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Design for Meaningful Work Experiences: A Holistic Approach to Human-Work Interaction Design

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Abstract. Promoting meaningful experiences at work is essential to employees' wellness and constitutes a strategic investment toward sustainable growth. Interactive work tools appear to have been excluded from most academic efforts to determine meaningful work. Yet, user experience for work tools can optimize interaction with technology, improve employee well-being, and give a more exciting, satisfying, and meaningful perception of the activity for workers. We conduct a two-stage qualitative study to develop a model of Design for Meaningful Work Experiences, aiming to answer the following question: how can researchers and designers approach work tool design to stimulate human flourishing through more meaningful work experiences? Based on a preliminary case study and a follow-up study consisting of 9 qualitative interviews, we develop a model that describes a new methodology to integrate Positive Design into the relationship between Human Work and Interaction Design. Creative inversion is introduced as an emergent design technique that can help foster creativity by facilitating communication between researchers, designers, and users.

Keywords: Human work, Interaction Design, Positive Design

1 Introduction

Employee well-being has received increasing attention in the past few years and became especially preponderant in the context of the COVID-19 pandemic, which has redefined people's relationship with work in many ways. Promoting meaningful experiences at work is essential to employees' wellness and constitutes a strategic organizational investment toward sustainable growth [1–3]. In a world increasingly demanding evidence and research-based products and services [4], the research agenda needs to adapt to the globally increasing interest in employee well-being and expand academic knowledge across fields. Although job characteristics and individual attributes have been well explored as determinants of meaningful work [2], interactive work tools[1] appear to have been excluded from most academic efforts [5]. Yet, user

[1] Interactive work tools refer to any information system that an employee needs to interact with to complete some or all of their work-related tasks.

experience for work tools can optimize interaction with technology, improve employee well-being, and give a more exciting, satisfying, and meaningful perception of worker activities [6, 7]. This paper reports the results of a two-fold study asking: *how can researchers and designers approach work tool design to stimulate human flourishing through more meaningful work experiences?* Based on a preliminary case study, we developed a sensitizing model of Design for Meaningful Work Experiences (DMWE). We then performed an empirical test of our model by conducting additional qualitative interviews outside the scope of the case study. The purpose of this article is thus to demonstrate how the DMWE can inform the design of features that not only help improve work efficiency but also create work experiences that enhance human flourishing[2].

2 Theoretical Framework

2.1 Problem-driven Work Tool Design

Human Work Interaction Design. Because employee well-being is a complex construct, designing for it calls for HCI research that can account for several social levels while still focusing on interaction design. Moreover, it is important that HCI research can contribute to practice by (i) being able to make design recommendations and (ii) acknowledging the environmental context as an integral part of the analysis [9]. *Human work interaction design (HWID)* adopts both technical and social perspectives as it considers the three areas of *human work*, *interaction design*, and *environmental context* as integral parts of its analytical potential [9]. This approach is particularly useful to study the connection between human work and interaction design in concrete cases through artifact design [10]. Consistent with HWID, most of the existing research on enhancing employee experience through tool design mostly focuses on pragmatic design [5].

Paradigmatic Innovation for Design Practice. While designers have historically been encouraged to pursue problem-solving (as per the *industrial paradigm*), there is now a call for adopting a possibility-seeking approach that better suits newer paradigms of innovation [5, 11]. Consistent with arguments of the Paradigmatic Innovation for Design Practice framework [11], workplace practices have arguably been characterized by a paradigmatic shift that emphasizes systems approaches to organizational development. This means that thriving organizations are now those capable of offering value to their customers, employees, and stakeholders in a dynamic fashion while considering factors such as experience, knowledge, and sustainability [11–13]. The same applies to design, with the emerging preponderance of human-centered approaches [11, 14, 15]. The main difference thus lies in the emerging importance of a

[2] Human flourishing focuses on "meaning and self-realization and defines well-being in terms of the degree to which a person is fully functioning" [8]

cohesive flow between all the elements related to an object of study rather than them standing as silos. As this trend emerges, we see an increased focus on organizations or artifact design as a system, making it important that researchers and practitioners take into account factors that used to be considered beyond the scope of an organization or artifact (e.g., sustainability used to be considered separately from an organization's overall strategy, employee well-being used to be considered separately from work tool design, etc.).

2.2 Possibility-driven Work Tool Design

Experience Design. The distinction between *welfare* and *well-being* is gaining more relevance as economies drift away from the industrial paradigm. While welfare is often focused on economic utility [16], well-being is less measurable and includes non-rational variables that contribute to human flourishing – closer to the eudaimonic tradition [17, 18]. Experience Design is a practice that prioritizes experience over usability and aesthetics [5]. Traditional approaches to the design of work tools have focused on providing features that are useful to human work while conveniently improving the interface aesthetics and usability of the interface. Instead, designers should place experience and human needs first and design experience-driven core functionality that directly addresses these goals [7, 19]. In line with the goal of Experience Design, Positive or Happiness Design has emerged as a practice with a specific focus on contributing to experiences of positive affect – such as happiness and pleasure [20–22]. However, practical applications of such practices can be challenging at two main levels: (i) defining the experience goals and (ii) designing features that fulfill these goals [5].

Positive Design. The Positive Design Framework is a helpful tool to navigate these challenges. It proposes three main components for design artifacts that enable or stimulate human flourishing: virtue (i.e., "being a morally good person"), personal significance (i.e., "pursuing personal goals"), and pleasure (i.e., "experiencing positive affect") [23]. Much of the value of this framework comes from its general applicability to a broad range of contexts and cultures. The framework does not prescribe specific elements or instantiations of virtue, pleasure, and personal significance, but instead focuses on universal factors of subjective well-being [5, 23].

Work Experience. The increased focus on experience and subjective well-being naturally question the nature and the meaning of work. While work primarily fulfills welfare-based needs, a rich stream of literature shows that meaningful experiences are also embedded into our work lives, suggesting that work can contribute to positive affect and human flourishing [1, 3, 5, 24]. In a theoretical integration and review of the literature about the meaning of work, Rosso et al. [24] develop a framework that describes the Mechanisms of Meaningful Work (MMW). These 13 mechanisms are either self-oriented or other-oriented. They include self-concordance, identity

affirmation, personal engagement, control or autonomy, competence, perceived impact, self-esteem, significance of work, value systems, social identification, interpersonal connectedness, interconnection, and self-abnegation [24].

