AdNovum

NOTITIA

NOTEWORTHY NEWS FROM AND ABOUT ADNOVUM

USER-CENTERED SOFTWARE DESIGN

Content

Dear Reader,

Nothing runs without UX – that about describes the expectations of today's users of smartphones, tablets etc. How would you like to still be working on a black background with an awful green font and keyboard commands? Right. In other words: The user experience is the top priority. To be a leader in a market that is constantly being flooded with news, it is therefore crucial for providers to base the development of their software on the perspective of the user.

In order to clearly identify the needs of the users and offer them the experience they desire, companies are increasingly hiring usability specialists. They are an important link between users and software engineers. In the introduction by Samuel Frischknecht, Interaction Designer, and Simon Zweifel, Senior Software Engineer, the authors discuss how the three players interact in order to achieve convincing results, and what the user experience, user interaction and usability are about.

How has classic software engineering changed since users increasingly got involved in designing the solution? How can reasonable technology management be realized notwithstanding the uncontrolled growth of frameworks, snippets and apps? These and other questions are answered by Tom Sprenger, AdNovum Group CTO, and Peter Boon, CTO AdNovum Hungary, in the interview.

Two case studies in the background article show how AdNovum handles user-centered software design as a process – and how much this can vary. Ann Nguyen, UX/UI Designer in Singapore, describes the approach to the conceptual design of the website commissioned for development by AdNovum for the local «Writers Festival» by the National Arts Council (NAC) in Singapore. Samuel Frischknecht and Loïc Pfister, Project Manager, report about the development of the WebMed cloud-based specialist application for the Swiss HIV cohort study.

Stumbling blocks are sometimes encountered when designing websites and implementing theoretical concepts in practice. Exactly where and how they can be avoided is explained in the partner article by Andrea Stojanov, Head of Digital Communication at the Asian Development Bank in Manila.

Enjoy reading the latest edition of Notitia for exciting insights.

Chris Tanner

CEO AdNovum Informatik AG

Through the eyes of the user

Operating today's smartphones and tablets is child's play –
thanks to user-centered design. But what exactly is UCD?

By Samuel Frischknecht and Simon Zweifel

Peter wants to access e-government services in his community. He reaches for the tablet as a matter of course and tackles the registration process. The form has its pitfalls. It refuses to accept his home address. When Peter wants to jump back a step to check the information he entered, it has disappeared. He gives up and tries his luck by telephone.

What is essential to the survival and success of online mail order companies such as Amazon or Zalando apparently still has potential in the world of e-government applications: the user experience. A clearly perceptible paradigm shift is underway in software engineering. While software companies used to base solutions on their technical possibilities, the user experience takes center stage and constitutes the starting point today. How did this transformation take place, and what are the effects on the technology, the established roles and cooperation in the software project? We take a look behind the interface.

Expectations regarding the user experience rose massively when mobile devices took over. The simplicity of mobile

*The **user experience (UX)** by definition (according to DIN EN ISO 9241-210) encompasses all perceptions and reactions of a person resulting from the actual and/or expected use of a system, a service or a product.*

***User-centered design (UCD)** is a model for creating an optimum user experience. Users are involved in development through an iterative process from design to development to testing in order to gain deeper insight into their tasks and their usage context. In software projects, the user experience is not designed by a role or individual. It is created through the interdisciplinary interaction of designers, developers, customers and users. This is the only way to explore possibilities and limitations in order to create the best possible user experience.*

Insights gained from this process are manifested in personas (profiles of possible users), scenarios and use cases. Commonly used methods (for example contextual inquiry, card sorting or user journeys) provide the required basis.

15 YEARS AGO «INTUITIVE AND EASY TO USE» APPEARED SUFFICIENT AS A UNIVERSAL REQUIREMENT FOR SPECIALIZED APPLICATIONS.

applications with their natural and direct interaction by touching the interface appears indispensable. There are needs and requirements for an application that, in many cases, apply beyond the context of private use and in the workplace. A logical consequence in an era where «angry birds» and mobile banking apps share the home screen.

UX as a requirement

Let us take a look back: 15 years ago «intuitive and easy to use» appeared sufficient as a universal requirement for specialized applications. This was often left up to the talent of

the developer who implemented the application according to the specification. While this resulted in a functionally correct application, it had to make do with a user interface that appears archaic from today's perspective. As a consequence, users were often preoccupied with operating the GUI instead of focusing on their tasks.

In the years that followed, usability and design specialists rose to the challenge of making applications «user-friendly». As a rule they were only involved once a lot of code and test cases had already been written, so that their suggestions led to added costs and/or project delays.

Recent years have seen the outsourcing of conceptual design to design agencies in order to meet the multilayered needs of the users and the high standards for platform-compliant design and interaction. This approach led to creative concepts and, initially, high user acceptance. But new project risks also resulted for

more complex applications. This is because separating design and development increases the communication effort for implementation, especially when it comes to mobile applications that need to be highly user-centered. Therefore, the additional effort is often at the expense of (user) testing.

Design does not happen quietly overnight. Interaction designers need access to users.

Integrated design

AdNovum follows the approach of integrating the design process in the established software development process. Not only do we actively involve the business and users in the design process, we also validate the results continuously with business analysts and software developers in an iterative procedure. This permits us to review the possibilities and limitations of design solutions early on, and to look for alternatives as needed. Regular feedback loops ensure a joint understanding among all project participants.

