

The Valleys of Death in Refugee Crisis

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ABSTRACT

The paper analyses the risks of a potential “Valley of Death” in the development of ICT (Information and Communication Technology) for refugees’ social integration. Today’s refugee crisis is distinct from previous ones because of the remarkable refugees’ reliance on technology. While academic literature widely accepts that ICT deployment is especially relevant to refugees’ social integration, little is done in terms of understanding that ICT impact requires a convergence of conditions of which ICT is only one of them. The paper questions the extent to which discrepancy between the ICT demand and supply creates a vacuum in the field of ICT for social inclusion. We put under the magnifying glass performance of ICT mobile solution specifically developed for refugees’ social integration, parallel with refugees’ testimonials on their everyday mobile usage practices. Finally, after identifying that ICT solution for refugees’ social integration is in the “valley of death” this study argues that ICT does not operate alone. Social inclusion is a bilateral social process that places demand on both refugees and the hosting society.

Keyword: Social media, social integration, mobile apps, immigration, innovation, invention, EU studies.

1 INTRODUCTION

In today’s globalised world, international migration is strongly influenced, even driven by new forms of information-sharing delivered by omnipresent ICTs (Frows et al., 2016; Andrade and Doolin, 2016). The advance of ICTs forever changed notion of time and space, making mobile phone a crucial

resource for navigating refugees' journeys. For nowadays refugees ICTs are as important as physical infrastructure (Gillespie et al., 2016). They consult social media on a daily basis to gather information, for instance, about destinations and routes as well as integration in their intended destinations. Simultaneously, while using the same device, they are in contact with their friends and relatives in countries of origin, transit and destination. Altogether, we can argue that ICTs drive migration where refugees are unprecedentedly dependent on technology.

Alongside, mobile phones have been identified as possible tools for helping in refugees and immigrants' integration into host countries. Research findings indicate that mobile phones and social media can play an important role in the creation and maintenance of bridging social capital which has pivotal role for social and economic integration (Bacishoga et al., 2015; Maric and Spotti, 2016). Besides being good ICT users, literature shows that Internet usage by refugees and immigrants is more frequent than among the locals (Lupianez et al, 2015).

However, social inclusion of newly arrived refugees represents a major issue burdening both refugees and their host societies. Agreeing with Andrade and Doolin (2016) we put aside traditional discussions on the digital divide to focus on exploring necessary parameters responsible for enabling ICTs to operate as a successful social integration tool. Bearing in mind that ICTs are increasingly proposed as useful resource for facilitating refugees' social integration in this paper we analyse the discrepancy between the ICTs demand and supply.

ICT FOR REFUGEES AND THE VALLEY OF DEATH

In recent years many research results converged arguing that refugees inhabit transnational spaces where ICTs enable them to participate in geographically independent social networks that constitute *deterritorialized* world (Gifford and Wilding, 2013) in which they profit from corner shop cosmopolitanism (Wessendorf, 2010). Moreover, it is proven that ICTs constitute a valuable resource for participation in information society: communication, information, relationship-building, help, and identity expression and re-construction (Caidi et al. 2010, Benítez 2012, Maric and Spotti, 2016; Andrade and Doolin, 2016). Therefore, and not surprisingly, the effective employment of ICT is often mentioned in conjunction with refugees' integration as a means of facilitating integrative efforts.

However, in dissonance of media and political debate about the challenges of so-called "refugee crisis" it is hard to hear refugees' voices or identify

reliable, relevant information that is offered to refugees. This problem is amplified by the lack of pan-European effort to arrive with well-coordinated effective policies and practices (Gillespie et al., 2016). Despite many initiatives use mobile apps for refugees, the information field is fragmented and cooperation is almost non-existent. To make this European problem worst, the lack of cooperation is identified even on European member states national level.

The “valley of death” metaphor is used here as analytical device for understanding problems in developing ICT. The Valley of Death is a concept that describes a frequent, problematic stage between initial stage of *invention* and later stage of *innovation* (Auerswald and Branscomb, 2003). Facing the fact that many projects fail to survive so called “early-stage technology development” this effect has been named the “valley of death”.

The metaphor of valley of death identifies a problem of activity gap, or “institutional and behavioral disjunctures”, when lack of funding in the space between invention and innovation appears (Auerswald and Branscomb, 2003; 230).

We will argue that much of this is valid in understanding the development of mobile apps as support initiatives for newly arrived refugees.