Positive Design Framework for Work. Experience design [19, 22, 25, 26], positive design [23], and happiness design [27, 28] have become well-known approaches for consumer products, but have been under-represented in the design of work tools – despite the growing interest in work-related happiness. The PDFWork is one of the few instances of academic attempts to improve employee well-being through work tool design. It was developed to help designers embody "meaningful experiences at work and a future of flourishing, motivated employees" [5] by leveraging experience and positive design principles. The PDFWork contributes to discussions about employee experience, experience design, and interaction design by proposing a model that integrates important elements of work-related happiness and experience design into a streamlined design methodology. The authors argue that the first step to designing work tools that contribute to employee happiness is to define experience goals. A suggested approach to defining meaningful experience goals is to use basic human needs as a starting point.
Psychological needs. Based on 10 original human needs [29] and models of user experience , Hassenzahl et al. [21] suggest that 6 needs are fundamentally relevant in the context of Interaction Design: autonomy, competence, relatedness, popularity, stimulation, and security. However, these are considered potential sources of positive affect, meaning that they do not constitute a fixed set of rigid categories – researchers and practitioners should feel free to add and remove needs from the list as they see fit. In the context of this study, we choose to use the toolbox of 8 psychological needs proposed by the Experience and Interaction Design working group as sources of positive experiences [33] (based on [21, 29, 34, 35]), which adds physicalness and meaning to the original 6 needs.

3 Method

This study unfolds through a two-step methodology using an abductive approach. We first conduct a case study and then build upon our findings to conduct a second qualitative study and develop a design model.

3.1 Case Description

We investigate the case of a customer relationship management system used in the MBA admission office of a Danish university. MBAs are a strategic area of the university's educational offering, as they are the most financially retributive. As a highly strategic department, the MBA admissions Office's functioning is closer to that of a corporate organization than the rest of the programs it offers. To support its recruitment activities, the MBA Office implemented a Customer Relationship

Management system specialized in the student life cycle. This case study will focus on two specific MBA programs as they both use the same CRM system – as opposed to their neighboring offices. While the two programs have their respective admission teams, they share supporting functions, such as the Marketing team. The team consists of one admissions manager and two student assistants (one for each program).

The CRM system is used for a wide range of admissions-related tasks, including collecting and organizing potential candidate data, conducting email campaigns, creating event sign-ups, and processing applications. The scope of this investigation is narrowed down to focusing on the email campaign function of the system.

Because the admission team delegates the task of formulating and sending email campaigns to the student assistants in the marketing team, the primary users in this study are the student assistants of the two programs.

3.2 Methodology

The case was selected because it is a critical example of a work tool primarily designed to fulfill functional needs while providing usability. We conducted semi-structured qualitative interviews with two student workers who are the main users of the CRM system – two 24-year-old female employees with respectively 1.5 years and 4 months of employment at the MBA admission office.

In the first round of interviews, we used the HWID approach to discover the main pain points of our users and use this insight as a basis for proposing a prototype. With the first worker, we used contextual inquiry to unveil her role, goals, tasks, and pains while understanding how she interacted with the CRM system. Based on this, we developed the first iteration of a prototype using Adobe XD. In the interview with the second participant, we conducted a usability test based on a think-aloud protocol to maximize the rigor and replicability of the test. After the test, the prototype, as well as the CRM system, served as probes to understand the participant's role, goals, tasks, and pains during our interview.

During our interview with the second participant, we were surprised to learn that after only a few months of employment, she had just handed in her resignation from the position. As this insight stood out during our analysis of the data, we decided to search the literature to make sense of this new information and explore opportunities for improving the experience of future employees. We used select elements of the Positive Practice Canvas (PPC) [36] to guide follow-up interviews with both participants and collect data that ultimately informed a sensitizing theoretical extension of HWID – the Design for Meaningful Work Experiences model. The PPC is a tool developed to "support designers with identifying concrete opportunities to improve wellbeing through design" [36]. It is a visual interview guide made of different sections: profile, practice, meaning, needs, skills, and material. The sections help identify a positive practice, understand what needs it fulfills, and the required materials (or interfaces) and skills used during the practice. The canvas was created to support "anecdotal design",

where specific and sometimes individual practices are used as starting points for design ideation. Using the anecdotal practices as inspirations, designers can come up with creative ideas for new features or functionality that can be useful to other people as well as other contexts [36].

For this case study, the PPC served as inspiration in structuring user interviews. Specifically, “practice”, “meaning”, “needs” and “skills” were used to build an interview guide that was adapted to an online format and mindful of the fact that this interview was a follow-up. The remaining sections (“profile” and “material”) were irrelevant in this case, as these details were already provided in the first interviews. We analyzed this data using the PDFWork and developed a user task flow based on the experience goals we defined from the data. We also developed the second iteration of our prototype to integrate the newly suggested features and functionality.

In the second stage of our research, we set out to refine and validate our proposed model. We, therefore, recruited nine participants working in the fields of sales, marketing, and management whose tasks involved the extensive use of an ERP, CRM, or collaborative file-sharing system. Our goal was to expand the context of our model while remaining within the scope of digital services. The participants were aged 22 to 35 and were located in Denmark (1), the United Kingdom (1), and the United States (7). A gift card of a value of approximately 10 USD was offered as compensation for the participants’ time. The interviews took place on Zoom, lasted between 32 and 46 minutes, and were recorded and transcribed using Konch.ai (all resulting transcripts were processed manually to ensure correctness). We used the same interview technique as during the second round of our first-stage interviews: the Positive Practice Canvas. We analyzed the data using the PDFWork and defined experience goals along with feature suggestions.

4 Findings

4.1 Findings from the Human Work Interaction Design Analysis

Users’ tasks and characteristics. The student assistants are in charge of sending out campaigns and their tasks are similar. Tasks, characteristics, needs, and pain points of the users were the main comparison elements in the study. Both users are 24-year-old females, with no prior experience working with CRM systems. The first participant has worked for the MBA office for 1.5 years, while the second participant had less experience – 4 months. According to Participant 1, her and Participant 2’s tasks are similar, with differences in how they execute them. Participant 2’s tasks focus on an MBA program that receives fewer applicants, so she is more personally engaged in contacting the applicants (i.e., phone calls, also resulting in a different way of selecting email recipients). Participant 1 uses the email campaign function more often and is engaged in more marketing tasks since she assists the marketing department, while Participant 2’s job is more administrative and HR-related. For this paper, only tasks related to the marketing campaign function of the CRM system were analyzed.

