D6V1.1
Proof-of-concept specification

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Summary

This deliverable describes the approach and results around investigations for the business rationale and functionality of lifestyle interventions for burn-out prevention or treatment. As a starting point, interviews with different potential customers have been chosen. These were followed up with discussions with experts in the field of vitality and burn-out. This resulted in two different concepts that provide mHealth support to improve people's vitality. Concepts are presented and their rationale is discussed in the light of the two different use cases and contexts.

1   Introduction

Employee vitality is a topic of growing importance in many organizations. Many of these organizations want to support their employee vitality. Often these companies already have complete programs consisting of a diverse set of instruments, such as: adapting the campus, offering healthier food in the company restaurant, creating manager awareness and employee awareness (e.g. Managing a Shiftwork Lifestyle), organizing events and workshops on vitality topics (e.g. mindfullness), training internal vitality coaches, etc.

One of the most notable interventions is the health check for employees. The checks often indicate that there is a lot of room for improvement, as the group with health risks is significant. Additionally, there is sometimes feedback from employees that there is a need to have follow up tools in place, as the checkup does provide a health insight, but does not help you get healthier, or more vital. This can lead, in the long run, to increased risk for burn-out, driving up costs and lowering quality of life for employees and their social network.

Next to many organizations working on the vitality of their own employees, there is also a mental health therapy market focused on patients who have more severe cases of burn-out and need professional support. In such cases, the professional support often takes the form of weekly therapy sessions in which patients learn to handle the different stages of their burn-out.

The starting point for the current deliverable was the notion we might be able to support employee vitality and burn-out therapy through context-awareness technology and digital coaching. Context-awareness technology may use many smartphone integrated sensors to understand the state of an individual in terms of physical activity, biorhythm, location, etc. This would allow users to keep track of their lifestyle automatically, receive automated coaching, set goals, and provide a digital lifestyle memory to discuss in the social network of the user.

As vitality and burn-out are often the result of lifestyle (exercise, nutrition, sleep), we have investigated together with partners from a large multinational organization, vitality experts, and a burn-out therapist if we could design a solution around this. The goals of this investigation were twofold:

1) Investigate what kind of and how context awareness technology can be used to support employee vitality and burn-out therapy together with leading experts in the field.

2) Investigate the business rationale for building such technology from the perspective of two potential partners, namely a large multinational and a mental healthcare institute.

The rest of this delverable is organized as follows. In the next section we describe our approach, specifying the different partners and explaining the procedure for getting to the results. Next, in the Results, we present the results and findings, both on the business rationale and the resulting proof of concept design. Finally, we provide a short discussion and next steps.

2 Method

The approach involved the following partners:

2.1 Sonnevelt opleidingen

Sonnevelt opleidingen is the leading academy for healthy life style in the Netherlands. Sonnevelt provides certified education for coaching in various topics ranging from healthy nutrition to mindfulness, coping with stress, etc. Founder Albert Sonnevelt is one of the leading vitality experts in the Netherlands. He cooperates with knowledge institutes to push the boundaries of our current understanding of vitality, and more importantly, he develops pragmatic and useful exercises, advice and tools for people to use. Albert is also a renowned author of books about vitality: "100 microbreaks", "gelukt", "kiezen vanuit je hart", en "de levenscode".

2.2 ASML

ASML is a Dutch company and currently the largest supplier in the world of photolithography systems for the semiconductor industry. The company manufactures machine for the production of integrated circuits, such as CPUs, DRAM memory, and flash memory. ASMLs corporate headquarters is based in Veldhoven, The Netherlands. ASML has a world-wide customer base and over sixty service points in sixteen countries.

ASML has around 20,000 employees world-wide, containing many shift workers and frequent flyers. The working environment is often characterized as putting a high pressure on employees and therefore there is an increased risk for lower vitality. Two years ago, ASML has started a global vitality program and created a full-time role for a corporate vitality manager.

2.3 PsyQ

PsyQ specialises in treating psychological and psychiatric disorders. Their psychologists are experts. They work closely together with patients to draw up a treatment plan so that patients can resume your daily life as soon as possible. PsyQ is the largest outpatient mental health organisation in the Netherlands. One section of PsyQ focuses on workrelated problems and burn-out. They treat patients with such complaints.

