Collective Speech in the Hybrid Urban Space. Intervention in a Residential Neighbourhood in an Ecuadorian Andean City

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Carlos Martín Román
Media Technology MSc program, Leiden Institute for Advanced Computer Science, Leiden University
Thesis advisors: Edwin van der Heide and Max van Duijn

Abstract

This thesis researches the integration of digital technologies with urban space assuming a threefold paradigm —*the right to the city, the hybrid urban space, the hackable city*— and approached a neighbourhood in a mid-size Ecuadorian city, whose cooperative association has been seeking bigger engagement of the inhabitants for a while. As an experimental way of dealing with this problem we have set up a public scrolling text LED display to which inhabitants can connect and contribute to a *collective speech* by writing a text and adding it up to the previous contributions. After ten months observing the functioning of the display, we analysed the produced interactions in relation with the social context and in contrast with the communication structure and language functions of the texts produced.

Data showed a rather constant use of the device over time, with some social context events which notably modified this pattern. There was a slight growth in complexity of individual interactions. Language function analysis showed a preeminence of the phatic function, and a notable poetic function, which was more important when analysing collectively composed texts rather than individual contributions. Analysis of communication factors showed a growing collective character of messages, and in messages regarding the two most salient social groups —neighbours and students— it showed a dominance of the neighbours and an unbalanced inter-group communication.

Our findings suggest that public interventions in the hybrid urban space can facilitate collective expression that help engagement in collective issues and provide insights on neighbourship in urban society.

1. Introduction

In this thesis we research the integration of *digital technologies* with *urban space* in an experimental manner by setting up an intervention in *the hybrid urban space* —defined in 2.4 below as those urban spaces where physical and virtual dimensions merge and influence one another— to articulate the *collective speech* of a neighbourhood, as an expression of the urban society.

The first part of this document describes the location where we set our intervention, a residential neighbourhood founded in the mid 90's called *'Los Olivos'*, in a medium-sized Andean city called Riobamba in central Ecuador. This neighbourhood was developed as a cooperative with the necessary initiative and involvement of the dwellers, but after some 30 years from its foundation, that involvement has notably weakened and the organisational structures of the neighbourhood are becoming marginal and at risk of disappearance. If this happens it would mean an impoverishment of the neighbourhood urban society.

We approached this problem assembling a threefold paradigm —*the right to the city*, *the hybrid urban space*, and *the hackable city*— which frames our city-making thinking and action, and from this threefold paradigm we set up an intervention to trigger and call attention on a participatory collective expression, with which to provide some elements for reflection and gain some insights on the neighbourhood urban society.

This document also describes the resulting system prototype and the analysis of the interactions with it. The prototype device consists of a scrolling text LED display which makes use of *the hybrid urban space* broadcasting a wifi network in the neighbourhood public park, display which was open for citizen interaction

to collectively compose a text, a collective speech. Analytical process turned around the collective and social dimensions of the communication taking place through the system and of the use of language in that communication.

In the discussion, results of the analysis are observed as to gain some knowledge on the involvement of the citizens on the collective expression proposed with the intervention, and also on some social relations in the neighbourhood.

Before the conclusion, further research is considered pointing out the need to continue developing the theoretical framework and praxis of the integration of digital technologies with urban space.
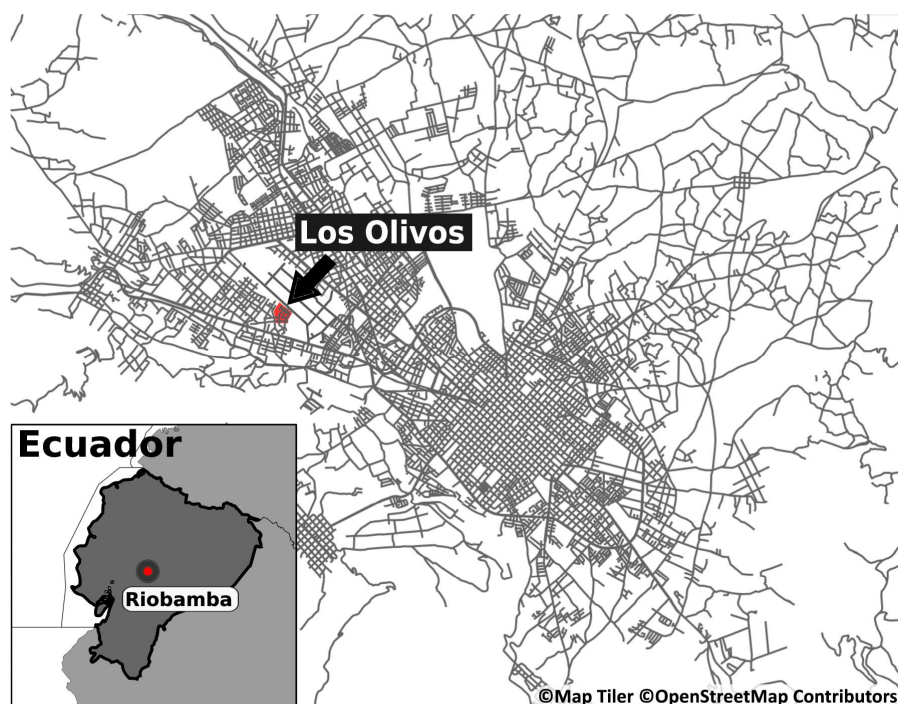

Fig. 1. Intervention is located in the neighbourhood *'Los Olivos'* in the city of Riobamba in central Ecuador.

2. Background and approach

2.1 Intervention location

'Los Olivos'[1] is a residential neighbourhood founded in the mid 90's, in what at that moment were the outskirts of Riobamba, a medium-sized Andean city in the central part of Ecuador (figure1). The origin and development of this neighbourhood is a rather usual process in Ecuadorian cities (Klaufus, 2012). *'Los Olivos'* construction started with a cooperative organisation gathering around 120 partners who shared a piece of land

and together worked for the construction and management of the urban infrastructure. This form of urban development usually takes several years, and often does not complete all of its initial goals, leaving some infrastructures unfinished. In the meanwhile cooperative partners build up their lot of land, each one according to its possibilities and will, which is also an uneven process. Together with the general scarcity of financial resources, the production of urban space yields a rather disintegrated and unfinished urban landscape.

As a result of the development process, the neighbourhood *'Los Olivos'* keeps to the present day an association legally constituted to which most of the house owners in the neighbourhood belong. This association is inherited from the time when a very active contribution from the neighbours was needed to push forward the construction of the neighbourhood infrastructures. Though the organisational structure remains, and the association owns the park and a communal facility inside, it has very reduced activity nowadays.

In its functional aspect, the neighbourhood had since its origin a strong residential character, which was complemented along the years with many of the houses hosting services for students of a closeby university called *'ESPOCH'*. These services are mainly of two kinds: rooms for student accommodation, and small shops on the ground floor. These services have become the main economic activity in this and other nearby neighbourhoods, all of which have suffered an important depression due to the university facilities being almost completely depleted of students for several months because of COVID-19 protection measures enforced from March 2020 up until first quarter of 2022.

