MAZI

ICT - Information and Communication Technologies

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D3.10 Comparative evaluation of the MAZI pilots (version 3)

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Slacktivist Limited	SPC	United Kingdom
INURA Zurich Institute	INURA	Switzerland
Common Grounds	CG	Germany
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History

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Executive summary

This deliverable is the third of three, reporting on the comparative evaluation of MAZI pilots (Deliverable 3.10). Across the course of MAZI, the pilots have engaged with communities in different ways, for different purposes. Common to all pilots has been the focus on using and developing the MAZI toolkit in order to facilitate Do-It-Yourself (DIY) networking. This has involved collaborations characterised by inter-disciplinarity, where academic and community partners have worked together to find effective ways of engaging the communities in meaningful ways.

In the previous version of this deliverable (D3.9), we defined our analysis methodology, which builds on the logic set out in the first report (D3.8). In this report, we will discuss the results of using of Realist Evaluation (RE) to form case studies (characterised by context, mechanism, outcome configurations) and Activity Theory (AT) to characterise each pilot as a separate activity system. To identify the generative mechanisms, we investigated the tensions and conflicts between the technical and semiotic levels of the pilots' activity systems. Evidence generated was presented alongside the insights from the MAZI handbook to inform best practice for supporting the MAZI toolkit.

Comparing across the pilots', we reveal tensions and conflicts between the technical and semiotic levels of the activity systems and the generative mechanisms used to meet the project and communities' objectives. This emphasised the importance of understanding the context, e.g. by valuing the time spent with communities and the importance of learning their language and vocabularies, and respecting others capital. It revealed mechanisms for understanding location, the importance of stories and storytelling, designing collaborative activities and embracing opportunities for conversations. It also echoed the need to identify key roles, guises and actors for DIY networking and the importance of the principle of adding value rather than adding work.

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1 Introduction

The objective of this deliverable (D3.10) is to carry out a comparative evaluation of the MAZI pilots. This builds on the theory and practice used to inform the preliminary methodology (D3.8) and uses the analysis methodology (D3.9) that was designed to help explore relationships between pilots' design choices and objectives for informing best practice (figure 1).

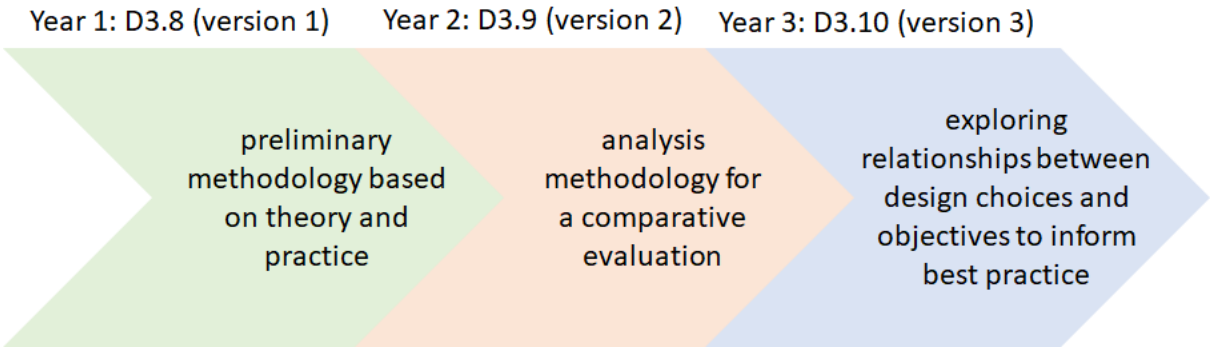

Figure 1: Illustrating the focus of the three versions of the comparative evaluation of the MAZI pilots reported on in Deliverables 3.8, 3.9 and 3.10 respectively.

This deliverable has been divided into the following sections.

- In section 2, we summarise our rationale for the approach we adopted.
- In section 3, we describe how MAZI partners have worked together to identify the key contexts, mechanisms, and outcomes that characterise their activities. We also provide summaries of insights regarding the range of mechanisms used by each pilot and the success and challenges they experienced.
- In section 4, we characterise the pilots as four distinct activity systems and present how the components of these systems compared.
- In section 5, we review how the pilots' activity systems compared in terms of observed tensions, conflicts, contradiction and generative mechanisms both within and across the pilots.
- In Section 6, we present the insights for informing best practice for engaging communities with DIY networking and the use of the MAZI toolkit.

