**ASSIGNMENT 1 FRONT SHEET**

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| **Qualification** | **BTEC Level 5 HND Diploma in Computing** | | |
| **Unit number and title** | Unit 14: Business Intelligence | | |
| **Submission date** | 10 April 2023 | **Date Received 1st submission** |  |
| **Re-submission Date** |  | **Date Received 2nd submission** |  |
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| **Student declaration**  I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice. | | | |
|  |  | **Student’s signature** |  |

**Grading grid**

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| P1 | P2 | M1 | M2 | D1 | D2 |
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| **❒ Summative Feedback: ❒ Resubmission Feedback:** | | |
| **Grade:** | **Assessor Signature:** | **Date:** |
| **IV Signature:** | | |

**Assessment Brief**

|  |  |
| --- | --- |
| Student Name/ID Number |  |
| **Unit Number and Title** | **14: Business Intelligence** |
| Academic Year | 2019-2020 |
| Unit Tutor |  |
| **Assignment Number & Title** | **Assignment 1: Discover business process and BI technologies** |
| **Issue Date** |  |
| Submission Date |  |
| IV Name & Date |  |

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| --- |
| **Submission Format** |
| The submission is in the form of a Microsoft® PowerPoint® style presentation to be presented to your colleagues. The presentation can include links to performance data with additional speaker notes and a bibliography using the Harvard referencing system. The presentation slides for the findings should be submitted with speaker notes as one copy. You are required to make effective use of headings, bullet points and subsections, as appropriate. Your research should be referenced using the Harvard referencing system. The recommended word limit is 500 words, including speaker notes, although you will not be penalised for exceeding the total word limit. |

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| **Unit Learning Outcomes** |
| **LO1** Discuss business processes and the mechanisms used to support business decision-making.  **LO2** Compare the tools and technologies associated with business intelligence functionality |
| **Assignment Brief** |

|  |
| --- |
| Your company is currently working in [Assumed Domain] for 2 years. For a new, young company, the competition in the market is very high. Therefore, the Board of Director has decided to apply Business Intelligence to improve the company business process by making better decisions.  The Board of Directors assigns a small group including you in Research & Development Department to study business intelligence to apply for the company in the coming years.  You need to research about business processes and decision support processes in the company and identify the types of data (unstructured, semi-structured or structured) generated by these processes with examples. You also need to research about current software used in the business process or decision support process and evaluate these usages (benefits and drawbacks).  Next you need to understand the types of support for decision-making at different levels (operational, tactical and strategic) within the company and study which business intelligence features can help on that types of support. Study the information systems or technologies (of BI) can be used in this case, compare and contrast them to conclude which should be used.  Your group needs to present the research results to the board in a presentation of 30 minutes. |

|  |  |  |
| --- | --- | --- |
| Learning Outcomes and Assessment Criteria | | |
| Pass | Merit | Distinction |
| **LO1** Discuss business processes and the mechanisms used to support business decision-making | | **D1** Evaluate the benefits and drawbacks of using application software as a mechanism for business processing. |
| **P1** Examine, using examples, the terms ‘Business Process’ and ‘Supporting Processes’. | **M1** Differentiate between unstructured and semi-structured data within an organisation. |
| **LO2** Compare the tools and technologies associated with business intelligence functionality | | D2 Compare and contrast a range of information systems and technologies that can be used to support organisations at operational, tactical and strategic levels. |
| P2 Compare the types of support available for business decision-making at varying levels within an organisation. | M2 Justify, with specific examples, the key features of business intelligence functionality. |

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**Assignment 1**

# I. Examine, using examples, the terms ‘Business Process’ and ‘Supporting Processes’.

## 1. Business Process.

### 1.1. Business Process definition.

According to ( Kissflow, 2023),a business process is defined as a set of tasks or set of activities performed by a group of stakeholders to achieve a business goal. A process is executed in a structured way by people or systems to achieve predefined goals. Efficient and streamlined execution of business processes contributes directly to business success and growth.

A business process is simply defined as a series of activities and tasks that, when completed, accomplish an organizational goal.

Each step in the business process represents a task assigned to a participant. It is a fundamental building block for several related ideas such as business process management, process automation, and others.

Much has been written and talked about business process management, but it is important to understand why they are so important to organizations.

### 1.2. An Example of a Business Process

According to ( Kissflow, 2023),as an example, consider the hiring process of a human resources department. From job postings to employee referrals, the process involves several steps. This varies by organization, but a simple workflow might look like this:

* HR manager publishes job updates
* Multiple candidates apply on her one portal
* HR manager looks at candidates and filters out the most suitable candidates
* Selected Candidates are Called for Next Stage Recruitment
* Suitable candidates are selected at the final stage of the recruitment
* Salary and contract negotiations take place
* The offer letter was sent and the candidate accepted

Then follows the lengthy employee onboarding process.

### 1.3. Business Process Phases

According to (Williams, 2021), there are no defined steps involved in creating and implementing a business process. However, it usually follows the following steps:

**Phase 1. Define your goals:**

Defining goals is the first step in any project. You should clearly state what you expect from the process implementation. Helps drive process development. When it comes to business, you should articulate metrics to measure the effectiveness of your results.

**Phase 2. Finding alternatives:**

Every plan you create has an alternative. Always look for other alternatives when designing your business processes. Do not start implementing the first draft without having a contingency plan in place. Each can be analyzed by examining the associated risks, length of time, and cost-effectiveness.

**Phase 3. Involve the stakeholders:**

Changes made within the organization require stakeholder approval. Anything as big as a change in procedure for improvement certainly requires stakeholder approval. Set up a meeting to explain how these changes will help improve the bottom line and organizational value.

**Phase 4. Run tests:**

Once the design is complete, the effectiveness of the new process should be verified. One way to do this is to run the process on a small scale. Most of the problems that may arise during the actual implementation are revealed at this stage. You can then easily make any necessary changes to the process document.

**Phase 5. Implement:**

This is the key stage of the project to execute the plan you designed. During implementation, there will inevitably be feedback from employees. Educating them on the positive changes this will bring to the business will ensure a smooth and effective adaptation.

**Phase 6. Analyses:**

There is always a way to improve your business. For the time being, we may get satisfactory results. But your opinion may change as you go along. Therefore, from day one of implementing these business processes, start analyzing the results. It helps to have a clear picture of what needs to be changed in case of failure.

### 1.4. Types of Business Processes

According to ( Kissflow, 2023), here are the Types of Business Processes.

**Core Processes**

These processes are key functions of a company that add value directly to the end customer. These processes are highly aligned with the company's core values, goals, and vision. As these processes primarily contribute to organizational growth and revenue streams, companies need to continuously monitor and improve these processes.

**Support Processes**

These processes enable and support the smooth running of core processes. It does not contribute to revenue generation, but it does help create a collaborative environment where internal departments can coordinate core processes to work better. Human resources, financial management, administration, and operations fall under supporting processes as they contribute to business expansion.

**Management Processes**

These processes are responsible for planning, monitoring, managing, and controlling core and supporting processes from start to finish. These processes are goal-oriented and ensure that operations run efficiently and smoothly. They oversee internal and external business functions, analyze opportunities and challenges, and focus on continuously improving all processes.

