Middlesex University Dubai

BIS1201

Information Systems Foundation

Process Mapping and Data Flow Analysis

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Introduction

Modern Business is known for putting its customers first. Efficiency can allow a business to get its products quicker to a customer. Order can help with organizational harmony. Management is responsible for achieving a high level of order and efficiency with a company. Modern Businesses rely on Information Systems to help them achieve their goals; this coursework looks at how organizations make this order and efficiency in providing a better experience for themselves and their customers. **Task 1** helps in understanding how the sales department of a business can use different forms of information systems such as Transaction Processing Systems and Management Information systems to aid the sales experience for a company. **Task 2** takes on a narrative that discusses the process of exam moderation in university; this is an explanation of a standard procedure in a distinct information systems approach. **Task 3** similarly follows a narrative of exam moderation, in this case, the relationships of the entities are on display through representation in an Entity-Relationship Diagram (ERD), this diagram describes the relationships of several entities in a specific domain, in this case, a university which is hiring external moderators. **Task 4** explains the Human Resources Management Information Systems (HRMIS). Human Resources is a critical player and business and can be very important in increasing the efficiency and order of a business; this task is an explanation of how human resources utilizes information systems to enhance its operations and support the three levels of management (strategic, tactical, and operational). All of the tasks are interrelated as they demonstrate the importance of information systems practices within core business activities and how efficiency and order are improved with the inclusion of said practices.

Task 1: - Input, Processing, and Output (Sales Order Form)

I. Definitions

- **Data: - Data** is defined as information that is collected to be analyzed and is used to make decisions, or store information in an electronic form to be used by a computer**.** Numbers or Facts are considered to be Data. For example, 100, James, 15000, etc. (Dictionary.cambridge.org)

- **Processes: -** A **Process** is defined as a set of instructions that is being processed by the computer processor. For example, A process may be media such as video wherein a website converts the video into a standard format. (Hope, n.d.)

- **Information: - Information** is defined as the data which has been processed in such a manner that the person who receives it find it meaningful. For example, a report card of a student which consists of specific student details and their marks is Information. (Thakur, n.d.)

- **Feedback: - Feedback** is a process through which a part of the output of a process is returned to the input, so that performance is maintained or process is controlled. For example, in an audio system, when the speaker (output) creates a sound and is retrieved by the microphone (input), a negative feedback is created such that a high-pitched noise is produced. (TheFreeDictionary.com)

- **Storage: - Storage** is the process through a storage device stores data by using Information Technology. Storage ensures that Data can be retained temporarily or permanently. For example, USB, Hard Disk Drives, Cloud Computing, etc. (Techopedia.com, n.d.)

II. An Introduction to Sales Order Processing

A **Sales Order** refers to the internal form detailing the sale of products that, in turn, provides necessary information to the staff. It is also a beneficial document that considers operations. A Sales Order Form usually stipulates that no further production is to be applied to the product. When a product is first sold, all the necessary information related to the customers' needs are taken by the Sales Staff. When this information is received, it is added either in the form of a document or a database so that the customer can ensure that his/her needs are taken into account. (Wilkinson, 2013)

The product chosen is **Mobile Phone** as it is used regularly by an individual in his/her daily life. It is used for various purposes, such as capturing pictures, communication, playing games, etc. The name of the hypothetical Smartphone manufacturer is **"TeleMobile".** TeleMobile was founded in 2015 in London, United Kingdom. With a presence in nearly 15 countries, TeleMobile aims to reach over 30 countries by 2025. TeleMobile sells its products through the e-commerce platform **Amazon**. The slogan of TeleMobile is **"See More. Do More"**.

Figure 1: - Logo of Company "TeleMobile"

III. Identification of Inputs

The types of information needed in a Sales Order Form are: - **Order Number, Date, Due Date, Salesperson ID, Salesperson Name, Customer ID, Customer Name, Phone Number, Shipping Address, Item Code, Description, Quantity, Price, Subtotal, Amount Including Tax, Discount, Shipping Charges, Grand Total and Mode of Payment.**

- **Order Number** is the number that is computer generated for an order placed by the customer. In a situation where the customer is not satisfied by the product and wants to refund the amount for the same or wants to buy another product in its place, the customer needs to provide the order number, which is given in the Order Form.

- **Date** represents the date when the transaction happened during the sales. The Date of a Sales Order Form is necessary so that the firm and customer can understand when the transaction occurred.

- **Due Date** represents the date where the debt or any other payment must be paid to the firm. If the customer fails to make a payment on or before the due date, the firm charges the customer a late fee, which is included in the next bill.

- **Salesperson ID** is the unique code assigned by the firm to each Sales Person and is used to distinguish between two salespeople with the same name to avoid redundancy. The advantage of each Salesperson having an ID is that it boosts up the professionalism of the firm as well as increases the customer relations.

- **Salesperson Name** is the person who dealt with the sale of goods to the customer at the time of selling. A Salesperson Representative performs various tasks such as finding new customers, solving customer complaints, etc. A Salesperson Representative requires many qualities such as the ability to work for long working hours, excellent communication skills, etc.

- **Customer ID** is the unique code assigned to each customer whenever he/she places an order for the first time. Each customer is assigned a Customer ID so that it can lead to easier measurement of customers; a customer may have the same name, so a Customer ID can be used to avoid redundancy.

- **Customer Name** identifies the name of the customer and can be used when he/she faces any problem with regards to the goods, so that is much easier for the firm to find out all transactions with the help of his/her name.

- **Phone Number** is the number of the customer to whom the product is being sold. With the help of the customer's Phone Number, the firm can solve the problems faced by the customer as well as promote the latest upcoming products.

- **Shipping Address** is required when goods are delivered to the customer's address and also to ensure when any transaction or any sales have been wrongly done so that a replacement can be provided.

- **Item Code** is the unique code which attains to the product to be sold by the firm. The Item Code of a product is essential as it can be used to categorize different products sold by a single brand as well as to check the availability of the product.

- **Description** includes all the names of the products as well its specific details which are to be sold to the customer. For example, out of the available storage options of 128GB or 256GB, the customer may choose to buy a Mobile Phone with a storage of 128 GB and is included in the sales order form.

- **Quantity** refers to how many items the customer purchased during the sales.

- **Price** refers to the amount of the sale of each product.

- **Subtotal** is calculated by multiplying Product Price into Quantity (Price x Quantity).

- **Amount Including Tax** is the percentage of tax applied to the particular product to be sold as required by the Government. This includes Value Added Tax (VAT), Goods and Services Tax (GST), etc.

- **Discount** is the reduced amount/percentage from the price of a product. Firms usually offer discounts for various reasons such as attracting new customers, boosting the firm's reputation, and for clearance of product stock.

- **Shipping Charges** include the additional cost, which is used to ship the product to the customer in case he/she has opted for home delivery. Shipping charges are always dependent on the weight of the product as well as the geographical location in which the product is delivered.

- **Grand Total** is the overall calculated price of goods sold after additional charges such as Amount including tax and Shipping Charges, are taken into account.

- **Mode of Payment** gives the customer the choice to purchase the goods either in cash or credit. Customers who buy the product on credit are sent an SMS by the bank to give a proof that the product has been obtained.

IV. Identification of Processes

The process included in a Sales Order From are: - **Selection, Create Order, Available Quantity, Status Tracking, Global Positioning System (GPS)**

- **Selection** is the process in which the customer chooses the product he/she intends to buy out of a given range of products. The customer may choose to buy a product based on various parameters such as Price, Convenience, Reputation, etc.

- **Create Order** is the process of creating an order when the customer agrees to purchase the product and has paid the amount to obtain the product. While creating the order, the customer has to specify the type of product he/she

- **Available Quantity** is the process of ensuring that the product chosen by the customer is available for sale by the firm. In case the product is not available, the product may not be sold by the firm currently but could be available in the future.

- **Price Calculation** is the process of calculating the price that the customer has to pay on purchasing the product. This includes Amount including Tax and Shipping Charges.

- **Status Tracking** is the process that allows the customer to manage the status of the purchased item. Status Tracking is usually provided to the customer on the website of the firm or through SMS after the product is purchased.

- **Global Positioning System (GPS)** is the process of finding the location of the customer who has agreed to purchase the product. The benefit of GPS is that it provides the shortest and easiest route for reaching the customers delivery address.

