

# Against Users

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**Abstract:** Ever since the 50's users has played a great role in the research about information systems. However, users have mainly been considered as operators of the information system or as managers receiving the output. In this article I argue that users are not operators but clerks performing their job. In the same way as I'm a driver and not a car user when I drive my car, the clerk is performing the work, not using an information system. Knowing how to use the information system the clerk produces useful information without paying any specific attention to the artifact. This perspective put certain demands on the designer of the artifacts, in fact (s)he should be a meta-designer, providing the clerks with useful tools for designing their own workflows.

**Keyword:** Human scale information systems, work role

## 1 Introduction and problem

The first IRIS I visited was the fourth Scandinavian Research Seminar on Systemeering in Oulo 1981<sup>1</sup>. I shared room with Markku Nurminen and we immediately connected. His paper had the challenging title of "Against System"[1]. In it he outlined what he later called Human scale Information Systems or HIS. We both thought this was the best paper at the seminar<sup>2</sup>. My own contribution [2] was about users develop their own information processing systems.

At that time there were two main directions in the research in information processing: Those who were interested in data bases (construction, management, design and modeling) and those who were interested in systems development. Markku and me belonged to the last category. Part of the systems development was about user orientation. It meant:

- Users should take more part in systems development,
- Systems development models which should pay more attention to users,
- Organizational aspects of systems development and use,
- Sometimes even about computers' effects on work.

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<sup>1</sup> The seminar changed name to IRIS in 1987.

<sup>2</sup> In those days we read ALL papers to the seminar.

Markku's contribution was without doubt the most far reaching of them all. He suggested that huge and integrated information systems should be replaced by small systems, supporting users in their work. Workers should be responsible for coordinating the systems, which should be a natural part of their work and hence very easy.

I belonged to the user orientation community and was also rather radical insofar as I suggested the users should develop their own systems. This idea, combined with Markku's HIS resulted 1986 in my thesis [3]. Already at that time I tried to avoid the concept of "user" since I claimed it divided the human specie into two parts: The users who know nothing and the experts, us, who knows. But I never explored the concept in detail. Until now.

## 2 Method and literature review: What is a user?

This paper is not a usual scientific report. It is a conceptual analytic approach, according to Järvinen's taxonomy [4]. I discuss and problematize a concept, "users", and claim the concept has caused much trouble and embroilment. "User", "Clerk", "Designer" etc. are Weberian ideal types in order to refine them as concepts.

In the beginning (40's and early 50's) there were no users. The constructors of the computer, the programmers and the users were essentially the same persons: They were scientists and mathematicians who needed to make long and complex computations. In 1951 the UNIVAC I was manufactured by Remington Rand and delivered to U.S. Census Bureau. It is considered as the first commercial computer to attract widespread public attention [5]. At that time different roles emerged, such as operators, programmers, systems analysts and even users. Joan Greenbaum has described this development in a wonderful essay [6]. In an early paper from 1956 Chapin [7] identifies two main problems concerning information systems design: The first is the fact that organizations do not operate in a strict logical way thereby making it difficult to obtain a complete requirements specification. The second is the lack of theoretical framework. Langefors [8] provided the latter, but except for in Scandinavia [9], it has not been widely accepted. In the paper Chapin [7] identified users as management, those who used the output from the system. In the late 70's Brandt and Johansson talked about *output users*, *input users* and *victims* (i.e. customers) in relation to information systems [10]. Fjellhem et al [11] defined a long list of different roles that was at hand in systems design:

- *Ruler: Controls the necessary resources of the system. Is using this for his own benefit.*
- *Supervisor: Is supervising the operation of the system. Local representative of the ruler.*
- *Operator: Is working in the system. Necessary for its proper functioning.*
- *Client: Dependent upon the system for certain services. In direct contact with the system for shorter periods of time.*
- *Misuser: Benefits from using the system against the purpose intended by the ruler.*
- *Constructor: Is designing and implementing the system (by means of resources from the ruler)*
- *Researcher: Brings forth new knowledge on the functioning of the system.*
- *Reformer: Wants to change the system, or the roles related to the system partly or totally.*

