

DOI: 10.21625/archive.v3i2.511

Mobilising Youth Towards Building Smart Cities Through Social Entrepreneurship: Case of Amman, Jordan

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Abstract

Social entrepreneurship is increasingly becoming a tool to undertake social, cultural and environmental issues in communities where startup businesses and entrepreneurs develop fund or implement ideas aimed for the solution of these problems. Whether intentionally or otherwise, numerous startups and spin-offs, have in a way or another, provided services that address larger themes including, but not limited to, sustainability, public transportation and mobility which are also key components to smart cities.

Often led by youth, and through the employment of Information and Communication Technology (ICT) and the Internet of Things (IoT), which have also become integral parts in smart cities thinking, social entrepreneurs are rapidly changing cities in ways city planners may never consider and thus becoming an under-recognised planning force to be reckoned with. On this note, this paper argues, a mobilisation for this force which aims to harnessing its potentials towards sustainable smart cities' development is becoming an urgent need. Moreover, as social entrepreneurship heavily depends on social networking and social media, thus acquiring an immediate interaction with a larger group of the local community as opposed to traditional planning methods, this paper argues it may further the advancement of participative approaches that include the public in the decision-making and planning of their own cities.

Through showcasing social entrepreneurship endeavours that have successfully addressed smart cities dilemmas in the case of Amman, Jordan, this paper aims to further explore the links between the two concepts. Furthermore, considering the little literature available on both topics in non-western literature and developing countries context, and through looking at the non-traditional ways these projects addressed city planning problems, this paper bids to find ways to inform traditional city planners towards the achievement of smart cities goals.

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Keywords

Social entrepreneurship; smart cities; big data; urban informatics; public participation; Amman

1. Introduction

In light of today's ICT and IoT advancement, cities are increasingly transforming into smart cities. Data is collected often from devices such as mobile phones and personal computers and are then processed and analysed in ways that help city planners in the management of services in addition to other city operations (J, 2015). In addition to profit generation, smart city applications aim to improve the quality of life and the performance of urban services as well as reduce costs and resources consumption (Deakin, 2013), moreover, in the typical case, they are used to

increasing the interaction between city planners and the local community and allows them to monitor and evaluate the provided services thus measure the evolution of the city and better address its needs and its ability to respond to potential challenges (Peris-Ortiz & Yábar, 2016). However, in the case of Amman, this cycle is often broken. Data is collected, processed and analysed but is solely used by software developers for the purpose of upgrading their products and city planners remain excluded from this process.

In the absence of resources and in the lack of countries abilities to address critical social, cultural or environmental problems, social entrepreneurship emerged as an attractive alternative, more specifically to young entrepreneurs, to help solving these complications while providing a potential newfound economy where profit is no longer measured with your typical return of investment, profit, revenues or other metrics, rather with 'return to society' along with different performance measurement tools (Thompson, 2002). In Jordan, the innovation and entrepreneurship movement is witnessing an unprecedented boom and hundreds of startups and spin-offs are mushrooming throughout its ecosystem. A large number of these projects fall under the loosely defined social entrepreneurship with an aim to address critical community needs including sustainability and transportation. These projects often heavily lean on social networking and require a basic level of data mining, processing and analysing and, in some cases, may require the use of sensors and machine learning which this paper argues may be of great help for city planners to include citizens in decision-making in addition to improve the overall city planning more specifically in developing countries context especially that the majority of research on both smart cities and entrepreneurship is based on developed countries literature.

2. Literature review

Innovation and entrepreneurship in urban planning

In the 'Big Data and Urban Informatics: Innovations and Challenges to Urban Planning and Knowledge Discovery' book, ((Vonu) & M, 2017) introduce the idea of seeing cities through big data. In their chapter they argue that newly emerging big data, more specifically data obtained from sensors (e.g, IoT) or socially generated (e.g, social networking and social media), are increasingly becoming important observational data in urban research. In the emerging area of urban informatics, they add, urban systems are better understood when constantly employing new sources of data.

According to them, "Urban Informatics utilizes Big Data in innovative ways by retrofitting or re-purposing existing urban models and simulations that are underpinned by a wide range of theoretical traditions, as well as through data-driven modelling approaches that are largely theory agnostic".