V. Identification of Outputs

The outputs included in a Sales Order Form are: - **Order Confirmation, Invoicing, Refunding, Product Delivery, Customer Feedback, and Sales Update.**

- **Order Confirmation** is the written confirmation which is sent by the firm to the customer on the sale of a product. On the approval of the order, a printed invoice is generated so that the payment can be confirmed.

- **Invoicing**, in the form of an invoice, is the written verified agreement that is sent by the firm to the customer on the sale of a product and, as a result, becomes a liability for the customer. It can either be a printed form or an electronic form and includes details such as Invoice Number, Date of Invoice, Total Amount to be paid, etc. An invoice needs to be presented in such a manner that is it is presented professionally, and its details ae clear.

- **Refunding** is done in a situation wherein the firm pays back the customer who may not be satisfied with the product. Refunding is used to ensure that no difference of opinion occurs between the customer and the firm, which is used to reduce customer disagreement.

- **Product Delivery** is the process of delivering the product to the customer to his/her given address. For Product Delivery, the customer is contacted by the courier (such as DHL, FedEx) either by a Phone Call or through SMS before the product is delivered to the customer's address.

- **Customer Feedback** is the most important output of a Sales Order Form as it helps the company to know how good its products are so that it can improve its services to boost up its reputation in the long run. A satisfied customer will then continue to purchase a product at any point of the time from the same firm.

- **Sales Update** is used to ensure that all the databases related to the sales department of the firm are updated so that the next occurring transactions which occur can take place smoothly. For example, when a product is sold to a customer, the firm may update its databases related to its inventory.

VI. Updating of Databases

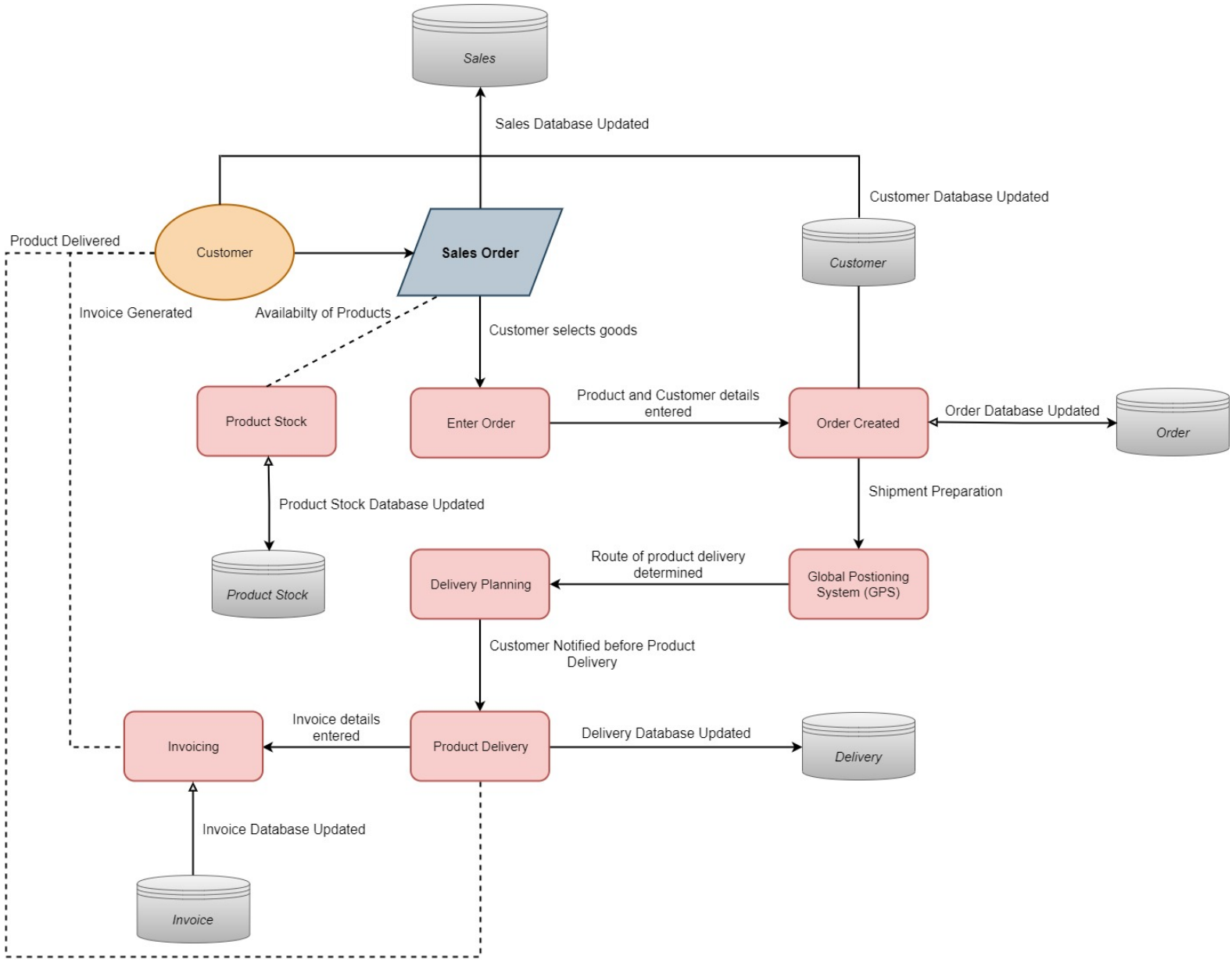


Figure 2: - Updating of Databases

The customer firstly chooses a product of his/her choice, and after selecting the product, an order is created. Before creating an order, the firm needs to ensure if the product has enough amount of inventory. If the product has enough inventory, then the firm proceeds with creating the order. This leads to the updating of the **Product Stock Database** because when the customer selects the product, there is a reduction in the quantity of the product chosen by the customer.

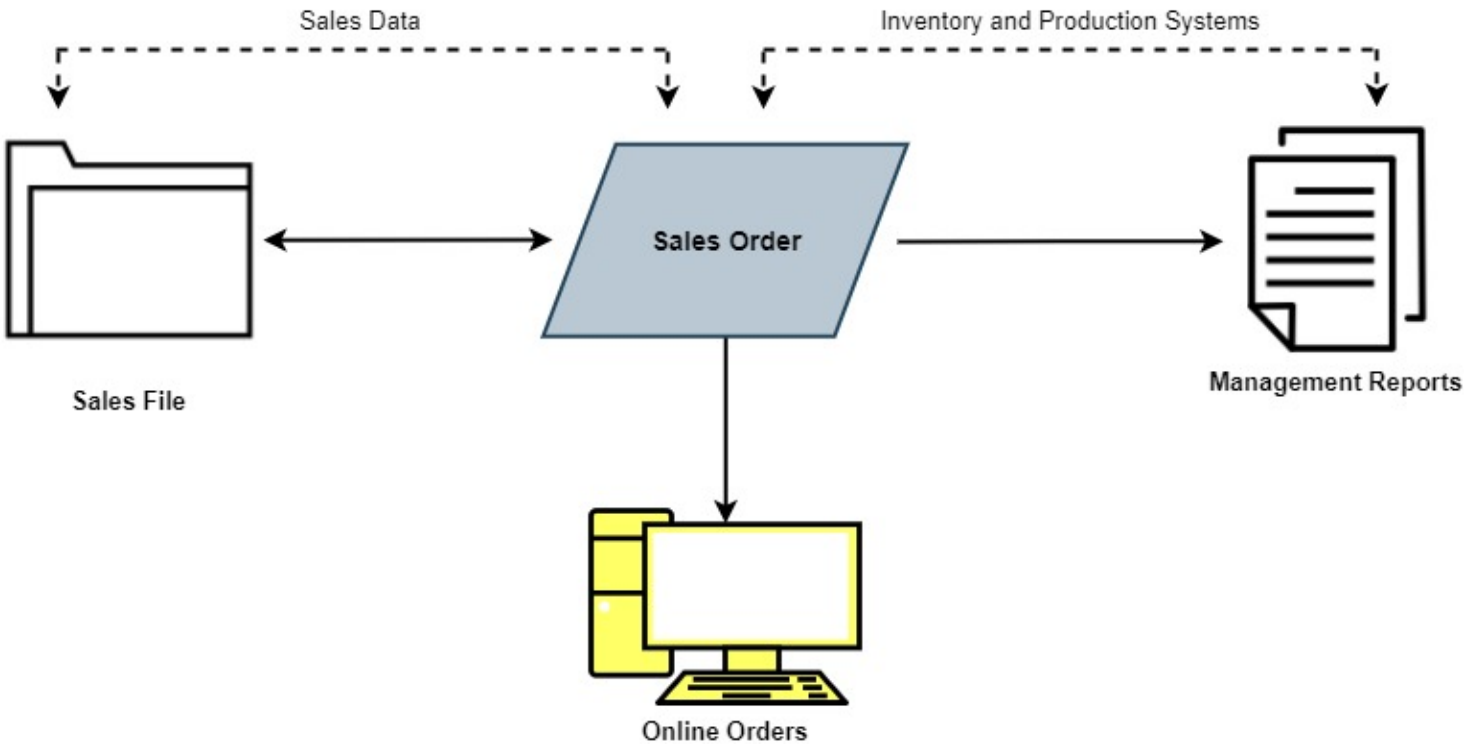
Once the customer selects the product, the **Customer Database** and the **Order Database** is updated as customer details such as Customer Name, Phone Number, and order details such as Order ID, Description respectively are taken into account while creating the order.

