MULTISCREEN UX DESIGN

DEVELOPING FOR A MULTITUDE OF DEVICES

Wolfram Nagel

MK
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Morgan Kaufmann is an imprint of Elsevier
225 Wyman Street, Waltham, MA 02451, USA

ISBN: 978-0-12-802729-5

British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library.

Library of Congress Cataloging-in-Publication Data
A catalog record for this book is available from the Library of Congress.

CHAPTER

1 Introduction

Users and information offerings are cross-linked ever more strongly. Information is retrieved all day long via a wide array of touchpoints. In this chapter, the influential factors and important terms are discussed in detail.

1.1 MULTISCREEN

Two of the most important assets of the digital society are information and content. The easier they can be retrieved, the more successful the provider will be.

The term *multiscreen* or *multi-screen* is composed of the words "multi" (multiple) and "screen." I prefer the notation without the hyphen because of the hashtag capability and because typographically it looks better. In general, multiscreen means that (multiple) various screens and/or devices are used for or during one activity. In this case, "screen" serves representatively for a device with a firmly built-in screen. With regard to the devices, the term "multidevice" is popular.

> *Multiscreen is about developing a single application for multiple interfaces—one for each screen type: smartphone, tablet, desktop, and television.*
>
> **Radley Marx (cofounder of cloud.tv)**

Information in the (digital) information age

We live in a time in which there is a flood of information (Evsan, 2013c). Due to the Internet, today potentially all users are simultaneously senders and recipients of information that is available at all times. Thus, it has become even more important that information arrives to the recipient(s) as easily as possible. The higher the quality of information, the higher the probability that it is relevant for someone. Offering maximally user-centered, relevant, and exciting information is a challenge that is increasingly gaining in importance in conjunction with cloud-based multiscreen scenarios.

> *Online time is screen time.*
>
> **Luke Wroblewski**

Multiscreen UX Design. DOI: http://dx.doi.org/10.1016/B978-0-12-802729-5.00001-2

1.3 THE BOOK AND ITS USAGE

Principles, patterns, and factors for the strategic development and conception of multiscreen projects

During the past few years, there has been much new knowledge and many new recommendations from the areas of usability, user experience design, interface design, interaction design, website conception, content strategy, and user research. We have compiled them as well as aggregated and continued to develop them for use in the multiscreen context.

Book sections

The book is divided into three main sections. Chapters 2–4 present the most important influential factors: device and/or screen, user, and context of use. Chapter 5 describes and recommends various patterns, principles, approaches, and examples of handling, strategic development, and the conception of multiscreen projects. Chapters 6 and 7 discuss what multiscreen especially means for content flows, processes, workflows, and tools now and in the future.

All methods, sources, prototypes, work materials, and aids serve as recommendations. In this regard, technologies are not in the forefront. The supplemental online platform, http://www.msxbook.com/en, is similarly structured like the book.

Compendium principle

You can read only individual chapters, subchapters or sections—for example, Chapter 4, Section 4.4 titled The Mobile Context of Use or, if you are focusing on the users, Chapter 3 Users and Their Typification. The compendium is supplemented by a comprehensive collection of source materials.

NOTE

At http://www.msxbook.com/en, we provide supplemental content, information, examples, and work materials. All examples and screenshots (in this book) serve as examples. They serve to explain the respective principle or pattern. The applications may also be available on other platforms in addition to the depicted platforms.

The goal of our approach is to help the reader understand users, devices, and other framework conditions and to more quickly be able to begin concrete problem solving and/or task formulation in order to develop sustainable solutions and concepts for constantly changing digital ecosystems. The user is always the main focus. Our recommendations are not patented formulas or ready-to-use cure-alls. It must constantly be weighed which recommendations are best for completing a task. Empathy, creativity, and a detailed requirements analysis are the foundation for a successful project.

Four Main Sections:

FOUR SCREENS
USERS AND THEIR TYPIFICATION
CONTEXT OF USE
STRATEGIES AND EXAMPLES

Principles, patterns and methods

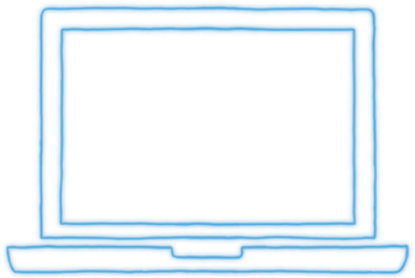
With the multiscreen experience design approach, we describe principles that we find very helpful. We also mention other approaches that are subjectively not our first choice, but perhaps are relevant for your project requirements. You should consider all of them and weigh up what matters most to your project. It is possible that some of the described principles may not function together or are contrary in certain circumstances. You should and will not apply all of them at the same time. It always depends on what you need. It is up to you to choose the appropriate methods and approaches.

Supplemental methods

We recommend examining and developing ideas, concepts, and drafts with suitable design methods. You can find a collection of helpful methods, for example, in the Design Methoden Finder (a German collection of various design methods) at http://www.designmethodenfinder.de.

Because the screen on a tablet is larger than that on a smartphone, the device is better suited for reading, watching films and viewing photos, and writing texts. The tablet is still not regarded as a work device or replacement for the desktop computer. The tablet device class has its justification and constitutes the best option for certain usage purposes. The devices are optimal for media consumption. In a non-desk environment, they can be used substantially more comfortably and conveniently than, for example, a PC on the desktop. With increasing technical developments, corresponding operating systems, interface concepts, and in combination with an external physical keyboard, tablets could perhaps someday supplant desktop computers in some situations. Additional information is available via http://msxbook.com/en/tablet and in Chapter 4 (Section 4.4) and Chapter 5 (Section 5.1).

2.5.3 LAPTOP OR DESKTOP PC



Strengths: Working and obtaining information
Desktop PCs and laptops are used both for work and for recreational purposes. As previously discussed, the classical "computer" is the best device for productivity, completing targeted tasks, and obtaining information in a targeted manner.

And then moving to the laptop, well, for me that's business. That's work. I feel like I've got to be crunching numbers or doing something.

Typical PC user (Google et al., 2012)

PC usage

The percentage of daily media usage on the PC is relatively high. Many people spend much time working on computers, and their work requires a high degree of concentration. The mouse, the keyboard, and the comparatively strong computing power make the desktop computer or the laptop the most efficient and most effective work device—optimal for serious and time-consuming research work. More complex tasks are best executed and completed on PCs.

A PC is primarily used in a stationary environment—this also applies in principle for laptops—and is almost always available at home and at the workstation. A laptop is also suited for mobile situations. The most important motives and needs for PC usage are the thorough search for information, to work productively, and to keep up-to-date. Thus, it is used primarily in the lean forward mode.

Users surf the Internet, obtain information about applications or themes, and (continue to) obtain additional information or interact with the service on another device. In the private sphere, watching online videos and doing complex activities such as vacation planning or monetary transactions are frequently begun on the PC.

When designing cross-device applications and services, the other device classes can be sensibly supplemented, integrated, and combined with the desktop PC (see Section 2.6). Additional information is available via http://msxbook.com/en/laptop and in Chapter 5 (Section 5.7).

2.5.4 SMART TV

This device prototype is an example of all "large screens" (thus also video screens, screen/projector combinations, or other large stationary displays).

Strengths: Entertainment and parallel usage
A TV is well suited for visual information with or without a small amount of text (moving-image contents or photo galleries) and, due to the screen size, also for groups of people. Frequently, another device is used on a parallel basis.

