1. STARTING SITUATION

1.1. INTRODUCTION

When interaction channels between administration and citizens are established[1], the following concepts are usually used:

| To raise awareness: Awareness-raising is a process that seeks to inform and educate people about a topic or issue with the intention of influencing their attitudes, behaviours, and beliefs towards the achievement of a defined purpose or goal.

> Awareness: knowing something; knowing that something exists and is important.

| To inform: To tell somebody about something, especially in an official way.

| To communicate: To share or exchange information, news, ideas, feelings, etc.

| To participate: To take part in or become involved in an activity.

Based on these definitions, in this document we use the term 'communication' to encompass the exchanging of information, as well as the awareness-raising process.

When we talk about communication campaigns, we refer to the realization of different communication actions aiming to achieve the same goal.

It should be noted that, although communication campaigns are traditionally unidirectional (from the administration to the citizens), work is currently underway to establish channels that allow two-way communication between citizens and the administration, so citizens may also establish communication with the administration, and send their questions, doubts, suggestions, and answers to questions asked by the administration.

1.2. KNOW AS YOU THROW

1.2.1. DESCRIPTION

KAYT (*Know-As-You-Throw*) is an innovative concept to reduce municipal waste and increase separate collection through a knowledge & persuasion-driven approach. The idea is that the habits of citizens towards separate collection can be improved by informing them in a continuous and convenient way, combining technology, gamification, one-to-one meetings with real informers and some economic and/or social benefits.

On the other hand, a PAYT (*Pay-As-You-Throw*) is an economic instrument based on the polluter pays principle, in which the user of the waste collection service pays a waste charge according to their real waste generation and the waste management service that is used. Thus, PAYT schemes allow to reward

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[1] We use *Citizens* in a broad sense, including all agents not being part of the administration: citizens, commercial activities, associations, etc.

those users that make an effort to reduce their waste and separate it correctly, as well as penalize those that do not do so.

1.2.2. TYPOLOGIES AND EXAMPLES

So far, two major approaches are known regarding KAYT schemes: one based on sending messages to users' mobile phones, and the other one based on displaying messages on vending machines.

<u>KAYT schemes based on sending messages to users' mobile phones:</u>

The first step when implementing this sort of KAYT consists of linking the user identification technology elements (such as bins fitted with a tag or a chip in case of door-to-door collection schemes, RFID cards in case of collection schemes with locked containers, or waste collection centre user cards, among others) with the user's mobile phones where to send personalized messages using communication channels such as WhatsApp, SMS or Telegram.

Since the *Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)* establishes that the use of personal data, such as user's' mobile phone number, must be informed and expressly consented by them, citizens participation on any KAYT scheme is strictly voluntary. Therefore, local authorities wishing to implement a KAYT scheme must:

> Explicitly inform users that joining the KAYT scheme is completely voluntary and, a document must be signed to formalize user's acceptance.

> Explicitly inform users participation involves the need to use personal information such as phone number.

> Explicitly inform users about the advantages established by the local authority to promote participation in such KAYT scheme. Some of the incentives might be, for instance, discounts on the waste collection charge, discounts in local shops, or giving awards and prizes based on a points system that can be obtained depending on the user participation.

> Establish mechanisms for obtaining and registering users' mobile phones. For that purpose, although local authorities may enable web pages to obtain this personal information by electronic signature, it might be more convenient to obtain this information and user consent in a presential manner. This could be done when delivering bins (fitted with a tag or a chip) or RFID cards to users, so then the campaign staff is able to respond to users' questions and doubts individually.

Currently, in the framework of the REthinkWASTE project (https://rethinkwaste.eu), funded by the EU LIFE programme, various pilot projects are being implemented in four areas: Bassano del Grappa (Veneto), Varese (Lombardia), and Bitetto (Puglia), in Italy, and in Catalonia (Sant Just Desvern, Santa Eulàlia de Rançana, Cardedeu i El Brull). In all these areas, the KAYT approach is quite similar, based on sending messages to users' mobile phones.

In the case of Sant Just Desvern (18.670 inhabitants), the local council is currently working on the implementation of a new waste management model in which biowaste and residual waste will be locked, being necessary to get a user's identification card to open them. This action is aimed at increasing the municipal collection waste rates and stimulate people to a better behaviour related with waste

management. This last goal will be achieved by the implementation of the KAYT approach. Finally, the municipality of Sant Just Desvern is willing to introduce a PAYT scheme by the end of 2022,[2] taking advantage of the data produced by the new waste management model.

