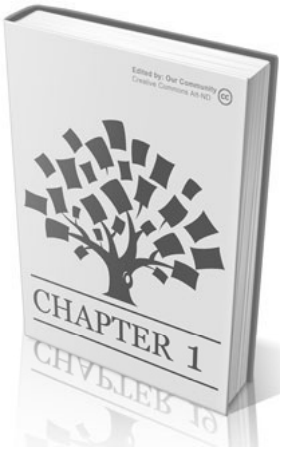
1. Interaction Design

by Jonas Lowgren. How to cite in your report.



The aim of the following chapter is to provide an introductory overview of the concept and the field of interaction design, loosely grounded in historical developments. This encyclopedia covers the full gamut of human-computer interaction (HCI), and it should be noted that interaction design covers only a part of the HCI field. My intention here is to provide a frame of reference that can be used in reading other, more substantial chapters to start filling the notion of interaction design with solid topical content. This chapter itself is brief and superficial, paints with a broad brush; yet it is my hope that it conveys some of the key characteristics and considerations of interaction design, thus informing the reading of the topical chapters.

In his 2007 book *Designing Interactions*, industrial designer and IDEO founder Bill Moggridge reminisces (p. 14):

> “I felt that there was an opportunity to create a new design discipline, dedicated to creating imaginative and attractive solutions in a virtual world, where one could design behaviors, animations, and sounds as well as shapes. This would be the equivalent of industrial design but in software rather than three-dimensional objects. Like industrial design, the discipline would start from the needs and desires of the people who use a product or service, and strive to create designs that would give aesthetic pleasure as well as lasting satisfaction and enjoyment.
>
> I gave my first conference presentation on the subject in 1984, and at that time I described it as “Soft-face”, thinking of a combination between software and user-interface design [�] we went on thinking of possible names until I eventually settled on “interaction design” with the help of Bill Verplank.”
>
> -- Moggridge, 2007

The interaction design label remained relatively marginal until the mid-1990s; the design community largely considered the behaviors of the virtual world to be a specialty within industrial design. During this period, academia as well as ICT industries were mainly occupied with usability and human factors engineering, focusing on ways to operationalize psychology and ergonomics into methods for creating efficient and error-free interactions to support work tasks.

1.1 Five major characteristics of interaction design

With the increasing penetration of the Internet, the advent of home and leisure computing, and eventually the emergence of digital interactive consumer products, the two cultures of design and engineering gravitated towards a common interest in discretionary use and user experience. Towards the turn of the century, the notion of interaction design started to gain in popularity as a way to acknowledge a more designerly approach to the topic going beyond pure utility and efficiency to consider also aesthetic qualities of use, for example.

Since then, a plethora of professional practices, academic study programs, literatures, networks and venues have formed under the umbrella of interaction design. It goes without saying that there are many different understandings of exactly what interaction design is. I don't see any real point in surveying all these definitions but instead I would like to offer a very simple formulation of interaction design, devised to capture the heritage of the term as outlined above and at the same time draw some demarcation lines to indicate potential edges of the field. It goes like this:

> ***“Interaction design is about shaping digital things for people’s use***

”

This is indeed a simple formulation. However, as we shall see in the following where I discuss one of its elements at a time, it is not entirely without power of discrimination.

The notion of **shaping** is used consciously to suggest a designerly activity (as opposed to, e.g., “building” which suggests engineering, or “making” or “creating” that could refer to more or less anything). More specifically, I find it to be a distinctive trait of interaction design that the gestation process is a Design process, in the capital-D sense of the word. This in turn implies five major characteristics.

1.1.1 Design involves changing situations by shaping and deploying artifacts

In other words, design is about transformation and the means available for the designer to initiate change in a particular situation is ultimately the designed artifact.

For interaction design, this connects to the notion of what the interaction designer designs. I am suggesting the delimitation that interaction designers design digital things more on this below. What that means for now, however, is that changing a situation by devising and implementing, say, a new political initiative could certainly be viewed as a design act but not an act of interaction design.

1.1.2 Design is about exploring possible futures

This seems almost too obvious to point out, but from an academic point of view it might be worth mentioning since it entails a fundamental difference in orientation; analytical and critical studies focus on that which exists, whereas design concerns itself with that which could be. This has epistemological consequences for, e.g., how research is conducted. Framing design as exploration also means that it often makes sense to spend time in early phases on divergent work, essentially looking around in a design space of possibilities before committing to a particular direction. Exploring possible futures in interaction design often involves inviting the future users in various forms of participation.