Attending one meeting of the neighbours cooperative assembly and one meeting of the direction board, we listened to the concerns among the neighbours and especially among the members of the direction board, about the disengagement with collective

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[6] https://www.openstreetmap.org/#map=18/-1.65726/-78.68094

decision making in the neighbourhood and a shrinking collective action, like the necessary for park maintenance, or the administrative work necessary, especially in transacts with other official institutions. There was a concern that the neighbourhood association might disappear in a few years, with the municipal administration taking over the decisions and the property of the communal assets of the neighbourhood, such as the park and the cooperative building. There was also a general complaint on newcomers and younger generations who did not take active part of the first infrastructural development, being especially disengaged with the organisation.

2.2 Problem statement and paradigm

Facing neighbours' concerns about disengagement on collective issues in the neighbourhood and the probable consequences of it, we decided to set up an intervention that could trigger some kind of collective engagement. Not with the aspiration of solving the problem with a single intervention, but to try to provide some elements for reflection and gain some insights on it.

We approached the neighbourhood problem from a paradigm constructed out of three components which we consider of great relevance for contemporary city-making thinking and praxis. These are *the right to the city*, as a philosophical and political approach; *the hybrid urban space*, as a paradigm to understand the mediatic nature of our urban context; and the idea of *the hackable city* or the hacker culture as an ethos to set up our action.

2. The right to the city

Over the past few years, some countries and cities are recognizing *the right to the city* in their legislation, as acknowledged in United Nations New Urban Agenda,[2] which refers to it as the non-discriminative use and enjoyment of cities, promoting the wellbeing of all. *The right to the city* is a concept introduced by Lefebvre (1968) yet still considered innovative today. It is a collective right which comprises, without being limited to, the right to housing, to work, and to freedom of movement. Also the right to public space, the right to access urban networks, including communication and information networks, can be seen as part of it. The right to

collectively build and transform the city is key to *the right to the city* as part of a paradigm to understand urban space, as it posits the urban society, the organised urban inhabitants, as the main actor in the city-making processes. Ecuador is one of the few countries who has included *the right to the city* in its legal normative body, though it has been acknowledged the difficulty to develop it (Martinez Moscoso et al., 2019).

The right to the city being part of Ecuadorian legislation and a concept of growing importance in urban thinking (Castro Seixas, 2021), needs to be brought to practical experiences. In our intervention we shared the concern of the probable disappearance of the neighbourhood association and we understood the necessity to facilitate neighbours' engagement in collective decisions and actions concerning the neighbourhood and provide tools to enable them for it.

2.4 Hybrid urban space

Contemporary construction of urban space, and thus contemporary development of *the right to the city*, needs to be framed together with the irruption of digital networks and the hybridization of urban space that they are producing. The term hybrid space referring to urban spaces can be used to define those spaces where physical and virtual dimensions merge and influence one another. Ubiquitous computing, especially the intensive use of mobile media anywhere-anytime, and the different electronic networks which are extensively present in our environment, are making hybridization of public space a common phenomenon of growing complexity (Seijdel, 2006). Hybridization of public space does not only mean that citizens have the opportunity to escape or migrate to a virtual layer almost at will anytime, anywhere, but more profoundly it is creating new social and political relations with public space, and changing the very function and character of it (Kluitenberg, 2006). We can benefit from the fact that hybridization of urban space is a phenomenon in development today, and it is yet to define the ways it can help to support *the right to the city*.

In our intervention we worked with digital networking intimately associated with a specific urban space. We set up our intervention in the central park of the neighbourhood, a concrete physical space, but also in the digital dimension of the cyberspace which is ac-

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cessible by a WiFi network broadcasted on-site. Both physical and digital dimensions are constituents of the hybrid space where we located our intervention.

2.5 The hackable city

While the concept of the smart city is too often adopted by political or economic actors to steer the construction of *the hybrid urban space* for their interest in top-down initiatives, not always coincident with the interests of the urban society (Willis, 2019); the idea of *the hackable city* tries to bring to the front bottom-up initiatives and at the same time open up top-down institutions for accountability and democratic control. There is a growing body of work taking the hacker culture into the city-making field of projects and research (Waal & Lange 2019). Moreover, there is an effort to use this concept to make a systemic ethical and meaningful change towards a more democratic and sustainable society (Schuler, 2019).

In our approach to the problem, we especially empathised with the form of action that *the hackable city* paradigm presents, which proposes to playfully work with urban systems connecting and reconnecting their links in a learn-by-doing manner, ethically com-

b.

a.

Fig. 2. Technology set up (a) with a photograph of the LED display on top of the neighbourhood communal building (b).

8 http://hablabarrio.org/losolivos/data.html

mitting with citizen's self-government.

These three ideas overlap each other and ideally they can configure a well-grounded and operative threefold paradigm for approaching our research and the urban problem we encountered. On the principles of this paradigm we designed our intervention to playfully engage neighbours in a collective expression. On the research level, the questions we set out to answer are:

— Can digital media technologies help to articulate a collective speech in the neighbourhood?

— What is the nature of the speech that emerges if a platform is created in hybrid urban space?

— How does this speech represent and reflect on the urban society of the neighbourhood?

3. Methods

3.1 'Neighbourhood:Talk'. Intervention design and technology setup

For our intervention we built a setup to be placed and function out in the public space for months. It invited persons who got in the visual range from the intervention setup device to connect to it and to contribute by writing a text from their mobile devices. The system setup added up successive text contributions by simple juxtaposition and showed the resulting text on public display. The core of the intervention setup was a digital system accomplishing three main functions (figure 2):
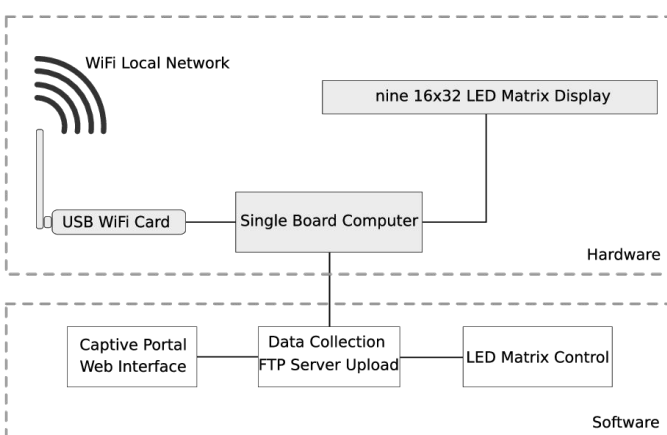
1- Creating a WiFi Local Network with a Captive Portal and a web server.

2- Collecting and storing users' text contributions, and interactions related data.

3- Controlling a LED Matrix Display to publish the collective text, and the instructions to contribute to it.

Additionally the system connected every night to a wifi router, in order to upload the data collected during the day to an FTP server over the internet. All data were stored for public access on the server.[3]

On the hardware-side we used a small Single Board Computer, a USB connected WiFi card to broad-

cast the Local Area Network (WLAN), and LED Matrix Display composed of nine 16x32 LEDs modules.

When a user connected to the WiFi network broadcasted by the system setup, connection was automatically driven to a captive portal which prompted on the user's device a web page based interface which leaded the interaction process asking the user to write and upload a text contribution for the LED display. When the text was uploaded it was added up by juxtaposition to the text which was already on display.