INVESTIGATING THE DYNAMICS OF ICT SUPPLY AND DEMAND FOR REFUGEES

2 Problem Statement and Research Questions

According to Swedish Migration Agency, nearly 163,000 sought asylum in Sweden in 2015, which is almost double the amount that came in 1992 during the Balkan crisis (Swedish Migration Agency, 2016-a). Having European governments failing to deliver refugees what they need, the main goal of this research is to analyse Swedish mobile app ecology for refugees and to arrive to a proposal for facilitating meaningful digital management efforts. With this in mind this research explores the demand and supply of ICTs for refugees in Sweden, focusing specifically on the solutions designed for mobile phones, or in other words mobile apps.

While aiming to understand the dynamics of Swedish mobile app ecology, this study combines quantitative approach to map existing efforts in the field of ICTs for refugees delivered on mobile phone and to analyse its usage, with a qualitative approach, interviews with refugees. In other words the enquiry focuses on analysis of dynamics created between supply and

demand of ICTs, or in other words, the effective usage of mobile apps for refugees in Sweden. The motivation for this research was to obtain an answer to the following problem statement:

PS: What is the characteristic dynamic in the pool of mobile apps for refugees?

To answer this question, we created three research questions, the first of which reads as follows:

RQ1: Who are the main actors in the field of mobile apps for refugees in Sweden?

To investigate responsible actors for driving dynamics in Swedish mobile apps ecosystem we first engaged in mapping all software solutions developed exclusively to help refugees in Sweden. Second, we performed their classification by the problem they aim to tackle. This way we arrived to a solid overview of offered solution on the supply side of mobile app market, and we identified Setel.In umbrella mobile application that offers numerous resources for refugees in Sweden.

In parallel, our aim was to analyse the driving dynamics on demand side, or characteristics of refugees' mobile use. In order to answer this, we created a second research question that reads as follows:

RQ2: What are the characteristics of refugees' smart mobile usage?

We interviewed 22 refugees that use smartphones. The interviews were performed in Swedish largest refugee camp Restad Gård, Vänersborg, in September 2016. Being in direct contact with refugees we have (1) introduced Setel.In mobile app to them, and (2) we asked participants to respond to a set of questions. For that purpose we created 36 structured questions and conducted synchronous online interview using Google Documents online tool. The interviews focused on the main patterns of mobile usage; their daily practices; information sought and results acquired from their mobile phone activity in the web community; and the role mobile phone has in the participant's offline life. In addition, a series of open-ended questions were asked about various aspects of the participant's social and cultural integration.

Finally, to understand the extent refugees use mobile apps designed for their social integration we performed analysis on the web analytics data provided by Setel.In. By being a mobile app that gathers all ICTs potentially useful

for newcomers under one name, at the time of this study, Setel.In was supported and promoted by the Swedish Migration Agency as a useful tool for social integration (Swedish Migration Agency, 2016-b).

Because of these two useful preconditions we chose Setel.In as the mobile application that has the most chance to attract refugees' attention. Thus, to round off this study and find out to what extent refugees use mobile apps developed for their social integration we created the third research question that reads as follows:

RQ3: Up to what extent do refugees use Setel.In mobile app?

The analysis of the data provided by Google Analytics free online tool enabled us to understand the effective usage of the deployed mobile app and to interpret the results.

In the following section, we offer answers to the three research questions and to the Problem Statement.

3 Research Findings

The unprecedented large influx of refugees in 2015 was followed by vigorous news and political debate about the challenges the so-called *refugee crisis* introduced to Sweden and Swedish lifestyle. Swedish society has undergone through dramatic changes, having witnessed two intuitively opposing processes simultaneously occur. On the one hand, with Swedish Democrats on the rise, Sweden was no longer exceptional case without electorally successful xenophobic populist right-wing party. On the other hand, the opposition towards immigration has decreased at the same time as Sweden received more refugees than ever (Rydgren and van der Meiden, 2016). This study was performed in the midst of this political and social turmoil, during the seven months - from September 2016 to the end of January 2017.

Mapping ICT's for refugees in Sweden

One could argue that almost palpable feeling of crisis is responsible for creative outburst where numerous ICT solutions were born. After following trends in other EU member countries that received, or had in transit, a great number of refugees (Germany, Austria, etc.) that arrived to Europe the “whatsapp” way (Frows et al., 2016), it does not come as a surprise that Swedish society too spontaneously replied to *refugee crisis* by offering a wide palette of ICTs for refugees.