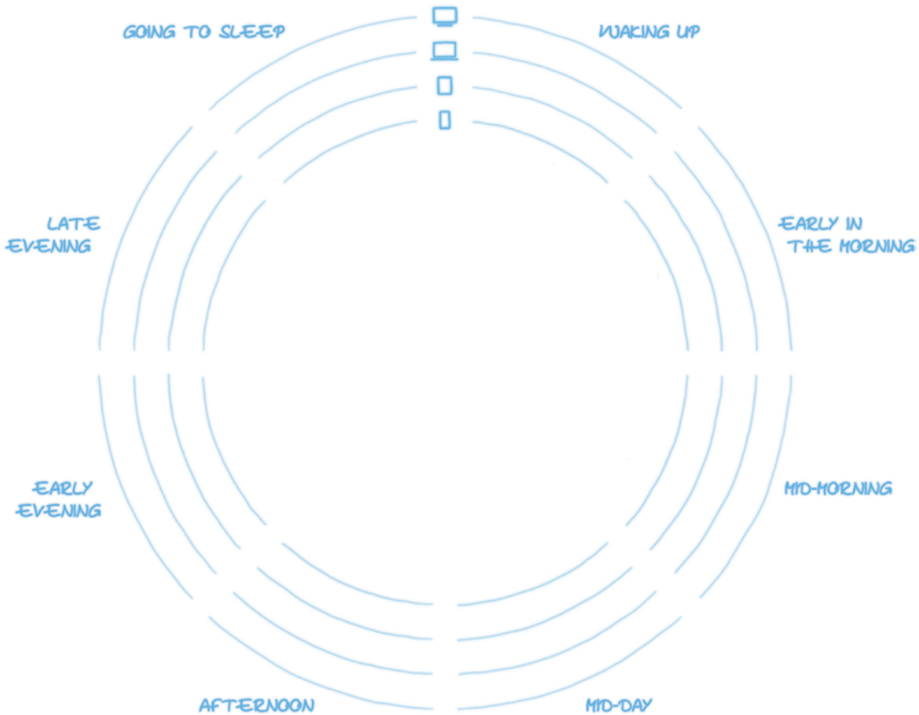
I'm sometimes shopping, sometimes looking for recipes, sometimes typing them up, you know. Sending e-mails, reading, I could do anything on there. It's not often that I just sit and watch TV and do just that.

Typical TV user (Google et al., 2012)

The day flow chart provides a compact overview of a user's daily routine and the device usage in the individual time frames, and it is offered when you primarily would like to find out which device a user will use and when. When there is little time, things must happen quickly, or easy-to-collect information is requested, the day flow is a useful tool.

People are nearly always online; they switch between different screens, but a smartwatch is always on the wrist and information is reachable at a glance (Wroblewski, 2015d). Please consider that if potential users wear and use smartwatches, those screens will almost always on and with the users during the entire day.

A blank form of the multiscreen day flow can be downloaded as a spreadsheet on the website. The day flows for the individual user prototypes are also available there (see http://www.msxbook.com/en/msxdfw).



Multiscreen day flow (blank)

On the blank form, you can enter information regarding the eight time frames (e.g., the precise time of day), regarding the device usage and the user. In the time frames in which the respective device is being used, the line will be drawn thicker. See a filled-out multiscreen dayflow in the example of Larry Newton (Section 3.5.12).

HINT

Print the blank forms on transparent paper, mark the relevant lines on the day flow for each user or persona, and lay all the papers on top of each other to relatively easily determine which time frames and devices are most important to the different personas or user types.

3.3 MOTIVES AND NEEDS

In the *user-centered design* the user is in the forefront. It is a matter of finding out the motives, goals, and needs of the potential users, and the limitations of a product or service and taking them into consideration during the conception and design work. Focus on the users. Only when you know them you should think about devices they use.

While taking the relevant devices and the context of use into consideration, you should anticipate the motives as best as possible in order to be able to adapt and adjust the interface and the application to them. It is important to ponder when, how, where, and why a service could be used with a device. Then the service experience can be designed as best as possible and, as required, influenced.

> *»What we are creating is less a product than a context for experience.«*
>
> **Bill Buxton (Microsoft Research)**

Psychology and user experience design

When it concerns the users' motives and needs, the user experience plays a central role. *User experience design* also always has something to do with psychology and emotion. It concerns not only the functionality and the usability of a product—thus to attain certain goals effectively, efficiently, and satisfactorily (see definition in accordance with DIN ISO 9241-11), but rather also the experience and discovery as well as the fulfillment of human needs during the usage.

Building blocks of a good user experience

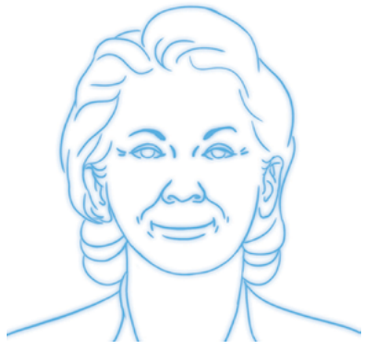
Functionality and usability are the prerequisites for pleasure. In order to experience pleasure, however, functionality and usability are still not enough. Thus, the goal of the methods subsequently introduced is to attain a positive user experience with a user-centered and comprehensive approach (Fischbein, 2010). Pleasure, emotion, psychology, and the user experience are closely related to each other (see Chapter 5, Sections 5.15, 5.12, 5.14, and 5.13).

Marc Hassenzahl and colleagues put the question if it is not possible "to 'design for happiness' by enriching people's everyday lives with positive experiences through artifact-mediated activities." They argue that it is actually the fulfillment (or

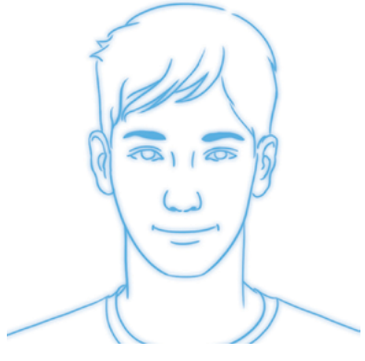
3.5.1 OVERVIEW OF USER PROTOTYPES

As an overview, here we show all of the user prototypes. Additional details can be found on the website at http://www.msxbook.com/en/usptyp.

Margaret Brown
Digital Outsider
Housewife, Retiree (Age 69 Years)



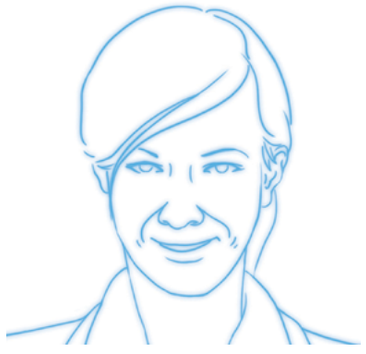
Barbara Stewart
Occasional User (Best Ager)
Housewife, Retiree (Age 61 Years)



Andrew Collins
Trend User (Young)
Pupil/High School Graduate (Age 20 Years)

Mark Hudson
Trend User (Gainfully Employed)
Event Manager/Event Agency (Age 35 Years)

Kelly Adams
Occasional User
Teacher/Temp (Age 47 Years)



Melissa Anderson
Professional User
Assistant to the Executive Management (Age 43 Years)

Robert Sullivan
Digital Pros
IT Entrepreneur (Age 39 Years)

Larry Newton
Digital Avant-Garde
Screen Designer/Clerk (Age 32 Years)