Unlike outsourcing design tasks to third parties, this integral approach has proven itself for the following reasons:

- An integrated user-centered solution is developed.
- The dual structure with the specific technical knowledge of the development company and an additional design agency is eliminated. This reduces costs for the customer.
- Synergy effects are realized between business analysis, development and UX design.
- Errors in the interpretation of design requirements are reduced. Mobile applications in particular benefit from the proximity of design and development, because the behavior of the user interface – such as gestures and animations – is difficult to capture with static documents.
- By making the UX designers part of the development team and using an interactive approach, input from the designers that is relevant for the architecture can be identified and taken into account in a timely and cost-effective manner.

Get out of the building

Design decisions have to be made. Continuously. Contrary to the belief that design happens quietly overnight, interaction designers need access to users. For custom software in particular, the roles of the users are often complex and demand a deeper understanding of the usage patterns. For example, the interaction

designers have to know whether a user repeats a task (typical for stack processing) or keeps doing different tasks (case processing). This provides important indications how the user interface for this role should be structured, what terminology has to be used and what degree of contextual help in the application is suitable.

The better the understanding of a task or the cause of an operating problem, the more precisely can a design decision be made. This attitude has already taken the AdNovum UX specialists into the passenger seat of a truck at a logistics company and to a medical consultation for clinical studies. All in the interest of getting a first-hand look at the context in which the application is used. Such research offers valuable insights and promotes acceptance and cooperation in the project.

Prototyping and frameworks

In practice, UX activities are constrained by limited project resources and must be carefully selected according to the available budget. Therefore, the design process is kept slim and only enough design is produced that value is actually added. When it comes to verifying the sequence of a registration process for example, pencil and paper (paper prototype) constitute an effective tool for quickly sketching proposals and defining details together with customers or users. Then the user experience can be realistically simulated in another iteration with an interactive prototype and tested with actual users, even before production code is written by the programmers. New requirements are often revealed in this process.

Prototyping is important from the engineering perspective as well. With the help of frameworks that correspond to the target platform and include a number of established code modules already, the technical feasibility of a design can be confirmed

The better the understanding of a task or the cause of an operating problem, the more precisely can a design decision be made.

early on. Such coordination reduces the risk of later encountering «blockers». If a function can be realized in the prototype, it can be integrated in the end product exactly like that. At the same time, the design prototype gains value for the end user when the interaction possibilities can already be experienced and correspond to the end product. Various behaviors using different web browsers or devices can for example also be compared and addressed early on.

Simon Zweifel and Samuel Frischknecht: Combining technology and design to create user-friendly solutions .

Therefore, 10 seconds x 50 tasks x 60 users equals a time saving of one full workday of 8.4 hours. Including more than one test subject is important here, similar to classic usability tests.

WE SEE DESIGN AS A TOOL TO NOT ONLY DEFINE THE INTERFACE BUT THE ENTIRE USER EXPERIENCE.

Conclusion

We see design as a tool to not only define the interface but the entire user experience. What is visible and especially experienced through the interface is ultimately always a result of considerations and decisions based on a deeper understanding and the compilation of facts. When we think from the user's perspective and when designers and developers work together closely from the outset, nothing stands in the way of a positive user experience.

Software developer profiles

The user-centered approach means the roles within a software development project have to be adapted as well. In the past it was important to have software developers with a universal skill set, covering the broadest possible variety of tasks with consistent quality. Even though this qualitative requirement continues to apply, a software developer can specialize in various common profiles. Differentiation between frontend and backend developers is a natural step, in particular for the development of a client-server application. While the focus in the backend is on stability, performance and backwards compatibility, usability is implemented in the frontend. Frontend developers with their technical understanding and their feel for usability constitute an important link between backend developers and UX designers.

Not tangible but measurable

Notwithstanding the common definition, the user experience is not easy to comprehend. Yet improvement measures in design quickly make themselves felt, especially when the original condition led to user errors and the application is noticeably easier and more convenient to use afterwards. Next to the subjective impressions, the effect of improvement measures can also be quantified, measured and statistically analyzed with the help of standardized questionnaires or log files. One example of a simple calculation: (measured time savings per task) x (number of tasks per user and day) x (number of users).

Samuel Frischknecht

Samuel Frischknecht, Interaction Designer (Eidg. dipl. Interaktionsleiter), started developing the user experience discipline at AdNovum in 2011. He focuses on mobile applications and generally on projects with a high level of user interaction, where he assumes the role of the user. Outside AdNovum he prefers to spend his time out and about on four wheels or with four paws in nature.

Simon Zweifel

Simon Zweifel, MSc in Computer Science ETH, has been with Ad-Novum since 2005. In his role as Technical Project Manager, he has already assumed responsibility for several larger banking and e-government projects. Very often the modernization and usability of an application was among the main objectives. In Simon Zweifel's private life, it has all been about the latest addition to the family since this summer – in other words, he currently leads a baby-centered life (BCL).

USABILITY FIRST — FROM THE FRONTEND TO THE BACKEND

In the era of smartphones and virtually unlimited technical possibilities, usability is key. Tom Sprenger, Group CTO, and Peter Boon, CTO AdNovum Hungary, talk about how this shift has influenced software engineering.

Compared with 10 years ago, how has software engineering changed?

TS: Our main goal is, and has always been, to satisfy the users' needs. When we started building software, our customers' processes were still paper-based. The main challenge was to build software to model these processes. This has changed dramatically. With the amount and availability of digital data growing at an astonishing pace, new possibilities and new needs have emerged. Today, we no longer take current processes as a given, but start by analyzing the business needs from the user's perspective. This has had considerable impact on the way we build software, look at staffing, or handle tooling and technologies.

