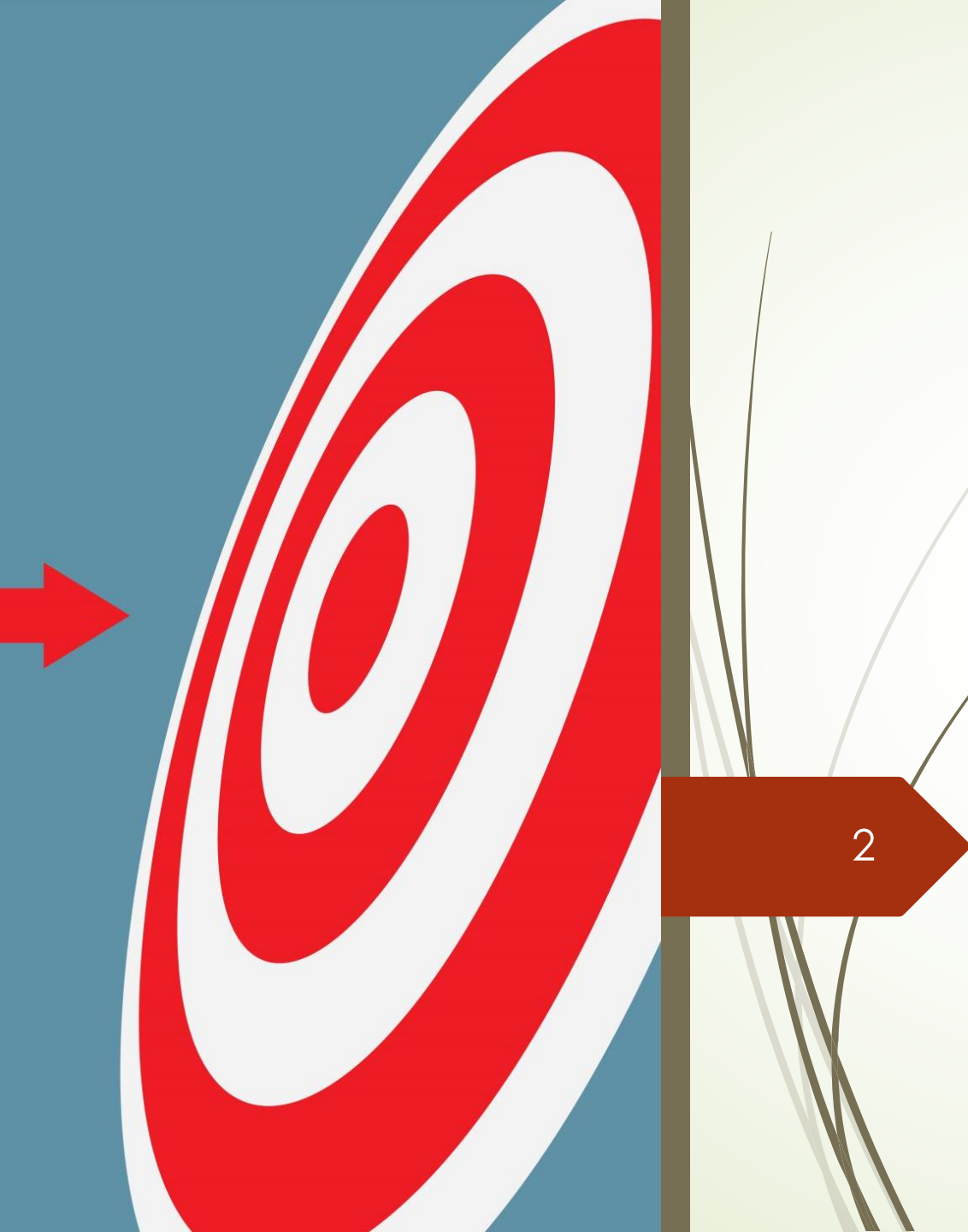# Makerere University Business School
Human Computer Interaction (HCI) for MBA II Informatics Option
Course Code: MBA8170