Once the order is entered, the ordered product is then prepared for shipment by the courier with the help of the Global Positioning System (GPS), which is used to find out the exact location of the customer to whom the product is being delivered. Before the product is to be delivered, the customer is notified through a phone call and SMS, after which the product is delivered to the customer. This leads to the updating of the **Delivery Database**, wherein the status of delivery is updated. In case the product delivery is canceled, the customer is refunded the amount which he/she had paid earlier.

When the product is delivered, an invoice is created which contains a unique Invoice ID, Description of the product, the total amount owed by the customer, etc. This leads to an update in the **Invoice Database,** wherein the Invoice Date and the Customer ID are taken into account.

Once the product is delivered, and the invoice is generated, the **Sales Database** is updated and is the main database of the firm. This database consists of all information related to the sale of various products. It includes details such as Order Number, Quantity Sold, Product Price, etc. All the databases (Product Stock Database, Customer Database, Order Database, Delivery Database, Invoice Database) are connected to this database. This process keeps on going when a product is sold to the next customer.

VII. Description of Transaction Processing Systems



Sales File Elements: -

- Item Code
- Unit Price
- Total Sales
- Description
- Quantity Sold
- Date

TeleMobile- Sales Report- as at 31st March 2019

Item Code	Description	Unit Price	Quantity Sold	Total Sales
I100	Smartphone- Model No: - T3	300.00	1000	£300,000
I101	Smartphone- Model No: - T5	350.00	2000	£700,000
I102	Smartphone- Model No: - T7	400.00	4000	£1,600,000

Total Sales made by TeleMobile for the year 2018-19 = £2,600,000

Figure 3: - Interface of TPS

A **Transaction Processing System (TPS)** is defined as an Information Processing System involving the collection, modification, and retrieval of all transaction data. Performance, Reliability, and Consistency are the characteristics that define a TPS. (Techopedia.com, n.d.)

The given figure illustrates a **Transaction Processing System (TPS) in a Management Information System (MIS)**. The main concept behind the implementation of a TPS is to ensure that the transaction is processed as soon as the order is initiated and that the decisions taken by managers are routine. When a customer places an order for a product, all the queries are organized in a separate back-end referred to as the **Online Orders**. This page is used to determine the status of the order and when it is expected to be delivered to the customer. This back-end can also be used to update the status of the order in a situation that the customer has decided to cancel his/her order.

A **Sales File** is created consisting of various elements such as Item Code, Description, Unit Price, and is a record of all transactions of products sold by the firm every year. This file is used to determine the amount of sales made on the sale of a product. When a product is sold, the Sales File is updated at the end of every month.

Based on the Sales File, **Management Reports** are created out of the products sold by the firm. These reports are useful in determining how is the performance of the management of the firm and to make the best decision affecting its long-term growth. Some types of Management Reports include Sales Report, Cash Flows, Profit Loss, and Balance Sheet. A **Sales Report** is taken as an example for a Management Report, which consists of products manufactured and its sales made by the firm for the year 2018-19. The Total Sales is calculated by multiplying Unit Price into Quantity (Unit Price x Quantity).

VIII. Graphical User Interface of Sales Order Form

TeleMobile

TeleMobile

Sales Order Form

Order Number: -

Date: - **Due Date: -**

Salesperson Name: - **Salesperson ID: -**

Customer ID: -

Customer Name: -

Phone Number: -

Shipping Address: -

S. No	Item Code	Description	Quantity	Price (in £)
1				
2				
3				

Subtotal: -

Amount Including Tax: -

Discount: -

Shipping Charges: -

Grand Total: -

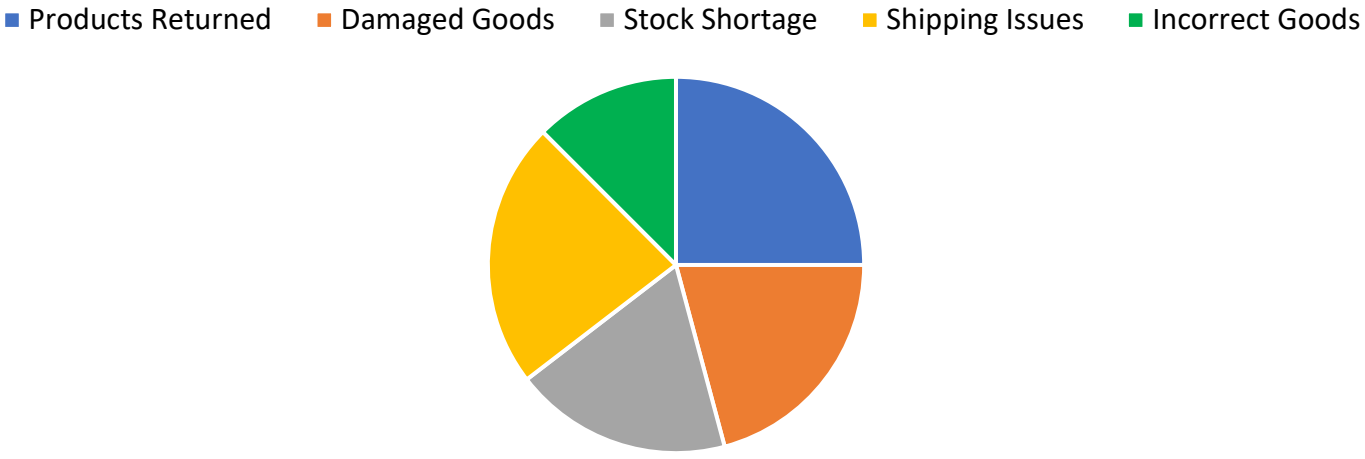
Mode of Payment: - Cash Credit

Figure 4: - GUI of Sales Order Form

IX. Generation of Management Information Systems Reports

i. Drill Down Report

TeleMobile- Sales Drill Down Report
as at 31st March 2019



TeleMobile- Products Returned

Date	Item Code	Shipping Charges	Region	Method	Total Amount
12/05/2018	I100	£3	London	Standard	£1,400
15/08/2018	I101	£3	Liverpool	Priority	£1,350
22/01/2019	I102	£3	Manchester	2-Day	£800

Total Products Returned= 12

TeleMobile- Damaged Products

Date	Item Code	Shipping Charges	Region	Method	Total Amount
01/05/2018	I102	£3	Oxford	Standard	£1,100
25/11/2018	I101	£3	Edinburgh	Standard	£1,000
30/01/2019	I100	£3	Cardiff	2-Day	£900

Total Damaged Products= 10

Figure 5: - Example of Drill Down Report

ii. Exception Report

TeleMobile- Daily Sales Exception Report- as at 31st March 2019

Date	Order Number	Salesperson ID	Expected Delivery Date	Region	Total Amount
11/07/2018	OR300	S100	12/07/2018	London	£300
15/08/2018	OR410	S110	15/08/2018	Liverpool	£450
22/10/2018	OR475	S105	25/08/2018	Manchester	£475
01/12/2018	OR580	S110	02/12/2018	Leicester	£290
31/01/2019	OR600	S103	1/02/2019	Birmingham	£280

Total Products Returned= 12

Figure 6: - Example of an Exception Report

A **Management Information System (MIS)** is defined as a computer-based information system that provides managers with the means to organize, analyze, and effectively supervise all departments of the organization (Beal, n.d.). As a business grows in size, the management of information, and the decisions based on such data get more complicated. MIS helps in organizing such information, such that decision making becomes more accessible from low-level decisions to strategic plans made at the top level of management (Toppr-guides, n.d.). The two reports taken in this example are: - **Drill Down Report and Exception Report.**

A Drill Down Report is defined as the report that is used to review information in a more detailed manner, principally in a database, to get a more comprehensive record (Yourdictionary.com, n.d.). The given example describes the Sales Drill Down Report wherein various concerns related to the delivery of goods are taken into account. Based on this report, the Management can look into detail how many products were affected by different concerns and how these concerns can be minimized in the future by the Management.

