Safety Officer, etc., are included in Appendix 2 ('Production Staff Duties and Responsibilities') in Part 2 of this book.*

**In conclusion**, when you think of the production management controls described in this chapter (production unit mission, goals, strategy, methodology, security plan, and the duties of several management staff, etc.) and what they may mean to you and your company, consider the following quotation by the famous American entrepreneur, investor and CEO of Berkshire Hathaway, Warren Buffett:

‘Rule number 1: Never lose money. Rule number 2: Never forget rule number 1’

**Recommendation 2:** Craft and communicate a meaningful vision, mission and strategy for your production. Hire the best people to manage your production function. Guide, coach, sponsor and support them. Give them the most capable human and other resources to execute their activities.

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# 3 Production Policies and Procedures

## 3.1 Purpose of production policies and procedures

The purpose of production management controls is to enable and facilitate the operation of running the whole production function of your organization. In chapter 2, I dealt with issues related to: Establishing your production function; and selecting and appointing production human resources. Crafting and executing your production policies and procedures is described in this chapter.

Developing and implementing detail production policies and procedures may be done by the functional managers of the various production units (manufacturing, quality, inventory control, purchasing, etc.). All these production policies and procedures should be ratified by the board before they are put into operational status. Also the audit program and checklists in Part 2 of this book may be used to support the design and implementation of the production policies and procedures for the specific organization.

The most crucial production policies and procedures you need to run your production function are presented next.

## 3.2 Production Policies and Procedures Manual

For the full execution of the production process of your business organization you need:

1. A set of production policies (specifying what is to be done) and
2. A set of procedures (detailing how what is specified in policies is to be done).

These should be cost effective and they should align with your company's corporate vision, mission, values and objectives.

Developing basic production policies and procedures helps to make production more flexible and enhance quality. Producing goods and delivering services and quality frequently rely on what may seem like two obvious elements: communication and coordination.

My consulting experience has shown that: production policies and procedures must be ratified by the board; these enable and facilitate the communication process in production issues; and these (policies and procedures) can help may the coordination of people, materials and equipment more consistent. These policies and procedures should be included in a manual, and should be reviewed annually and kept current at all times. These policies and procedures should cover the following issues:

1. Purchasing/Procurement
2. Supply chain management
3. Freight management (incoming/outgoing and customer)
4. Inventory management
5. Business Continuity and Emergency management (evacuation instructions and plan)
6. Manufacturing (of new products) or assembly of new products on pre-fabricated parts and sub-assemblies
7. Standardization and Quality Management Procedures
8. Receiving and Returns (return to stock, return to vendor)
9. Health and Safety
10. Environment
11. Performance management and measurement (see Chapter 6: Performance Management Controls), and
12. Repairs and Customer support, etc.

Developing production policies and procedures can best be done by the use of a methodology and a questionnaire. These are detailed in Appendix 11 'How to develop policies and procedures' (Part 2 of this book).

Production policies and procedures should be based on a set of national laws and regulations, and international (U.N., E.U., OECD, etc.) guidelines and specific-industry codes and standards, such as: Industrial Engineering and Manufacturing Standards, Quality Standards, Financial Accounting Standards, Audit Standards, Commerce Acts, Industrial Standards, Civil Code, Tax and Customs Code, Electronic Fund Transfer Act, Health, Fire and Safety Regulations, etc.

The most important, as a minimum, production policies relate to health, safety, environment protection, fire safety, business continuity and quality.

*The first five are detailed in Appendix 3 ('Production Methodologies, Policies and Procedures') in Part 2 of this book.*

Quality is described in chapter 5. Other policies are outlined in chapter 4.



Also another most crucial procedure for production pertains to purchasing. A summary of this is outlined next, while its full description is contained in Appendix 3 (***Production Methodologies, Policies and Procedures***) in Part 2 of this book.

### 3.3 Purchasing Procedure

This also another crucial policy in establishing and running your production operation as it concerns getting inputs and resources necessary for your production. It belongs to both Input and Resources components of your company's Production System (see IPORS Model in chapter 1). This procedure is crucial as it mitigates if not minimizes altogether the occurrence of any potential cases of purchasing fraud in your business enterprise.

The steps of this procedure are described next. Full details are provided in Appendix 3 in Part 2 of this book.

Step 1: Purchasing Forms Design

Step 2: Purchase Requisition

Step 3: Market Research

Step 4: Proposal Evaluation

Step 5: Expenditure Approval

Step 6: Placement of Purchase Order

Step 7: Final Delivery

**In conclusion**, when you think of the production policies and procedures outlined in this chapter (Health and Safety Policy, Fire Safety and Evacuation plan, Purchasing Procedure, etc.) and what they may mean to you and your business organization, consider the following quotation by the IKEA Founder, Ingvar Kamprad:

‘Only those who are asleep make no mistakes.’

**Recommendation 3:** Design and implement effective production policies and procedures considering the following: Assign one person to be responsible for each production policy and associated procedures. Your production manager should ensure that all these are well coordinated. Train all people to apply them correctly. Monitor their use and update them, at least, once per year. Have them available online to make communication, training and application easier.

## 4 Manufacturing Process Controls

### 4.1 Purpose of Manufacturing Process Controls

The purpose of manufacturing process controls is to enable and facilitate the manufacturing operation of the production function of your business enterprise. In previous chapters, I dealt with issues related to: Establishing your production function; and selecting and appointing production human resources; and crafting and executing your production policies and procedures.

Developing and implementing manufacturing process controls may be done by the manufacturing manager or executive, in charge, of the manufacturing operation. All these controls should be ratified by the board before they are put into operational status. Also the audit program and checklists in Part 2 of this book may be used to support the design and implementation of the manufacturing process controls for the specific organization.

The usual manufacturing process controls are described next.

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## 4.2 Production-Manufacturing Action Plan

The development of your Production-Manufacturing Action Plan is the first and most crucial plan in establishing and running your production operation. It pertains to all components of your Production System (see IPORS Model in chapter 1): Input, Processing, Output and Storage.