In the following table we list all ICT solutions specifically designed for helping refugees to deal with the problems on the road to their social integration (see Table 1).

Table 1. ICT solutions specifically built for refugees in Sweden

Category	Name	URL
Language learning	Let's talk	http://lakerol.se/letstalk/en/
Information	Mobilearn	https://se.mobilearn.com/en/
Local contacts	Welcome!	http://welcomemovement.se/
Accommodation	Refugees welcome	https://refugees-welcome.se/
Job	Competency	https://competency.se/
	JustArrived	http://justarrived.se/
Umbrella concept	Setel.In	https://setel.in/#/app/categories

The classification of ICT in this research is based on the specific aim of each application. Therefore the classification reads as follows:

- 1) language learning - mobile apps that are designed to help users learn or practice Swedish language, e.g. Let's talk¹;
- 2) information - mobile app designed to offer numerous information about Swedish society in several languages, e.g. Mobilearn;
- 3) local contacts - mobile app for getting in direct contact with local people, e.g., Welcome!;

¹ For the purpose of this research *Duolingo* and *Lingio* mobile applications are not counted since they are not specifically developed for refugees, but are still identified and acknowledged as quite useful for refugees' L2 acquisition

- 4) accommodation - mobile app designed to help refugees to find the accommodation, e.g., Refugees Welcome;
- 5) job - mobile apps that help refugees to find the employment, e.g., Competency and JustArrived;
- 6) umbrella concept - mobile app designed to gather everything of importance for refugees and offer it in one place, under one name Setel.In. All of the listed applications are designed for smart mobile phones and are developed between 2015/2016.

Finally, the answer to RQ1 reads as follows:

Seven independent mobile applications were developed to help refugees' social integration in Sweden.

Analysing the demand

The focus here is an attempt to grasp the main patterns of refugees' mobile usage and the role mobile phone may have played in the lives of the refugees. To be able to answer RQ2, we continued this research by interviewing 22 refugees in possession of smart phones willing to take part in the study. The interview took place in Restad Gård on the 9th of September 2016, three days after Setel.In was officially launched.

We offer the results in the following five sections.

1. Demographics: Majority of informants (68.2%) were younger than 35 years and mostly male (59.1%). They come from Syria (40.9%) and Afghanistan (59.1%), and speak Arabic (40.9%) and Dari (59.1%) language (see Table 2 and 3).

Table 2. Age

Age	10 - 20	21 - 35	36 - 45	46 - 55	56 - 65	65+
%	9.1	59.1	13.6	4.5	13.6	0

Table 3. Gender, country of origin, and mother tongue

Gender	Female	Male
%	40.9	59.1
Country of origin	Syria	Afghanistan
%	40.9	59.1
Mother tongue	Arabic	Dari
%	40.9	59.1

Further, the majority (54.6%) poses higher than high school education, university or masters (see Table 4). All of them (100%) named war or life threatening situation as a reason to leave their countries of origin. They arrived to Sweden in the past 6-12 months (86.4%) and most of them have spent 6-12 months (68.2%) in the Restad Gard refugee camp (see Table 5).

Table 4. Education level

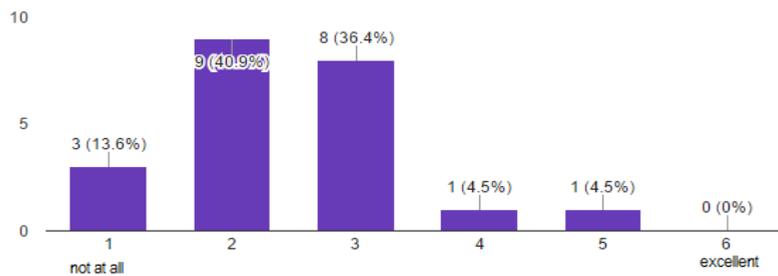
Education level	%
No school	4.5
Several years if elementary school	4.5
Elementary school	0.0
High school	36.4
College or after high school education	9.1
University	27.3
Masters	18.2
PhD	0.0

Table 5. Residing in Sweden

	How long are you in Sweden?				
months	1-3	3-6	6-12	12-24	24+
%	0.0	0.0	86.4	13.6	0.0
	How long are you in this camp?				
months	1-3	3-6	6-12	12-24	24+
%	13.6	9.1	68.2	9.1	0.0

