Computer Aided Decision Systems – Industrial Practices Using Big Analytics

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Lecture 3
Misconception & Components of DSS

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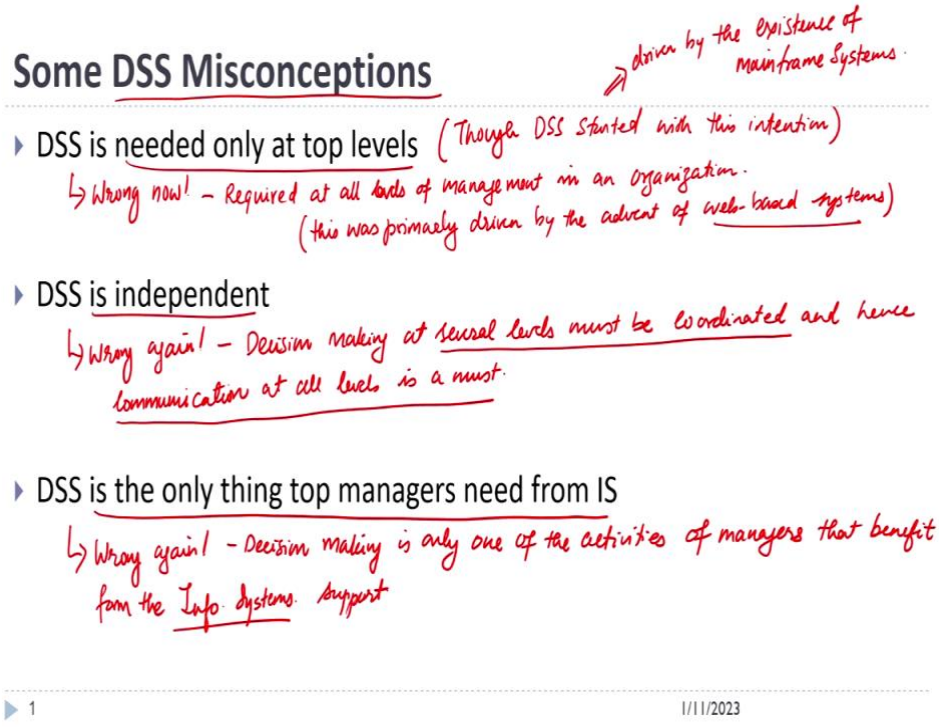

Now with this, we also would like to discuss some of the misconceptions. This is required because pretty soon, we all get into this kind of confusion with the DSS. So, the misconceptions associated with the DSS are:

1. DSS is needed only at the top levels. Yes, though DSS started with this intention. When the original revolution happened, it was intended to deal with the top levels, and also driven by the existence of mainframe systems. It was very expensive. Computers were extremely expensive and there was no other way you could do it. So, you ended up doing it specifically limited for top management. Now, this assumption is not true. It is required at all levels of management in an organization. This was primarily driven by the advent of

web based systems, when the web based decision support systems came into picture, the extension of the DSS to all different levels of the management was easy to do that.

2. DSS is independent. This is wrong again. It is no longer independent. Because decision making at several levels must be coordinated, and hence, communication at all levels is a must. Now, most of the decision is coordinated at several levels, the production department does not make a decision by itself. It actually coordinated with the finance department and marketing department. And hence, this communication at all levels is very critical for the system, in this regard. So, the DSS is not independent. It allows for coordinated stuff.
3. DSS is the only thing that top managers need from the IS or the information system. This is again wrong. If you assume that I have a DSS then I have done, this is wrong again. I would call this wrong again, because decision making is only one of the activities of managers that benefit from the information systems support. Now, information support can also be used for driving, innovation, across inter departmental collaboration, and all those kind of things that are part of the information system. So, DSS is not just the only function of information system, it can be there for other reasons as well.