- *Bypasser: May be indirectly affected by the system by consumption of limited resources or other social effects.*
- *Teacher: Is conveying knowledge of the system*

Common to these roles are the orientation towards the IT system. It is the operation and the function of the system, which is focused. I myself became interested in users in the end of the 70's. "User" I then interpreted as input users, people who had to feed the computers with information. We wanted to study real users in their work situation and see how the IT system affected their work. Once we visited Kockums shipyard in Malmö and talked to the CIO there, Kai Holmström. Something strange happened: When we met, he took my hand, looked me deep in the eyes and said: "Per, we have users to our system!" In doing this he managed to communicate a great and surprising insight: There were real people, of flesh and blood using their systems! They were not models or "stochastic variables at the system's outer rim", they used the system and benefit from it in their daily work! This made a great impact on me!

I wanted to get an idea of how the concept of "user" was conceived over the years and made a survey from JSTOR database and ACM Digital library. I selected articles responding to the keyword "user oriented" in the title for not achieving too much irrelevant hits. However, the search algorithms provided me with much stuff not having user oriented in the title. I manually scanned the articles received and classified them as either relevant or not. For the relevant articles I copied reference and abstract in a file and when the allocated timespan was finished I provided an idea about the main subjects about users in that period (*Table 1*).

Interval	JSTOR	ACM Digital library
1947-1959	Not available	28 hits. 3 relevant. Use of program languages
1960-1969	37 hits "User orientation" in title. None relevant	181 hits. 9 relevant. User oriented program languages and specific applications
1970-1979	70 hits, 11 relevant, User model	27 hits. 8 relevant. User oriented specific applications, many graphical or interactive
1980-1989	114 hits, 25 relevant. End user computing in the later half, not much pre -84. MISQ most of refs.	16 hits. 6 relevant papers. "User oriented interface" and "user oriented databases".
1990-1999	146 hits, 24 relevant. More spread. User satisfaction, relation user-system, user -analyst	"User oriented" in title gave 32 hits. 7 relevant. Object orientation and user interface is the main topics.
2000-2009	164 hits, 17 relevant, no clear issue, adaption maybe.	12 hits 2 relevant. Mobile phones and touch controlled laptops.

*Table 1. Main impression of the user concept*

Not very surprising, ACM Digital Library focuses the technique; how it is used or might be used. JSTOR is covering a lot of stuff from humanities and social sciences, so here I chose “Management and organizational behavior” as the main topic, since information systems originally sprung from these areas. But I achieved a variety of different areas ranging from use of contraceptives in Brazil, via Jewish women literature to traffic allocation in networks! The search algorithms are indeed mysterious!

However, almost all papers I have seen in this investigation, deal with users associated with information systems or other artifacts, except two of them which discussed user as a concept [12, 13] and among them only Lamb & Kling [12] criticize the traditional user model, based upon individuals with well articulated preferences but with certain cognitive limits. They cite several researchers i.e. [14-16] and argue:

*In fact, users don't think of themselves as primarily having anything to do with the computer at all. They see themselves as professionals, working with others, and using computers in support of those interactions.*

Lamb & Kling develop an alternative view of the ICT-user as social actor characterized by four dimensions: affiliations, environments, interactions and identities. But still, it is a user model, focused on the relation computer-operator.

One of the reviewers<sup>3</sup> of this article helped me with some more references:

Maaß & Oberquelle [17] argues that “*the design process should include intense and continuous cooperation with prospective users in order to assess, verify and iterate on their requirements for a new system*”. Still, focus is on designing the system, not designing or supporting work.

Budde & Züllighoven [18] reflects on the problem from software engineering perspective. They say: “*When we formalize we explain how an object functions, when we work purposively with a thing, we understand what it means*”. This demonstrates, in my opinion a surprising insight: The important issue is to understand what the system *means*, not how it *works*!