An **Exception Report** is defined as the report that identifies those occurrences wherein the actual performance is divergent, particularly from expectations, usually in an unfavorable direction. The primary purpose of this report is to gain the management's attention around those operations that require prompt response (Bragg, 2018). In the given example, the Sales Exception Report identifies the products that were expected to be delivered on a particular date and which salesperson had initiated the sale of the product. With the help of this report, the Management minimizes the number of errors committed by them currently as well as avoid the number of errors that could be made by them in the future.

Task 2: - Data Flow Diagram

I. Definition of Process Modelling

Business Process Modeling, also referred to as **Process Modeling**, is the graphical representation or outline of the business processes of an organization. (Stuart and Rouse, 2012). Process Modeling is widely viewed as a vital element in successful Business Process Management (BPM) by outlining an organization's current processes to create a baseline for improving processes and designing future processes with the improvements taken into account. Process Modeling often uses Business Process Modeling Notation (BPMN), a standard method of outlining processes with flowchart-like diagrams that both IT and Business Managers can understand (Stuart and Rouse, 2012).

II. Hierarchies/Levels of Data Flow Diagrams

A **Data Flow Diagram** (**DFD**) is defined as the characterization of the flow of data with the help of an Information System (Hope, 2017). It illustrates how information is to be inputted to and outputted from the system, sources of information, and where its storage takes place (Hope, 2017).

The Hierarchies/Levels of Data Flow Diagrams are: -

- **Level 0 DFD: - A Level 0 DFD**, also known as **Context Diagram**, are diagrams that provide a general outline of the system and how it interacts with its external entities. (Cs.uct.ac.za, n.d.)

- **Level 1 DFD: - Level 1 DFDs** provides a broader outline of the system than context diagrams. It shows the main sub-processes and storage of data representing the entire system. (Cs.uct.ac.za, n.d.)

- **Level 2 DFD: -** A **Level 2 DFD** represents a Level 1 DFD, which is further broken into detailed subprocesses. Some components of a DFD can be broken down into a more detailed model that is a level lower in the hierarchy. (Cs.uct.ac.za, n.d.)