Users' problems and needs. Both participants emphasized that the system is easy to learn and use. Additionally, Participant 2 mentioned that the CRM system's customer support is fast and helpful. Participant 1 specified that the process of sending out campaigns is intuitive. However, we found that Participant 2's work is very manual and that she sees certain functionalities as inconvenient or useless. Similarly, Participant 1 found some functions inconvenient or lacking customization. The main user pain points during the campaign setup process include messaging, audience sorting, and sending out test emails. A sample of supporting quotes is presented in Table 1.

Messaging. This refers to the part of the campaign setup where email templates, visuals, and copy are done. Besides limited editing possibilities, email templates can be accessed in two places, which confuses the users. The main problems with the messaging functions could be summarized as lacking customization, unintuitive, and leaving little room for creativity.

Audience sorting. Within an email campaign, users can select relevant recipients using filters and tags. As it seems, users are involved in large amounts of manual tasks – Participant 2 searches each recipient manually on a separate page because she cannot find the relevant filters on the campaign level, while Participant 1 spends a lot of time navigating filters and selecting each of them. Both users may therefore benefit from improved audience sorting, especially in terms of geographical sorting.

Sending out test emails. Lastly, both users recognized that it is only possible to send out test emails to their own email addresses. Since both users have to confirm campaigns with their manager, improving this functionality could be beneficial.

Table 1. Sample of supporting quotes for the Human Work analysis

	Messaging	Audience sorting	Test emails
Problem	Limited customization; hard to express one's creativity; non-intuitive work-flow since templates can be accessed on two separate pages	A lot of manual work to find relevant recipients; the system lacks relevant filtering options that would help narrow down the audience; many useless functions; the overwhelming amount of filters	Only possible to send test emails to oneself
User quotes	"Formatting is very limited, lacks visual elements such as content boxes, video formats"; "Lack of functionality limits	"It takes too long to create rules so I just search for people manually"; "I don't think it would be possible to make useful filters, I don't see how, because there are so many different people"; "There are many useless	"I have to confirm everything with my manager before sending out the campaign"; "I can't send test

	creativity and that's why I only copy campaigns"; "Campaign functions are not put together nicely"	illogical functions when filtering audiences on the campaign"; "It's almost like there's too much customization, too many possibilities"; "I just stick to what I know"	emails to anyone else"

The HWID analysis unveiled that users are engaged in a variety of manual tasks and they need improved efficiency. The main pain points were identified as messaging, audience sorting, and sending out test emails. Based on the insights and discussion's themes (functionality, user critically reflecting on how the system works), it appeared that both shared a need for improved usability so they can become more competent. When asked about specific usability elements that could be improved, both participants indicated that the performance and stability of the system were satisfactory, whereas task efficiency had room for improvement.

This stage of the research aims to propose a prototype based on the pain points identified in the above analysis, consequently creating value within the Industrial Paradigm through faster production of email campaigns and less manual labor required to execute them [11]. Consequently, a prototype was constructed to address these issues and served as a connection between HW and ID (see Appendix I).

4.2 Findings from the Positive Design Analysis

The Positive Practice Canvas helped identify tasks and activities that constitute positive experiences for the users. Specifically, both interviewees mentioned design and copywriting activities as great sources of positive affect. Therefore, this is the positive practice that we chose to analyze. Through discussing the participants' creative practices (email design and copywriting), we were able to understand what were some of their important psychological needs, and specifically how the creative activities help fulfill them. Table 2 present a sample of quotes that helped us discover each psychological need.

Table 2. Psychological needs and sample of supporting quotes

Psychological need	Sample of quotes
Meaning	"I want to learn more practical things that are relevant to my studies"; "I want to get experience with things that would help in my career"; "Creativity is important because then the work would be more meaningful"; "I feel I'm doing more valuable work for myself and the company when I'm creating like I'm spending my time more usefully"
Stimulation	"When I'm designing, I don't even feel like I'm working"; "Marketing-related tasks are the most exciting"; "You enjoy work more if you can do

	your own ideas"; "I like creative things like design, it doesn't really feel like work"
Autonomy	"I appreciate that my colleagues trust my copywriting skills enough that they don't feel they have to supervise me"; "I like to have brief guidelines and then create"; "Boundaries like feedback, timelines are important for me but it's also important that they would let me do my own thing"; "Flexibility and independence reflect my lifestyle"

Gaining a deeper understanding of the basic needs of our participants helped us identify the mechanisms that made their work meaningful to them. This further helped us define experience goals for redesigning the email campaign functionality of their CRM system in a way that would address these needs and directly contribute to the identified mechanisms.

Specifically, we found that creative tasks were a common and redundant theme among our participants because they triggered feelings of *self-concordance*, *personal engagement*, and *independence*. These mechanisms of meaningful work could be mapped into the Positive Design Framework for Work components, leading to the adoption of experience goals based on the following psychological three needs: meaning, stimulation, and autonomy. This analysis helped design a proposal for a digital experience that would let users complete their work tasks in a more meaningful way, thereby improving their job satisfaction and subjective well-being. A summary of our analysis can be found in Table 3.

Table 3. Defining experience goals

Experience goals	Explanation	PDF Component	Mechanism of Meaningful Work
Meaning	Realizing the user's own goals and objectives through accomplishing work tasks	Virtue	Self-concordance
Stimulation	Getting enjoyment from work tasks by embedding personal hobbies into practices	Pleasure	Personal engagement
Autonomy	Feeling that one is the cause of their own actions, rather than being directed into specific tasks	Personal Significance	Independence

Based on our analysis, several features were considered as suggestions for improving the user's experience using the CRM's email campaign function. Based on these features, we developed user stories as a roadmap for our improved prototype.

The user stories induced from the HW analysis are: (i) users should be able to schedule campaigns, (ii) users should be able to sort campaigns based on the recipient's geo-localization and/or citizenship, and (iii) users should be able to send test emails to other employees.

With regards to the Positive Design analysis and newly defined experience goals, we opted to combine all three into an element-based design section within the CRM

system – in the current version of the system, the design tab is hard to access and inflexible, leading to the assistants sticking to the same templates. The user stories for creating a positive experience that fulfills the needs for "meaning", "stimulation" and "autonomy" are: (iv) users should be able to add and edit text, (v) users should be able to change existing colors and add custom colors, (vi) users should be able to add and edit elements and (vii) multimedia files. The resulting user flow is visualized in Fig. 1 (the dotted lines represent tasks that were visually included in our prototype but not functional).