The trade union approach [19-23] within the Scandinavian School also recognizes the importance of focus on the work and the effects the IT system might have on the work. The sociotechnical approach [24-26] tries to establish a balance between technical and social demands on the final system. But in both cases they see the system and the work as separate entities and require a better fit between the system and the job.

Nygaard [27] describes an example from a workplace where Ms Brown works: “*To Ms. Brown, her workplace is not 'a system', whereas the system analyst regards the purpose of the work she/he is engaged in exactly as: to develop 'a system'*”. He recognizes the difference in perspective from the workers and the systems analysts but realizes also that the system analyst establish a perspective monopoly by introducing his terminology. So this is something that should be avoided.

Bannon [28] writes :

*The focus of the system design or human - computer interaction (HCI) research group is biased towards the technology, and the view of people is often*

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<sup>3</sup> Thank you, Yvonne!

*simply as "users" of this piece of technology, and "naive users" at that! This can lead to problems. People may not know the technology, but they are not "naive" as to their work, rather it is the system designers that are "work naive"! ... In fact, it is often still the case that computer users still need to make some modifications to the system in various ways, tailoring the system (see the Chapter by Henderson and Kyng) before it is truly usable, so that in a very real sense users are designers as well.*

This is very close to my idea in this paper! But I think Bannon stops halfway and don't go the whole way.

I will now continue my own analysis of what it means to be a user, a clerk or designer and how they are related.

### 3 Result: What does it means to be a user?

Users are always users of something. So when I am writing this article I'm user of the program Microsoft Word for Mac:2011, version 14.5.0. This program is running on a Mac mini, late 2012 under the operative system Yosemite, ver 10.10.3. But when my wife asks me what I'm doing, I don't say I'm using Word or using the Mac; I simply say: I'm writing my paper. When I use the car for transporting me from Fristad to Trollhättan, I'm driving. I don't say to my colleagues that I have used the car; I say I have driven the car. And the salesman receiving orders is doing just that: Receiving orders! He does not think of himself as using SAP; he is receiving orders!

I talked to one of the clerks at my job and she confessed: "I think of myself as using Excel! I love that program!" And thinking of myself: I use Disco<sup>4</sup> when I distribute stuff to the students, I use Kubiken<sup>5</sup> when I write course plans. In all cases, this is due to the fact that Excel, Disco and Kubiken performs work I can't do without them. I'm *writing* when I use Word but there is no similar word for the activity when I use Excel. So what does it mean for the salesman to use a computer-based information system (CBIS) when receiving orders? It could be described in many ways:

1. (S)he is operating a system, telling her exactly what to do. (S)he executes a pre-planned work.
2. (S)he is receiving orders, using a CBIS as support in this work.
3. (S)he is fighting a system hindering her to do a good job!
4. (S)he enters number in a computer

In my previous research I preferred the first description, maybe with a touch of the third. Number two was the intention of the developer, but very often it failed [28] and it ended up in some of the other. After some years, however, the clerks found ways of using the CBIS in a beneficial way [29, 30]. This was very often different from the intended way. I argue that one of the main reasons for this was that clerks were thought of as users.

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<sup>4</sup> A learning management system

<sup>5</sup> A system for administrering cours plans

Being “user” means the CBIS is the important thing. The user exists only in relation to the CBIS. Even if the designer place the user in the centre, s(h)e designs a CBIS and that is the focus of her attention. The clerks are thought of as “users”. As I saw in the literature review, users are often thought of as “user models” or “typical users” or stereotypes of users. But as Nurminen [31] says: “*all clerks are different, they are individual humans of flesh and blood, having their own ideas, goals and meaning of life*”. This was what Kai Holmström at Kockums realized! Nurminen [1, 31] realized this too, but he was too much focused on breaking up the big integrated information system, that he still considered the clerks as users. But they were not; they were clerks!