'Smart cities' have been describes as an evasive and multifaceted term (Nilssen, 2018). Building on that, Nilssen (ibid) explored the ways it may be coined with innovation in her research on smart urban innovation where she argues that innovative city initiatives contribute to the smartness of cities and that some types of innovation (between technological, organisational, collaborative or experimental) are central in the smart city. (Caragliu & Bo, 2018) support this argument and add that cities engaging in smart cities policies tend to patent more intensively which suggests possible innovation as a result of technologies directly involved in smart cities policies.

Integrating urban and digital planning, smart cities are being promoted as the solution to the challenge of urbanization and sustainable development (Datta, 2015b) . It is a part of a longer Utopian urban planning that emerged as a response to the challenges of development and modernity, moreover, it highlights the shift to 'entrepreneurial urbanisation 'as Datta argues.

Smart cities

Until this day, the term 'smart city' remains ambiguous and the abundant similar terms that are often used interchangeably— including intelligent city, information city, virtual city— add to the confusion and stresses the need for a shared definition of what constitutes a smart city (Albino, Dangelico, & R.M., 2015) .

According to Batty (Batty, 2013) , "... smartness in cities pertaining primarily to the ways in which sensors can

generate new data streams in real time with precise geo-positioning, and how the data bases that are subsequently generated can be integrated so that value can be added”, furthermore, he argues that cities only become smart when people are smart.

In their research on smart cities of the future, Batty et al. (ibid) define a smart city as “... a city in which ICT is merged with traditional infrastructures, coordinated and integrated using new digital technologies”. According to them, there are six challenges smart cities face including (1) the relation of smart cities’ infrastructure to their operational functioning and planning through management, control and optimisation; (2) the exploration of the notion of smart cities as laboratories for innovation; (3) the provision of portfolios of urban simulation which inform future designs; (4) the development of technologies that ensure equity, fairness and realise a better quality of city life; (5) the development of technologies that ensure informed participation and create shared knowledge for democratic city governance, and lastly; (6) ensuring greater and more effective mobility and access to opportunities for urban population.

Although abundant literature is increasingly discussing the rise of smart cities and attempts to offer an interpretation for what the term may convey, (Batty, Axhausen, & Giannotti, 2012; Bunnell, 2015; Datta, 2015a; Watson, 2015) the term remains loosely defined and future research may offer a more comprehensive definition.

3. Methods

This paper will look at two social entrepreneurship projects developed for the city of Amman which this paper argues, if shared with city planners and professionals, may contribute to achieving a smarter Amman.

The first project is a mobile application named ‘Khotutuna’ (Arabic: Translated to English meaning: our lines) offered by ‘Mean Nasel’ (Arabic: Translated to English meaning: together we arrive) whom describe the app as Amman’s unofficial transport map. The second project this paper aims to highlight is another social entrepreneurship effort aiming towards achieving sustainability through waste management and recycling.

The paper identifies as a qualitative research and thus utilises qualitative methods including observation and semi-structured interviews. Within the wider qualitative design, the study adopts an interpretive philosophy which puts the emphasis on the researcher’s interpretation of the data. Moreover, the research design is exploratory, which puts an emphasis on exploring specific areas of research and does not necessarily strive to achieve final or conclusive answers to the research problem rather, the recommendations are more tentative than final.

4. Discussion

From online banking, travel guides to food delivery, mobile applications have become the new way to getting things done. Governments have also realized this and the transformation towards smart governance through eGovernment mobile applications is currently trending in Jordan. See below examples for eGov apps, found in the next pages:



Figure 1. Chamber of commerce mobile application. Source: Google Play store, retrieved August 14, 2018.