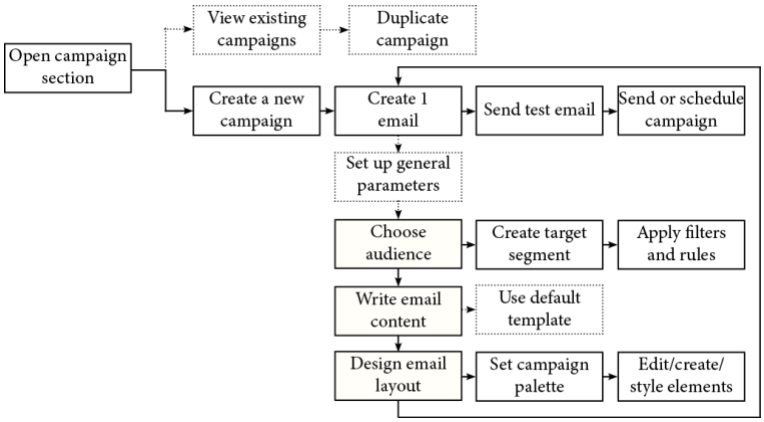

Fig. 1. Suggested new user task flow

4.3 A Sensitizing Model of Design for Meaningful Work Experiences

Because our data revealed new insight, we chose to trust the research process and embrace the pivot. As a result, the afore data collection and analysis constitutes a combination of Human Work (HW), Interaction Design (ID), and Positive Design (PD). Given the power of this combined approach, we propose to conceptualize it into a sensitizing Design for Meaningful Work Experiences model (see Fig. 2).

We argue that Human Work and Interaction Design provide the groundwork for solving functional issues, including informing about users' characteristics, problems, and needs, the technology they work with, and how they interact with it. Positive Design builds upon this practical understanding of a given case to help create an experience that addresses pain points but also has the potential to improve employee experience and job satisfaction. Importantly, Positive Design contributes to human flourishing by helping design features that increase feelings of pleasure, virtue, and/or personal significance.

While it is common to only address one of the three areas in one design, such a proposal should "avoid imparting any negative effects on the other two" [23]. In our case, we learned from the interview that several features of the existing artifact were

pain points for the users – which means that other aspects of the design could negatively impact the positive experience we were designing. Therefore, we deemed it necessary to also address functional pain points that did not directly result in meaningful experiences, because we believed that the negative emotions they could generate would likely undermine the positive effects of our proposed design. We thus want to emphasize that all three approaches have much to learn from one another and benefit from being combined. While human work alone lacks the human-centered elements that unlock meaningful experiences at work, positive design may lack the functional and contextual understanding of a work environment. Finally, interaction design must learn from both HW and PD so it can support functional and meaningful user experiences – but interaction design also has great potential to contribute to HW and PD by acting as a probe and supporting effective communication between users, designers, and researchers.

The environment wherein an organization is embedded inevitably impacts all aspects of the design and is reciprocally impacted by the users' experiences – as such, it permeates the whole structure. Our case revealed several instances of interaction between work, the artifact, the workers, and the environment. One of the most telling examples was that at the time of the data collection in April 2020, most of the Danish workforce had been sent home to work remotely due to the COVID-19 pandemic. At the time, the CRM system was desktop-based, and as a result, the student workers could not access it remotely – therefore Participant 1 emphasized that an area for potential improvement would be to make the software available on the browser and via a mobile application. Both participants also acknowledged the customer support team of their CRM provider who regularly makes adjustments to the system based on their feedback. This is not only an example of the role of external stakeholders in the work experiences, but it also shows that workers can influence their environment.

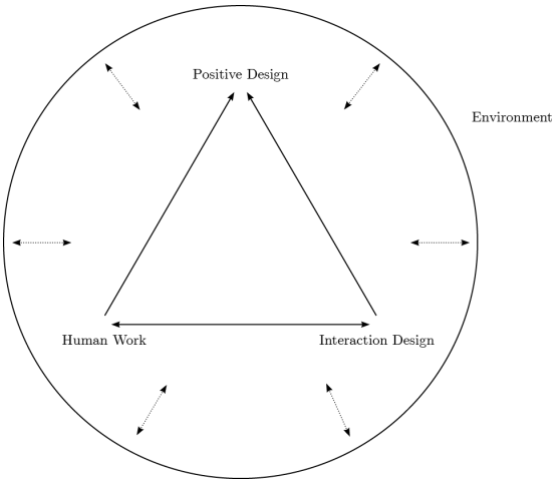

Fig. 2. Design for Meaningful Work Experiences (DMWE) sensitizing model

4.4 A Validation of the DMWE model

To test our sensitizing model, we conducted a new round of 9 semi-structured interviews in May 2022. We summarize our findings hereafter.

Human Work. We started the interviews by asking users to describe their roles, goals, and some challenges they encounter at work and when interacting with their work tools. This provided a context for the discussion that followed – about their positive practices and psychological needs. The participants' goals varied from supervision duties (P4) to marketing activities (P5, P6, P9), including data analysis (P3), customer satisfaction (P2), project management (P7), etc. Many participants encountered relatively minor technical challenges and software limitations, including lagging performance (P1, P9), system complexity (P3, P6, P7), and a lack of integration of other business processes in the main system (P4, P5, P6, P7). The bulk of their occupational challenges however is entangled in their work environment. For example, P5 explains that a lag in customer responses to feedback surveys slows her down and impedes her progress ("Delay in receiving a response from satisfaction surveys. It discourages me because I need feedback from customers so I can improve. When I don't get it leaves me with no idea what to do"). P4 recounts how a lack of direct interaction with customers led the company to set up a physical suggestion book directly in the store. Every Friday, the sales team picks up the book and uploads the suggestions to the CRM system where managers can access it and further act on it. However, sales associates often linger in reporting the suggestions which causes the managerial team to be stuck in their work and have to put in extra work to go retrieve the suggestions. Workers develop interesting practices to overcome some of these challenges, thereby being actors in their work environment. For instance, P5 reports using WhatsApp conversations to overcome the inequalities in access to her company CRM system's internal communication channels. P6 explains how his team adapted to a lack of integration by using two different laptops when performing data analysis on SPSS and going through qualitative customer feedback on Microsoft tools or dividing all projects into different parts so that different employees take care of different parts of the analysis ("Right now you have to use two laptops, which makes work more tedious. We're used to it"; "Most times it doesn't make me feel comfortable because what I do so I don't have so much stress, I assign most of the work to my colleague"; "I would be happier, I would be grateful because it would […] make our work, our duty run very smoothly. Because we would be able to scale our target").