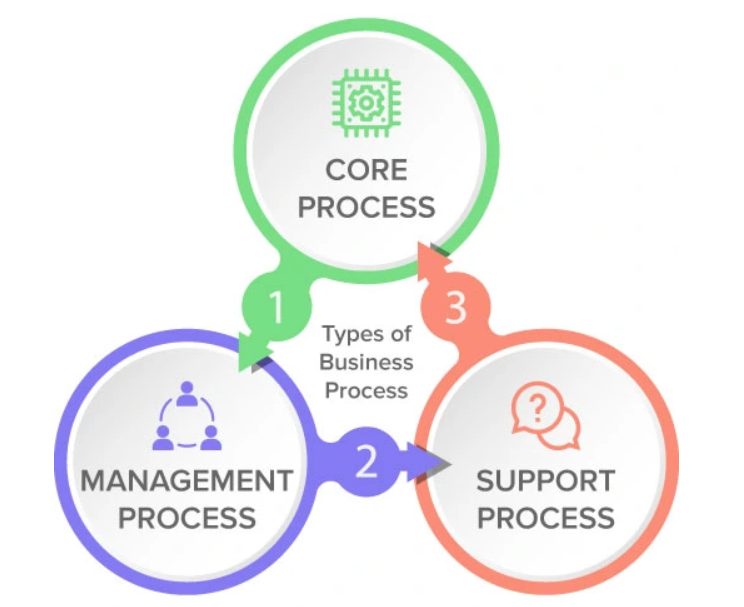


Figure 1: Types of Business Processes

### 1.5. Steps of the Business Process

According to ( Kissflow, 2023), here are the seven steps in the business process lifecycle.

**Step 1: Define goals**

What is the purpose of the process? Why was it created? How do you know if it was successful?

**Step 2: Process planning and mapping**

What is the strategy required to reach the goal? This is a rough roadmap of the process.

**Step 3: Configure actions and assign stakeholders**

Identify individual tasks that teams and machines need to complete to execute the plan.

**Step 4: Test the process**

Run the process on a small scale to see how it works. Note the gap and adjust.

**Step 5: Implement the process**

Start running the process in the live environment. Appropriate communication and education for all concerned.

**Step 6: Monitor the results**

Check your processes and analyze their patterns. Document process history.

**Step 7: Repeat**

If the process can achieve the goals set, replicate it for future processes.

## 2. Support process

### 2.1. Definition

According to (Kaczmarczyk, 2023), the support process (also known as the enablement process) involves different areas of your company to make your products and services available to your customers. Support processes within companies vary depending on the type of product or service offered. Areas understood as support processes are:

* **IT** - maintenance of systems and software (e.g., to support manufacturing or controls),
* **Human Resources** - e.g., employee recruitment,
* **Facilities** - e.g., buildings leased or owned by the company,
* **Accounting** - maintain accounting, pay taxes,
* **Customer** - Responding to customer inquiries (e.g., after purchase)
* **Service** - day-to-day operations (service desks are often set up to cover incidents, problems, or change management).

### 2.2. Support process in value chain context

According to (Kaczmarczyk, 2023), in the context of the value chain, support processes are distinguished from core processes. A core process creates a product or service, but a supporting process (although it adds no value) is necessary to run the core process. The third type is administrative processes. Our support process includes:

Order consumables, accept suppliers, and maintain inventory. The support process iterates over time, enabling core processes to follow management decisions.

Table 1: Support process in value chain context.

|  |  |  |
| --- | --- | --- |
| **Management process** | **Management process** | **Core process** |
| establishing sourcing procedure | ordering supplies | receiving order |
| signing contracts | receiving supplies | approving order |
| evaluation of vendors | supplying stock | filling order from stock |
|  |  | delivering order |
|  |  | product reaches the customer |

### 2.3. Designing support process

According to (Kaczmarczyk, 2023), support processes should be created under the core process. This means that core processes are first defined internally and then analyzed in terms of the necessary supporting processes. It's not easy in reality. The IT is usually responsible for the link between core processes and support processes, but he has a two-pronged approach to IT support.

* Generation and maintenance of all systems with IT support for supply chain, sales, and marketing (matrix organization type can respond more quickly),
* Treat your IT department as a separate company with a separate value chain. It can be legally outsourced, but it can also be done within an organizational structure. The only thing that needs to be changed is the approach.

### 2.3. Examples of Support process

According to (Kaczmarczyk, 2023), here are some Support process example.

* **Help desk:** This is a support process that provides technical assistance to our customers. This may include troubleshooting software and hardware problems, providing advice on how to use our products, and answering questions about our products and services.
* **Customer Service:** This is a support process that assists with customer queries and issues. This includes providing product information, responding to customer complaints, assisting customer orders, and providing technical support.
* **Technical Support:** This is a support process that assists customers with technical issues. This may include troubleshooting hardware and software problems and providing advice on how to use our products.
* **Training and development:** This is a support process that trains and educates employees. This includes providing training on new products and services and providing advice and guidance on how to use our products and services.
* **Quality Assurance:** This is a support process to ensure that products and services meet the standards set by the company. This includes testing products and services, providing feedback on performance, and ensuring that customers are happy with their purchases.

### 2.4. Advantages of Support process

According to (Kaczmarczyk, 2023), support process, also known as an activation process, is a system of tools and processes that support customers and stakeholders. Our support process has many benefits, including:

* Improved Customer Relationships - By providing customers with support resources and timely assistance, organizations can increase customer satisfaction and foster better relationships.
* Increased Efficiency – Using automated processes and procedures, organizations can streamline their support processes, resulting in faster resolution times and fewer errors.
* Increased Accountability - By tracking customer requests and providing a detailed record of support requests, organizations can address all issues in a timely manner.
* Improved customer experience - By providing customers with effective support processes, organizations ensure that customers have access to the information they need to make informed decisions. Cost savings - By automating support processes, organizations can reduce costs associated with manual processes and procedures.

### 2.5. Limitations of Support process

According to (Kaczmarczyk, 2023), support processes, also known as enablement processes, are an integral part of any organization because they help ensure that employees and customers have the resources they need to succeed. However, this process has some limitations that need to be addressed. These include:

* **Potential for human error:** The support process relies heavily on the accuracy of the data collected, and errors in this data can greatly affect the results of the process.
* **Introductory cost:** Depending on the size of your organization, implementing support processes can be very costly. This can be a major stumbling block for smaller organizations.
* **Need for further training:** Support processes are constantly changing, so it's important to keep your staff up to date with the latest procedures and technologies to keep your processes successful.
* **Possibility of misunderstanding:** Different employees may not know the same information, which can easily lead to misunderstandings in the support process. This can cause delays and confusion.

### 2.6. Other approaches related to Support process

The support process, also known as the enabling process, includes various approaches to ensure customer satisfaction. These other approaches include:

* **Customer Relationship Management (CRM):** CRM is a customer-centric business approach that builds relationships with customers to understand their needs and provide the best possible service.
* **Knowledge Management (KM):** KM is the process of gathering and sharing knowledge within an organization to improve efficiency, customer service, and problem resolution.
* **Quality Assurance (QA):** QA is a systematic process to ensure that products and services meet customer expectations and industry standards.
* **Continuous Improvement (CI):** CI is the process of improving processes, products, and services to meet customer needs and increase organizational effectiveness.
* **Benchmark:** Benchmarking is the process of comparing an organization's performance against industry standards to identify areas for improvement.

In summary, the support process also called the enablement process, includes various approaches to ensure customer satisfaction, such as customer relationship management, knowledge management, quality assurance, continuous improvement, and benchmarking.

### 3. Describe company/datasets in project.

Datasets link: <https://www.kaggle.com/datasets/mirzahasnine/car-price-dataset>

The growing car manufacturing industry led to the growth of the car trade. I own a dataset containing information on more than 200 cars. This data set stores details of each car, the information includes the Car name, car body, drive wheel, engine location, fuel type, and aspiration, etc. The above information is explained in detail. in the table below. The sales activities performed based on this dataset are: Customers order cars online, Sell cars directly at the store, and Import cars, etc.