Facilitators: Prof. JK Bada and Lugemwa Bryan

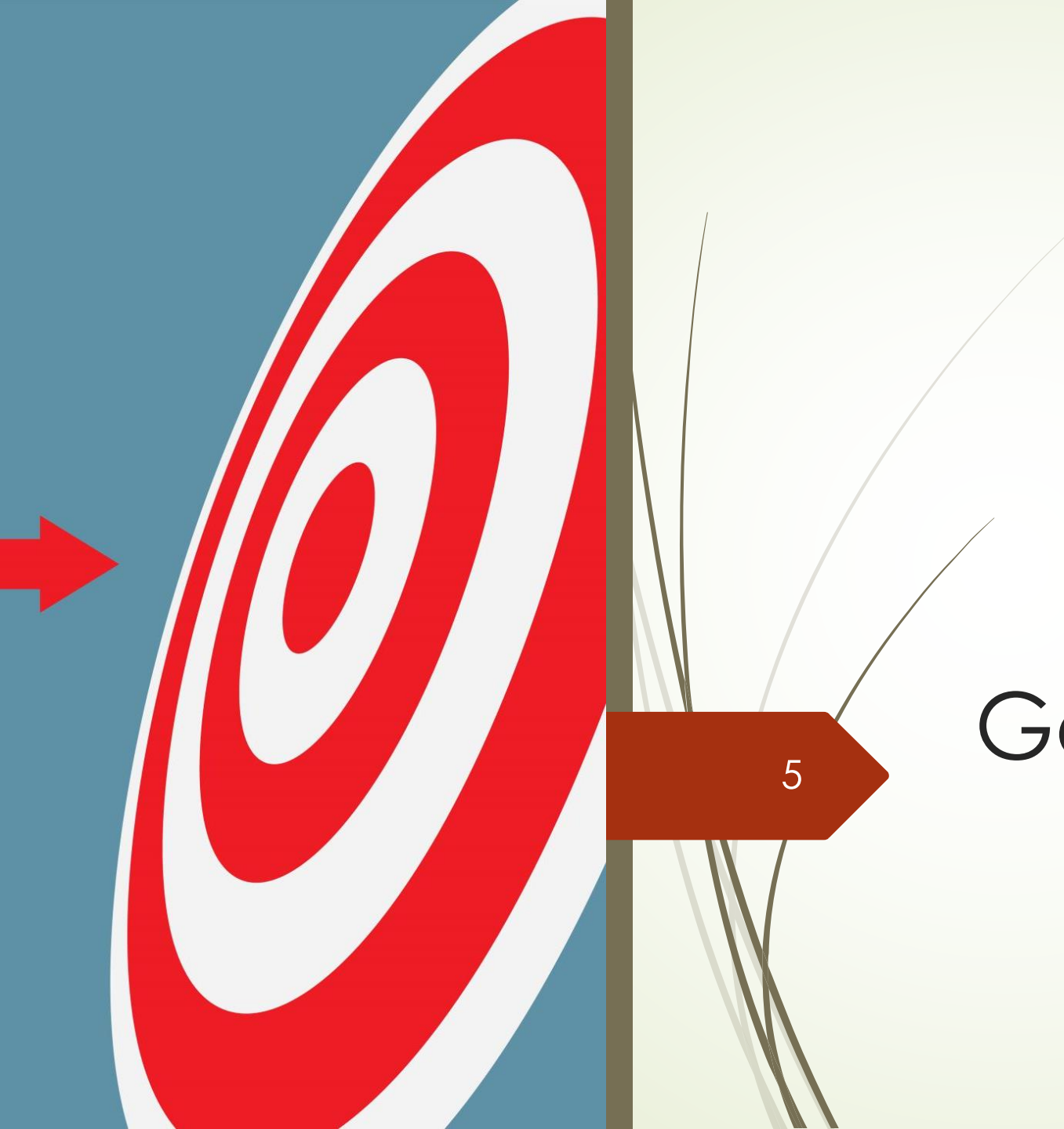**HCI -Usability Goals**

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HCI -Usability Goals

➡ Usability refers to ensuring that interactive products are easy to learn, effective to use, and enjoyable from the user's perspective.