2.4   Procedure

The procedures consisted of three phases. In the first phase, we had interviews with the two potential customers among the partners. For ASML, we spoke with the corporate vitality manager and the director of the medical program. For PsyQ, we spoke with one of their leading burn-out therapists. These interviews were aimed at figuring out the business rationale for their specific context and the main goals for the proof-of-concept product.

After the business rationale and the goals for the proof-of-concept product became clear, we discussed with experts in the field of vitality, biorhythm, and nutrition the different aspects the solution should address. These experts were connected to us by ASML.

After speaking with the experts and having a good idea of what the goals and necessary functionality in the solution, we used a paper prototyping approach to make rapid iterations through several designs of the app. In every iterations, we worked closely together with the stakeholders from the different partners. We pitched intermediate results to a larger group within ASML as well.

Finally, the efforts culminated into two different final prototypes (or APPetizers as we like to refer to them), one for ASML and one for PsyQ. Both have been pitched to major stakeholders within the organizations, at ASML involving even the most senior management.

3 Results

3.1 Business rationale

For Psyq, the business rationale consists of two different elements. First of all, the solution should be able to improve therapy effectiveness and efficiency. As such, it should be able to lower costs and lead to better outcomes. This simply means that PsyQ can lower prices becoming more competitive, or gain a larger profit margin on the offered therapy. Hence, the first business rationale is based on better bottomline result. Second, the solution will contribute to showing PsyQ as a leading institute in the adoption of eHealth and mHealth technologies. This will improve the brand, driving demand and growing the organization. In all cases, PsyQ stresses that their main priority is offering the best available care they can with the available resources.

For ASML, we initially expected the business rationale to be focused on cost reduction by lowering burn-out and illness rates. Allthough this might lead to some estimated cost reduction, it is not their main reason for investing in employee vitality. First and foremost, ASML wants to present themselves as an exemplary employer, trying to support employees in the best way they can. They hope that this might help them filling vacancies, but also boosting motivation among existing employees. Moreover, improved vitality is likely to improve productivity and creativity, improving results of the entire workforce. ASML recognizes that they are extremely dependent on the brain power of their workforce, and they want to do everything they can optimize this brainpower. Finally, they feel responsible as an employer for all the employees and their families, so they want to offer them tools to better cope with the demands that ASML puts on them.

3.2 Background and functionality

Talking to the different experts in the field, we came to four areas that would benefit from addressing in the solution.

1. The first area is biorhythm. Biorhythm constitutes a users sleeping behavior, but also alert moments and moments of relaxation (based on the physiological responses of their body). Through automatic measurement, the solution should give the user insight in his/her sleep/wake rhythm, learn his/her most alert moments during the day and provide hands-on information about effective sleep strategies.

2. The second area is exercise and movement. Exercise and movement are well-known interventions for a multitude of health problems. Even simply moving at least 30 minutes a day will already significantly improve someone's health. Through automatic measurement and goal setting, the solution should make users aware of their physical activity and stimulate them to be physically active at the right moments.

3. The third area of concern is nutrition. Nutrition is a very complex and influential factor for vitality. To give a user a better grip on a healthy nutrition, the solution should focus on providing users with information and advice about the right timeof eating and information about what would be good to eat at that specific time. This is closely related to moments of sleep and exercise and therefore forms a natural link with them.

4. The fourth and final area of concern is mental resilience. Mental resilience refers to a users facility to cope with outside stressors. Mental resilience can be separated in several categories: Control, Confidence, Motivation, Adaptability, Optimism, Socializing, and Mood.

By tracking (some of) these dimensions users will become more aware about how they are feeling, which is the first step towards potential improvements. Second, when things seem to worsen the solution can provide advice and escalate to support.

These four areas form the main functionality in the solution. Next to that, the use cases for ASML and PsyQ are a little bit different because of different user groups and different contexts. First, ASML asked us to focus specifically on frequent flyers for transmeridian travel (i.e., resulting in jetlags) and shift workers. Both groups form a significant part of ASML's workforce and are at extra risk for vitality reduction. Hence, the solution for ASML should focus specifically on supporting shifting biorhythms.

Second, PsyQ wants the solution to be used not only by the patient but also by their therapist. It should function as an interface between the two roles and stimulate social contact. Whereas ASML had a similar request, they are also worried that employees won't use the tool if they might think that their manager is able to view aspects of their life. Hence, ASML wants to keep the measurements shielded from others to see, whereas PsyQ would like to use the measurements for feedback to patients and therapists.

