Computer Aided Decision Systems
Industrial Practices using Big Analytics
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Lecture 07
Introduction to User Interface System

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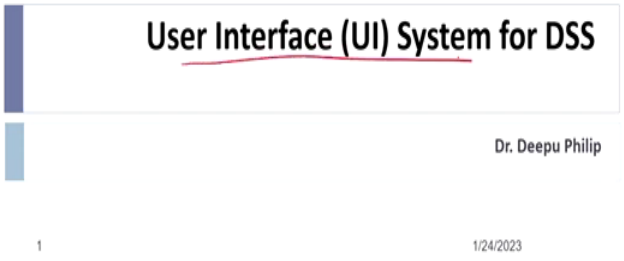

Good evening, we are back in the course Web-based Decision Support System for Business Decisions and so far we have been going through individual modules or individual subsystems of the Decision Support System. As we discussed earlier that Decision Support System from the standpoint, is divided into four parts:

i) DBMS or Database Management System

ii) Knowledge Base Management System or KBMS

iii) MBMS or Model Based Management System

iv) User Interface or UI

So, today we are going to discuss the 'User Interface' and after that we will go into the 'Knowledge Base Management System'. So, UI system or User Interface system for Decision Support System is what we are going to talk today.

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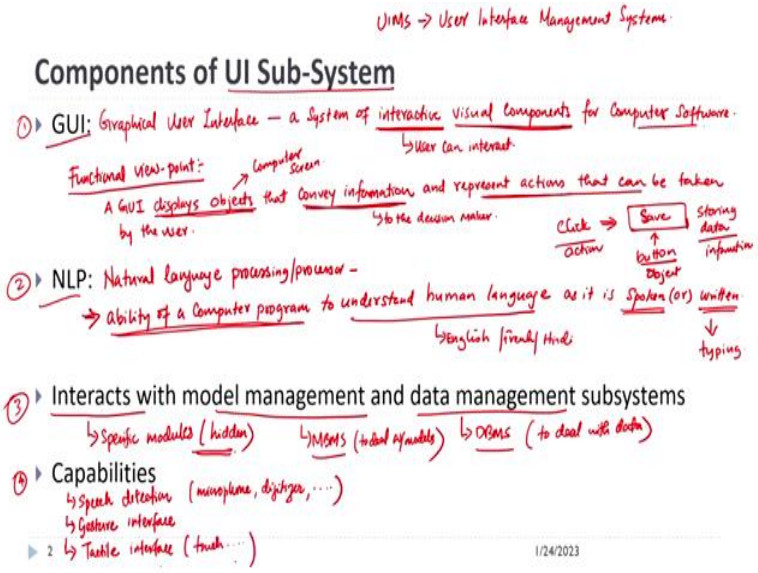

So, the first we will start with the components of UI sub-system, also called as 'UIMS' (User Interface Management System). So, in this case we are going to talk that what are the major components of the UI subsystem.

So, the first component we are going to talk about is:

- GUI or 'Graphical User Interface': -
  - Definition- It is a system of interactive visual components for computer software.
  - Functional view-point- A GUI displays objects that convey information and represent actions that can be taken by the user. For ex- If a button is provided with 'Save' written on it. So, action it does is 'Click' the button and the information that it conveys is, if you click 'Save' button, then things will get saved. So, the information is (storing data). And the object here is the 'Save' button. So, the action is click, the object is the button and the information provided on the button is that if you click this button it will store data.
- NLP or Natural Language Processor/processing.
  - Definition- the ability of a computer program to understand human language as it is spoken or written.
- Interacts with model management and data management subsystems
  - This is a specific module. These modules are usually hidden; you would really do not see them. It deals with model management and data management. So, the user

interface also provides specific modules (mostly hidden modules) that can interact with the MBMS. So, why database management system has to deal with the data? and why model based management system has to deal with models?

- Capabilities

i) Speech Detection- some examples are microphone, digitizer, etcetera, (a combination of technologies which converts a human speech to understand this into text and then convert it into computer instruction).

ii) Gesture Interface- it is like hand gesture or sometimes, in a computer or in a touch screen, most of us have used right fingers in the mobile to zoom, so if you do like this then the things get zoomed into a mobile interface, so that is where your gesture is.

iii) Tactile Interface- What happens, certain times when you have a mobile keypad you know that when you type the keypad it gives you tac-tac-tac sound, that is one response that you touch the key.