➡ It involves optimizing the interactions people have with interactive products to enable them to carry out their activities at work, at school, and in their everyday lives. More specifically, usability is broken down into the following six goals:

- Effective to use (effectiveness)

- Efficient to use (efficiency)

- Safe to use (safety)

- Having good utility (utility)

- Easy to learn (learnability)

- Easy to remember how to use (memorability)

Usability Goals (Continued)

- Usability goals are typically operationalized as questions.

- The purpose is to provide the interaction designer with a concrete means of assessing various aspects of an interactive product and the user experience.

- Through answering the questions, designers can be alerted very early on in the design process to potential design problems and conflicts that they might not have considered.

- However, simply asking "Is the system easy to learn?" is not going to be very helpful.

- Asking about the usability of a product in a more detailed way—for example,

  - "How long will it take a user to figure out how to use the most basic functions for a new smartwatch; how much can they capitalize on from their prior experience; and how long would it take the user to learn the whole set of functions?"

Goals explained

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Usability Goals (Continued)

Effectiveness is a general goal, and it refers to how good a product is at doing what it is supposed to do.

➤ Question: Is the product capable of allowing people to learn, carry out their work efficiently, access the information that they need, or buy the goods that they want?

Efficiency refers to the way a product supports users in carrying out their tasks.

➤ A highly successful mechanism patented by Amazon.com is the one-click option, which requires users to click only a single button when they want to make another purchase.

➤ Question: Once users have learned how to use a product to carry out their tasks, can they sustain a high level of productivity?

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Usability Goals (Continued)

Safety- involves protecting the user from dangerous conditions and undesirable situations.

- For example, where there are hazardous conditions—such as X-ray machines or toxic chemicals—operators should be able to interact with and control computer-based systems remotely.

The second aspect refers to helping any kind of user in any kind of situation to avoid the dangers of carrying out unwanted actions accidentally. It also refers to the perceived fears that users might have of the consequences of making errors and how this affects their behavior.

Safety Cont'd

Making interactive products safer in this sense involves

(1) preventing the user from making serious errors by reducing the risk of wrong keys/buttons being mistakenly activated (an example is not placing the quit or delete-file command right next to the save command on a menu) and

(2). Providingusers with various means of recovery should they make errors, such as an undo function.

Usability (A safe and unsafe menu. Which is which and why? (b) A warning dialog box for Mac OS X)
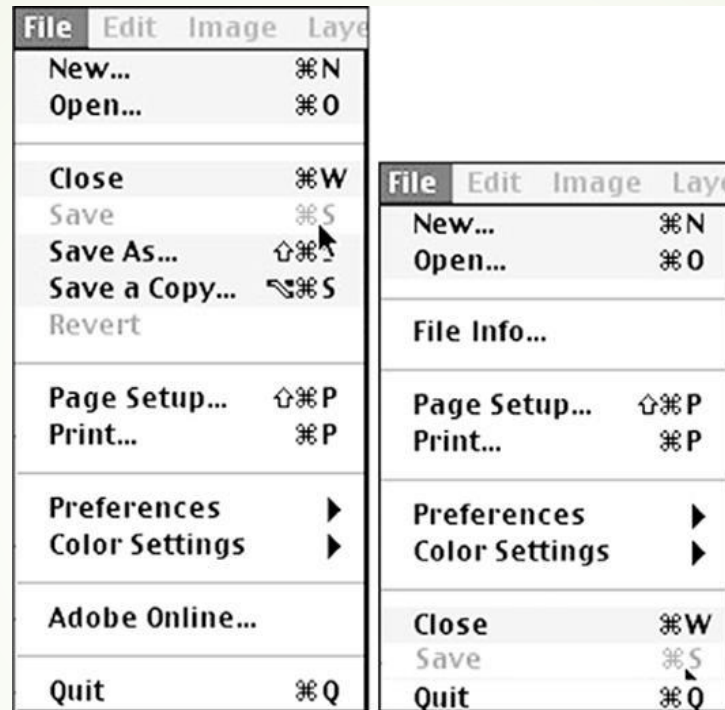
(a)

