CSCM69 – CW2 - Digitalisation of the Work-Life Balance

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ABSTRACT

Work-life balance in the workplace and the transformation to smartphone digital mindfulness apps. Human users benefit from work-life balances within the workplace and through a digital medium, favouring the task scheduling aspect and a reward system for completing tasks successfully, often in groups with other people. A user interview study was performed across Habitica, Rescue time and Forest apps. Digital apps were found to help with task achievement goals and wellness is a valued part of these apps. Voice assistant suggestions were given with priority to task management and audible notifications.

INTRODUCTION

Work-life balance has been considered as important throughout the literature. The literature shows the focus around work-life balance was centred around how to gain more productivity from employees. This was implemented with the thought that employees being healthier both in mind and body would increase productivity and reduce absences from the workplace. There has been much research into the psychology and methods that facilitate humans to change their behaviour through habit-forming and aid in mental health through self-help. The review will investigate how work-life balance can be utilised in the designing of a digital mindfulness app and what approaches are required to be part of the design process.

Multiple apps in the work-life balance domain will be compared, these are Habitica, Rescue Time and Forest. An interview will then be completed by users of the selected applications and formulated to suggest possible improvements in design while considering the human as part of the design process.

LITERATURE REVIEW

In 1976, Hackman and Oldham [1] implemented a model using 658 human workers, that spanned 62 different jobs across 7 organisations. The implemented model (Figure 1) attempted to categorize human workers into several psychological states; and how these states can be used to facilitate more productivity from human workers. The three critical psychological states each show the model has a focus on an increase in human worker productivity. The personal and work outcomes focus around work-related

goals and the reinforcement of a human workers motivation through learning, responsibility and caring about completing work tasks. Hackman and Oldham hint at the human worker's outcome from the model but only about work productivity. The term 'personal' refers to the responsibility a human worker feels to facilitate the completion of work tasks and avoid absences from work. ignoring any after-effects this could cause on human worker life outside of the working environment.

In the years following Hackman and Oldman's [1] paper, there has been an increase in concern on the mental and physical health impacts on working people and how work-life balance could be used to promote physical and mental health for working people.
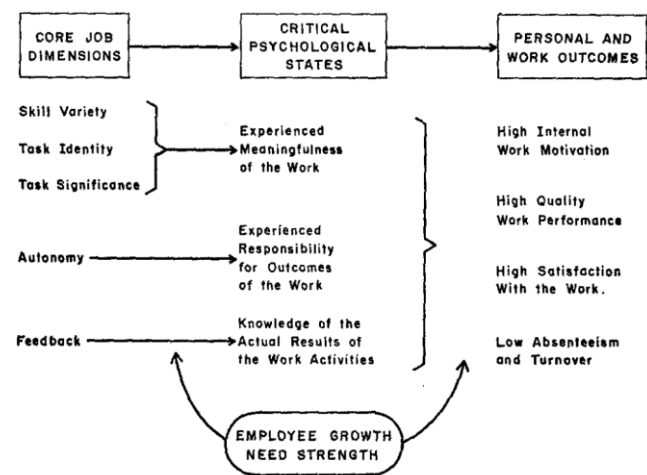

Figure 1. Hackman and Oldham's [1] psychological states model. The three critical psychological states each show the model has a focus on an increase in human worker productivity. The personal and work outcomes focus on work-related goals and the reinforcement of a human workers motivation through learning, responsibility and caring about completing work tasks.

In 1988, Conrad [2] highlights the increase in programs created by employers around health and safety in plans and benefit packages created in the workplace that covers health and safety in the working environment, disability issues and health insurance packages that cover the workers family members as well. Approximately 21.1% to 37.6% of USA companies implemented reduced-rate health insurance costs.