Positive Design. During the second part of the interviews, we employed the Positive Practice Canvas to steer the conversation away from problem-solving and towards possibility-seeking instead.

Table 4 provides an overview of the positive practices identified and discussed during the interviews. Some of them who were redundant across several participants were clustered to simplify the analysis and demonstrate the transferability of anecdotal insight. The analysis of positive practices helped identify and illustrate the different psychological needs that workers evoked (see Table 5 for a sample of supporting quotes for each of the eight needs).

To clarify the process, we can consider the specific instance of "learning". P1, P2, and P3 all reported experiencing positive affect when engaging in activities such as reading studying, or doing research. These activities created feelings of discovery, richness, and excitement which are indicative of a psychological need for *stimulation*. They were also sources of feelings of liberty, independence, and self-reliance – fulfilling the participants' need for *autonomy*. Finally, participants shared described feelings of self-realization, meaningfulness, and fulfillment through these activities, which we argue contribute to their need for *meaning*. We further identified that these learning activities require time-management skills (e.g., setting time apart to dedicate to learning, or making sure that learning practices do not overflow on work tasks of higher priority) and the ability to focus. Moreover, participants reported using a range of materials when they engage in learning practices, including sources of content such as digital and physical documents, note-taking tools (e.g., Microsoft Word), and ways to bridge this practice to other areas of their work environment (e.g., shared documents to engage in collaborative learning, calendar applications to define boundaries between learning activities and immediate duties).

Table 4. Identifying Positive Practices

Positive Practice	Participants	Social Practice
Learning (reading, studying, researching)	P1, P2, P3	**Psychological needs**: stimulation, autonomy, meaning **Skills**: time-management, focus **Materials**: YouTube, web browser, books, white papers, calendar app, Microsoft Word
Having conversations with co-workers	P4, P5, P8	**Psychological needs**: relatedness, meaning, stimulation **Skills**: communication, availability **Materials**: lunch break, office
Energizing snack	P2	**Psychological needs**: physicalness **Skills**: know what to choose **Materials**: coffee, juice, meal
Writing content	P3, P9	**Psychological needs**: meaning, stimulation **Skills**: proficiency, vocabulary, competence **Materials**: pen and paper, Microsoft Word, digital notepad

Organize company trips	P4	**Psychological needs**: stimulation, relatedness **Skills**: relationship management **Materials**: trophies, budget, employees
Listen to music	P6	**Psychological needs**: stimulation, meaning **Skills**: focus, music selection **Materials**: iTunes, playlists, AirPods
Stretching	P6	**Psychological needs**: physicalness **Skills**: be quick and effective **Materials**: none
Time-pressured tasks	P7	**Psychological needs**: competence, stimulation, popularity **Skills**: efficiency, organization, Excel skills, focus, prioritization, time flexibility **Materials**: Evernote, Excel, iMessage/WhatsApp,
Helping co-workers	P1, P3, P5, P7	**Psychological needs**: popularity, competence, meaning, stimulation, relatedness **Skills:** leadership, social, communication, counseling, charity, care, accountability, professionalism **Materials**: coffee, lunch, online resources about mental health
Keeping paper records	P1	**Psychological needs**: security, competence **Skills**: professionalism, accountability **Materials**: printer, digital and physical diaries, sheets of paper, digital and physical records

Table 5. Psychological needs and sample of supporting quotes

Psychological need	Interview quotes
Stimulation	"I like to work on pressure"; "Sometimes, even if it's a boring task – but something different than what I usually do on my day-to-day basis, I like to change a little bit"; "It's fun for me on a daily basis because I learn each and every day"; "Often, I go for lunch with colleagues, making fun, having chats of different software, how the future is going to look like in the software market. It's often very fun and interesting"; "I love researching more, reading more about a particular product that might be new"; "What I love about writing is that you know, you get to

	come across new words and this helps increase your vocabulary”; “Music gives me more energy, it serves as a renewal, it gives me more motivation”
Competence	“The whole process wasn't something I'd done before. And I was happy, I was able to do it right the first time”; “Wow, well my day is always hectic but at the same time, I love my day because I always accomplish whatever I have to do for the day”; “What really interests me is see how the content gets to generate more sales. I love it when I see those contents attract people, it makes me feel good about myself, it shows the work I’m doing is productive”
Popularity	“They trust me to do it. I like it. […] So I feel really happy if I know that they chose me to do something”; “When someone acknowledges you, saying ‘thank you’, when the person sees your worth, you feel valued. And you feel happy”;
Autonomy	“And I also really appreciate how he gives me like freedom and flexibility to do things my own way”; “As you’re working, you don’t need to wait for your boss to come out and tell you everything”;
Meaning	“I choose to be professional because I want to be professional, because I want to do a good job, because I want my company to actually stand strong, I want customers to always give us a 5-star feedback”; “[Learning] is important to me because I’m doing it for the better mental, and to broaden my knowledge”; “When I’m writing I really get inspired, you know? I love writing. It’s part of me. I think it’s one of my favorite activities, I love it”; “[Knowing how my colleagues feel] is very important to me because I believe in teamwork”; “If we should have music in the software it would actually change the orientation because I would feel like I’m working for myself, I’m working in my home – this is my project and I’m not working for the business. If I feel like I’m working for someone, then I can’t really concentrate”
Physicalness	“[Drinking coffee] makes my brain to be calm, my nerves to be calm, and I feel relaxed while using the computer”; “I stretch, it’s some exercise – if someone can sit for 6 hours, man! You start to feel the pain. You need to stand up, stretch, sit down and continue working”; “[Taking care of your physical health even when you’re at work] is the major priority, because if you’re not physically fit, you can’t work for long, then you can’t meet your goals”
Relatedness	“I have the love for everyone around me, and I love my social network, the community”; “Sometimes if I’m lost or if I need their help on something I go and ask and they will be willing to help me and they will not ask for anything in return. And they will do this thing to just help me with what I just showed them – and I’ll feel happy”; “My happiness is when my employees are happy”; “[When my colleagues are struggling] it gives me the urge to encourage the person”;

Security	"I have a diary, I keep physical records. It's compulsory […], to do a good job, you also need to have backup plans"; "Prompt responses to duties by my co-workers – that makes me so happy my co-workers responding to their duties"

Experience goals. Based on our Human Work analysis and Positive Design insights, we were able to use the psychological needs to develop experience goals. These experience goals served as guidelines to develop creative ideas for features that enable or stimulate human flourishing. They do so by fostering positive affective experiences, but also by alleviating pain points through functional or "palliative" design. Table 6 provides a sample of selected experience goals. To define a new experience that bridges positive design and meaningful work, we collected interview quotes supporting each psychological need and sought to understand how they relate to elements of the Positive Design Framework and the Mechanisms of Meaningful Work, following the methodology of the PDFWork.