3.5.8 ROBERT SULLIVAN

Digital pros

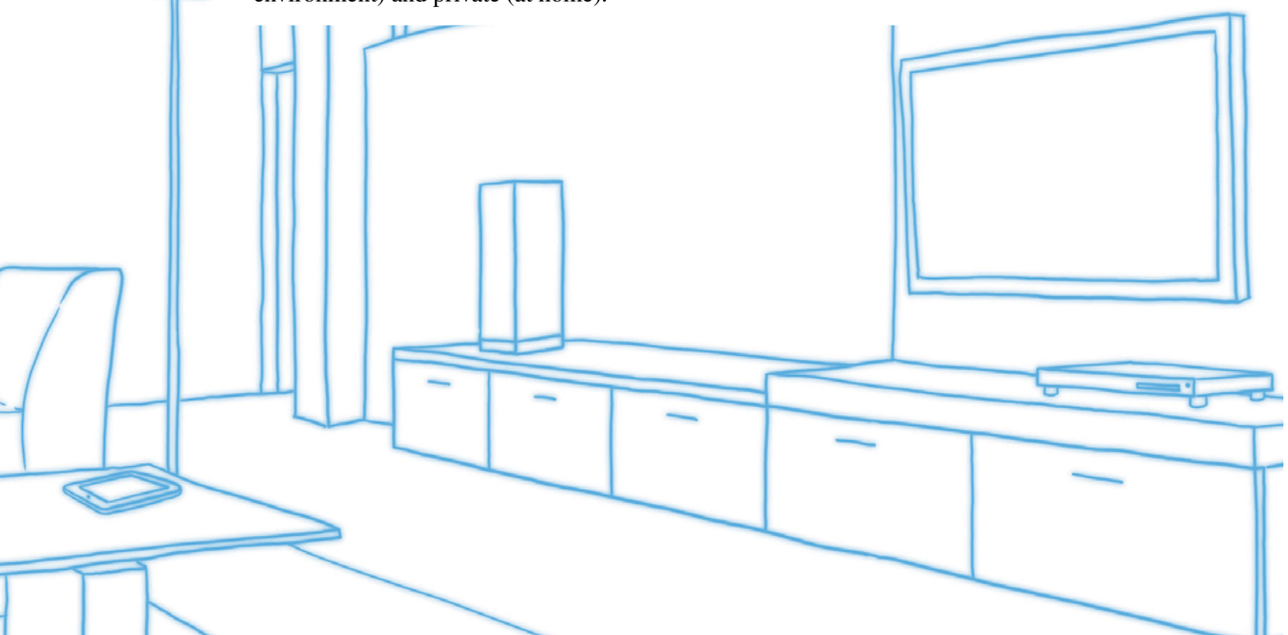
39 years old, in a relationship

IT entrepreneur, studied at a university of applied sciences and did postgraduate studies (earned diploma in informatics and a master's of science)

"Quality has its price. Thus, I always buy the best devices. Then I know that everything will work right. In my home, everything is networked. Regardless of whether it is HDTV, a media hard disk, or my laptops."

Robert's typical day begins very early and ends relatively late. As an entrepreneur, he is in the office or on the go for his job almost the entire day. He carefully structures his minimal free time. He uses his smartphone and laptop for his job; in his private environment, he supplements them with his tablet and his TV.

Robert has very many device touchpoints. His life's motives are predominantly in the areas of discipline, enjoyment, and excitement. He is curious, diligent, ambitious, and distinguishes himself through his top-class work and conscientiousness. His environment alternates very strongly between the workplace (semipublic environment) and private (at home).



3.5.9 LARRY NEWTON

Digital avant-garde

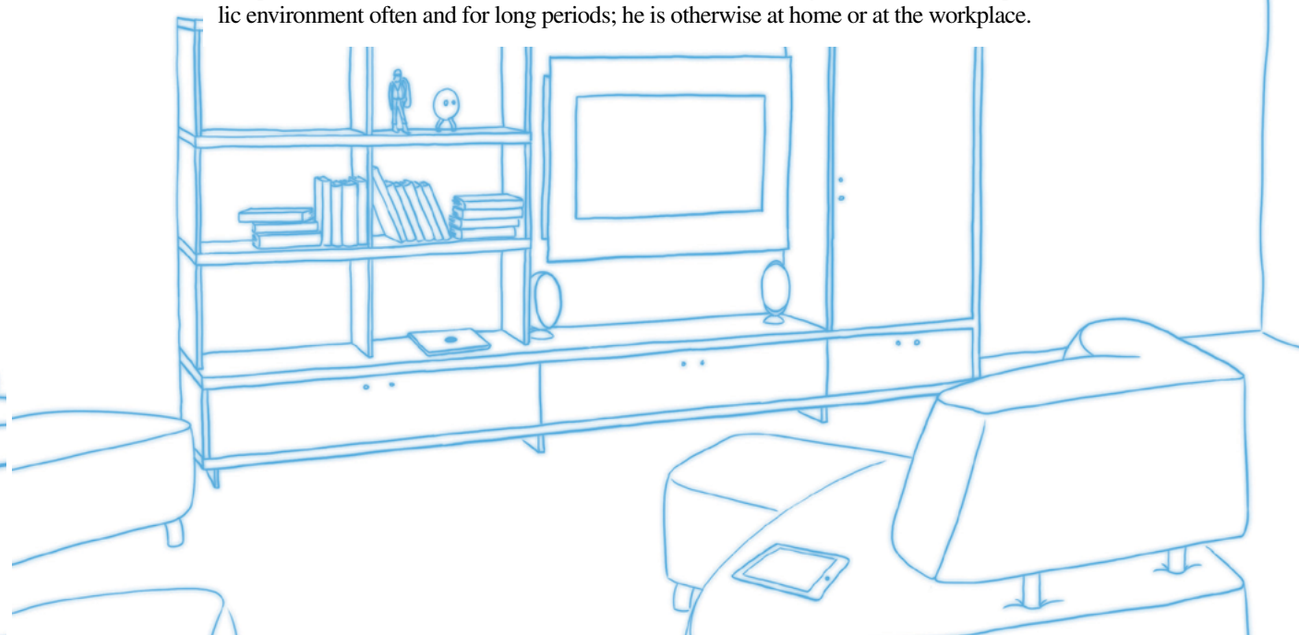
32 years old, single

Screen designer/clerk
University studies (Bachelor of Arts)

"I am always online. I have access to my data from everywhere and with each device. When watching TV, I am using at least one other device upon a parallel basis so that I don't miss anything."

The day begins for Larry at approximately 7:30 a.m. and ends at approximately 11:30 p.m. During the day, he works or gets together with friends. During a typical evening, he uses all devices on a parallel basis at home. He relaxes, surfs and communicates on the Internet or reads digital articles, watches TV on a parallel basis, or sometimes works at the same time on the laptop.

Larry is a multiscreener (see Section 3.5.14). He uses all devices very excessively and has an extremely large number of device touchpoints. His life's motives involve mainly the areas of excitement, enjoyment, and autonomy. He is curious; interested in many things; and places value on social contacts, individualism, and efficiency. He is active in the public environment often and for long periods; he is otherwise at home or at the workplace.