This action plan usually consists of very detail activities to ensure that all production and manufacturing is executed to the most optimal way<sup>3</sup>.

An example of such a plan for a manufacturing operation follows:

**Activity 1: Purchasing raw materials and parts.** You need a steady supply of raw materials and parts to assemble, manufacture or produce your goods and distribute them to your customers. Your plan to purchase raw materials and parts should ensure availability and timely delivery of the required items for timely production according to your quality specifications and other cost considerations. The purchasing procedure described in chapter 3 of this book and in Part 2 should be used for this purpose.

**Activity 2: Inspecting materials and parts.** You need to inspect all materials and parts before the production process starts. Your engineering and quality teams, according to your inspection and quality standards procedure, should ensure that these are of the right characteristics before being used.

**Activity 3: Inspecting and monitoring production equipment and systems.** You need to also inspect initially all production equipment materials and systems before the production process starts. Also your engineering and quality teams, during the production process, should continuously monitor their operation to ensure that these function according to what is expected of them.

**Activity 4: Manufacturing products.** According to the production or manufacturing recipe, an appropriate quantity of materials and parts are put into the manufacturing process, and production starts. Production follows the policies and procedures defined in chapter 3 and the standardization and quality management procedures described in chapter 5. All production equipment, systems, measurement and other control devices are regularly inspected and corrected so as to be minimized errors. The outputs of this process are the products manufactured or assembled. These are stored in the company warehouse for later packaging and delivery to customers.

**Activity 5: Final Inspection.** The inspection team of your quality management department collects samples from all manufactured items to get them through the inspection and quality testing procedures according to your standards.

**Activity 6: New Product Development Controls.** Developing a new product entails a complex set of activities, such as:

1. Concept development: conceptual design and definition of the characteristics of the new product.
2. Product planning: market building, small scale testing and feasibility study.
3. Product and process engineering: detail design of the product, identification of the tools, processes and equipment required and building first prototypes.
4. Pilot manufacturing: fabricating the first products, reviewing and improving the manufacturing process, marketing the first products, and planning the full production process.
5. Market introduction: evaluate field experience with product, fill distribution channels, promote products, and interact with key customers.

**Activity 7: Performance Management and Measurement Controls.** Developing a system to collect and manage performance for your production process (see Chapter 6: Performance Management Controls),

You should also note that the full and effective execution of this plan for your production also depends on the best operation of the following production-manufacturing support controls. Pay attention to them as your production requires them.

#### 4.3 Production-Manufacturing Support Controls

1. **Master Production Schedule (MPS):** This is your first production-manufacturing support control. The MPS is a time-phased plan specifies how many and when your company plans to build each end item (product).
2. **Material Requirements Planning (MRP) Process:** This is your second production-manufacturing support control. The MRP process provides the schedule specifying when each of the materials, parts, and components should be ordered for the products to be manufactured. Also contains the logic for determining the number of parts, components and materials needed to produce the intended products.
3. **Bill of Materials (BOM) File:** This is your third production-manufacturing support control. This file supports and implements your Production-Manufacturing Plan. The BOM file is a file maintained by a computerized application containing the complete product description, and the list of the materials, parts, and components, and the sequence in which the product is created.

4. **Preventive maintenance program:** This is your fourth production-manufacturing support control. A stoppage in production in any area of the plant is usually due to a breakdown in machines and parts. A simple but effective program of preventive maintenance can save you many more dollars (or Euros or other currency) than it costs. Most manufacturers recommend periodic maintenance. I recommend that you follow their advice. Also it is a good idea to maintain your own maintenance log to ensure that all maintenance activities are properly recorded and monitored.
5. **Materials and vendors contingency list:** This is your fifth production-manufacturing support control. To minimize your possible shortages of critical materials, it is highly desirable to maintain a list of substitute materials and suppliers, in case you need them. These should be kept by the person responsible for purchasing.
6. **Equipment Operational Description File:** This is your sixth production-manufacturing support control.

It is essential to keep a full description of all equipment used for production purposes and their operational characteristics, in order to have the production equipment operate in an optimal, efficient and effective mode.

The typical information that should be kept includes: Serial number, Name and technical specifications, Maximum operating capacity (rate per hour and any work-size limitations), Operators required, including skills, Setup time, Maintenance schedule and parts list, Maintenance contractor details, etc.

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7. **Production Systems and Equipment Maintenance Contract:** This is your seventh production-manufacturing support control. Production systems and equipment should be adequately inspected, cleaned and maintained. Systems and equipment that generate or measure data should be tested, calibrated, and/or standardized in accordance to standards. Written records should be maintained of all inspection, maintenance, calibrating, and standardizing operations. The records should also describe whether the maintenance is routine or non-routine.

A **Maintenance Contract** should cover all production systems and equipment (see example in Appendix 3 in Part 2 of this book).

Also a **Maintenance Log**, either manual or computerized, should be established and used for each system and equipment.

The log provides you with a comprehensive system for tracking systems and equipment maintenance.

This log is used to record all regular (routine) and irregular (non-routine) maintenance actions by: equipment type, model number, serial number, location, date of maintenance, date and nature of error or defect, remedial action taken, authorized signatures, etc.

8. **Inventory Management System:** This is your eighth production-manufacturing support control. It contains several sub-controls that operate as a whole and support each other in inventory management. A typical Inventory Management System includes, as an example:

- 8.1. **Inventory Control Procedures:** The use of inventory control procedures is critical to maintaining accurate, reliable numbers for your operation. Control can be a complicated balancing from the time a stock order is placed, received at your warehouse, counted, verified, labeled, put away, picked and shipped out or picked up.

Knowing where your product is with accuracy at all times is vital to your success.

These procedures are needed to manage the raw materials, parts, and products manufactured or assembled by your company.

These procedures include, as an example, the following:

1. Inventory Stocking and Storage,
2. Inventory Usage,
3. Inventory Protection,
4. Inventory Obsolescence,
5. Inventory Disposal,
6. Inventory Counting, and Period End Cut-Off, and
7. Inventory Reporting.