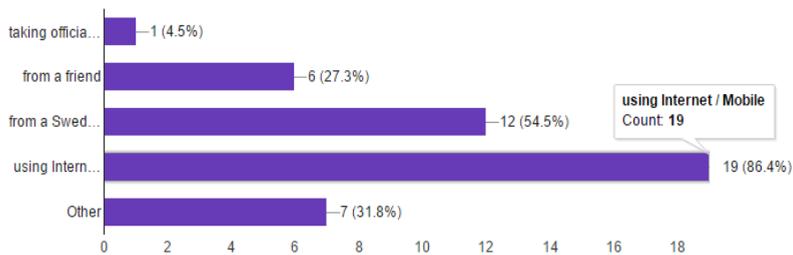
2. Swedish language: Beside mother tongue they report knowledge of English language (45.4%) and Swedish language (40.9%). When asked to express their level of Swedish knowledge on scale 1-6 (zero to maximum) majority (77.3%) have chosen level 2-3 (see Figure 1).

Figure 1. The level of Swedish language



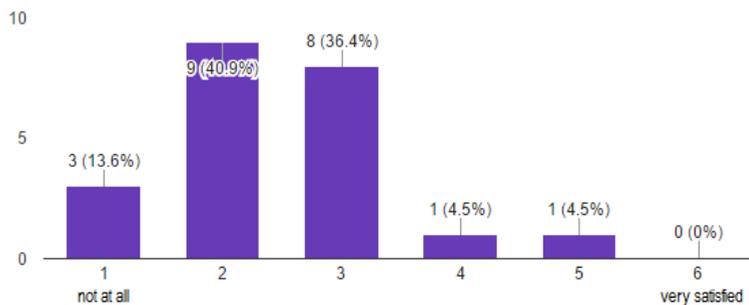
For the purpose of this study two translators for Arabic and Dari were engaged that actively translated through the whole interview in both directions. The fact that informants report the knowledge of English and Swedish language comes as a surprise. Therefore we can argue that informants have some level of knowledge of second and third language, but most probably closer to basic level. All of the informants report that they are learning Swedish (100%) for the past 3-6 months (72.7%) from a Swedish person (54.5%) and by using Internet or mobile phone (86.4%) (see Figure 2).

Figure 2. Learning Swedish language



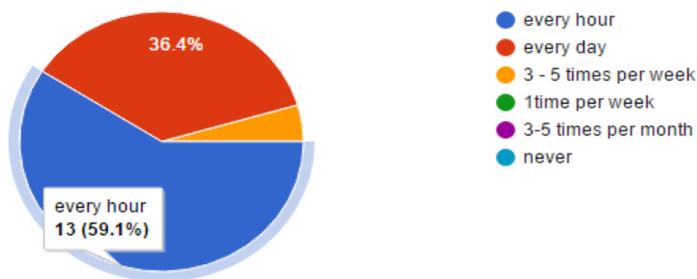
3. Contacts: Describing their everyday contacts majority of informants report that they have contacts in Sweden (68.2%). Their contacts are mostly people that they met in the refugee camp (86.4%) where number of people from their native country that they met in the refugee camp is also high (68.2%). Beside people them, and beside people employed in the refugee camp and those employed by Swedish governmental institutions, refugees report having other contacts in Sweden (59.1%). In order to express their satisfaction when meeting people from Swedish governmental institutions refugees were given option of choosing 1-6 scale. The majority (63.6%) report 2-3 level of satisfaction which is below medium, while the rest (31.8%) have chosen 3-4 level (see Figure 3). In most cases the reason for their communication is discussing their “case”, “problems”, “difficulties”, “refugee status”.

Figure 3. The level of satisfaction with meeting people from Swedish governmental institutions



4. Plans: All of the informants report plans for the future (100%), where majority (63.6%) would not like to go back to their native country. Those planning to return back (36.4%) say they need to be sure their country of origin is in peace and that they would feel safe. Of those who could not imagine returning back to their country of origin the majority would like to permanently settle in Sweden (77.3%).
5. Mobile phone practices: As mentioned before a great majority owns smart phone (95.5%) and in the period of last 3 months they use it every day (36,4%) or every hour (59.1%) (see Figure 4).