What a developer might consider to be a detail may actually be quite important.

PB: The focus has shifted from the backend to the frontend. While we quite reliably master the backend applications, we — from project managers to developers — have to change the way we think and approach tasks on the usability side. New approaches are required. Previously, engineers could just do what they thought made sense. Now they have to take the usability aspects much more into account and maybe even discuss possible solutions with a usability expert. What a developer might consider to be a detail may actually be quite important.

There's obviously a paradigm shift taking place …

TS: Yes, this shift has considerable impact on the way in which we build applications. We now start at the frontend and work our way to the backend. The different layers of our reference architecture are decoupled. This allows backend engineers to focus on developing services and the frontend engineers to focus on implementing functionality from the user's perspective — and hence to focus on user interaction. I'm convinced that we will benefit from this approach in many ways, one of them being that it increases the testability and flexibility of our solutions.

PB: It is easier for the younger engineers. They have grown up with much more exposure to applications with a «rich" user interface (UI) and mobile devices. To be able to reproduce and work with that is really cool for them, whereas more experienced engineers are used to focusing on functionality and the backend. Yet, whenever you get in touch with frontend, you have to just be aware that the UI is much more important than it was five years ago.

When did you first become aware of this shift in perspective?

PB: Working on a mobile banking project. We had a design company and it was all about creating a consistent UI for the whole app. There I realized that user experience (UX) is a big thing. As regards my first private UX experience, I've used computers for a long time. That grew naturally, starting with when mobile phones really took a flight.

TS: To me, it happened way back when getting in contact with the first Apple Macintosh around 1985. It was the first computer which came with a mouse that allowed drawing and cutting stuff in a painting application! Another UI revolution was the iPhone — the first mobile device to be designed around the user. At that time, established brands had big issues just to provide the functionality of mobile telephony and the user interfaces were horrible. Apple's entry into the market was not

Tom Sprenger and Peter Boon: With UX, non-technical topics gain importance in software engineering.

so much based on functionality, but on providing a nice and innovative user interface. These two experiences made me aware of the added value of well-thought user interaction design. Looking back today, I think that its impact proved even more important than I had thought at the time. Apple for sure is a special case, but it illustrates very nicely that the combination of being rock solid in the backend and very user-centric in the frontend could be a differentiating factor on the market.

How would you describe today's typical app and software user?

PB: A few years ago, people could not imagine the systems which we were building. They would go from manual processes to an automated system. So whatever we would provide was great. It was about functionality. Nowadays, they are used to working with all kinds of websites and apps with high usability — and expect the same from us. They even give precise feedback about the solution, saying, for example, that the buttons are not placed correctly or something is inconsistent.

TS: In the earlier days, we mainly built applications which were used by our customers' staff in their daily work, that is to say business to business applications (B2B). Today, we build business applications which are used by our customers to interact with their customers, namely business to business to customer applications (B2B2C) whose expectations regarding usability are even higher. But also for applications used within the enterprise, expectations have changed. In general, the end users' benefit and experience take top priority today for companies, something which we realize again and again, for example, when working on tenders. To integrate the user perspective into the design

process from the very beginning, AdNovum has established a dedicated UX team.

How does involving designers in the engineering process impact the work of developers?

PB: Dealing with UX designers is new, but not much different from a developer having to work with a business analyst. Of course, we had to adjust our tooling and processes to ensure seamless integration of the new tools and roles.

TS: The early involvement of the UX team fundamentally influences the way how project teams talk about the solution

> ## The engineers see having UX designers as a complementary discipline in the project as a benefit.

which they are building. Non-technical topics gain importance. Developers see it as enrichment and acknowledge the benefit of having UX designers as a complementary discipline in the project.

How do you make them speak the same language?

TS: On a roles and functions level, we see that, while engineers and UX designers are perfectly capable of understanding each other, there is a profile missing in between, namely the frontend developers. Frontend developers with their flair for user interfaces and a profound technical understanding act like

interpreters between our engineers and the UX designers. As a result, it was evident that we had to hire additional frontend developers. On a technical level, we adjusted the software engineering process, different aspects of the software architecture and aligned the frontend tooling to reflect and support their involvement.

Something which is easy to use may be quite complex to implement.

Where does the customer fit in?

TS: As a well-established approach, we involve customers at a very early stage in a project. Our project platform provides the required tooling, such as collaborative services which enable the customer to see what we're doing, from the early drafts to the first UI prototypes and the development. A good example is a project which we did for a logistics company. UX designers accompanied drivers on their trucks to see exactly what they were doing. Based on this, they presented an early prototype to the customer. Today, user experience is very important to gain customer acceptance, whereas a few years ago, the customer primarily expected the application to provide the required functionality.

PB: This is exactly why we positioned AdNovum's UX designers very close to the business analysts. Together with the customer, they figure out on a functional level what the application should do and how it should work.

If customers and users are involved from the very beginning and help engineer the best solution, where is the challenge?

TS: The major challenges are that, to begin with, something which is easy to use may be quite complex to implement, and then that, to do so, you have to choose between endless UX possibilities. In close cooperation with the customer, we have to find the most suitable solution, set the right priorities, pick the right hot spots and define a roadmap for the solution to evolve. From a technical point of view, a major challenge is to provide applications without any media disruption, from UX to frontend to backend.