- 8.2. Inventory Master Records (IMR) File:** The IMR file, usually in computerized form, contains all the data describing the inventory items, and maintained by a Computerized Inventory Control System. These data usually contain the following information: part number, part description, lead time to order, standard cost, safety stock indicator, order quantity, setup, last year's usage, item category, scrap allowance, on hand quantity, order details, manufacturer's serial number, scheduled receipts, allocated numbers, etc. It usually also contains all the details of the products produced by your manufacturing process.
  - 8.3. Inventory Transactions File:** The Inventory Transactions file is a computerized file containing all the details of inventory item movements, such as: receipts, disbursements, scraps, cancelled orders, wrong parts, etc.
  - 8.4. Inventory Forms:** Specific forms that must be designed and used by each organization to execute these procedures may be: Asset and Inventory Entry Forms, Inventory Requisition, Inventory Count Sheet, Inventory Tag, Capital Asset Requisition, Asset Disposition Form, Bill Of Sale, and Material Return Notice.
- 9. Computerized Production Information Systems:** This is your ninth production-manufacturing support control. It contains several sub-controls that may exist independent of each other.

The modern production systems require the development and deployment of computerized production information systems. Developing and implementing such systems may be done by the manufacturing manager or executive, in charge, of the manufacturing and production operation, with the assistance and support of the IT department.

The usual computerized production information systems are:

- 9.1. Material Requirements Planning (MRP) System:** An MRP system is an integration of software, people, equipment, methods and controls, designed to carry out the operations of production scheduling, identification of the parts and materials to produce the end products, and manage the purchasing process for obtaining these parts and materials.

The major files employed by this system are: inventory file, the master production schedule file, and the Bill of Materials file.

- 9.2. Cost Accounting (CA) System:** CA systems are defined as an integration of software, people, equipment, methods and controls, designed to manage the cost accounting function of the manufacturing or services processes of the organization. The major files employed by this system are: inventory file, general ledger file, standard cost master file, employee payroll master file, budgets master file, work-in-progress inventory file, etc. The major forms used by this system are: job time ticket, material issued, material turned into store, completed move ticket, quantity standards, price standards, labor rate standards, etc.



- 9.3. Production Planning and Control (PPC) System:** PPC systems are defined as an integration of software, people, equipment, methods and controls, designed to manage the manufacturing function of the organization. The major files employed by this system are: material requirements planning file, work center master file, work center status file, parts master file, bill of materials file, routing file, etc. The major forms used by this system are: master production schedule, order requirements schedule, etc.
- 9.4. Computer Integrated Manufacturing (CIM) System:** CIM systems are integrated ready-made computerized application software systems designed to provide complete integration of your company's production and manufacturing processes (production forecasting, production scheduling, MRP, capacity planning, production cost control, shop floor scheduling, machine control, production simulation, etc.) and all related data.
- 9.5. Enterprise Resource Planning (ERP) System:** ERP systems are integrated ready-made computerized application software systems designed to provide complete integration of your company's business information processing systems (accounting, human resources, production, manufacturing, sales, logistics, etc.) and all related data. A methodology to develop your ERP is *included in Appendix 4 ('How to Develop an ERP System') in Part 2 of this book.*



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10. **Production-Compliance Records management:** This is your tenth production-manufacturing support control.

This system is used to systematically keep all relevant business records related to all produced and manufactured products and their maintenance details. It is used to show to authorities, regulators, auditors and other professionals how the company complies with the relevant national and industry rules, regulations, codes and standards<sup>4</sup>.

**In conclusion**, when you think of the manufacturing process controls described in this chapter (Production-Manufacturing Action Plan, Production-Manufacturing Support Controls, and Computerized Production Information Systems, etc.) and what they may mean to you and your corporate organization, consider the following quotation by the Walmart Founder, Sam Walton:

‘We’re all working together; that’s the secret.’

**Recommendation 4:** Make products to suit customer’s needs and expectations in the most effective, minimum cost and highest quality way. Use computerized systems and IT applications to improve and stream line your production and manufacturing operation. Apply project management to ensure that IT systems are designed and implemented with minimum specifications, cost and time overruns.

# 5 Standardization and Quality Management Procedures

## 5.1 Purpose of Standardization and Quality Management Procedures

The purpose of these procedures is to produce products and deliver services at a predictable, affordable and best quality way.

Establishing these procedures may be done by the quality officer, production manager, or quality team of the organization, or a combination of both. Also the audit program and checklists in appendix 10 of Part 2 may be used to support the design, implementation and post-implementation review of the standardization and quality procedures for your business organization.

### What is Standardization?

**Standardization** in general terms is the formulation, publication, and implementation of guidelines, rules, and specifications for common and repeated use, aimed at achieving optimum degree of order or uniformity in a given context, discipline, or field. You may find this nebulous and difficult to use in a business environment. I do. Let's, however, make things easier for us.

One general definition I have seen some business consultants use is: 'Standardization refers to the degree to which an organization specifies how decisions are to be made so that the behavior of all employees becomes predictable'.

I think this is valid. I have, nevertheless, used the following definition in my consulting assignments related to production:

'**Standardization** in production terms is the process of developing and implementing technical standards, with the main objective being to improve all aspects of the production process: Inputs, Processing, Outputs, Resources and Storage, by making the creation of products more predictable, with better quality and less costly'.

## 5.2 Standardization Procedures

In practice there are five things a business organization can standardize according to the production (IPORS) model presented in chapter 1: inputs, processing, outputs, resources and storage.