Table 2: Datasets explanation table

|  |  |  |
| --- | --- | --- |
| **No.** | **Cullum name** | **Explain** |
|  | CarName | Save the name of the cars |
|  | carbody | Save cars body information |
|  | drivewheel | Save cars drive wheel information |
|  | enginelocation | Save the location of the car engine |
|  | fueltype | Store fuel type of the cars |
|  | aspiration | Store how air enters the combustion chamber of a car's engine |
|  | doornumber | Contains car door number information |
|  | cylindernumber | Save information about the car's cylinder number |
|  | fuelsystem | Stores how a car's fuel system stores fuel and delivers it to the engine's combustion chambers. |
|  | symboling | Symboling is a term used by insurance companies to describe the rating system used to determine the risk of insuring a particular vehicle. |
|  | wheelbase | The wheelbase is the horizontal distance between the centers of the front and rear wheels |
|  | carlength | The Cullum that stores the cars length |
|  | carwidth | The Cullum that stores the car width |
|  | carheight | The Cullum that stores the car height |
|  | curbweight | The curb weight of a car is the weight of the vehicle minus the passengers, luggage and accessories and what remains is the standard fitment that it comes with from the manufacturer. |
|  | enginesize | Engine size refers to the total volume of the cylinders in the engine and is usually expressed in liters or cubic centimeters |
|  | boreratio | Bore ratio is the ratio of the stroke length (L) to the bore (D, aka diameter of cylinder) of an engine |
|  | stroke | The stroke is the up or down movement of the piston in the cylinder between the top and bottom positions |
|  | compressionratio | The compression ratio of an internal combustion engine is the ratio between the volume of the cylinder and combustion chamber at their maximum and minimum values |
|  | horsepower | Horsepower is a unit of power that refers to the power an engine produces |
|  | peakrpm | Store how many times the engine's crankshaft rotates per minute |
|  | citympg | Store the average miles per gallon (MPG) for your car in the city |
|  | highwaympg | Highway MPG is the average a car will get while driving on an open stretch of road without stopping or starting, typically at a higher speed |
|  | price | Save the cars price |

## 4. List all the business processes of Sale Car System

At Sale Car System, the system provides efficient and convenient business processes for car buyers. Customers can Order a Car Online through our website or app, just choose the vehicle type, color, price and payment method. After placing an order, the customer will receive an order confirmation and an appointment for delivery. Customers can also Buy Cars Directly at the System, with the support of enthusiastic and professional consultants. To ensure supply, we also regularly import goods from reputable domestic and foreign manufacturers.

## 5. Activity diagram

* **Activity diagram of the online ordering process**

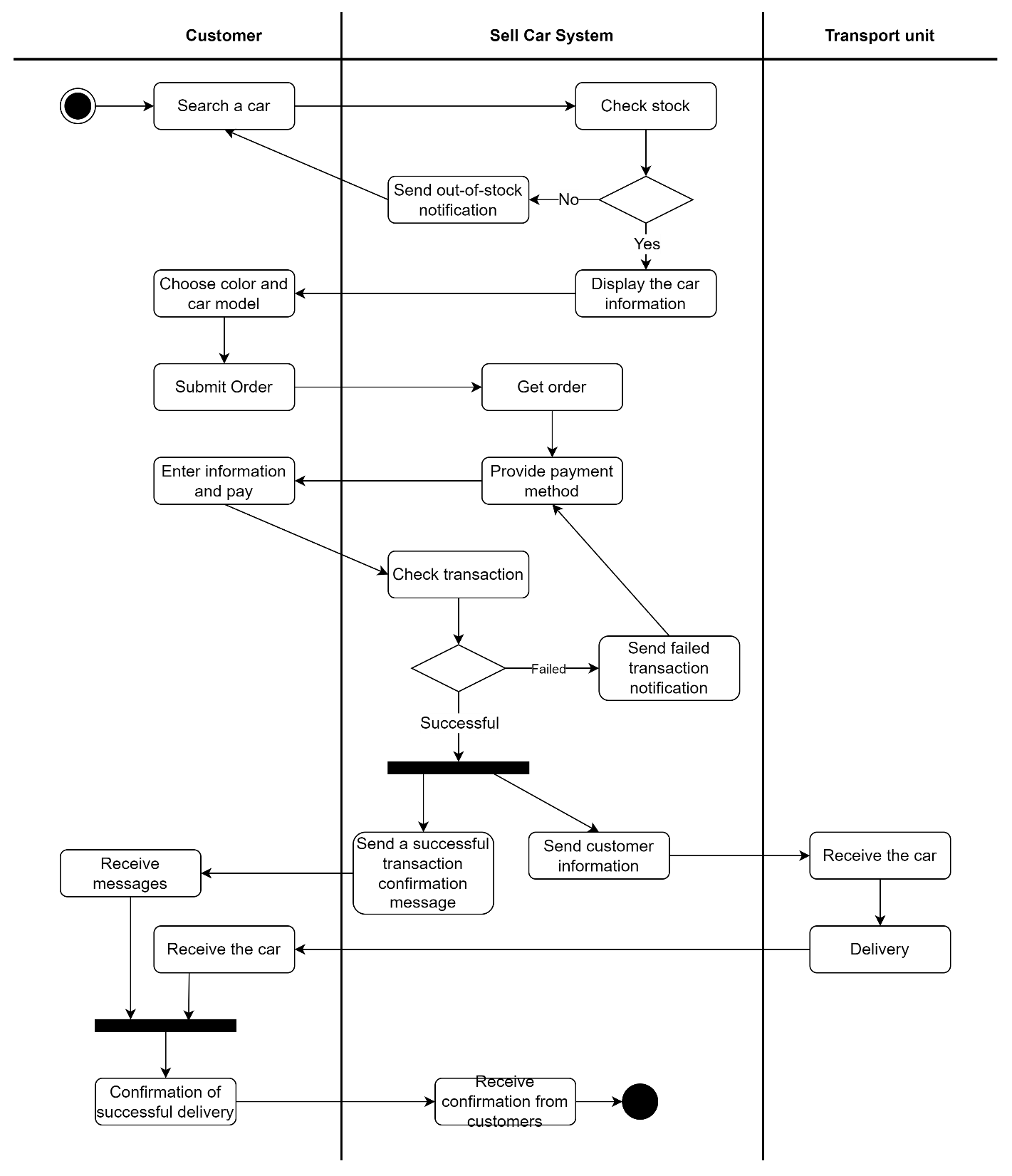
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Figure 2: Activity diagram of the online ordering process

**Explanation:**

The workflow consists of 3 streams Customer, Sale Car System, and Transport unit. The customer first searches for a car then Sale Car System checks stock if the car is in stock Sale Car System will display the car information to the customer if the car is out of stock the system returns to the step the customer searches for a car. After receiving the car information Customer chooses the car color and car model, after choosing the customer Submit an order to Sale Car System. Sale Car System gets the order and provides the payment method to the Customer then Customer performs Enter information and pays Sale Car System will Check the transaction if the transaction is successful Sale Car System will perform 2 jobs in parallel Send a successful transaction confirmation message to the Customer goods and Send customer information to the Transport unit. The transport unit receives customer information and Car from Sale Car System will start transporting the car to the customer. The customer receives the message from Sale Car System and Car from the Transport unit will Confirmation of successful delivery to the Sale Car System. After Sale Car System when receiving receives confirmation from customers, the process ends.