III. Level 0 DFD

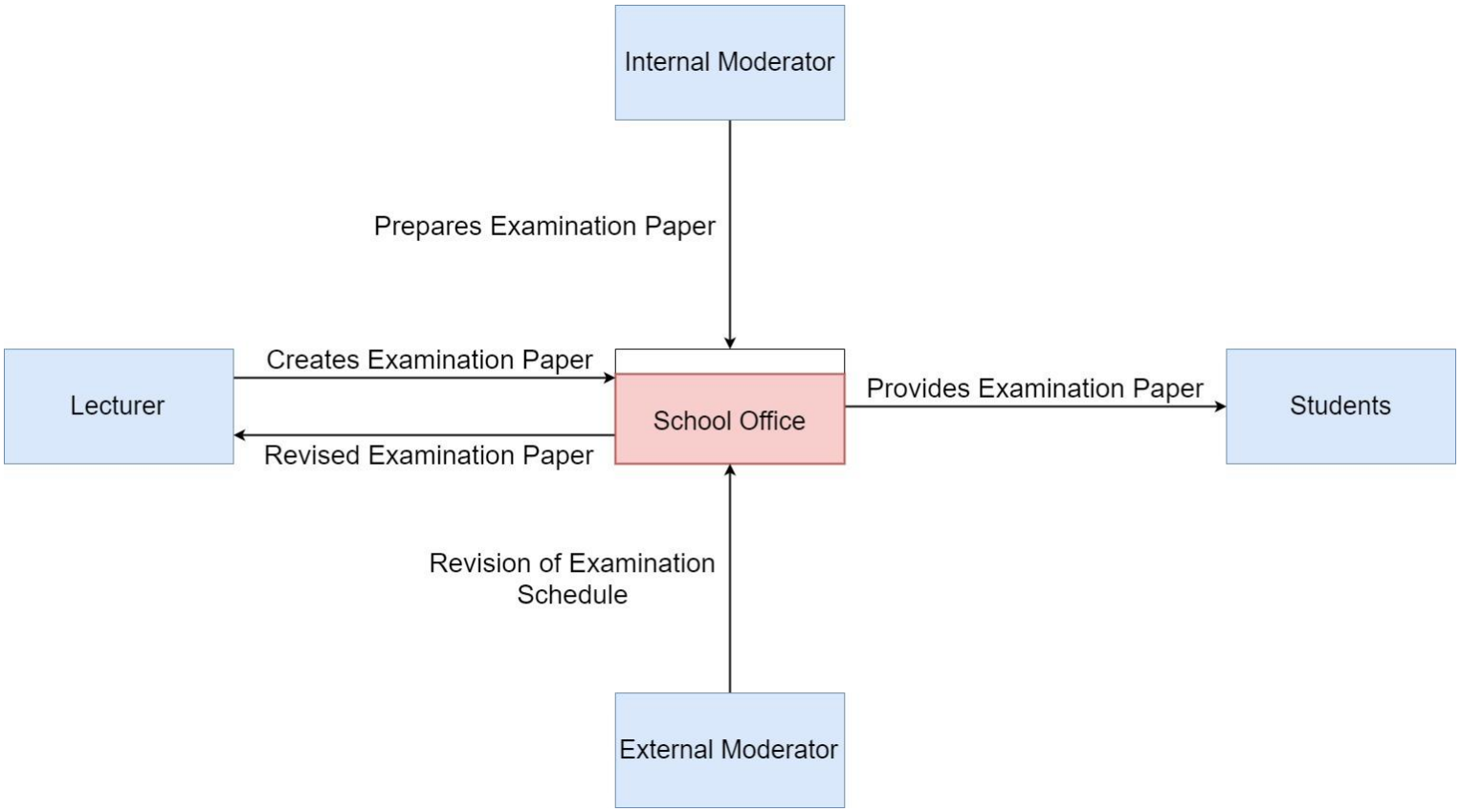


Figure 7: - Level 0 DFD

IV. Level 1 DFD

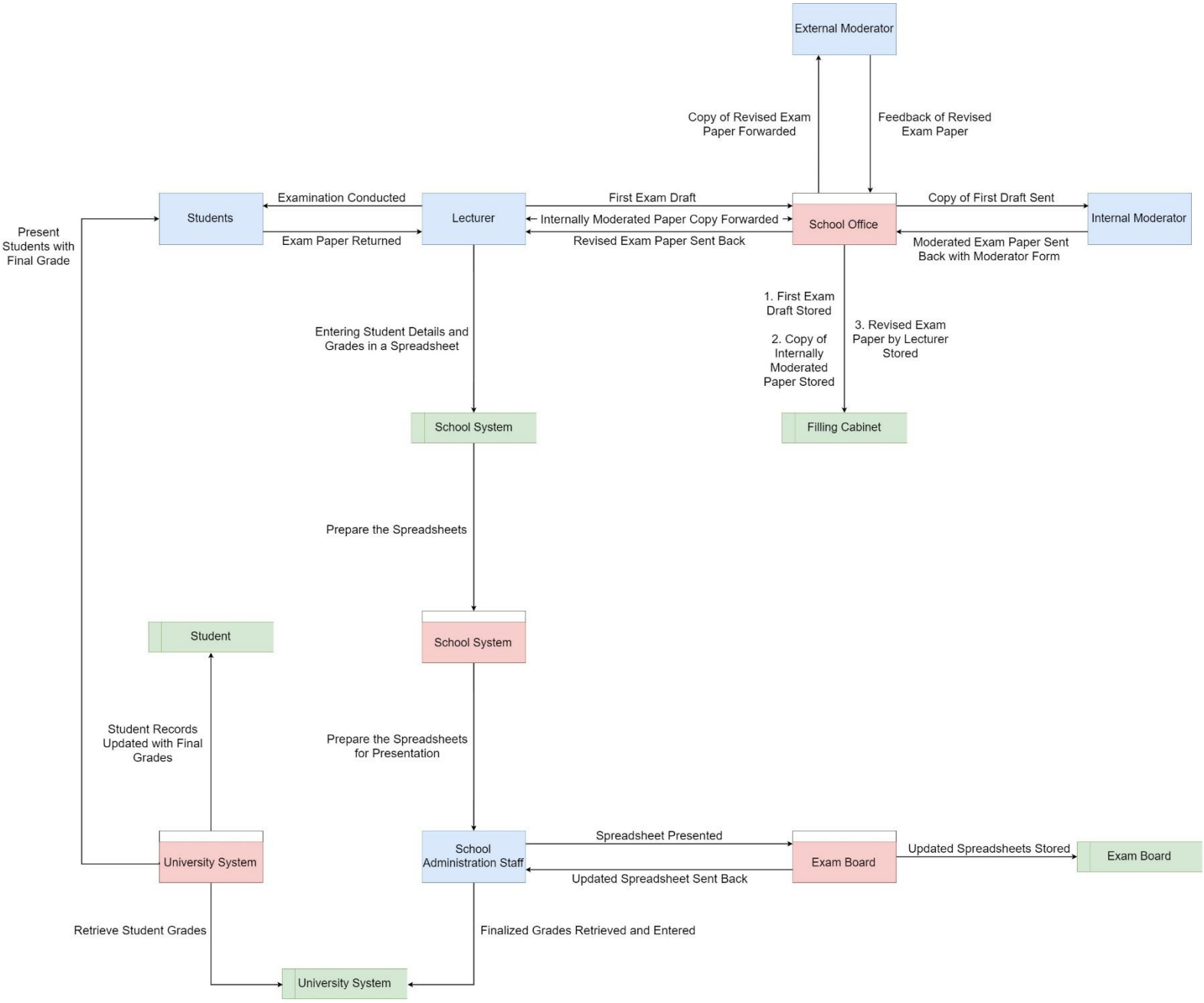


Figure 8: - Level 1 DFD

V. Level 2 DFD

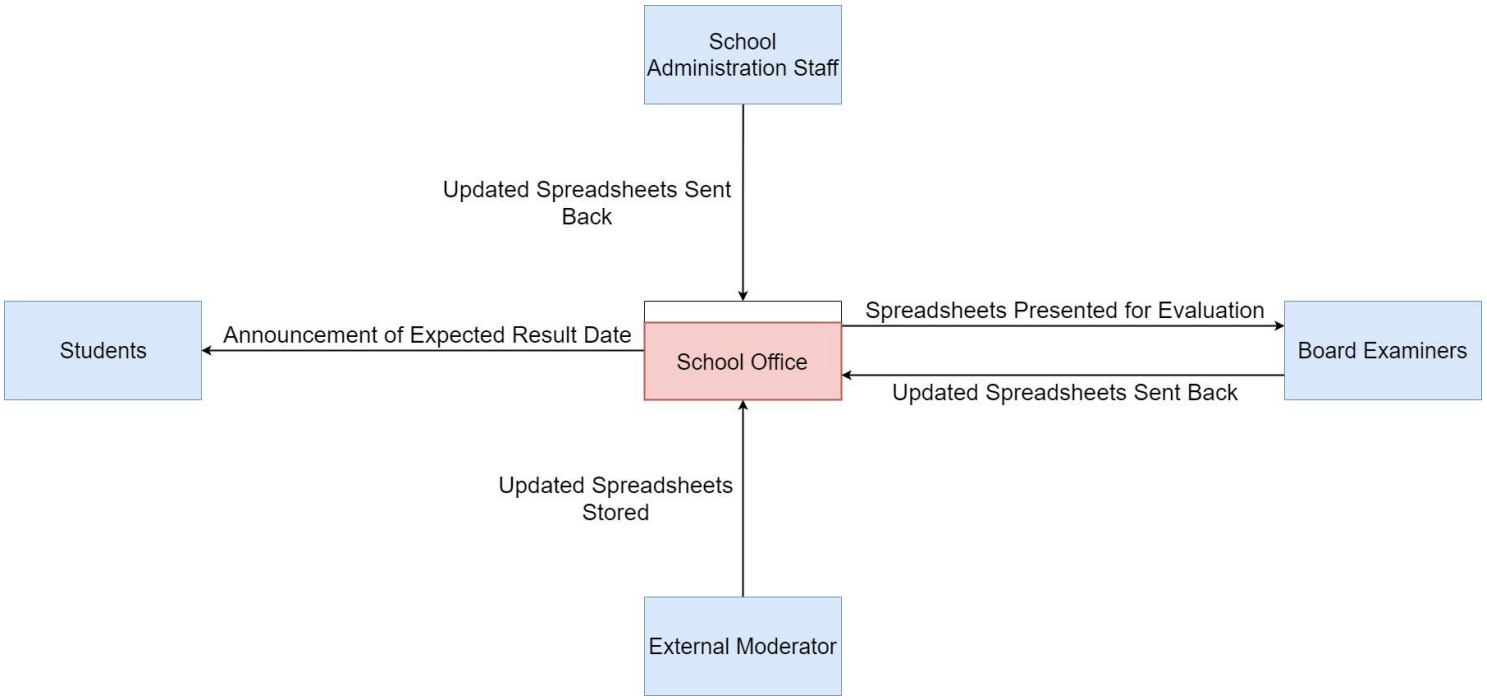
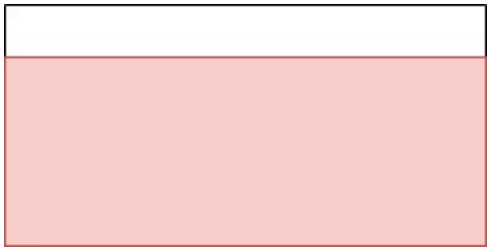


Figure 9: - Level 2 DFD

VI. Key for Symbols in Data Flow Diagram

- **External Entity: -**

- **Process: -**



- **Data Store/Storage: -**

- **Data Flow: -**

Figure 10: - Key for Symbols in DFD

Task 3: - Entity Relationship Diagram

I. Definitions

- **Data Modeling: -** Data Modelling is defined as the representation of the data structures in a table for the database of a company and is a potent expression of the company's business requirements. Functional and Technical analysts use this data model in the creation and implementation of a database. (Techopedia.com, n.d.)

- **Schematic Models: -** A Schematic Model is defined as a diagram representing the elements of a process, or system by using consistent symbols and lines. Schematic diagrams are useful in illustrating the main parts of a complex business model and presenting how they all relate together. For example, a marketing plan may have various elements, such as strategy, objectives, and an action plan. With the help of a schematic diagram, all elements are organized, as well as elements within each category, such that the main ideas are conveyed clearly and briefly. (Lim, 2019)

- **Entity Relationship Diagram: -** An Entity Relationship Diagram is defined as a Data Modelling Technique that outlines the entities of an Information System and relationships between the entities. An ERD is a visionary and depictive data model representing entity framework infrastructure. (Techopedia.com, n.d.)