1. **Standardization of input:** This is the first area of standardization in production. Inputs are raw materials, semi-finished goods, sub-assemblies, parts, ideas, information, data, knowledge, etc., used in production. One way you can control inputs is to standardize and inspect their characteristics before they enter the production process. This means you must screen inputs according to pre-established criteria or standards and then decide which inputs to allow into your company and production process. At the company level, your corporate governance and other administration policies and procedures handle this standardization. At the production level and for raw materials (for example), your production-related managers (e.g., purchasing manager) ensures this via the execution of production policies and procedures for purchasing (see chapter 2). Raw material standardization can apply in a manufacturing unit to sheet-metal fabrication, molding, casting, protective coatings, and programmable chips. Likewise, standardizing how dates should be inputted into all the production computerized applications may be done by IT systems on the requirements of production, etc..
2. **Standardization of processing:** This is the second area of standardization in production. Processing is the use of several methods, techniques, systems and tools and a well-defined set of step-by-step sequence of activities that must be followed in the same order to correctly perform a conversion task. The aim of standardizing processing activities is to program work activities so that they are done the same way time and time again. For example, healthcare and medical companies use the standardization methods of ‘**the good manufacturing practice (GMP)**’. This is a production and testing practice that helps to ensure a quality product.

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Many countries have legislation enforcing pharmaceutical and medical device companies to follow GMP procedures, and have created their own GMP guidelines that correspond with their legislation. GMP guidelines are not prescriptive instructions on how to manufacture products. They are a series of general principles that must be observed during manufacturing<sup>5</sup>.

Standardization, as an example, is implemented greatly when companies release new consumer products or software to market. For example, compatibility is important for digital products to be successful; many digital devices coming out recently must have various interfaces like USB, or other standard types of connection. This allows consumers to use their new items along with what they already own.

3. **Standardization of output.** This is the third area of standardization in production. Output consists of a pre-determined number of finished goods and services that provide value to customers and society. To ensure that your products are standardized, you may apply quality control and use various criteria to measure this standardization. One criterion might be the number of goods returned from your customers or the number of customers' complaints. On production lines, periodic sampling of products can indicate whether they are meeting performance characteristics. In output reports of computerized production systems standardization means that all these reports should present the data in the same format, etc.
4. **Standardization of resources.** This is the fourth area of standardization in production. Resources are the required managers, staff, industrial and knowledge engineers and other workers, land, plants, tools, equipment, supplies, IT systems, tools, etc., to execute the production process and produce the pre-defined goods or services.

One way in which an organization can control the behavior of both people and resources is to standardize their definition and use by the company's production function. This means that managers set corporate criteria or standards for all resources and then decide which resources should be used in production. If production employees are the resource in question, for example, then one way of standardizing them is to specify which qualities and skills in production they must possess and then to select only those applicants who possess them.

5. **Standardization of storage.** This is the last area of standardization in production. Storage is the location (or locations) where raw inputs or finished or semi-finished goods are placed for possible use at a later point in time or to be shipped to customers. Standardization here means that you apply the same warehousing controls and security procedures for all warehouse locations. For IT production facilities, standardization means that you store all computerized output data by the use of the same storage-type facilities; that you backup all your production and corporate data by the use of the same IT procedures; and that you use the same digital means to store your data.

To give you, however, a better and more practical idea of what standardization means to companies, please see the following two examples:

1. **One example** of standardization would be the case of McDonald's. They have standardized procedures for bookkeeping, purchasing, dealing with employees and customers and food preparation and serving identical food products around the world<sup>6</sup>.
2. **Another example** of standardization would be the Generally Accepted Accounting Principles. These apply to all companies listed on U.S. stock exchanges much adhere. GAAP is a standardized set of guidelines created by the Financial Accounting Standards Board (FASB) to ensure that all financial statements undergo the same processes so that the disclosed information is relevant, reliable, comparable and consistent.

### 5.3 Standardization Methodology

**Standardization in business terms**, like any other tool, or procedure can have many benefits if used properly, or can be harmful if poorly designed or misapplied.

One methodology I have effectively used to standardize production aspects, and minimize potential failures<sup>7</sup> is presented in Figure 3.

1. Understand your business operating model and production model very well
2. Understand your industry and its regulations and standards very well
3. Document all your business overhead and production processes in terms of their flows (business, data), systems, procedures, interfaces, problems and bottlenecks
4. Involve all your key personnel in the process
5. Develop standardization procedures for the processes selected
6. Test standardization procedures before implementation
7. Review and improve your standardization procedures on a periodic basis and when a problem arises

Figure 3: How to Standardize

### 5.4 The Standardization Coin

In various consulting assignments on improving business processes and IT systems, I have used the following concept of 'The Standardization Coin'.

One side of the coin has to do with the policies, procedures, rules, guidelines, practices and standards that promote quality in products, services and systems.

The other side of this coin represents trust, confidence and faith. Each side of the coin complements the other side.

You need policies, procedures and standards to impart quality in everything you do.

When the producer has quality, you, the customer trusts and has confidence and faith in the products and services given to you.

When you exhibit and feel trust, confidence and faith in your producer, you expect their products and services to be of the highest quality.

This issue, quality, is further detailed next.

### **Quality Management Controls**

*But one may wonder: 'What is quality?'*





**Quality**, in general terms, denotes a characteristic or feature that someone or something has. Quality, according to the ISO quality standard (ISO 8402) means ‘the totality of features and characteristics of a product or service that bears its ability to satisfy stated or implied needs’. Quality is a perceptual, conditional and somewhat subjective attribute and may be understood differently by different people. Consumers may focus on the **specification quality** of a product/service, or how it compares to competitors in the marketplace. Producers might measure the **conformance quality**, or degree to which the product/service was produced correctly. Support personnel may measure quality in the degree that a product is **reliable** and maintainable.

I have used the following seven characteristics to define quality in an IT production system (ITPS):

1. **Conformity:** Conform to the ITPS's initial design specifications.
2. **Efficiency:** The software of the ITPS should use resources in the best way.
3. **Reliability:** The hardware and software of the ITPS should function without errors, defects or other anomalies.
4. **Portability:** The software of the ITPS should be developed in such a way that it makes it possible for it to be used in other installations (in case of disaster recovery situations).
5. **Flexibility:** The software of the ITPS should cover new needs easily.
6. **Maintainability:** The errors and defects related to the hardware and software of the ITPS should be easily researched and corrected.
7. **Documentation:** There should be full documentation on all hardware and software of the ITPS.

How is practice related to all of these? I found that quality is not easily achieved, and in many cases this is the reason companies have disastrous results in this regard.