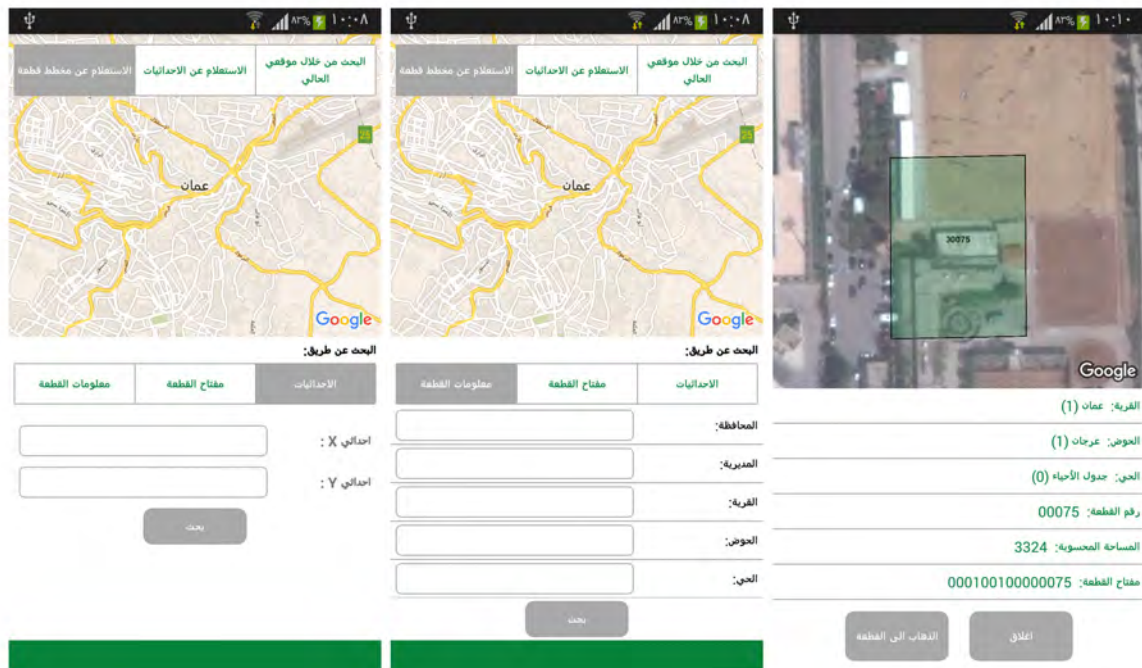


Figure 2. Department of Lands and Survey mobile application. Source: Google Play store, retrieved August 14, 2018.

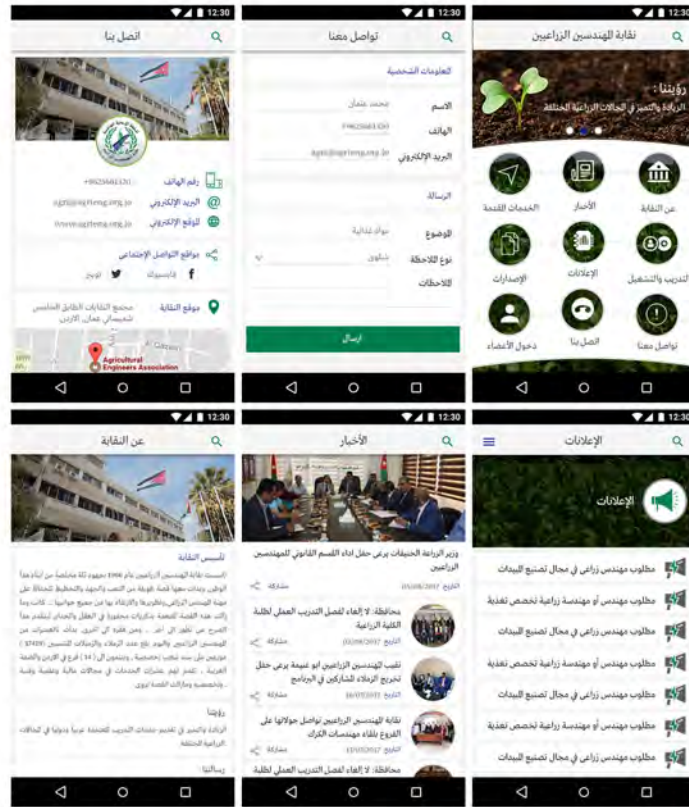


Figure 3. Agricultural Engineers Association mobile application. Source: Google Play store, retrieved August 14, 2018.