II. Versions of the Entity Relationship Diagram

i. Many to Many Relationships

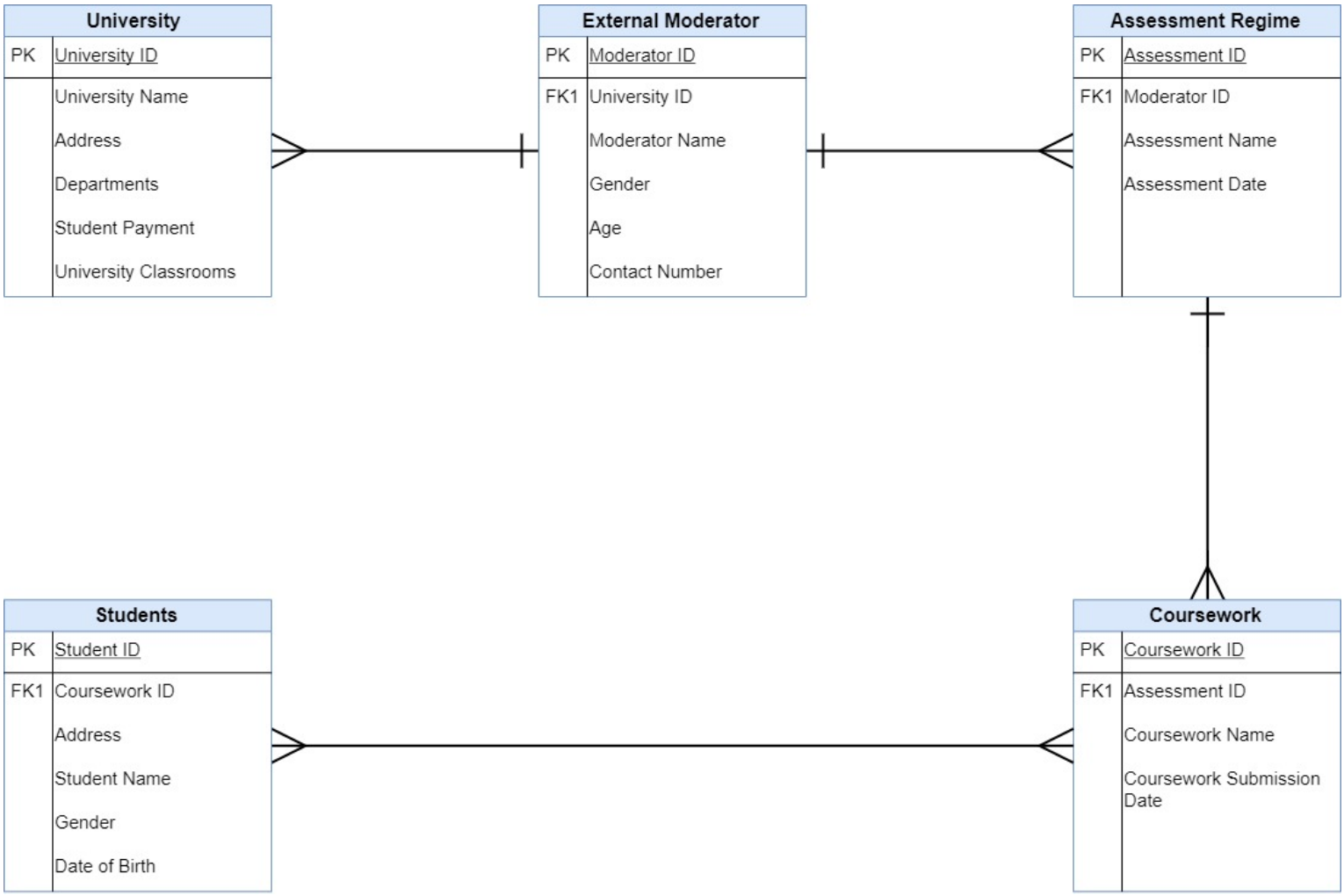


Figure 11: - ERD of Many to Many Relationships

ii. Many to Many Relationships resolved via Link Entities

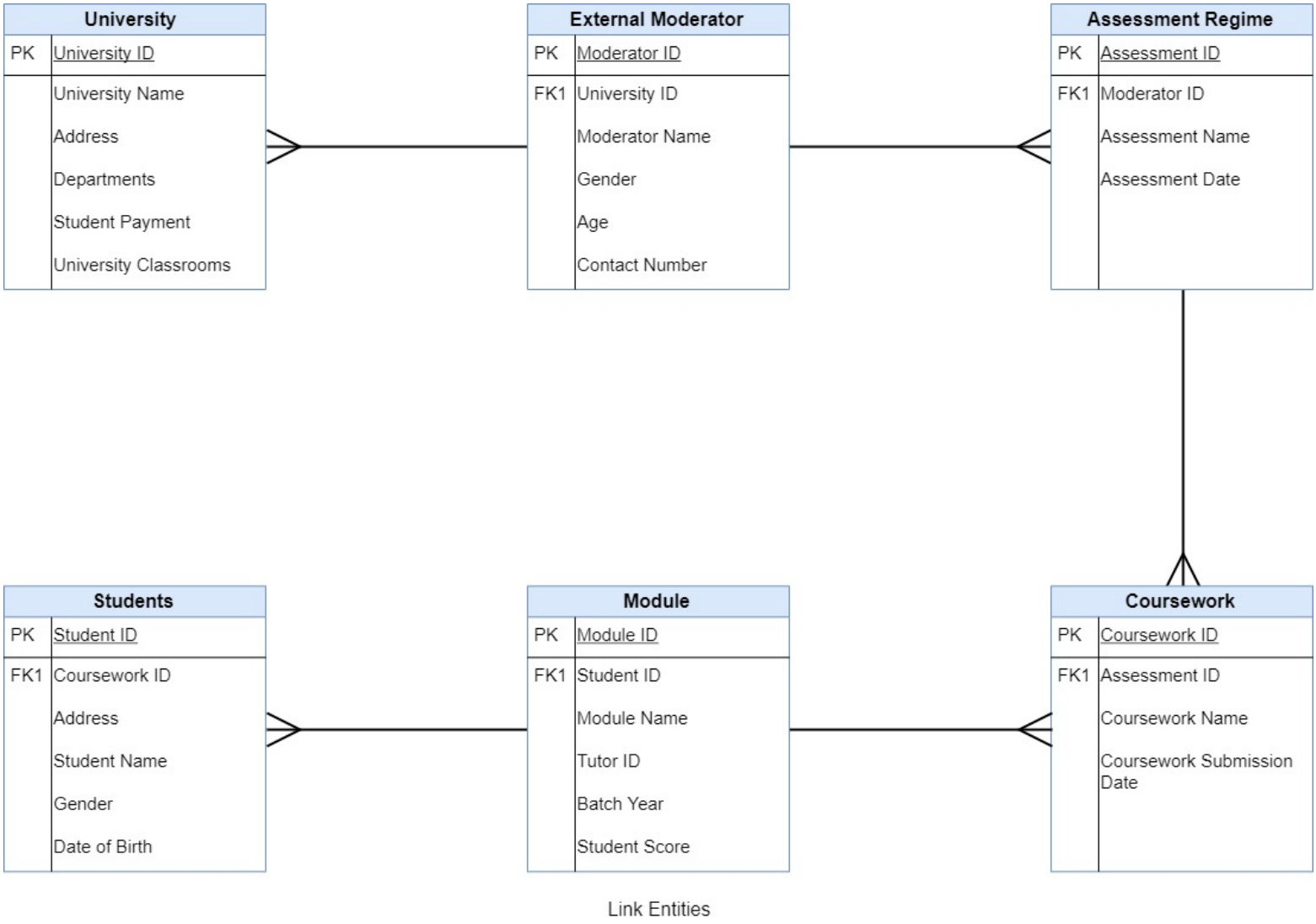
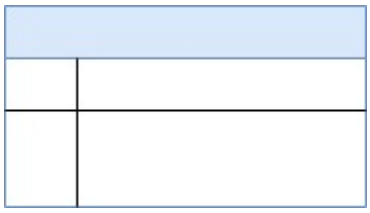


Figure 12: - ERD for Many to Many Relationships resolved via Link Entities

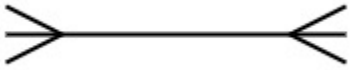
III. Key for Symbols in Entity Relationship Diagram

- **Entity: -**

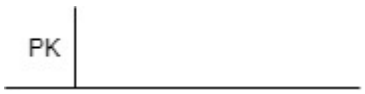


- **One to Many: -**

- **Many to Many: -**



- **Primary Key: -**



- **Foreign Key: -**

Figure 13: - Key for Symbols in ERD

Task 4: - Human Resource Management Information Systems

I. Description of Management Information System

A **Computer-Based Management Information System (MIS)** is a database that contains information relevant to an organization. It is programmed to generate reports on operations for different levels of management in a company (Rhind, 1968). In (Rhind, 1968), it is mentioned that computer-based MIS can aid in the three levels of management, which are Strategical, Tactical, and Operational. According to (Sharma, n.d.) using financial information, management information systems can generate many different types of reports which can be useful to the strategic level management, tactical level as well as operational level, this includes various types of reports such as Sales Report, Production reports, Cash Flow statements, Machine Usage reports, etc. (Sharma, n.d.) explains that Sales reports are produced to demonstrate how a company is performing in its sales figures, it can show the performance in different geographical areas in which the company has chosen to sell its products, and its analysis is based on sales budgeted (a financial plan which shows how resources should be allocated) and actual sales figures this is also known as sales variance (Dictionary.cambridge.org, 2020). A sales variance can aid a business in understanding market conditions. A production report is like a sales report in that it is meant to compare organizational production targets (or budgeted production) with actual production figures (Sharma, n.d.).