2. Rationale of the approach adopted

This is the third and final version of the comparative evaluation of the MAZI pilots. This section provides a brief overview of the stages undertaken to carry out this comparative analysis of the MAZI pilots. See D3.8 and D3.9 for a more in-depth explanation of the underpinning theories and concepts that form the rationale for the chosen approach.

The following figure 2 shows the four stages followed to explore relationships between design choices and objectives to inform best practice. This was achieved using document analysis (Bowen, 2009) and thematic analysis (Braun and Clarke, 2006); drawing on Realistic Evaluation (Pawson and Tilley, 1997) and Activity Theory (McAndrew et al., 2010) as lenses for understanding the effect of contributing factors.

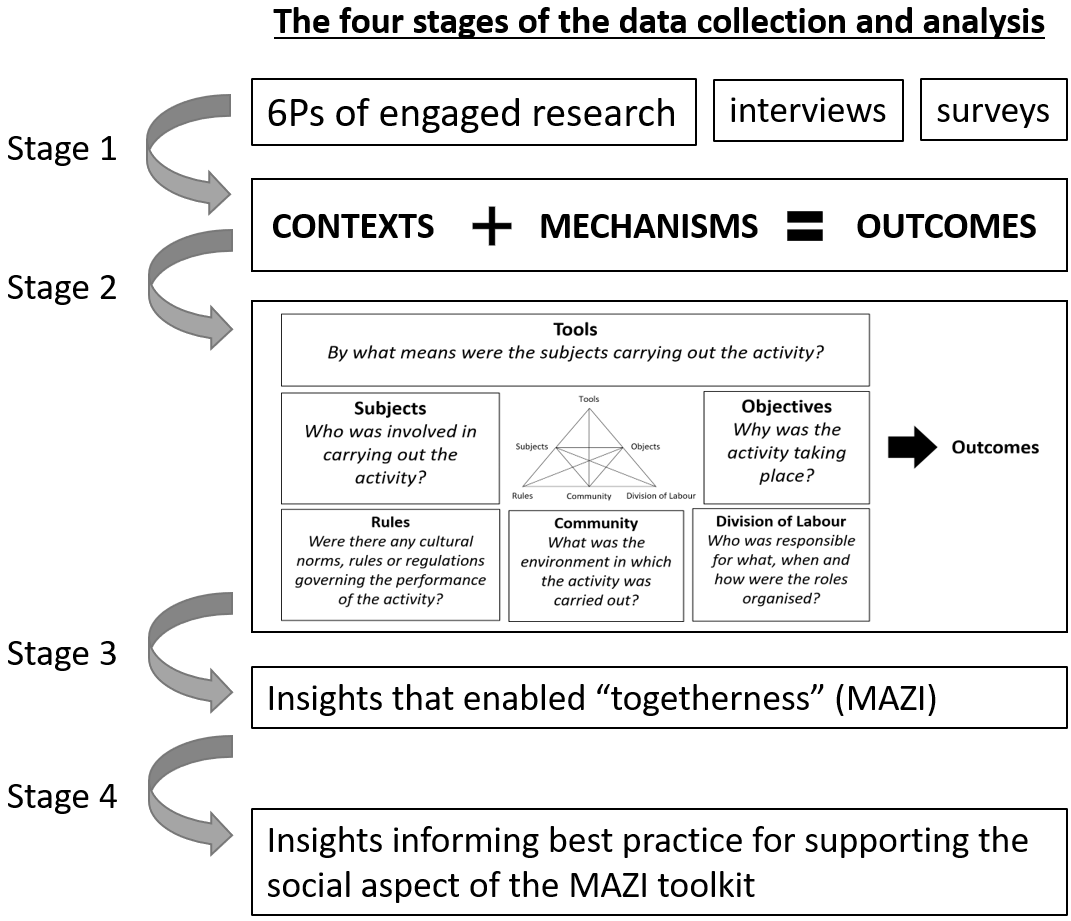

Figure 2, Showing the four stages followed to gather data, process and analyse data, discuss findings and report on best practice.

The following sections present the results of these four stages.

3. Stage 1' - initial data collection and analysis using Realist Evaluation

The challenge of carrying out an evaluation across the MAZI pilots has been finding common attributes that can be compared. The following table 1, taken from the project's Description of Work, shows the baseline that was initially used for comparing the relationships between design choices and objectives in each of the four pilots.