There is no Mobile Web. There is only The Web, which we view in different ways. There is also no Desktop Web. Or Tablet Web.
Stephen Hay (Zero Interface)

4.2 PARAMETERS OF THE CONTEXT OF USE

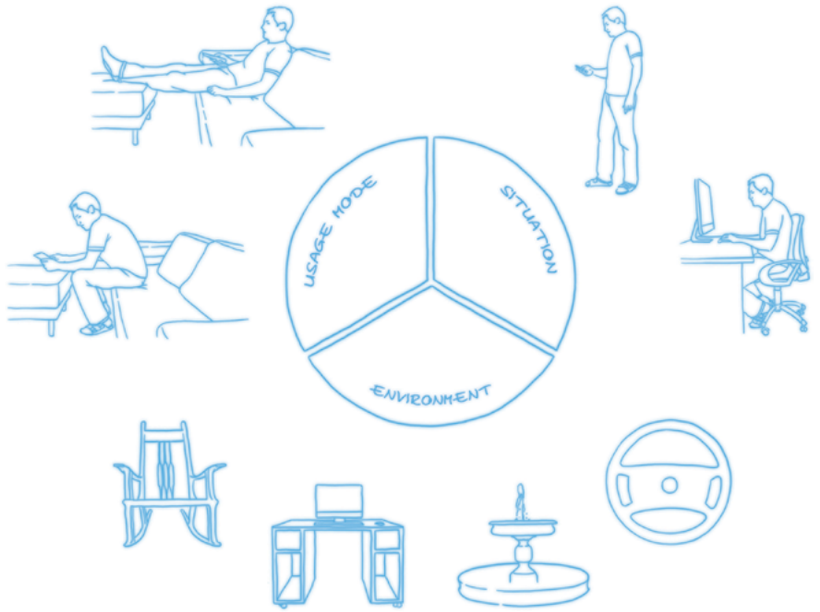
In practice, there is often not enough time or budget to very precisely examine all details. Often, not all details are relevant or known. You never have absolute certainty about the potential usage situation anyway. In these cases, it helps to forecast the context of use and the relevant parameters as best as possible.

The parameters of the context of use

The definition of the context of use can be reduced in simplified form to what is essential. In addition to the *user* (see Chapter 3) and the *device being used* (see Chapter 2), it is characterized by the parameters of the *usage mode* (lean back or lean forward), *situation* (stationary or mobile), and *environment* (private, semipublic sphere, public sphere, and on the go). These parameters influence each other and ultimately define the individual context of use that prescribes the framework conditions. The usage intention (intention, task, or goal) of the user is also co-determining.

In the lean back mode (usually more often in the private environment), the user is predominantly relaxed and passive. Conversely, the *public sphere* is accessible to everyone and not private. As such, based on the project and factors associated with it, you can conclude that users in this environment possibly want no audio output or do not want to use language as an input method because it can be unpleasant for them or even restricted.

An information offering or service must be adapted to the context of use in a maximally flexible manner. In the context, we recommend not differentiating between mobile and stationary. The publisher, provider, and creator of information cannot predict in what context, by whom, and with what device the information will be obtained. Thus, in principle, only one offering is retrieved in various contexts of use.



In addition to the user and the device being used, the context of use is influenced by the parameters of usage mode, situation, and environment.

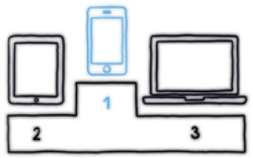
Differentiation between the parameters of situation and environment

A *situation* comprises all the current circumstances that have a determining effect on our action (activity environment). The word "situation" refers to the framework conditions for an activity, the connection to circumstances, or psychologically to the effectiveness of a (clearly) defined circumstance such as an emergency situation, read situation, written situation, speaking situation, stressful situation, or traffic situation.

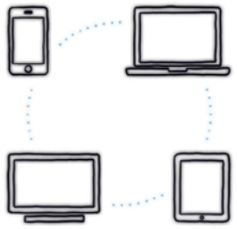
An *environment* generally describes the totality of the natural and social circumstances. Concretely, it involves a group of persons who surround the individual (social environment) or an area that surrounds a location (the physical environment). Synonyms are *milieu* and *surroundings*.

OVERVIEW

There are various patterns, principles, methods, and approaches that you can rely on during the conception of cross-device and cross-platform services. The basis for this is the information presented in Chapters 2–4 regarding device classes, user types, and the context of use. With the aid of the previously described device, persona, and context prototypes and the ideas presented in this chapter, sensible and user-centered concepts and strategies can be developed for various screens. Some of the following patterns are based in part on the classification and definition of *precious design studio* from Hamburg (Stoll and Schardt, 2010). We have expanded, aggregated, and adapted these patterns.



5.1 Mobile first
When you first develop for small screens, this results in a better structuring of the information due to the necessity of reduction.

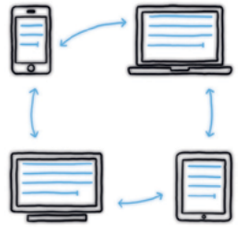


5.2 Simultaneity
Various devices or information offerings are used on a parallel basis whereby the pieces of information can reciprocally complement each other.

5.3 Social TV
Spatially separated viewers can quasi *watch TV together* or directly participate. Broadcasts are recommended by user profiles.

5.4 Device shifting
The displaying of contents and information can be shifted from one device to another device.

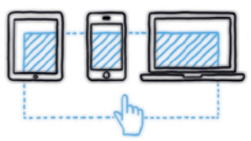
5.5 Complementarity
Both the devices and the information depicted on the screens reciprocally influence, control, and complement each other.



5.6 Synchronization
Information is always synchronized across devices and thus kept updated and to the same degree.

5.7 Screen sharing
An information (source) is displayed across multiple screens and shifted or expanded to them.

5.8 Coherence
A user interface should be comprehensible and understandable across devices as well as displayed similarly and in a logical visual connection.



5.9 Fluidity
Information offerings should function similarly across devices and offer an unchanging and fluid user experience.

5.10 Smart content
The more granular the contents are, the more flexibly they can be utilized and published across devices.

5) INTERACTION WITH THE TV PROGRAM

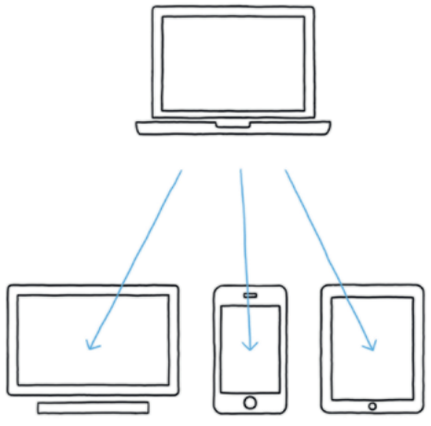
Interaction defines the broadcast and the result: This last step is the most difficult because not only does it involve the users interacting with individual parts of the program and discussing them but also they have an influence on the program's outcome. That means that the interaction of the users guides the program, which is possible with only great difficulty for many programs. However, especially for events and shows, several approaches for this type of interaction can be considered. Votes are the easiest answer, as the *MTV Movie Awards* show. Another option for designing formats that are really interactive is to get users to the program via social media—as occurs with *Rundshow*—or to at least supply contents to them. How interaction can be sensibly integrated into the narration without losing the non-active viewers, is still another major challenge of social TV that must be solved in the future.

In 2012, **MTV** included social media as a decision-maker in the *MTV Movie Awards* program. Via Twitter, users could vote to determine the winner of the award for Best Hero.

Text adopted with courtesy of Bertram Gugel (2012).

5.4 DEVICE SHIFTING

The displaying of contents or information can be shifted from one device to another device. In so doing, the display is alternated between the participating screens. The advantage for users is that they can use as many devices as they desire and/or the currently available devices and the information can be displayed on the preferred device—always suitable for the context of use. The users thus remain very flexible when obtaining information.



If I'm watching TV I won't go upstairs to grab my laptop to follow up on a product I see, I'd just pull out my phone.
Sophie (Google et al., 2012)

Of course, each user has preferred devices for certain activities. Nonetheless, the closest or available device is often used because it is simply more convenient.

Device shifting is also relevant in conjunction with time-delayed information. For example, if you find an interesting article or video during work or on the go, you can bookmark it for later (watch/read later) and continue to read it later or read it in its entirety at a later suitable time. The watch later function has been directly integrated into the video players of YouTube and Vimeo. Bookmarking services with the read later function are Pocket or Instapaper.

