A. Management Support Systems - Overview

Management Support Systems (MSS) are computer-based systems that are supposed to provide information to be used by or at least to support managerial decision making. Management Support Systems is seen as a subset of management information system (MIS), which extends the information retrieval capabilities of the end-users with ‘query and analysis functions’ for searching a database, generating ‘what if’ scenarios, and other such purposes. Thus they are collection of all advanced computer technologies for supporting solutions of managerial problems. Sometimes called Decision Support Systems or Business Intelligence but there are some distinctions.

A major problem in management support systems development is requirements specification. There exist a large number of systems development methods for MSS. Watson et al. (1997) also pointed out that there are differences between traditional SDM and MSS development methods and that the former are not very useful in MSS development. In a study focusing on the MSS development methods used by organizations in the US, Watson et al. (1997) found that only two formal methods were used, namely: the critical success factors (CSF) method and the strategic business objectives (SBO) method. They, as well as other less used methods, focus primarily on specifying managers’ information needs and how an MSS can fulfil information needs. Although, they can be useful, they have one major limitation. Since they primarily focus on information needs they are not complete in generating MSS requirements. More complete needs requirements specification can be generated by focusing on managerial roles and how an MSS can support a manager’s different organizational roles. We present an MSS design approach based on a current management theory and model. In doing so, we build on three postulates.

In most cases the MSS features easy-to-read bar graphs and quick access to important data. The system enables you to look at a real-time report or to "drill down" to the details of a particular order, receipt, stock-keeping unit (SKU), etc.
It also complements decision making by checking current and "what if" scenarios to determine the best use of manpower.
With the use of MSS one can examine worker productivity based on comparisons to a pre-set standard and the average worker; refresh your memory on a certain function; and more.
The MSS gives you real-time feedback on your operations so you can make quick and informed decisions.

The Management Support System is used to interfacing database with the Customs Handling of Import and Export Freight (CHIEF) system the HM Revenue & Customs (HMRC). With this it contains archive data for all cleared customs declarations for import and export, offering importers and exporters the opportunity to purchase a subscription or one-off report to keep accurate records of their consignments. Reports available from MSS are:

*Sample reports* - these include three months’ import and export data. If you’d like to receive a sample report, send a written request by the company signatory to the MSS Operational Team.

*Standard reports* - These cover import items, import entries, import tax lines and export item data.
**Customised reports** - these reports can be requested with any additional data items or historical data at an extra cost. However, users reserves the right not to provide certain confidential information.

**Mintzberg’s 10 Management Roles**
Mintzberg’s Ten Management Roles are a complete set of behaviours or roles within a business environment. Each role is different, thus spanning the variety of all identified management behaviours. When collected together as an integrated whole, the capabilities and competencies of a manager can be further evaluated in a role-specific way.

<table>
<thead>
<tr>
<th>Category</th>
<th>Role</th>
<th>Activity</th>
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<tbody>
<tr>
<td></td>
<td>Monitor</td>
<td>Seek and receive information, scan papers and reports, maintain interpersonal contacts</td>
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<tr>
<td></td>
<td>Disseminator</td>
<td>Forward information to others, send memos, make phone calls</td>
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<tr>
<td></td>
<td>Spokesperson</td>
<td>Represent the unit to outsiders in speeches and reports</td>
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<td></td>
<td>Figurehead</td>
<td>Perform ceremonial and symbolic duties, receive visitors</td>
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<td></td>
<td>Leader</td>
<td>Direct and motivate subordinates, train, advise and influence</td>
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<td></td>
<td>Liaison</td>
<td>Maintain information links in and beyond the organisation</td>
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<tr>
<td></td>
<td>Entrepreneur</td>
<td>Initiate new projects, spot opportunities, identify areas of business development</td>
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<td></td>
<td>Disturbance handler</td>
<td>Take corrective action during crises, resolve conflicts amongst staff, adapt to external changes</td>
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<tr>
<td></td>
<td>Resource allocator</td>
<td>Decide who gets resources, schedule, budget, set priorities</td>
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<tr>
<td></td>
<td>Negotiator</td>
<td>Represent department during negotiations with unions, suppliers, and generally defend interests</td>
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*Fig 1 Mintzberg’s Ten Management Roles*

