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Student Name: SALAJ SUBEDI

Group: C12

London Met ID:

College ID:

np01cp4s210311

Salaj_subedi.pdf

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I confirm that I understand my coursework needs to be submitted online via Google Classroom under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a marks of zero will be awarded.

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Question Number 1: What is an Information System? Write down your understandings. Give suitable examples where required.**1.1 Information system:**

Any organization wanting to function efficiently and in coordination requires a set of interconnected modules that carry out different goals and task to achieve a collective goal. For instance: in a business environment the production team can only produce goods efficiently and up-to the market standard when the research team in that org. provides information regarding the current market situation its needs and demands.

An integrated set of components for collection, storage, coordinated analysis, decision-making and processing raw data obtained through internal or external resources to deduce meaningful information.

1.2 Data processing model

It is the groundwork of all the components internal/external, tangible/intangible of an information system. (Namely Input-Processing-Storage-Output). Data processing model follows this general pattern to obtain data, store-process them and conclude them into meaningful information.

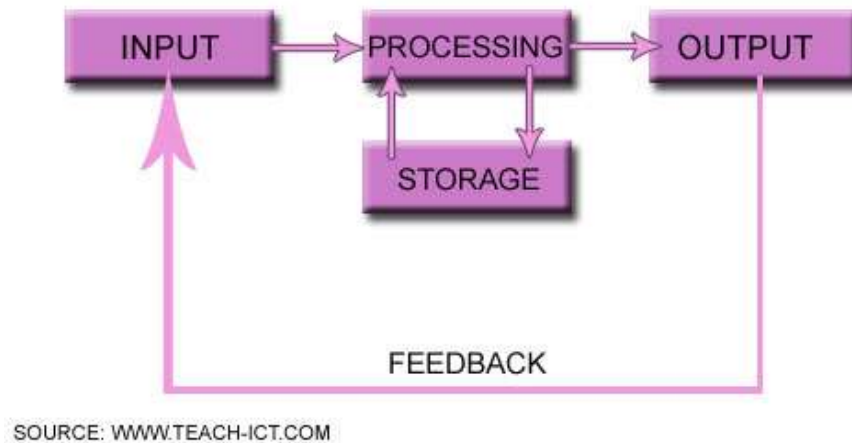


Figure 1: Data processing model

https://www.teach-ict.com/gcse_new/data_info_knowledge/input_process_output/miniweb/index.htm

1.2.1 Input:

The raw atomic data are-collected in various forms through various external/internal sources relative to certain context.

1.2.2 Processing & Storage:

The data collected is stored in raw form in various hardware or software components either in a physical place or over the cloud storage.

The act of deducing the collected and stored atomic data into some usable information through various internal and external (hardware/software) via computer intelligence or human brain.

1.2.3 Output:

The meaningful result obtained after data processing is output. It is ready to use data that is efficient to predict the upcoming situations and carry out tasks accordingly.

1.2.4 Feedback:

The Feedback is where the output of a system is fed back into the input of the system in order to influence the overall result.

1.3 Components of Information System:

Information System is the organization of integrated components. Through the appropriate coordination of these components, data is processed. There are mainly four components of information system that are responsible for data analysis and decision making. Namely: Data, Processes, People, Technology (lecture slides referenced).

1.3.1 DATA:

Data refers to any raw facts, figures, statistics, diagrams or any other raw material that do not carry any contextual meaning or relative information that is usable.

1.3.2 PROCESSES:

The raw data stored is processed i.e. aligned, formatted, filtered edited and many more using various methods to produce meaningful result. Processed output satisfies the need of an objective which is then followed by archiving that information in case it is required for future references.

1.3.3 PEOPLE:

People consist of the demographic group that mend the data into information using interconnected components of information system. They are the technical workers who are assigned to control the daily administrative tasks of the business. They are also the final consumers of the processed data who use them in different business scenarios to study about the business trends, situations and reach common objectives.

1.3.4 TECHNOLOGY:

Technology refers to any technological components within the information system. These generally include hardware and software components that aid in the process of data modelling, and equipment that possesses as the technical aspect of any company. These parts usually include hardware components such as hard-drives, CDs and different apps that allow to mend the data into desired results and archive them in online or offline storage such as cloud storages for future use.