Conrad [3] made a further publication in 1988 showing that in addition to health insurance cost reduction incentives employers had implemented several other benefits and programs. The approach of implementation often selected some of the benefits instead of every possibility from a very

broad range of activities and benefits across the self-learning and self-help domains. Health benefit programs included activities such as aerobic exercise, group fitness classes, hypertension screening, weight control, stress management, quit smoking help, self-care help, drug and alcohol abuse help, accident prevention and protection, posture ergonomics (e.g. back health in a desk job). It was found that larger companies (e.g. IBM, Ford Motor Company, Pepsico, etc) were more likely to have benefit and incentive programs. Programs varied in cost from free, subsidised and charged. Both in work and outsource programs existed. Company bosses suggested implementation of benefit programs were established from the desire to increase employee health and happiness, to achieve more productivity and fewer absences from employees. Participation rates for these programs ranged between 20% - 40% across several companies, suggesting there was a keen interest in benefit and incentive programs. Conrad [3] found a beneficial gain to people working in companies which have benefit and incentive programs. Health and fitness, lowered absence rates, increased morale and company loyalty were reported. There was also a large reduction in insurance claims shown at worksites that implemented the most intensive amounts of health and well-being programs.

There have been several other studies on work benefit and incentive programs around the world. In 1996, Daley and Parfitt [4] investigated health and fitness programs provided by the employer in the UK. It was found that people who participated in these programs reported increased job satisfaction and both physical and mental health well-being. In 1999, Danna and Griffin [5] suggested a framework to implement in the workplace that allows for an organisations priorities (productivity, lowered absences and focus to the current task), and the personal well-being of the employee (psychological and physical consequences) to be classed at the same importance level as each other. Allowing a work-life balance that is healthy for both an employer and an employee, rather than a focus on one side of the work-life balance.

In 2012, Håkansson et al [8] suggested technology use in mental health and physical fitness could be utilised as a great work-life balance tool if the human user is considered as part of the design process. The simplicity of design is key to an app not becoming a chore or distraction tool rather than an improvement of balance tool.

Slow technology was suggested by Hallnas and Redstrom [9] as a simplicity to design that included reflection time for users placed in the environment. A word processor was used in regards to if a text popup displayed a message such as "Please REFLECT ON X" [9] and it is likely the user would ignore this reflection prompt. In comparison, a message displayed as "SMILE" [9] vs looking up from your office desk and looking at your favourite painting on your office wall. Designing of reflection is less about just a tool

but how to incite reflection through good design of both logic and aesthetics to provoke the reaction. Like how one would critique an art piece vs a notification to remember your favourite painting. The tool can be implemented as part of the environment more so that being a separate tool for this specific task.

Several physical examples of such tools have been created recently, revolving around personal wearables for notification alerts through the vibration of the device (Fitbit, Apple watch, etc).

A physical device called Timeular [10] used for user-set tasks can be said to have some elements of the Slow Technology [9] design paradigm. Timeular is an 8-sided physical device with an accompanying app. Each side can be set to an individual user task once a user switches task they can flip the Timeular cube to the tasks side and an internal timer will start. The timer is automatically updated for that task in the accompanying application. When the task is complete it will automatically be added to a calendar-like interface display the user can navigate to keep track of progress. This could be utilised for a productivity tool on the work side of balance or as a life balance reflection tool. Enabling reflection on how much work and life moments the person is spending time on.
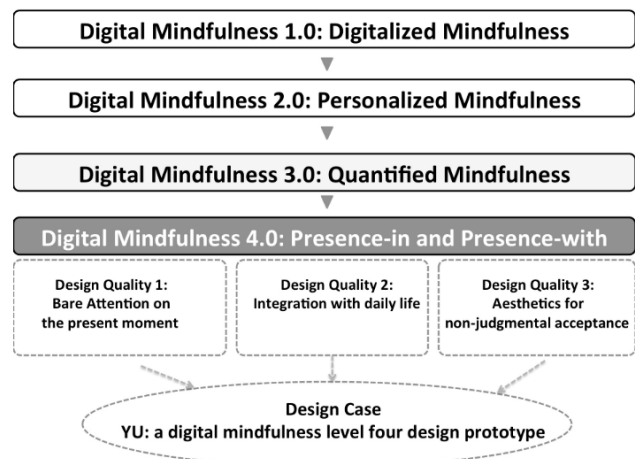
Figure 2. Zhu et al [11] four-level framework for developing a digital mindfulness app. The four levels are proposed to allow thought behind transferring real-world mindfulness skills into a digital app. Focussing in-depth on mindfulness reflection rather and aesthetics as one.