#### 4 Result: What does it means being a clerk?

The modern clerk and the clerk of the future performs tasks, some a pretty formalized, some are routine based, and some require great efforts and some almost no effort at all. It is a variety of tasks, often performed in an unpredictable way and associated with great responsibility. When a CBIS is introduced, the clerk is reduced to a user and an operator of some electronic devices. Still with the same responsibility! This was my focus in the last millennium. I made a mistake, when I considered the clerk as user of the CBIS. However, it should be mentioned, to my defense, that I wanted to give the user the power over the machine and let him develop his systems himself. In certain cases, this was possible.

Today, the clerk connects to different corporate systems, retrieves the desired information, process it in the way needed and send it further to those who need the processed information. Technically the clerk is using the systems, but mentally s(h)e is just doing her job. The systems are at hand, being efficiently used for solving a variety of problems. The clerk does not see her as a user, s(h)e is only doing her job! Using the terminology from the 80's: Today almost every clerk is doing end-user computing and we simply take it for granted.

Doing the job requires knowledge of different kinds. Based upon Habermas [32], I first identify the *technical* knowledge, which means knowing which form to use in a specific case, knowing which fields must be filled in and with what. Principally: Knowing which button to hit in order to accomplish a desired action. Next we can talk about *understanding*, knowing *why* a specific field must hold a specific data and how the resulting information is further processed. The funny thing is, that when you understand something, you have a tendency to *accept* it. Almost all education aims at this: Make you understand something and then accept it! For instance when a new CBIS is introduced, the clerks are taught how it works and why it works that why. The idea is that they shall understand *and accept* the system. The third type of knowledge Habermas describes is the *emancipative* knowledge [32], where you free yourself from oppressive structures and come up with creative solutions of problems. Russell Ackoff wrote a well known book about problem solving [33]. He says, for instance, that the best way to solve a problem is to redefine the system so it is no longer a problem. This is an example of emancipative knowledge.

When a clerk starts a new job (s)he frequently has to use the manuals and other work instructions in order to perform the job. When time goes by, the clerk learns how to do and don't use the instructions much. Eventually, (s)he understands the job and can take care of exceptions and other irregular cases. When getting really used to the job the clerk internalize the knowledge about the work and it becomes tacit [34]. So strictly spoken, the clerk has forgotten how to do the job and not until that (s)he fully knows it! Cook & Brown [35] calls this for "epistemology in practice" or *knowing* and argues it is different from the traditional type of knowledge, "the epistemology of possession" meaning that *knowledge* is something you posses in contrast to *knowing* which is your way of acting.

A CBIS is based on the epistemology of possession, since the system possess information about the status of certain objects in the company. The clerks interpret this information to knowledge and act upon it, *knowing* what to do. The result of the action might be something different than anticipated by the system designer, who only has access to the epistemology of possession. Teaching how to use the system is based on a technical knowledge interest, since this is necessary to operate the system. The clerks are transformed to users of the system. So how should a designer work to avoid that?

### 5 Result: What does it means to be a designer?

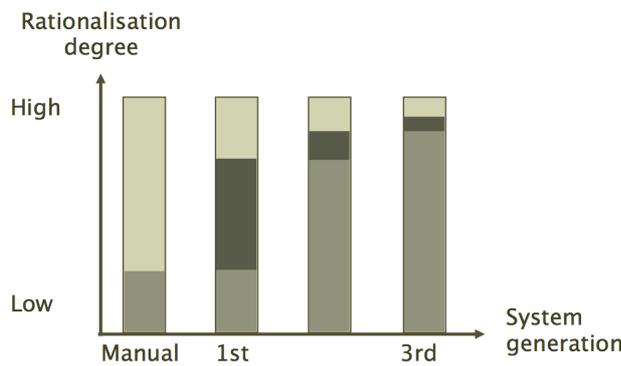


Fig 1. Systems development and the gain of it

Lets start looking at fig 1, coming from one of my books [36]. It is to be mentioned, that the picture is only an illustration, I have not done any investigation to find out the exact numbers. It illustrates a tentative relation between systems development and the gain of systems development. The main goal introducing a CBIS

in a company was from the beginning to reduce the cost for administration. The bars in the picture illustrate the rationalization degree for administration. Having a manual system probably allows a very low degree of rationalization, marked by the dark part of the first bar. Introducing a CBIS of the first generation took care of the most common routine (80/20 rule!) work and gained a huge benefit, the black part of the second bar. When the second generation was to be introduced, the potential was much less, the light part of the second bar, and the cost was considerably higher since the transactions are more complex. The pay-off was much less and took much longer time than in the first generation. In the third generation, the payoff is even less, but the costs are higher, since the transactions are yet more complex. Hence, these systems never payoff and that could

be one of the reasons why we still have systems from the 80s, even the 70s, running in big companies.