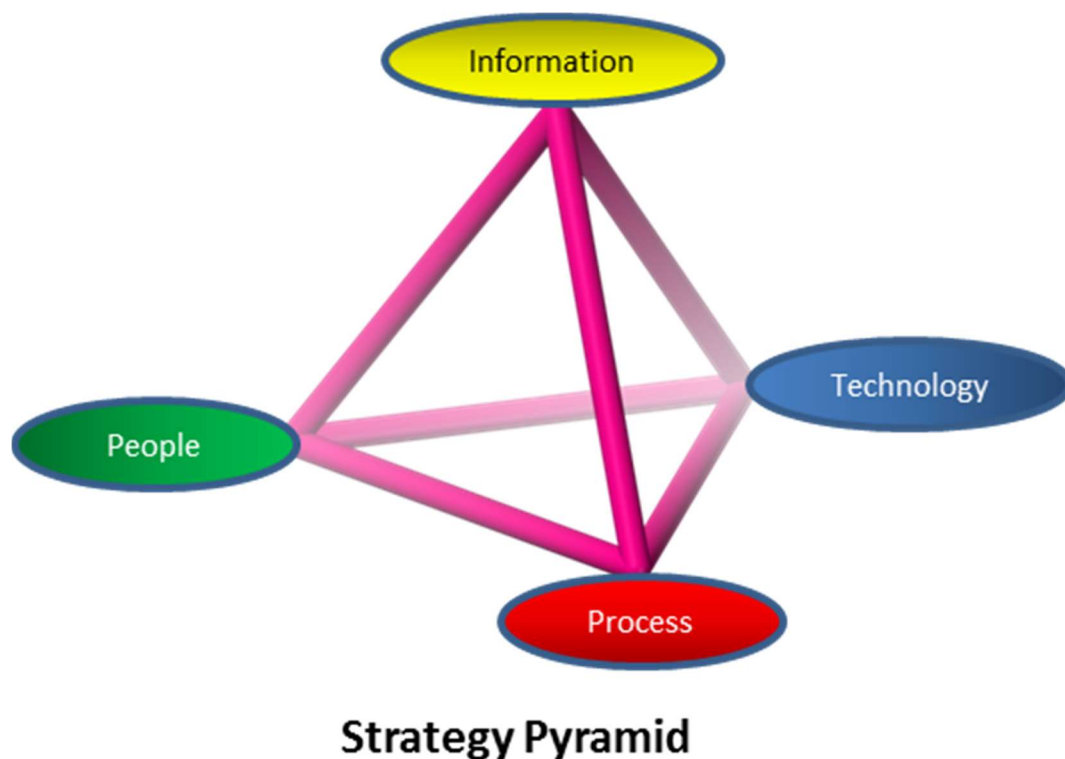


Figure 2: Components of information system

<https://resources.casknx.com/blog/2014/02/people-process-technology-and-information-the-four-components-of-a-successful-business-strategy>

1.4 Role of information system in a business environment

Businesses and other organizations hugely if not solely depend in Information system to run its daily tasks efficiently as it has many merits relating to aid businesses.

- It assists organizations to go head to head with different organizations in the commercial sectors by closing data in regards to the current market patterns and situations.
- The Information framework permits organizations to figure out their activities in a more compelling manner, as it doles out representatives in the firm they are undertaking, keeping away from complications.
- Information System assists an association to encounter their clients and providers and facilitate the exchange
- Information system acts as a doorway providing easy administration for a business to have a smooth and efficient functionality of different daily radical tasks towards a collective goal.
- It helps in storage and backup of data that a business might have collected through a period and might need it in the short or long runs.

Information System goes about as a scaffold between a customer and an association. From the metadata above we could presume that Information System is the core of an association and without its quality no advanced association could work appropriately as per its set objectives.

Question Number 2: What are databases? What is the role of database in an organization? Write down your understanding with suitable examples where required.

2.1 DATABASE:

Data is any context less value that provides strings of information when compiled and given context. For instance- library , 3 people , rainy day , these words doesn't mean anything because they don't have context in them but the same thing if I place it as ... it's a rainy day today so there are only 3 people in the library. This sentence gives a sensible meaning. This sentence can be called an information that is derived from the raw data as now the data have been given context, produces meaning.