A Management Information Systems can be used to produce cash flow statements; this report highlights the cash inflows and cash outflows of a business during a period of operations, (Sharma, n.d.) explains that it can allow management to track spending of a business and revenue streams. A machine usage report according (Sharma, n.d.) can inform operations level management of the usage of machinery from the manufacturing division. These reports can be detailed and provide the duration of machine usage and the distinct usage for which the machine has been operating; it also shows the time the device was idle (not running).

Management Information Systems are essential to businesses and can aid in several different ways to a company, the reports as mentioned earlier are just some of the capabilities of management information systems, proving that modern businesses require such MIS's to help a business meet its strategic, tactical and operational objectives.

II. Description of Human Resource as a Functional Department and its Explanation

Human resource management refers to the act of undertaking the responsibility of employees in an organization; this includes a variety of tasks such as providing training to employees, managing their employment details, helping with issues amongst other co-workers as well as employment termination and recruitment (Boon, Den Hartog, and Lepak, 2019). Environmental analysis is one of the critical operations of Human Resources as it examines components of the business (internal and external) that have an impact on the performance of a company and whether or not these goals are achievable with the applied strategies. (Buzkan, 2016) discusses how the Human Resources department can be vital for organizations and can allow the business to run their operations in a manner that helps them achieve objectives. In (Nagendra and Deshpande, 2014), it is implied that HR can also use the information systems to compare the organization with its competitors to remain vying.

Modern Human Resource Management has included the use of Information systems; this system can provide a structure to the information used in HRM (Buzkan, 2016). (Nagendra and Deshpande, 2014) tells us Human Resource Management Information Systems (HRMIS/HRIS) will store, process, and manage essential employee data. This data can include employee name, address, National IDs, Visa information as well as information in regards to an employee work permit. Human Resource Management Information systems work with sensitive data; therefore, this data must be used securely and effectively used. HRMIS uses this data to find trends, evaluate and manage costs for the business (Buzkan, 2016). HR can also use the information systems to compare the organization with its competitors to remain vying.

III. Objective of HRMIS

HRMIS can improve the interaction of the data and processes for generating reports (Nagendra and Deshpande, 2014). (Nagendra and Deshpande, 2014) talks about the critical roles of human resources information systems, which aim to help businesses with HR planning, HR Training, and Development functions.

HRMIS can support the business in the decision-making process through interactions with processing systems, decision support systems, and communication systems (Nagendra and Deshpande, 2014). HRMIS is used for strategic tactical and operational management as HR works to improve these levels of management (Nagendra and Deshpande, 2014).

IV. Management Decisions supporting HRMIS

Modern HRMIS manages data such as an employee's payroll, leave, travel, expense (to the company), attendance, and skills catalog, the HRMIS can analyze this data, with the use of metrics and information processing this can be used in HR planning to make decisions. As previously mentioned in (Nagendra and Deshpande, 2014), HRIS impacts the three levels of management. Operational management is provided data that supports routine human resource decisions; this can include tasks such as applicant selection

and placement, performance analysis, as well as updating employee records and details. HRMIS is also used in tactical management, as it can aid in making decisions; this includes recruitment decisions, job analysis, training, and compensation plans for employees whose contracts have been terminated. Job analysis entails correctly identifying the skills, experience, and knowledge needed for a specific job as well as the tasks which need to be accomplished (Dictionary.cambridge.org, 2020). HR information systems are capable of using raw data and processing it into information to help make such decisions, as these information systems analyses current job positions and the employees in those positions it can support management in making appropriate decisions. Job analysis can also help management in understanding the potential required training for new employees, also known as succession planning (Nagendra and Deshpande, 2014). (Buzkan, 2016) discusses how these information systems can also calculate benefits and compensations for employees who are leaving the company, either through retirement, contract termination, and or leaving on their merit. Strategic level of management is supported through HRMIS informing the top level of management on how to remain competitive, by setting organizational objectives, these can come from within the business or externally. When a company has achieved its operational and tactical goals, it is on its way to achieving its strategic goals. HRMIS can help a business remain competitive as it protects an organization's most valued assets, in turn, it can also inform a company when the asset becomes less valuable and potentially a liability to the business (Buzkan, 2016).

V. Sources of Data input to HRMIS

As mentioned, human resource information systems interact with many parts of business due to the responsibility of the department — information put into the HRMIS database is taken from multiple sources. Human resources information systems database acts as a repository; it takes internal sources of information from subsystems, these can include data processing subsystems, accounting based subsystems, and research-based information systems (Ghosh, 2019). (Ghosh, 2019) further explains that the HRMIS database can also use environmental sources such as the human resources intelligence subsystem (which collects stakeholder data for a company). The data from these subsystems fed into an HRMIS database, which can then provide data for subsystems that process this data and produce reports as an output (Buzkan, 2016). These processing subsystems generate reports for management; these reports include workforce planning subsystem, recruiting subsystem, workforce management subsystem, compensations/benefits, and environmental reporting subsystem (Ghosh, 2019).

VI. Types of Data input to HRMIS

The types of data in HRMIS can vary as different subsystems produce different kinds of reports. Each system appropriately extracts data types from the HRMIS database; data types include employment details, dates absence, dates on leave, time employed, performance metrics, earnings, etc.

VII. Outputs produced by HRMIS

The Outputs are reports generated for management to make decisions; the below diagram illustrates how HRMIS subsystems work.

