From COP15 to Copenhagen Fashion Week

Involving Users in Development of Event Applications

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From COP15 to Copenhagen Fashion Festival – involving users in development of event applications

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Abstract—**Mobile application has become an important parameter when it comes to presenting possibilities for small handheld devices such as mobile phones. One of the trends within mobile application development is applications for special events such as sports, conferences and TV shows. The purpose of this paper is to present and discuss the challenges of developing event applications with a strong involvement of users. The concepts and characteristics of the Living Lab approach has been used to develop an event application for the Copenhagen Fashion Festival 2010. As part of the development process, an application was developed for the Copenhagen held COP15 conference held in December 2009. The project shows that the Living Lab approach is challenging in relation to development of mobile event applications, and that the concept of stakeholders involved in the process could be modified to involve the right segments of potential users.**

***Index Terms*—User Involvement, Mobile Applications, User Experience, Events**

I. Introduction

MOBILE applications have become one major element when talking about mobile use growth. It is predicted that: by 2011 more than 85% of all users (globally) will have access to fast mobile Internet services; and between 25 and 40% of all mobile subscribers use applications in 2010, [1]. Mobile applications are seen to be a growing mobile service.

With Apple's iPhone, mobile applications found its way to the users. One of the trends in mobile applications is that they are made and used in particular situations and contexts or for particular events. Examples of such applications are the Copenhagen Jazz Festival ([2]), or the application for directing tourists through the streets of Amsterdam when visiting ([3]). The growing number of mobile applications is a clear indication that organisations and companies have seen some potential in this.

The development of applications targeted for particular events has a clear user centred focus; either users have developed the applications, or professional developers have developed the applications with the aim that users will adapt this, for use. In either situation, the success factor will be the number of users buying or downloading the application for a mobile device.

Within the last years, there have been discussions on how and to which extend users shall be actively involved in software development processes (see for example [4]). Currently, there is a trend towards involving users in the development processes not only in the beginning and end of the process but also as a co-creating partner in-between the idea and evaluation phases ([5]).

The purpose of this paper is to discuss the premises and challenges for involving users in the process for development of an application for a particular event. The event is the bi-annual event of Copenhagen Fashion Week (CFW, [6]), which attracts thousands of buyers, designers and fashion-interested people (both public and professionals).

In the development process, another event was targeted as an intermediate event and with the overall purpose of this to identify generic user requirements and expectations to mobile event applications. This event was the COP15 meeting held in Copenhagen in December 2009 ([7]). COP15 was the 15th UN conference on Climate Change where a new treaty was to be signed by the world leaders.

The work around and the development of the mobile applications have been made as part of the Danish Enterprise and Construction Authority financed project: "Events and Mobile Media". The project was financed under the "User Innovation" programme. This project has been run from July 2009 to September 2010.

The paper is organised as follows: section 2 summarises existing work and experiences on user involvement in software development, and describes the approach used in the case. In section 3, the case is described in relation to the user involvement process and the results. This section is divided into describing the project phases and the user involvement in relation to COP15 and CFW. Additionally, there is a short description of the event application developed. The user involvement process and the results of the project are discussed in section 4, and finally section 5 presents the conclusions.

II. User involvement

Within the last decades there has been an extensive discussion on the involvement of users as part of or providing input to development projects ([8]). Many studies point in the direction of that user involvement provides an increased likelihood of successful projects. User involvement has been reported to correlate positively with project success and user satisfaction ([9]). Furthermore, the Standish Group made an extensive study on software projects failure. In this study, user involvement was recognized as the most significant success factor while lack of user input was seen as the highest priority-challenging factor ([10]).

In traditional engineering processes, users have been involved in the last part of the development process for evaluation of the system/software. However, there are studies showing that the earlier user involvement takes place in a project the more positive influences can be seen on the requirements quality. And if users are obtained as a primary

source of information this will act as an effective means for the requirements elicitation ([9]).

A. Defining User Involvement

User involvement is a broad concept covering different levels of user contact and different approaches to involving users. Damodaran ([11]) characterizes user involvement in three categories:

- Informative–where users provide and/or receive information
- Consultative–where users comment on a services or pre-defined facilities
- Participative–where users influence on decisions relating to the whole system.