Mainly we find data in two variants i.e. qualitative data that describe someone or something based on their feature, structure and so on e.g. The Earth is round, The cloud are black today and quantitative data that contains raw numeric value such as 1994, 1668, 9813255040, 243678 which without context give no sensible meaning. A database is an organized collection of structured information, or data, typically stored electronically in a computer system. A database is usually controlled by a database management system (DBMS). Together, the data and the DBMS, along with the applications that are associated with them, are referred as a database system, often shortened to just database. Related data are usually stored in a single database in tables containing rows and columns that give contextual meaning to it. For example : In any organization the data of customers and the data of administrative staff are not kept together hence, a separate database is created to maintain the records. .The modernization of databases has come a long way, from the earliest record keeping in stoned and carving records to writing them in paper and filling up cabinets to now storing, editing and deducing them in different structured applications such as MS.Excell, MS.Access and so on, data now can not only be written but also edited and displayed conveniently using different features in the application or by writing codes for it such as SQL codes .

2.2 REQUIREMENT AND APPLICABILITY.

Database is a dig for information and data. It gathers internal/external information of an organization to pre-plan, characterize arrangements and objectives continued by the execution of an essential arrangement for the further development of that organization. Database goes about as a backbone for the making of business rules through the definition of approaches which screens the functioning standard of an organization making greater profitability in the workforce. Databases can be used to keep confidential data safe without losing any of it. In contrast to days of yore, current databases are safer and private because of the digitalization of databases and execution of Database Management System (DBMS). It tracks the utilization of organization assets and screens its stream to ensure it is not misused. It discovers better approaches to diminish the expense through recognizing if there is an oversupply of organization assets in a particular division of the organization and the other way around. Database urges the organization to take client's criticism to check as to whether the organization is running according to its set objectives. Client criticism assists with improving the everyday work process of an association to accomplish its set target.

Application of DBMS

Table 1: application of DMBS

Sector	Use of DBMS
Banking	For customer information, account activities, payments, deposits, loans, etc.
Airlines	For reservations and schedule information.
Universities	For student information, course registrations, colleges and grades.
Telecommunication	It helps to keep call records, monthly bills, maintaining balances, etc.

Finance	For storing information about stock, sales, and purchases of financial instruments like stocks and bonds.
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Sales	Use for storing customer, product & sales information.
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Manufacturing	It is used for the management of supply chain and for tracking production of items. Inventories status in warehouses.
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HR Management	For information about employees, salaries, payroll, deduction, generation of pay-checks, etc.
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<https://www.guru99.com/what-is-dbms.html>

Database plays an indispensable role in keeping the flow of data to and from and within the organizations and its components, hence it is very much possible to say that the modern-world businesses and associations would not flourish and be modernized with time as like of today.

Question Number 3: Select an organization of your choice and design a database for it. Explain your database design:

The organization I choose to design a database for is an airport. This database shows the dataflow and interconnection of different entities within the airport system.

3.1 What is the database about?

The database is about ABC airport that contains details of how customers books tickets and flights for a particular airlines through a booking agent.

3.2 What each entity (table) represents

There are a total six tables that represents different entity of an airport system. Namely:

1. Customer table that represents customers that are the passengers for different flights.
2. Meeting table that represents the meetings scheduled between the customers and particular booking agent. This table acts as a bridge between customer and agent table.
3. Booking agent table represents agents who book tickets for customers for different flights. Agents in this table knows about different airlines.
4. Airline details table represents details of all the airlines in the airport.
5. Flight details table this table contains data of flights that occur via different airlines
6. Tickets this table represents details of different tickets in a particular flight.

3.3 What each attribute (column) represents? What kind data do they store?

i . **Customer id** : This column holds unique identifier for each customer and if or varchar data type.

ii. **name**: The column holds the information regarding name of customers. The column holds VARCHAR (string) data type.