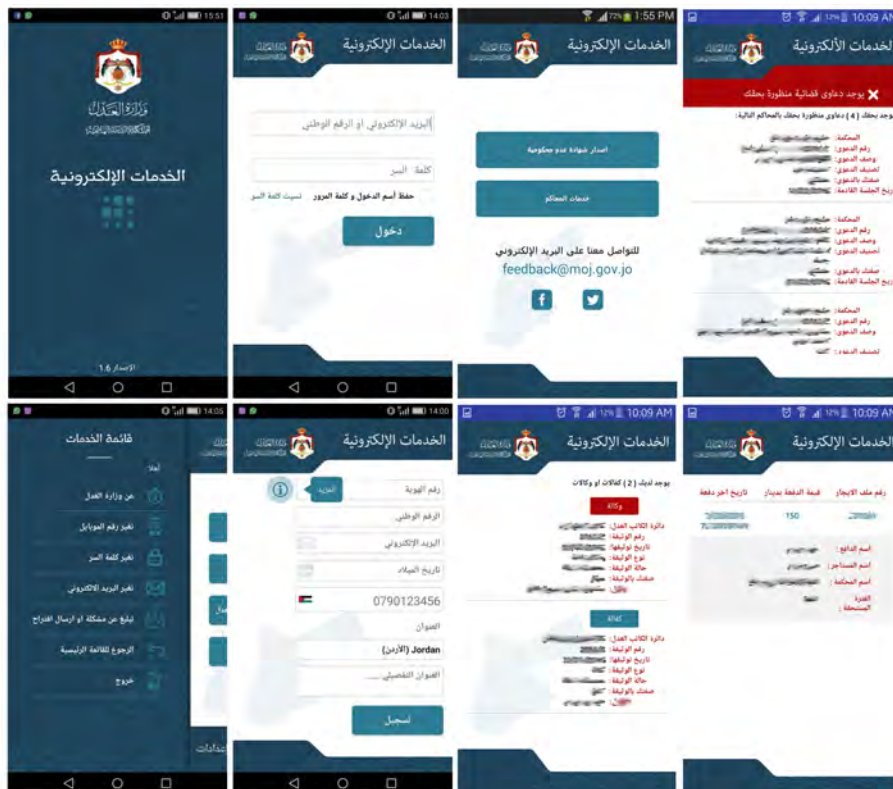


Figure 4. Ministry of Justice mobile application. Source: Google Play store, retrieved August 14, 2018.



Figure 5. Social Security Corporation mobile application. Source: Google Play store, retrieved August 14, 2018.



Figure 6. Greater Amman Municipality mobile application. Source: Google Play store, retrieved August 14, 2018.

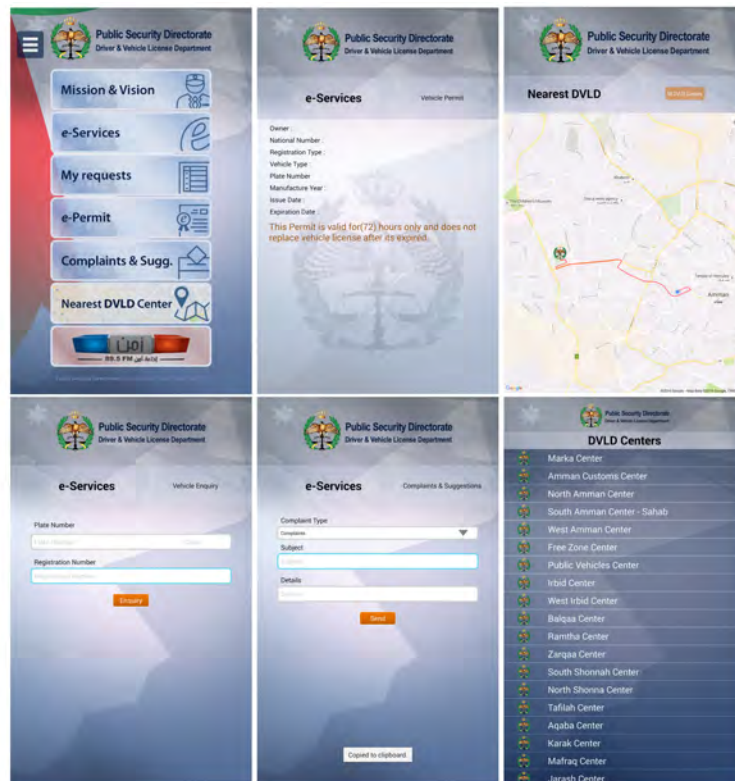


Figure 7. Driver and Vehicle License Department mobile application. Source: Google Play store, retrieved August 14, 2018.