I have two points here: First, since the back-bone systems in the companies have been used for so long time, they are very reliable, the clerks know exactly how to work with them for achieving useful information. The systems are well established in the organization and they are almost impossible to get rid of. Second, systems development today means integration of old systems and adoption to new circumstances. This design process is broad, creative and aims at creating something the clerk finds useful in her work. It is very important in such a process to avoid thinking about users. Introducing a user inevitably divides the design in a technical artifact being very smart and used by a naive user. The designer must consider the whole work, not only the technical knowledge and the possessing epistemology but also the knowing, understanding and emancipation of the clerks in their jobs. Since much of this knowledge is tacit and the emancipative action unknown, the obvious solution should be design by the clerks as I suggested in my thesis [37]. N.B. I don't say design by the users, because in doing so I introduce once more an artifact that should be operated. But we have to examine the relation between the clerks and the technical artifact in order to obtain some ideas for further investigation.

## 6 Analysis: Relation clerk – technical artifact

When the clerk is familiar with his or her job, (s)he performs the actions knowingly and relay on knowledge that has become tacit. If the clerk uses a technical artifact in this job, the relation must be self-evident and natural. The clerk does not think of the artifact as something (s)he is using, it is just something that is at hand. In analyzing this relation I turn to Heidegger and his ontology in "Sein und Zeit" [38, 39]. The clerk is, according to Heidegger, "*being-in-the-world*". He defines the concept as: "*The compound expression being-in-the-world indicates, in the very way we have coined it, that it stands for a unified phenomenon.*" ([39] p 49). The unified phenomenon is the clerk and the technical artifact. Heidegger defines the relation (or *association* as he says) between the clerk and the artifact as:

*However, as we showed, the closest kind of association is not mere perceptual cognition, but, rather, a handling, using, and taking care of things, which has its own kind of "knowledge."* (ibid p 62)

Here the things (i.e. the artifacts) are considered as our preliminary theme and established as a pre-phenomenal basis. This means that the artifact is considered as "*that with which one has to do in taking care of things in association (praxis)*". What is important is the artifact is not seen as something that should be operated, it is something that should *be taken care of*. N.B. not used, but taken care of. Heidegger now says "*We shall call the beings encountered in taking care useful things*". He now defines what makes a thing useful: "*what makes a useful thing a useful thing: usable material*". In our example with the clerk the usable material is information, processed with help of the artifact. This is an

aspect very often forgotten in user-oriented research: The result obtained from the CBIS. This is the material for the clerks work. Heidegger means that the useful material always belongs to a useful thing, the useful thing mediates the useful material:

*These things never show themselves initially by themselves, in order then to fill out a room as a sum of real things. What we encounter as nearest to us, although we do not grasp it thematically, is the room, not as what is between the four walls in a geometrical, spatial sense, but rather as material for living*

Applied to our case, this can be interpreted such as the artifact is needed for the clerk to be “alive”, that is, to work. But the clerk does not think of it as something special, it is only a useful thing. Heidegger gives an example with the hammer:

*The less we just stare at the thing called hammer, the more actively we use it, the more original our relation to it becomes and the more undisguisedly it is encountered as what it is, as a useful thing. The act of hammering itself discovers the specific handiness of the hammer. We shall call the useful things kind of being in which it reveals itself by itself handiness.*