Purely software implementations have been referred to as "digital mindfulness apps" by Zhu et al [11]. The key features of these apps are defined to use as mindfulness, well-being, and stress reduction tools. Zhu et al suggested a four-level framework for developing a digital mindfulness app (Figure 2). The framework focuses on the digitalisation of real-life mindfulness, personalisation of this mindfulness, quantified output, and a reflection level. The reflection level contains design quality considerations around short attention (in the moment), seamless integration with current

life and simplified visual design choices for the creation of the full design case. Zhu et al consider an opposite to previously reviewed Slow Technology by Hallnas and Redstrom [9], suggesting aesthetic experiences is not the only thing to consider when designing mindfulness experiences. Suggesting aesthetic only targeting would result in an escapism approach rather than a mindfulness one [11].

In 2020, Neștian et al [12] researched the effect of a mobile phone being used in a workplace setting. The results showed that the ability to keep in contact with life outside of the workplace (using instant messaging apps) employees gained an increase in both work and life balance.

CRITIQUE OF WORK-LIFE BALANCE APPS

The apps chosen below were selected due to variety of available options in popular apps available across multiple devices with varying differences across several categories: work-life balance features, aesthetic design, pricing model, task management, habit tracking and incentive/ disincentive features. The considerations for differing levels of features were aimed at establishing features that were seen to work mainly focuses on the life side of the work-life balance and ease of use.

Habitica

Habitica [13] is an app that uses gaming elements to allow users to be rewarded for the completion of tasks and punished when tasks are not complete. This app was the choice deemed mostly weighted towards the life only balance of work-life balance. The app is categorised under the "Productivity" category in the Google Play Store and originally had only simple elements of gaming included. Tasks can be scheduled as dailies or repeating every week on any number of days to ease micro-management of repetitive tasks.

The gaming element of the app started by focusing on earning coins and being able to level up your avatar and purchases items (clothing, etc) for your avatar to wear. The app has since progressed into turning your task list into mini-quests you can set out to complete, defeating monsters utilising certain skills depending on your avatar class. This transformation into completing quests for a task could be related to the suggestion by Hallnas and Redstrom [8] that reflection is vital for work-life balance. Spending time completing a quest for a task could allow the user to be more aware and reflect on the task that allowed them to obtain this quest.

There is also a social aspect included in the Habitica app. Users of the app can create or join guilds and parties (a group of users) to complete a quest for a common task to gain greater rewards (solo play is also possible). Other party members not completing their tasks will also damage your avatars HP, suggesting a peer pressure system to completing tasks.

Habitica has a freemium business model and can be used across Android, Mac, iOS, and Windows platforms. There are gems available for purchase for cosmetic item rewards if a user enjoys the app enough to contribute to its development. The options for gems purchases are currently a one-off fee ($48 at time of writing) or a monthly subscription ($5 at time of writing). The pricing model matches the differences between physical workplace benefits and incentive packages, such as free and employer-funded programs stated in the literature review above [3] [5] [6] [7].

The android version of the application has over 1 million installs and a rating of 4.3 / 5 from a total of 17,642 users left reviews [14]. This shows a huge demand and satisfaction in a task-based app that has a fun game element.

There are a few missing features in comparison to other apps, such as time tracking, app/website blocking and time overview for tasks. Time overview only shows the number of times you completed a task, there is no feature to filter this by time-period. Habitica lacks a calendar and only shows the current day and up to a week in the following tasks.