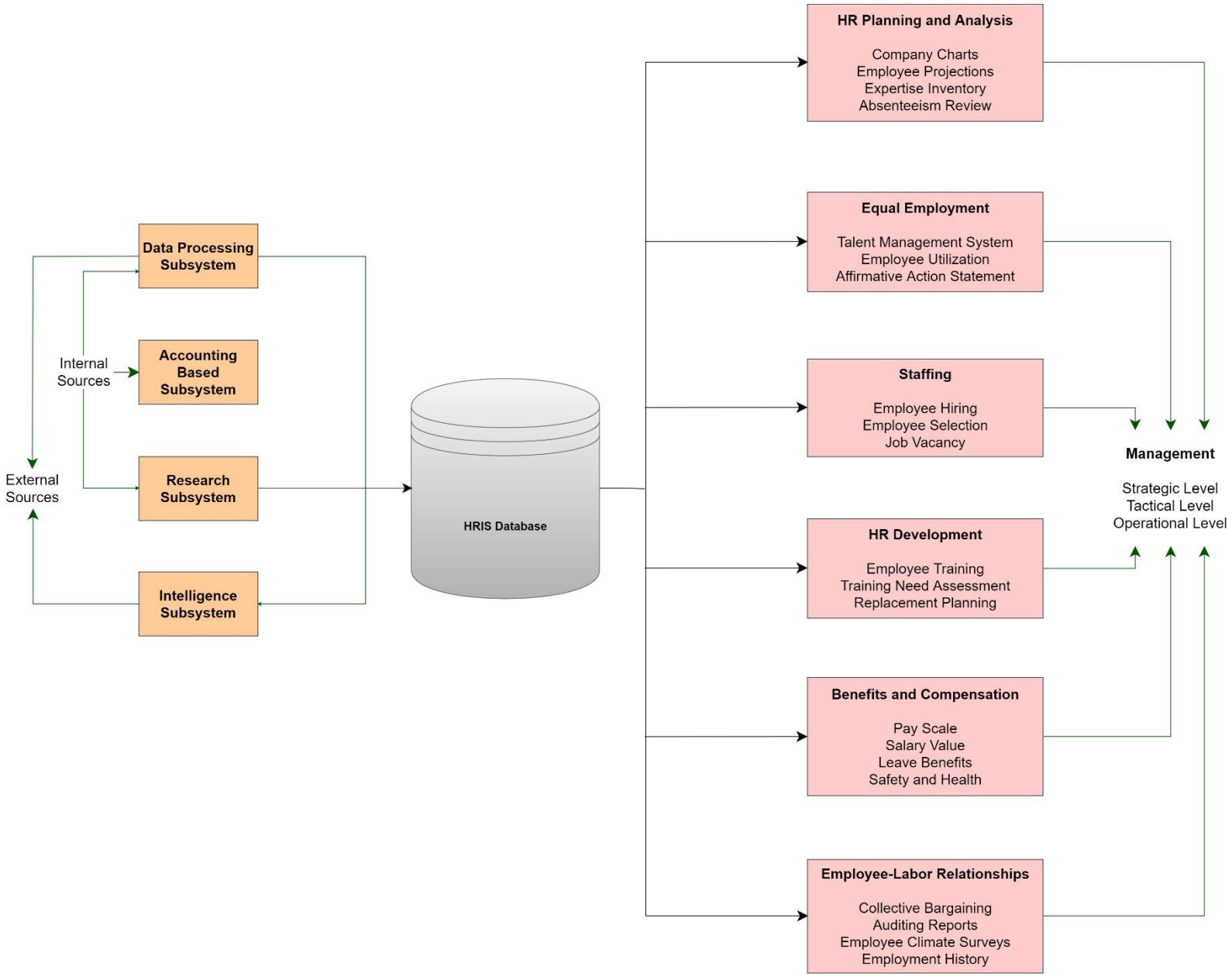


Figure 14: - Outputs produced by HRMIS

Conclusion

To conclude this coursework, it is essential to understand all that has been discussed. Information Systems and their practices are quite critical in businesses. The usage of MIS, TPS, DSS, HRMIS are all designed to reduce the cost for a business, maintain order, and overall enhance efficiency. The standard practices of information systems are also vital in understanding how specific processes work, how data flows in a business, and how particular entities are related. Demonstrating how sales processing works, how it interacts with systems such as TPS, and what reports are produced is informing in a way that it explains how something as simple as sales processing can have a convoluted method of behaving. Information Systems practices such as Data Flow Diagrams and Entity-Relationship Diagrams allow semi-complex processes to be understood clearly and effectively provides for core functions to be put ahead. The importance of an excellent human resource department is vital for a business; the need for a Human Resources Management Information System is equally essential as it can help a company achieve its strategic, tactical, and operational targets. Information systems and their practices allow businesses to remain orderly, efficient, and effective in a competing industry.

References

Beal, V. (n.d.). *What is MIS - Management Information System? Webopedia Definition*. [online] Webopedia.com. Available at: https://www.webopedia.com/TERM/M/MIS.html [Accessed 10 Jan. 2020].

Boon, C., Den Hartog, D. and Lepak, D. (2019). A Systematic Review of Human Resource Management Systems and Their Measurement. *Journal of Management*, 45(6), pp.2498-2537.

Bragg, S. (2018). *Exception report — AccountingTools*. [online] AccountingTools. Available at: https://www.accountingtools.com/articles/2017/5/6/exception-report [Accessed 10 Jan. 2020].

Buzkan, H. (2016). The Role of Human Resource Information System (HRIS) in Organizations: A Review of Literature. *Academic Journal of Interdisciplinary Studies*.

Cs.uct.ac.za. (n.d.). *Chapter 6: - Data Flow Diagram*. [online] Available at: https://www.cs.uct.ac.za/mit_notes/software/pdfs/Chp06.pdf [Accessed 7 Jan. 2020].

Dictionary.cambridge.org. (2020). *Cambridge Dictionary | English Dictionary, Translations & Thesaurus*. [online] Available at: https://dictionary.cambridge.org/ [Accessed 7 Jan. 2020].

Dictionary.cambridge.org. (n.d.). *DATA | meaning in the Cambridge English Dictionary*. [online] Available at: https://dictionary.cambridge.org/dictionary/english/data [Accessed 7 Jan. 2020].

Ghosh, P. (2019). *What Is HRIS? System, Model, and Application*. [online] Hrtechnologist.com. Available at: https://www.hrtechnologist.com/articles/performance-management-hcm/what-is-hris/ [Accessed 9 Jan. 2020].

Hope, C. (2017). *What is a Data Flow Diagram?*. [online] Computerhope.com. Available at: https://www.computerhope.com/jargon/d/data-flow-diagram.htm [Accessed 10 Jan. 2020].

Hope, C. (n.d.). *What is a Process?*. [online] Computerhope.com. Available at: https://www.computerhope.com/jargon/p/process.htm [Accessed 7 Jan. 2020].

Lim, A. (2019). *What Is a Schematic Diagram?*. [online] ThoughtCo. Available at: https://www.thoughtco.com/what-is-a-schematic-diagram-4584811 [Accessed 7 Jan. 2020].

Nagendra, A. and Deshpande, M., 2014. Human Resource Information Systems (HRIS) in HR planning and development in mid to large-sized organizations. *Procedia-Social and Behavioral Sciences*, *133*, pp.61-67.

Rhind, R. (1968). Management information systems. *Business Horizons*, 11(3), pp.37-46.

Sharma, P. (n.d.). *Top 14 Management Information System (MIS) Reports*. [online] Your Article Library. Available at: http://www.yourarticlelibrary.com/management/information-system/top-14-management-information-system-mis-reports/70214 [Accessed 6 Jan. 2020].

Stuart, A. and Rouse, M. (2012). *What is business process modeling? - Definition from WhatIs.com*. [online] WhatIs.com. Available at: https://whatis.techtarget.com/definition/business-process-modeling [Accessed 10 Jan. 2020].

Techopedia.com. (n.d.). *What is a Transaction Process System (TPS)? - Definition from Techopedia*. [online] Available at: https://www.techopedia.com/definition/707/transaction-process-system-tps [Accessed 10 Jan. 2020].

Techopedia.com. (n.d.). *What is an Entity-Relationship Diagram (ERD)? - Definition from Techopedia*. [online] Available at: https://www.techopedia.com/definition/1200/entity-relationship-diagram-erd [Accessed 7 Jan. 2020].

Techopedia.com. (n.d.). *What is Data Modeling? - Definition from Techopedia*. [online] Available at: https://www.techopedia.com/definition/14/data-modeling [Accessed 6 Jan. 2020].

Techopedia.com. (n.d.). *What is Storage? - Definition from Techopedia*. [online] Available at: https://www.techopedia.com/definition/1115/storage [Accessed 7 Jan. 2020].

Thakur, D. (n.d.). *What is the Difference between Data and Information ?*. [online] Ecomputernotes.com. Available at: http://ecomputernotes.com/fundamental/information-technology/what-do-you-mean-by-data-and-information [Accessed 7 Jan. 2020].

TheFreeDictionary.com. (n.d.). *Feedbacks*. [online] Available at: https://www.thefreedictionary.com/feedbacks [Accessed 7 Jan. 2020].

Toppr-guides. (n.d.). *Management Information Systems (MIS) & Accounting Information System*. [online] Available at: https://www.toppr.com/guides/accountancy/application-of-computers-in-accounting/management-information-systems-and-accounting-information-system/ [Accessed 10 Jan. 2020].

Wilkinson, J. (2013). *Sales Order Definition | Sales Order Example • The Strategic CFO*. [online] The Strategic CFO. Available at: https://strategiccfo.com/sales-order/ [Accessed 10 Jan. 2020].

Yourdictionary.com. (n.d.). *Drill-down dictionary definition | drill-down defined*. [online] Available at: https://www.yourdictionary.com/drill-down [Accessed 10 Jan. 2020].