In all of the four areas mentioned above, automated coaching can contribute positively to the effect of the solution. Coaching goes beyond providing users insight in their biorhythm, level of physical activity, nutrition and mental resiliance. By coaching, we mean to provide users feedback about these aspects, but additionally give concrete tools or instructions to help users perform desired behavior and change undesired behavior. Especially coaching users towards a personalized goal by using previous performance and progress over time has been shown to be effective. Additionally, interventions that use personalized coaching show significantly higher effect sizes than interventions that give general feedback or that do not use coaching.

Taken together, the solution should allow setting of goals and provide (automated) tracking on the above mentioned aspects. Next to that, it should provide coaching support to users and information about improvement of lifestyle. Extra functionality for ASML focuses around shifting biorhythms of frequent travellers and shift workers. For PsyQ there is a need for an interface to the therapist as well. Because of the differences between use cases for ASML and PsyQ we present to potential designs below, one focussing specifically on temporal aspects of the intervention whereas the other is more general.

3.3   Design

3.3.1   ASML

The resulting design for the solution (app) for ASML is depicted in Figure 1. The main page is organized around a timeline in which all the different goals and measurements around a user's vitality is organized. Users can see automatically shifting goals based on their travel plans or planned working shifts. Automated coaching messages will provide feedback and reminders (for instance, when a meal should be eaten, and what kind of meal would be ideal to eat at that time).

The interface has been kept somewhat analytical on purpose. It corresponds to the analytical nature of many of the people working at ASML and is therefore likely to interest them. Social aspects have

been integrated in the app in several occasions as to engage users more. They can have group discussions, contact one of the vitality coaches of ASML for more information and receive invites for specific events relevant to their own situation.
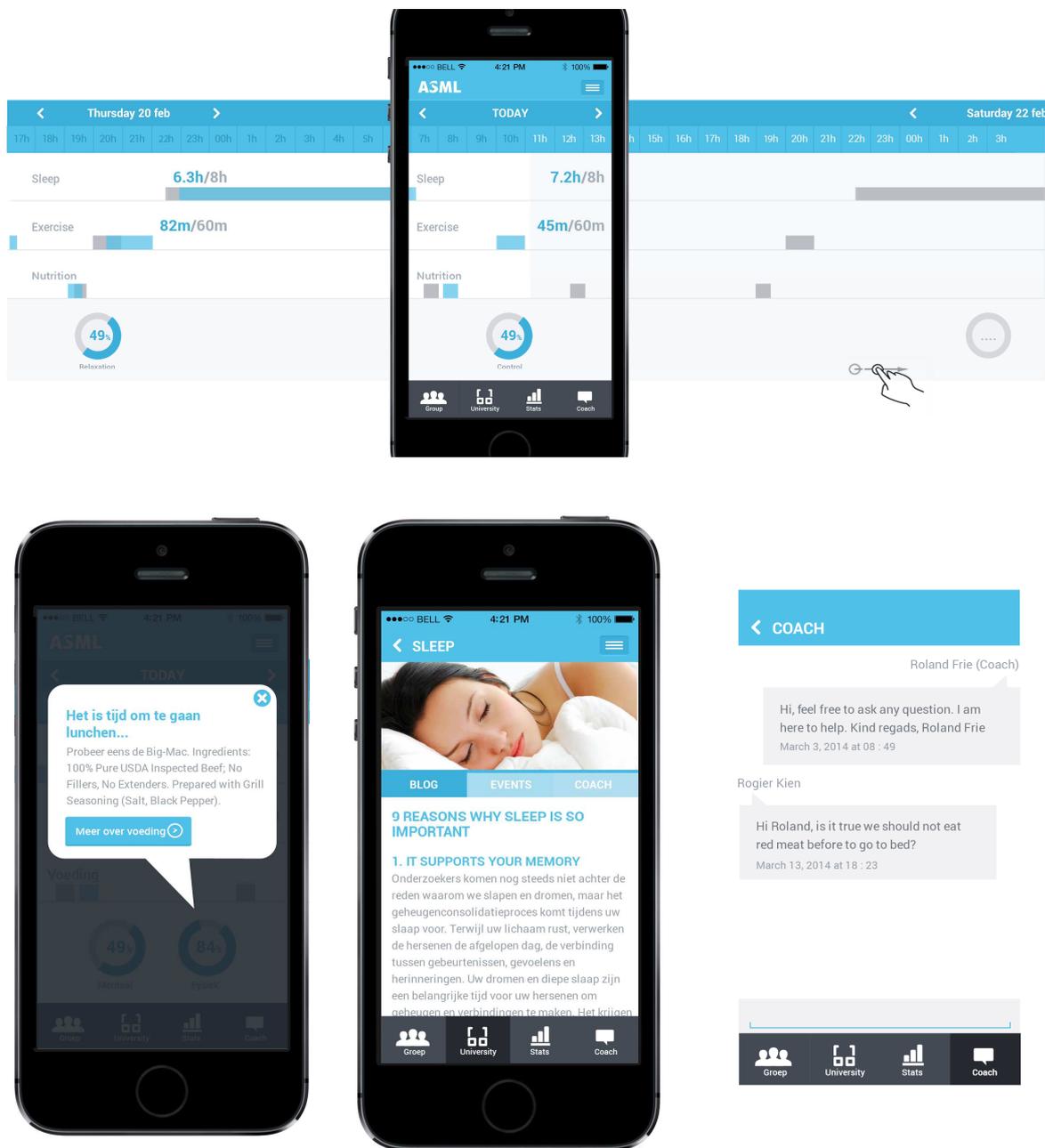

