

Chapter 7. Understanding use of IT

The learning aim of this chapter is to be able to determine the tasks for which the IT taught will be used, and to identify levels of understanding of IT use.

7.1. *Levels of mastery of using computers in work tasks*

Sein et. al. (1998) and Coulson et. al. (2003) have proposed levels of knowledge of software use, where an important distinction goes between competence of the software and of its use. Their distinction is similar to the distinction in this book between competence on IT and on using computers in tasks. As mention in Chapter 4, they do not consider the competence in the information area.

The previous literature considers that a basic competence is knowing how to use IT in one's work tasks, and a more advanced competence is to see what IT does for the organisation. The Committee on Information Technology Literacy (1999) also considers the societal impact as part of IT competence. One dimension of competence on IT use is therefore its scope, extending from the individual through the organisation and into the societal level.

Sein et al (1998) distinguished between the ability to apply an IT system and to see what else the system can do. This will be expanded here to include the ability to suggest changes of the IT to fit work, organisation and society.

The competence of using computers will therefore be considered as an *externalisation of IT use*, having both an individual and social dimension. The mastery will be considered at three levels:

Skills for use in tasks. The skills of using IT to support activities, both individual action and social interaction.

Understanding current situation. The ability to explain how IT supports activities and other consequences IT has for own tasks, the organisation and the society. This includes understanding of why an application is useful or not, which seems to be the most important factor affecting learning and using the application (Davis 1989).

Understanding possible changes. The ability to explain what IT can do, how IT systems can be changed, and how tasks can be changed in the future. This level also includes the ability to predict changes of IT and of how IT, organisation and society might affect each other.

We will look at some examples of people at different levels of mastery. When asked about the impact of IT in her workplace, Kirsten replies:

I inform customers about new services and change of terms, and I remind them about appointments. When doing this, I look up the customer's history in our computer system and then write them letters in Word. Thereafter I send the letters off in Thunderbird.

Kirsten is telling about her own work and is providing some information on which IT tools she is using for three tasks. She is not showing any motivation for using the IT tools in the sense that she can point explicitly to their usefulness, for example by comparing these tools with other solutions. Her reference to “our computer system” is rather vague, and she is not telling anything about other consequences of IT for her work or the organisation. Although she is able to tell a little bit on how IT supports her activities, she is not at the Understanding level yet.

Leonard, being asked the same question, replies:

The corporate database means a lot to my work and to the organisation as a whole. Now I enter all incoming mail in the system, and if it is on paper, I scan it. That means that I can search everything that is there and also that people in the claims payment department has the information at once. Delays due to waiting for papers to be transferred or finding the case in the archive have been eliminated. Besides, it gives us the up to date information on how we are doing, so that there is no longer any argument with management on productivity measurements. I see this as a win-win-win situation for us, management and customers.

This explanation is telling little about Leonard’s skills, but it demonstrates that he has understood consequences for his own work, for colleagues in other departments, for management, and for customers. He demonstrates an Understanding of the current situation and compares it to the previous system. His enthusiasm of the usefulness of the corporate database demonstrates a clear motivation for using the system.

Melly says:

After we got the basic patient information in the computer system, I don’t have to waste my time waiting for the patient record any longer. I look forward to the time when the record in the computer is complete with x-rays and attached documents, but we can do most of what we need by the diagnoses and lab info which is there now. Also, when we receive a patient from Jakarta Central, they also send us the patient info, so that before the patient is here, we know what to do.

The main trouble with this system has been the security. You have to log in here and there, and after 20 minutes of idle time, you are logged off. If a nurse has logged on in the meantime, we were stuck, and had to find her to log off before we could access the data. We discussed this with the IT guys several times, but they said it was a policy decision such that medical data should not be spread to those who have no rights to see it. However, in my opinion, it is more important that the medical staff who needs the information gets it than that others are denied access. That means that we give priority to providing the right medical treatment rather than protecting the patient’s privacy. The latter will never cure their illnesses. So since the IT people did not help us out, we found out that all staff in the department should have the same password. Thereafter we have had no trouble opening the system when needed.