Table 1: Summary of the MAZI pilots, as set out in the project DoW

Pilots/Variables	Pilot 1: UdK/CG Prinzessinnengaten	Pilot 2: OU/SPC Creeknet	Pilot 3: NetHood/INURA Kraftwerk1	Pilot 4: NU/UM unMonastery in Greece
Context	Community garden at Berlin city core	Urban neighbourhood (2km radius) plus related urban groups	Cooperative housing and living complex (~300 residents)	Residents in the villages of Kokkinopilos & Tsepelovo in Greece
Framing	Information Discourse	Contact Information Discourse Knowledge	Knowledge	Contact Information Discourse Knowledge
Toolkit	Content sharing	Self publishing, content sharing, shared storage	Knowledge production	Multiple modes
Actors	Community Neighbours Activists City officials	Artists, Activists, Citizens, Educators	Community Catalyst	Artists Citizens - villagers unMonasterians
Duration	Long term Continuous	Long term Continuous, Short term, Temporary	Long term Continuous	Short term Long term Continuous
Design process	Co-design workshops Iterative prototyping	Co-design workshops Observations, Training, Iterative testing	Deliberation	Co-design Workshops Critical Design Cultural Probes
Evaluation	Activity Content analysis Interviews	Activity Interviews Self-reflection Continuous observation Workshops	Activity Interviews Continuous observation	Workshops Interviews
Phases	1. Framework co-design; 2. Early prototyping;	1. Community engagement and	1. Observation 2. MAZI offering	1. Initiation and setup

	3. Information base; 4. Co-Creation of application; 5. Synthesis & filtering; 6. Public debate; 7. Evaluation and dissemination	relationship building; 2. Iterative implementation and deployment; 3. Ongoing evaluation	3. Implementation and evaluation	2. Relationship building 3. Iterative trials

3.1 Data collection

To understand in more detail how the pilots differed with respect to the variables described in Table 1, and changed as the project continued, the following primary and secondary data was collected.

Primary data collection:

- Pilot surveys: Updated responses to pilots' strategic goals, detailed objectives, key performance indicators and metrics
- Semi-structured interviews: Overcoming linguistic divides by capturing pilots' definitions of success and failure; and pilots' explanations of what, how and why things changed regarding their progress, design and evaluation
- Focus groups: Exploring the contexts, mechanisms and outcomes in activities carried out by pilots, and eliciting their generative mechanisms.

Secondary data collection:

- WP2 deliverables: Reporting against the six principles of engaged research (6Ps) (Holliman et al., 2017). This aligned with the spirit of what each pilot was trying to achieve: encouraging upstream planning of potential proprietary and political constraints, who and why people were engaged, the processes of engaging and the means of measuring performances.
- WP3 deliverables: Self-reporting of experiences, specifically looking at opportunities and barriers to inter-disciplinarity and the sharing of strategies for engaging publics at project cross-fertilization events.
- Insights gained from project meeting notes and WP5 deliverables: Updates on pilot activities, approaches, opportunities and barriers to progress and evaluation.

Looking at the feedback from pilots we decided that the common unit of analysis should be the activities that pilots carried out. To characterise these activities and compare them, we used the logic of theory-led Realist Evaluation (RE).

3.2 Realist evaluation

RE is a theory-driven evaluation based on critical realism (Pawson and Tilley, 1997). It assumes transformations to perceptions, behaviours and circumstances are contingent on the social circumstances of the people being engaged (Astbury & Lecow, 2010; Best at al. 2012). Instead of searching for the perfect programme of activity that will work for all in all situations, it recognises that successful activities are self-transformative, where changes to publics' reasoning also changes the social reality and circumstances that caused the activity to be effective in the first place (Dalkin et al., 2015). This ensured that our analysis acknowledged the differences between the pilots. We recognised that different people would react differently in different circumstances and that this would be influenced by their experiences of engaging with the MAZI pilots.

Using realist evaluation as a framework has enabled us to characterise the different pilot activities as context, mechanism and outcome configurations (CMOs):

- *Context:* A chronological account of the events that took place prior to and during the pilot activities. For example: What happened, how was it carried out, by whom and who was involved? What happened prior

to the intervention taking place? How did MAZI partner get invited to participate in the event? What was the main theme of the event? What different publics did they see engage during the course of the activity?

- *Mechanisms:* Understanding the methods, tools, artefacts that pilots used to meet the objectives of the activities. For example, whether (or not) these acted as boundary object to helps bridge disciplinary boundaries, generating conversations that resulted in learning outcomes.
- *Outcomes:* Including cognitive, relational, normative and operational outcomes. The focus is on both the positive and unintended negative outcomes. For example, what were the outcomes resulting from attending/hosting an activity? Was this different for different publics? If so, how?

This framework provided a common language and structure for the interdisciplinary group of partners on MAZI to interrogate and analyse their very different activities.