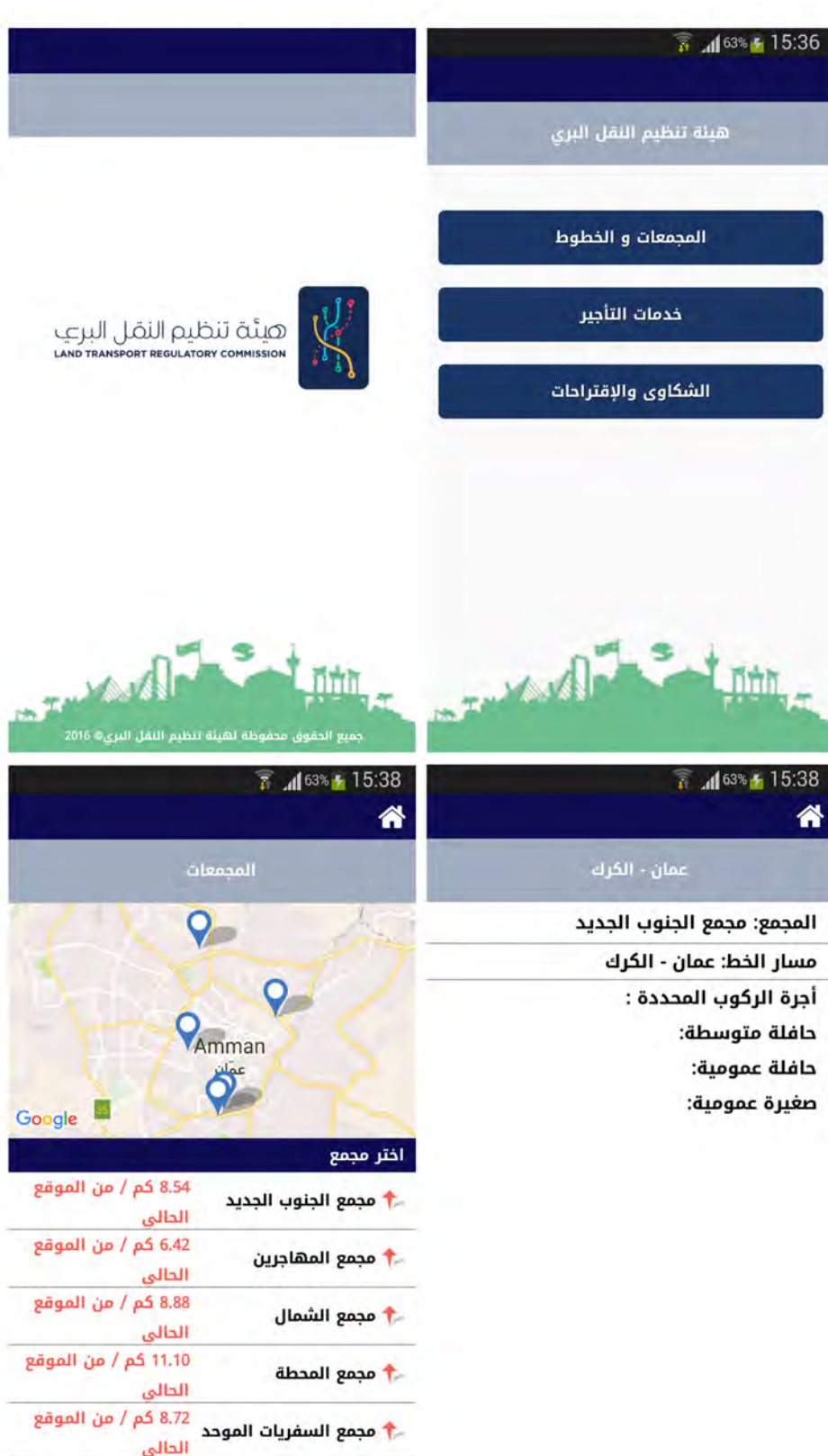


Figure 8. Land Transport Regulatory Commission mobile application. Source: Google Play store, retrieved August 14, 2018.

EGovernment mobile applications, this paper argues are not solely integral to achieving smart governance, rather, they are equally important to achieving smart cities. Moreover, smart governance, this paper suggests, must benefit from other applications not necessarily designed for the advancement of governmental operations.

In a recent video posted on Facebook, August 10th, 2018, his Excellency Prime Minister of Jordan Dr Omar Razzaz highlighted that smart phone transportation applications allow users to trace buses, make complaints amongst other features. Technology may be a facilitator to find quick solutions to improve the public transportation user experience, he added.