Figure 4. The frequency of mobile phone usage

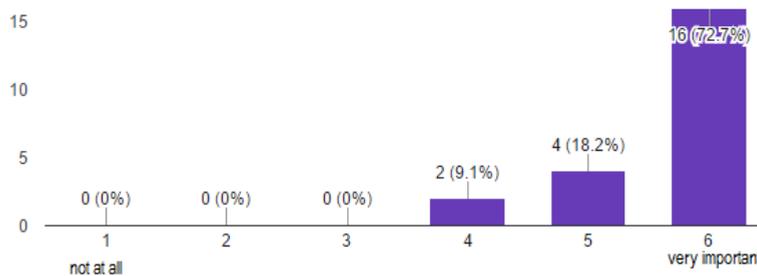


The purpose of their mobile phone usage reads as follows:

- a. communication (mails, social networking, posting) 86.4%
- b. information from their native country (reading news, radio, tv) 72.7%
- c. information from Sweden (reading news, radio, tv) 77.3%
- d. sms and phonecalls 86.4%
- e. using GPS to move around 50%

On a scale of 1-6, a great majority (72.7%) reported mobile phone as very important in their everyday life (level 6) (see Figure 5).

Figure 5. The level of importance of smartphone usage in everyday life



Having almost all of them (95.5%) using internet every day and accessing it by using mobile phone (90.9%) this statement is coming with no surprise. It is interesting to note that quite a high number of participants (81.8%) use mobile phone for voip applications (viber, whatsapp, skype, etc). Even though minority of participants (40.9) use their mobile phones to contact Swedish governmental bodies or administration to learn about Sweden, or their legal rights and duties, a great majority use mobile for learning online (86.4%) and practicing and learning Swedish language (95.5%).

Below we offer our conclusions.

The people we met in Restad Gard refugee camp are young, educated people from Syria and Afghanistan. By running from war and life threatening situations they arrived to Sweden in the past 6-12 months. Up to some extent, beside mother tongue they speak and actively learn Swedish language. With civil status unresolved their current situation is difficult and unsettling. However, they have a lot of energy and have many plans for the future. One of it is to permanently settle in Sweden. To communicate with their friends and family, to be informed about their country of origin and Sweden, and to learn - they use smartphones every hour. Finally, on demand side we have heavy, advanced users of Internet on smartphones.

Thus, the answer to RQ2 reads as follows.

Smartphones are very important in refugees' everyday life, and they use it every day to (1) communicate, (2) be informed, and (3) to learn.

Analysing the supply-side

Setel.In is a mobile application developed by volunteers on eastern coast of Sweden, Stockholm area. This umbrella concept - mobile app that gathers all solutions useful for newcomers - was born in hackathon organised by Refugees Tech association and Swedish Migration Agency. Swedish Migration Agency strongly supported Setel.In by going public with two public relation activities.

First, on the day of Setel.In launch (6th September 2016) Swedish Migration Agency published a long article in News Section titled “Sweden first with new platform to assist migration and integration”. The event was covered by many mainstream media. The quote below describes the level of support Setel.In received from the Swedish Migration Agency.

“Not only is Sweden the country with the highest number of asylum seekers per head in Europe, it also has the second-highest number of start-ups in the world. The Swedish Migration Agency turned to the tech world to explore how technical and digital solutions could be applied for some of the challenges and issues commonly faced by asylum seekers and new arrivals. A hackathon was organised in May, aiming to use innovative technology to develop creative solutions in a short space of time.” (Swedish Migration Agency, 2016-b)

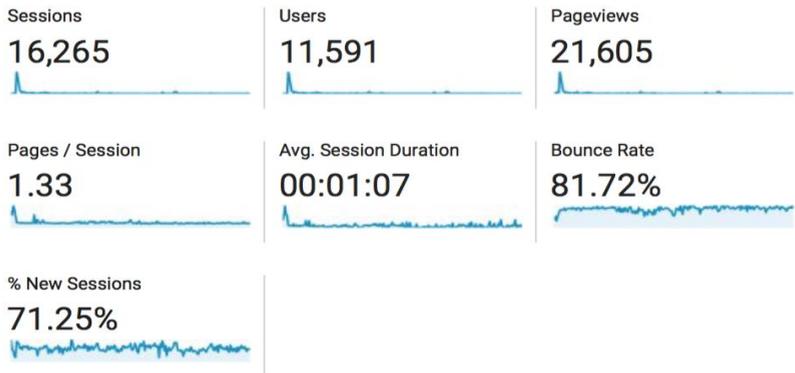
Second, the article titled “While you wait” was published next to the link “To apply for asylum”, where Setel.In is highlighted as useful ICT resource intended for those willing to find the information on how Swedish society works, and have questions regarding accommodation, jobs, learning language, education and social networks (Swedish Migration Agency, 2016-c).