Claiming that design entails exploring possible futures also means that activities like user studies and summative evaluations in themselves do not constitute interaction design. However, they are often used within interaction design processes, and arguably it makes sense to consider the larger process including fieldwork, innovation and evaluation as a design process in its entirety as the larger process is actually about exploring possible futures.

1.1.3 Design entails framing the “problem” in parallel with creating possible “solutions”

From the notions of changing situations and exploring possible futures follow the conclusion that when we have designed something, the situation in which it is used is no longer the same. This in turn means that analyzing the existing in order to define a “problem” that subsequent design should solve is essentially of limited merit. Exploring possible futures implies not only different “design solutions” but also different “problems.” For contemporary interaction design practice, this has implications such as reconsidering notions of exhaustive specifications before build in favor of perpetual-beta approaches and the like.

A consequence of this characteristic is that traditional systems development and engineering processes, where the aim is to finish descriptive analysis for a requirement specification before creative design begins, are not considered designerly processes. This is quite intentional.

1.1.4 Design involves thinking through sketching and other tangible representations

When sketching snapshots or aspects of possible futures (such as a not-yet-existing product), the designer is not merely copying images from her inner eye. The drawings are micro-experiments that respond with insights into strengths, weaknesses and possible changes in a tight loop of thinking that involves the hand, the senses and the mind. The same notion applies for other sketching media used in design practice. For interaction design, there are particular implications to be observed from the temporal nature of our design material. One of them is that when designing innovative interaction techniques, it may be necessary to sketch in software and hardware rather than staying with lo-fi sketching media.

In general, the notion of sketching is more about the mindset of the designer than about the medium used. If a particular external representation serves to engage the designer in a conversation about the details and implications of a not-yet-finalized idea, and if it is quick, tentative and truly disposable, then it is a sketch. It could be anything from a napkin drawing to a piece of programming code, perhaps even written in the language that is normally used to build products for

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delivery — what matters is the purpose and intention.

1.1.5 Design addresses instrumental, technical, aesthetical and ethical aspects throughout

Each of the possible futures being explored in a design process introduces considerations and tradeoffs in all these dimensions, and there is no obvious way in which they can be sequenced. This holds equally for interaction design: Technical decisions influence the aesthetic qualities of the resulting interaction, instrumental choices on features to offer have ethical repercussions, and so on.

Historically, there has been a tendency in human-computer interaction, usability engineering and human factors to focus on instrumental and technical aspects. Interaction design as a designerly activity would insist that the aesthetical and ethical qualities can never be ignored or factored out. Whether something looks and feels good to use, and whether it makes you comfortable in terms of social accountability and moral standards, has a real impact not only on the overall user experience but also on measurable, instrumental outcomes. For an interaction designer, users are whole people with complex sensibilities and design processes need to be conducted accordingly.

1.2 Digital materials and interaction design

Digital things are what interaction design shapes. This is essentially to say that interaction designers work in *digital materials* — software, electronics, communication networks, and the like. And, as pointed out above, the digital materials pose specific requirements on, e.g., sketching practices. When designing an innovative interaction technique, where there is not much previous experience to rely on, it is sometimes necessary to experiment with constructions in software and/or hardware. Those constructions should be made with a sketching mindset, however, which among other things means that it is quickly made, focuses on behaviors and effects, is disposable and ideally also that it is one among many variations on the same theme (see above).

Historically, the digital things made by interaction designers were largely *tools* — contraptions intended to be used instrumentally, for solving problems and carrying out tasks, and mostly to be used individually. Much of our ingrained best-practice knowledge in the field emanates from this time, expressed in concepts such as user goals, task flows, usability and utility. However, it turns out that digital technology in society today is mostly used for communication, i.e., as a *medium*. And as a medium, it has characteristics that set it apart from previously existing personal and mass communication media. For example, it lowers the thresholds of media production to include virtually anyone, it provides many-to-many communication with persistent records of all exchanges that transpire, and it offers access to ongoing modifications of its infrastructures. These characteristics of what we might call *collaborative media* are only beginning to be understood in interaction design, and one might expect that this will be one of the most significant areas for future conceptual developments in our field.

By limiting the scope of interaction design to digital things (including media), we also *exclude* large parts of service design, organizational design, sociopolitical intervention, and so on. A historical analogy may be the typical experience of an enterprise systems consultant in the 1980s whose client asked for a new system to manage payroll. Analyzing the current situation might have turned up the insight that the old system as such had no major shortcomings, but that the workflow of the personnel department was severely convoluted and crippled. Would the consultant propose a new system anyway, or more rightly point out the need for an organizational development consultant? Or perhaps even try her own hand on organizational intervention?