Table 3: Table of data online ordering process activity diagram

|  |  |  |
| --- | --- | --- |
| **Unstructured** | **Semi-structured** | **Structured** |
| Pictures of the car, description of the car | The successful transaction confirmation message, confirmation of successful delivery | Customer information, vehicle information, payment information, invoices. |

* **Activity diagram of the in-store sales process**

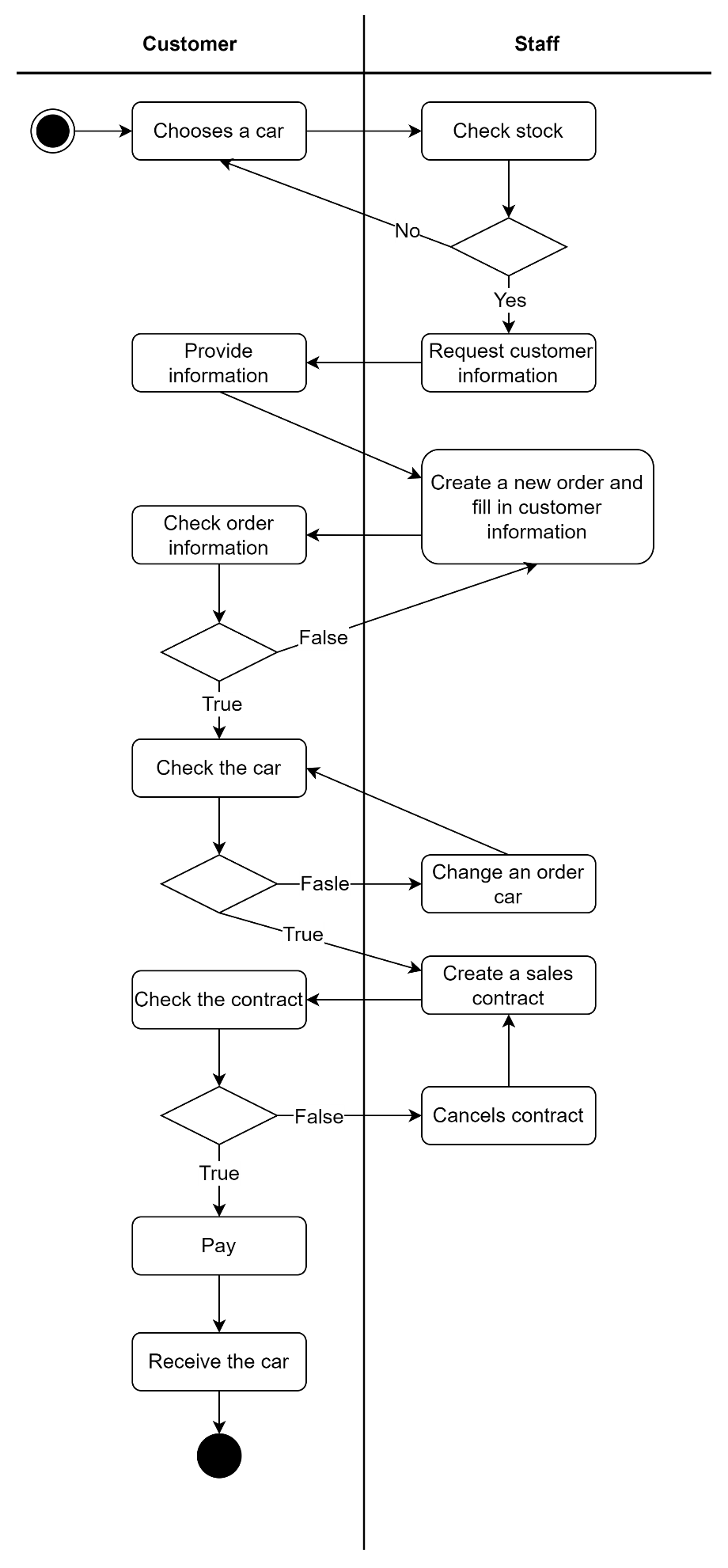
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Figure 3: Activity diagram of the in-store sales process

**Explanation:**

The process includes 2 flows, which are the Customer and Staff of the Sale and system. Customers first Choose a car, then Staff will check if the car is in stock, and if not in stock Customer will choose another car if the car is in stock Staff Request customer information. After the customer Provides information Staff creates a new order and fills in the customer's information. Customers check the information on the order, if the information is incorrect, the staff will re-fill the order. After completing the invoice, the customer checks the vehicle's condition, if the car does not pass, the staff will Change to an ordered car if the car passes the staff will make a sales contract. The customer checks the contract again if the contract is incorrect. Staff will cancel the contract and create a new contract if the contract is reasonable, the customer will pay for and receive the car. Process ends.

Table 4: Table of data in-store sales process activity diagram

|  |  |  |
| --- | --- | --- |
| **Unstructured** | **Semi-structured** | **Structured** |
| Car, customer feedback, | Sales contract | Customer information, order, and cars information |