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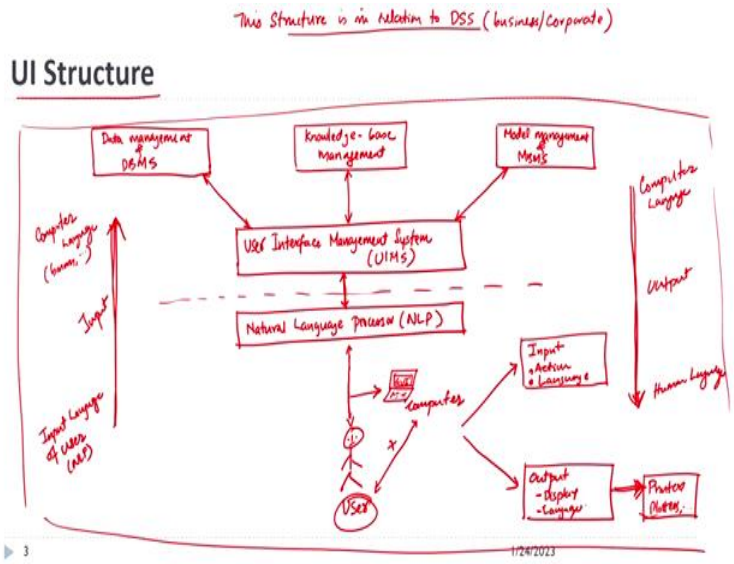

Now we are going to learn about what is UI structure and what are the components is. By the way, (this structure is in relation to DSS and the business or corporate).

i) The major component is Data Management and DBMS.

ii) The second component is the Knowledge Base Management System

iii) The third part is Model Management and MBMS.

All the three are interacted or interfaced using what we call as ‘User Interface Management System, we can call it as UIMS.

So, this User Interface Management System interacts bi-directionally with the Database Management System, the Knowledge Base Management System and the Model Based Management System. But the user also needs to interact with the system.

So, below this you have the next layer what we call as the ‘Natural Language Processor or Processing’ or NLP that also does bi-directional interaction with the User Interface Management System. What does the NLP do? NLP deals with the stick figure or user. So, the user is supposed to interact using NLP. (Only because this interaction is not just like an interaction). For this interaction, you require a computer.

So, the user using a computer deals with the: it uses the natural language processing to interact with the computer. And the thing is you have to also understand there is two sub parts to this:

a) Input- there is action, language, etcetera.

b) Output- Once the model is invoked, the output has to come out, and the output comes in the form of a display and language typically.

Input language of user which is in the natural language, gets translated to computer language, whether it is a binary, hexadecimal, it does not matter. It could be binary. The output, which is in the computer language, is translated to human language. So, the user uses the computer to convey the input to the system using the ‘User Interface management’ and the output of the system is conveyed back to the user by doing this.

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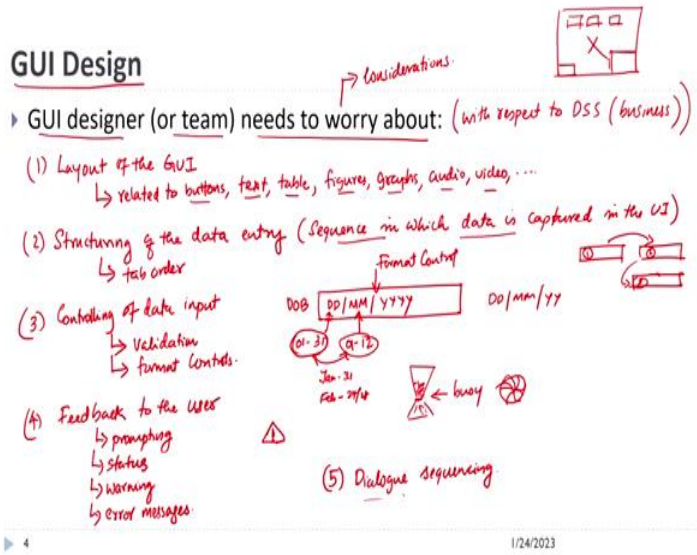

So, now let us move to the next one, the GUI, because GUI is the primary way in which the user interacts with the system.

- GUI designer (or team) needs to worry about:
- the primary focus, with respect to business DSS (Business Decisions).

What do we need to do when the DSS is aimed at a corporate DSS or a business DSS?

So, the first consideration is, they need to consider as part of this is something like:

i) Layout of the GUI: -

- The layout is related to buttons, text, table, figures, graphs, audio, video, etcetera.

ii) Structuring of the data entry: -

- Sequence in which data is captured in the UI. So, let us say you have a height, weight, address, etcetera. You fill your address format or your personal details, you take the first name, then the middle name, then the last name, then the date of birth MM-DD-YY, house name, street name, city, pin code, state, country, etcetera so that sequence came into picture.