Table 6. A sample of experience goals

Psychological need	Definition of experience goal	PDF Components	Mechanism of Meaningful Work
Stimulation	Giving the user opportunities for self-fulfillment through autonomous discovery and exploration while doing their job	Pleasure, virtue, personal significance	Personal engagement, autonomy
Relatedness	Help users develop and nurture healthy relationships with co-workers	Virtue, personal significance	Interpersonal connectedness, interpersonal sensemaking
Meaning	Make it possible for workers to embed their personal passions and values into some of their work tasks	Pleasure, virtue, personal significance	Self-concordance, identity affirmation, personal engagement
Competence	Automate the instantiation of workers' ability to achieve their goals	Virtue, personal significance	Personal control, self-efficacy

The newly defined experience goals then served as probes for us to ideate new features or functionality to be implemented into the work tools discussed with the interviewees. Table 7 provides a brief sample of the output of the ideation process. These proposed features are not meant as unique or ideal solutions but serve as evidence that combining human work analysis with the sharing of positive anecdotes can generate potentially valuable creative output.

Table 7. Examples of new features based on experience goals

Experience goals	Example 1	Example 2	Example 3
Stimulation	AI-powered chatbot that recommends online resources for self-paced learning based on worker's repeated tasks	Development of e-learning modules in partnerships with universities and MOOC platforms	Designated notebook available within the main work system to facilitate and centralize learning
Relatedness	Develop a communication system based on topical channels using conversation prompts with different levels of privacy based on role and hierarchy	AI-powered calendar feature to find free times and probe workers to use them for social activities	Create a function within a collaborative system to send digital/physical gifts to co-workers when they complete a task or assignment
Meaning	Create a personal dashboard where workers can curate content that helps them feel better (e.g., music playlists, mindfulness exercises, stretches)	Scatter artwork, pop-up inspirational quotes, and well-being tips throughout the interface	Generate a cyclic survey that asks workers about the alignment between their personal preferences and work tasks
Competence	Track worker's completed tasks (e.g., sent email, launched campaign, reconciled transaction) and show a list of completed tasks when the worker logs off	Create a space where co-workers can keep track of their achievements (i.e., journal or diary)	Automatically prompt the worker to create a printed record of newly created digital transactions

5 A Refined Model of Design for Meaningful Work Experiences (DMWE)

The first stage of this study was a stepping stone to understanding the complexity of improving work experiences through work tool design – and discovering between Human Work, Interaction Design, and Positive Design. It enabled the creation of a sensitizing model that stimulated the second stage of our study and encouraged us to further explore the potential of our research opportunity. The second round of interviews provided a variety of experiences and contexts that were lacking in the initial study. This richness helped better capture coherent patterns and relationships that were only emergent in our sensitizing model.

In our refined model of Design for Meaningful Work Experiences (see Fig. 3), we first clarify the relationships between Human Work, Interaction Design, and Positive Design. We argue that Human Work has a revelatory role in Positive Design. Because it emphasizes employees' roles, goals, and challenges, it facilitates the discussion between researcher/designer and worker in a way that reveals positive practices at work. In many cases, positive practices emerge where workers experience challenges or achievements concerning their roles and goals. For example, P6 evokes challenges in the configuration of some of his tasks, which generate stress and make his work tedious. Soon after, when we probed him to think about positive practices, he immediately thought of listening to music – which he does when he feels stressed ("I play my music to ease the stress, so I get to worry less"). This naturally led him to come up with the idea of embedding a music player within the CRM system he uses for work. We argue that moving from functional design/problem resolution toward positive design results in a "creative inversion" where we turn negative practices or experiences into opportunities for positive experiences. This creative inversion results in concrete artifacts (design guidelines, prototypes, features) that contribute to human flourishing. In other words, we suggest that Positive Design is a mediator between Human Work and Interaction Design in that it prevents researchers, designers, and users to get stalled and instead fosters open conversations conducive to creative ideas.

Second, we refine the role of the environment. Our data showed that the role of the environment is complex, plural, and multidirectional. It primarily acts as an enabler or as an inhibitor. In the relationship between Human Work and Positive Design, the environment can be an inhibitor to how people exteriorize or even experience negative experiences, challenging the process of creative inversion. On the other hand, it may in some instances serve as an enabler of Positive Design. Returning to the example of P6's music – he can use AirPods at work, which enables him to turn stressful triggers into an experience that he describes as meaningful and significant. If his work environment made it impossible to use earbuds in the office (organizational culture, corporate policy, large amount of phone calls or meetings, etc.), it would act as an inhibitor instead. The environment similarly impacts the development of Interaction Design through Positive Design. In our case study, the CRM system used at the Danish university has a customer support team who is willing and able to make quick customizations to the software

based on direct conversations with the student workers. In this case, the environment acts as an enabler. Less accessible vendors would instead inhibit the development of Interaction Design through Positive Design. Finally, we emphasize that users, artifacts, and practices reciprocally influence the environment, by enabling or inhibiting environmental change – either in the way, they relate their work experiences to positive experiences (Human Work to Positive Design) or in the way that they interact with positive artifacts (Positive Design to Interaction Design).

We would like to note that the relationship between Human Work and Interaction Design in our model of Design for Meaningful Work is faithful to what is described in the Human Work Interaction Design framework [9, 10].

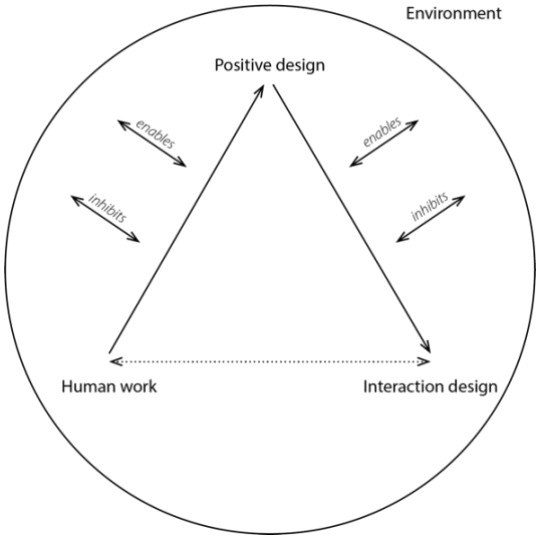

Fig. 3. Design for Meaningful Work Experiences (DMWE)

6 Conclusion

Our model describes a new methodology that emerges through the implementation of Positive Design into the relationship between Human Work and Interaction. Creative inversion is an emergent design technique that can help foster creativity by facilitating communication between researchers, designers, and users. User experience research has developed several studies and frameworks using Positive Design. However, less research was conducted in the workplace, and most was focused on pragmatic design [5].

