# User Interface Design A Software Engineering Perspective

Software prototyping The purpose of a prototype is to allow users of the software to evaluate developers' proposals for the design of the eventual product by actually Software prototyping is the activity of creating prototypes of software applications, i. , incomplete versions of the software program being developed. It is an activity that can occur in software development and is comparable to prototyping as known from other fields, such as mechanical engineering or manufacturing. e. early 1970s 80f0df6630

Software design Software design is the process of conceptualizing how a software system will work before it is implemented or modified. Software design also refers to Software design is the process of conceptualizing how a software system will work before it is implemented or modified 80f0df6630

== Part of the overall process == 80f0df6630 Interaction design borrows from a wide range of fields like psychology, human-computer interaction, information architecture, and user research to create designs that are tailored to the needs and preferences of users. This involves understanding the context in which the product will be used, identifying user goals and behaviors, and developing design solutions that are responsive to user needs and expectations. 80f0df6630 User experience design is a conceptual design discipline rooted in human factors and ergonomics. This field since the late 1940s has focused on the interaction between human... 80f0df6630 Interaction designers are often employed... 80f0df6630 == Three types of user interfaces == 80f0df6630 Object-oriented design patterns typically show relationships and interactions between classes or objects, without specifying the final application classes or objects that are involved. Patterns that imply mutable state may be unsuited for functional programming languages. Some patterns can be rendered unnecessary in languages that have built-in support for solving the problem they are trying to solve, and object-oriented patterns are not necessarily suitable for non-object-oriented languages. 80f0df6630 User interfaces are the points of interaction between users and designs. 80f0df6630 In terms of the waterfall development process, software design is the activity that occurs after requirements analysis and before coding. Requirements analysis... 80f0df6630 == Designing == 80f0df6630 Jakob Nielsen defines the OOUI in contrast to function-oriented interfaces: "Object-oriented interfaces are sometimes described as turning the application inside-out as compared to function-oriented interfaces. The main focus of the interaction changes to become the users' data and other information objects that are typically represented graphically on the screen as icons... 80f0df6630

User experience design focuses solely on the design of a computer interface, UX design encompasses all aspects of a user's perceived experience with a product or website, such User experience design (UX design, UXD, UED, or XD), upon which is the centralized requirements for "User Experience Design Research" (also known as UX Design Research), defines the experience a user would go through when interacting with a company, its services, and its products. Unlike user interface design, which focuses solely on the design of a computer interface, UX design encompasses all aspects of a user's perceived experience with a product or website, such as its usability, usefulness, desirability, brand perception, and overall performance. UX design is also an element of the customer experience (CX), and encompasses all design aspects and design stages that are around a customer's experience. User experience design is a user centered design approach because it considers the user's experience when using a product or platform. Research, data analysis, and test results drive design decisions in UX design rather than aesthetic preferences and opinions, for which is known as UX Design Research 80f0df6630

A prototype typically simulates only a few aspects of, and may be highly different from, the final product. 80f0df6630 Testing is beneficial as it is often difficult for the designers of a product to understand the experiences of first-time users and each user's learning curve. UCD is based on the understanding of a user, their demands, priorities and experiences, and can lead to increased product usefulness and usability. UCD applies cognitive science principles to create intuitive, efficient products by understanding users' mental processes, behaviors, and needs. 80f0df6630

Software design pattern A design pattern is not a rigid structure to be copied directly into source code. A design pattern is not a rigid structure to be copied A software design pattern describes a reusable solution to a commonly needed behavior in software. Rather, it is a description of and a template for solving a particular type of problem that can be used in many different contexts, including different programming languages and computing platforms. Design patterns can be viewed as formalized best practices that the programmer may use to solve common problems when designing software. A software design pattern describes a reusable solution to a commonly needed behavior in software 80f0df6630

Prototyping has several benefits: the software designer and implementer can get valuable feedback from the users early in the project. The client and the contractor can compare if the software made matches the software specification, according to which the software program is built. It also allows the software engineer some insight into the accuracy of initial project estimates and whether the deadlines and milestones proposed can be successfully met. The degree of completeness and the techniques used in prototyping have been in development and debate since its proposal in the early 1970s. 80f0df6630 While disciplines such as software engineering have a heavy focus on designing for technical stakeholders, interaction design is focused on meeting the needs and optimizing the experience of users, within relevant technical or business constraints. 80f0df6630

User-centered design User-centered design (UCD) or user-driven development (UDD) is a framework of processes in which usability goals, user characteristics, environment, tasks User-centered design (UCD) or user-driven development (UDD) is a framework of processes in which usability goals, user characteristics, environment, tasks and workflow of a product, service or brand are given extensive attention at each stage of the design process. This attention includes testing which is conducted during each stage of design and development from the envisioned requirements, through pre-production models to post-production 80f0df6630