PB: Quite a lot of effort and time goes into details and making them work. When the business analyst and the UX designer figure out at an early stage how a solution should work, they choose the general screen layout and flow. But then a number of details need to be defined such as how do different controls have to work? How about responsibilities, response times, speed, accessibility, user navigation with keyboard and shortcuts? These things might change during the process and the time required to implement them is easily underestimated.

Do you have to re-design your applications from scratch to make them user-friendly and stay competitive?

TS: No, the core can quite often be reused. The almost revolution takes place on the UX level where we see substantial development and motion. Often, legacy applications are cut on a suitable tier and a new frontend is popped onto them. In many cases, the only real change is how functionality is presented and how users interact with it.

PB: In addition, multiple frontends — for example a mobile app, a desktop application or a website — can be used to access the same backend.

The almost revolution takes place on the UX level.

What if a customer asks for the impossible?
TS: Then, he's at the right place with us! (laughing) Since we talk to the customer at a very early stage, it's all about expectation management. Of course, there are limits, but we try to push those limits hard.

PB: Users have certain expectations based on what they have seen in other applications. However, they also know the limits. An example: we are currently re-implementing a desktop application into a web application. The users understand that we cannot provide the same functionality at 100% because the web application needs to run in a browser.

TS: Most applications run on a certain system which already has some UX guidelines, for example how to swipe, delete or implement a list. However, on rare occasions, customers do come up with unusual ideas, for example an application where a certain element is scalable in multiple dimensions and has a really complex visual functionality. Although this is technically possible, we do not recommend implementation of such requirements because it does not comply with the specific guidelines of the operating system (OS) and hence, this would have a negative effect on overall user experience.

How do customers react if you advise against a requirement or functionality?
PB: Generally, they understand the reasons and they accept it. For example, when we migrate a desktop application to a web application, they usually understand that there are certain limitations. Or if the customer's requirements are in conflict with the policies of an app store, we can only suggest and provide alternatives.

From a user-experience point of view, how does a browser-based solution fare when compared with a fat client?
PB: People have become used to browser technology because they use online services. Yet, compared with a fat client, there

Group CTO and Local CTO define the company-wide strategy …

is always a little delay. However, we can overcome this gap quite well and it is not a 'no go' for web applications.

TS: There has been major progress in executing web applications in a browser. All the big companies, including Oracle, Apple, Mozilla and Google, put tons of effort into improving the execution speed of web applications, from which also usability greatly benefits.

> ## Big companies put tons of effort into improving the execution speed of web applications, from which also usability greatly benefits.

How does this affect the technologies which are used?

TS: Technology cycles keep getting shorter. What is cutting-edge today may be outdated tomorrow.

PB: Some 10 years ago, we replaced many legacy applications for exactly this reason. As for the generation for which we are now building, I am not sure if the replacement cycle will accelerate.

TS: I would rather expect a flat curve on a high level. Currently, mobile is still a hot topic, as everybody has his/her own ideas what to do with a mobile device. Another one is mobile payment.

PB: For enterprise applications, the technology cycle is less of an issue. But those end-user-facing applications are really a different category. At the time when e-banking applications were going mobile, I saw cases where just the UI was upgraded in several iterations to stay competitive, without any functional changes.

Given these shrinking development cycles, how can you ensure efficient technology management?

PB: AdNovum has always had a very good and strict technology management process. This has become even more important with the number of components, frameworks and third-party libraries increasing dramatically over the last two or three

… while always keeping the overview in the jungle of technologies.

years. Basically, we rely on our experience and prefer tools which have been tried and tested. Once we have decided, we focus on the selected tools, invest in their integration and build up know-how. In case of open source components, we also take into account the community which is behind them, how long it has been around and how many people are contributing. Based on these factors, we can make quite reliable predictions about whether a tool will continue to provide the features which we are going to need over the coming years.

TS: Currently, we are building our frontend technology stack as a managed stack from where we can start when developing a customer solution. Unlike for the backend, there are hardly any standards for frontend tools besides the core technologies, such as HTML, JavaScript, and CSS. On top of this, there is no standard widget set, for example. The fragmentation is also considerably higher, i.e. the libraries are much smaller — just snippets in some cases. The challenge is to pick the right ones and make sure that they integrate nicely so that we can efficiently build user-centric and reliable solutions for our customers. ■

Tom Sprenger

Tom Sprenger, Dr. sc. techn. from the Swiss Federal Institute of Technology (ETH), joined AdNovum in 2000 as a Software Engineer. From 2002 to 2004, he was Head of AdNovum Software Inc. in San Mateo, CA. In 2007, he was promoted to Chief Information Officer (CIO) and a member of management. In this function, he built up the strategic business area IT Consulting. Since 2013 he has assumed responsibility for the company's technology strategy and engineering process in his role as Chief Technology Officer (CTO). In his private life, Tom Sprenger enjoys spending time with his family and going on a downhill bike tour every now and then.

Peter Boon

Peter Boon, MSc in Computer Science from VU University Amsterdam, started working for AdNovum Hungary in 2009 after moving to Budapest from The Netherlands. He had the technical lead in various desktop and mobile related projects. As CTO AdNovum Hungary, Peter Boon took part in defining AdNovum's strategy for mobile applications. Outside of work, he enjoys running, photography and travelling with his family.

Multifaceted design

The user comes first. Always. The design approach varies.
While it is based on concrete tasks for specialized applications,
websites serve a variety of purposes.

By Ann Nguyen, Loïc Pfister and Samuel Frischknecht

Applications and websites can be as multifaceted as the users themselves. Individual approaches are therefore in demand. The examples that follow illustrate the approach used by AdNovum in order to provide its customers with user-friendly solutions.