In this way a collectively composed text grew larger on the display with each new contribution. Contributed texts remained on display approximately for two days, for they were erased from public display the second night after they were uploaded to the system, after they had been automatically sent to server storage via FTP. There is an exception to the second night erasing rule; in the wild operation of the system resulted in difficult connection to the internet and failure to upload data some of the due nights. In those cases data
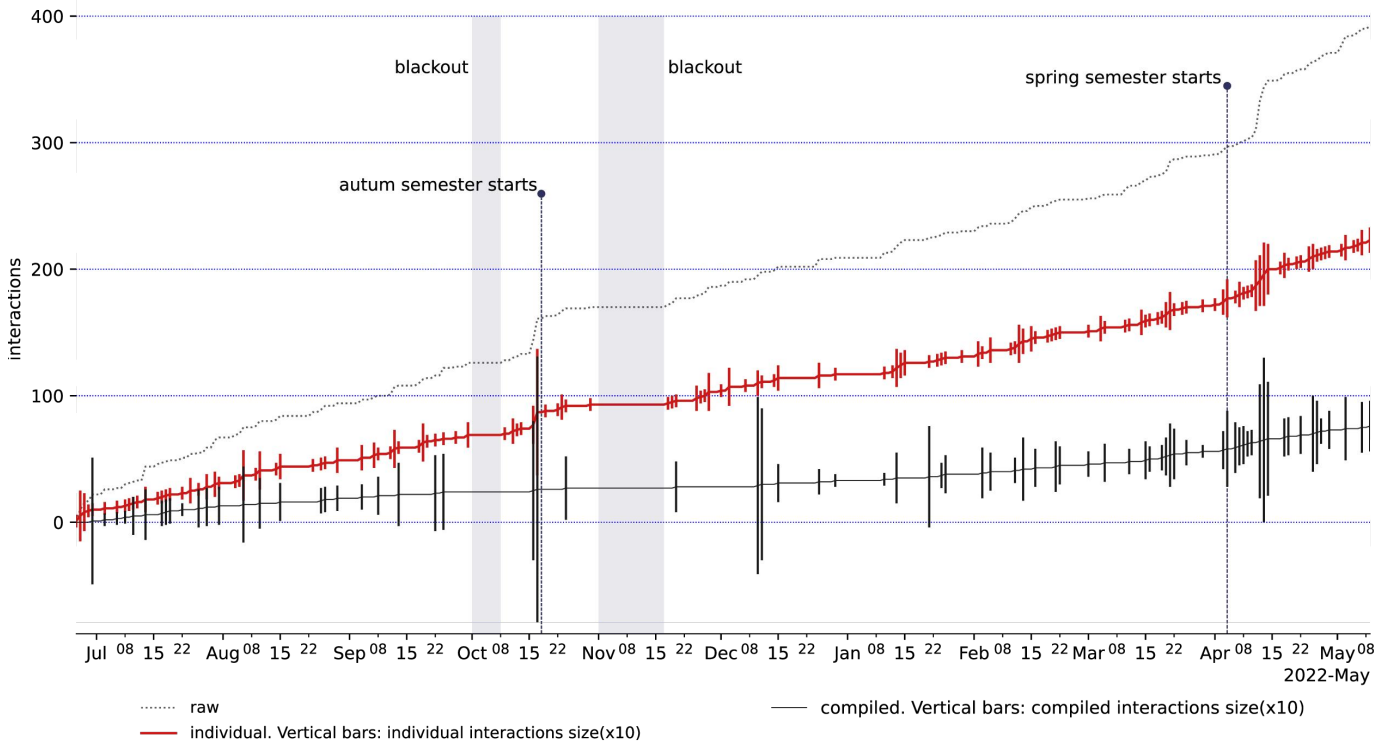

Fig. 3. Interactions registered by the system during 318 days, from June 26th 2021 to May 9th 2022. Vertical bars represent the size of the respective interactions measured by the number of raw interactions.
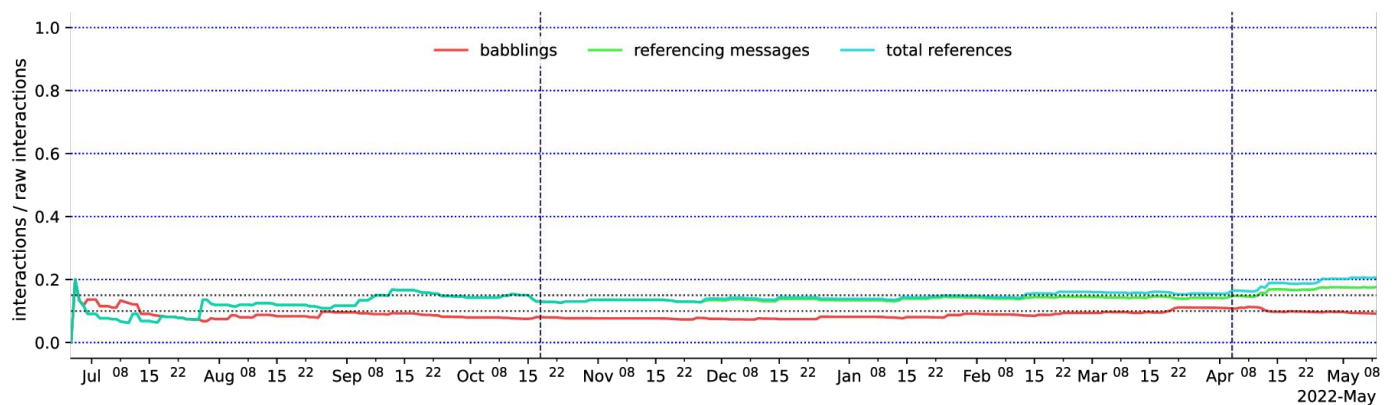

Fig. 4. Babbling, referencing and referenced interactions. After the initial oscillation period, referencing messages are more abundant than babbling messages indicating a growth in complexity of the messages after the initial period. This difference shortens when university autumn semester starts and students arrive to the neighbourhood, indicating that the new users produce less complex messages than the previous users. After that difference stabilises until it shortens again before spring semester starts and new students arrive, but this time the difference starts to grow soon afterwards indicating that new users start producing more complex messages.

were not lost, but kept on display until next night connection. Therefore the display time of each text contribution varied depending on the success of the FTP nightly connections.

We presented a system prototype to the neighbourhood association direction board as a project under the title 'Neighbourhood:Talk' [original in Spanish: 'Habla:Barrio'], and asked for their permission to set up the LED display on top of the communal house, which is in the upper part of the communal park in the centre of the neighbourhood. The final prototype was set in place on June 24th 2021.

4. Results

4.1 Raw, individual and compiled interactions

We analysed data collected by the system for 318 days, starting June 26th 2021 until May 9th 2022. During this time the system registered a total of 392 interactions. There were two blackout periods, one in October and the second in November where the system could not function due to power cuts. There were two moments where the number of interactions grew notably faster than other periods. These two moments appear related to the beginning of the nearby university autumn and spring semesters, and the consequent arrival of students to the neighbourhood (figure 3).