The simplest term for this is also known as 'Tab Order', so in the GUI, we will first input.

iii) Controlling of data input: -

How do you control the data input and lot of these things? It involves two major aspects as part of it:

- ❖ Validation
- ❖ Format Controls

So, let us say for an example, in this case is you have your date of birth is captured. So, let us call it as DD/MM/YYYY. You can also capture it as DD/MM/YY. Also, in this case, you have to give the entire year as part of it. How do you do validation? One of the way to do validation is for example 'M' should be between 01 to 12, you cannot have a value of 23 given for month because there is only 12 months as part of it. The date is can vary from 01 to 31 you cannot have 32 or something so depending upon what it is and this combination means January has 31 days, February 28 or 29, depending upon the leap year. And then the third part is, you can think about the year, you cannot have a date of birth of tomorrow maybe you might be putting the data of a today born child because today is allowed, you will not give the day tomorrow, you will not give a year which is 2025 or something like that because that is not possible as part of that for a date of birth, so that type of 'Validation' is also part of the GUI design.

iv) Feedback: -

- It is supposed to provide feedback and the multiple type of feedbacks that are expected out of it. Some of the feedbacks are:

- ❖ Prompting- So if you say that shall I delete? if you delete a file, are you sure? So those kind of things are all what you call as 'Prompting'.
- ❖ Status- Status is really interesting. One of the example of status is, you have seen an hourglass image and this shows that I am busy or sometimes you might have seen this beach ball that rotates which basically tells you that I am busy doing something, so that tells you the status of what is going on in the system.
- ❖ Warning- "Warning all the data will be erased, do you want to continue?". So, warning basically comes up with something like, an image like this (as shown in slide) with an exclamation mark, which tells you that, here is a warning given to you pay attention to this kind of a thing.
- ❖ Error Messages- You know 'Windows', the classical function is, you wanted me to do something, I am sorry, I cannot do it, it gives you the blue screen that is an example of an error message.

- Dialogue Sequencing- We will see what this is, but the dialogue is, how the user interfaces with the system? So in which a sequence like, you do something the computer responds that is one way to think about sequence or when you open a particular user interface, the computer immediately gives you a response which prompts you for something and then based on your response, it comes up with, what to do next. So, that is also the other aspect of GUI design.

So, these are the five aspects that a GUI designer or a design team, when creating a Graphical User Interface for a Decision Support System.

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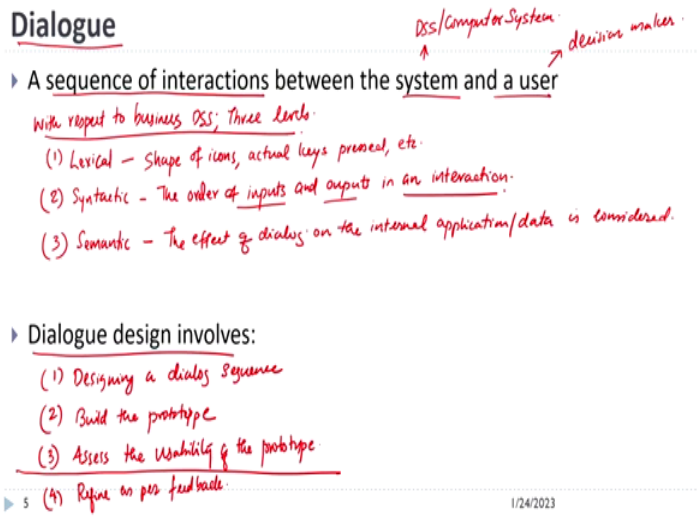

So, let us take a look what is a 'Dialogue'? This is a critical one because most of the time people do not realize what 'Dialogue' is.

In this case, we can talk about the DSS or a computer system and the user is a human being, it is also decision maker.

- It is an order of interactions between the system and the user.

So, there in broader sense, with respect to business DSS, three levels of dialogue we can talk about: -

i) Lexical- Lexical sequence of dialogue means the shape of icons, actual keys pressed, etcetera.

ii) Syntactic- The order of inputs and outputs in an interaction.

iii) Semantic- The effect of dialogue on the internal application/data is considered.

- Dialogue design involves:

i) Designing the Dialogue sequence

ii) Prototype

iii) Refine as per Feedback

So, the next topic is the GUI principles and this is also taken from the direction of how is it important for a business DSS is what we will be talking about, whatever the principles that are important for that. So, this will be part of the next lecture, we will start the next lecture from here. Thank you.