Example SHCS web application

Paper remains popular as a data carrier for medical data collection in hospitals. Even though patient dossiers, in other words medical records and corresponding laboratory data, are stored electronically more and more often, additional patient information that is purely for research purposes (for example cohort data) is still mainly communicated on a paper basis. The Swiss HIV Cohort Study (SHCS), a highly successful long-term multicentric study of HIV positive adults, has now dared to take the step from a paper-based to a digital solution. In an initial step, it will convert to computer-based data capture for the purely scientific element of patient information regarding the extremely complex medical treatment. Further stages for other sections of the paper-based questionnaire will follow. AdNovum is supporting this new beginning.

Paper remains popular as a data carrier for medical data collection in hospitals. Shcs is going all digital.

Paper does have its advantages: An incorrect entry can be crossed out and corrected in seconds. The feel of paper and the change from purely digital work on the computer are valued as well. But unfortunately there are also some major disadvantages: Data collection requirements are growing continuously while the increasing size of a cohort, new questions and new treatment options require a highly flexible approach. Medical centers are usually under tremendous time pressure as well. Thanks to the digitalization and direct linking of patient information to a database, the unaltered high standards for excellent data quality in the interest of scientific work can nevertheless be met.

The unaltered high standards for excellent data quality can be met thanks to digitalization.

What is SHCS?

SHCS is an ongoing multicentric study of people with HIV. As a future-oriented study, it is a powerful tool for the scientific examination of patients infected with HIV, regarding among other things:

- Antiretroviral therapy, including the inherent risks of resistance development, toxicity and the side effects of lifelong therapy
- Social aspects in an ageing group of patients
- Transfer mechanisms at the population level
- Treatment and transfer mechanisms during pregnancy

Next to the remaining information, medications prescribed by a doctor as well as details for their administration have been documented on paper questionnaires until now. The documents pass through several stages: from the attending doctor via study nurses to data managers, who check the data for integrity before obtaining and updating missing information. Then the questionnaires and medication sheets are sent by mail to the data center in Lausanne, where they are first entered into the existing database and then analyzed further by data managers.

Getting to know users in their environment

Digitalizing the process described above and therefore optimizing it in several ways is the objective. To familiarize ourselves with the as of yet unfamiliar field of activity, we followed up a kick-off by conducting field research with the persons responsible for the project and future users at the clinics in Bern, Zurich and Basel. Getting to know the future users in their environment and understanding their current situation was the goal. Direct dialog meant we quickly learned the ropes in this new field, which limited the leeway for interpretation later in the project and therefore prevented misunderstandings.

Field research began with the process of recording medications during a patient visit. Since the digital solution was to build on the familiar, without breaking existing patterns when reading the paper version, the static tables of the questionnaire became a dynamic timeline representation. This made it possible to jump ahead and back in time without losing track. Abstraction levels also had to be created in the digital version so that the information appears and is captured in an ordered hierarchy.

WebMed: Tablet version for great flexibility.

To verify the user-friendliness of these new input patterns, we first used sketches and then clickable prototypes in common Office formats as part of an iterative process.
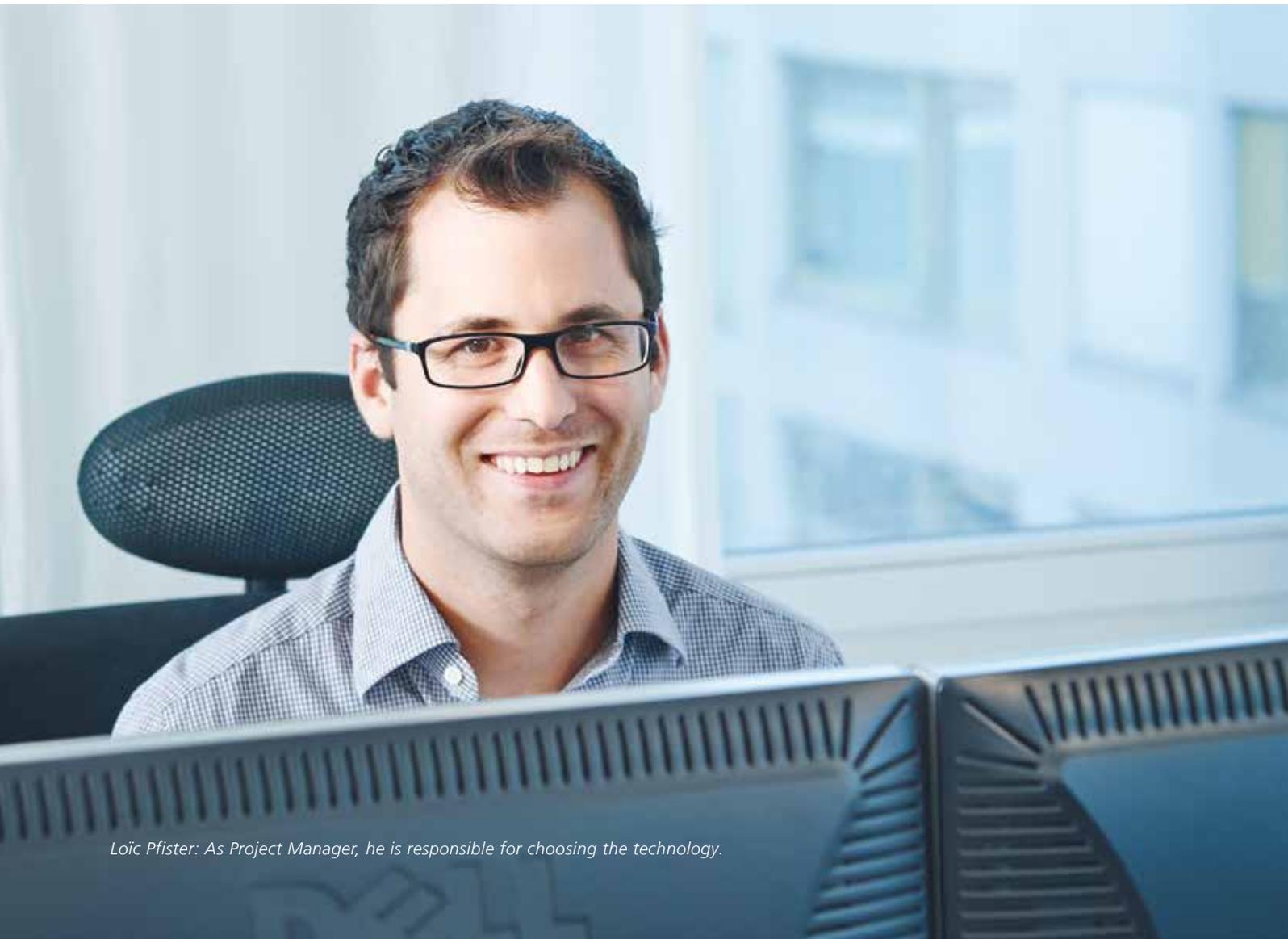
Loïc Pfister: As Project Manager, he is responsible for choosing the technology.