During a workshop at the July 2018 MAZI meeting in Volos, all partners were given blank strips of paper and asked to write down a narrative of up to three memorable activities. They were asked to focus on the context, mechanisms and outcomes and any reasons they had for being able to characterise their chosen examples as being successful or challenging (figure 3).

Figure 3, Pilot partners engaging in discussions as they constructed narratives characterising activities they had carried out to engage publics with MAZI.

As the partners verbally presented their narratives, the mechanisms that were mentioned were written down on post-it notes, and the partners discussed their significance (figure 4).

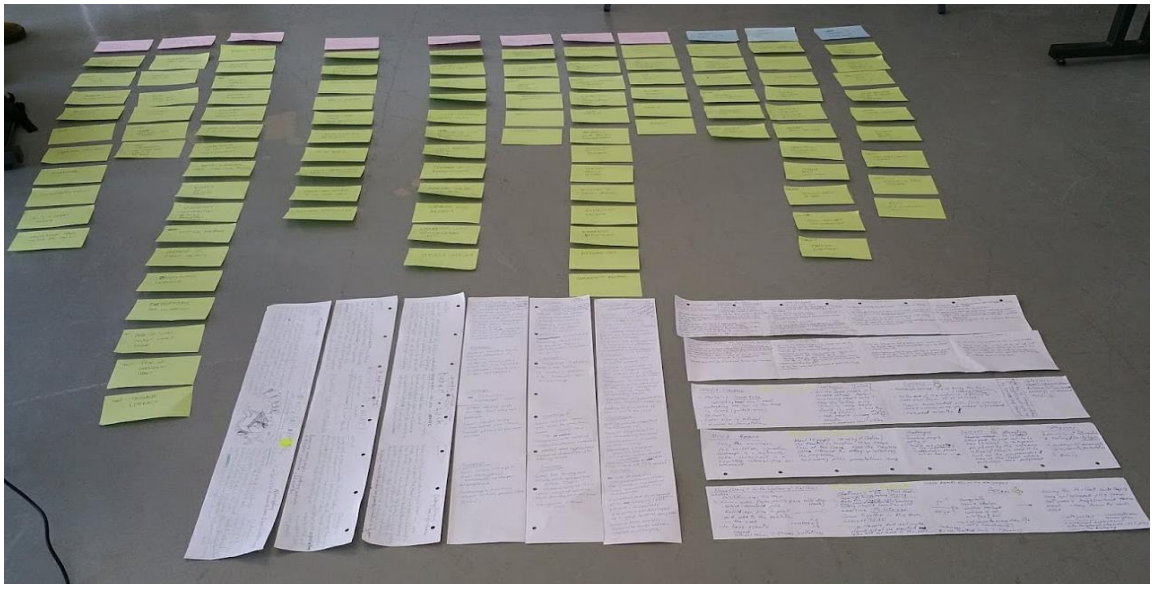

Figure 4, Output from the workshop, where each white strip of paper represents an activity and the yellow post-it notes represent the mechanisms referred to by pilots as they presented their narratives.

The following subsections summarise the context, mechanisms identified and the successful and challenging outcomes characterising this selected sample of activities. The rationale for showing context and the outcomes as a composite as opposed to mechanisms pilot by pilot was to show the range of different mechanisms that were being used. See Appendix A for a description of the activities shared during the workshop.

3.3 Summary of contexts

The activities that the pilots selected only represented a sample of the range of the total activities that had been carried out, but these were enough to highlight a wide variety of differences across contexts. Some of the characteristics included: time (short or one-off events vs. long and continuous); occupation of space (permanent vs. temporary); location (mobile vs. specific); audiences (individuals vs. organised groups); nature of involvement (paid vs. unpaid); social objectives (e.g. information sharing, raising awareness, building communities, connecting strangers, building common ground, shaping communities). Through a group discussion of the differences between the pilot activities, it was agreed that all these factors will be important for anyone wanting to use MAZI to engage communities.

We now consider the mechanisms used within each of the pilot's selected activities. These are broken down by each pilot to show the relative range of mechanisms. The below summaries represent a combination of what was written down on the slips of paper and the following explanatory verbal presentation given by partners (transcribed by the evaluation team).

3.4 Berlin pilot mechanisms

Included communities early in the process to allow for time to create a trusted environment. Turned up to community events, e.g. students/public presentations. Maintained a very close relationship with members of the community and remained very invested in community activities and the sharing of common agency. Started out with a formal introduction to how the technology works, e.g. using 'unboxing workshops' and 'MAZI Sunday' meetings and moved on to co-creating workshops. Initially concentrated on one application rather than trying to engage people with a dashboard showing all the applications, e.g. using the Interview app to share information. Maintained a service hotline to help community's assistance if they faced any challenges. Encouraged members of the community to become MAZI champions.