With the help of volunteers, information on current buses, coasters and service cars was collected with an aim to help local Ammani's as well as visitors arrive to their desired destinations.

According to the developers; "... this map is the result of the efforts of volunteers whom love their city and care about it. . . It aims to clarify the currently unclear public transportation routes in order to encourage Ammani's and visitors to use them. . . we did extensive fieldwork and research in order to be the most accurate in tracing the public transportation routes throughout the city and that was not easy!" (Interview, H.Z, head developer)

Similar to common transit maps, the Khotutuna map is also not geographically accurate and does not show real dimensions, however, it includes the larger majority of Amman's bus, coaster and services line with a total of 76 routes. The map is colour-coded, it categorises the routes according to their directions which are non-existing neither on the vehicles or the street.

The only existing code describes the big 'Amman transport' buses, otherwise, a proposed code is used for the unnamed buses (B), coasters (C), and services (S).

Each line demonstrates all the routes that passes through it as well as the direction (back, forth or both).

The application heavily depends on mobile Global Positioning System (GPS) data and socially generated data which according to the developers are happy to share with city planner.

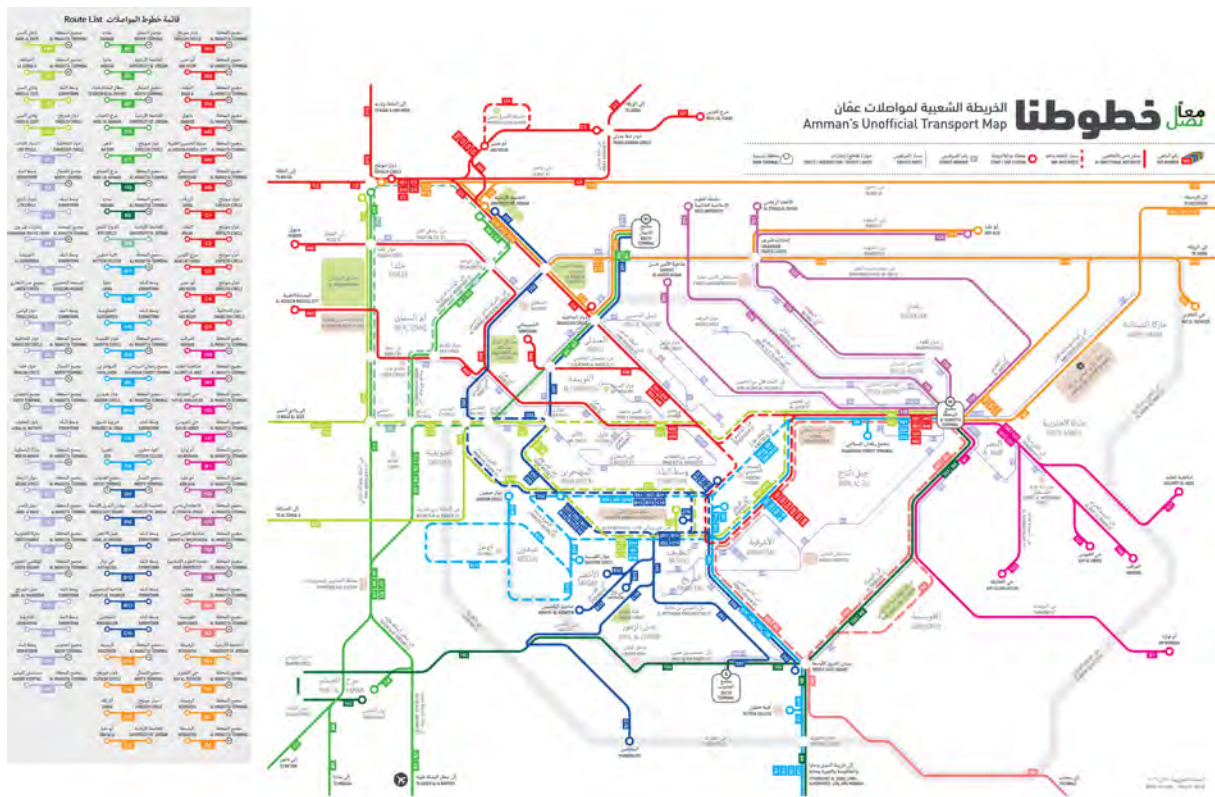


Figure 9. Khotutuna map. Source: <http://maannasel.net/map/>. Retrieved August, 11, 2018.