Technology support for the conversion

Choosing the right technology is crucial for the success of the user-centered approach. The technical setup must be fast and flexible at all times. Even with a clearly defined project objective, features and therefore the user interface can change in the course of the project. For this reason, it is also important to get the users involved in an early project phase and to consult them regularly, respectively after brief development sprints, rather than first doing months of development work. This allows the application to be tailored precisely to user requirements. Expensive changes in a late project phase are prevented and the acceptance of the future solution is assured.

Dynamic 2-week cycle

In the course of this step-by-step approach, SHCS users tested the new features in a 2-week cycle. The results were consolidated, prioritized based on the business requirements and implemented in the application by the developers.

The members of the development team were miles apart – only in terms of geography of course: Some of the developers worked from Singapore while additional developers as well as design and project management were based in Switzerland. We were able to turn this situation to our advantage thanks to careful planning: At the end of the workday, the team in Switzerland tested and reviewed the functionality of the application. All the feedback was recorded in a ticketing system and available to the Singapore team when they started to work the next day. This allowed the team to work on the feedbacks and commit their changes to the application in a central server.

> In a step-by-step approach, users tested the features in a 2-week cycle.

That means that when the Swiss team continued to work the day after the feedback was already processed and ready to be tested.

From a technology perspective, SHCS brought with it some new challenges since the web application would have to run on various devices. While data managers tend to work at a desktop

Ann Nguyen as UX/UI Designer turns applications into a user experience.

computer with Windows XP and Internet Explorer 8, the mobility of study nurses who move around the hospital a lot demands a mobile application, for example in the form of a tablet. When we launched the project at the end of 2013, we

WebMed runs in the private cloud and is available at a click around the world.

therefore chose what are known as «bleeding edge» technologies for the frontend – technologies that have not been thoroughly tested yet, like the Bootstrap 3 CSS framework in combination with the open-source framework Angular JS. These technologies are tremendously flexible and can be easily and conveniently adapted based on user feedback. We also had to have a reusable library with UI widgets in order to try out various workflows and UI patterns, finding the most suitable solution for the SHCS users. We tested the UI patterns for the tablet version directly on the device in order to ensure that the application is easy to use. For users who will use the web application on a tablet down the road, being able to work efficiently even without a mouse and keyboard is especially important.

Immediate availability thanks to the private cloud

The web application runs in the AdNovum private cloud. Therefore, SHCS not only benefits from the usual advantages of the cloud, such as increased scalability, lower fixed costs and reduced operating costs, but also and especially from practically immediate and worldwide application availability – at a click! Availability and flexibility are also improved by having a dedicated integration server next to the production server, so new features can be tested in everyday life. AdNovum operates an internal server for both the testing team and the engineering team. AdNovum's security and compliance suite Nevis along with daily data backups ensure security.

Example SWF website: a different story

The UX design process as such is very linear: Research and analysis, design and prototyping, presentation and implementation of the solution.

Specific approaches are required for websites, since these in contrast to specialized applications provide content for target groups from the general public and serve communicative, informative, representative or commercial purposes.

We took the following approach for the website of the Singapore Writers Festival (SWF) commissioned by the National Arts Council:

Research and analysis

We meet with the customer to determine the project requirements. Standard specifications and a briefing by the customer are very helpful here. If the project involves an existing website, we comb through and test it from the user perspective in order to uncover possible weaknesses. Once we understand the problem, we perform a benchmark and trend analysis to find out how similar websites look and work. We write user stories with personas which we derive from the target groups.