Melly demonstrates understanding of how IT systems affect her and the organisation, how the systems can and should be changed, and even the ability to work around the rules set up. She is also arguing about a societal issue like the access to data versus privacy.

7.1. Usefulness

The second level of Externalisation of IT use is to understand how IT supports activities and other consequences IT has for own tasks, the organisation and the society.

One of the few, well documented connections within use of IT in organisations is the Technology Acceptance Model (TAM). In its original form, it says that the usefulness of a technology is the strongest factor concerning whether the technology will be used, while its ease of using and learning is of less importance (Davis 1989). TAM predicts that if a computer software is experienced as useful by the users, they will use it, even if they have to put effort into learning it. On the opposite side, a system which is easy to learn and use will not be used if the users do not experience that it is useful for their tasks.

The model is illustrated in Figure 32, where the bold arrow indicates a connection that is stronger than the other one.

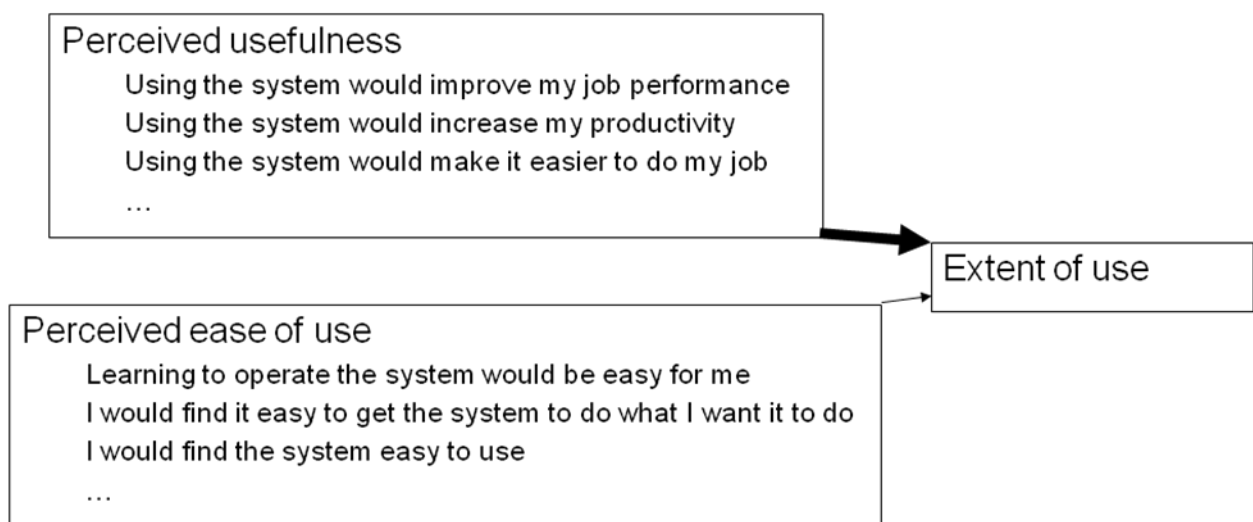


Figure 32. The Technology Acceptance Model, original version, adapted from (Davis 1989).

An example: At a time when computers were not everywhere, a hospital installed a computerised encyclopedia for nurses in one ward, where they could find information on care procedures, medical explanations, guidelines, etc. The nurses had previously experienced that their questions were not always answered in a polite way, and that looking ignorant in front of superiors was a bad experience. Therefore, they quickly adopted the system to avoid having to ask doctors or administrators for help. The system only had one terminal, and after a while, this terminal was moved to another ward 5 minutes walk away. Despite this extra time, they continued using it. In order to reduce disturbances, they organised a buddy system, so that one nurse collected the questions and walk over to the other ward, while the others took over her

tasks during the half hour needed. Thus, they added lots of additional effort in order to achieve the usefulness which they experienced.