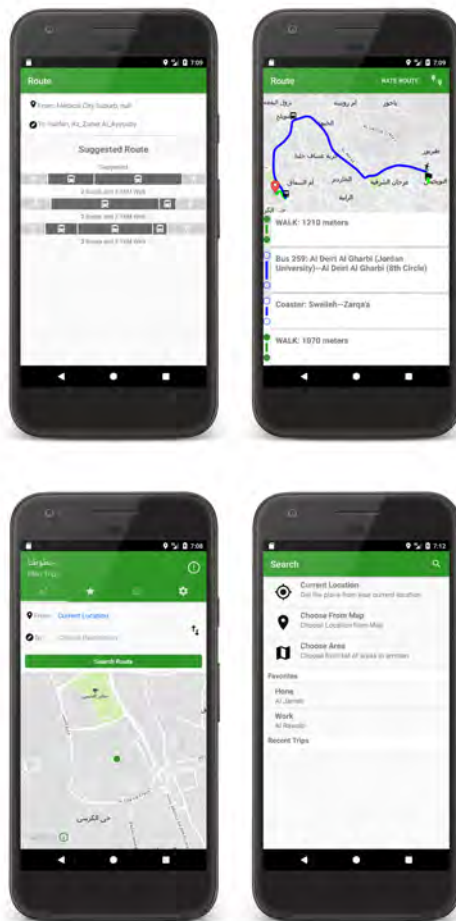


Figure 10. Khotutuna mobile interface. Source: Google Play store, retrieved August 14, 2018.

The initiative aims to be a community impact tool to push for public transportation to become a national priority through monitoring and evaluating the government’s work towards developing a comprehensive and sustainable public transport system in Jordan as well as provide the necessary success factors from policies, legislation, systems and funding that ensure the integrity of relevant city planners’ decisions.

The initiative also aims to spread and raise awareness among both decision makers and citizens on the importance of public transportation and encourage their use and preservation.

The initiative aims to provide proposals for improving the performance of public transport in the short term and push for their implementation, suggestions include: providing information on public transportation services through the distribution of maps and information leaflets in public places and at current bus stops; promote the use of mobile apps and collaborate with Traffic Management towards the implementation of traffic and safety systems including the number of passengers allowed; adhering to the specified bus stops; compliance with the allocated routes and lines; identifying specific public transportation segments of the street; providing handicapped- friendly vehicles, and lastly; raise the efficiency and awareness of workers in the public transportation industry.

According the developers, to improving public transportation in Jordan and towards achieving smart cities goals, the budget allocated for public transportation investment must be increased, contemporary public transportation laws must be fully activated in ways that guarantee the rights of the user, users voices must be heard, and lastly, orderly public transport for Jordanian universities must be insured.

Until this day Khotutuna developers encourage users to join them and feed the map with more routes covering the different parts of the city and eventually the totality of Jordan.

The second social entrepreneurship initiative this paper aims to highlight is one aimed towards achieving sustainability through waste management and recycling. Environmental Solution Pioneers (EPS) is until this day the only mobile application that serves this purpose in Jordan.

According to the developers, EPS is a system that aims to systemise the collection of waste including plastic, paper and cardboard, aluminum, and non-ferrous metals through a user-friendly mobile app. They are currently working with just over 600 establishments including hospitals, restaurants, schools, universities, cafes, in addition to factories and aim to include households in the near future to achieve a comprehensive waste management sustainability.