Design and prototyping

At this stage we work with quickly sketched drafts or paper prototypes. This makes it possible to try different concepts and also test the concrete ideas directly. Once the concept has been established, we prepare a few wireframes and an information architecture, normally in the form of a site map. This is usually sufficient for presenting the idea to the customer and obtaining feedback. Often we go a step further and design a realistic prototype with visual elements. Here we
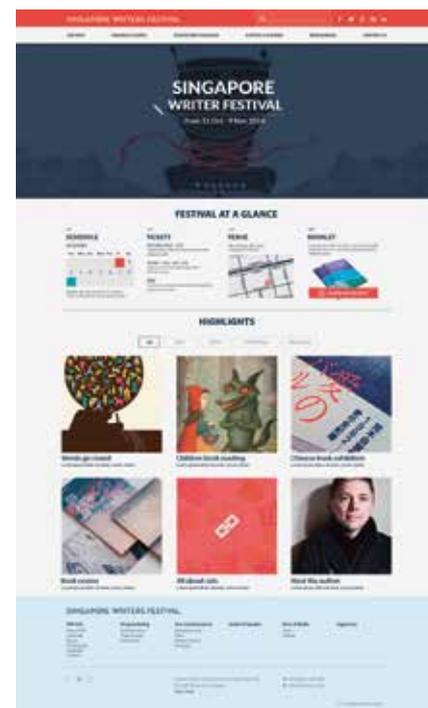
The wireframe is followed by the prototype.

are already in the midst of usability, because we have to consider whether the call to action button is visible, if the user understands the labels and whether the design focuses on the most important services. A mood board with examples, typographies and a color palette can be very inspiring when designing a very visually appealing product.

Presentation and implementation of the solution

We present the concept and its benefits to our customer. This includes in particular:

- A design catalogue which lists the most important points of the concept and illustrates them with screenshots.
- Mock-ups, because the concept only comes to life when the customer looks at it on the device.
- A special presentation in which we tell the design story to the customer, go through the personas and typical scenarios, and actively and emotionally provide access to all of our information. Last but not least, we implement the solution in close cooperation with the software engineers.

> THE CONCEPT ONLY COMES TO LIFE WHEN THE CUSTOMER LOOKS AT IT ON THE DEVICE.

Consistently positive experiences

The SHCS and SWF projects have shown that the user-centered approach works extremely well for AdNovum. Next to suitable technologies, interdisciplinary cooperation in the project and the direct interaction of design and development are crucial for success.
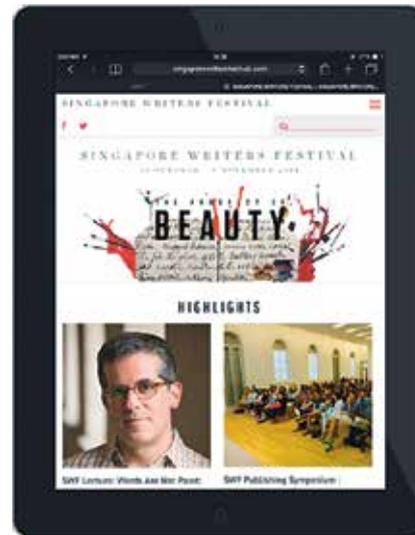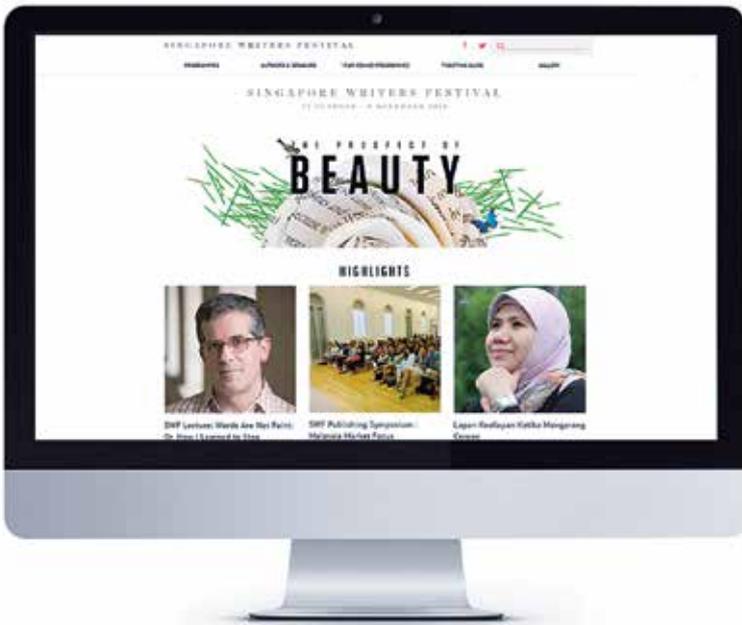
Desktop, tablet, mobile: The application works on any device.

Ann Nguyen

Ann Nguyen, Mechanical Engineer and MA in Human Computer Interaction (HCI) and Ergonomics, joined AdNovum in March of 2014 as UI/UX Designer. Her job is designing an interface that is as simple and intuitive as possible, but still has a unique aesthetic appeal. Outside of work, she enjoys traveling, cooking and doodling in her sketch book.

Loïc Pfister

Loïc Pfister obtained a Master's degree in Communication Systems from EPFL in Lausanne. In May 2011, he joined AdNovum's Singapore office as a Mobile Technology Expert. Back in Switzerland since 2013, his main focus has been on enterprise mobile applications and mobile banking applications. In his spare time, he loves to travel and try new food.

User-centered website design – reality check

Web design ideally focuses on meeting user requirements.
This insight is gradually being accepted in practice.

By Andrea Stojanov

Taking user requirements into account in a website or application may sound self-evident. However, this principle is in fact not always easy to put into practice with large company websites. That is because the websites often serve many purposes that are given priority over the user. Here are three of the stumbling blocks most often encountered in practice.