* **Activity diagram of the import process**

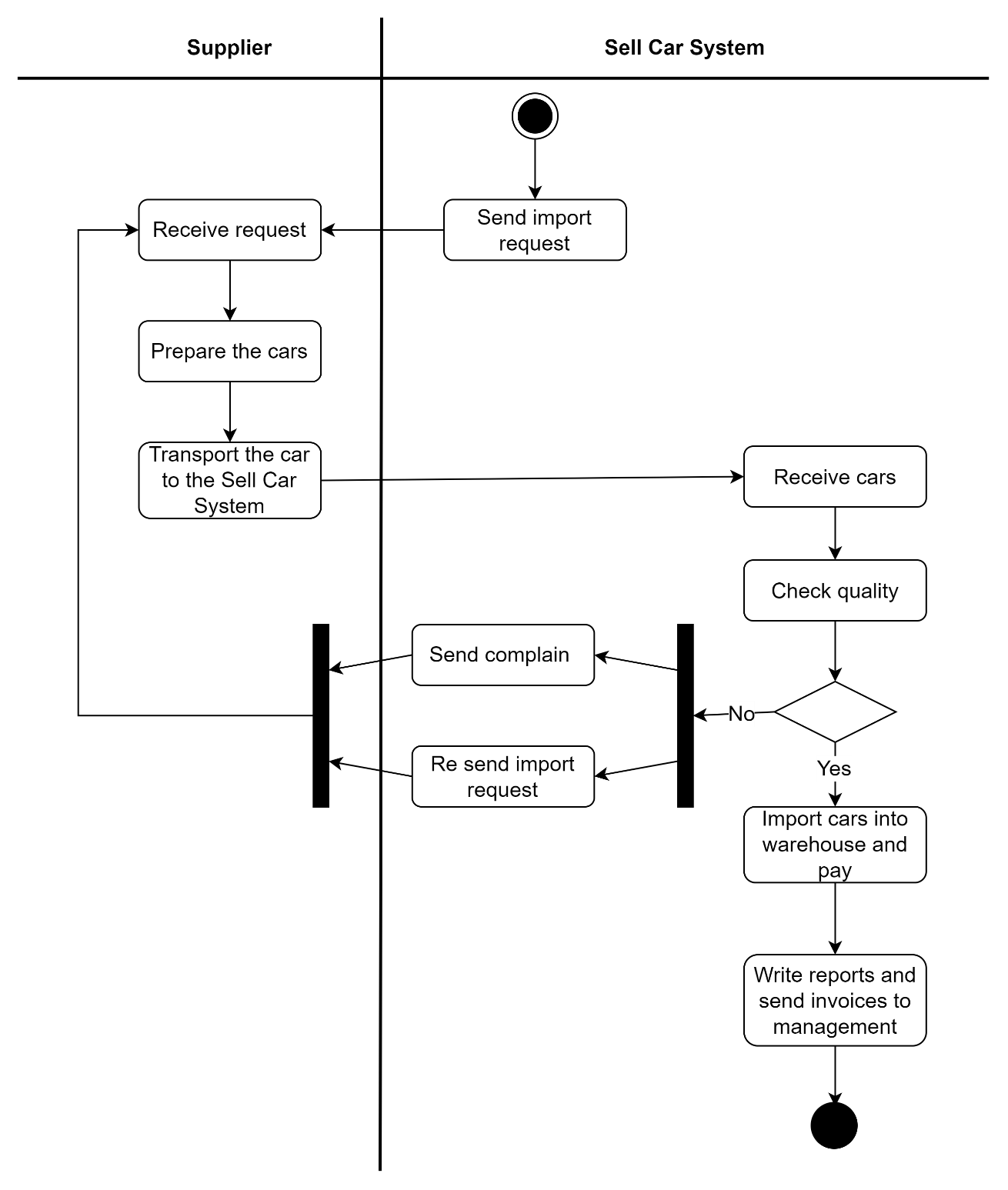


Figure 4: Activity diagram of the import process

**Explanation:**

The process consists of two flows, Supplier and Sale Car System. Start Sell Car System and send import requests to the Supplier. After receiving the request to Sell the Car System the Supplier Prepares the cars, next Supplier transport the car to the Sale Car System. The Sale Car System Receives cars and then Check the quality of the cars if the cars are not qualified Sale Car System Send complaint and re-sends the import request to the Supplier, if the cars are qualified Sale Car System Import cars into the warehouse and pay then write reports and send invoices to management. Finally, end the process.

Table 5: Table of data import process Activity diagram

|  |  |  |
| --- | --- | --- |
| **Unstructured** | **Semi-structured** | **Structured** |
| Import requests, Sale system complaints, car | Reports and invoices | Car’s information |

# II. Compare the types of support available for business decision-making at varying levels within an organization.

According to (Academic material of the University of Massachuset, 2023), decision making is the process of making decisions by identifying decisions, gathering information, and evaluating alternative solutions.

A step-by-step decision-making process helps you make more conscious and thoughtful decisions by organizing relevant information and defining alternatives. This approach increases the chances of choosing the most satisfying option.

**Step 1: Identify the decision**

You realize that you need to make a decision. Try to clearly define the nature of the decision you must make. This first step is very important.

**Step 2: Gather relevant information**

Gather some relevant information before making a decision.

The information you need, the best sources, and how to get it. This step includes both internal and external "work". Some information is inside information:

You seek it out through a process of self-assessment. Other information is external information:

You can find it online, in books, from other people, or from other sources.

**Step 3: Identify the alternatives**

Collecting information may identify some possible courses of action or alternatives. You can also use your imagination and additional information to build new choices. In this step, list all possible and preferred alternatives.

**Step 4: Weigh the evidence**

Imagine what would happen if you used your information and emotions to complete each option. Evaluate whether the needs identified in Step 1 are met or solved using each alternative. As you go through this difficult internal process, you develop a preference for certain alternatives.

People who seem more likely to achieve your goals. Finally, prioritize alternatives based on your own value system.

**Step 5: Choose among alternatives**

Imagine what would happen if you used your own information and feelings to complete each option. Evaluate whether the needs identified in Step 1 are being met or resolved with each alternative. As you go through this difficult internal process, you develop a preference for certain options.

People who are more likely to reach their goals. Finally, prioritize alternatives based on your own value system.

**Step 6: Take action**

You’re now ready to take some positive action by beginning to implement the alternative you chose in Step 5.

**Step 7: Review your decision & its consequences**

In this final step, review the results of your decisions and assess whether they meet the needs identified in Step 1. If the decisions do not meet the identified needs, certain steps in the process can be repeated to make new decisions. For example, we may collect more detailed or slightly different information or consider additional alternatives.

## 1. Strategic decisions

### 1.1. Definition

According to (Bhasin, 2020), strategic decisions are long-term decisions that can have effects in a year, ten years, or even beyond the professional life of the people who make the decision. These decisions can have large effects on how an organization operates and what it looks like in the future. They are resource-intensive, meaning they take a lot of resources to create, implement, and maintain. Because these decisions affect the long-term nature of an organization, it can take a lot of resources over a prolonged period to implement the changes fully. Any decision that deals with how aspects may be in the future has a certain amount of risk associated with it because the future is uncertain for any organization or industry. When an organization makes a large-scale decision like this, they evaluate as many variables as possible so it can understand how the decision can affect its performance, revenue, and public trust. This level of calculation often takes many professionals to understand as many effects as possible and to create smaller plans.

### 1.2. Characteristics of Strategic Decision

According to (Tyonote, 2023), Strategic decision making is the process of choosing the best strategy for an organization to gain a competitive edge. Characteristics or characteristics of strategic decision making are:

* **Directive**

The long-term direction of an organization is determined by strategic decisions. In short, it provides a roadmap for future operations in unpredictable environments. Strategic decisions have far-reaching implications. It was also aimed at achieving the long-term goals of the organization.

* **Rare**

Like strategic decisions, big decisions require a lot of thought. They are so extensive and require so many resources that they are done once in a while. They are critical to the long-term growth and development of an organization. They are different from routine decisions that are made on a regular basis.

* **Consequential**

Strategic decisions are the actions and decisions you make to achieve your organization's long-term goals. Therefore, they are result-oriented or consistent.

* **Competitive Advantage**

Competitive advantage is when a firm gains a relatively high advantage over its competitors. Strategic decisions are always aimed at gaining a competitive advantage over competitors. This enables companies to perform, assert themselves and grow in a highly competitive environment.

* **Strategic Fit**

Strategic decision-making is concerned with maintaining strategic fit, defined as the alignment of organizational structure, policies, resources, and capabilities with market prospects. An organization's competitive advantage is enhanced through strategic fit.

* **Define Scope**

Strategic decisions define the scope of an organization. They deal with actions taken by an organization. In other words, it describes the organization's products and markets.

* **Top Management Oriented**

Strategic decisions are so important to a company that they are made by top management with input from the middle and lower management. Therefore, effective strategic decision-making requires top management commitment and competence.

* **Involve Resource Management**

Long-term resource use is an important part of strategic decision-making. Therefore, the long-term effectiveness of strategic decisions is highly dependent on resource availability and management.

* **Dynamic**

Strategic decisions are dynamic in nature as they are made to seize opportunities within the environment. They are intended to protect organizations from hazards emanating from the environment. They are also insecure, complicated, and dangerous.

* **Irreversible**

Strategic decisions are long-term decisions. They require considerable resources and effort. Therefore, unlike operational decisions, they cannot be easily reversed.

### 1.3. Advantages of strategic decision

According to (Indeed Editorial Team, 2022), strategic decision-making can bring many benefits to a company or organization. It is closely related to strategic planning as it concerns resource allocation and the long-term future of the organization. Many companies recognize the importance of strategic planning and decision-making but may neglect the company's mission and vision. Here are the benefits of effective strategic decision-making:

* **Structure**

Strategic decision-making provides structure to guide the evaluation process. Structure helps reduce stress caused by complex situations. Depending on your organization's structure, it can also be an effective way to help your team collaborate and work towards a common goal. Make sure you use the Strategic Decision Framework for all major business decisions.

* **Predictability**

By correlating short-term decisions with long-term consequences, the consequences of some business decisions can be more predictable. This is very useful when trying to predict the progress and growth of an organization. Consider using strategic decisions as part of predicting company development.