Recorded data included a total of eight variables for each individual interaction. For our analysis we used four of those variables:[4] (1) user MAC address; (2) date and time of interaction; (3) text uploaded in the present interaction; (4) compiled text composed from the addition of the previous interactions' texts plus the present interaction text uploaded —compiled text is the text shown on display when finishing the present interaction.

We observed very often in the data how single users (single MAC addresses) produced several consecutive interactions in short periods of time. We considered these consecutive interactions by a single user in a single date as fragments of one single interaction and we decided to consolidate them by aggregating the fragments together. We called the resulting aggregate interactions individual interactions.

Individual interactions are more suitable than raw interactions for analysis of individual contributions to the collective text. But for a more in-depth analysis of the collective aspect of the produced text, we considered one more aggregation level of interactions. We named compiled interactions the aggregated individual interactions whose juxtaposed text messages were visible on the display right before data were collected and sent out by the system every night.[5] In other words, these were at every time the largest possible chunks of publicly readable text before the text (or part of it) was removed from public display.

Summing up, the three levels of interactions corresponding to three different manners of aggregating interactions together resulted in:

— Raw interactions: 392

— Individual interactions: 223

— Compiled interactions: 76

4.2 Babbling interactions

In a first overlook of the data we could distinguish some babbling interactions from those interactions with apparent meaning. By 'babbling' we mean here those interactions that either are only intended to test the channel or fail to communicate any content due to unfamiliarity with the system. This category included the interactions which contributed text has no apparent meaning (e.g. 'Kjkj' [raw interaction#5]), empty interactions (e.g. raw interaction#2), or interactions in which user had mistaken the 'upload text' field in the system interface by the 'principal street' and 'secondary street' fields (e.g. '11 de noviembre y milton reyes' [raw interaction#300]), mistakes which we considered failed interactions, hence we included them in the babbling group. In total there were 36 babbling interactions among the raw interactions. Figure 4 shows the proportion of produced babbling interactions relative to total produced raw interactions along the days of system operation.

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[9] The four variables recorded but not used in this research included: (1)principal and (2)secondary residential street address, (3)time and date when user starts writing the text, and (4)time and date when user uploads the text (or time and date when the interaction finishes). The date and time variable which was included in the analysis corresponds to the date and time when the interaction starts.

[10] As explained before, in the wild operation of the system resulted in difficult connection to the internet and failure to upload data some of the due nights. Data were not lost, but kept on display for next nightly connection. The result was that compiled interactions do not happened every day, but only days in which connection was effective. Therefore the dates span of each compiled interaction varied depending on the previous nights' connections.

4.3 Referencing interactions

In contrast with babbling interactions we found interactions which were making reference to interactions by other users. There were 69 raw interactions making reference to 89 other interactions (figure 4). For example:

'Help looking for it scuishy'

[original in Spanish: 'Ayuden a buscarlo scuishy' raw interaction#6][6]

Making reference to:
'Scuishi got lost.'

[original in Spanish: 'Se perdió el scuishi.' raw interaction#0].

4.4 Communication structure and functions of language

For characterising the text messages in our data we applied the functions of language as defined by Roman Jakobson in his model of communication. In his theory Jakobson defines six functions of language associated with six factors taking part in an effective communication. These six functions are defined dependent on which of the factors the message is oriented to. In this way, a message that gives information about the context has a referential function; a message communicating some aspect of the addresser has an emotive function; a message oriented towards the addressee accomplishes a conative function; a message oriented to the contact factor has a phatic function; a message on the code has a metalingual function; and a message taking a communication on the message itself makes a

poetic function (Jakobson, 1960). Also, it is important to point out that a message typically shows not only one single function, but it often accomplishes several functions.

Though this is not the only theory of communication in linguistic discussions, it has been very influential in modern linguistics, and it can very well suit us in characterising our data for practical analysis. Also for practical analytical purposes, and with McLuhan's permission, we extended Roman's factors of communication with a seventh element to include media and its correspondent function which we called metamedial function (figure 5). We introduced this element because in the communication which took place through our intervention, the media in the form of the LED display was a novel and noticeable element in the urban context and thus it was often the object of the communication. So it was often represented in the text messages, with references to the device or to the project title —Neighbourhood:Talk.
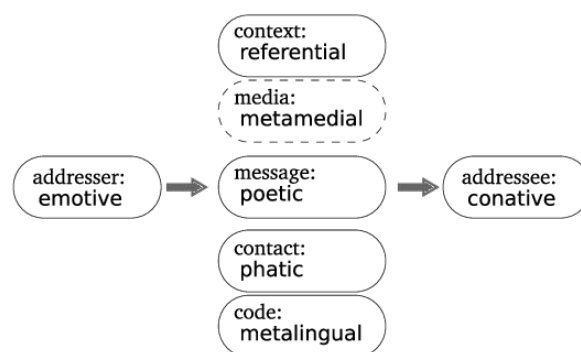
Fig. 5. Jakobson communication structure with the addition of media as a seventh factor of communication and metamedial as a seventh function of language (modified from Jakobson, 1960).

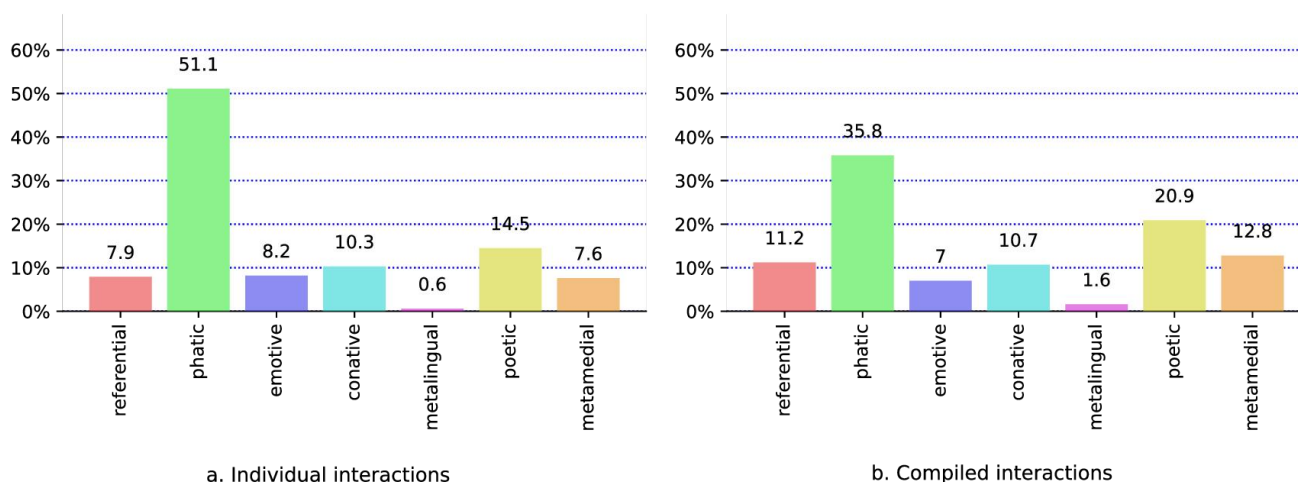a. Individual interactions

b. Compiled interactions

Fig. 6. Occurrence of the seven language functions in individual and compiled interactions. Phatic function is the most frequent function of language in text messages analysed, but when considering collectively composed messages (compiled interactions) poetic function has an important position.