The ten management roles explored in this theory have extensive explanations which are briefly developed here:

- **Figurehead**: All social, inspiration, legal, symbolic and ceremonial obligations. In this light, the manager is seen as a symbol of status and authority.
- **Leader**: Duties are at the heart of the manager-subordinate relationship and include structuring and motivating subordinates, overseeing their progress, promoting and encouraging their development and balancing effectiveness.
- **Liaison**: Maintains information links both inside and outside organization; use mail, phone calls and meetings. It describes the information and communication obligations of a manager. One must network and engage in information exchange to gain access to knowledge bases.
- **Monitor**: Duties include assessing internal operations, a department's success and the problems and opportunities which may arise. All the information gained in this capacity must be stored and maintained.
- **Disseminator**: Highlights factual or value based external views into the organisation members and to subordinates. This requires both filtering and delegation skills.
- **Spokesman**: Serves in a public relation capacity by informing and lobbying others to keep key stakeholders updated about the operations of the organisation via speeches, reports, memos.

- **Entrepreneur**: Roles encourage managers to create improvement projects, identify new ideas and work to delegate idea responsibility to others, empower and supervise teams in the development process.

- **Disturbance handler**: A generalist role that takes charge when an organisation is unexpectedly upset or transformed and requires calming and support. That is taking corrective action during disputes or crises; resolve conflicts among subordinates; adapt to environmental crises

- **Resource Allocator**: Describes the responsibility of allocating and overseeing financial, material and personnel resources. Also decides who gets resources, scheduling, budgeting, setting priorities

- **Negotiator**: Is a specific task which is integral for the spokesman, figurehead and resource allocator roles. Negotiator represents department during negotiation of union contracts, sales, purchases, budgets; represent departmental interests

As a secondary filtering, Mintzberg distinguishes these roles by their responsibilities towards information. Interpersonal roles, categorised as the figurehead, leader and liason, provide information. Informational roles link all managerial work together by processing information. These roles include the monitor, the disseminator and the spokesperson. All the remaining roles are decisional, in that they use information and make decisions on how information is delivered to secondary parties.

**Generalist and specialist management**

The core of Mintzberg’s Ten Managerial Roles is that managers need to be both organisational generalists (consciously choose to offer a broad spectrum of services) and specialists (purposefully chosen their area of specialty). This is due to three reasons:

- External frustrations including operational imperfections and environmental pressures.
- Authority disputes which upset even basic routines.
- The expected fallibility of the individual and human, manager.

Generalist management is that it is someone who has mastered no specialty and practices anything that an occasion/client demands. In fact, a generalist can be someone who has not only mastered but also integrated more than one specialty. A generalist’s practice is an expanded one by virtue of synthesis or integration, not mere addition.

By this definition, a consultant who has mastered more than one specialty, but who has not yet integrated them is a specialist still – a set of solutions instead of a single solution, but still in search of corresponding problems.

Generalists can be found within specialty fields and ranging across them. There are people, for example, who are generalists in the field of training, that is, they are capable of developing class-room instruction or programmed instruction, of developing media, of constructing tests, and of actually delivering the
training. There are also people who specialize in each of these areas. And there are people who are capable in several areas of training and in other areas as well (e.g., or-ganization development, management development, performance technology, and classic man-agement consulting).

Mintzberg's summary statement may be that the role of a manager is quite varied and contradictory in its demands, and that it is therefore not always the lack of managerial prowess, but the complexity of individual situations demanding a variety of roles, which troubles today's manager.

The ten roles, therefore, can be applied to any managerial situation where an examination of the levels to which a manager uses each of the ten 'roles' at his or her disposal is required.