- iii. **Address:** The address column in the table Customer holds the information on address of the customer. This column as well holds VARCHAR (string) data type.
- iv. **phone:** This column includes information regarding phone numbers of the customers. The column holds Integer data type.
- v. **meeting id:** This column includes a unique code for each meeting scheduled. It holds VARCHAR (string) data type.
- vi. **Agent id:** The agent id column in meeting table is referenced from the booking agent table. It holds VARCHAR (string) data type.
- vii. **Agent id:** The column in the table booking agent holds the information on the unique agent codes . This column also holds VARCHAR (string) data type.
- viii. **customer id:** The customer id column in booking agent table is referenced from the customer table. It holds VARCHAR (string) data type.
- ix. **name:** The column holds the information regarding name of booking agents. The column holds VARCHAR (string) data type.
- x. **email:** The emails of booking agents are entered here. The column holds VARCHAR (string) data type.
- xi. **Airline id:** This column holds a unique identifier for each airline.. The column holds VARCHAR (string) data type.
- xii. **Agent id:** The agent id column in meeting table is referenced from the booking agent table. It holds VARCHAR (string) data type.

xiii. **name**: The column holds the information regarding the name of airlines.
The column holds VARCHAR (string) data type.

xiv. **Flight id**: This column in the flight details table holds the unique identifier for each flights. The column holds VARCHAR (string) data type.

xv. **Airline id**: The airline id column in flight details table is referenced from the airline details table. It holds VARCHAR (string) data type.

xvi. **dep destination**: This column holds the destination for departure of all flights. This column holds VARCHAR (string) data type.

xvii. **Ticket id**: This column represents the unique identifies for each tickets. This column holds INT (integer) data type.

xviii . **class**: This column represents the class of tickets and contains varchar data type

xix. **price**: This column represents the price of tickets and holds integer value data type currency.

Xx. **Flight id** : This column represents the reference from flight table primary key as a foreign key in tickets tables.

3.4 Which attributes (columns) are the primary keys and what are the reasons for selecting them?

- The columns Customers id, meeting id, agent id, Airline id and Flight id and ticket id from tables customers, meeting, booking agent, airline details, flight details, ticket details are primary keys. They are selected because they are unique, non-repeatable and also they don't hold the null data.

3.5 Which attributes (columns) are the foreign keys and how do they form the relationships between tables?

The attribute Customer id and agent from meeting table and the Agent id in Airline details table, airline id in flights details table and flights id in tickets table are the foreign keys. They are selected because they form the relationships between tables and they contain values or data from primary keys of another tables.

Question Number 4: Draw an entity-relationship diagram (ERD) for the database you have designed in question no.3**1. CUSTOMER TABLE**

Customer id	Name	Address	Phone
CUS1	Hari Prasad	Lalitpur	9813254020
CUS2	Ram Karki	Kathmandu	9876543210
CUS3	Ridhima Pokhrel	Janakpur	9822365348
CUS4	Salaj Subedi	Dharan	9813255040
CUS5	Mark Garfield	Bhaktapur	9824566782
CUS6	Henry White	Jhapa	9835723875

*Table 2: CUSTOMERS TABLE***2. MEETING TABLE**

Meeting id	Agent id	Customer id
MI1	AG1	CUS1
MI2	AG2	CUS2
MI3	AG3	CUS2
MI4	AG4	CUS3
MI5	AG1	CUS4

*Table 3: MEETING TABLE***3. BOOKING AGENT TABLE**

Agent id	Name	Email
AG1	Sofia Nelson	Snelson@gmail.com
AG2	Holland Rice	Hrice@gmail.com
AG3	Bucky Cold	B.cold@gmail.com
AG4	Jack Willow	Jwillow@gmail.com

Table 4: BOOKING AGENT TABLE

4. AIRLINE DETAILS TABLE

Airline id	Name	Agent id
Air1	Alpha Airways	AG1
Air2	Beta Airways	AG2
Air3	Delta Airways	AG3
Air4	Omega Airways	AG4
Air5	Gamma Airways	AG4

Table 5: AIRLINE DETAILS TABLE

5. FLIGHT DETAILS TABLE

Flight id	Dep id	Airline id	Dep. Date
Flight1	D1	Air3	2021/01/11
Flight2	D2	Air3	2021/02/13
Flight3	D3	Air4	2022/01/01
Flight4	D4	Air2	2021/10/05
Flight5	D4	Air1	2021/09/17