Regardless of how you define it, however, if your production system does not provide quality products and services to the market you will not survive for very long. You will lose your customers quite quickly. You must therefore act.

## 5.5 Developing quality management controls

Establishing the quality management process (in general terms) should be done by your board. The actual detail quality management controls may be developed by your quality officer, production manager, or quality team of your business enterprise. Also the audit program and checklists in appendix 10 of Part 2 may be used to support the design, implementation and post-implementation review of the quality controls for the specific organization.

In practice, quality in producing products and providing services, can be implemented in all parts of the production (IPORS) model presented in chapter 1: inputs, processing, outputs, resources and storage. This is carried out by developing a quality policy and associated procedures (quality management, quality inspection, quality testing, etc., termed 'quality controls') for your company and by specific duties exercised by your staff at all level.

*An example of quality controls is contained in Appendix 5 and Appendix 7 of Part 2 of this book.*

## 5.6 Main Responsibilities for Quality

The main quality responsibilities of your company include the roles, duties and responsibilities, as summarized next:

1. **Production quality officer:** The duties, role and responsibilities of a typical production quality officer, in general terms, are described in chapter 2 (production management controls).
2. The CEO of the organization and the Compliance Officer (if one is established) are responsible for ensuring compliance to this policy.
3. A Senior Manager assigned by the board, is responsible for coordinating, designing, implementing, reviewing, improving, communicating and monitoring quality reports and controls.

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4. The human resources function is responsible for obtaining the necessary funds and for coordinating all the required quality training for all staff of the organization.
5. Department and other level managers (i.e., higher, lower, team, project, etc.) are responsible for carrying out their duties according to this quality policy.
6. Employees are responsible for fostering quality in the execution of their daily tasks and for self-development to ensure total customer satisfaction.
7. Other stakeholders of the organization (i.e., shareholders, external consultants, vendors, etc.) are responsible abiding by this policy.
8. The internal audit function is responsible for including quality reviews into their annual (or ad hoc) audit program.

**In conclusion**, when you think of the standardization and quality management procedures outlined in this chapter and what they may mean to you and your company, consider the following quotation by Henry Ford, in 1926:

‘Today’s standardization is the necessary foundation on which tomorrow’s improvement will be based. If you think of ‘standardization’ as the best you know today, but which is to be improved tomorrow, you get somewhere. But if you think of standards as confining, then progress stops.’

**Recommendation 5:** Manage your standardization and quality processes so that they do not become your white elephants (useless and expensive). Only your excellent quality in products will provide your company with a *Midas touch* (ability to make money). Your business is bound to have its *halcyon days* (days of happiness and prosperity) when it also delivers and supports your products and customers in all aspects, in an integrated way.

# 6 Production Performance Management Controls

## 6.1 Purpose of Production Performance Management Controls

The purpose of these controls is to define performance management for production systems and present measures and methods that may be used to manage and improve production performance for your company.

### Performance Management Approach

**Performance Management** is usually defined as:

- a) The calculation of achievement used to measure and manage quality of products and services,
- b) The level of attainment of an objective in comparison to a given effort, and
- c) The act of measuring or the process of being measured.

**Production performance management** is part of your company's overall performance management that contains *performance measures* to manage and improve governance, risk, compliance, strategic, operational and production aspects of your company.

**Performance measures**, via the performance management system:

1. Monitor the implementation and effectiveness of an organization's strategies (overall business as well as functional, such as sales, production, IT, etc.).
2. Determine the gap between actual and targeted performance.
3. Determine organization effectiveness, quality of products and services, and operational efficiency.

**Performance Management** in practical purposes for the production function includes the following parts:

Part A: The performance goals at the divisional, departmental and individual level set by the higher level managers of your company;

Part B: The production performance measures to monitor and evaluate the performance of your production function; and

Part C: A system to manage, measure and improve your production performance.

These are detailed next.

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## 6.1 Part A: Corporate Performance Goals

While financial measures are an important part of the classical performance management measurement approach, it is also necessary to develop goals and controls that tell managers how well their strategies are creating a competitive advantage and building distinctive competences and capabilities that will lead to future success. This is the role of **corporate performance goals**.

By the use of this system senior managers estimate or forecast appropriate performance goals for each division, department, and employee and then measure actual performance relative to these goals.

**Divisional Performance Goals.** This is the first activity in **corporate performance goals** setting. Divisional goals state corporate managers' expectations for each division concerning performance on such dimensions as efficiency, quality, innovation, and responsiveness to customers. For example the business goals for a large manufacturing division with many plants and products could be: Increase market share in each of our markets. *More goals are detailed in Appendix 8 ('Production Performance Goals and Measures') in Part 2 of this book.*



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**Departmental Goals.** This is the second activity in **corporate performance goals** setting. **Corporate performance goals** control, at the functional and individual levels, is a continuation of control at the divisional level. For example the business objectives for a production unit producing one or more products could be: Increase customer base by 3% in each year for the next 4 years. *More goals are detailed in Appendix 8 ('Production Performance Goals and Measures') in Part 2 of this book.*

**Individual Goals.** This is the third activity in **corporate performance goals** setting. Finally, departmental (functional) managers establish performance goals that individual employees are expected to achieve to allow the function to achieve its goals.

For example the individual performance measures for each person in the production function could be set on the basis of: Number of new products developed. *More goals are detailed in Appendix 8 ('Production Performance Goals and Measures') in Part 2 of this book.*

Once you have set up goals and targets at all levels you need performance measures to track and review the achievement or not of the specified business goals and objectives for your production function. This is discussed next.

### 6.3 Part B: Production Performance Measures

The most crucial aspects of your production that need to be monitored, according to consulting and management experience, relate to performance measures of the following seven areas: Inventory Control; Manufacturing; Production Cost; Service Productivity; Supply Chain; Quality; and Innovation.

**Examples are:**

1. Inventory holding costs
2. Production rate (number of units completed per unit of time)
3. Productivity ('outputs' divided by 'inputs')

*More measures are detailed in Appendix 8 ('Production Performance Goals and Measures') in Part 2 of this book.*

### 6.4 Part C: Managing and Measuring Production Performance

How are all these performance measures tie in to your production and business operations?