**Productivity Management**

The aim of productivity management guide is to provide small business owners and managers with an overview of how company productivity can be improved. Productivity is a ratio, a comparison of what is produced and what is used to produce it. This is usually expressed in ratios of inputs to outputs. That is (input) cost per (output) good/service. It is not on its own a measure of how efficient the conversion process is.

It compares outputs with inputs, that is, it divides outputs by inputs. Output is a physical entity - a car, a lightbulb, a typed page, or a processed pay voucher. Productivity may also be defined as an index that measures output (goods and services) relative to the input (labour, materials, energy, etc.), used to produce the output. For measurement, an output must be countable over time, a direct result of identifiable activities, and homogeneous (don't mix apples and oranges). Inputs can be classified into four types: labour, materials, capital and energy.

A simple way of looking at productivity in a business organization is to think of it in terms of the productivity model below.

The Productivity Conceptual Model below takes the form of a ‘productivity tree’. The roots denote the inputs to the system, the trunk the conversion process and the foliage and fruits the systems outputs.
The successful management of this process is ultimately the key to survival of any organization. It should be the concern of and a development goal for all organizational members, irrespective of their position.

**Factors Affecting Productivity**

There is quite a variety of factors which can affect productivity, both positively and negatively. These include:

1. capital investments in production
2. capital investments in technology
3. capital investments in equipment
4. capital investments in facilities
5. economies of scale
6. workforce knowledge and skill resulting from training and experience
7. technological changes
8. work methods
9. procedures
10. systems
11. quality of products
12. quality of processes
13. quality of management
14. legislative and regulatory environment
15. general levels of education
16. social environment
17. geographic factors

The first 12 factors are highly controllable at the company or project level. Numbers 13 and 14 are marginally controllable, at best. Numbers 15 and 16 are controllable only at the national level, and 17 is uncontrollable.

How Productivity is Improved

Productivity improvement can be achieved in a number of ways.

1. If the level of output is increased faster than that of input, productivity will increase.
2. Conversely, productivity will be increased if the level of input is decreased faster than that of output.
3. Also, an organization may realize a productivity increase from producing more output with the same level of input.
4. Finally, producing more output with a reduced level of input will result in increased productivity.

Any of these scenarios may be realized through improved methods, investment in machinery and technology, improved quality, and improvement techniques and philosophies such as just-in-time, total quality management, lean production, supply chain management principles, and theory of constraints.

A firm or department may undertake a number of key steps toward improving productivity. William J. Stevenson (1999) lists these steps to productivity improvement:

- Develop productivity measures for all operations; measurement is the first step in managing and controlling an organization.
- Look at the system as a whole in deciding which operations are most critical, it is over-all productivity that is important.
- Develop methods for achieving productivity improvement, such as soliciting ideas from workers (perhaps organizing teams of workers, engineers, and managers), studying how other firms have increased productivity, and re-examining the way work is done.
● Establish reasonable goals for improvement.
● Make it clear that management supports and encourages productivity improvement. Consider incentives to reward workers for contributions.
● Measure improvements and publicize them.
● Don’t confuse productivity with efficiency. Efficiency is a narrower concept that pertains to getting the most out of a given set of resources; productivity is a broader concept that pertains to use of overall resources. For example, an efficiency perspective on mowing the lawn given a hand mower would focus on the best way to use the hand mower; a productivity perspective would include the possibility of using a power mower.

As a cautionary word, organizations must be careful not to focus solely on productivity as the driver for the organization. Organizations must consider overall competitive ability. Firm success is categorized by quality, cycle time, reasonable lead time, innovation, and a host of other factors directed at improving customer service and satisfaction.

**Managerial Decision Making**

Decisions are very important factors that determine the growth of organizations. Decisiveness is a quality which distinguishes very good managers from very bad managers. Managerial Decision Making Decision making is the process by which managers respond to opportunities and threats by analyzing options as well as making decisions about goals and courses of action. When it comes to decisions which are in response to opportunities, the managers involved respond to ways to improve organizational performance. On the other hand, decisions in response to threats occurs when managers are impacted by adverse events to the organization.