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[11] Inside brackets are notes for facilitating interpretation of interactions' text messages.

We measured the occurrences of each of the seven functions in each of the text messages of the interactions in the data, both for individual and for compiled interactions (figure 6). Thus, in the next example we can count conative, metalingual and metamedial functions:

> 'Guys do not be badmouthed. This media is for neighbourhood expressions and not for writing disrespectful terms., Neighbours put on your facemask, keep your distance and be careful.'

> [original in Spanish: 'No sean mal hablados mijines. Este medio es para expresiones del barrio no para poner términos irrespetuosos., Pónganse mascarilla vecinos, guarde el distanciamiento y sean cautos.' individual interaction#50]

While this one counts only for phatic function:
> 'Have a nice day'

> [original in Spanish: 'Que tengan un buen día' individual interaction#100]

4.5 Collective and individual identities

In order to gain some insights into the collective dimension of the communication process, we selected interactions where text messages explicitly manifest a collective or an individual identity, as assumed by the sender —or addresser— and for the receiver —or addressee— as in Jakobson's model of communication factors (figure 5). We did this both for individual interactions, and for compiled interactions (figure 7.a and 7.b).

Message-expressed sender and receiver identity being individual or collective does not necessarily mean that the sender or the receiver are an individual or a collective, but it indicates whether the message writer assumed one of the two when writing the text. Because of the design of the system, most of the compiled interactions were collectively composed and they were always displayed to the public collective, but with this variable we measured when a collective or an individual sender/receiver identity was explicitly expressed on the text. Besides, many messages do not expressed an individual or collective sender or receiver identity, and they were written expressing an impersonal identity form. We used for our analysis the compiled interactions, which are collectively composed texts (table 2).

As an example, which manifests a collective identity assumed by the sender, and a collective receiver identity:

> 'Los Olivos Los Olivos ðŸ™,[emoji, not readable]hello Hello Los Olivos Los Olivos Los Olivos ðŸ™,[emoji, not readable]hello Hello Los Olivos Let's take it all 1234 We are now vaccinated, a hope of life. Come out to play, neighbours. '

> [original in Spanish: 'Los Olivos Los Olivos ðŸ™,[emoji code, emoji is not readable on the display]hola Hola Los Olivos Los Olivos Los OlivosðŸ™,[emoji code, emoji is not readable on the display]hola Hola Los olivos Vamos con todo 1234 Ya Vacunados, una esperanza de vida. Vecinos, salgan a jugar. ' compiled interaction#35]

Here another example, where the sender does not express neither an individual nor collective identity, but there is an individual receiver identity:

> 'Hello Twister Twister Smiling makes your soul happy Hello[in english in the original] Hello Hello Twister Smiling makes your soul happy Hello[in english in the original] Hello'

> [original in Spanish: 'Hola Twister Twister Sonreir alegra el alma Hello Hola Hola Twister Sonreir alegra el alma Hello hola ' compiled interaction#70].
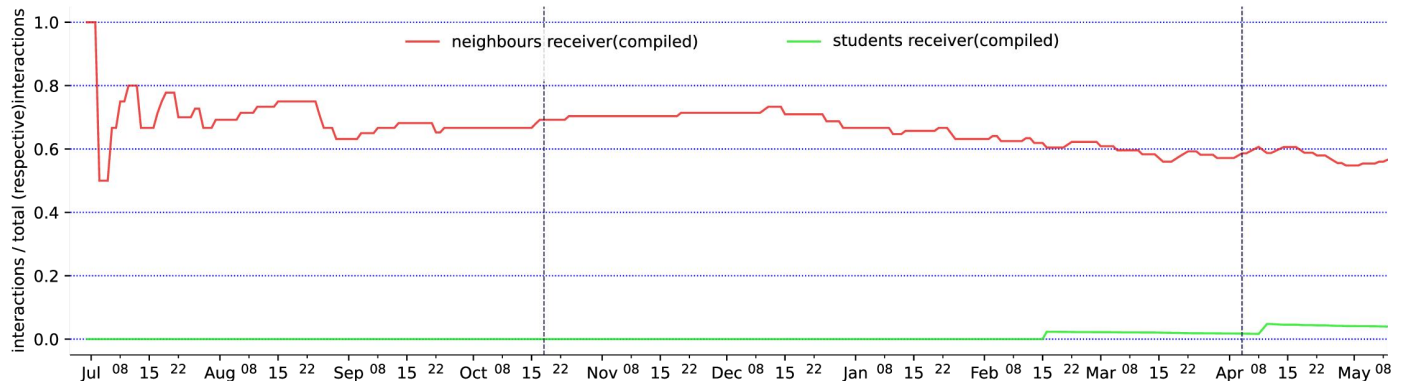
4.6 Neighbours and students social groups

We identified neighbours and the nearby university students as the two most salient social groups in the urban context of our intervention. We could identify those two groups first on the informal conversations with neighbours and with the association board members. Moreover, the importance of these two groups was visible both on the interactions' text topics and in the noticeable effect that the arrivals of students had on the behaviour of the system when semesters started. We selected interactions whose text message sender identifies with the neighbours or the students social groups (figure 7.c). We also selected interactions whose text messages explicitly express a receiver belonging to the neighbours or students social groups (figure 7.d).
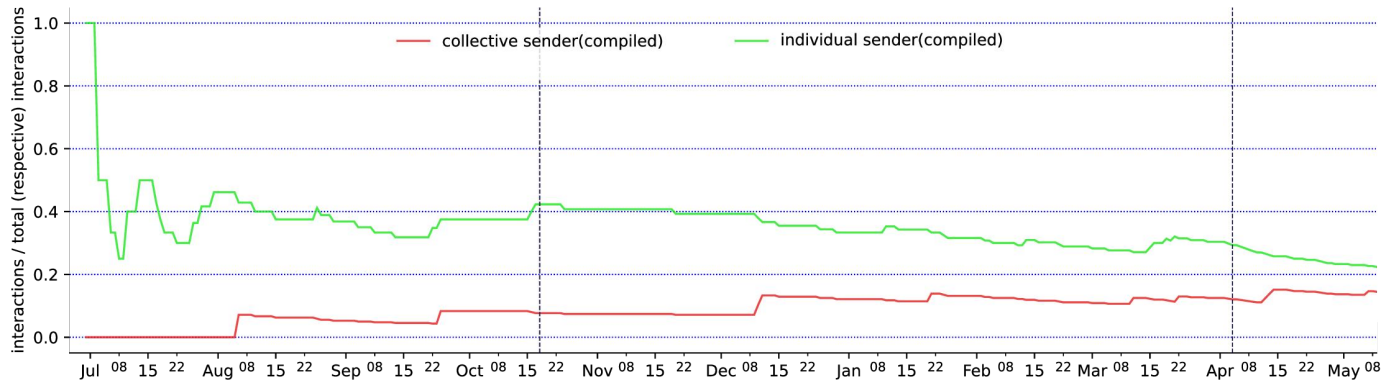
a. Number of Interactions showing sender-expressed collective and individual identities. There are more messages expressing individual identity, but they decline over time while messages expressing collective identity grow.
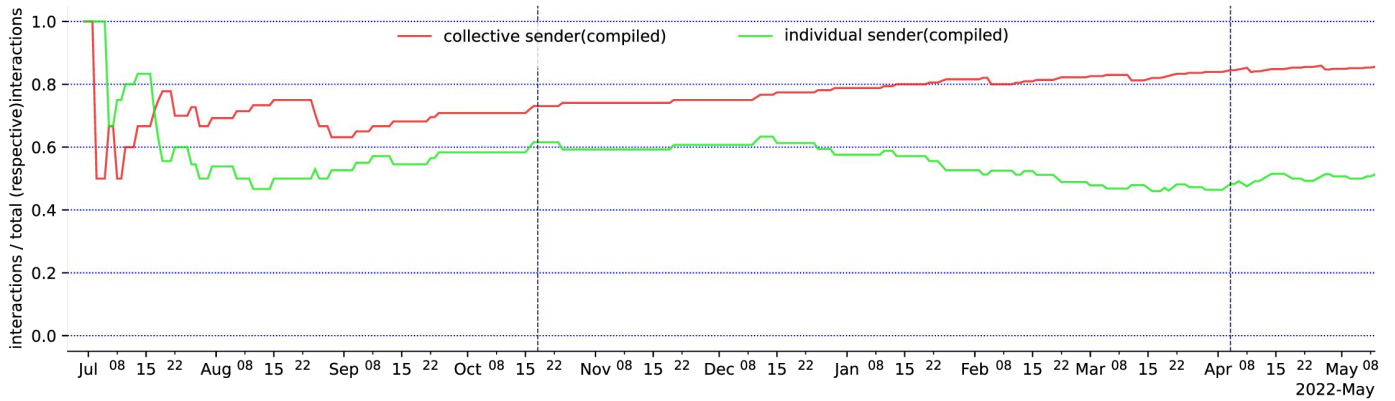
b. Number of interactions expressing receiver collective and individual identity. There are more messages expressing collective than individual identity. The tendency grows over time.