My consulting and management experience has shown me that you need an integrated performance system made up of two major components: A standard ready-made framework and a methodology.

**First Component-Performance Frameworks:** First of all you need a framework if you want to be serious about performance.

Different standard ready-made frameworks for managing and measuring business and production performance have evolved from a variety of origins. Some very-well known frameworks are:

Balanced Scorecard (BSC), Economic Value Added, Activity-based costing, and Total Quality Management (TQM).

The BSC framework (detailed in Appendix 9 of Part 2) is the most well-known with thousands of applications to various companies and public organizations across the whole world. Selecting and using a standard framework will make your job easier as you do not have to experiment.

**Second Component-Performance Methodology:** Second of all you need a methodology if you want to implement a performance system and improve your corporate and production performance.

This methodology consists of the following steps:

- Step 1. Connect your production mission and goals
- Step 2. Ensure your production strategy and structure
- Step 3. Create Production Management Control Systems
- Step 4. Manage Production Performance
- Step 5. Use the Corporate Business Dashboard System
- Step 6. Link Production to your Business Management Reporting Procedure
- Step 7. Improve Production Performance

*Full details of these are contained in Appendix 3 in Part 2 of this book.*

Will you improve your production performance with these?

My experience is that you will. You will know how things are going for your production before you undertake initiatives to improve your production setbacks and performance and therefore ensure your company's long-term survival.



**In conclusion**, when you think of the production performance management controls presented in this chapter (Setting of Performance Goals, Production Performance Measures, Methodology, etc.) and what they may mean to you and your corporate organization, consider the following quotation by Socrates, the ancient Greek philosopher:

‘Employ your time in improving yourself by other men’s writings, so that you shall gain what others have labored hard for.’

**Recommendation 6:** Implement a small and manageable set of production performance measures that make sense in your production and business environment. Enable, motivate, engage and train your people in their best use. Link your production performance not only to money but also to other non-monetary awards, benefits and promotional opportunities.

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# 7 Conclusion and Final Recommendations

## 7.1 Conclusion

In the previous chapters so far, I have:

1. Defined what production is and how it fits in a business environment,
2. Described several production controls in terms of policies, procedures, plans, measures, etc.,
3. Provided specific examples of all these, and
4. Offered specific methodologies to implement such controls.

Also in Part 2 you will find additional tools to help you audit and improve the production operation of your company.

Thus, you may very well wonder.

*Are all these production controls enough for me?*

*Will I be successful if I implement these only?*

My answer is NO!

This is because all these (policies, procedures, plans, measures, etc.) and what we call in the field '**hard controls**', fail many times as managers forget one basic issue: the human aspects related to an effective implementation of such controls.

When you design, develop and implement hard production policies and procedures (controls) for your own company and business environment remember that the most important issue for success is to manage the human aspects (so called '**soft controls**') permeating any such difficult and cumbersome task like this (i.e., the good implementation of production controls).

All of these **soft controls** relate and interact in a very specific way in your own business environment and pertain to:

1. Tone at the top (management level) of your company,
2. Thorough and full knowledge of your company specifics and its production function by your board, and

3. The corporate culture; structure of reporting relationships; morale' integrity and ethical values' operational philosophy; trust; ethical climate; empowerment; and other psychological aspects embedded in managing human resources in both your corporate and production functions of your company.

All of these are directly linked to the emotional contracting issue, also referred to as 'the psychological contract'.

This is the crucial and powerful link between the intent of your company, manifested by your hard corporate and production controls, and the motivations, values and aspirations of the production people (soft controls) instructed to carry out all production implementation tasks.

## 7.2 Final Recommendations

How can you make sure that you manage well this link ('psychological contract') to enable and facilitate better production for your company?

My experience is that you can achieve this, in most cases, by executing the action plans noted next.

### **Final Recommendation 1. Production Soft Controls Action Plan**

This plan contains your first set of activities you can use to manage your human aspects (soft controls issues) related to your production more effectively.

**Activity 1: Monitor Ethics and Fraud:** Monitor the implementation of your corporate ethics code, fraud policy and associated procedures<sup>8</sup> for your production function.

**Activity 2: Ensure Ethics and Fraud:** Ensure that all your production staff follow and comply with all these ethics and fraud codes by interviewing them and checking their attitude on moral and other corporate ethical issues. Also discuss ethics unresolved issues related to production with proper corporate ethics and compliance officials.

**Activity 3: Improve Employee Motivation:** Motivation, on general terms, is 'inner or social stimulus for an action' for human beings. In your production environment, the respective department managers (manufacturing, warehouse, purchasing, etc.) need to motivate their employees to do a better job. This is achieved in a corporate setting, according to various thinkers<sup>9</sup> such as Maslow, Argyris, etc., by your managers using various strategies and practical methods, such as:

- 1) Providing friendly and positive reinforcement,
- 2) Using effective discipline and fair punishment,

- 3) Treating people with justice and fairness,
- 4) Satisfying employee needs on a personal and cost-benefit case,
- 5) Setting achievable production work-related goals, objectives and targets,
- 6) Restructuring production jobs/tasks to become more manageable, and
- 7) Rewarding production people on job performance.

**Activity 4: Improve Production Performance by Training:** Consider implementing coaching and mentoring programs for all your critical staff<sup>10</sup> as both of these improve the production performance very effectively.

**Activity 5: Engage Employees:** Use internal audit programs and questionnaires to ask and obtain the feedback of your production employees on all of these (see audit checklists in the Part 2).

**Activity 6: Enhance Production Competence:** Enhance your production performance by certifying first your production and second the other related staff supporting your production function (e.g., finance, IT, audit, purchasing, etc.).

**Activity 7: Review and Improve Whole Process:** Review, amend, customize to your needs and expectations, and implement any or all of the specific recommendations related to each of the above-mentioned soft controls activities.



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Will all these be adequate?

I think that you also need to complement these and have a better chance of being successful in production by reviewing and improving your whole production process and its operational characteristics periodically, as noted next.