Instapaper is a web service that you can use to bookmark online articles in order to read them later on any device of your choice (read later function). To use it, you must merely install a bookmarklet in the browser. The bookmarks can be managed and sorted in a folder. There are also clients for mobile devices. All articles are stored locally on the device and can also be read in pure text display on the go and without an Internet connection. You can change devices at any time and decide on what screen you would like to read your articles. The synchronization (see Section 5.6) takes place automatically as soon as you call up a client or use it and indirectly supports a modified form of device shifting—a type of virtual, time-delayed shifting between the devices (device switching).

With Apple AirPlay (in conjunction with Apple TV), you can change devices in the middle of a film and continue obtaining information on another device. The film is shifted from one (e.g., the iPhone) to another device (e.g., the TV) in order to continue obtaining information on it at the same point. In order to transmit videos via AirPlay to a TV, an Apple TV receiver box is required. For wireless music streaming, Bluetooth can also be used. You can also shift images or the iOS screen to the AppleTV screen.

You can search, find and show details of a restaurant on your smartwatch. If you like to reserve a table (for example), you choose the phone number on the watch and make a phone call with your smartphone. Thus the **smartwatch controls the smartphone**. You start an action on one device and continue and complete it on another (the example shows the Yelp Apple Watch smartphone app). See Section 2.6.2 “Continuous Experience.”

Remote-control release from your wrist: **ProCamera** turns the Apple Watch into a remote shutter with a few other features (e.g., taking multiple shots and setting a timer). Images can be displayed on the watch screen, too. The app also has editing features if you want to do that from your watch.

With **Adobe Nav**, you can move the Photoshop toolbar from the desktop PC to the iPad and conform it so that it can be better operated via the tablet (see Section 5.5) and create more space on the main screen.

In the **Couple Up to Buckle Up** campaign from Scandinavian Airlines, the members are asked to jointly book a trip while using a smartphone. The “2 for 1” offer can be seen only if both of you are using both screens together (Carlsson, 2012; for video, see http://www.msxbook.com/en/cutbu).

Llévalos a la escuela is a project cooperated by ING DIRECT and UNICEF. There a two screens involved. The story begins on a desktop website and ends on a smartphone. The website shows children who are waiting to go to school. The smartphone app acts as a virtual school. When the smartphone (respectively its camera) is held over an orange smartphone-shaped space on the website, one by one the children come off the website and jump into the phone in order to go to school. **All the profits raised via app downloads go to UNICEF’s educational projects. You can support it at** http://www.llevalosalaescuela.com/en.

Brass Monkey is a complementary game in which the browser serves as a console and the smartphone as a controller. Once the browser is synchronized with the phone, you can choose between various games and play them on the desktop browser (see http://playbrassmonkey.com).

are shown in the circle around the map. The motives and needs are located on the map depending on to which need-driver each one is associated with. Thus, the typical user or target group can be classified and appealed to via the respective motives and values (see Chapter 3, Section 3.3.1).

Motives and needs (or rewards and values)

The various research approaches and models regarding essentially the same motives and basic rewards behind human behavior are frequently essentially based on the *Zurich model of social motivation* from Professor Norbert Bischof. Rewards motivate us to do something—to strive for something rewarding (Scheier and Held, 2007). These rewards are comparable to the main motives and emotions from the reward profiles (Scheier and Held, 2007), the Emotion Grid (Roth and Saiz, 2014) and other approaches on which the emotion map (see Chapter 3, Section 3.3.1) and the assessments as well as the daily routines of the user prototypes (see Chapter 3, Section 3.5) are based.

The following comparison between two beer brands highlights the classification of the various motives and rewards. Beer is well-suited as an example because there are hardly objective differences on the product level. The accompanying graphic shows the implicitly measured reward profiles of the brands Jever (green) and Beck's (blue). We have slightly modified the graphic (from Scheier and Held, 2007) and conformed it to the emotion map.

Both beer brands provide the basic reward of enjoyment. That is the practical value that a beer brand is supposed to fulfill. The brands differentiate themselves with regard to other basic rewards. Whereas Beck's appeals to the basic rewards of adventure and excitement with its brand message and young people seeking adventure on a three-master, Jever rewards discipline, harmony, and autonomy with its calming imagery (beach, lighthouse, and sand dunes).

Photos with friendly approval of Jever and Beck's.

Implicit perception and neurodesign

People consciously process only a small fraction of the information that is collected by their sensory organs. The conscious perception can process only 0.0004% of all sensory impressions. Humans subconsciously evaluate the rest. By the time the brain begins to process the tiny fraction of sensory impressions, a person has already subconsciously evaluated enormous quantities of information. He uses the implicit evaluation in order to optimally utilize the consciously perceived information. The conscious perception is thus controlled by the implicit perception. In other words, the subconscious can very quickly process large quantities of information as well as influence and control the conscious perception. Humans can only consciously perceive language and text. Patterns and photos are recognized faster than written words.

Steve Krug recommends providing users with all central information implicitly. The fact that a person cannot perceive more than seven things at the same time is also important. Implicit perceptions can change human behavior. Krug (2005) states, "A fruit juice tastes fruitier depending on the color of the packaging. Test subjects move more slowly when they are confronted subliminally with the term 'age.'"

You can and should take that which is implicit (thus, the findings from neuropsychology) into consideration in a targeted manner in the design process and address the expectations, motives, and needs of the users. The user's expected attitude, the core messages that are to be sent to him, and his implicit perception can be somewhat influenced by neurodesign.

The user should always and directly be rewarded with simplicity and beautiful, sensible content or a feature (see Section 5.15).

Dan Saffer recommends to consider four parts when you build micro-interactions. First, there is any kind of trigger that initiates an action. Rules define what happens in the interaction. Then the user must realize that something is happening and how, he must get feedback by the interface (via a transition, animation, or change of state of an interaction or UI element). And finally, he has to understand and to be clear what next will happen (via Carrie, 2015 and Saffer, 2013b). These four parts and rules (the behavior of the interface) have to be as consistent as possible across different devices and touchpoints, and furthermore should adapt to different situations and the context of use. Perhaps and in some cases they can also incorporate the user and his particular capability and state of knowledge according to the service he is using.

Focus on and improve the little details

When we talk about digital products it is important to focus on the details of the small interaction units of a graphical user interface. Microinteractions are small and subtle visual enhancements of a UI or interaction (e.g., animations, transitions, or a sound). They are always very concrete and well-defined use cases: defining a password, completing a transaction, synchronizing data, favoriting an item, prompting a pop-up message, or regulating volume.

Interactive animations can make an interface more appealing. A well-designed animation can show status and provide feedback, increase the sense of direct manipulation, show the results of the users actions and make an interface comprehensible no matter how complicated and tricky the logic behind it is.

> *The details are not the details. They make the product.*
>
> **Charles Eames**

Microinteractions are an important factor when it comes to how a product "feels." Good microinteractions are not just for the Joy of Use, they also convey a consistent mental model of what happened with the UI. Animations can explain how an interface works.

Surprise your users with an **extraordinary transition**. Icons of the *Google Material Design* styleguide change smoothly from one image to another to serve dual functions at different times.

mytaxi is the first taxi ordering app in Germany. The app on the Apple Watch is very simple. You can find and order a nearby taxi easily by turning your wrist. A Google Maps shows the passenger's position as well as nearby taxis. One tap on the order button suffices. When the driver accepted the tour, the passenger gets helpful information about the driver and the remaining waiting time. At the end of the taxi ride the passenger can easily pay by one tap on his watch and rate the driver (cf. mytaxi, 2015).