Barki and Hartwick ([12]) operate with another definition of user involvement: "user involvement generally refers to participation in the systems development process by potential users or their representatives and it is measured as a set of behaviors or activities that such individuals perform". In this definition lie an inherent perception of a deeper contact of users participating in the systems development process, and does not indicate different levels for this.

Ives and Olson ([13]) have defined user involvement as "participation in the development by a member or members of the target user group" and operate with the following levels of participation:

- No involvement–Users are unwilling or not invited to participate
- Symbolic involvement–User input is requested but not ignored
- Involvement by advice–Advice is solicited through interviews or questionnaires
- Involvement by weak control–Users have "sign-off" control at each stage of the system development process
- Involvement by doing–A user is a design team member, or is the official "liaison" with the information system development group
- Involvement by strong control–Users may pay directly for new development out of own budgets, or the user's overall organizational performance depends on the outcome of the development effort.

With Ives and Olson's ([13]) categorization, the understanding of user involvement becomes a bit broader in respect to who the users are (end users and/or other stakeholders) and how their involvement is organized.

This perspective is taken even further in the literature on co-creation in design and service development (see for example [5]; [14]; [15]; [16]). This concept focuses on users as co-creators of services where the co-creation becomes central for deriving value in the user experience for the user ([17]). In this perspective the user is defined as the stakeholders of the services and not only the end user. This trend is furthered in the Living Lab approach (see for example [15]) where user involvement is seen to involve all stakeholders of a development project (the vertical value chain in which customers, producers and suppliers are involved in the objective to create commercially interesting innovations, [18]). Living Labs are furthermore characterized by involvement of all the stakeholders to the extent of being co-creators; a timely involvement following the full development project; and they take place in real-world contexts ([15]; [19]). In this way, the concept of user involvement becomes much more far reaching than the definitions by Damodan ([11]) and Barki and Hartwick ([12]).

In the following, the characteristics from the Living Lab are applied in the development of an event application.

III. Towards an Event Application

In July 2009, the project "Events and Mobile Media" started. The overall purpose of the project has been to develop an event application that builds on a strong user involvement process and to research this process. The project has been a part of the Danish Enterprise and Construction Authority financed program on User Innovation ([20]).

The consortium for the project was made up by: two university partners (Copenhagen University, [21]; and Aalborg University; [22]); a tourist organisation (Wonderful Copenhagen, [23]); a network between industry and universities (Crossroads Copenhagen, [24]); and a software developer (LittleBig Ideas; [25]).

A. The Process

Since the project was financed by the User Innovation program under the Danish Enterprise and Construction Authority, it was born with a special emphasis and focus on user involvement and user innovation. The Living Lab Approach and the co-creator concept were, therefore, taken into practice. This means that users in the project were defined broadly as: end-users divided into both participants at the events and the ordinary public in Copenhagen who would take part in the events; and the organising stakeholders of the events–organisations responsible for the events such as governmental representatives and non-governmental representatives (lobbying organisations and grass roots). Additionally, the project set-up (and limited number of partners) allowed for a close collaboration between the partners and for a direct involvement of all partners in all parts of the project.

At the beginning of the project, it was decided to target two different events–the COP15 (to take place in December 2009) and the CFW in August 2010. The decision to target exactly these events was based on a combination of expressed interests from event organisers, the expected number of participants for the events and therefore the potential users of the developed application (for both events there was expected around 40.000 participants). Additionally the timely placement of the events was seen to fit well into the project's phases. Furthermore, the CFW, that is a bi-annual event, allowed the project to carry out an extensive user study (a pre-study) at the event in January 2010, and to use the results from this study in the application development. An overview over trials, event and time can be seen in Figure 1.1.

The timeline (Fig. 1) shows that the total process of development involved development of two applications (one for COP15 and one for CFW), two workshops with stakeholders for the two events, field studies (qualitative interviews) with potential users of the applications at both

COP15 and the CFW events (in total 796 interviews with Danish and International participants), and finally a usability trial of the almost finalised application for the CFW in August.