(b)

Usability - Utility

Utility – refers to the extent to which the product provides the right kind of functionality so that users can do what they need or want to do.

- An example of a product with high utility is an accounting software package that provides a powerful computational tool that accountants can use to work out tax returns.

- An example of a product with low utility is a software drawing tool that does not allow users to draw freehand but forces them to use a mouse to create their drawings, using only polygon shapes.

- Question: Does the product provide an appropriate set of functions that will enable users to carry out all of their tasks in the way they want to do them?

Usability - Learnability

▶ Learnability - refers to how easy a system is to learn to use. It is well known that people don't like spending a long time learning how to use a system.

▶ They want to get started right away and become competent at carrying out tasks without too much effort.

▶ This is especially true for interactive products intended for everyday use (for example social media, email, or a GPS) and those used only infrequently (for instance, online tax forms).

▶ To a certain extent, people are prepared to spend a longer time learning more complex systems that provide a wider range of functionality, such as web authoring tools. In these situations, pop-up tutorials can help by providing contextualized step-by-step material with hands-on exercises.

▶ **Question:** Is it possible for the user to work out how to use the product by exploring the interface and trying certain actions? How hard will it be to learn the whole set of functions in this way?

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Usability - Memorability

➡ ***Memorability –*** refers to how easy a product is to remember how to use, once learned. This is especially important for interactive products that are used infrequently.

➡ If users haven't used an operation for a few months or longer, they should be able to remember or at least rapidly be reminded how to use it.

➡ Users shouldn't have to keep relearning how to carry out tasks. Unfortunately, this tends to happen when the operations required to be learned are obscure, illogical, or poorly sequenced. Users need to be helped to remember how to do tasks.

➡ There are many ways of designing the interaction to support this. For example, users can be helped to remember the sequence of operations at different stages of a task through contextualized icons, meaningful command names, and menu options.

➡ **Question**: What types of interface support have been provided to help users remember how to carry out tasks, especially for products and operations they use infrequently?

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Usability-Experience

➤ Many of these are subjective qualities and are concerned with how a system feels to a user.

➤ They differ from the more objective usability goals in that they are concerned with how users experience an interactive product from their perspective, rather than assessing how useful or productive a system is from its own perspective.

User Experience Goals

A diversity of user experience goals has been articulated in interaction design, which covers a range of emotions and felt experiences. These include desirable and undesirable ones, as shown in Table 1

Table 1: Desirable and undesirable aspects of the user experience		
Desirable aspects		
Satisfying	Helpful	Fun
Enjoyable	Motivating	Provocative
Engaging	Challenging	Surprising
Pleasurable	Enhancing sociability	Rewarding
Exciting	Supporting creativity	Emotionally fulfilling
Entertaining	Cognitively stimulating	Experiencing flow
Undesirable aspects		
Boring	Unpleasant	
Frustrating	Patronizing	
Making one feel guilty	Making one feel stupid	
Annoying	Cutesy	
Childish	Gimmicky	

Understanding Users

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Need to Understand Users

- A main reason for having a better understanding of people in the contexts in which they live, work, and learn is that it can help designers understand how to design interactive products that provide good user experiences or match a user's needs.

- A collaborative planning tool for a space mission, intended to be used by teams of scientists working in different parts of the world, will have quite different needs from one targeted at customer and sales agents, to be used in a furniture store to draw up kitchen layout plans.

