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.
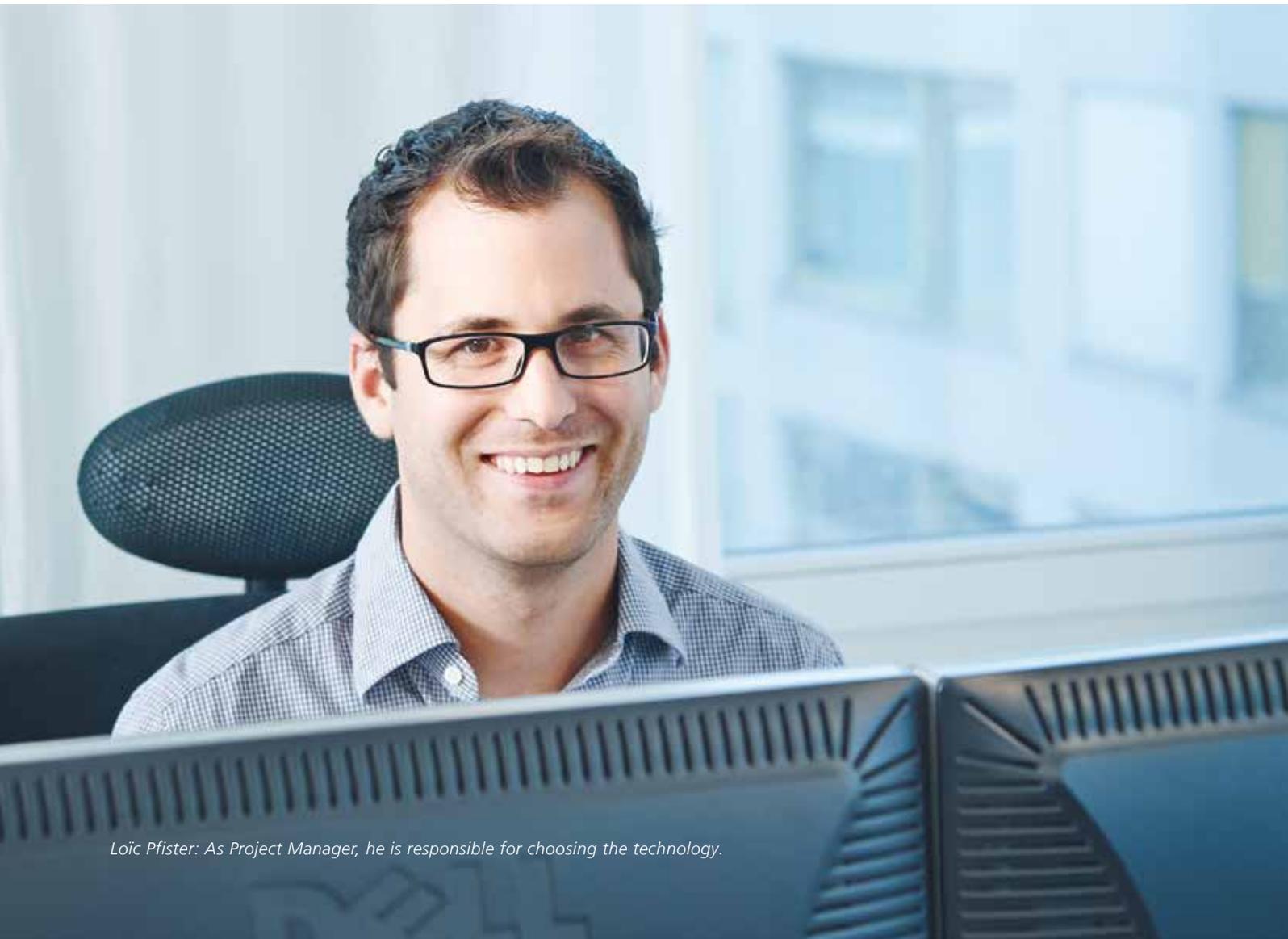
Loïc Pfister: As Project Manager, he is responsible for choosing the technology.

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
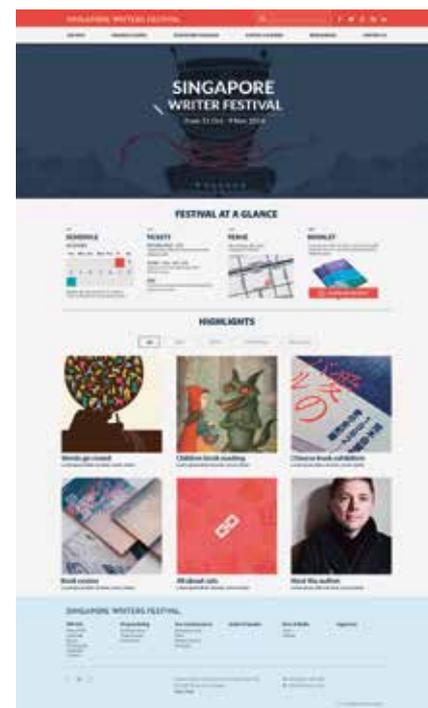
The wireframe is followed by the prototype.

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.
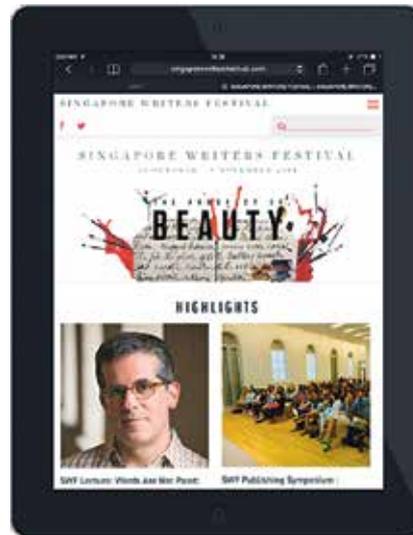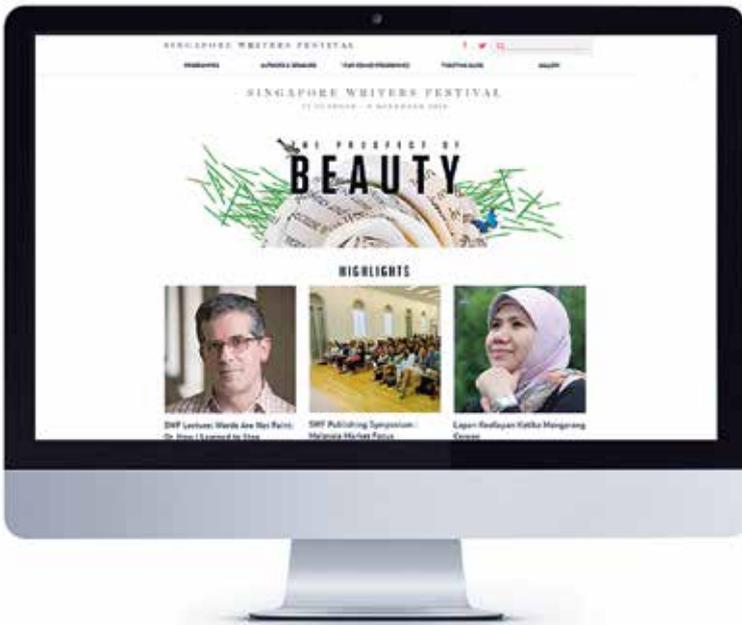
Desktop, tablet, mobile: The application works on any device.

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.