Interaction design has its origins in web and graphic design, but has grown into a realm of its own. Far from merely working with text and pictures, interaction designers are now responsible for creating every element on the screen that a user might swipe, click, tap, or type: in short, the interactions of an experience. This article serves as a good jumping off point for people interested in learning more about Interaction Design. To that end, we’ll briefly cover the history, guiding principles, noteworthy contributors, and tools related to this fascinating discipline.

**Table of Contents**
- What is Interaction Design?
- Common Methodologies
- Daily Tasks
- People to Follow
- Tools of the Trade
- Associations
- IxD Books

**What is Interaction Design?**
Interaction Design (IxD) defines the structure and behavior of interactive systems. Interaction designers strive to create meaningful relationships between people and the products and services that they use, from computers to mobile devices to appliances and beyond. Our practices are evolving with the world.

**The Interaction Design Association (IxDA)**
Interaction design began the day the first screen was designed to hold more than static copy. Everything from a button to a link to a form field is part of interaction design. Over the past several decades, a number of books have been released that explain facets of interaction design, and explore the myriad ways it intersects and overlaps with experience design.

Interaction design has evolved to facilitate interactions between people and their environment. Unlike user experience design, which accounts for all user-facing aspects of a system, interaction designers are only concerned with the specific interactions between users and a screen. Of course, in practice things are never so crisply delineated.

**Common Methodologies**
Although interaction design spans myriad types of web and mobile applications and sites, there are certain methodologies that all designers rely on. We’ll explore some of the more common methodologies here: goal-driven design, usability, the five dimensions, cognitive psychology, and human interface guidelines.

**Goal-Driven Design**
Goal-driven design was popularized by Alan Cooper, in his book *The Inmates Are Running the Asylum: Why High-Tech Products Drive Us Crazy and How to Restore the Sanity*, published in 1999. Alan defines goal-driven design as design that holds problem solving as a highest priority. In other words, goal-driven design focuses first and foremost on satisfying specific needs and desires of the end-user, as opposed to older methods of design, which focused on what capabilities were available on the technology side of things.

Today, some of the points Alan brings up seem obvious, since designers rarely select interactions based solely on development constraints. However, at its heart, the methodology is all about satisfying the end-user’s needs and wants, which is just as necessary today as it ever was.
The process involved in goal-driven design, according to Alan, requires five shifts in the way we think as interaction designers.

5 Tenets of Goal Driven Design

1. Design first; program second.
2. Separate responsibility for design from responsibility for programming.
3. Hold designers responsible for product quality and user satisfaction.
4. Define one specific user for your product.
5. Work in teams of two.

Design first; program second. In other words, goal-driven design begins with considerations for how users interact (and how things look!), rather than beginning with technical considerations.

Separate responsibility for design from responsibility for programming. This refers to the necessity of having an interaction designer who can champion the end-user, without worrying about the technical constraints. A designer should be able to trust his or her developer to handle the technical aspects; in fact Alan Cooper suggests that to do otherwise places the designer in a conflict of interest.

Hold designers responsible for product quality and user satisfaction. Though stakeholders or clients will have their own objectives, the interaction designer has a responsibility to the person on the other side of the screen.

This particular idea has developed into something that is now more commonly associated with user research: personas. Yet Alan reminds us to connect personas back to the product, and constantly ask: where will this person use this? Who are they? What do they want to accomplish?

Work in teams of two. Lastly, interaction designers should never work in a silo. Collaboration with others, which Alan Cooper calls a “design communicator,” is key. Though the design communicator Alan envisioned in 1999 was typically a copywriter intended to provide marketing copy for products, today that has expanded to include a project manager, content strategist, information architect, and many others.

Usability
Usability may feel like a vague term, but at its heart, designers are simply asking “can someone easily use this?” It’s been explained in books and online in a myriad of ways, and we will review a few different definitions to uncover some common themes and nuances:

In the book Human Computer Interaction by authors Alan Dix, Janet E. Finlay, Gregory D. Abowd, Russell Beale, usability is broken down into three principles:

1. Learnability: how easily can a new user learn to navigate the interface?
2. Flexibility: how many ways can a user interact with the system?
3. Robustness: how well are we supporting users when they face errors?

Meanwhile, Nielsen and Schneiderman explain usability as being made up of five principles:

1. Learnability: how easily can a new user learn to navigate the interface?
2. Efficiency: how quickly can users perform tasks?
3. Memorability: if a user hasn’t visited the system in a while, how well will they remember the interface?
4. Errors: how many errors do users make, and how quickly can they recover from errors?
5. Satisfaction: do users enjoy using the interface, and are they pleased with the results?

Lastly, the international standard (ISO 9241) has also broken down the word into five principles:

1. Learnability: how easily can a new user learn to navigate the interface?
2. Understandability: how well can a user understand what they are seeing?
3. **Operability**: how much control does the user have within the interface?
4. **Attractiveness**: how visually appealing is the interface?
5. **Usability compliance**: does the interface adhere to standards?

