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Title: Social Media Users as Carriers into the Last Mile Delivery

1. Introduction

European Commission initiates every year a number of events and actions to promote sustainable urban mobility, with great interest in pioneering initiatives that enable participation of citizens. Nowadays, that the social media support active participation of the users and the e-commerce owing to online purchases is booming, "Social delivery" could significantly contribute towards sustainable urban mobility, as an alternative urban distribution method [1]. Social delivery constitutes a form of crowdsourcing for last mile distribution through the use of social media. Specifically, the concept proposes that a share of daily deliveries is performed by social media users, named onwards "acquainted carriers" who sustain a level of familiarization with the final recipient [2]. This way delivery costs will be decreased and multiple trips due to not-at-home situations will be nearly eliminated, bringing sustainability benefits to all stakeholders.

Crowdsourced delivery is a relatively new concept. After the gigantism of social media platforms within the last five to ten years, a number of companies have pondered new models and technologies to make last mile delivery cheaper, faster and thus, more sustainable by leveraging social media platforms. In 2015, Amazon world's third most valuable company according to Fortune [3], tentatively inaugurated the "On My Way" service [4] recruiting ordinary people to make deliveries and drop offs on their way to an activity and rewarding them with discounts on their future purchases. Other crowdsourced delivery on-demand startups, as Postmates [5], Instacart [6] and Deliv [7]

leverage mobility services, i.e. Uber, in highly dense urban areas, to connect businesses to nonprofessional carriers. Given that Uber drivers' personal information is registered and that they fulfil certain requirements [8], challenges such as accountability and insurance issues were overcome.

2. Methodology

The scope of this study is to explore the applicability of the Social Delivery concept, assess and evaluate its impacts in terms of transport and environment. This will be achieved in two steps; a survey to gauge the willingness of social media users to contribute to the delivery process through their participation and the design of a traffic model that will be used to quantify the impacts.

2.1 Survey

An ongoing on-line questionnaire survey [9] targeted to social media users at international level was developed to gauge their willingness to contribute to the delivery process. The survey was pretested by undergraduate and post graduate students of the Department of Civil Engineering of the University of Thessaly in order to identify abstruse questions, avoid biased answers and provide feedback for the improvement of the overall survey. The questionnaire was designed in Surveymonkey [10] in the English language and is being disseminated via four Instagram and Facebook accounts with a total of 25,250 followers/friends.

- Instagram account 1: Followers: 19,981
- Instagram account 2: Followers: 3,251
- Facebook account 1: Friends: 942
- Facebook account 2: Friends: 1,076

The survey consists of four parts. The first part records the socio-economic characteristics of the respondents, by collecting personal information such as gender, age, employment status etc. The second part refers to the use of social media and collects data regarding the type and frequency of social media use, the distribution of followers/friends to the social media account mostly used by the participant etc. The other two parts aim to gauge the willingness of the social media users to get involved into Social Delivery concept, as receivers and as acquainted carriers, respectively.

Analytically, for the receivers, the survey measures the likelihood to post on their social media accounts based on parameters such as the price of the item in the package, its weight, size and delivery urgency, while for the acquainted carriers the considered parameters are the willingness to deliver a package depending on the familiarization level with the receiver, the extra time to pick up the package, the weight and size of the package and the time of the day that he/she performs his/her daily travel routine. The

considered levels of familiarization with followers/friends arouse from the study of Van de Bunt et al. [11] as follows:

- Unknown (Follower/friend on social media, but I don't know him/her personally)
- Social media friend (Someone I barely personally know)
- Friend (Neighbor, colleague)
- Best friend/Relative

2.2 Simulation

Without loss of generality, survey's results in a synthesis with findings from literature and similar studies that used ICT platforms to improve the last mile delivery, will be used to determine the number of trips that can actually be saved every day. For this purpose, a medium sized city in Greece, Volos, will be used as a pilot. Analytically, data (in the form of postcodes) from clients of a major online company selling electronic devices with a physical store in the urban area of Volos will be given. This data will be used along with delivery scenarios and will be tested in a traffic microsimulation software – VISSIM – to evaluate the impacts of the measure in the urban area of Volos.

3. Preliminary Results

Preliminary results of the current sample size show that 81.8% of the responders would be at least "slightly" willing to post on their social media account about the delivery of a package by an "acquainted carrier". In addition, all respondents would be at least "neutral" to participate as "acquainted carriers" if the final receiver of the package is a "friend" or "best friend/relative" of theirs, see Fig. 1.
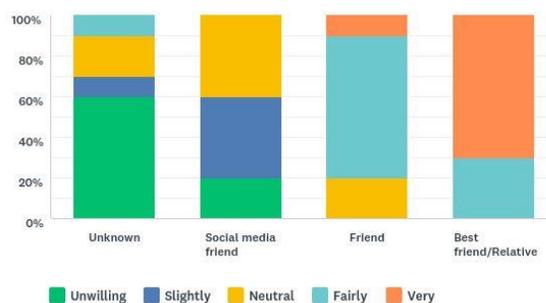

Fig. 1. Preliminary results on willingness to participate in Social Delivery as acquainted carriers

The above results are considered promising for the acceptance and adoption of Social Delivery given that "friends" and "best friends/relatives" correspond to 50% of the total

number of followers/friends of the social media account that the respondents are mostly using, based on responses of the respective question of the online questionnaire.

Final results will be collected and analyzed after questionnaire's closure deadline at the end of March 2018.

4. Discussion

The evaluation of the Social Delivery measure requires in depth analysis in order to determine the adoption rate as well as the trade-offs with daily parameters. However, it is expected that as a number of the daily deliveries will be taken on from "acquainted carriers", the delivery costs and thus customer's costs will be decreased, while in parallel traffic congestion will be alleviated, along with resulting environmental impacts. In addition, it is believed that such a concept will improve neighborhood acquaintance, resulting to strengthen other community integration services as car-pooling.

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