Similar situations are legion in contemporary interaction design, as the use of digital technology is often deeply intertwined with other aspects of everyday life in the design situations approached by the interaction designer. What I propose — that interaction design creates digital things — should be understood as a recognition of the complexities and professional demands involved in related disciplines such as service design, urban development and political change. Essentially, the position adopted here is that when an interaction design process moves into the territory of non-digital intervention, the ideal scenario would see the establishment of a *multidisciplinary* design team. In practical work, however, this is not always a feasible option. The short-term benefits of being able to deliver must then be weighed against the potential long-term risks of doing a less-than-professional job in a related field.

1.3 People's use and interaction design

People's use is what interaction design shapes digital things for. As indicated above, the historical notion of people's use was tightly connected to workplace settings and instrumental motivations: Use the program to get the job done as quickly, efficiently and correctly as possible. With the growth of digital technology outside the workplace in the form of consumer products came other notions of use, such as using for entertainment and for pleasure. Internet penetration has made way for use as communication, which is arguably today the most prominent kind of use of digital technology.

This broadened understanding of use has had a major impact on interaction design, most notably in the rise of the notion of *user experience* to capture all manners of non-instrumental, aesthetical, emotional qualities in the human use of a digital thing. However, following on from the heritage of digital things as individual tools, user experience in the literature is mostly an individual construct. Qualities that are essential social or communal in their nature, such as ethical implications and aspects of communication, are as yet somewhat underdeveloped in interaction design. Again, with the development of digital things towards collaborative media, one might expect more interest in this area in the near future.

To conclude, interaction design can be understood as shaping digital things for people's use. The practice of interaction design is knowledge-intensive and multidisciplinary at heart. The chapters of this encyclopedia provide much of the relevant knowledge that forms the basis for interaction design practice as well as its scholarship.

1.4 Where to learn more

To me, the most approachable book-length introduction to interaction design is *Designing for interaction: Creating innovative applications and devices* by Dan Saffer (New Riders, 2nd ed., 2009).

Following on from that, *Sketching the user experience: Getting the design right and the right design* by Bill Buxton (Morgan Kaufmann, 2007) offers a very useful treatment of what a designerly approach to the digital materials means and what its implications are in the contemporary ICT industry.

Compared to other design fields, interaction design largely lacks a sense of a historical canon of products, concepts and designers. This is where *Designing interactions* by Bill Moggridge (MIT Press, 2007) comes in. It is an admirable first step towards establishing the much-needed discourse of the interaction design canon, and has a lot to offer for someone learning the field.

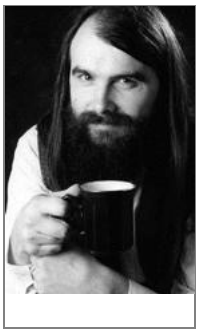
The book *Thoughtful interaction design: A design perspective on information technology* by myself and Erik Stolterman (MIT Press, 2004) introduces a number of concepts for thinking about interaction design processes, skills and practices.

A more extensive annotated bibliography of books pertinent to interaction design can be found at http://www.librarything.com/catalog/jonas.lowgren

The most significant professional network for interaction design is the Interaction Design Association (IXDA), which engages several thousands of interaction designers worldwide. The website at www.ixda.org offers several resources for professional learning and development, including a lively discussion forum. They also organize an annual international conference called Interaction.

Academic research in interaction design is somewhat scattered across venues. The premiere international conference on human-computer interaction is called CHI and is organized annually by ACM since the early 1980s. Its proceedings contain quite a lot of quality interaction-design research, as well as other work that is not as designerly in terms of approach and significance. The ACM also runs a smaller biannual conference called DIS (Designing Interactive Systems) that is more closely limited to interaction design. Moreover, there is a whole range of conferences in related fields where the interaction design student can find relevant material, such as Ubicomp and DPPI (Designing Pleasurable Products and Interfaces).

The academic field of HCI has a broad range of archival journals, where interaction-design research is occasionally published. Examples include *Human-Computer Interaction*, *ACM Transactions on Computer-Human Interaction* and *ACM Computers in Entertainment*. Finally, the magazine called *interactions* from ACM publishes many interaction-design related articles that aim to address professional as well as academic audiences.



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The field of design research in general has less of an academic heritage than the field of HCI, and it comes as no surprise that its selection of academic literature is more limited. A notable exception is the *International Journal of Design*, which has quickly reached a respectable level of academic quality and which publishes interaction-design articles occasionally. Other journals that might be interesting for students of interaction design are *Design Issues* and *Digital Creativity*.