First, we successfully applied the Positive Practice Canvas to a workplace context, suggesting that the guide is also relevant for fostering communication around interaction with work products and not only consumer products.

Second, we expand the empirical field of work tool design and contribute to research on positive/experience design and work experience by using the PDFWork and developing a new model of Design for Meaningful Work Experiences. The first iteration of our model had already received attention from Human-Computer Interaction scholars, suggesting that there is a need for continuing academic research that can build bridges between Human Work, Interaction Design, and Positive Design [37]. We, therefore, encourage other researchers and practitioners to use our model to inform their work and stimulate fruitful conversation with users – for example, an action design study could help validate the model through a real-life intervention that would make it possible to measure the concrete outcomes of the model.

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7 References

1. Bergs J (2002) Effect of healthy workplaces on well-being and productivity of office workers. In: Proceedings of International Plants for People Symposium

2. Wright TA, Walton AP (2003) Affect, psychological well-being and creativity: Results of a field study. Journal of Business & Management 9:

3. Lips-Wiersma M, Morris L (2017) The Map of Meaning: A guide to sustaining our humanity in the world of work, 1st ed. Routledge

4. Sein MK, Henfridsson O, Purao S, Rossi M, Lindgren R (2011) Action Design Research. MIS Quarterly 35:37–56. https://doi.org/10.2307/23043488

5. Lu Y, Roto V (2015) Evoking meaningful experiences at work – a positive design framework for work tools. Journal of Engineering Design 26:99–120. https://doi.org/10.1080/09544828.2015.1041461

6. Grundgeiger T, Hurtienne J, Happel O (2021) Why and How to Approach User Experience in Safety-Critical Domains: The Example of Health Care. Hum Factors 63:821–832. https://doi.org/10.1177/0018720819887575

7. Savioja P, Liinasuo M, Koskinen H (2014) User experience: does it matter in complex systems? Cogn Tech Work 16:429–449. https://doi.org/10.1007/s10111-013-0271-x

8. Ryan RM, Deci EL (2001) On Happiness and Human Potentials: A Review of Research on Hedonic and Eudaimonic Well-Being. Annual Review of Psychology 52:141–166. https://doi.org/10.1146/annurev.psych.52.1.141

9. Abdelnour-Nocera J, Clemmensen T (2019) Theorizing About Socio-Technical Approaches to HCI. In: Barricelli BR, Roto V, Clemmensen T, Campos P, Lopes A, Gonçalves F, Abdelnour-Nocera J (eds) Human Work Interaction Design. Designing Engaging Automation. Springer International Publishing, Cham, pp 242–262

10. Clemmensen T (2011) A Human Work Interaction Design (HWID) Case Study in E-Government and Public Information Systems. International Journal of Public Information Systems 7:

11. Gardien P, Djajadiningrat T, Hummels C, Brombacher A (2014) Changing your Hammer: The Implications of Paradigmatic Innovation for Design Practice. International Journal of Design 8:119–139

12. Schwaninger M Managing Complexity—The Path Toward Intelligent Organizations. Managing Complexity 35

13. Schwaninger M (2001) Intelligent organizations: an integrative framework. Systems Research and Behavioral Science 18:137–158. https://doi.org/10.1002/sres.408

14. British Design Council (2015) What is the framework for innovation? Design Council's evolved Double Diamond. In: British Design Council. https://www.designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond. Accessed 17 Mar 2022

15. Brown T, Katz B (2011) Change by Design. Journal of Product Innovation Management 28:381–383. https://doi.org/10.1111/j.1540-5885.2011.00806.x

16. Maximo M (1987) The difference between welfare and wellbeing and how objective the concept of a good life can be. In: International Conference Economic Philosophy

17. Deci EL, Ryan RM (2008) Hedonia, eudaimonia, and well-being: an introduction. J Happiness Stud 9:1–11. https://doi.org/10.1007/s10902-006-9018-1

18. Ryff CD (2014) Psychological Well-Being Revisited: Advances in the Science and Practice of Eudaimonia. PPS 83:10–28. https://doi.org/10.1159/000353263

19. Sanders E, Dandavate U (1999) Design for experiencing: new tools. In: First International Conference on Design and Emotion, TU Delft

20. Yoon J, Pohlmeyer AE, Desmet PMA, Kim C (2021) Designing for Positive Emotions: Issues and Emerging Research Directions. The Design Journal 24:167–187. https://doi.org/10.1080/14606925.2020.1845434

21. Hassenzahl M, Eckoldt K, Diefenbach S (2013) Designing Moments of Meaning and Pleasure. 7:12

22. Jordan PW (1998) Human factors for pleasure in product use. Applied Ergonomics 29:25–33. https://doi.org/10.1016/S0003-6870(97)00022-7

23. Desmet P, Pohlmeyer A (2013) Positive Design: An Introduction to Design for Subjective Well-Being. International Journal of Design 7:

24. Rosso BD, Dekas KH, Wrzesniewski A (2010) On the meaning of work: A theoretical integration and review. Research in Organizational Behavior 30:91–127. https://doi.org/10.1016/j.riob.2010.09.001

25. Hassenzahl M (2010) Experience Design: Technology for All the Right Reasons. Synthesis Lectures on Human-Centered Informatics 3:1–95. https://doi.org/10.2200/S00261ED1V01Y201003HCI008

26. Hekkert P, Mostert M, Stompff G (2003) Dancing with a machine: a case of experience-driven design. In: Proceedings of the 2003 international conference on Designing pleasurable products and interfaces. Association for Computing Machinery, New York, NY, USA, pp 114–119

27. Desmet P, Hassenzahl M (2012) Towards Happiness: Possibility-Driven Design. In: Studies in Computational Intelligence. pp 3–27

28. Desmet PM, Pohlmeyer AE, Forlizzi J (2013) Special issue editorial: Design for subjective well-being. International Journal of Design 7:1–3