The challenge for the Apple Watch user interface was to reduce the app to the absolutely necessary, but to keep the smooth functionality and interaction options that users knew from the smartphone app. You do not need to pull out the app from your pocket, but it's always synchronized and uses internet via iPhone. The service is also available for desktop browsers.

As it is difficult to show animations and motion on a static medium, you should have a look at some animated examples on the web, for example, in the Google Material Design Styleguide. Links to examples and resources can also be found on the website via http://www.msxbook.com/en/mcrjmt.

6.3.2 SMART CONTENT MANAGEMENT

Today, almost everyone is both a creator and a recipient of information at the same time. Websites are not isolated and detached information sites but, rather, dynamic web applications. Via open interfaces, contents can be dynamically compiled like with a construction kit.

Media companies, website operators, publishers, journalists, editorial staffs, and publishing houses need a future-oriented application concept for media-neutral data management and multichannel publishing. They must be able to manage contents from a wide array of sources in a flexible, media-neutral, structured, redundancy-free, and comprehensible manner—that is, in a future-oriented manner in order to then be able to publish them in a device-independent, cross-media, and cross-platform manner. Processes and workflows must be adapted to the looming challenges and complemented, supported, and supplemented by corresponding systems.

An information system should offer the possibilities of networking pieces of information among themselves. In addition to the structure of information and suitable operating concepts, the focus in this regard is on complex data constructs that can be set up by creators and providers in a maximally granular and flexible manner.

COPE is a work- and time-saving system for future-oriented content that functions with various content suppliers and applications (Jacobson, 2009). If it does not matter whether the contents are created in an editorial system such as Medium, in an enterprise CMS (e.g., TYPO3 or Drupal), via Twitter or Facebook, or by any number of users in the form of comments (see Chapter 5, Section 5.12) and the information is then aggregated or managed at a central location, the flexibility increases during the "selection" of software for the content creation. The content creators are unaffiliated and can use their individually preferred tools for creating contents. Such a system is supposed to supply all communication channels, markets, and technical platforms with consistent information (applicable for example, by editorial staffs, publishing houses, TV companies, and media companies). This processing system does not necessarily have to be the content-collecting system but, rather, can also be "fed" via (application programming) interfaces by the content-creation systems.

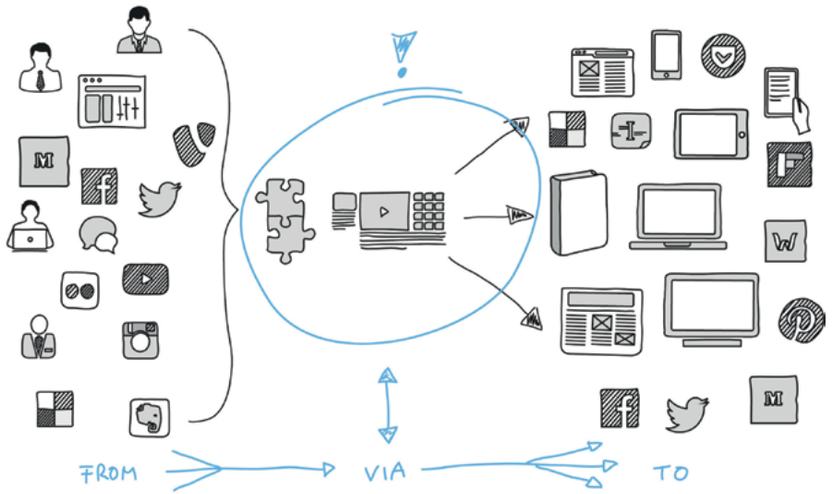
6.3.3 SYSTEM, METHODS, AND PROCESSES

Centralized hub and content channeling

If the CMS or generally a system serves as the centralized content hub for the management of the various information and information sources, information and contents can be managed in a future-oriented manner according to the COPE principle.

"Content management system" is possibly no longer the correct term because not so much is being managed anymore. Accordingly, perhaps terms such as "content channeling system" or "content workflow system" are more suitable.

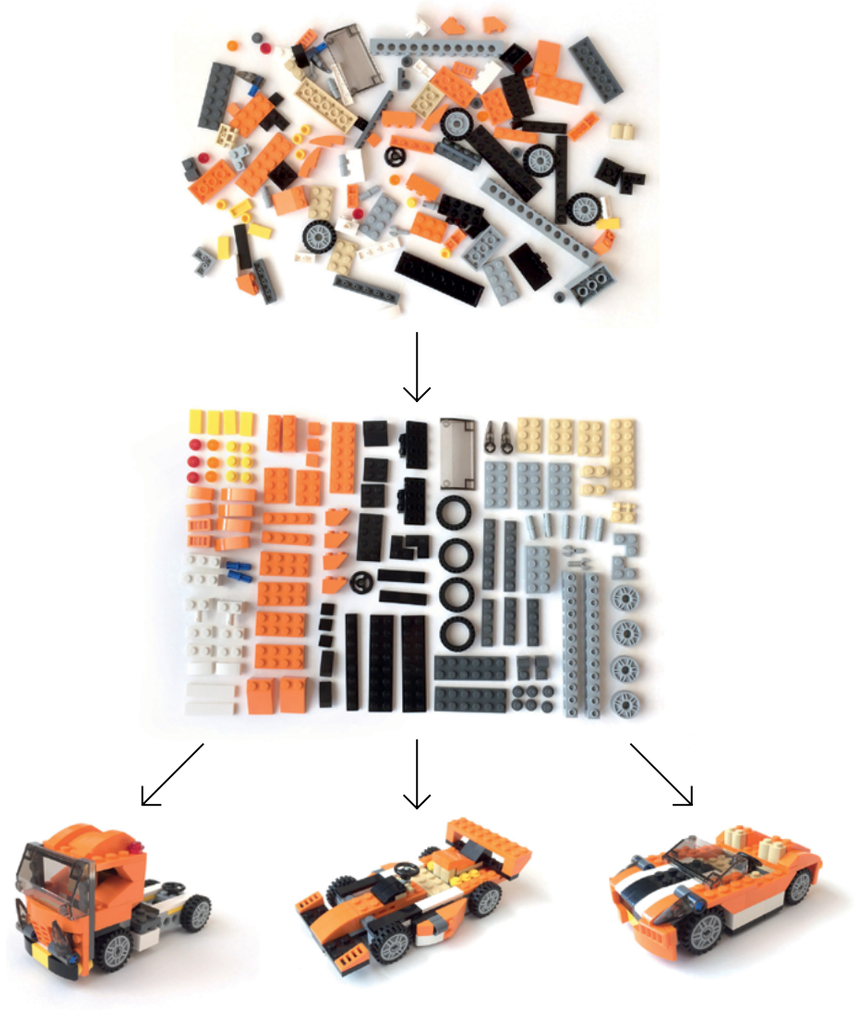
The system serves as a connective link for any type of digital communication and as a cross-media tool for all types of devices, media, and content types. Optimally, different and regularly recurring work steps can be automated. However, the responsible parties should at least always have a good overview and be kept informed of the current condition and status.



Schematization: A (central) system as the content hub with easy access for all editors and flexible content input from and output to various media and channels. There is a three-step content and information flow: (1) capturing, creating, and collecting; (2) managing, editing, and curating; and (3) using content (then, as required, commenting, modifying, supplementing = repeated collection).