* **Collaboration**

Strategic decisions are usually more effective when people work together. When teams make decisions collaboratively, they can come up with more innovative solutions and understand more nuances than working alone. The collaborative nature of strategic decision-making also helps foster a culture of collaboration and innovation within an organization. You may also consider incorporating strategic decisions into your hiring and retention efforts.

* **Flexibility**

An organization's long-term vision and mission can evolve and grow over time, and strategic decision-making provides the necessary flexibility. You can use it to keep up with evolving goals and align smaller short-term goals and decisions with your long-term company vision. This makes it easier to change short-term decisions to support long-term goals.

## 2. Tactical decisions

### 2.1. Tactical decisions definition

According to (Lumen Learning, 2023), Tactical decisions are decisions that relate to the implementation of strategic decisions, which are long-term and complex goals set by senior managers. Tactical decisions are usually made by middle managers who are responsible for developing divisional plans, structuring workflows, establishing distribution channels, and acquiring resources. Tactical decisions are medium-term and less complex than strategic decisions, but they still require analysis of information and evaluation of alternatives. Tactical decisions focus on the big picture and the here and now and aim to achieve specific objectives that will directly and immediately benefit the most people. Examples of tactical decisions include launching a new product, opening a new branch, or choosing a supplier.

### 2.2. Characteristics

According to (Venkatesh, 2023), following are the characteristics of decision-making:

* Decision-making is based on rational thinking. The manager tries to foresee various possible effects of a decision before deciding a particular one.
* It is a process of selecting the best from among alternatives available.
* It involves the evaluation of various alternatives available. The selection of best alternative will be made only when pros and cons of all of them are discussed and evaluated.
* Decision-making is the end product because it is preceded by discussions and deliberations.
* Decision-making is aimed to achieve organizational goals.
* It also involves certain commitment. Management is committed to every decision it takes.

## 3. Operational decisions

### 3.1. Definition

According to (Quixy, 2023), operational decisions are short-term decisions that are typically made weekly, daily, or hourly. They primarily deal with operational details, daily resource allocation, inventory management, and supply planning to maximize product flow along the biomass-based production chain. Operational decisions are often modified and supplemented by changing internal and external conditions in the supply chain and related activities.

Operational decisions consist of three steps:

* Input Data
* Decision Logic
* Output or action

### 3.2. Characteristics of Operational Decision

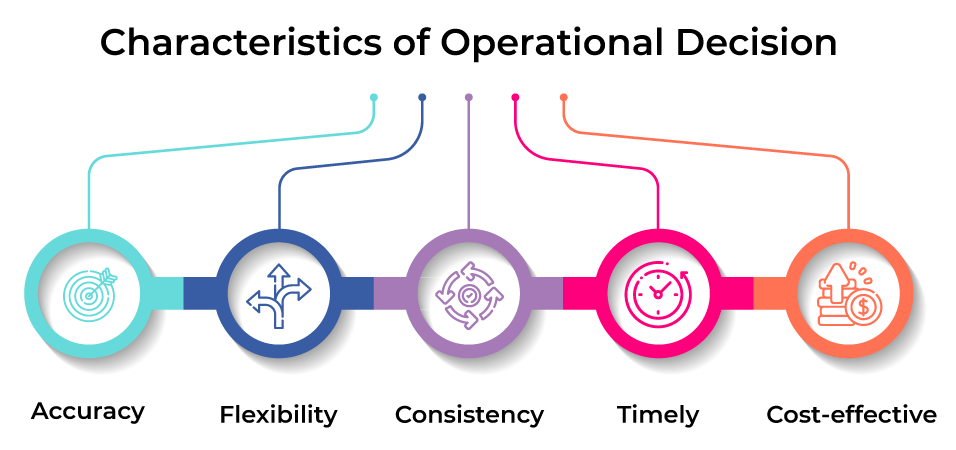


Figure 5: Characteristics of Operational Decision

* **Accuracy**

Good operational decisions are like informed employees with good reporting and analytics, using data quickly and effectively to take the right actions. Don't just recognize the past, use that data to gain insight into the future and use that understanding to act better. Through micro-segmentation and focused customization, we use information about our customers to target them.

* **Flexibility**

Operational decisions must be made quickly to reflect new opportunities, organizations, and threats. Otherwise, its value will decline rapidly. Modern business systems cannot withstand static electricity for long periods of time. In today's competitive, economic and regulatory environment, this is not possible. As organizations automate transactions and processes, the speed at which information systems can change often has a significant impact on how quickly they respond to change. To reduce the cost of lost opportunities and increase overall business agility, operational decisions must be changed easily, quickly, and effectively.

* **Consistency**

You need to be consistent in time and space across the many channels you use to do business, including the web, mobile devices, interactive voice response systems, and kiosks. Different actions can be taken if necessary. B. Offer discounted prices online to encourage the use of cheaper channels, but avoid unintentionally acting differently. These systems support the people who work directly for you and the third parties and agents who represent you. They stay out of trouble by complying with company laws, regulations, and social preferences wherever the company does business. Continually provide a first-class experience for your employees.

* **Timely**

We must act as soon as possible. As they say on the internet, your competitors are only 3 clicks away. Your peers develop short attention spans and a lack of patience. Systems that manage supply and demand chains are increasingly functioning in real-time, so they need to work fast and smart. We need to reduce wait times for these employees. Fewer employees mean more customers, partners, and suppliers. You have to make a choice and act quickly.

* **Cost-effective**

Above all, operational decisions must be economical. Despite significant efficiency gains and reductions over the past few years, cost reduction remains critical. Effective operational decisions reduce costly reports and unnecessary tasks. Reduce fraud and avoid penalties. Empower your employees to work more effectively and manage their time wisely. They try to get as many things right the first time and avoid costly rework. They reduce friction, slow down operations, and increase costs.

## 4. Compare strategic, tactical, and operational.

Table 6: Difference between strategic, tactical, operational is as shown.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Types of Control** | | |
| **Types of Decisions** | **Operational Control** | **Managerial Control** | **Strategic Control** |
| **Structured** | Accounts receivable Accounts payable Order entry | Budget analysis Short-term forecasting Personnel reports Make-or-buy | Financial management Investment portfolio Warehouse location Distribution systems |
| **Semi-structured** | Production scheduling Inventory control | Credit evaluation Budget preparation Plant layout Project scheduling Reward system design Inventory categorization | Building a new plant Mergers & acquisitions New product planning Compensation planning Quality assurance HR policies Inventory planning |
| **Unstructured** | Buying software Approving loans Operating a help desk Selecting a cover for a magazine | Negotiating Recruiting an executive Buying hardware Lobbying | R&D planning New tech development Social responsibility planning |

(University Of Greenwich Learning Materials, 2022)

# III. Differentiate between unstructured and semi-structured data within an organization.

## 1. Unstructured data

According to (IBM Cloud Education, 2021), Unstructured data is defined as follows. Unstructured data, which is typically classified as qualitative data, cannot be processed and analyzed using traditional data tools and methods. Unstructured data has no predefined data model and is best managed in a non-relational (NoSQL) database. Another way to manage unstructured data is to use a data lake to hold the raw data.

## 2. Semi-structured data

According to (IBM Cloud Education, 2021),Semi-structured data is defined as follows. Semi-structured data (JSON, CSV, XML, etc.) is a "bridge" between structured and unstructured data. It has no defined data model and is more complex than structured data, but easier to store than unstructured data.