Measuring the result of use of IT systems in organisations in general has shown impossible. Normally, you cannot isolate the costs of technology implementation, and you cannot isolate their effects. Expenses are interwoven with the costs of learning and changing work processes, and correspondingly, the products and services produced by an organisation depends on a package of factors, including competence, infrastructure, and the market. TAM therefore measures the degree of success in the time the technology is used, and this kind of measurement has over the years become a standard for measuring technology acceptance and success.

Later on, TAM has been refined with more factors, and a combined model looks like Figure 33.

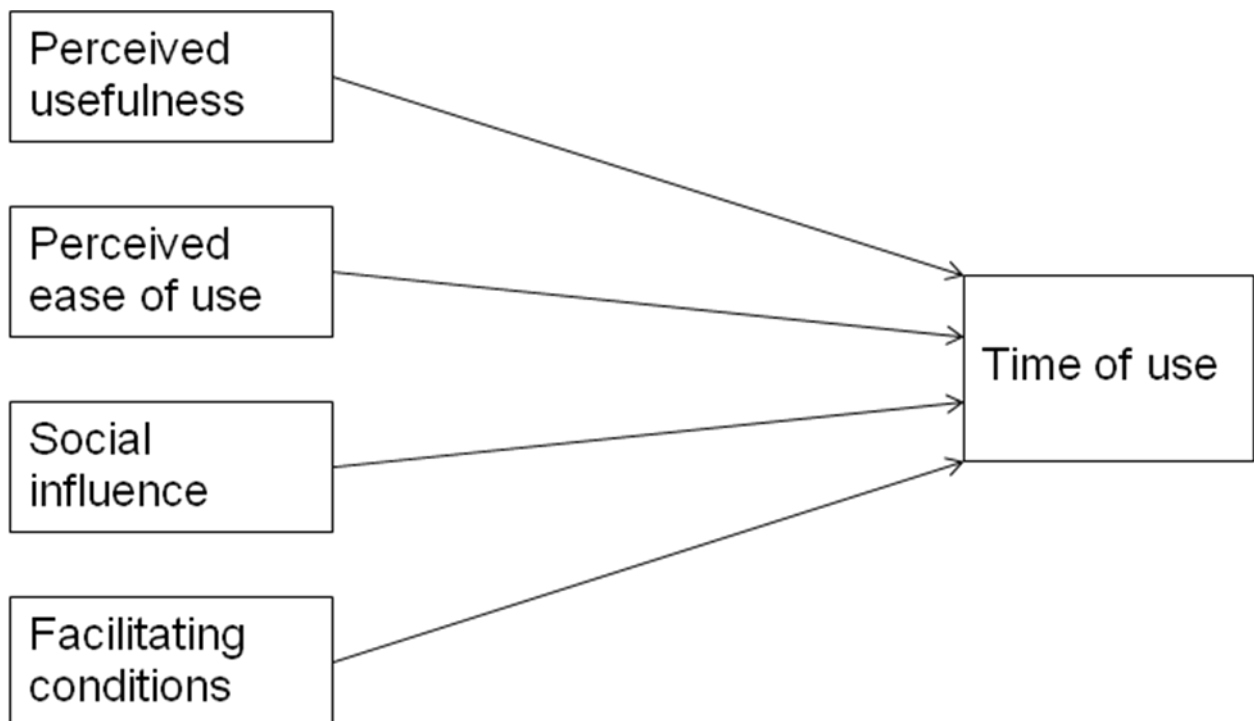


Figure 33. The revised Technology Acceptance Model, adapted from (Venkatesh, Morris et al. 2003).

When colleagues use the system or your boss tells you to use it, the social influence is increased. Facilitating conditions concern accessibility, including network connection, electricity, printers, etc.

When evaluating proposed IT systems, the model tells us about four factors to consider. Beware that it is the prospective users' opinions which matter. If outside consultants do not see the point in a software package, while the users do so, the system will probably persist. On the other hand, if the consultant thinks that some information produced by the system will be very valuable for the organisation, while those working there do not share that opinion, we cannot expect that they will take the effort of learning and using a new system.