Collaborating, curating, and combining

A system of the future supports the examination, filtering, and moderation of contents from a wide array of sources. Accordingly, it needs reliable processes for the management and dissemination of contents. You must endeavor to establish efficient processes and workflows that support the collaborative creation of contents by a wide array of authors. Editorially combined contents from "professional" authors and/or users, user-generated contents, comments, links, dynamically complemented information based on meta-data, integration and linking of other channels, social media and social media functionality, and open (application programming) interfaces to other networks and platforms together produce an individual information package or an information product.



If you have a bunch of unsorted LEGO bricks (comparable to a lot of content and UI elements on a website, for example) you can (and should) first sort them to get an overview. **Make an inventory** of all the bricks that are available and shall be used to build any LEGO model. You can build different cars out of the same elements, if you combine them in a different manner. That's the same what you can do and must think about with your content (and your user interface). Different elements can and will be shown and differently used and combined on various channels and touchpoints (compare example with New York Times in Section 7.1). A systematic and structured approach helps to tackle that challenge.

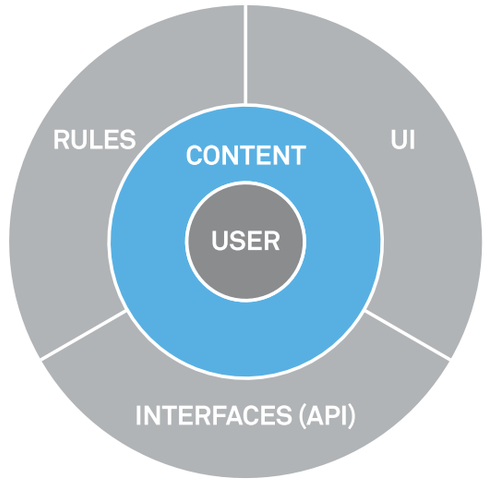
7.1.3 FOUR CORE AREAS

In order to plan and implement services and processes in a flexible, structured, and modular manner, four core areas must be fundamentally observed during the course of the project: contents, user interfaces (UI), workflows, and application programming interfaces (API).

The content and its users, of course (they are both the authors and the editors as well as the recipients of the information), should be the focus of the analysis and the starting point for further steps.

Design from the content out.

Stephen Hay (as quoted in Frost, 2012f)



Four core areas. Start with the content. Initially you must know and understand all involved users. That can be described as *user- and content-centered design*.

Information (data/content)

Based on the thematic tendency (taxonomy, "unit," or domain), there are content elements for various content types. In addition, there are the corresponding form elements for the "front end of the back end" in order to build the input mask for the content objects (assumed that the contents are collected in your own CMS). A content type consists of various content elements. The semantic meaning influences the structure of the content type, its classification, corresponding categories, and labeling of the form fields.

UI (graphical user interface)

In this case, the UI (or graphical user interface) also includes visual design and interaction design. The UI elements are structured according to the atomic design principle (see Chapter 5, Section 5.8.1). They are relevant for the front end output, for the form elements in the back end, and for the (preview) display of the contents in the back end. Visual design and individual styling are described via a "living style guide" (as described in Chapter 5, Section 5.8.1) that is constantly being updated. The UI and the UI elements for the back end are generically prepared. The UI elements and libraries can be successively supplemented.

Processes and workflows (rules)

They define—according to the "if this then that" principle—how contents relate to each other or can change if an event occurs or a change takes place. In this regard, it concerns the definition of rule-based interaction between two objects.

API (application programming interface)

The concept of the original app with its independent content is dissolved by the concept of the app as a content supplier. It provides contents (broken down into small units) via an (application programming) interface to other services (Schätzle, 2015a)—within the content building blocks in the content hub and from and to other applications in order to exchange and/or synchronize the contents and data.

7.2 BUILDING BLOCK PRINCIPLE

7.2.1 MODULAR APPROACH: ATOMIC DESIGN AND CONTENT MODELING

Structure and modularity

Apps and websites will be less autonomous entities in the future; rather, they will be systems consisting of a wide array of modules. This aspect will become even more important if smartwatches are disseminated more widely in the shadow of the Apple Watch.

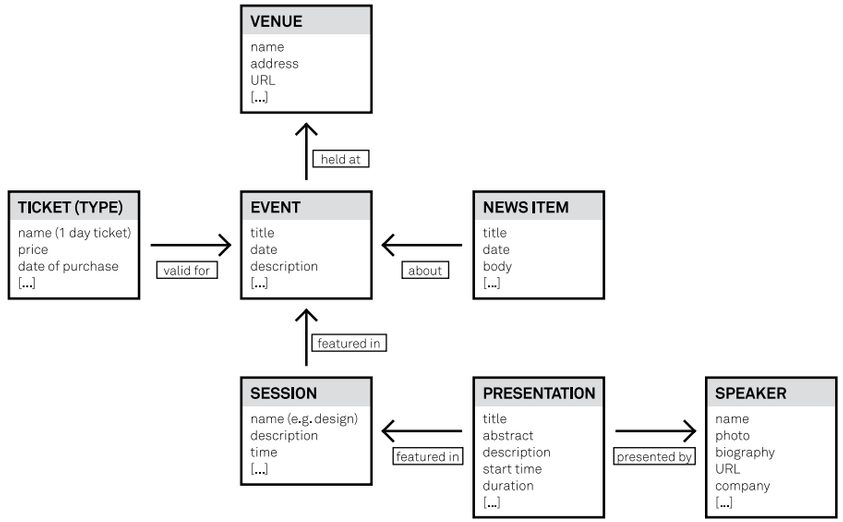
An information is composed structurally of individual elements. The corresponding elements are displayed based on the platform, target channel, and context. This structure is described by Brad Frost in the user interface design context with atomic design (Frost, 2013a). Based on the same principle, content can also be structured atomically whereby one could speak of "atomic content." (Other popular terms are structured content, future-friendly content, intelligent content, adaptive content, or smart content [see Section 5.10]).

With atomic design (see Chapter 5, Section 5.8.1), similar to chemistry (thus the atom metaphor), web projects are broken down into the smallest building blocks possible. These building blocks are subsequently combined to form larger entities (compare to molecules or organisms in chemistry) that extend to complete pages (see Chapter 5, Section 5.8.1).

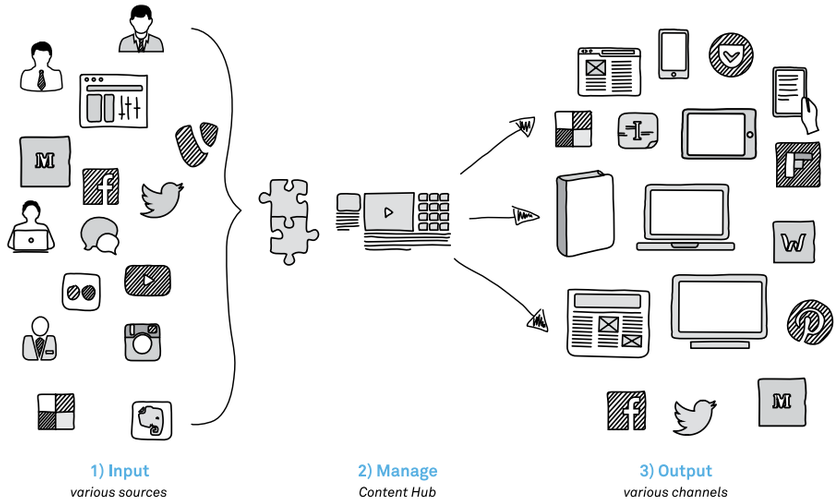
With content modeling (Gibbon, 2015; Lovinger, 2012), based on the content concept, content models are created that describe structured content in the form of content types, individual attributes, and data types and their relationship to each other. In order to structure content, you must be familiar with the content types and also the thematic area it concerns because it decisively influences the structure and the semantics.