A person who is not good in decision making is not fit to be called a manager but an administrator. Corporate investment decisions often involve substantial amounts of money. Many investment decisions are also difficult to reverse and can affect the company's business far into the future. (Corporate Finance, 2009). There are different theories on managerial decision making. One of such which effectively summarizes this is Vroom and Yetton’s normative model of decision making. According to Vroom and Yetton (1973), each decision is influenced by two major factors: *decision quality* and *acceptance*.

But in most cases, managerial decision making usually involves three major stages, each of which are enumerated below:

*Firstly*, the manager needs to define the problem or challenges facing him which calls for the decision making. In getting any work or job done, it is best to start from the beginning. In this extremely important step, a good context of the problem must be grasped. This means that he has to get a good understanding of the problem to be solved.
Next, the manager gathers data, lists and enumerates the alternatives before him. He collects all relevant facts and figures, from which he identifies all the various alternatives of choice. This is needed to facilitate and support the decision making process. Information collection can be done through research, brainstorming or experimentation. It is important during the information gathering phase to also consult “people who know” and “people who matter”.

Finally, after weighing all the alternatives, he chooses and implements the best alternative. In this step, he ponders over the issues peacefully without distractions, and then decides on the best choice or best courses of action.

In conclusion, managerial decision making may just involve a “Yes” or “No” decision. In which case, the solution is simple. But in cases where the issues are of serious nature, even making a “Yes” or “No” decision may involve all the different steps enumerated above.

### Decision Support Frameworks

<table>
<thead>
<tr>
<th>Type of Decision:</th>
<th>Operational Control</th>
<th>Managerial Control</th>
<th>Strategic Planning</th>
</tr>
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<tbody>
<tr>
<td><strong>Structured</strong></td>
<td>Accounts receivable, accounts payable, order entry</td>
<td>Budget analysis, short-term forecasting, personnel reports</td>
<td>Investments, warehouse locations, distribution centers</td>
</tr>
<tr>
<td><strong>(Programmed)</strong></td>
<td>Production scheduling, inventory control</td>
<td>Credit evaluation, budget preparation, project scheduling, rewards systems</td>
<td>Mergers and acquisitions, new product planning, compensation, QA, HR policy planning</td>
</tr>
<tr>
<td><strong>Semi structured</strong></td>
<td>Buying software, approving loans, help desk</td>
<td>Negotiations, recruitment, hardware purchasing</td>
<td>R&amp;D planning, technology development, social responsibility plans</td>
</tr>
<tr>
<td><strong>Unstructured</strong></td>
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</tr>
<tr>
<td><strong>(Unprogrammed)</strong> These are unusual situations that have not been often addressed. No rules to follow are present since the decision is new. These decisions are made based on information, and a manager’s intuition, and</td>
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Factors Affecting Decision Making
Whenever we are involved in making decisions a number of factors can affect the process we follow and ultimately the decision we make. We can organise the factors affecting decision making into three major groups:

- Perception Issues
- Organisational Issues
- Environmental Issues

**Perception Issues:** Perception can be described as the way in which individuals interpret their environment. An individual's perception can influence how they make decisions and solve problems. For example, when information about a problem needs to be gathered the individual's perception will impact on where the information is sought and the type of information regarded as relevant. Perception can be influenced by the following: The perceiver, The object and The situation

*The Perceiver*

The perceiver, the individual perceiving the object, will be heavily influenced by their personal characteristics. The types of personal characteristics that can affect an individual's perception include: Background and experience, Personal values, Personal expectations and Personal interests.

*The Object*

The object, which refers to any person, item or event can have an impact on the way it is perceived. For example, when a manager receives a number of reports to read he may be more inclined to read the one with the most colourful cover as this one stands out. The relation an object has to other objects can also affect the perception of the perceiver. For example, an individual team member may be judged on the actions of the whole team even when it is more appropriate for them to be judged on their own merits.

*The Situation*

Time, location and other situational factors can influence our perception of an object. For example, a Team Leader may notice team members who work late on the same evenings as the Team Leader. However, team members who work late on other evenings may not be noticed by the Team Leader.