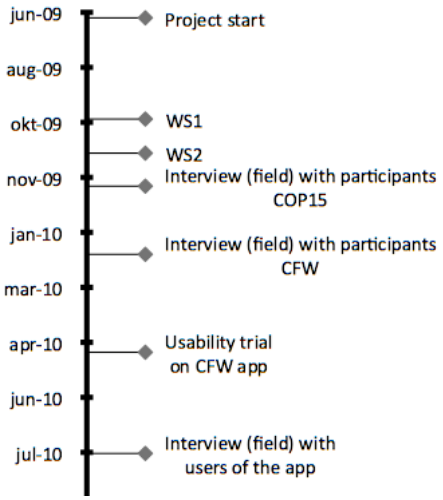

Fig. 1. Overview of the timeline of the project "Events and Mobile Media", user trials, event and time. WS is short for workshops

From Fig. 1 it can be seen that the user involvement took place over the whole period of time; through workshops (WS1 for COP15 and WS2 for CFW) where stakeholders from the two events were present; interviews with randomly selected participants at the events (December 2009 at COP15, February 2010 at CFW and again in August 2010).

All interviews were based on random recruitment of participants and based methodologically on convenience sampling as described by Koeber and McMichael ([26]). Also there has been conducted a more traditional usability trial where usability and user experience criteria have been tested with a set of potential users of the CFW event. Details on the workshops, interviews and usability trial will be given in the following sections.

B. COP15

Each year, Copenhagen hosts a set of relatively large international conferences. However, 2009 was special, since Copenhagen was the host of the COP15 meeting. Details on COP15 can be found on the official web page ([27]). This conference hosted thousands of international people (there exists no official numbers on this but it is estimated to be between 40.000 and 70.000 participants) from the highest political levels around the world, to journalist and grass root groups. And therefore, it was decided to develop a mobile application representing all the different stakeholders at the conference. At the same time, the experiences from this event were seen to feed directly into work with the application for the Copenhagen Fashion Week.

The COP15 Workshop

In order to gain knowledge and understand the needs for the application, there was organised a workshop where representatives from 4 different stakeholders were invited. The stakeholders represented: People's Climate Action, People's Climate Movement ([28]), The Danish Foreign Ministry and the Climate Consortium Denmark ([29]). The People's Climate Action was established as a strategic and practical platform securing well-coordinated activities for the Danish citizens as well as for international visitors. The People's Climate Movement covered a number of Danish and International environmental and civil/social organisations and networks. They focused on establishing a parallel climate conference in Copenhagen for grass roots and other organisations. The Danish Foreign Ministry had the responsibility for the whole logistics for the COP15 conference as well as for the involvement for the civil society up to the conference. And finally, the Climate Consortium was the official umbrella organisation for all Danish industry related activities relating to the UN COP conference. It was a public/private cooperation between the Danish Economy- and Industry Ministry as well as 5 large branch organisations in Denmark (Danish Industry, Danish Energy, Danish Construction, Windmill Industry and the Farmers Council).

Since the COP15 was held in December, it was evident that the representatives from the organisations were busy and were extremely focused on their own representation and work. The workshop, therefore, took place over a morning session and with a special set-up so that the participants would have the chance for expressing their views.

At the workshop all stakeholders were introduced to the project and the idea with the application. The idea for the application was to provide an overview of the official programmes, which would take place at 3 different locations in Copenhagen. Following this, the stakeholders had the possibility to express ideas and comments in the group. Since the stakeholders represented rather different participants at the event, individual interviews were carried out (as part of the workshop) in relation to understanding needs, views and wishes for the application.

The overall results of this workshop were:

- The number of stakeholders represented numerous needs and interest points related to the participant group they represented
- The needs and interest points did not necessarily go in the same direction (for example: The People Climate Action represented the ordinary Copenhagen citizen and could not see the need for a mobile application while the Danish Foreign Ministry represented the political delegates of the meeting)
- A number of the representatives did not think that the delegates and other participants at the event would have time and interest for an application as outlined in the introduction of the workshop
- The People Climate Movement was particularly interested in the application and could identify several needs for it in relation to the participants they represented. This organisation did organise an alternative conference in the centre of Copenhagen.