Stumbling block 1: The user – an unfamiliar creature

When you ask the person responsible for business who the target audience for a new website or section of a website will be, you often get this answer: «Everyone of course.» Or a discussion follows about who the company's most important internet target group is.

In my experience the question itself is not asked correctly. In contrast to classic marketing, it is not so much about who the users are (age, gender, origins, etc.), but more about what they are supposed to do on the website. Nobody goes to a company website just to read. As a rule the user wants to find an address, download a report, conduct data research, find a job and so on. The more easily and quickly the user can accomplish this goal, the more satisfied he or she will be – which in turn has a positive impact on the company's image. The usability expert Gerry McGovern for example found that only a few «top tasks» have a significant influence on user-friendliness.

Agreement on the user objectives (tasks) is often easier to reach than a consensus about a demographic target group description, which does not really help us much in web design.

About Andrea Stojanov

Dr. Andrea Stojanov is Head of Digital Communication with the Asian Development Bank in Manila. In this function, she manages the company website among other things. Information management, usability and information architecture are topics of special interest to her. She has worked as a consultant for the web projects of telecommunication firms and banks, and has been responsible for intranets and company websites in international organizations (UN, OSCE, ADB) since 10 years.

We can describe virtual personas on the basis of the specific objectives. Fictitious names, attitudes (adept, impatient, detail-oriented, etc.) and objectives are assigned to them so they provide good orientation for information architects, developers and editors.

It is not so much about who the users are, but more about what they are supposed to do on the website.

Stumbling block 2: «Small kingdoms» block the view of the user

In some companies, the management of the company or internal website is highly decentralized. Departments manage sub-sites under their own responsibility and usually have their
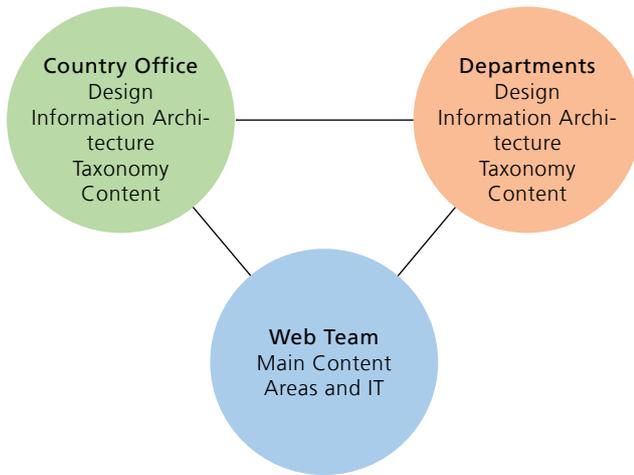
Decentralized structure: Risk of a heterogeneous appearance.
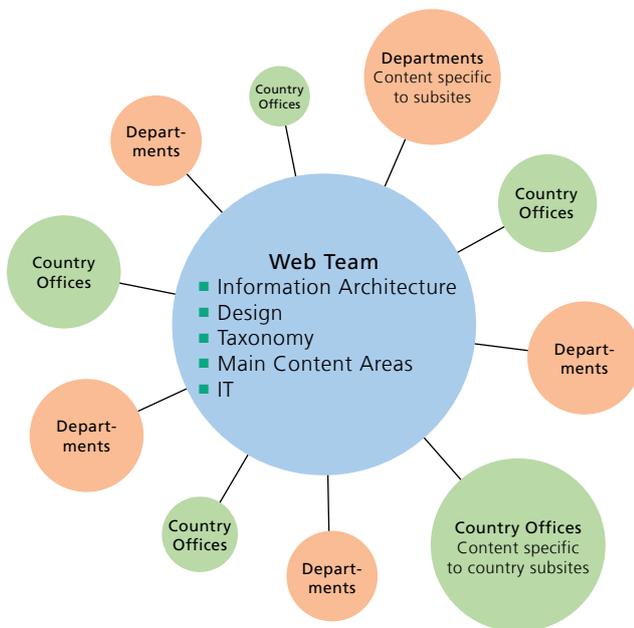
Hybrid structure: Departments are responsible for content, the web team for the overall appearance.

own web budget as well. Very often this results in a heterogeneous information architecture and taxonomy. Even for important terms such as PIN or password, different words may be used from one page to the next.

In my experience, a hybrid management structure is the solution most easily implemented in practice: A central web team representing the interests of the users is responsible for a uniform information architecture, taxonomy and editorial guidelines. The departments focus on the content, which they enter into a content management system according to defined rules.

Personas provide good orientation for the transition from a decentralized to a hybrid management structure as well. As with all change processes, management support is also indispensable.

Stumbling block 3: The «web designers» in upper management

Website design also gets tricky when the designer wants to take all of upper management's ideas and wishes into account. The various perspectives and priorities reveal themselves rather quickly here.

More attention is often paid to colors than they really deserve. «Like/don't like» is an argument frequently given more weight than actual usability considerations. Then there is the battle over scarce space on the homepage: Some managers believe that they are unimportant if «their» topic is not represented there. Whether this topic is actually of interest to the user is a minor point. The results of user surveys, website statistics and personas – with a dose of patience – usually help convince the «web designers» in upper management.

> ## More attention is often paid to colors than they really deserve.

Conclusion

User-centered design has become so important with the spread of mobile devices that it has changed the way software is developed. Rather than technical possibilities, user requirements serve as the starting point for the engineer today. This paradigm shift should boost awareness of user-centered design on a broad basis … and also clear away some of the stumbling blocks in the web design process. ■

The best project has no value if it is not complete.

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