c. Number of interactions expressing neighbours and students social groups sender identities. Messages expressing neighbours group identity are much more than those of students group.
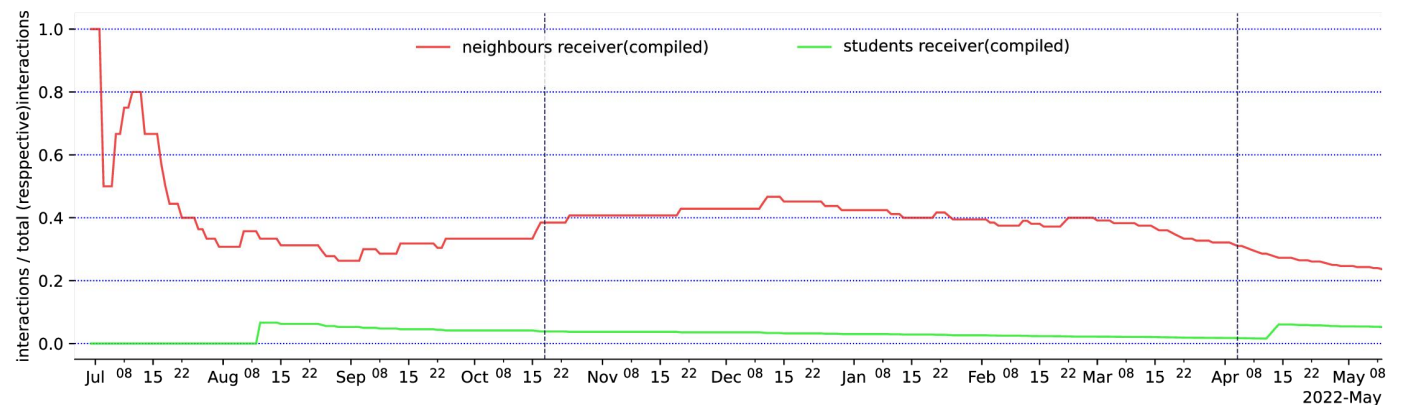
d. Number of interactions expressing neighbours and students' social groups receiver identities. Messages expressing neighbours group identity are much more than those of students group, though the tendency declines during the last months.

Fig. 7. Number of interactions over time, relative to the total number of compiled interactions, showing sender expressed identity(a and c) and receiver expressed identity(b and d).

	to neighbourhood	to students	about neighbourhood	about students
from neighbourhood	18	0	18	4
from students	4	0	1	4

Table 1. Intergroup communication messages from and to neighbours and students groups, and messages from the two groups about the neighbourhood and about the students.

	collective	individual	impersonal	collective	individual	impersonal	neighbours	students	other/no group	neighbours	students	other/no group	neighbourhood	other topics	no topic	total
number of compiled interactions	11	17	49	65	36	2	18	4	54	43	3	30	37	12	27	**76**
		sender identity			receiver identity			sender social group			receiver social group			about		

Table 2. Number of compiled interactions, for different sender, receiver and message topics.

Table 1 shows the number of communications in which the sender expresses an identity belonging to one of the two social groups, and messages which express a topic about the neighbourhood or about the students.

As an example of these interactions' messages, the interaction here below accepts the categories from the neighbours group and about students group:

'Take care of your neighbourhood Foreigners[students] [are] back July 7th Connect to Digital Riobamba network[free access public internet network] ðŸ¤¬[emoji code, emoji is not readable on the display] Take care of your neighbourhood Los olivos[neighbourhood name]'

[original in Spanish: 'Cuida de tu barrio Foráneos de vuelta 7 de julio Conecten la red de Riobamba Digital ðŸ¤¬[emoji code, emoji is not readable on the display] Cuida tu barrio Cuida tu barrio Los olivos ' compiled interaction#13]

5. Discussion

5.1 Can digital media technologies help to articulate a collective speech in the neighbourhood?

Neighbourhood commitment

When trying to find out whether the intervention here presented was helping to articulate a collective speech of the urban space, the first question that arises is whether there is a collective speech at all in the text collected. We could argue that similar to the surrealist cadavre exquis,[7] the mere juxtaposition of the parts is creating a new and distinct piece of text, no matter if conscious or unconsciously done. No doubt it is in the design of the system, the media, to produce the juxtaposition of individual texts, but it is also true that this could not happen without the participation of the inhabitants of the space where the system had been set up.

Figure 3 shows that there was a rather constant flow of interactions in the system of 0.76 interactions per day in a rough average (excluding blackout periods). This constant flow was notably perturbed in the aforementioned starting dates of university semesters. This indicates the importance of these social events for the neighbourhood and that the flow of interactions was sensitive to them. Moreover, the notable increase of interactions on those two periods could be explained by some novelty effect of the device on some newcomer students, since after those increases the flow of interactions kept its constant track and therefore users' engagement with the system was steady.