29. Sheldon KM, Elliot AJ, Kim Y, Kasser T (2001) What is satisfying about satisfying events? Testing 10 candidate psychological needs. Journal of Personality and Social Psychology 80:325–339. https://doi.org/10.1037/0022-3514.80.2.325

30. Hassenzahl M (2004) The Thing and I: Understanding the Relationship Between User and Product. In: Blythe MA, Overbeeke K, Monk AF, Wright PC (eds) Funology: From Usability to Enjoyment. Springer Netherlands, Dordrecht, pp 31–42

31. Gaver B, Martin H (2000) Alternatives: exploring information appliances through conceptual design proposals. In: Proceedings of the SIGCHI conference on Human factors in computing systems - CHI '00. ACM Press, The Hague, The Netherlands, pp 209–216

32. Jordan PW (2002) Designing Pleasurable Products: An Introduction to the New Human Factors. CRC Press, London

33. Hassenzahl M, Sheldon, K.M., Elliot, A.J., Kim, Y., Kasser, Diefenbach, S., Göritz, A, Eckoldt, K., Laschke, M, Lenz, E (2022) 8 needs as a starting point for designing interactive technology

34. Hassenzahl M, Diefenbach S (2012) Well-being, need fulfillment, and Experience Design. In: Designing Well-being Workshop. Retrieved August. p 2013

35. Hassenzahl M, Diefenbach S, Göritz A (2010) Needs, affect, and interactive products – Facets of user experience. Interacting with Computers 22:353–362. https://doi.org/10.1016/j.intcom.2010.04.002

36. Klapperich H, Laschke M, Hassenzahl M (2018) The positive practice canvas: gathering inspiration for wellbeing-driven design. In: Proceedings of the 10th Nordic Conference on Human-Computer Interaction. Association for Computing Machinery, Oslo, Norway, pp 74–81

37. Clemmensen T (2021) Human Work Interaction Design: A Platform for Theory and Action. Springer International Publishing, Cham

8 Appendices

8.1 Appendix I

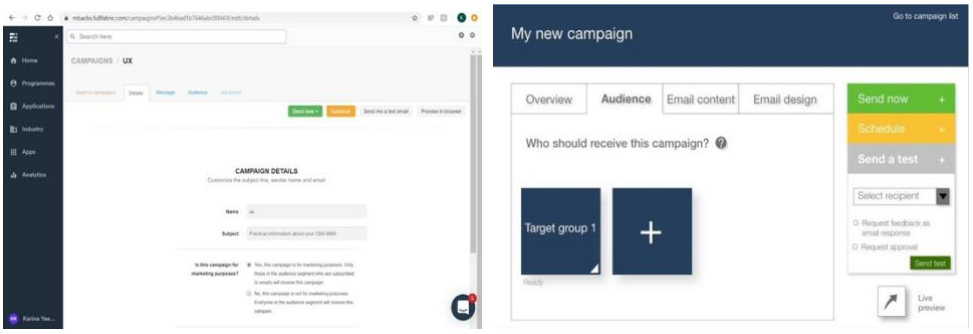

Figure 2. From left to right, original FF and prototype.

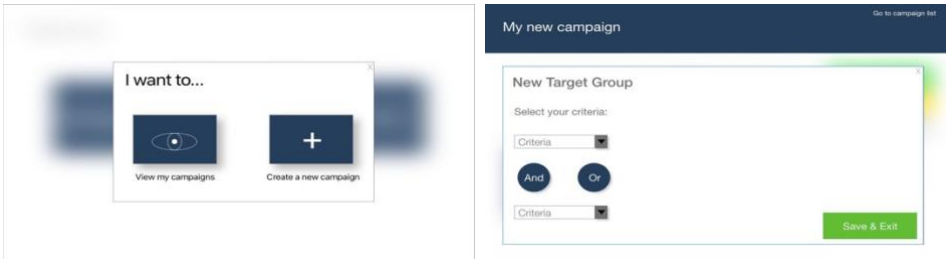

Figure 3. From left to right, entering the campaign area and audience rules settings.

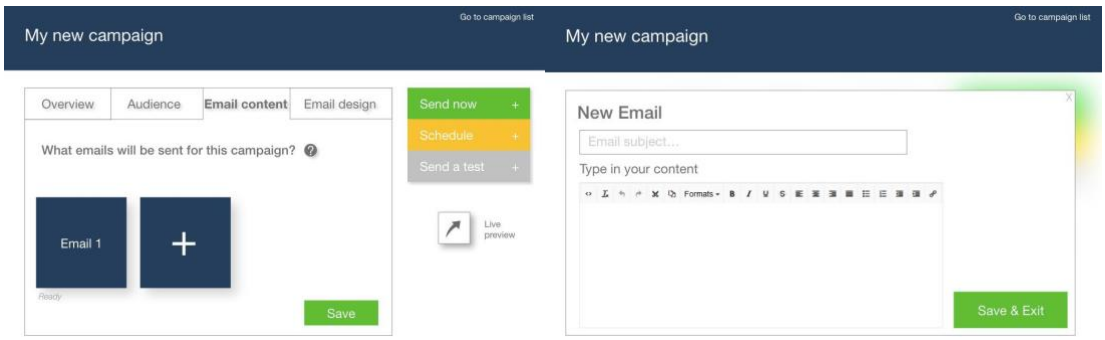

Figure 4: “Email content” area on the prototype.

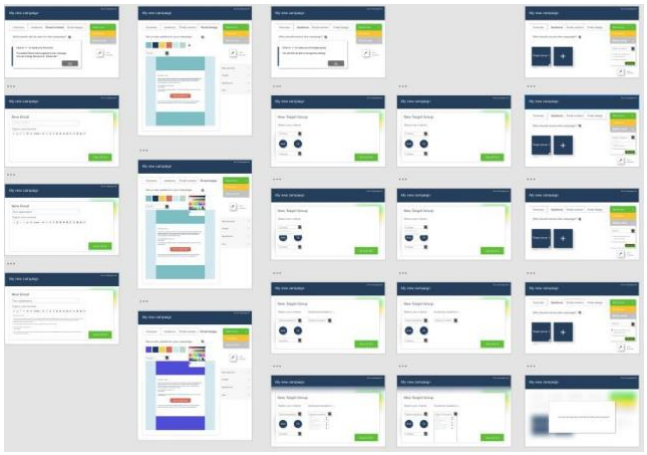

Figure 5: Full overview of the prototype[3]

[3] A recorded demo of the prototype can be viewed here.