Now we have a word, for this specific ability of the artifact: Its *handiness*. It is not the same as usefulness, because usefulness is directed towards some goal. Here we just mean that the artifact is handy, with help of it the clerk can perform his work and live in the world, or in Heideggerian words: The clerk is *being-in-the-world*. Heidegger also express the same ideas as I have above:

*What is peculiar to what is initially at hand is that it withdraws, so to speak, in its character of handiness in order to be really handy. What everyday association is initially busy with is not tools themselves, but the work. What is to be produced in each case is what is primarily taken care of and is thus also what is at hand.*

I think Heidegger [39] has helped me to understand what it means for a clerk working and producing useful things with handy artifacts. I have described an intrinsic and not-so-easy to grasp relation between the clerk and the artifact.

However Lamb & Kling [12] have a point when they emphasize the social aspects. No work is performed in isolation but instead in an organizational setting. Giving the clerks too much freedom can cause more trouble than benefits. In a report from Linköping university [40] the use of a learning management system is evaluated. The teachers had great freedom to organize their teaching stuff and consequently every teacher had his own structure. The pupils had great problems in coping with at least 10 different structures, organized with different principles. A design of the platform, imposing some specific and common structure would have been much helpful. Of course some personalization above that must be allowed. I have great confidence that the teachers could cope with a common structure and still preserve their professional work. After all, that’s part of their job: Be able to handle different types of artifacts imposed upon them from outside.

But now the great 10 000€ question arises: How do we design such an artifact?

## 7 Conclusion: Designing a workflow

The question is wrong! We shall not design an artifact; we shall design a workflow. The clerk has a lot of artifacts at hand, knowing how to use them. The question is how they should be used in order to provide the desired information.

Let's take an example. Suppose the clerk is planning a project with a planning system. It provides certain functions of which the clerk probably uses only a fraction. In the planning work, the clerk also needs functions not provided by the planning system. (S)he then uses other systems at hand, such as Excel, Word, e-mail, web-browsers etc. to perform these functions. The clerk does not think of these as specific artifacts or systems and (s)he does not do any specific design or previous analysis. (S)he just uses these tools. When a skilled systems designer look at it from outside, he can for sure design a much more efficient system for this specific task. But since the tasks of a modern clerk seldom is repetitive, such a system will never payoff. Expressed in design terms we have a user-designed system and a user who is designing her system. But the clerk is not aware of that and does not need either, the systems are *being-in the-world* and the clerk takes care of them for producing useful things in this case: Information for decisions.

Certain of these artifacts can be used for only one thing. The planning system can be used for planning only. An order entry system can be used for entering orders only. When the clerk uses them (s)he is planning, receiving orders etc. But other artifacts, such as for instance Excel, can be used for a variety of tasks. When the clerk uses Excel, it is for performing certain required tasks in a work-flow, in many cases ad hoc based. In fact, Excel can be seen as a design tool for its user in his work. In my thesis [3] I noted that the clerks talked about "this way of working" and were absolutely not talking about any kind of system, development or design. As Heidegger said above: "*What everyday association is initially busy with is not tools themselves, but the work*". Hence, what should be designed is part of the clerk's work. Seen from an individual viewpoint, the possibility to move information from one artifact to another, being aware what it really means [41] is the critical design issue. The clerks have to create a workflow for doing this and they need appropriate tools for doing this. Excel helps a lot, but there must be other tools too!

## 8 Summary

To summarize: I don't think "users" is a good concept, it focuses on the system and the user becomes an operator of it. Instead the focus should be on the work. In their work the clerks have already managed to integrate and combine different systems in order to do their job. Some of these systems can perform only one task and other systems are used for ad hoc based design of work and workflow. The clerk needs better and more handy tools for creating this workflow. If an artifact is to be used by several people it must provide a common structure, which over the time is accepted and integrated by the people using it. But every single person using the artifact, use it in his or her own way, creating an individual workflow. The workflow becomes a handy phenomenon, creating

important information. This was also Nurminen's idea in the paper in Oulu 1981 [1] and in his book from 1988 [31]. However, Markku was only against systems, now I think he would agree being also against users!

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