	Habitica	Rescue Time	Forest
Time Tracking			
Time Overview			
App/Website Blocking			
Task Management			
Habit Tracking			
To-do List			
Social			
Payment Options	Free	Subscription	One Time Fee
Incentive and Disincentive			
Wellness			
Aesthetics			
Simple Design			
Platform	Android, iOS, Browser	PC, MacOS, Android, iOS	Android, iOS

Table 1. Work-life Balance Apps comparison table formed as part of the Critique section. Features of each app are easily portrayed in the table and discussed further in both the results and critique sections.

Rescue Time

Rescue time [15] is an app focussed on tasks relating to productivity, in a manner of insight and reflection, as the suggestion of reflection based mindfulness from Hallnas and Redstrom [9]. The app automatically tracks the time spent on websites and applications by the user. The user can then go back and look at the statistical data of how they are spending their time and adjust accordingly.

Tasks get sorted into productivity rating categories that a user can manually change from the provided default setting. Rescue time gives detailed reports in the form of various

visualisations. These reports can be filtered by time frames, categories, changing trends, among others.

The downfall of Rescue Time is the free version only allows the last 3 months of reports. The premium version is expensive in comparison to other selected apps, it is $9 per month (at the time of writing) but provides access for longer than 3 months to reports. The amount of information provided could be a deterrent to new users of the platform. The interface design has not been changed for several years and could be due to an upgrade in aesthetics. The lack of aesthetics could also be a deterrent to users, as suggested by Hallnas and Redstrom [9] and a focus on only the tool side of the design and not both the tool and aesthetic design was stated as a negative by Zhu et all [11]. There could also be a privacy concern due to Rescue Time automatically monitoring all your activity on a device.

Forest
Forest is an app with the broadest range across the work-life balance encompassing most of the features in the comparison table 1. Forest utilises the incentive and disincentive reward system and transfers this to the real world. When users keep completing tasks, they grow a virtual tree and have the potential to grow a whole forest of virtual trees. If the user opts to pay for the premium version for a one-off fee of $1.99, they can facilitate the planting of a real tree through completing tasks. This is made due to Forest Apps business model of freemium with a one-off fee to enable a partnership with a third-party company who will plant the user trees.

The growing of a tree is a key feature of this app, so much that a tree can only grow if the user puts their phone down, as the app is required to be open in the foreground for a tree to grow. There is a limit of between 5-minutes and 120-minutes per task that can grow a virtual tree. On successful completion of growing a tree, the app also rewards the user with in-app coins, however, 2 hours task would reward 43 coins and the cost of a real tree planting is 2500 coins. Users can buy in-game coins to facilitate the planting of a real tree, but there is also a limit of 5 real trees planted for each user over a lifetime. The inclusion of real-world rewards could make some users more likely to stick to tasks if they do not value virtual rewards. Tree growing can again be related to the statements from Hallnas and Redstrom [9] regarding bringing the environment into the workplace in the form of the phone screen being on with the outside world growing a tree (even as a virtual cartoon tree).

Forest can be related to Zhu et al [11] suggested framework of including a tool and aesthetics together to gain the most incite of reflection. Håkansson et al [8] suggests a user-focused design and requiring the app to be open at all times to grow a tree could be seen as human inclusive in the attempt to stop habits taking over. The disincentive of the reward system is focussed through notifications when the user leaves the app that if they do not return soon their tree will die. When I user chooses not to return to the app in time, the virtual tree does die, and the user gets a notification and an animation of the tree dying on returning to the Forest app.

The Forest app does not include the most features in our chosen apps but is the most broadly balanced between work and life. The app includes time-based report history in a forest view screen. The report shows how many minutes the user completed in manually timed tasks while being only on the growing a tree timed screen. Users can also categorise what they have chosen to do during their break from timed tasks and can track these activities also, allowing for intrigue and reflection. Achievements and rewards through the coin system and real tree planting are also present. There is a social aspect of Forest by making groups and not completing tasks that affect other groups members trees growing.