Table 6: FLIGHT DETAILS TABLE

6. TICKETS TABLE

Ticket id	Flight id	Price	class
Ticket101	Flight2	25\$	Economy
Ticket102	Flight3	24\$	Economy
Ticket103	Flight4	29\$	Economy
Ticket104	Flight5	35\$	Business
Ticket105	Flight4	50\$	First

Table 7: TICKETS TABLE

PRIMARY KEY	FOREIGN KEY

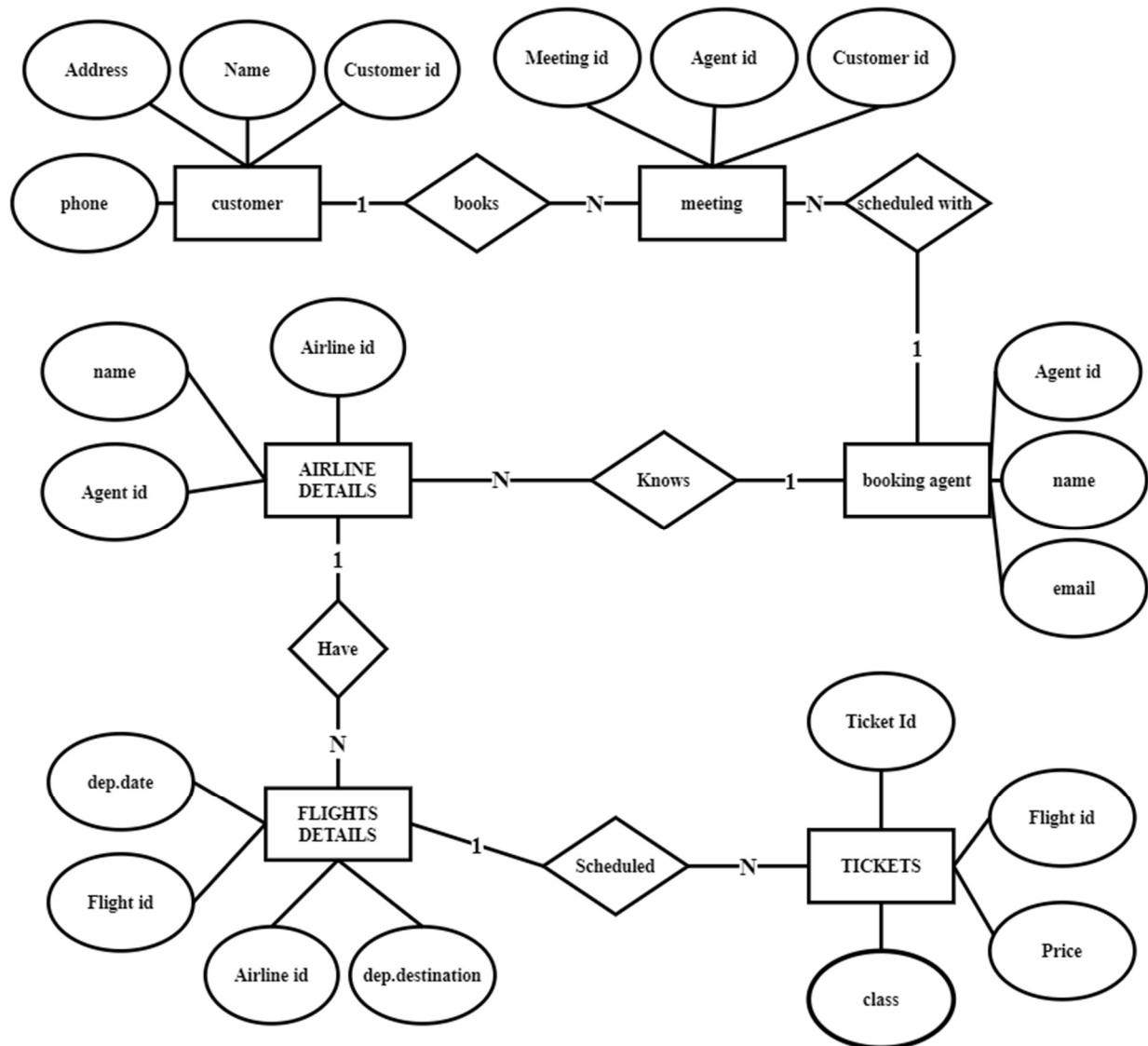


Figure 3: Entity Relationship Diagram

Question number 5: Write a personal reflection (max. 800 words) of the learning process up to the moment. You may wish to summarize your thoughts on the following points:

- ☐ **your preparation for the subject before you started the module**
- ☐ **your expectations from the module when you started it**
- ☐ **looking back, were you able to meet those expectations**
- ☐ **how are you coping with the requirements, are you managing it**
- ☐ **what are your current difficulties; if any, what do you think you need to do to get the most out of this module.**

The current module was about Introduction to the information system and database. The name caught my attention as I was always fascinated with databases handling big-data and mending them through various applications. I briefly made up my mind regarding what the module might contain for me. Me being an A-level student I was very much familiar with use of different applications to handle databases, through this my curiosity had skyrocketed as to what other things I will be able to learn from this module. I vaguely thought that the module might be the same as what I studied in my college days, ever I have come to find out that the module contains much more than just handling data and databases. Learning from learning to code in SQL to making complex ERD had caught my attention and has kept me hooked.

After my lecture slides were out I quickly downloaded them and went through them briefly to get adequate information regarding the upcoming workshop sessions. After knowing regarding the coursework I found two books that I took reference from, named Information System for Business and Beyond by David T. Bourgeois , PhD and Bourgeois (Dave Bourgeois, 2019) and Database step by step by Mark L. Gellenson (Gillenson, 1985) these along with other websites that I randomly found to be very useful and provide adequate information. I used the bibliography of these websites to look upon further. I used the google classroom videos and slides to get a gist as to what this

Course work holds. I used applications like draw.io, xampp to correct and revise my works as asked by my teachers. I asked my teachers help either physically or through the mail to proofread my answers as well as guide me in constructing tables and ERDs. Me and my friends created groups to discuss and share ideas that would elaborate our knowledge base and provide us more information to work on. After some reference to the websites, lecture slides and you tube tutorials I was able to create a functioning ERD and review my answers for the asked questions regarding the information system and databases.

At first I thought it would be a tough challenge to collect information regarding such a broad topic but later through some research I found out it was relatively easier than I thought. The information I got regarding the information systems and databases were on point and helped me to understand exactly what the course work asked me as an answer. I understood that at the core of any efficiently functioning organization there is its information system that is interconnected through various nodes and components that cooperatively works together towards a common objective. The digitalization of the market has allowed businesses to be flexible regarding data collection, assembly, storage- procession and deducting them into meaningful information. These data allow any business to get knowledge regarding current market trends and cope with the upcoming business trends. It is a fascination as to how data storage has advanced in a short course of time, from writing everything down in sheets of papers and keeping racks and racks of them in physical form to storing larger amounts of data in hard-drives that would save up space and time. With the latest advancement of cloud storage business have flourished in aspects of data collection and storage and cloud computing allows business to not only store unimaginable amounts of data but also save up space for what would previously be taken by physical papers or its own servers. Cloud computing has played a big part not only in the business world but in general public as well, from storing photos and documents in papers and albums to storing them over the cloud storage like in google drives such as google docs and google photos over the web consumers have little to worry about their data getting lost or damaged in any sort.

Through this module, as expected I was able to understand the ways of data collection, storage, editing and conclusion of it into sensible information, how every organization has its own data flow structure and how even the radical administrative components of and organizations are inter-connected to each other. I learnt to make the ERD and conclude tables from it for my coursework. I really enjoyed doing the course work as this provided me with not only knowledge regarding information systems and databases but also inculcated in me an understanding as to how businesses work in its core and how huge data are summed up into meaningful information using a few simple software and tools.

References

Bourgeois, D. and Bourgeois, D. (2014) "Chapter 4: Data and Databases", Published through the Open Textbook Challenge by the Saylor Academy, p. Available at: <https://bus206.pressbooks.com/chapter/chapter-4-data-and-databases/> (Accessed: 14 April 2021).

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References also taken from the already provided pdf regarding (information system and databases)