Figure 4 shows the development over time of babbling and referencing interactions as an approximative measurement of the complexity of the individual interactions of the urban inhabitants with the system. We can appreciate that after some first weeks of oscillation, babbling messages were most of the time just

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[7] See the Tate's online glossary of art terms: https://www.tate.org.uk/art/art-terms/c/cadavre-exquis-exquisite-corpse Accessed: July 2022.

below 10% of the total raw interactions. It only went somewhat above 10% when university semesters started and thus students arrived in the neighbourhood, supporting the interpretation of there being a novelty effect. Referencing messages were most of the time 15% of the total and show the opposite tendency of the babbling messages, they decreased when students arrived. These opposing tendencies are especially visible in the second event —spring semester—, and interestingly a couple of weeks after the semester started, there was a slowly increasing difference between babbling and referencing interactions. Moreover, the total number of referenced messages increases slightly more rapidly (figure 4), which supports the tendency of a slowly increasing complexity of the interactions over time.

Though the tendency is weak, the fact that users of the system were producing over time less meaningless and more complex interactions indicates some interest and possibly some commitment to contribute to the collective text. Here also it is noteworthy that the system was sensitive to starting dates of university semesters and the consequent arrivals of student population to the neighbourhood. It might be also meaningful that the behaviour of the system on these two events —starting of autumn and spring semesters— was different in each case. In the first event, the difference between babbling and referencing messages decreased just a few days before semester's starting date, and just after the date it stabilised for a long period. When the second semester started, again the difference between the two decreased some days beforehand, but a few days afterwards it started growing to reach its maximum (not counting initial oscillation period).

We can say then, that we have been able to expose a collective text produced by the voluntary contributions of the inhabitants of the urban space, contributions produced in a rather constant flow over the time observed and sensitive to some social events in the neighbourhood.

5.2 What kind of speech?

Phatic and poetic communication

Language functions as defined by Jakobson's model (Jakobson, 1960) (figure 5), are part of the communication structure and they can make us gain some knowledge on the character of the communication mediated by our system. It is interesting to observe the differ-

ence in language function frequencies when measuring individual interactions —that is, individually composed texts— or when measuring compiled interactions —that is, collectively composed texts.

Language functions as defined by Jakobson's model (Jakobson, 1960) (figure 5), are part of the communication structure and they can make us gain some knowledge on the character of the communication mediated by our system. It is interesting to observe the difference in language function frequencies when measuring individual interactions —that is, individually composed texts— or when measuring compiled interactions —that is, collectively composed texts.

The collective character of communication

We are especially interested in the collective dimension of the communication mediated by our system, so we look in our analysis at interactions where the message is expressing a collective identity in contrast with individual and impersonal identities. It can be useful to look at the sender and at the receiver defined as factors of the communication structure, using Jakobson's model again (figure 5).

Data show that impersonal sender identity is by far the most frequent (49 interactions), and that individual sender identity is more present than collective sender identity (17 to 11 interactions) (table 2), though we can see over time a decreasing individual sender identity (from 40% to nearly 20%) and increasing collective sender identity (up to 15%) (figure 7.a). This progression is accentuated by the university semesters' start dates, which on the first event marks the maximum of individual senders, and on the second seems associated with accelerating the tendency of less individual and more collective senders, though this last event is not very pronounced.

Data regarding communication receiver shows that collective receiver identity is almost double compared to the individual receiver identity (65 to 36 interactions) (table 2) and that impersonal receiver is marginal (2 interactions). Also on the data over time, collective receiver grows most of the time while individual receiver decreases, although this last seems to slightly grow and stabilise after the spring semester starts at the nearby university (figure 7.b). Overall it seems that there is a clear character of the communication through the system being addressed towards the collective identity.

When considering together the collective/individual sender assumed identity and the collective/indi-

vidual receiver expressed identity, tendencies of both variables indicate that though individual identity is much present in the communication produced through the system, collective identity has a growing presence over time. This could be related to the public exposure of the communication in this case, but some social networks are also publicly exposed and nonetheless do not observe the tendency towards a collective character (Miller, 2008). Another reason could be an increasing awareness among the users about their contributions to be composing a collective text anyway, and thus assuming over time their collective agency. We read this as a positive indication of the intervention helping to build collective identity and to improve public exposition and awareness of collective issues, which would be a positive step for the neighbourhood society to re-engage neighbours in collective issues.

5.3 How does it represent urban society?

Social relations represented

With the purpose of gaining some insights on the urban society where the intervention took place, we look now at how the most important social groups in the neighbourhood are represented in the data collected. We find that messages from neighbours are much more abundant than messages from students (18 to 4 interactions), however most of the interactions are outside these two categories (54 interactions) (table 2). When we look at the interactions from neighbours and from students over time, we find that there is a noticeable increase in the students group after the second event of students' arrival to the neighbourhood when the spring semester starts (figure 6.c).

In data representing interactions to neighbours and to students as receivers of communication, again neighbours receive much more interaction messages than students (43 to 3 interactions) and even more than all the rest (30 interactions) (table 2). Over time, however, neighbours show a progresive decay and students a slow growth (figure 7.d).

Neighbours being more represented than students in messages is not a surprising result as they outnumber the students group. Especially considering that during the months of data collection anti COVID pandemic restrictions took many students out of the neighbourhood to go back to their home locations.

Nonetheless we need to consider that anti COVID restrictions took not only students out of the neighbourhood, indeed many owners and long time residents also moved to out-of-the-city locations, and the neighbourhood suffered a general low activity period, starting to gain activity along the time when data were collected with the progressive arrival of students and other inhabitants.[8]

When we look at inter-group communication between the two social groups studied, we find that neighbours are the only group that receives messages (18 interactions) (table 1). Messages that the student group is sending to neighbours represent indeed 100% of the student as sender group (4 interactions), but they do not expressly receive any messages from neighbours or from themselves. On the other side, messages from neighbours do express a topic about the students (4 interactions), though they are mostly about themselves (18 interactions). And curiously, messages from students also are mostly about themselves (4 interactions) (see annex 1, Intergroup communication examples).

Therefore, there is an inter-group communication where neighbours do not communicate to students, but they do communicate to themselves about students, and where students communicate to neighbours mostly about themselves. This could fit a neighbours-students relationship as a business-customer relationship and not so much as a social peer. From the point of view of the neighbourhood association seeking the neighbours engagement, it would be worth considering giving more participatory space or even an institutional role to the students group which could benefit both groups and the neighbourhood with a more inclusive construction of the urban space.

6. Further research

It would be worth observing, in a longer data collection, if the tendency of communication gaining a more collective character sustains in time. A time-evolving behaviour of this kind could be interpreted in line with neo-organicist conceptions of urban space (Sanchez, 2001), with its urban society capable of showing emerging collective properties such as some kind of civic intelligence (Schuler, 2019), capable of self organising and transforming itself creating new collective beha-

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[8] Google Mobility Reports shows data indicating 12% less visits to parks in Riobamba from start date of our project data collection (June 26th) to autumn semester start date (October 18th), 5% less visits from October 18th to spring semester start date (April 4th) and 21% more visits from April 4th to end of data collection date (May 9th) (Google, 2022).

viours (Sassen, 2013), and takes us to speculate with integrating the threefold paradigm of *the right to the city*, *the hybrid urban space*, and *the hackable city*, with that of the cyborg urbanization (Gandy, 2005), considering the city as a technological extension of the human body (Mitchell, 2007) and the definition of cyborg as a human-technology assembly (Haraway, 2000), after all, if humans are natural born cyborgs (Clark, 2003) it is possible to think that ultimately the city is human collective body and thus a collective cyborg, an urban cyborg.