- Understanding individual differences can also help designers appreciate that one size does not fit all; what works for one user group may be totally inappropriate for another. For example, children have different expectations than adults about how they want to learn or play.

Cont'd

- They may find having interactive quizzes and cartoon characters helping them along to be highly motivating, whereas most adults find them annoying.

- Conversely, adults often like talking-head discussions about topics, but children find them boring.

- Being aware of cultural differences is also an important concern for interaction design, particularly for products intended for a diverse range of user groups from different countries.

  - An example of a cultural difference is the dates and times used in different countries.

Understanding Users (continued)

- In the United States, for example, the date is written as month, day, year (05/21/20), whereas in other countries, it is written in the sequence of day, month, year (21/05/20).

- This can cause problems for designers when deciding on the format of online forms, especially if intended for global use.

- It is also a concern for products that have time as a function, such as operating systems, digital clocks, or car dashboards. To which cultural group do they give preference? How do they alert users to the format that is set as the default?

- This raises the question of how easily an interface designed for one user group can be used and accepted by another.

Accessibility and Inclusiveness

Accessibility and Inclusiveness

➡ Accessibility refers to the extent to which an interactive product is accessible by as many people as possible. Companies like Google and Apple provide tools for their developers to promote this.

➡ The focus is on people with disabilities. For example, Android OS provides a range of tools for those with disabilities, such as hearing aid compatibility to a built-in screen reader,

➡ while Apple VoiceOver lets the user know what's happening on its devices, so they can easily navigate and even know who is in a selfie just taken, by listening to the phone.

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Accessibility and Inclusiveness (continued)

- Inclusiveness means being fair, open, and equal to everyone. Inclusive design is an overarching approach where designers strive to make their products and services accommodate the widest possible number of people.
  - An example is ensuring that smartphones are being designed for all and made available to everyone—regardless of their disability, education, age, or income

- Accessibility can be achieved in two ways: first, through the inclusive design of technology, and second, through the design of assistive technology.

- When designing for accessibility, it is essential to understand the types of impairments that can lead to disability, as they come in many forms.

- They are often classified by the type of impairment, for example:

- Sensory impairment (such as loss of vision or hearing)

- Physical impairment (having loss of functions to one or more parts of the body, for example, after a stroke or spinal cord injury)

- Cognitive (for instance, learning impairment or loss of memory/cognitive function due to old age or a condition such as Alzheimer's disease)

Cont'd

- Within each type is a complex mix of people and capabilities. For example, a person might have only peripheral vision, be color blind, or have no light perception (and be registered blind).

- All are forms of visual impairment, and all require different design approaches. Color blindness can be overcome by an inclusive design approach.

- Designers can choose colors that will appear as separate colors to everyone. However, peripheral vision loss or complete blindness will often need an assistive technology to be designed.

Accessibility and Inclusiveness (continued)

➤ Impairment can also be categorized as follows:

- Permanent (for example, long-term wheelchair user)

- Temporary (such as after an accident or illness)

- Situational (for instance, a noisy environment means a person can't hear)

➤ The number of people living with permanent disability increases with age.

➤ Fewer than 20 percent of people are born with a disability, whereas 80 percent of people will have a disability once they reach 85. As people age, their functional abilities diminish.

➤ For example, people older than 50 often find it difficult to hear conversations in rooms with hard surfaces and lots of background noise. This is a disability that will come to most of us at some point.

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Accessibility and Inclusiveness (continued)

- People with permanent disabilities often use assistive technology in their everyday life, which they consider to be life-essential and an extension of their self.

  - Examples include wheelchairs (people now refer to "wearing their wheels," rather than "using a wheelchair") and augmented and alternative communication aids.

- Current HCI research into disability explores how new technologies, such as IoT, wearables, and virtual reality, can be used to improve upon existing assistive technologies.

********THE END********