

Summary
Masterthesis

**Development of a concept for the prevention
of inadequate smartphone use in road traffic**

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1. Research questions and background of the thesis

Over the past four years, the proportion of smartphone users over the age of 14 has more than doubled from 36 percent (2012) to 74 percent (2016) of the total population. With the advancing, nearly spread-out spread of smartphones, the criticism of the handling of the devices is also increasing. The booming multi-optional technology, led by a multitude of new and innovative apps, is the result of the attention of its users. The stimulus to deal with a device instead of its real environment becomes bigger and bigger with each update. Apart from the actual use of the device, the pseudo-active consumption of information of all kinds poses a problem for the user in dealing with his environment. There is a disruption of everyday communication. You sit at the joint dinner with friends or the partner and the smartphone takes the part of the moderator. The latest news from Facebook, WhatsApp or Twitter are now more important than the human being facing you. This phenomenon is called *phubbing*, an artificial word from the words "phone" and "stubbing". Conversations seem to be more and more superficial. We cannot check the news on Facebook, WhatsApp or Twitter and at the same time pay full attention to our counterpart. The competent handling of the smartphone does not just mean knowing how a smartphone is served, but also when it makes sense to simply not use it. Studies show that after a three-minute interruption of the concentration we need a good twenty minutes to be mentally back in the previous environment. In addition to the disruption of everyday social interaction, the interruption of concentration, especially in public road traffic, is an issue which is to be examined more closely in the context of the thesis.

Question 5: Do you use your smartphone while driving a car?		
	Percent	Frequency
Yes	54 %	98
No	46 %	84
Basic population (N)	100 %	182

SOURCE: OWN PRESENTATION

Table 1: Smartphone usage in public road transport

According to a recent survey by the opinion research institute *forsa* on behalf of the Automobile Club Traffic (ACV) and the German Traffic Watch (DVW), 64 percent of all German drivers use their smartphone at least occasionally. 71 percent report frequent, or even very often, other traffic users as they use the smartphone. The majority are self-critical, the risky traffic behaviour has become accepted normality. 40 percent of respondents said they were "strongly" distracted by smartphone use, 40 percent even "very strong".

In these deflection moments, the smartphone is increasingly taken into the hands, to prevent any approach of boredom already in the approach. Whether it is at the traffic lights, in traffic or simply while driving, the environment and thus the other traffic users are blinded for a short time to elicit the latest information from the smartphone. It is not only telephoned, but also checked e-mails, updated its status in social networks, answered WhatsApp messages, hunted Pokémon, or retrieved the current Bundesliga score. In the thesis, the use of smartphones with the focus on public road traffic is to be investigated and a solution for the integration is to be worked out. In addition, the question is asked how such a solution must be designed to gain acceptance by the users. The following research questions arise for the author, which are to be answered in this thesis.

The leading research question is:

Can a smartphone app reduce the inadequate usage of smartphones within the public transportation?

The subordinate research question is derived from this:

How a smartphone app needs to be designed to prevent drivers from using smartphones on public roads?

The first part of this thesis is a situation analysis of the current state of research of smartphone usage in a public context. Focus of the research is the public transportation. This is followed by an empirical data collection in the form of an online survey including analysis and evaluation for inadequate smartphone use in public road transport. The main part of the work deals with the analysis of the market and the development of a concept for the avoidance of inadequate smartphone use in public road traffic.

2. Applied methods and instruments

A questionnaire developed as part of a study work on the topic of "Situation analysis for improper use of smartphones in a public context" is used to collect personal empirical data and as a basis for the following concept. The survey took place in the form of an online survey of 182 subjects from the personal and professional environment of the author. The respondents answered questions about their own smartphone usage in private co-operation and in public road traffic and had to evaluate the use of smartphones by third parties.

The aim of the online survey is to determine whether the phenomenon of disruptive use of smartphones among the subjects is known, experienced itself, and is also understood as a problem or possibility.

To develop and implement a user-centric concept, it is essential to have the role, objectives and potential usefulness for the user in view. A goal group segmentation with the help of the six "digital lifestyle profiles" by TNS in combination with the current sinus milieus for Germany helps to maintain this. Based on this information of typical segment representatives' individual personas will be derived. With the help of personas and user scenarios, further content, functions and navigation elements can be evaluated, tested and optimized in view of the behaviour and needs of the users. In the thesis, two models are presented, each of which attempts to provide answers on the technical affinity, the level and the degree of engagement of a target group. From this can be derived, with the description of typical segment representatives, personas developed. With the help of personas and user scenarios, content, functions and navigation elements can be evaluated, tested and optimized at any time regarding their behaviour and their needs.

Based on data collection, target groups, personas and user stories, the digital concept for the app FOCUS2DRIVE is derived. After the definition of the creative guiding principle, the basic idea of functionality, benefit and benefit is defined within the framework of the concept model. The functionality of the app is exemplarily explained by three different user journeys to the individual personas. For a

detailed description of the concept model, additional flowcharts help to visualize the hierarchical and functional description of individual pages.¹

¹ Vgl. <http://bit.ly/2hPyPYZ> (Passwort: Master).