> *Content modeling gives you systematic knowledge; it allows you to see what types of content you have, which elements they include, and how they operate in a standardized way.*
>
> **Sara Wachter-Boettcher (2012b)**

Well-structured modular content can also be utilized as rich snippets for the search engine optimization. These elements are displayed in the search results. For example, quality assessments or—for recipes—photos, calorie data, cooking times, and ingredients.



The **content model** (for example of a conference with location, tickets, presentations and speakers) describes the content structure with different content types, individual attributes and their relationship to each other. The figure is based on and adapted from Jonathan Kahn (2010).



The **Three-Step Content Hub** (principle): 1) Collecting and authoring 2) combining and managing 3) outputting and distributing to various channels. The content hub in the middle plays a central and important role in the content flow. Content will be aggregated, mapped to a predefined structure (if there are different input channels), organized and prepared for flexible output in the content hub (see also the content mapping example at the beginning of this chapter).

Combining theory and practice

It is hoped that a tool will be developed that can be used to combine processes and methods from content modeling and UI architecture because it then serves as an interface (or link) between these both disciplines. It would unite the theory and the methods with the practice and provide concrete benefits for the project.

Whenever I can implement content modeling directly in or with the content (management) hub, I quasi automatically receive (generic, automated, but individualizable) work results that I can use for the interface and depiction for the recipient. One has to do everything only once, and directly gets a concrete result.

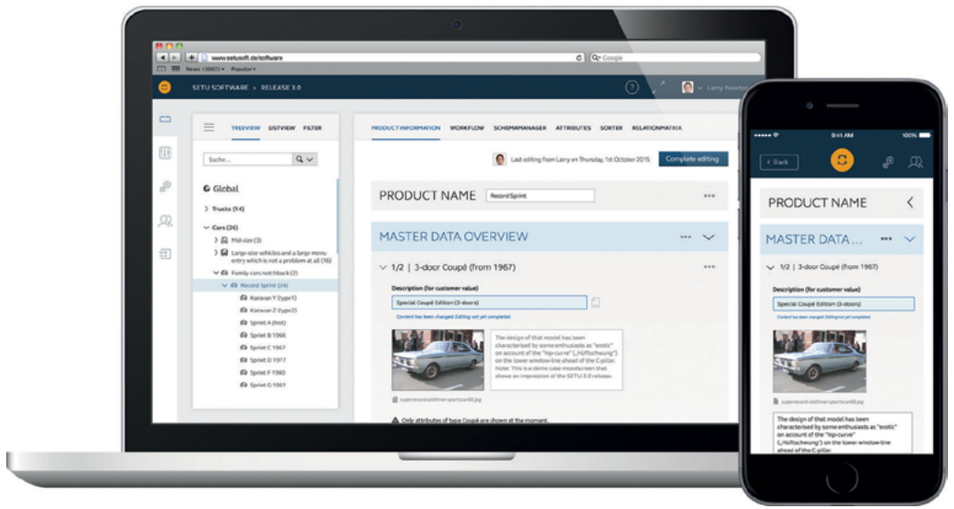
7.3.3 A MODELING SOFTWARE THAT IS SUITABLE FOR THE BUILDING BLOCK PRINCIPLE

SETU as the tool for future-oriented content

Based on the aforementioned ideas, we at SETU GmbH (www.setusoft.de) have developed a concept for such a "content management hub" that is integrated into our SETU 3.0 release. With it content management apps can be realized for various thematic focuses (units).

The content architect has predominantly free rein with the structuring of the data bodies. The software offers a large library of predefined (and extendable) form and output elements and supports iterating elements within a data model (including more complex structures such as text with an image) as well as relationships and kinds of relationships to other elements. It offers functions for the creation and management of language- and market-specific contents such as heredity and workflow support. Existing platforms can be supplemented with freely definable workflows in customer communication.

Moreover, rule-based and connected and related and individually personalizable context-based contents can be supplied. Context relevance can be recognized and utilized via rules and meta-information. Personalized contents dependent on, among others, the log-in, user profile and user type, Internet speed, device, output medium, channel, etc. (see Chapter 4 for more details in this regard). The structured information that has been supplied can be integrated into as many platforms and channels as desired.



SETU 3.0: **Content Modeling Software** suitable for the building block principle. The mood-screen shows an impression of the user interface of a demo use case of the SETU 3.0 release (www.setusoft.de).

7.3.4 QUO VADIS CONTENT AND USER INTERFACE?

For the future, it is recommended to plan and collect information in any shape according to the building block principle in order to publish information in all conceivable channels with the right tools and without large additional expenditures insofar as this is possible. The suitable principles, methods, and processes should be described,

9.2 ABOUT THE AUTHOR

Wolfram Nagel is a UX Designer, UI Architect, and Concept Developer. As the Head of UX at SETU GmbH (a German software engineering company) he is responsible for conception and design and supervises internal and external web and software projects in the areas of content design, UI architecture, and visual design in close interaction with front end and back end developers.

Wolfram is very engaged and has worked for many years with the themes of multiscreen, UX, and the future of information and content (management). In 2013 he published the German book "Multiscreen Experience Design." He speaks regularly about these topics at various conferences, such as Usability Professionals, IA Konferenz (the German IA Summit), or regional World Usability Days.

He worked as a Media Designer for Digital and Print Media and studied at the Hochschule für Gestaltung Schwäbisch Gmünd, Germany (University of Applied Sciences). He holds degrees in Information Design and Design Management (Master of Arts).

He is the Co-Initiator of the award-winning *Design Methoden Finder (*www.designmethodenfinder.de*)*, a web-based collection of design methods, and he holds main management duties for the *Multiscreen Experience Projekt.* These initial ideas and approaches were already created during his first studies around 2005.

He is always searching for new ideas, approaches, methods, and processes that support the strategic development, conceptual design, and implementation of projects. He endeavors to continue to expand, adapt, combine, and sensibly integrate them into his work in order to find new added-value approaches and to obtain additional benefits and efficient synergistic effects.

Besides all that multiscreen and UX design stuff, Wolfram loves his family, spending time with his wife, playing LEGO with his son, and hiking in the nature around his hometown. He likes barbecuing with friends, playing football (soccer), football culture in general, and travelling to football games.

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MULTISCREEN UX DESIGN

DEVELOPING FOR A MULTITUDE OF DEVICES

A holistic approach to UX for designing across multiple screens

People today use technology on different devices in different locations. Users expect to access information on all relevant screens and across multiple channels through smartphones, tablets, laptops/desktops, smart (internet-connected) TVs, and other devices, such as smartwatches for example. Multiscreen is no longer a nice add-on, it's a requirement. In this environment, user experience needs to cater to multiple devices.

This book provides a holistic approach that will help UX professionals to offer a hands-on guide for UX design across multiple screens. It presents an opportunity to learn how to cater designs for customers. Readers will find patterns, strategies, examples and case studies, methodologies, and insights to help inspire them to develop a viable strategy for their own digital products and services. UX professionals will walk through important elements of multiscreen UX:

- Investigating the devices and their capabilities
- Understanding the users and their capabilities
- Considering the context in which users use these devices
- Navigating next generation information experiences and the future of content management
- Designing content and UI architecture for multiscreen projects

Key features include:

- A hands-on, practical guide to UX design for how users approach content – across more than one screen at a time
- Discusses devices, users, and their practices
- Includes best practices, real-world examples, and tips and tricks
- A preface written by Scott Jenson

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Computing/Human Interaction

ISBN 978-0-12-802729-5

9 780128 027295

MORGAN KAUFMANN PUBLISHERS

AN IMPRINT OF ELSEVIER

mkp.com