Figure 1. Different pages of the design for the ASML app. On top: the timeline depicting different vitality aspects their goals (in time) and measurements. Bottom left: a pop up notification with lunch suggestion. Bottom right: coaching interface. Bottom centre: Sleep information.

3.3.2   Design PsyQ

The design for PsyQ existed already in the form of an app for people with depression and agorafobia. This is depicted in Figure 2. It consists of a home screen listing a patients lifestyle goals and the progress towards those goals. Patients can get more information by clicking onwards through the

app. Next to the app, there is also a therapist dashboard in which therapists can set the goals for the patients.

It turns out that a similar approach can be used for the burn-out solution. With the exception of the specific agorafobia goal all the other goals remain relevant for burn-out treatment. A worthwhile addition might be the tracking of several other mental resilience metrics next to emotion which can already be tracked.
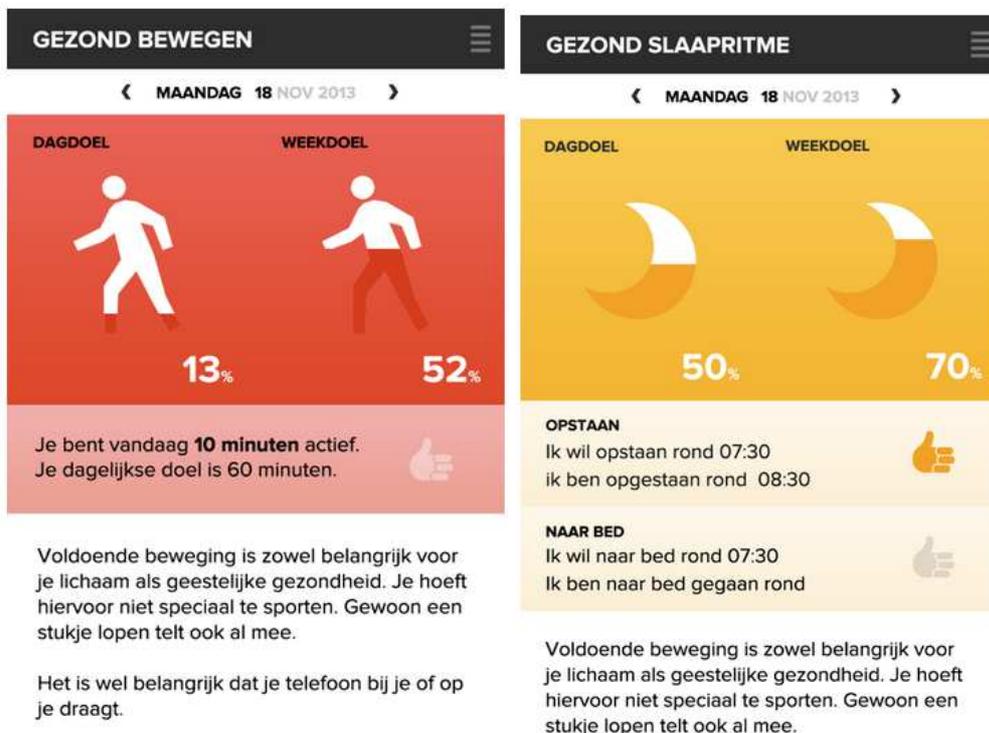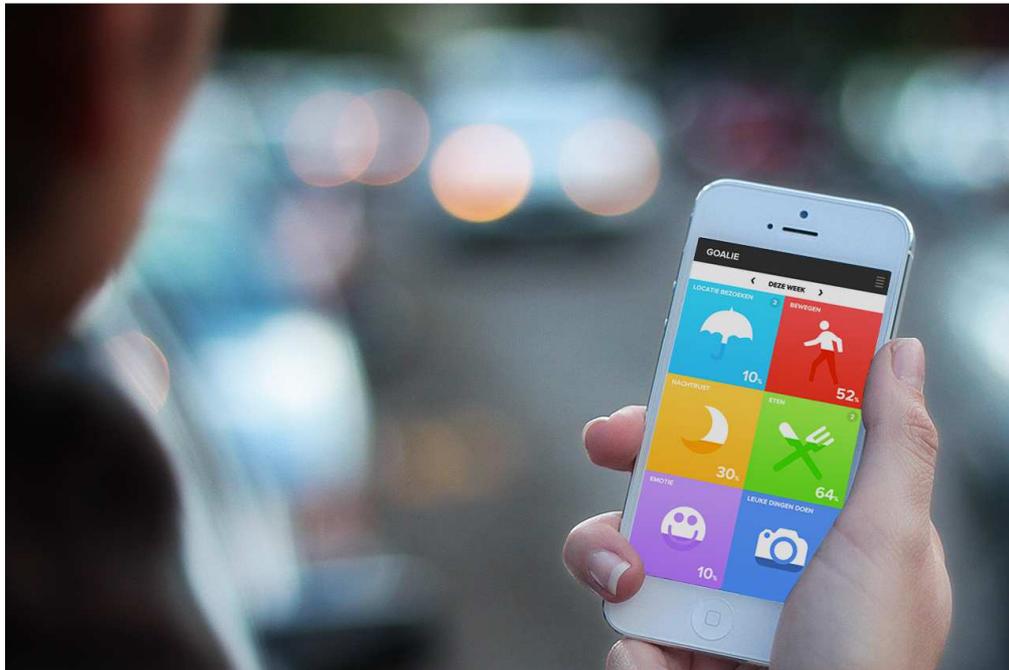

Figure 2. Design for the PsyQ mHealth solution. On top: the main screen with an overview of all goals. On the bottom two detail screens (in Dutch) for movement and sleep goals.

4 Discussion

We have described the process and results of close cooperation between different partners for creating mHealth tools to improve vitality and treat burnout. Through several interviews and focus groups with potential customers, several interviews with domain experts, and rapid prototyping iterations keeping them in the loop as well, we have come to the design of two potential approaches. One approach focuses more on the interplay between patient and therapist whereas the other focusses on employee empowerment and has features for shifting biorhythms (for shift workers and frequent cross meridian travellers).

Some surprises occurred regarding the business rationale for the large corporate organization among the stakeholders. We had initially expected that their business rationale would be focused on cost reduction. However, a more important reason for putting resources into employee vitality for them was their responsibility and image as an employer. For the mental health institute, image was also a factor, but in the end it needs to improve their bottomline result as well.

Looking back on our approach of rapid prototyping and strong customer and expert involvement we believe that this a very powerful way of promising co-creation. It is extremely important to have all stakeholders in the loop to come to high quality results in a short time period. Being able to translate customer insights into easy to use and effective technological solutions is not an easy task and should not be underestimated. Moreover, involving more than one customer is likely to be necessary as different customers may have different demands. This is what we experienced combining a large multinational organization with a mental health institute.

As a next step, we will decide which of these two designs will be further developed. One the designs will be further implemented to be evaluated with the customer. This depends on the involvement and commitment of both customers.

To conclude, we believe this is very good starting point for furthering the vitality solution. The approach seems promising with interest from different parties and room for different technological directions. This only further underlines the potential of the underlying technology. Based on our results, we are confident that this technology can come to fruition into improved vitality and burn-out treatment.