The android version of the app has over 10 million installs and has a rating of 4.4 / 5 from a total of 269,677 users left reviews [16].

Figure 3. Forest App showing: Left - Time tracking of previous minutes spent growing trees (completing tasks), Right: Succesful completion of growing a tree once a task has been completed.

USER STUDY INTERVIEWS
The interviews were conducted with 5 users of the 3 apps chosen above (either currently or recently used). Due to limitations of space in this report, we will only display answers of some of the questions. The questions asked that will not be covered were asked featuring a range from extremely effective to extremely defective: 1. How satisfied are you with your current work-life balance? 2. How effectively did you find the app for task management? 3. How effective was the app at managing life tasks? 4. How effective was the app at managing work tasks? 5. How did you find the interface of the app? Other questions were in the form of the comment box and were:

1. What was the MOST helpful and intuitive feature of the app?

Answers: a. social grouping of people and tasks, b. daily tasks being movable to the future with no consequences, but TODO tasks having a hard set date, c. earning virtual currency for completing tasks and growing a tree in real life was encouraging, d. the ability to create custom tasks with a due date and repeating and day customisations and, e. the ability to log habit tracking and daily tasks.

2. What was the LEAST helpful and intuitive feature of the app?

Answers: a. coming up with tasks can be hard, b. there was a lack of notifications, c. sometimes its difficult to determine if something is a habit, a daily task or a to-do task (Habitica), d. there's no calendar and, there's a bit of a learning curve because of all the features.

Main insight questions

	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Habitica	■	■	■	■	■	■	■	■		
Forest	■	■	■	■						
Rescue Time	■	■	■	■	■	■				
Wysa	■	■	■							
Fabulous	■	■	■	■						

Table 2. What work-life balance apps have you used before?

	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Calendar	■	■	■	■						
General Wellness	■	■	■	■	■					
Inspirational Quotes	■	■	■							
Timers and Alarms	■	■	■	■	■	■	■	■		
Help Focussing	■	■	■	■						

Table 3. How effective did you find using the app to manage tasks for life?

	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Extremely Effective	■	■	■	■						
Very Effective	■	■	■	■	■	■				
Neither Effective nor Ineffective										
Very Ineffective										
Extremely Ineffective										

Table 4. How effective did you find using the app to manage tasks for life?

I would like to see more NPCs with positive feedback and more inspirational lore. Voice commands like List new challenges, or to add a new task would be helpful
check my stats (health, gold, etc)
a voice command to check off when you have done a good habit or a bad habit
Add new to-do list item, add daily task, add habit
Add Daily task, Check off Daily Task
Allow for notifications to be audible through [google?] home

Table 5. What voice commands would be useful if this app featured voice assistant input? What other features would you like to see?

DISCUSSION

The outcome of the user interview studies suggests people can benefit somewhat from using work-life balance applications (Table 4). Users of these apps show multiple features present in a single app is a likeable feature and timers and alarms for when tasks are starting or finishing, alerting to breaks could be beneficial. Wellness was the second priority in applications, which can support Hallnas and Redstrom [7] and Zhu et al [9] in allowing for consideration for reflection, aesthetics and insight into how a person spends their time. Voice commands through a voice assistant had several suggestions on implementation ideas. Adding/deleting of a new/daily task appears multiple times in a custom comment text box, suggesting this would be a core feature to be added through a voice assistant app.

CONCLUSION

Work-life balance in the workplace and via smartphone apps was looked at. The literature suggests a need for both tool and aesthetics to be present in the design, as well as a human user presence during app design. The results from the user interviews regarding Habitica, Rescue Time and Forest apps shows a need for work-life balance apps. The key features are task-related, regardless of if these are for work or life tasks. Voice assistant commands to set and manage tasks was the most requested feature, with many other suggestions.

ACKNOWLEDGMENTS

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