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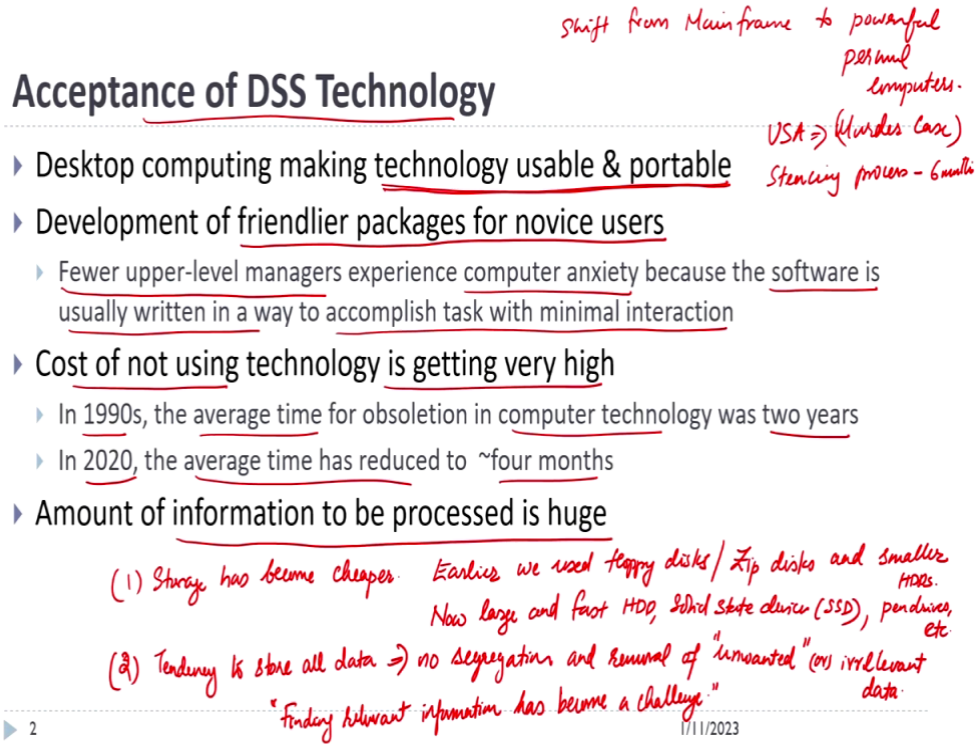

What is the acceptance of the DSS technology?

1. If you look in this slide, the major change on this one is the shift from mainframe to powerful personal computers. This is one of the reasons, why the DSS technology has become more and more acceptable. So, the desktop computing is making technology usable and portable. For example in the USA, now if you take a murder case in a judicial system. From the start of this, it completes within 6 months in united states. In India, you know, how many years it will take. It may take 6 to 7 years, the minimum. So, in the judicial decision support system, they were been able to develop and use within their system to allow them to make rapid decisions as part of it.
2. Then, the second part is more and more friendly packages for the novice users started coming into picture. So, languages like PHP, Python, Perl etc, came into picture, which came up with rapid competition power using the web based interface. And hence, even for the novice users, applying a complicated neural networks to come up with a decision has become much more of an easy job. And hence, if you look into it, fewer upper level managers experienced the computer anxiety. So, many of the upper level managers are also tech savvy, unlike the earlier days, and because why, their computer anxiety is reduced, because the software is usually written in a way to accomplish the task with minimal interaction. Lot of the people say that when you design something with three to five clicks, and somebody can get it done in three to five clicks, then it is actually an ideal system, and people will tend to use it in a very good fashion.
3. The third part is the cost of not using the technology is getting very high. So, if you do not use the technology, and if you do not make the timely decision, it also has very big impact. In 1990s, the average time for obsoletion in the computer technology was two years. So, if you buy a laptop in 1990s, for two to three years, that laptop will be fresh, and then slowly degrade. So, for five to six years, you will be happily able to use the laptop. Whereas, in 2020s, the average time was reduced to four months. Let us say, in four to six months and maybe in a year, you see that a much better computer has come into picture, and then, now you are like, I have now become obsolete, in that regard.
4. The last part of it is the amount of information to be processed is huge. Why? Well the reason is

a. Storage has become cheaper. Earlier, we use floppy disks or zip disks and smaller hard disks. Now, large and fast hard disks, solid state device or SSD, pen drives, etc.

b. So, when the storage has become cheaper, tendency to store all data with no segregation and removal of unwanted or irrelevant data. So, we store everything. We just take it and store everything in one go.