Clearly, there are common themes that make up what it means for an interface to be “usable.” Regardless of the usability principles a designer follows, it’s an important consideration for any interface.

### The Five Dimensions

In Bill Moggridge’s book of interviews, *Designing Interactions*, Gillian Crampton Smith, an academic in interaction design, introduced the concept of four dimensions of an “interaction design language.” In other words, these dimensions make up the interactions themselves, and as a result they make up the communication between a user and the screen. The four original dimensions are: *words, visual representations, physical objects or space*, and *time*. More recently, Kevin Silver, senior interaction designer at *IDEXX Laboratories*, has added a fifth dimension, *behavior*.

1D: **words** should be simple to understand, and written in such a way that they communicate information easily to the end user.

2D: **visual representations** are all graphics or images, essentially everything that is not text. They should be used in moderation, so as to not overwhelm.

3D: **physical objects or space** refers to the physical hardware, whether it’s a mouse and keyboard, or a mobile device a user interacts with.

4D: **time** is the length that the user spends interacting with the first three dimensions. It includes the ways in which the user might measure progress, as well as sound and animation.

5D: **behavior** was added by Kevin Silver in his article, *What Puts the Design in Interaction Design*. It is the emotions and reactions that the user has when interacting with the system. Using these five dimensions, an interaction designer can pay attention to the very experience the user has when communicating and connecting with a system.

### Cognitive Psychology

Cognitive psychology is the study of how the mind works, and what mental processes take place there. According to the American Psychological Association, these processes include “attention, language use, memory, perception, problem solving, creativity, and thinking.”

While psychology is an immensely broad field, there are a few key elements of cognitive psychology that are particularly valued, and in fact may have helped form the field of interaction design. **Don Norman** called out many of them in his book, *The Design of Everyday Things*. Here are just a few.

- **Mental models** are the images in a user’s mind that inform their expectation of a certain interaction or system. By learning the user’s mental model, interaction designers can create systems that feel intuitive.
- **Interface metaphors** make use of known actions to lead users to new actions. For example, the trash icon on most computers resembles a physical trash can, in order to alert a user to the expected action.
- **Affordances** are things that are not only designed to do something, but that are designed to *look* like they are designed to do something. A button that looks like a physical object you can push, for example, is an affordance designed so that someone unfamiliar with the button will still understand how to interact with it.
**Human Interface Guidelines**
This section is a bit of a misnomer; there actually is no single set of human interface guidelines. However, the idea behind creating human interface guidelines is in itself a methodology. Guidelines have been created by most major technology design businesses, including Apple and Android, Java and Windows. The goal is the same for all of them: to alert prospective designers and developers to advice and recommendations that will help them to create universally intuitive interfaces and programs.

**Daily Tasks and Deliverables**
An interaction designer is a key player throughout the entire development process. They have a set of activities that are key to the project team. These typically include forming a design strategy, wireframing key interactions, and prototyping interactions.

**Design Strategy**
Although the boundaries here are fuzzy, one is certain: an interaction designer will need to know who they are designing for and what the user’s goals are. Typically, this is provided by a user researcher. In turn, an interaction designer will assess the goals and develop a design strategy, either independently or with help from other designers on the team. A design strategy will help team members have a common understanding of what interactions need to take place to facilitate user goals.

**Wireframes of Key Interactions**
After the interaction designer has a good idea of the strategy motivating a design, they can begin to sketch the interfaces that will facilitate the necessary interactions. The devil here lies in the details: some professionals will literally sketch these interactions on a pad/dry-erase board while others will use web applications to aid them in the process, and some will use a combination thereof. Some professionals will create these interfaces collaboratively while others will create them alone. It all depends on the interaction designer and their particular workflow.

**Prototypes**
Depending on the project, the next logical step for an interaction designer might involve the creation of prototypes. There are a number of different ways in which a team might prototype an interaction, which we won’t be covering in extensive detail here, such as html/css prototypes, or paper prototypes.

**Stay Current**
One of the hardest parts about being a practicing interaction designer is the speed of change in the industry. Every day, new designers are taking the medium in a different direction. Consequently, users are expecting these new kinds of interactions to appear on your website. The prudent interaction designer responds to this evolution by constantly exploring the web for new interactions and taking advantage of new technologies—while always keeping in mind that the right interaction or technology is the one that best meets the persona’s needs, and not merely the newest or most exciting. Interaction designers also stay current by following thought leaders (like the notable designers below) on Twitter, and pushing the medium forward themselves.

**People to Follow**
As we noted before, it’s nearly impossible to identify someone as “only” an interaction designer. The field overlaps with UX design, UI design, development, and visual design, and as a result not all the designers listed here even refer to themselves as interaction designers. We’ve included them because of their impact on the field, and because the things they have taught and written about are worth exploring if you yourself work in interaction design.