**Organisational Issues:** A number of organisational issues can impact on the decision making process. These issues include: Policies and procedures, Organisational hierarchy and Organisational politics.

*Policies and Procedures*

Many organisations have formalised policies and procedures which have been developed to resolve common problems and to guide managers when making decisions. For example, many organisations
have documented disciplinary procedures which guide managers through a process of resolving issues with staff members.

**Organisational Hierarchy**

Organisational hierarchy refers to the management structure of the organisation. Most organisations have different levels of management which carry with them different degrees of authority. The degree of authority directly impacts on the nature of the decisions an individual can make. For example, a Customer Contact Centre Team Leader cannot make decisions about the overall goals of the organisation. However, the Team Leader can make decisions about how their team contributes to the achievement of the organisation’s goals.

**Organisational Politics**

Organisational politics refers to behaviour displayed by individuals and groups which is designed to influence others. Individuals and teams will often use politics to: Advance their careers, Advance their interests and ideas and Increase their rewards

Organisations are made up of individuals with different beliefs, values and interests. These differences are often the driving forces behind organisational politics. For example, two teams believe they require an extra team member. Unfortunately the organisation can only afford one new employee. The two teams may well use politics in an attempt to influence their manager to allocate the new employee to their team.

**Environmental Issues**: Environmental issues are the external factors that affect the organisation. The types of external factors that can have an effect on decision making include:

- The market in which the organisation operates
- The economy
- Government legislation
- Customers’ reaction to the organisation’s products and services

For example, B&B online™ decided to create a new team, B&B for Busy Bodies™ because they believed that a corporate market existed for the bed and breakfast industry.

**Common Decision Making Mistakes**

Many of the factors which affect the decision making process can lead to mistakes being made. By being aware of the types of mistakes that can be made and by understanding the reasons for the mistakes a Team Leader is in a better position to avoid making them.

Some common mistakes that decision makers should be aware of include:

- Only hearing and seeing what we want. Each individual has their own unique set of preferences or biases which blinker them to certain information. The best way to deal with this problem is to identify your preferences and biases whilst attempting to be open to the information around you.

- Placing too great a reliance on the information you receive from others. Often we rely on certain individuals to provide support and guidance. This may be a suitable course of action in many cases.
However, if the individual is not closely involved in the problem situation they may not have the necessary information or knowledge to help make the decision.

- Placing too little emphasis on the information you receive from others. This issue can easily occur in a team situation. In many cases the team members are the people who are most closely involved in a problem situation and they often have the most pertinent information in relation to the problem. The best way to deal with this issue is to ensure that team members are involved in the decision making process.
- Ignoring your intuition. On many occasions we are actually aware at a subconscious level of the correct course of action. Unfortunately, we often tend to ignore our intuition.

Cognitive Limits

- The human mind has limited processing and storage capabilities.
- Any single person is therefore limited in their decision making abilities.
- Collaboration with others allows for a wider range of possible answers, but will often be faced with communications problems.
- Computers improve the coordination of these activities.
- This knowledge sharing is enhanced through the use of GSS, KMS, and EIS.

Dimensions of Management Support Systems

Management Support Systems addresses four critical dimensions that serve as integrated building blocks supporting improvements across the enterprise:

Process

The first dimension for institutionalizing MSS principles is set of robust, flexible and repeatable processes. Simply defining these processes is insufficient though, to effectively implement MSS requires that processes be defined and consistently optimized evaluated to ensure:

- General quality of business practice—Doing the right things
- Efficiency—Doing things quickly with little redundancy
- Effectiveness—Doing things well.