After the workshop it was decided to divide the application menu into headlines for each of the four activities (representing the four stakeholders activities) and under each menu place relevant material on program etc. Also, in the top menu was placed a button for visitor information (tourist information).

The COP15 field interviews

The COP15 took place from 7-18 of December 2009. In that period of time, the project had 5 anthropologists spending a total of 150 hours across the activities at the People's Climate Movement (since they could get access to this), at public demonstration sites across Copenhagen, outside the official venue for the official COP15 meeting (with people waiting in line to enter the UN conference-the project was not granted access to this), and a lot of other sites in Copenhagen. A total of 340 people were interviewed and asked about their use of mobile phone applications, the developed mobile application and the potential need for the service represented by the application. The application was launched in both a flashlite and a browser version in order to address a broad number of users. Fig. 2 shows a picture from the COP15 event in Copenhagen. The picture show the most visible communication form used throughout the event; flyers!

Fig. 2. Picture from the COP15 event showing flyers on a table at the Peoples Climate Movement conference. Flyers were present all over and as such represented a communication form between the many international representatives.

The study concluded on a number of parameters:

- The application was not used. Only 5 of the interviewed persons had tried to use it while 13 others had heard about it.
- Due to the large number of participants with different backgrounds and purpose of being present at the conference, there was revealed a large number of different needs, priorities and wishes for a mobile service.
- The participants generally had a number of other communication channels to keep updated on (other than a mobile phone) and they were not used to using a mobile application for keeping updated. The primary channels for keeping updated were the Internet (via a computer), SMS chains, boards, flyers, etc.
- Most participants used the mobile phone for communication (texting and phoning) but used the mobile phone only marginally for search of practical information.
- Only 36% of the interviewed persons had mobile Internet, and of these most phones were featured phones with small screens.
- All interviewed agreed on the concept of trustworthiness in relation to updates and changes in programmes was key for their potential usage of an application.
- Some interviewed persons saw potentials in being able to communicate via the application and link directly to Twitter or Facebook.

After the survey, it was concluded that the application aimed at a too broad and diverse audience. It was hard for the interviewed participants to get overview of the application and to understand why it was build up as it was.

C. Copenhagen Fashion Week

The Copenhagen Fashion Week event was the key event for the project aiming at providing the best possible application for this event. Therefore, the process of developing the application went through a series of user involving stages to give the best possible basis for the work on the application.

The CFW workshop

Also in 2009, a first workshop was set-up to initiate the user participation and to get the first ideas of wishes, expectations and needs from the organizers side. Historically, the CFW event has been running for several years, and therefore, there exists a relatively good understanding of whom and what the participant needs are in respect to communication and information gathering at the event and up to and after the event. The CFW has a relatively well-informed and extensive web page with many photos from shows, designers, etc.

At the workshop representatives from the Copenhagen Fashion Week, the application developers and representatives from the project were present. The workshop was set-up with an introduction to the project, a description from the Copenhagen Fashion Week on their views and knowledge on the event, and finally an idea and discussion session to find ideas for the application.

The overall result of this workshop was that the organizers wanted an application, which would be as close to the CFW Internet web page as possible. Additionally they wanted to target the iPhone/smart phone participators more than anything else, since they knew that the genuine participants of the event already use iPhones/smart phones. Photos are one reason for this; the smart phones are able to show pictures, and details in photos, which is essential for the CFW participant. The organisation expressed a need to provide the users with a possibility to search for special shops, cafés or sites related to Copenhagen (touristic information).

The CFW field interviews in February 2010

The CFW event was held 10-14 February 2010. The event took place at 5 different places in Copenhagen as well as at a number of selected places for smaller events/shows. Five anthropologists did a total of 150 interviews over the event days. Interviews were held at the trade fairs, at public shows and events and a few fashion shows (which they generally didn't have access to). The purpose of the survey was to gain insight into the CFW participant's communication

needs and habits, and their needs and viewpoints on electronic media. At this time in the project, there did not exist an application for the event so the purpose was to get information for this work.