In addition to the four factors, which seem to be relatively stable, other factors will moderate the picture. For a young man, the usefulness will be more important than for others, while for an elderly lady with little IT experience, ease of learning will count more than for others. Such moderating factors may depend on the local culture, and the studies behind TAM are carried out in North America.

Based on TAM, learners who have not understood the usefulness of an IT will be less likely to learn its operation. Teaching usefulness should therefore precede teaching skills, which is also recommended in the conceptual-practical training in Chapter 2.

7.2. The organisational level

Nusrat is working on designing dams by means of a geographical information system. His reply is:

When I get the right data from the surveyors, I can plan exactly where to place the dam and how to construct it, so that we can control the river. However, the data is often inconsistent. They are making too many mistakes out there. With correct data, we can get the dam built straight away. But now I have waited for six months to get this right, and I have called them several times lately to remind them to send me accurate data. I clearly see the need for automatic transmission of data from their instruments through wireless modems to my computer, so that we can avoid all these errors, so I proposed this equipment for the next year's budget.

Nusrat has understood how he can design a dam by means of his GIS, and the six months waiting for data indicates that his motivation to use the system is high. He sees possible outcomes of what he is doing, and he has plans for improving the system. In this way Nusrat is at the level of Understanding possible changes of IT for his work. However, his attitude towards the surveyors also points to some lack of understanding organisational issues. Nusrat is the one benefitting from the data entered, while others are doing the data entry job. He has seen the usefulness of the system, while the surveyors have not, so they are less likely to make the extra effort. Also Nusrat's conviction that once he has designed the dam, it will be built, points in the direction that his competence of IT for his own job is at the level of Understanding possible changes, while when it comes to organisational issues, his understanding is limited.

Since application of IT in work practices, for leisure, education or any other activity is a multifaceted endeavor, most of us might be like Nusrat; we might understand some issues very well while being ignorant of other. The three level model of externalisation of IT use might therefore have to be qualified concerning various aspects.

During an implementation of an enterprise resource planning system, most users avoided learning it in the beginning and left the data entry to a few super-users (Boudreau and Robey 2005). The majority did not see the usefulness for their job, and they were not convinced that it was an advantage for the company. Learning it became a burden which added to their

normal, busy day. Usefulness according to the Technology Acceptance Model is an individual experience, so usefulness for the organisation does not imply immediate learning.

Research points to that when we work together with tasks which depend on each other, training is more important for our adoption of IT and information systems than when adopting a single user application (Sharma and Yetton 2007; Reynolds 2010). So, for people to use an enterprise wide information system appropriately, training is more essential than when downloading an app to a phone, even when the technical challenge is at the same level.

7.3. Summary

People become motivated to learn new IT when they understand its usefulness for the tasks they are carrying out. Also understanding how the technology and the information are embedded in the organisation is advantageous for user learning.

4. Train users so that they understand the usefulness of the IT.

Exercises

1. Arja is a teller in a store. When asked about how she uses the computer, in her work, she responds:

I scan the goods, then tell the customer the total, receive money, and return the change, which I read from the computer.

On which level of competence for using IT in tasks is Arja?

2. Arja's boss is Shakira. She is telling this about the IT system in the business:

I use the system to supervise our sales, and in particular I look out for new trends amongst our customers. When I see that some brands or types change more than the seasonal variations, I change the place of the goods in the store, organise a sale or start a campaign. Without the computer system, we would have seen the trends much too late compared to our competitors. Also, I observe the salespeople's achievements, and I bring this information to the weekly pep talks. I wish that we would get direct computer links to our main suppliers, so that we could avoid all the operations of preparing an order and sending it off.

On which level of IT user competence is Shakira? Consider all three subject matter areas.

3. Consider a reasonably complex IT application in an organisation. Ask your fellow students to explain it. Note down what they say as precisely as possible. On which level of IT user competence is your fellow student for this topic? Consider all three subject matter areas.

4. Grudin (1994) argues that one challenge to introduction of groupware is that those who get the benefits are not necessarily the same people as those who have to put additional work into the systems, including data entry. This argument might also hold for other collaborative IT systems. What are the challenges for learning in such cases, and how can these be overcome?