So then, once you do that, then finding relevant information has become a challenge. That is the one aspect of this. The amount of information processed these days become huge, because you keep on storing, storing and storing. So, that is why, you probably give an acceptance of DSS technology.

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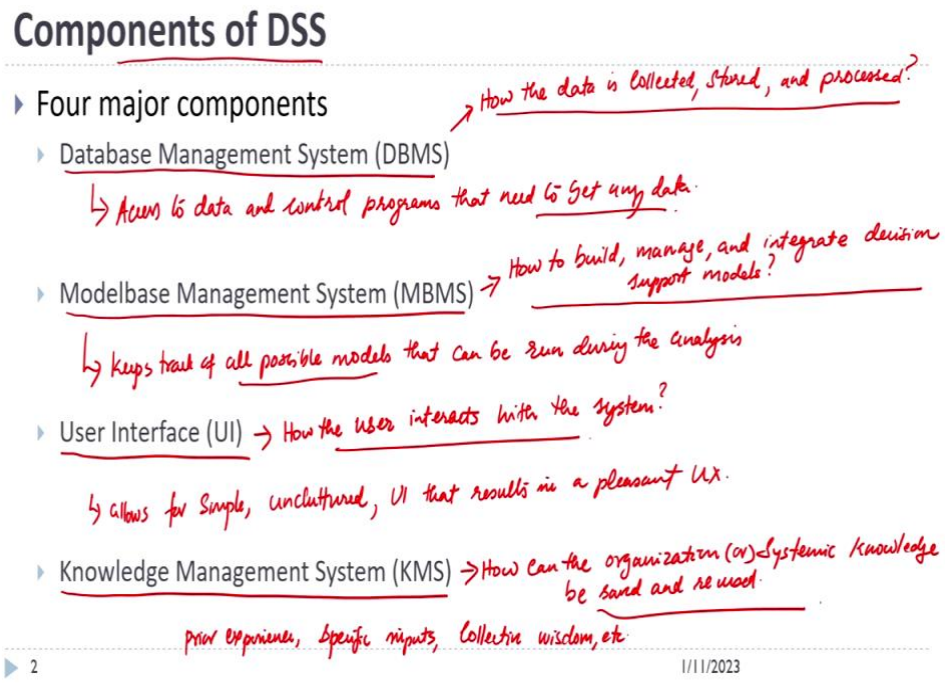

Now, let us talk about the components of DSS. Let us look into this slide about the major components of DSS. So, up to this point, we have been talking about the details of the DSS, and now we are going to talk about the four major, the integral parts of the DSS.

1. The first thing is the database management system, which is very popularly known as DBMS. The main function is, how the data is collected, stored, and processed. It allows for access to data, and control programs that need to get any data. If a program wants to get any data, and the system actually gives you the access to that data.
2. The second one is the model based management system, MBMS. The fundamental question here is, how to build, manage and integrate decision support models. So, you may end up making a linear regression model, or a classification model, or decision tree model. So, how do you build them? Then, how do you integrate with the decision making process? And once you integrate, how do you manage them? When? Which one to use when and where? All those aspects are part of this. So, the main thing here is, it keeps track of all possible models, that can be run during the analysis. So, when you are doing the analysis, you track all possible models, and then make the decision based on it.
3. Then comes a third component of it, which is the user interface. The user interface tackles the question of how the user interacts with the system. So, this is the main aspect of it. How will the user interact with the system? The simple uncluttered UI that results in a pleasant user experience. So, the user should be motivated to interact with the decision support system, and then make our decisions accordingly.
4. And then, the last part of it is the knowledge management system, or some people call it as, knowledge base management system. How can the organizational or systemic knowledge be saved and reused? How can you capture the systemic knowledge? This could include the prior experiences, specific inputs, collective wisdom, etc. These are the things that are

very important to the organization. How can you collect them? How can you take it forward from there?