The United Nations in its World urbanizaton prospects acknowledges that in 2018, 55% of the human population resided in urban territory, expecting to be 68% by 2050, and declared the need of an economic, social and environmentally sustainable urban growth (UN DESA, 2018). If this need is not clearly addressed, we will be likely ahead of an environmental crisis with probable consequences of social unrest. It is also a time now when digital technologies may become an economical and social disruptive element. Artificial Intelligence, the Internet of Things and the growing automation of a big part of production and services may profoundly change the economy and social relations, but it is not decided whether these changes will go towards a more sustainable society.

It is especially important for urban society to have the knowledge and tools to drive the production of urban space in a social and environmentally sustainable direction. Hybridization of urban space and, more generally, the integration of urban space with digital technologies are growing phenomena and further research on them is needed for understanding how they are developing and how these phenomena contribute to a more sustainable city-making praxis.

In this direction, for a practical exercise of *the right to the city* in a more social construction of urban space (Low, 1998), urban society needs to develop its own hybridization of urban space. It would be worth to further research the thinking and action paradigm proposed here, opening opportunities for urban society to develop bottom-up initiatives. Supplying digital media and promoting digital literacy in neighbourhoods like the one of the intervention in this thesis could be a trigger for urban society creativity, and could set a productive academic research environment for observing the integration of urban space and digital technologies, the emergence of civic intelligence, or the development of the working paradigm.

7. Conclusion

We have set up an intervention in the neighbourhood *'Los Olivos'*, standing out from a framework built upon a threefold paradigm used to understand contemporary urban space and to develop meaningful actions within it, namely *the right to the city*, *the hybrid urban space*, and *the hackable city*. With our intervention we tried to gain insight into the neighbourhood, and specially on a problem that was presented to us: neighbours disengagement with the neighbourhood collective issues.

With our intervention we provided a system in *the hybrid urban space*, through which urban society can engage in creating a collective speech and display it in public space. Analysis of interactions with the system, which are contributions to the collective speech, showed enough engagement as to have a steady flow of collective texts on display. Furthermore, we gained some insights on the (increasing) collective speech produced, and on the urban society contributing to it. Collective speech produced through our intervention has a strong phatic character, meaning that it is strongly used to make and sustain social contact; and a notable poetic character, meaning that there is a notable use of the system to write messages for the sake of the message.

Finally, analysis of interactions also revealed some relations between the two more salient social groups in the neighbourhood, which are neighbours and students. Data showed an unbalanced intergroup communication, where neighbours do not address to students but they do communicate about them; and students do address to neighbours, usually to communicate something about themselves.

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Annex 1, Intergroup communication examples.

Here are some examples of the intergroup communication:

From neighbours to neighbours about students. Compiled interaction#26, October 24th:

'Jc Jc[nickname] Neighbours, it is time for the neighbourhood to wake up. Next semester at Espoch[university] there are face to face classes. Jc jc[nickname] Neighbours Los Olivos Neighbourhood Jc Jc neighbours Life is beautiful and we have to value it'

[Original in Spanish: 'Jc Jc Vecinos, hora de que se despierte el barrio. El próximo semestre de la Espoch ya son clases presenciales. Jc jc Vecinos Barrio los olivos Jc Jc vecinos La vida es hermosa y hay k valorarla']

From Students to Neighbours about students in. Compiled interaction#14, August 10th:

'Neighbourhood:Talk[LED display project name] Hello Juan de sosaya and esteban marañon[address] [we are here]to study Neighbourhood hello juan de sosay and esteban marañon[address] [we are here]to study'

[Original in Spanish: 'Habla:Barrio Hola Juan de sosaya y esteban marañon Para estudiar Barrio hola juan de sosay y esteban de marañon para estudiar']

From neighbours about neighbours. Compiled interaction#40, February 11th:

'Internet These boley[=ecuavoley, local volleyball version][misspelling] sick men Sick guys[,]let us sleep[.] Kind regards[,] Mr. olivo[former neighbourhood association president] Throw 3 in[,] pack of llazy[misspelling] guys'

[Original in Spanish: 'Internet Estos enfermos del boli Flacos enfermos dejen dormir atte don olivo Saquen 3 tarea de bagos']

From students about students. Compiled interaction#64, April 13th:

'No No You owe homework from the polytechnic university no no Yes Yes We are polytechnic[students] Hello how is it going Hello how is it going Hello how is it going Hello how is it going Hello how is it going Hello how is it going Hello how is it going Hello how is it going Hello how is it going We need the digital Riobamba network[public internet access] this is [not][typo] very useful to us We need the digital Riobamba network this is [not][typo] very useful to us We need the digital Riobamba network this is [not][typo] very useful to us We need the digital Riobamba network this is [not][typo] very useful to us We need the digital Riobamba network this is [not][typo] very useful to us We need the digital Riobamba network this is [not][typo] very useful to us We need the digital Riobamba network this is [not][typo] very useful to us We need the digital Riobamba network this is [not][typo] very useful to us We need the digital Riobamba network this is [not][typo] very useful to us Riobamba Hnello how is it going No, you do not owe homework to the Polytechnic University. No, you do not owe homework to the Polytechnic University Yes yes we are Polytechnic[students] YES YES WE ARE POLYTECHNIC[students] YES YES WE ARE POLYTECHNIC[students] Hello how is it going No you do not owe homework to the Polytechnic university No you do not owe homework to the Polytechnic university Yes Yes we are Polytechnic[students] YES YES WE ARE POLYTECHNIC[students] YES YES WE ARE POLYTECHNIC[students] Hello how is it going .. Alex is a soulmate'

[Original in Spanish: 'No No Debes tareas de la universidad politécnica nno no Si Si Somos politécnicos Hola q hace Hola q hace Hola q hace Hola q hace Hola q hace Hola q hace Hola q hace Hola q hace Hola q hace Ola que hace Politécnica Politécnica hola q hace hola q hace Necesitamos la red d Riobamba digital esto nos nos sirve de mucho Necesitamos la red d Riobamba digital esto nos nos sirve de mucho Necesitamos la red d Riobamba digital esto nos nos sirve de mucho Necesitamos la red d Riobamba digital esto nos nos sirve de mucho Necesitamos la red d Riobamba digital esto

nos nos sirve de mucho Necesitamos la red d Riobamba digital esto nos nos sirve de mucho Necesitamos la red d Riobamba digital esto nos nos sirve de mucho Necesitamos la red d Riobamba digital esto nos nos sirve de mucho Necesitamos la red d Riobamba digital esto nos nos sirve de mucho Riobamba Hola q hace No no debes tareas a la universidad Politécnica No no debes tareas a la universidad Politécnica Si Si somos Politécnicos SI SI SOMOS POLITÉCNICOS SI SI SOMOS POLITÉCNICOS Hola qué hace No no debes tareas de la universidad Politécnica no no si si somos politécnicos hola qué hace .. El alex es un pana del alma']