3. Results and outlook

Why use an app and not simply turn off the phone while driving, turn on the flight or non-interfering mode? From the point of view of the author, the two last-mentioned functions are no longer up-to-date and have not experienced any innovation for years. Simply turning off the smartphone would be a viable option for disciplined users. However, this type of users seems to have no problem with the inadequate smartphone use during the car journey anyway. FOCUS2DRIVE presents itself to undisciplined users as an assistant who reminds, guides and develops them. Through automatic functions and intelligent dialogs, the app can keep smartphone users from inadequate use of their smartphones in road traffic and reduce their usage behaviour sustainably. The app is always looking for a dialogue with the user: always when it can be assumed that the user drives himself and still deals with his smartphone. But also, to inform him about the latest findings quickly and quickly. Model behaviour is also commented by the app through a short message as well as inadequate behaviour. Where turning on the flight mode or even turning off the smartphone requires the discipline to think about it at the appropriate moment, FOCUS2DRIVE wants the user to take this load off the shoulders and activate the mode as best as possible. The automatic activation by means of movement data or by means of the coupling with the entertainment system of the motor vehicle permits an exact, but not 100%, identification of the user. If the app is not sure whether the user is currently active at the wheel of a motor vehicle, a dialog is established to clarify this. Here lies the weakness of the app, which could not be solved within this work. Now, the app cannot distinguish between the driver and the passenger, and cannot identify whether the user is not in a public transport vehicle while he is using the app. By means of the combination of an automatic start during movement and the coupling with the entertainment system of the motor vehicle, this can be approximately, but not completely, excluded. However, in most cases, it is assumed that the coupling to the entertainment system is also the driver of the motor vehicle.

This is precisely the problem in the current concept. To have valid data for the comparison of the users, they must also be recorded in a correspondingly secure manner. It would be possible to identify the data in the My Feed area, whether

they were recorded with Bluetooth coupling or manually. This allows users to compare their data on a fairer basis.

In general, several Quantified Self apps in the Fitness and Sports category are facing this problem. Jogging or running apps such as *Runtastic*, *Strava* or *NIKE Running Club* cannot ensure whether the recorded data has been run by the registered person or whether these data have been recorded on a bicycle with or without auxiliary motors or with inline skates. It does not matter to users, as all the apps mentioned above are of great popularity.

It is presumptuous that most users are not concerned primarily with competition and comparison with others, but primarily about recording and comparability of their own successes. If one assumes false information would lead to the user deceiving himself.

As mentioned above, this problem does not affect the core functionality of the app, but this focus has not been more focused on Focus & Pay. Too high would be the hurdles of the correct identifiability of the user at the current time and without this it would be very difficult to offer gratification in the form of free products or services. It is not, however, to be excluded that this problem can be solved by creating a technical prototype.

The coarse concept developed in this work is to be understood as the basis for the agile development of a prototype. As a result, the appearance and structure of the app can change and evolve. The key idea remains the development of a smartphone assistant, which helps drivers to focus on traffic and the surrounding environment, thus ensuring safe access from A to B. Road safety is to return to its own standard using FOCUS2DRIVE, and in the best case as the use of smartphones becomes a daily routine.

With the advance integration of the smartphone into the media interface of the automobile, there will be possibilities in the future to match the user of a smartphone with the driver of an automobile. Possible approaches are that the user connects to his automobile via his Smartphone using Touch ID and starts it via his own fingerprint. The smartphone could in the future replace the car key and authorize the user to enter and start. Any communication with the smartphone would then take place via the media interface and be appropriately regulated by the user or manufacturer.

Current vehicle concepts, e.g. From TESLA already offer future-oriented communication solutions between the smartphone and the media interface of the automobile. However, by using touch interfaces instead of intuitive switches or rotary knobs, they still distract the user from the actual task of driving the car.

If the driving of motor vehicles does not take place one hundred percent autonomously, man will remain the security risk number one. Regardless of which service or system is to ensure our safety in the public road traffic, the user decides in the end whether and how he takes part in it and thus also makes a certain degree of self-determination. In the best case, the systems always make the dialogue with the user and thus also provide a certain degree of security in semi-automatic operation.

In addition to all the opportunities offered by digitalization, everyone must be aware of when and how to utilize the available technology for his own benefit and to recognize the moments in which he should concentrate on himself and his environment. It is necessary to think individually about where everyone draws the border and how strictly this is to be observed.

At the same time, the question must be answered about how new technologies and services, such as FOCUS2SDRIVE, can help us to meet the limits, to ensure our own security and the third party without endangering the user to be taken away. If FOCUS2DRIVE can solve these problems by keeping the user at risk, by providing permanent and persistent hints, supporting and clarifying the user, establishing a dialogue and a relationship, then the service technology has been used for several purposes and has shown the user new possibilities of use Quality of life and road safety.

In the best case, services such as FOCUS2DRIVE help us to be more concentrated, focused and safer in public road transport by means of newly acquired usage habits. Using concepts like FOCUS2DRIVE, the inadequate use of smartphones in public road traffic can be reduced, but not avoided, according to the author. In the end, the user always decides about his behaviour. Technical concepts and services for smart devices can only be supported here.