The results of the interviews pointed towards the following statements:

- The participants who had been at the event several times did not have a need for information as such –they knew their way around etc. New participants on the contrary clearly had a need for information on where to find the fashion events, activities, transport, restaurants, etc.
- The participants clearly expressed a need to be motivated in their choices (by an application) but not so much that they would be led or pushed in a specific direction by the application. They need to be in control of what they are offered on the application.
- The participants on the CFW event had a focus on their unique mixes of different components – clothes, characteristics of clothes, form etc. That could indicate the need for applications, which could be personalised to a certain extend.

The results from the interviews provided a further focus on the target users of the event.

The CFW usability trial

In spring 2010, the application was developed in relation to the idea, architecture and the content (screens and functionalities). It was decided to set-up a usability trial where the idea of the application would be presented for potential users of the coming CFW in August, and to get feedback on functionalities, design and the overall user experience of the application. Screens were not programmed into a workable application yet, so it was decided to make a low-fidelity trial ([30]) where paper pictures (screen dumps) were printed and showed to the participant. The screen prints were used go through a number of scenarios in which the participants were asked how they would find this and that and what they wanted to press to get to this. The participants were asked to think aloud ([30]), and were presented for new pictures of screens when they had expressed their opinion on where to press and what to do. A total of 10 individual sessions were held in a laboratory set-up in the middle of Copenhagen. All sessions were recorded and were used as basis for the conclusions afterwards. Participants were a mixture of people met at the CFW in February who had indicated their willingness to participate in more trials, and professional workers in a tourist organisation who have experiences in understanding needs for events and for tourist information generally. All trials took around 20-30 minutes. A representative from the application developer was present at the first 6 trials to get first hand feedback on the application.

There were a number of results from this trial:

- Generally all participants had interest for an application and thought that the presented screens and functionalities were surprisingly fine.
- There was recorded a number of smaller usability errors such as colours, missing indications on where the participant would be on the maps of the application and a few other things
- Furthermore, the participants expressed a number of new ideas for further development of the application, such as the possibility to use the application off-line (for economical reasons), to be able to share searches via the application with friends (a link to social networking sites), a possibility for saving special searches and for marking specially selected shows/restaurants etc.

Overall, the application idea and design was accepted and the problems recorded at the usability trial were brought back to the application developer to be dealt with.

The CFW field interviews in August 2010

From 11-14 of August 2010, the second CFW event was held. The premises around the sites etc. were the same as for the CFW February event. The project application was launched just a few days before the start of the event, and therefore, the survey focused on getting responses to the use and experience of the participants using the application or being presented for the application (by the interviewers). A total of 306 participants were interviewed/talked with during the days, and this time 4 anthropologists did the interviews.

The survey showed the following overall responses:

- Most of the participants asked (around 80%) had never heard about the application, only 10% of the participants had heard about the application and only 10% had actually tried to use it.
- Around 50% of the persons who were asked about the application, said that they did not have an interest in it. The reasons for this was associated with roaming prices, lack of general interest for applications, that they were in Copenhagen only for a short time (a day or two days), and that they had no time to use the application (and get to know the application).
- Of the persons who tried to use the application, was a generally good feedback to the content and the features of the applications. Some programming errors were discovered, and some further ideas on what the participants would like to have in the application were identified (examples such as more detail in respect to the categories restaurants should be divided into, overview of the sites and parking lots etc.
- Generally, the participants expressed concerns about the service provider of the application; they would have to be able to trust the application before they would use it as their information and communication tool at the event.

D. The CFW Application

The application for the CFW event was made to service the participants at the event. From the event organization side there was already at the project workshop in November 2009 expressed a need for photos/videos and features, which their audience already can find, on the event Internet web

page. Therefore, the application focused on representing the event in colours and content while at the same time provided information on Copenhagen, which could be of interest to the international audience. In Fig. 3 examples on screen shots from the application can be seen.