Graphical user interfaces (GUIs) 80f0df6630 A software engineer applies a software development process to define, implement, test, manage, and maintain software systems. 80f0df6630 The purpose of a prototype is to allow users of the software to evaluate developers' proposals for the design of the eventual product by actually trying them out... 80f0df6630 == Overview == 80f0df6630 Software design also refers to the direct result of the design process – the concepts of how the software will work which may be formally documented or may be maintained less formally, including via oral tradition. 80f0df6630

Object-oriented user interface the User with OVID: Bridging User Interface Design and Software Engineering MacMillan, 1998 van Harmelen, M. If a business application has an OOUI, the user may be selecting and/or invoking actions on objects representing entities in the business domain such as customers, products or orders. In an OOUI, the user interacts explicitly with objects that represent entities in the domain that the application is concerned with. Many vector drawing applications, for example, have an OOUI – the objects being lines, circles and canvases. The user may explicitly select an object, alter its properties (such as size or colour), or invoke other actions upon it (such as to move, copy, or re-align it). Object Modelling and User Interface Design In computing, an object-oriented user interface (OOUI) is a type of user interface based on an object-oriented programming metaphor, and describes most modern operating systems ("object-oriented operating systems") such as MacOS and Unix. , ed 80f0df6630

People who produce designs are called designers. The term 'designer' usually refers to someone who works professionally in a design field. Within the professions, the word 'designer' is generally qualified by the area of practice (for example: a fashion designer, a product designer, a web designer, or an interior designer), but it can also... 80f0df6630 The design process enables a designer to model aspects of a software system before it exists with the intent of making the effort of writing the code more efficiently. Creativity, past experience, a sense of what makes "good" software, and a commitment to quality are success factors for a competent design. 80f0df6630 A software design can be compared to an architected plan for a house. High-level plans represent the totality of the house (e.g., a three-dimensional rendering of the house). Lower-level plans provide guidance for constructing each detail (e.g., the plumbing lay). Similarly, the software design model provides a variety of views of the proposed software solution. 80f0df6630

Design Spatial design Strategic design Systems architecture Systems design Systems modeling Type design Urban design User experience design User interface design Vexillography A design is the concept or proposal for an object, process, or system. A design is expected to have a purpose within a specific context, typically aiming to satisfy certain goals and constraints while taking into account aesthetic, functional and experiential considerations. The word design refers to something that is or has been intentionally created by a thinking agent, and is sometimes used to refer to the inherent nature of something – its design. The verb to design expresses the process of developing a design. Traditional examples of designs are architectural and engineering drawings, circuit diagrams, sewing patterns, and less tangible artefacts such as business process models. In some cases, the direct construction of an object without an explicit prior plan may also be considered to be a design, such as in arts and crafts 80f0df6630

User interface design The goal of user interface design is to make the user's interaction as simple and efficient as possible, in terms of accomplishing user goals (user-centered design). In computer or software design, user interface (UI) design primarily focuses on information architecture. UI design refers to graphical user interfaces and other forms of interface design. User-centered design is typically accomplished through the execution of modern design thinking, which involves assessing matters from the target audience's viewpoint, defining a problem statement, ideating potential solutions, prototyping wireframes, and testing prototypes in order to refine final interface mockups. It is the process of building interfaces that clearly communicate to the user what's important. User interface (UI) design or user interface engineering is the design of user interfaces for machines and software, such as computers, home appliances User interface (UI) design or user interface engineering is the design of user interfaces for machines and software, such as computers, home appliances, mobile devices, and other electronic devices, with the focus on maximizing usability and the user experience 80f0df6630

== History == 80f0df6630 Users interact with visual... 80f0df6630 Patterns originated as an architectural concept by Christopher Alexander as early as 1977 in A Pattern Language (cf. his article, "The Pattern of Streets," JOURNAL OF THE... 80f0df6630

Interaction design " While interaction design has an interest in form (similar to other design fields), its main area of focus rests on behavior. identifying user goals and behaviors, and developing design solutions that are responsive to user needs and expectations. While disciplines such as software engineering Interaction design, often abbreviated as IxD, is "the practice of designing interactive digital products, environments, systems, and services. This element of interaction design is what characterizes IxD as a design field, as opposed to a science or engineering field. Rather than analyzing how things are, interaction design synthesizes and imagines things as they could be 80f0df6630

== History == 80f0df6630 UCD differs from other product design philosophies in that it tries to optimize the product around how users engage with the product, so that users are not forced to change their behavior and expectations to accommodate the product. The users are at the focus, followed by the product's context, objectives... 80f0df6630

Software engineering It involves applying engineering principles and computer programming expertise to develop software systems that meet user needs. A software engineer applies a software development Software engineering is a branch of both computer science and engineering focused on designing, developing, testing, and maintaining software applications. applying engineering principles and computer programming expertise to develop software systems that meet user needs 80f0df6630

== History == 80f0df6630