As a continuation of our research, our goal was to grasp the situation on supply-side. Do refugees use mobile applications specifically created for their social integration?

To answer RQ3 we used a quantitative research method. In cooperation with Setel.In developers from Refugee Tech, we analysed the reports gathered from Google Analytics Setel.In account. Below we present our findings.

During the first six months Setel.In attracted approximately 11,500 users resulting to 16,000 sessions (see Figure 6.) of which new visitors are responsible for more than 70% of sessions.

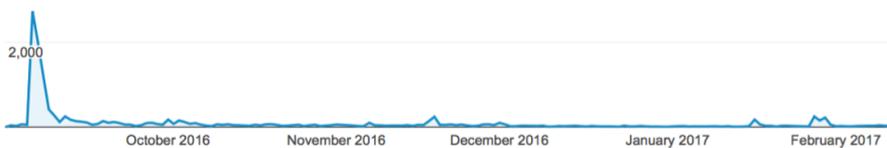
Figure 6. Setel.In Overview



The users were mostly based in Stockholm, Västra Götaland and Skåne counties. Having named counties home of the three biggest Swedish cities Stockholm, Göteborg, and Malmö respectively, this does not come as a surprise. To approach the application users used desktop computers (51.83%) and mobiles (phones and tablets) (48.17%) almost equally.

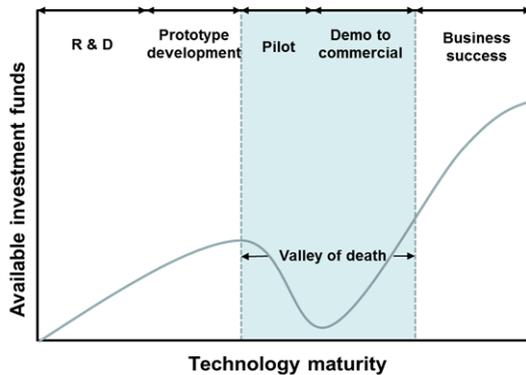
By looking at the sessions trend graph (see Figure 7.) one can see that on the day of the launch (6th September 2016) Setel.In gathered more than 2,000 sessions, and 6 months after, the activity level were almost zero (February 2017).

Figure 7. Setel.In session trend



With enormously high bounce rate (81.26%) (see Figure 6.) and high drop off rate (98,4%) in user flow, we can with certainty argue that Setel.In is in the “Valley of Death”. A metaphor often used to describe challenging gap between research on one hand and successful operational technology use on the other (Auerswald and Branscomb, 2001; Maughan et al., 2013) (See Figure 8.).

Figure 8. The Valley of Death in technology development (Government of Canada, 2013)



Putting all findings together and interpreting their results, we can answer RQ3. The answer reads as follows.

Refugees are not using Setel.In application.

The answer to the Problem Statement

Combining all the answers from the above into a full picture of the refugees' activities in ICT for refugees' social integration, we are able to answer the Problem Statement through the three following points:

1. The mobile apps for refugees ecology in Sweden is healthy and comprise a) the demand-side - refugees as advanced everyday users of smartphones, and b) the supply-side - seven mobile apps specifically developed for social integration of refugees.
2. However, even though literature, mainstream media, and Swedish governmental bodies express support and promote the idea of using ICT as tools for refugees' social integration, the results show that refugees are not using these applications.
3. Therefore, we can argue that the most plausible explanation to this phenomenon is that mobile app market for refugees is in the Valley of Death.

4 DISCUSSION

At the start, we listed some of the important factors for using ICT for social integration purposes suggested in academic literature, such as

communication, information, relationship-building, help, and identity expression and re-construction. Although the usage patterns on the demand-side align well with the reasons proposed in the literature, however, after performing three steps of analysis we have come to the realisation that refugees have not particularly embraced Setel.In; consequently, the supply-side is in the “valley of death”. Let us discuss a number of the possible reasons.