### **Final Recommendation 2. Production Assurance, Review and Improvement Plan**

This plan contains your second set of activities you can use and execute, on a periodic basis, to review and improve your production function.

**Activity 1: Production Controls Examination:** Examine all production policies, procedures, plans and actions contained in the previous chapters to ensure that they were executed fully<sup>11</sup>. *You may also use the Checklists contained in Appendix 6 and Appendix 12 (in Part 2 of this book).*

**Activity 2: Compliance:** Evaluate the compliance system of your company at two levels:

1. Your company level as a whole entity;
2. Your production and manufacturing functions, as units.

Both of these should have only one main objective to ensure that your business, production and manufacturing records system complies with all relevant intellectual rights, labour law, health and safety, and environmental protection regulations (local, national, international and industry).

**Activity 3: Production Output Evaluation:** Evaluate the results of all the procedures and actions carried out and their results in terms of products produced and services provided by your company.

**Activity 4: Production Function Evaluation:** These should be carried out by the following activities:

1. Monitor the whole implementation of your production function and its related components;
2. Ensure that your company is protected against product liability cases by having proper insurance coverage against these risks;
3. Ensure that all your critical staff (production, manufacturing, research, purchasing, IT, etc.) have signed a confidentiality statement to mitigate the potential risks of disclosing your sensitive information to unlawful parties and competitors; and
4. Evaluate all aspects of your production function and its related components, as well as the production performance on the basis of the specific performance data collected<sup>12</sup>.

**Activity 5: Intellectual Rights:** Ensure that the intellectual rights of algorithms, brand names, product names, design specifications, recipes, methods, processes and products, and anything else of value regarding your company's research, production, manufacturing, and software, etc., are properly registered and patented, as required, at all levels (local and international).

**Activity 6: Audit:** Audit all production systems and activities by the use of the audit programs and checklists described in appendix 10 of Part 2 to improve all elements of your production.

**Activity 7: Improve:** Plan focused initiatives and executive specific actions to improve on all the findings of the examinations, audits and evaluations described above.

One word of caution here: You should take care so that you are both efficient and effective when it comes to producing goods and providing services. And as Peter Drucker, the noted management guru has said: 'Efficiency is doing things right; effectiveness is doing the right things.'

You can use both of these action plans and their activities to manage your human aspects (soft controls issues) more effectively and ensure better implementation of your production controls for your company.

**It is worth noting that I have used this successfully in a variety of business enterprises. It is up to you to consider it and amend it to your business purposes.**

I must emphasize again that you should tailor the aspects of production controls implementation contained in this book to your own company's production needs and requirements. 'One-size does not fit all' is my guidance in production controls development and implementation. And as Carlos Slim Helu, the noted Mexican CEO of several Mexican companies has said: 'When you live for others' opinions, you are dead'.

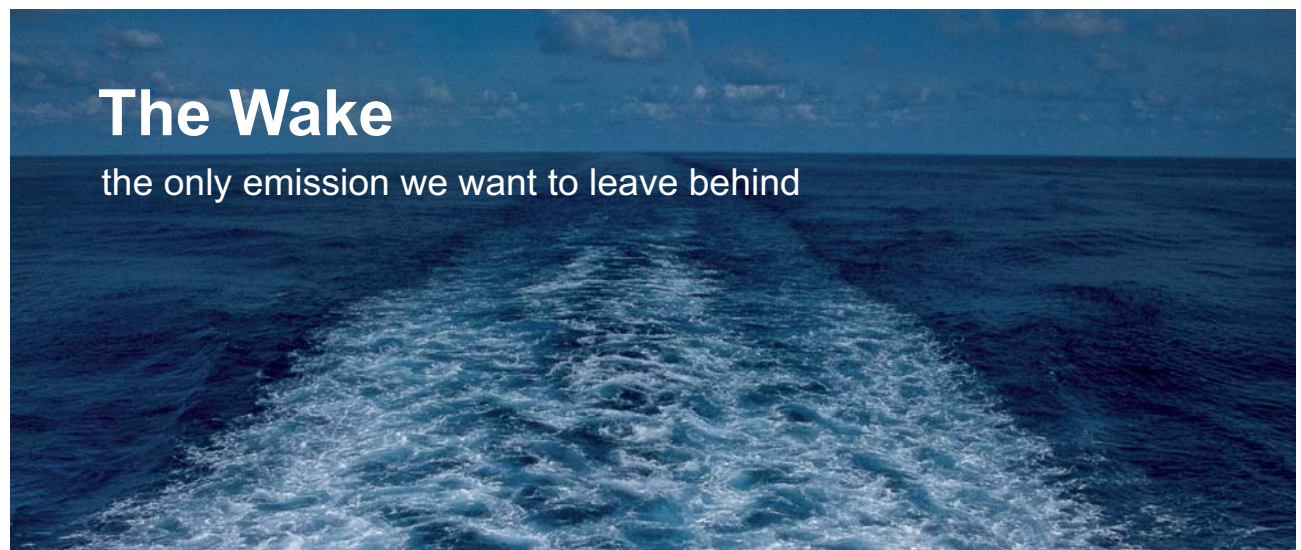
**FINALLY**, one last word of caution: Considering all of the above, remember not to forget compliance. I have recently found that many production managers do, as they think it is not their main job. The fines and damages that this approach brings to your production and business could be tremendous and in many cases catastrophic. You need to take care.



IN CLOSING, let me finish this book with the following story about quality by Aesop, the ancient Greek philosopher, told 2500 years ago:

'A lioness and a vixen were comparing their young. The vixen said how beautiful her litter of cubs was, and remarked sneeringly that the lioness only ever had one cub. 'Ah yes,' said the lioness, 'but that one is a lion...'

I sincerely hope that this book will prove to be of a certain value, somewhat beneficial and informative to all production and manufacturing managers, board members, auditors as well as all other professionals and general-public readers.