So, these are the major components of DSS, as we discuss.

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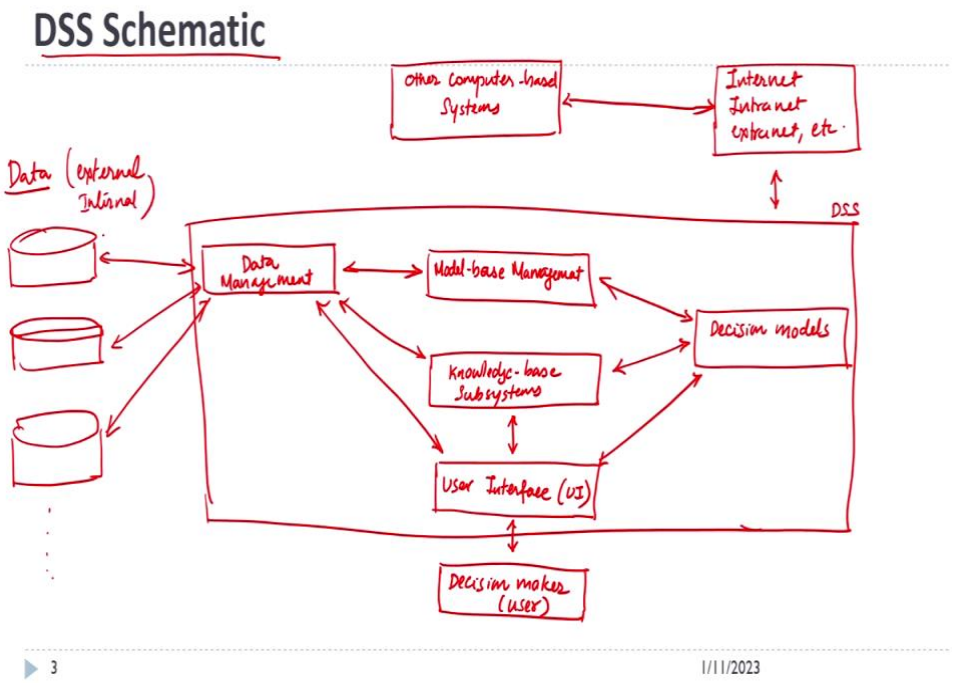

Let us look at the schematic of the DSS at this point. Let us try to draw in a way, how the DSS interacts with the internal and the external world. There are many ways we can look into it. So, let us start with the user at the bottom. Let us call as the decision maker, or in simple terms, the user of the system. So, it could be a top decision maker, a lower level decision maker, whatever it is.

That person will interact with the system, as we said earlier, using the user interface, the UI. So, UI is the way in which the user will interface with the system. And through the UI, the user will interface with knowledge base subsystems. So then, the UI will interact on behalf of the user with the knowledge base subsystem, and the UI will also interact with the user on the decision models.

And, in between, there is the model based management. It will be talking about creating and storing decision models that way. And the other one, the model based management system will also interact with the data management system, because both data and model base are required for this.

Then, the knowledge base system can also interact with the data management, and the user interface will also interact with the data management, as part of this.

Then we have the internet, intranet, extranet, etc. So, these are different ways you can interact with the external world, as well.

And, you have decision system that allows you to interact with them through that internet or intranet, something like that. And then you have is data, at some place. It is usually because you do not store data along with this. So, you have different types of data. So, the data management interacts with all the data systems, like this. This data is both external data, and it could also be internal data as well. And finally, one last thing as part of this is, there is a organizational knowledge. Some specific knowledge that is part of the organization, which will be interacted with the knowledge base subsystem. Sometimes, we take it outside the DSS, it is not an interactive DSS part of it.

So, the DSS is which conveys the data management, model based management, decision models, knowledge base subsystem, user interface, etc. Then, the decision maker organization allows data etc, these kinds of things are typically considered as external to the system.

Now, with this, we should be able to understand the major broad concepts of the DSS, and how the DSS integrates with the user, with the external world, with the organization, with the organizational data, external data, internal data, all these aspects through its different components, and why this is very important and critical for long term decision making.