## 3. Differentiate between unstructured and semi-structured data within an organization.

Table 7: Table of the differentiate between unstructured and semi-structured data

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Key** | **Semi Structured Data** | **Unstructured Data** |
| 1 | Level of organizing | On other hand in case of Semi Structured Data the data is organized up to some extent only and rest is non organized hence the level of organizing is less than that of Structured Data and higher than that of Unstructured Data. | In last the data is fully non organized in case of Unstructured Data and hence level of organizing is lowest in case of Unstructured Data. |
| 2 | Means of Data Organization | While in case of Semi Structured Data is partially organized by the means of XML/RDF. | On other hand in case of Unstructured Data data is based on simple character and binary data. |
| 3 | Transaction Management | In Semi Structured Data transaction is not by default but is get adapted from DBMS but data concurrency is not present. | While in Unstructured Data no transaction management and no concurrency are present. |
| 4 | Versioning | On other hand in case of Semi Structured Data versioning is done only where tuples or graph is possible as partial database is supported in case of Semi Structured Data. | Versioning in case of Unstructured Data is possible only as on whole data as no support of database at all. |
| 5 | Flexible and Scalable | While in case Semi Structured Data data is more flexible than Structured Data but less flexible and scalable as compare to Unstructured Data. | As there is no dependency on any database so Unstructured Data is more flexible and scalable as compare to Structured and Semi Structured Data. |
| 6 | Performance | On other hand in case of Semi Structured Data only queries over anonymous nodes are possible so its performance is lower than Structured Data but more than that of Unstructured Data | While in case of Unstructured Data only textual query are possible so performance is lower than both Structured and Semi Structured Data. |

(Parahar, 2020)

# IV. Justify, with specific examples, the key features of business intelligence functionality.

According to (Janani, 2021), the features of Business Intelligence:

* **Reporting**

Business users can stay up-to-date and get answers to regularly asked questions with business intelligence reporting software that collects information from one or more data sources and presents it in an easy-to-read style. can. Create ad-hoc reports for web, paper, or mobile devices, and rich, interactive, pixel-perfect dashboards that scale to thousands of users.

***Example:***Visual financial business report example

According to (Calzon, 2022),this first example focuses on one of the company's most important and data-driven departments: Collect key financial KPIs that managers need to have on hand to make informed decisions.

Both Gross Margin, Operating Expense Ratio (OPEX), Earnings Before Interest (EBIT), and Net Profit Margin and Income Statement. In addition, the development of sales over the year compared to predefined targets, the development of operating costs for various internal departments over the year, and the development of his EBIT compared to targets.

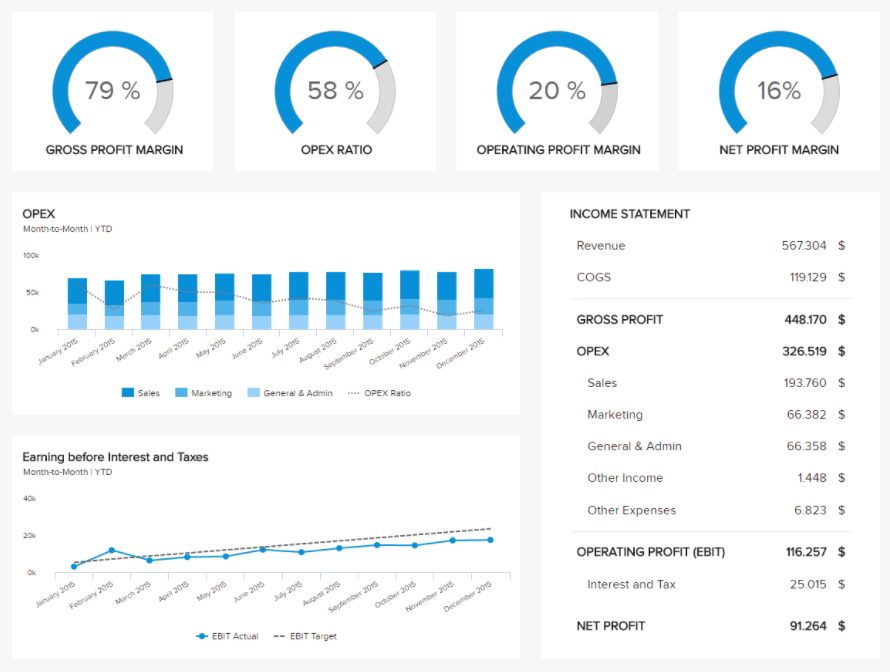


Figure 6: Visual financial business report example

Different visual representations of data can highlight specific trends and behaviors necessary to understand the financial health of a company. Consolidate all your financial analyses on one screen. As the presentation becomes interactive, you can click through to gain deeper insight into your financial KPIs and the outcomes you need to make your company financially sound. The importance of this financial dashboard is the fact that a financial manager can easily track and measure the overall financial overview of a given company while gaining insight into her most valuable KPIs and metrics. is in Achieving a robust operationally prudent plan is one of the most important goals a business can have, and finance is at the heart of that process. Having all this information in one dashboard greatly enhances your reporting and allows you to make informed decisions, backed up by accurate information. It facilitates the implementation of a robust and operationally sensitive management plan.

* **Analysis**

Business users can stay informed and get answers to frequently asked questions with business intelligence reporting software that collects information from one or more data sources and presents it in an easy-to-read style. in May. Create ad-hoc reports for web, paper, or mobile devices and rich, interactive, pixel-perfect dashboards for thousands of users.

***Example:*** Uncovering Fresh Business Insights

According to (Durcevic, 2019), the business analytics example focuses on discovering new business insights that ultimately help streamline business processes, thereby increasing productivity and increasing revenue.



Figure 7: Uncovering Fresh Business Insights

A leading online grocery ordering company wanted to better understand the customer lifecycle and optimize sales reports and marketing campaigns in a time-efficient, cost-effective and autonomous manner.

Real-time, self-service access to insights helps the company streamline marketing and sales efforts, make better and faster decisions based on real-time information, and uncover new insights that help improve the customer experience. I was able to. The result is increased brand loyalty.

With real-time dashboards, the fast-growing online grocery giant can now monitor all key business operations through custom KPIs. In addition, the new business analytics platform has enabled the company to address challenges within days rather than weeks or months. With the help of sales graphs and charts, the data could be easily manipulated and presented to him on one screen.

* **Dashboard**

Users can explore business health, track key performance indicators (KPIs), gain insights in historical and real-time context, and create dashboards that combine data and graphical indicators to provide an at-a-glance overview. Use it to act faster. When software developers integrate these dashboards into applications used by executives and knowledge workers, they increase the value and competitiveness of their products.

***Example:*** AAPL Ticker

According to (TABLEAU SOFTWARE, 2023), check out this visualization by Yuri Fal to track Apple's (APPL) stock price over the years. Inventory tracking is only part of the story. It's also interesting to see what events happened and their impact on the stock. We can click the dots on Tableau to see what role product releases or quarter-end reports play for Apple's stock performance.