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## 8 Endnotes

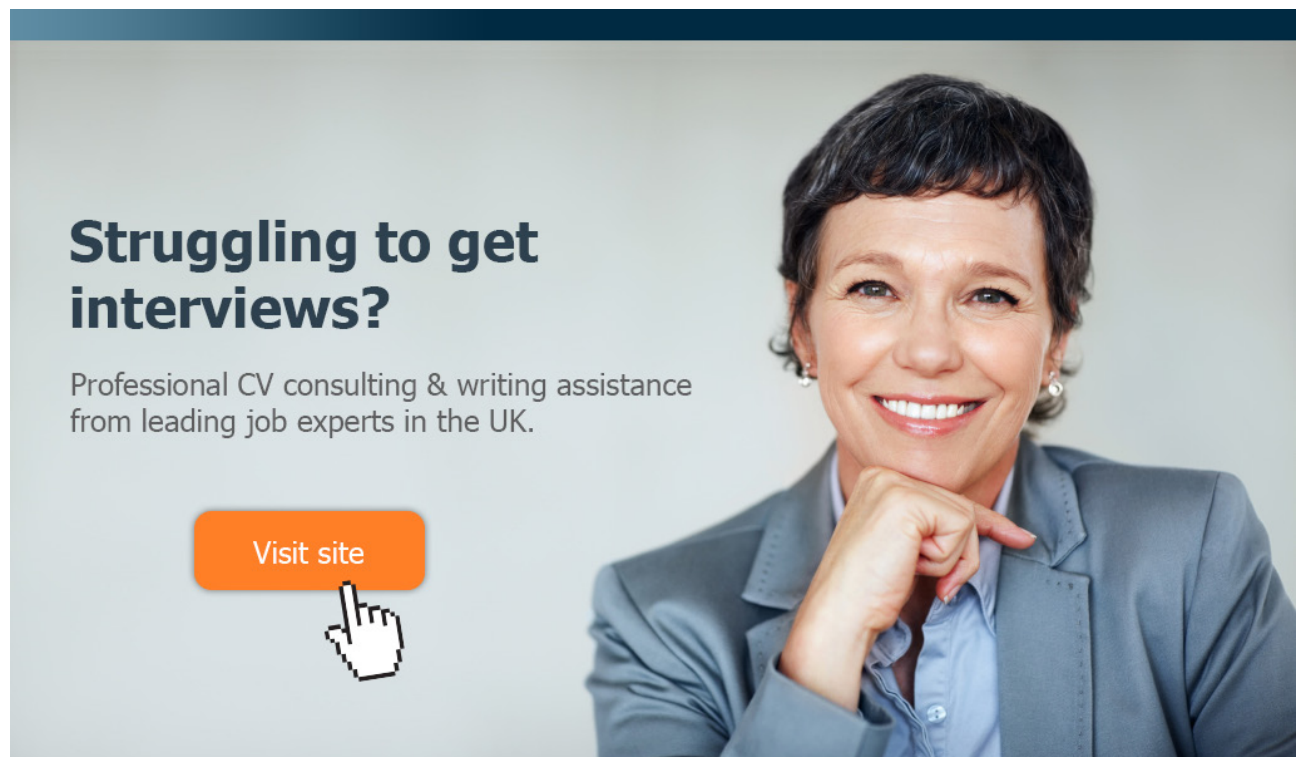
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  - d) <http://eh.net/encyclopedia/article/engen.greece>
  - e) [http://en.wikipedia.org/wiki/Economy\\_of\\_ancient\\_Greece](http://en.wikipedia.org/wiki/Economy_of_ancient_Greece)
2. See my blog: <http://businessmanagementcontrols.blogspot.com/>
3. For other relevant tools and technologies in this area, see: Manufacturing process management (MPM), at: [http://en.wikipedia.org/wiki/Manufacturing\\_process\\_management](http://en.wikipedia.org/wiki/Manufacturing_process_management)
4. For more details see my books:
  - a) Printed Book: Business Management Controls: A Guide, [www.itgovernance.co.uk](http://www.itgovernance.co.uk).
  - b) Printed Book: Business Management Controls: Toolkit, [www.itgovernance.co.uk](http://www.itgovernance.co.uk).
5. For more details, see: The U.S. FDA Organization, The World Health Organization, The European Union's GMP, U.K's Medicines Act, etc. at: [http://en.wikipedia.org/wiki/Lean\\_manufacturing](http://en.wikipedia.org/wiki/Lean_manufacturing), and <http://www.design4manufacturability.com/standardization.htm>
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  - a) <http://www.lean.org/WhatsLean/Principles.cfm>
  - b) [http://www.booz.com/media/file/Standardized\\_Work.pdf](http://www.booz.com/media/file/Standardized_Work.pdf)
 For healthcare standardization, see:
  - c) <http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/nqfpract.html>
  - d) <http://www.leanblog.org/2009/11/ny-times-on-standardization-deming-and-lean-principles-in-healthcare-2/>
8. For more on ethics and fraud, see (a) ethics and fraud posts in my blog, <http://businessmanagementcontrols.blogspot.com/> and (b) various fraud prevention resources at: [www.acfe.com](http://www.acfe.com).
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12. For a relevant article in this area, see:

[http://www.snt.hu/downloads/MFG\\_process\\_management.pdf](http://www.snt.hu/downloads/MFG_process_management.pdf) and  
[http://www.touchbriefings.com/pdf/11/auto031\\_t\\_Polyplan.pdf](http://www.touchbriefings.com/pdf/11/auto031_t_Polyplan.pdf).



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# 10 About the Author

John Kyriazoglou obtained a B.A. (Honours) from the University of Toronto, Canada, also earning a Scholastic award for Academic Excellence in Computer Science. John has worked in Canada, several European countries (England, Switzerland, Luxembourg, Greece, etc.) and other countries for over 35 years, in various management and technical roles (e.g.: Chairman of various corporate committees, Senior IT manager, Managing Director of IT Services company, Senior Group Internal Audit Manager, IT auditor and business management consultant), in a variety of clients and projects, in both the private and the public sectors. He has published several books and articles in professional publications, has served in numerous scientific committees and is a member of several professional and cultural associations.

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<http://www.itgovernance.co.uk/products/3066>

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