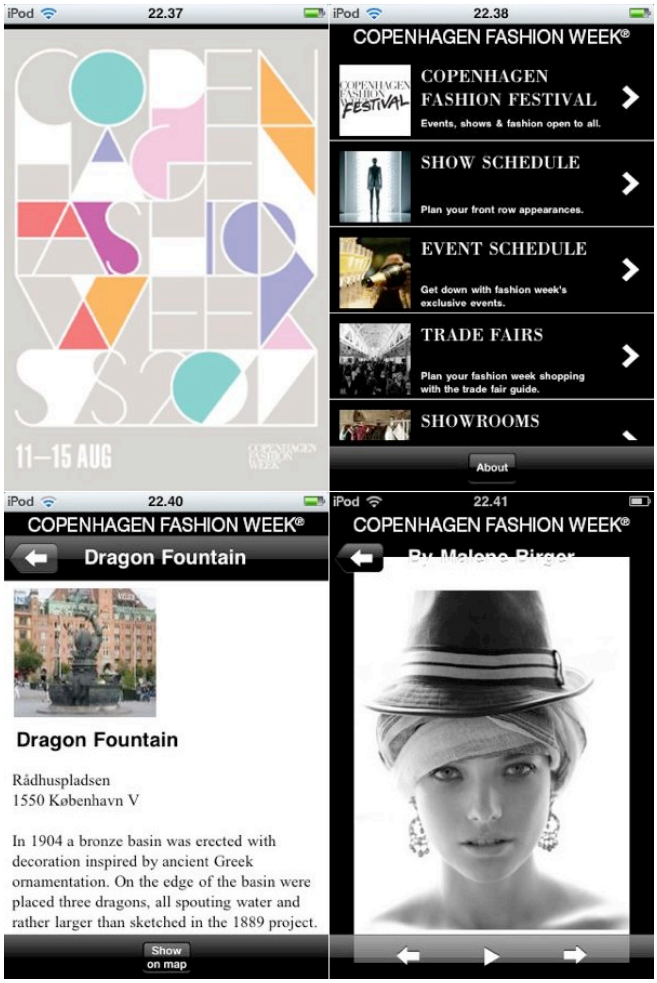

Fig. 3. Screen shots from the CFW application. All pictures were shown on an iPhone application. Top left: Front screen designed by the official event organization. Top right: First screen showing the possibilities of the application. Bottom left: Example on touristic information. Bottom right: Photo from a designer collection.

In order to be able to see the use patterns of the application, data use of the application was logged. This showed the following statistics:

- The application was downloaded in total 4100 times
- Of these 4100 downloads, iPhones were used 86% of the time while Android phones were used 14% of the time
- The fashion photos were in top when it came to generation of traffic. Details on designers and shows (which both provided extensive fashion photos) represented 50% of the traffic in the application. Only 7% of the traffic was related to the city guide build into the application.

IV. Discussion

The process for developing the final application did involve a large number of users at different stages of the development process. However, the development of an application aiming at particular events has derived certain points for discussion.

A. Involving Two Events

Early in the project, it was decided to address two separate big events held in Copenhagen, to use these to gain experience for the final application development, and to have the possibility of involving many users as part of the development process. However, the use of the two events has raised some considerations about the selections of events.

Common characteristics of the two events were: a large international participation and media interest; events taking place at different locations around in Copenhagen; and events with a large diversity of participants present–some working and some participating for other purposes. From both events, it was clear that the participants were much more interested in the event itself than in a mobile application and that this had an impact on the participants interests in spending time to get familiar with the application.

Additionally, the events show that participants who has an interest in an application first and foremost look for information on the event itself, then look for hotels, food and transport, and lastly look for general tourist information.

However, there were also some large differences in the events, which became visible during the project phases. The participants at the COP15 were in Copenhagen for the first time and expressed a feeling of “once in a lifetime”. The majority of the participants at the CFW, contrary, had been participating in the event several times and therefore they expressed a feeling of “business as usual”. It could therefore be expected that the general needs and wishes expressed and the COP15, not necessarily can be adapted to the CFW application. While the COP15 participants expressed a large need for establishment of new communities and networks, the CFW participants already had established the social networks and were therefore less inclined to express needs in this direction.