Organization

Management processes are more likely to succeed when they are supported by appropriate organizational structures based on clear understanding of roles, responsibilities, and decision rights. Such organizational structures generally include:

- Participative bodies—involving senior-level business and technology participants on a part-time but routine basis
- Centralized bodies—requiring specialized, dedicated technology staff
- Needs-based bodies—involving rotational assignments, created to deal with particular efforts

The right set of structures will vary according to an enterprise’s value discipline, its primary organizational structure, and its relative BTM maturity. Centralized bodies, such as an Enterprise
Program Management Office (EPMO), tend to require specialized, dedicated staff. Participative bodies, such as a Business Technology Investment Board, are ongoing, part-time assignments for their participants—the key stakeholders. Needs-based bodies—functionally specialized groups such as project teams—tend to be rotational assignments created in response to particular needs.

**Information**

Valid, timely information is a prerequisite for effective decision making. This information must be delivered in a way that is comprehensible to non specialists and, at the same time, actionable in terms of informing choices that matter. Useful information does not just happen. It depends on the interaction of two related elements: data and metrics. Data must be available, relevant, accurate, and reliable. Metrics distill raw data into useful information. Thus, metrics need to be appropriate and valid for strategic and operational objectives. Internally, they should be comparable across the enterprise and across time; and externally across industries, functions, and extended-enterprise partners.

**Technology**

Effective technology, (that is, management automation tools) can help connect all the other dimensions. Appropriate technology helps make processes easier to execute, facilitates timely information sharing, and enables consistent coordination between elements and layers of the organization. It does this through the following:

- Automation of manual tasks
- Reporting
- Analytics for decision making
- Integration between management systems

The simple addition of technology to automate existing processes leaves most of its potential value untapped. The largest gains result from the optimization of processes, organizational structures, and information flows. The complexity of managing the business technology function and increasing demands of an ever-evolving business climate require more information transparency and operational synchronization than basic computing tasks can provide. The appropriate use of technology should not only ease the development and reporting of information needed to fuel management processes across the organization, but also to achieve consistent horizontal and vertical management integration.

**Management Support Systems capabilities**

A MSS Capability is defined as a competency achieved by combining each dimension and creating well-defined repeatable management processes that are executed through appropriate organizational structures, using an effective information architecture that is supported by the right level of automation and technology. **Management Support Systems** defines 17 of these specific capabilities, and each is grouped into one of four functional areas. The **first** area is Governance and Organization is focused on enterprise CIOs and business executives concerned with enterprise-wide governance of business technology. The capabilities that must be
developed to support this functional area ensure that required decisions are identified, assigned, and executed effectively. Necessary capabilities also include the ability to design an organization that meets the needs of the business, manages risk appropriately and gives proper consideration to government, regulatory and industry requirements.

The **second** area is Managing Technology Investments. This functional area focuses on the Enterprise Program Management Office (EPMO) and other technology and business executives who are concerned with ensuring selection and execution of the right business technology initiatives. The capabilities that must be developed to support this functional area ensure that the organization understands what it owns from an IT standpoint, what it is working on, and who is available. The organization must make certain that business technology investment decisions are closely aligned with the needs of the business and that technology initiatives are executed using proven methodologies and available technology and IP assets.

The **third** area is Strategy & Planning. This functional area focuses on enterprise CIOs, divisional CIOs, and business executives who are responsible for the efforts to synchronize business technology with the business. The capabilities that must be developed to support this functional area ensure that a target set of applications will meet the needs of the business and reduce overall complexity. In addition, annual planning and budgeting must incorporate elements of business technology strategy and other evolving needs of the business.

The **fourth** area is Strategic Enterprise Architecture. This functional area focuses on the Office of the Chief Technology Officer and business and technology executives who are concerned with the overall architecture and standards for the enterprise. The capabilities that must be developed to support this functional area ensure that appropriate information and documentation exists to describe the current and future-state environments. Also, it is necessary to verify that business and technology people can implement strategies and plans and make recommendations simplifying the existing business technology environment.

A business strategy identifies target markets and the value proposition that will win in those markets. To implement the business strategy, the enterprise requires particular operational capabilities; for example, a high tech company pursuing a low-cost strategy may need the ability to build entirely to order and limit inventory risk. The most successful companies will craft their business strategies with full regard for any gaps or misalignments between current and required enterprise capabilities—including, of course, its technology capabilities.