Life REthinkWASTE project in Sant Just Desvern

The implementation process of this KAYT scheme includes a first engagement letter sent by the city council to the citizens informing about the new waste collection model (how the system works, how the data privacy will be managed, as well as the place, day and hour to pick up the electronic card). At the same time, a website has been launched (https://residus.santjust.net/index.php/life-rethinkwaste/) to provide specific information. A label has been proposed (#Coneixelquellences) to be used in social media.

In this case, the strategy to capture the attention and interest of citizens is a rewarding system based on eco-points for accessing prize draws. Gaining more eco-points means more possibilities to gain prizes and sustainable gifts in local shops and businesses. The users can gain eco-points by interacting with the messaging system and according to their habits in relation to the new separate collection system. Currently, eco-points more can be obtained:

| By signing up for the KAYT scheme. It implies the user gives his/her phone number and signs a consent document for the transfer of personal data (5 points).

| By receiving messages informing about user's use of containers for refuse and organic fractions (5 points).

| By using the organic fraction container more than three times a week (5 points)

| By participating to campaign meetings, interacting, and visiting the campaign staff, etc. (15 points).

- By sending questions and doubts, as many as desired, although exceeding 5 questions/doubts per month would not give extra points (3 points).

- By answering 'OK' to a message that propose challenges on household waste management (5 points).

- By participating in the challenge, but the answer is not correct (5 points)

- By participating in the challenge, and the answer is correct (10 points)

<u>KAYT schemes based on displaying messages on garbage bag vending machines;</u>

The Italian city of Bergamo (12.639 inhabitants, 59.174 households) introduced a KAYT scheme to increase the recycling rate by means of a door-to-door collections scheme, and with a view to introducing PAYT at a later stage. Bergamo's residents were used to disposing of their residual waste in transparent standard bags. The new system will obligate them to purchase the bags at designated vending machines located in each district. These machines are equipped with a display that interacts with the waste charge software, which counts the number of bags dispensed per user. Each user receives personalised messages based on the behaviour of their neighbours from the same district.

Example of personal message from the machine. Bergamo.

The kind of machines needed does not exist on the market yet, so they needed to be designed and built. To ensure that each user will access information regularly at the vending machines, the bag rolls were designed to contain only 10 bags of 40L each.

The new system was announced in advance through local newspapers, and local council and waste collection service provider websites.

It has been calculated that the production and assistance of the machines, over 5 years, will cost 0,50€ per capita, each year.

The main advantage of this KAYT approach is that the system does not require using personal information such as user's phone number. Then, since participation is not voluntary, contrary to approaches based on sending messages to users' mobile phones, such as in Sant Just Desvern, not only those who are already sensitised to the topic are reached, but also those less engaged in waste reduction and separate collection.

1.2.3. COMPARING COMMUNICATION IN PAYT AND KAYT

As previously seen, PAYT and KAYT have different purposes and particularities. Here, the main features of both schemes are compared from the perspective of communication:

- While on a PAYT scheme, communication is mainly unidirectional (at least once a year, when local authorities send the waste bill to users), a KAYT approach becomes an interactive communication tool between the administration and the citizens. Thanks to this bidirectional character of KAYT, not only the administration may send personalized information to users, such as tips and challenges according to user's behaviour on waste collection (among other possibilities), but also users may answer and interact with the administration.

- While on a PAYT scheme the information send to users is mainly economic, on a KAYT system, administrations may also send environmental information on a regular basis, so then habit changes may be achieved sooner.

- Since KAYT systems are voluntary, only those citizens participating on the KAYT would enjoy the established discounts and offers. Instead, since PAYT systems are compulsory, the same criteria for waste taxation are applied to everyone.

- Related to last point, higher citizen participation on PAYT schemes is believed to improve the results of selective collection and waste reduction, more than in KAYT schemes.

- A PAYT system has an intrinsic purpose, which is to achieve a financial stability of the waste collection service, whereas a KAYT approach does not have this purpose.

- While it has been proofed that PAYT systems lead to an increase of selective collection and a decrease on waste generation, there are still not concluding results showing a significant effect of KAYT schemes on selective collection and waste generation, reason why it is necessary to evaluate the effect of KAYT experiences on such indicators. Despite this, since citizen participation on PAYT schemes is much higher than in KAYT, it is though than the effect on both selective collection and waste generation is also higher.

1.2.4. LEGAL PRECAUTIONS

The Regulation (EU) 2016/679, also known as the General Data Protection Regulation (GDPR), establishes that the use of personal data, such as users' mobile phone number, personal data may not be processed unless the data subject has given consent to the processing of his or her personal data. In this case, consent must have been explicit for data collected and each purpose data is used for.

Consequently, this implies that citizens participation on KAYT schemes based on sending messages to users' mobile phones is strictly voluntary.