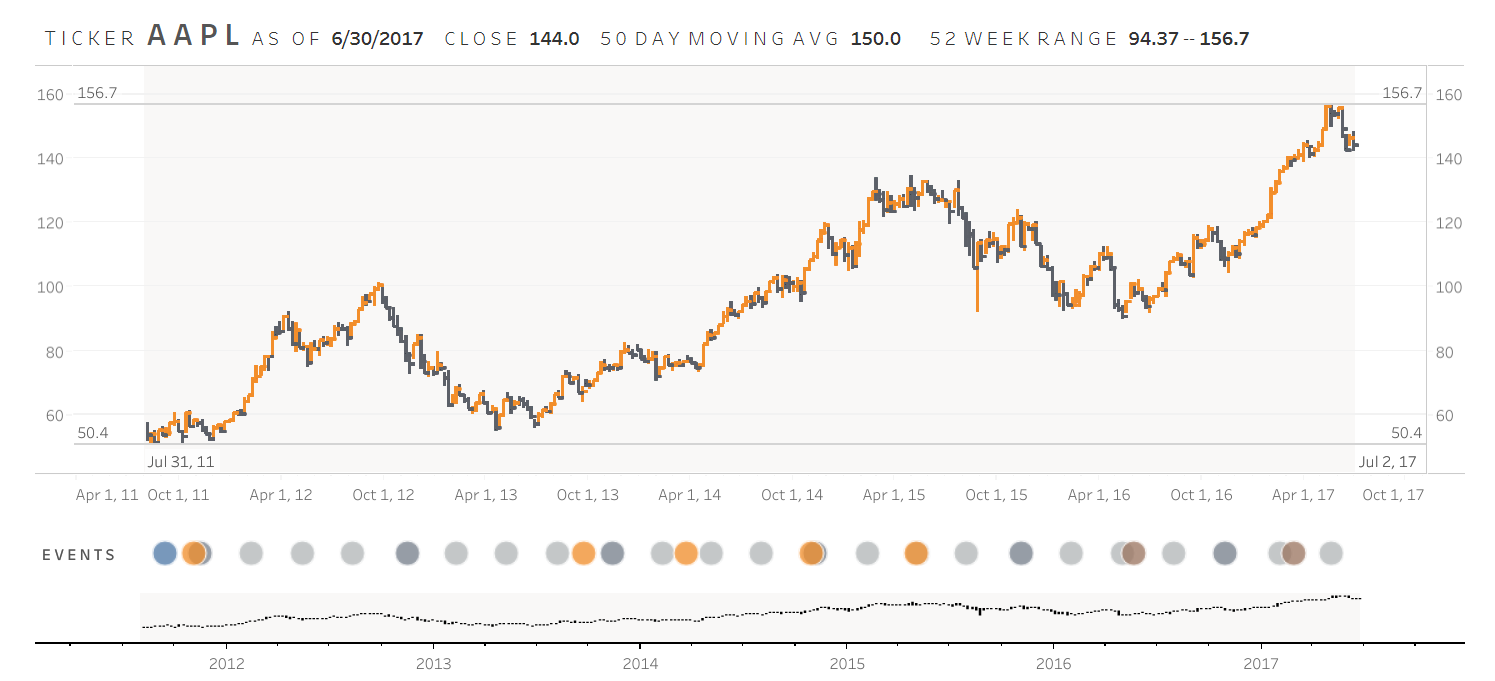
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Figure 8: AAPL Ticker

* **Data Integration**

Users can explore business health, track key performance indicators (KPIs), gain historical and real-time contextual insights, and create dashboards that combine data and graphical indicators to provide at-a-glance views. You can create Use it to trade faster. When software developers integrate these dashboards into applications used by executives and knowledge workers, they increase the value and competitiveness of their products.

***Example:***

Let's take the example of a company called See Food, Inc. (SFI). SFI's product is his mobile app that allows users to take pictures of various items and determine if the item in the picture is a hot dog. SFI uses many tools to run its business.

* Facebook Ads and Google Ads in order to acquire new users
* Google Analytics to track events on its website and in its mobile app
* MySQL database to store user information and image metadata (e.g. hot dog or not hot dog)
* Marketo to send marketing email and nurture leads
* Zendesk to perform customer support
* Netsuite for accounting and financial tracking

Each of these applications has a silo of information about the operation of SFI. To give SFI a 360-degree view of their business, they need to bring all this data together in one place. This process is data integration.

# V. Evaluate the benefits and drawbacks of using application software as a mechanism for business processing.

Application software is a type of software that performs specific tasks for users or organizations, such as word processing, spreadsheet, database, presentation, or web browsing. Application software can be used as a mechanism for business processing, which is the set of activities that transform inputs into outputs that create value for customers. However, using application software for business processing has both benefits and drawbacks that need to be evaluated carefully.

Some of the benefits of using application software for business processing are:

- Application software can increase the efficiency and productivity of business processes by automating repetitive or complex tasks, reducing errors, and saving time and resources.

- Application software can enhance the quality and consistency of business outputs by providing standardized formats, templates, tools, and features that ensure accuracy, completeness, and compliance with regulations and standards.

- Application software can facilitate the communication and collaboration among business stakeholders by enabling data sharing, integration, synchronization, and access across different platforms, devices, and locations.

- Application software can support the innovation and improvement of business processes by allowing customization, modification, adaptation, and extension of existing functionalities to meet changing needs and expectations.

Some of the drawbacks of using application software for business processing are:

- Application software can incur high costs of acquisition, installation, maintenance, upgrade, and training that may outweigh the benefits or exceed the budget of the organization.

- Application software can pose security and privacy risks for the organization and its customers by exposing sensitive data to unauthorized access, modification, deletion, or theft through hacking, malware, or human error.

- Application software can create dependency and vulnerability for the organization by relying on external vendors or providers for technical support, updates, patches, or backups that may not be available or reliable when needed.

- Application software can limit the flexibility and creativity of business processes by imposing predefined structures, functions, and rules that may not suit the specific needs or preferences of the organization or its customers.

# VI. Compare and contrast a range of information systems and technologies that can be used to support organizations at operational, tactical and strategic levels

## 1. Transaction Processing System (TPS)

According to (Martin, 2023), transaction processing systems are used by organizations to track their day-to-day business activities. Used by production-level users. The primary purpose of any transaction processing system is to provide answers to frequently asked questions.

The TPS system quickly answers the above questions by monitoring daily operations.

Operations managers rely on detailed data from transaction processing systems to make routine, rational decisions.

***Examples*** of transaction processing systems include:

* Point of Sale Systems – records daily sales
* Payroll systems – processing employees salary, loans management, etc.
* Stock Control systems – keeping track of inventory levels
* Airline booking systems – flights booking management

## 2. Management Information System (MIS)

According to (Martin, 2023), a Management Information System (MIS) is used by tactical managers to monitor the current performance status of their organization. The output of transaction processing systems is used as input to management information systems.

The MIS system uses routine algorithms to analyze the input. H. Aggregate, compare and summarize results to produce reports used by tactical managers to monitor, control and predict future performance.

***Examples*** of management information systems include:

* Sales management systems – they get input from the point of sale system
* Budgeting systems – gives an overview of how much money is spent within the organization for the short and long terms.
* Human resource management system – overall welfare of the employees, staff turnover, etc.

## 3. Decision Support System (DSS)

According to (Martin, 2023), decision support systems are used by senior management to make non-routine decisions. Decision support systems use input from internal systems (transaction processing systems and management information systems) and external systems.

The primary purpose of decision support systems is to provide solutions to unique and frequently changing problems. A decision support system answers questions such as:

* How will employee performance be affected if we double the production lots in our factory?
* What will happen to our sales if a new competitor enters the market?

Decision support systems use advanced mathematical models and statistical techniques (probability, predictive modeling, etc.) to provide solutions and are highly interactive.

***Examples*** of decision support systems are:

* **Financial Planning System** – Managers can evaluate alternative ways to reach their goals. The aim is to find the best way to reach your goals. For example, a company's net profit is calculated using the formula of total sales minus (cost of sales + expenses). A financial planning system allows management to ask what-if questions and adjust values ​​such as gross sales and cost of goods sold to see the impact of decisions and net income and find the best path forward.
* **Bank Loan Management System** - used to check the creditworthiness of loan applicants and predict the likelihood of a loan being repaid.

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