B. The Concept of Users

As already mentioned, the concept of users was defined in broad terms in the projects (according to the Living Lab Approach). This however, caused some challenges in relation to understanding the users’ needs and requirements in the application development process. This was particularly clear at the workshops held in the beginning of the project. At the COP15 workshop, it was clear that the different stakeholders had diverging ideas, needs and interest in an application. This was even more emphasised since the whole COP15 clearly was a Danish high prestige project where the Danish Government (and its representatives) was pressed to the limit to make it work. This could have been a factor in the workshop.

At the CFW workshop there was only representatives for the Copenhagen Fashion Institute. There were no representatives from the trade fairs (which represents a big part of the event). That naturally provided a much more focused application idea with more expressed requirements.

As defined in the Living Lab approach ([15]) all stakeholders should be part of the innovation/development

process. This process shows that there is a need to deal with this concept in much more detail than it is described in general Living Lab literature today.

The user surveys showed a clear segmentation of mobile users: Users who are front runners and have an interest to use an application for the fun of it; users who will use an application if they have a need for it; and finally a group of users who have no interest in the use of a mobile application for a variety of reasons. This is backed-up by Wieland ([31]) who has identified four user segments for mobile use. This segmentation involves a further consideration for application development since not all users can be reached by one single application–and perhaps is the random recruitment of users in the survey not the best basis for the user involvement.

C. *The Process Involving Users*

The process of involving users has in this project been emphasised by a number of different user surveys and involvements mixing workshops, individual qualitative field interviews and laboratory usability and user experience trials. This process is close to the Living Lab approach. The experience of the project has been that the interviews carried out during the event and in the context and situation provides a good foundation for elicitation of needs, ideas and feedback as well as for understanding the user experience of using the application. However, workshops and usability trials (as methods) provide foundations for a more detailed understanding and feedback of other parts related to the application (such as the focus and idea of the application and the design of the single screens of the application). The user involvement in the field, therefore, cannot stand-alone. The different approaches to user involvement, and the mixture, seem as a good match for a mobile application development process.

This project is characterised with a large number of involved participants. Compared with other projects with a relatively high number of users involved (see for example [32]) this project has involved a significantly higher number. Question is then if the number of participants involved in the project provides more learning and understanding into the development of the application. Being part of the project, it has provided a sound basis for the conclusions drawn at different stages in the project. There has been a high confidence in the decisions made and a good feeling before sending out the final application. That so few users actually used the application is not because of the application but more a combination of the fact that application was launched just a few days before the actual event and therefore the PR material on the application wasn't distributed before the event, and that the users of the events were working and not had the time to "play around" with an application. The large number of involved users did allow the project to gain a better understanding of the users and the events.

V. Conclusion

This paper has addressed the issue of user involvement in a development project for a mobile application for a particular event. The project has involved a large number of potential users of the mobile application for two events; the COP15 and the Copenhagen Fashion Week.

There can be concluded on three areas; the user involvement; the development of event applications; and the concept of the user. In respect to the user involvement, the paper concludes that user involvement of many users (796 users in this case) provides a sound basis for decisions being made in the development of the application. Furthermore, this project has involved users in a combination of methods; workshops, field interviews and usability trials. This variety of involving users lies close to the concept of the Living Lab approach. However the concept of the users has been a challenge in the project. Defining users as stakeholders in relation to events that international and large as the COP15 and the CFW did reveal some challenges. The project showed that the many stakeholders had a variety of visions and ideas on such an application-visions and ideas often conflicting. Additionally, the project showed that the concept of the end-user is a broad concept, which in future work should take different segmentation types into consideration both when developing the application and in the user involvement itself.

The development of the application has taken place in two steps: first one application for the COP15 and then the application for the CFW. This development process has been challenging in many respects and has been completely linked to the user surveys for directions and feedback. Additionally, it shall be mentioned that the development process not only was been directed by user surveys but also by several one-on-one meetings between the developers and the stakeholders of the CFW. This was necessary in order to make arrangements with data transfer amongst others.

This paper shows that developing mobile applications for special events is a challenging task, which needs many considerations in respect to the user involvement and the users.

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Throughout the project, there has been produced several reports. These reports have been the basis for this paper.

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