The first reason might be the design of the mobile application. If we put Setel.In mobile application under the magnifying glass we can notice several problems. First, Setel.In as an umbrella application lacks important feature of mastering or understanding of the user profiles that would enable users to easily access any of the nested applications. On the contrary, users are expected to open personal user-profile for each one of the applications nested under Setel.In application. Therefore, we can argue that this is neither user-centered nor user-friendly technical solution. Further, we could also say that most probably Setel.In was launched in a pilot - research/innovation phase, expecting to evolve in a much better user-centered commercial product. Thus, we can argue that more technical development is needed to arrive to a good and useful design of the mobile application.

Second reason is the lack of users. Majority of applications offered under Setel.In are built with expectation to connect two types of users, refugees and Swedish citizens. After looking at the results of the third step of this research we argue that the other side necessary for establishing healthy mobile app communication was absent too. It might be that the lack of motivation to use the solution provided is identified.

Third reason is the casual support of Swedish Migration Agency. If one analyses the support of Swedish Migration Agency by looking only at their public statements (pages published online, the statements of Swedish Migration Agency establishment, and mainstream media coverage) it would be easy to come to a conclusion that Setel.In application was heavily supported and promoted. Unfortunately, the support of Setel.In by Swedish Migration Agency was only nominal. In situations when Refugee Tech volunteers needed help and media attention to launch the application they partnered up with Swedish Migration Agency hoping for help. However, since nothing more happened beside publishing few newspaper articles and organizing media coverage (according to personal communication with Refugee Tech developers) where Swedish Migration Agency was depicted as innovative organisation that uses modern technology to tackle social integration of refugees, one could reason that Setel.In launch was recklessly misused for Swedish Migration Agency public promotion.

The perceived casual approach can seriously endanger the whole field of using ICT for social integration, or even general attitude to ICT usage in crisis management. Thanks to the lack of time and resources to properly research and implement user-centered solutions, this low performance result can be used as a support for enlarging technological pessimists' doubt that ICT can help any offline situation, which as a consequence can even increase the lack of users' motivation to participate in the future. Altogether this might create a downward spiral resulting in decrease in funding of ICT solutions for refugees by governmental institutions that should be the major drivers of future social innovation.

In this respect, we could witness the double valley of death problem quite difficult to bridge without miraculous "tunnel effect" that would pull the technical solution out through the steep barrier. Finally, in such scenario all interested parts - our society, refugees, natives - everybody lose by not finding way to bridge technological valleys of death, and by missing the opportunity to create social innovation with the help of modern technological achievements.

5 CONCLUSION

This research examined the driving dynamics between the demand and supply in the field of ICT for refugees' social integration. Specifically, this research analysed the Apps designed for smartphones. Results revealed that seven mobile applications were developed in Sweden in 2016 to cater for refugees' social integration in Sweden. On the demand-side, refugees' smartphone usage is identified as a very important everyday activity associated with three distinct factors: (1) facilitating communication, (2) information resource, and (3) learning resource. These factors align with three main reasons responsible for use of ICTs by refugees and immigrants suggested in the academic literature, such as (1) profiting from live information-learning centre, (2) new communication space, and (3) relationship building-maintaining tool. However, the use of mobile application for refugees' social integration is in the valley of death on the supply-side.

Together, these factors provide more detailed picture of ICT usage by refugees than provided by previous work, circumscribing not only array of reasons behind the positivistic arguments to use ICT for refugees social integration, but also the range of factors that describe ICT actual usage.

There are two limitations of our research. The non-representative sample limits the ability to make generalisations to a wider range of refugees. Especially having our study participants consisted of owners and advanced users of smartphones who are likely to be much better users of ICTs than general refugee population. However, we believe this research offers a solid foundation to those who are interested in researching further the pathways to successfully use ICTs for refugees' social integration.

The findings of this study serve to inform several audiences. Considering that our participants are highly reliant on smartphones, the findings could be used as a roadmap for other developers that are reconsidering ICT usage for refugees' social integration. Our research also shows that developing an ICT solution is not enough to arrive to a healthy commercial usage. Plus, we argue that ICTs for social integration do not operate alone. Social inclusion is a bilateral social process that places demands on both refugees and the hosting society. With that in mind we call for overcoming simplistic view of the need of ICT development for social change per se, and propose deeper analysis of all parameters necessary for delivering meaningful and effective ICT solution for social change. Policy makers and governmental bodies can use this study to reconsider their approaches when supporting ICTs in the field of social integration. Finally, this study can be useful for researchers as a starting point when discovering factors that drive the adoption and motivation of smartphone use in the field of social integration as well as in other sectors.

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BIOGRAPHICAL NOTES

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