# [**Human-Computer Interaction: Introduction and Overview**](http://mcom.cit.ie/staff/Computing/prothwell/hci/papers/HCIIntro.pdf)**, Butler *et al.*, Proceedings of ACM CHI 1999, pp100-101.**

**GOMS** is a specialized [human information processor model](https://en.wikipedia.org/wiki/Human_information_processor_model) for [human-computer interaction](https://en.wikipedia.org/wiki/Human-computer_interaction) observation that describes a user's cognitive structure on four components. In the book *The Psychology of Human Computer Interaction*.[[1]](https://en.wikipedia.org/wiki/GOMS#cite_note-psychology-1) written in 1983 by the authors introduce: "a set of **Goals**, a set of **Operators**, a set of **Methods** for achieving the goals, and a set of **Selections rules** for choosing among competing methods for goals."[[1]](https://en.wikipedia.org/wiki/GOMS#cite_note-psychology-1) GOMS is a widely used method by usability specialists for computer system designers because it produces quantitative and qualitative predictions of how people will use a proposed system.

http://www.cs.umd.edu/class/fall2002/cmsc838s/tichi/printer/goms.html

An important concept in user interface software is to separate the design of an interactive system into distinct levels, i.e., the conceptual, semantic, syntactic, and lexical levels, and to develop a design Ior each level

Hand-mounted sensors allow the user to interact with these images as if they were real objects located in space surrounding him or her.

[**The Importance of Designing Usable Systems**](http://mcom.cit.ie/staff/Computing/prothwell/HCI/papers/susandray.pdf), Dray Susan, Interactions, Jan. 1995.

the means by which the user and a computer system interact, in particular the use of input devices and software.

The UI is made up of everything that the user experiences, sees and does with the computer system.

**This includes:**

* l the match with the tasks of the user
* l the metaphor that is used (e.g., the desktop, etc.)
* l the controls and their behaviors l navigation within and flow between screens l
* integration among different applications l the visual design of the screens

New Ui systems help and make it better to get more information,

Not surprisingly, the UI represents an increasingly large portion of the investment in I/T.

GUIs require a significant portion of total code for an application.

Recent data suggest that:

* l the user interface is 47% to 60% of the lines of code [l]
* l a GUI is minimally 29% of the software development project budget[2]
* l a GUI may take as much as 40% of the development effort [3]

Failure to properly consider the user inter&e can also impact the bottom line. Examples of UI problems defeating major system development projects are common [4].

For example:

l An insurance company invested $3 million in an application to be used by independent agents to support them in selling this company’s products.

However, agents simply refused to use the application, because the interface was “unlearnable and unusable.”

l A financial services company had to scrap an application it had developed, when, shortly before implementation, developers doing a User Acceptance test found a fatal flaw in their assumptions about how data would be entered. By this time, it was too late to change the underlying structure, and the application never implemented.

l In a Customer Service organization, training on the system took six months, but employees typically had a tenure of only 18 months in this department.

l Extensive and expensive functionality in a Human Resources system was not used at all because users forgot how to access it a mere week after training.

**Designing Usable Systems**

Well-designed systems are “usable”: They work the way the user thinks they should and let the user focus on the task without having to pay attention to the technology tool itself UI.

**Benefits of Good UI Design**

* **reduced errors**
* **l lower support costs**
* **l lower initial training costs, and greatly \ reduced retraining**
* **l less productivity loss when the system is introduced, and more rapid recovery**
* **l more focus on tasks to be done, rather than on the technology tool**
* **l lower turnover and better morale l reduced rework to meet user requirements**
* **l high transfer of skills across applications, further reducing training needs**
* **l fuller utilization of system fimctionality**
* **l higher service quality**
* **l higher customer satisfaction.**

An IBM study showed that end-user training for an internal system with a welldesigned front-end was one hour, as compared to one week for similar systems without such a front-end [4].

User-centered design methods also have been shown to have quantifiable benefits. Clearly, anything which makes it easier to identify and fur errors early has a significant impact on the cost of the system. User-centered design methods, such as evaluating paper prototypes with users, improve communication between the business and I/T early on, so as to reduce later redesign costs.

[**The Human Interface**](http://mcom.cit.ie/staff/Computing/prothwell/HCI/papers/The%20Human%20Interface.pdf), A. J. Dix (1994). [***Assembly Automation***](http://www.emeraldinsight.com/aa.htm), **14**(3): 9-13.

The interfaces to office systems have changed dramatically over the last decade. However, some care is needed in transferring the idioms of office-based systems into the industrial domain. Office information is primarily textual and slow varying, whereas industrial interfaces may require the rapid assimilation of multiple numeric displays, each of which is varying in response to the environment. Furthermore, the environmental conditions may rule out certain interaction styles (e.g., the oil soaked mouse). Consequently, industrial interfaces raise some additional design issues rarely encountered in the office.

For example, a data value might be given both in a precise numeric field and also in a quick to assimilate graphical form. In addition, the same information can be shown on several screens. However, the information is not located in physical space and so vital clues to context are missing - it is easy to get lost navigating complex menu systems. Also, limited display resolution often means that an electronic representation of a dial is harder to read than its physical counterpart; in some circumstances both may be necessary as is the case on the flight deck of a modern aeroplane.

**Bad interfaces cost money and can be dangerous. Furthermore, in the European Community, this has become a health and safety matter: employers have a legal duty to ensure that their employee's systems have usable interfaces. In a low budget project, a few measures combined with a 'user oriented' attitude can prevent the worst errors in interface design. However, the human interface should attract at least the same level of resources as any other major part of system design. This might involve training existing staff or bringing in an interface consultant. Remember, whether you are considering a single item of equipment or a whole factory, no matter how well engineered it is, if the operators cannot use it, it is useless**

**UI deisgn is complex becaus marking complex systems is clear & understanidng is not easy**

**No Training possible -=> must be easy**

**Indedisciplary**

**integrate hco into existing methods analyis design**

**Subconscious**

**GUI Not equal usable**

**uI - USER FLEXISITY**