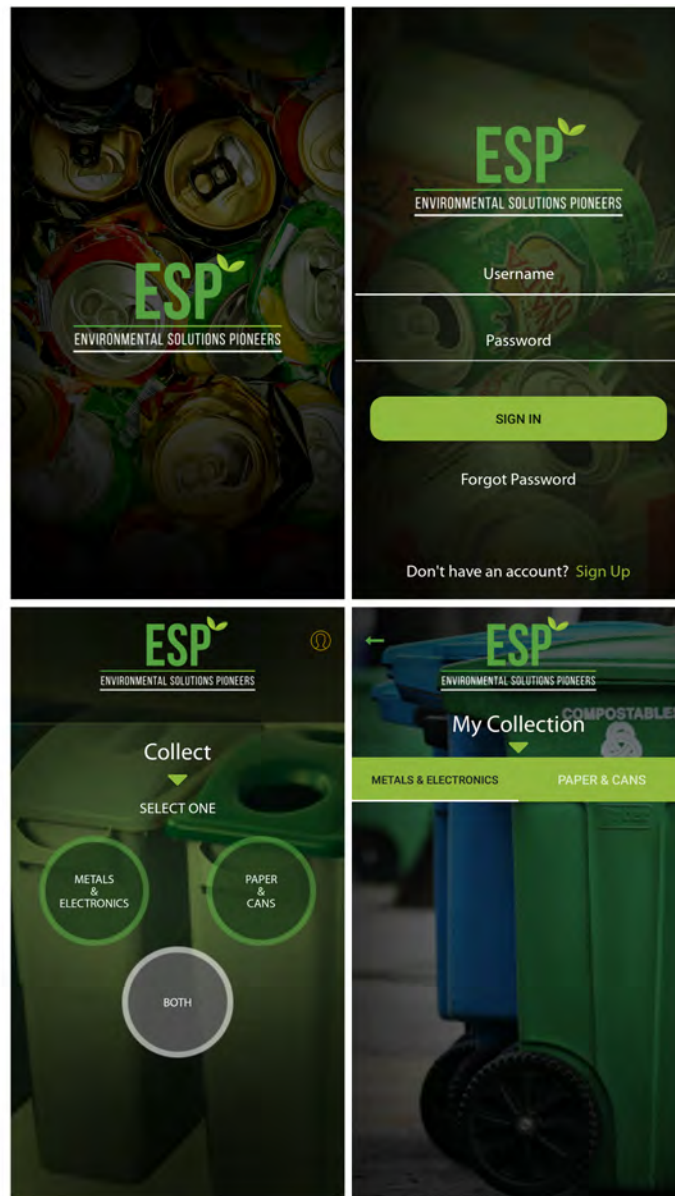


Figure 11. Environmental Solutions Pioneers mobile application. Source: Google Play store, retrieved August 14, 2018.

EPS aims to achieve environmental sustainability not only through the recycling and waste management but also by minimizing the trips necessary to the process which, this paper argues, also complements smart cities goals.

As demonstrated above, the system also heavily depends on big data and similar to Khotutuna, the developers are more than happy to share this data with city planners and professionals in order to increase the smartness of Amman.

5. Conclusions

Social entrepreneurship continues to offer innovative solutions to social, cultural and environmental issues. Through the facilitation of ICT and IoT, it is increasingly transforming cities including Amman, Jordan from data-poor cities to data-rich ones and numerous researchers explored the links between big data, more specifically obtained from sensors or socially generated, as observational urban research data in the area of urban informatics which is central to achieving the notion of smart cities.

This paper concludes that social entrepreneurship efforts including resulting data in addition to social interaction must be harnessed and mobilised towards the achievement of participative, effective, realistic and applicable solutions to urban problems and thus the realisation of smarter cities.

Although this paper was set forward to address the gap in research on smart cities and innovation and entrepreneurship, big data and urban informatics more specifically in developing countries and Middle Eastern contexts, yet, it concludes that further research that takes into consideration context particularities and that identifies what constitute a smart city in these contexts is still much-needed. Moreover, although this paper was set forward to highlight the significant role the youth may take in achieving smart cities goals through their innovative and entrepreneurial projects, the links between them and city planners and officials need to be further explored.

Innovation and entrepreneurship in all their types are central to smart cities and as a response for the challenges related to this notion, smart cities are increasingly explored as laboratories of innovation, however, this paper concludes that instead, perhaps we should look at innovation and entrepreneurship as catalysts for achieving smart(er) cities through the development of services that ensure equity, fairness and realise a better quality of urban life as well as the development technologies that ensure informed participative planning and create shared knowledge for just city governance, while ensuring greater and more effective mobility, sustainability and access to opportunities for the urban population.

Lastly, this paper ends on the note that technological advancement will never a replacement for good planning, however, reaping the outputs of endeavours aimed to improving urban systems and operations, and thinking of ways these outputs may be used to inform city planners and officials may bring developing countries a step closer towards achieving their best version of what they may constitute as smart cities.

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