3.5 UnMonastery pilot mechanisms

Spent time exploring how the toolkit could be used internally within the pilot organisation's practices for collaborating, organising and documenting practices, before they tried to engage residents with the toolkit. Combined UnMonastery techniques for creating communities, with the MAZI zone toolkit. Adopted an outreach approach towards engaging folk rather than expecting the residents to come to them. Recruited local coordinators to contact and invite people to UnMonastery events. Purposefully held events at busy times in the local community so lots of people would be there. Offered workshops on the MAZI toolkit and what networking is generally. Held workshops in neutral spaces, where residents felt comfortable and which were not closely aligned with any local politics. Had people on hand during workshops to guide residents through the process. On initial contact with residents, choose to present one option at a time, e.g. just the Guestbook, rather than trying to engage them with the dashboard showing all the applications. Created templates within the MAZI toolkit as a navigation system, e.g. embedding templates within Etherpad to facilitate writing a diary. Adopted a participatory and co-design approach, so workshops began as educational, teaching members of the community how to use the toolkit. At the same time the toolkit was used as a 'hybrid object' to explore what could be designed and built together. Used the MAZI toolkit as a boundary object. Tended to talk and not write down what was being discussed during the workshops and then retrospectively documented the insights. Used a MAZI zone to create archives that could be used to share images, documents etc. Provided extra one-to-one tutorials, as and when these were needed.

3.6 Kraftwerk1 pilot mechanisms

Created a permanent MAZI deployment and initially used this to promote entertainment, pleasure, art, playfulness and community building, encouraging residents to do stuff together. Held exhibitions in a communal public space, where there would always be someone around. Put up pictures on the wall and left leaflets explaining how to use the MAZI zone. Hung up the cards from the Hybrid letterbox asking people if they should continue with the exhibitions or not. Set up a new exhibition from the local tournament that is organised within the neighbourhood that was made from Kraftwerk - football tournament. Pictures were printed from the two last year's attracting the residents to come and see if they could see themselves in the pictures. Created a MAZI zone to facilitate the sharing of information at an international conference, which organizes city tours and a retreat at the of the city part of the conference, so the MAZI zone was used during the tours to upload photos and to organize the retreat. Called this the INURA zone to avoid confusing delegates. Shared presentations, supporting documents, the programme etc. Used the Etherpad application so people could share notes about the different presentations, and to codesign the retreat program**.** Encouraged delegates to upload their pictures by telling them to contribute to the INURA photo archive, which would be included in the next INURA book.

3.7 Creeknet pilot mechanisms

Running weekly Wireless Wednesdays Workshops to help locals improve their basic computer skills. Having a MAZI champion on hand to provide one to one support for those with limited technical literacy. Carrying out regular (sometimes daily) visits to check on community situations, where introductions and sometimes explanations were required. Purposefully trying to provide patient and careful interactions. Regular attending meetings hosted by different groups. Using extra media, such as paper-based flyers, to communicate the values of those using the MAZI or indeed the values of MAZI and DIY networking. Integrating the MAZI toolkit into existing services to broaden the reach of information services enabling users to upload their experiences of using the MAZI. Using the dual Internet access option within MAZI to give organised groups the option of sharing internet access with people attending their events. Helping groups to find novel ways of representing their status using a bespoke preconfigured MAZI zone, sometimes requiring translation into other languages to be made. Facilitating local artists to set up their personal MAZI zone that can be taken on tour, allowing audiences to view music recordings and choose to purchase CD's, and inviting messages and upload of images and bootlegs. Supporting requests from third party stakeholders wanting replica MAZI zones setup for members already engaging with the pilot. Collaborating with stakeholders beyond the initial remit of Creeknet, resulting in travel outside the UK to host a series of rapid workshops, where new MAZI zone had to be setup sometimes daily, and it was important that the learning from the previous day was incorporated. Offering groups, a hardware (Raspberry Pi computer, solar panel, battery) and software (the MAZI image) pack that they can take away and set up their own MAZI zone.

3.8 Summary of challenges

The most common challenge across the pilot activities was having to deal with limited time. This manifested itself in several ways. For example, knowing how to convince publics to give up their time to collaborate with MAZI. Generally, publics were "*super busy in their lives*", making it a challenge to: 1) convince people to come together and 2) why they should use the Raspberry Pi based MAZI zone instead of the Intranet or the Internet in general. Sometimes this was because of tight schedules, e.g. where pilots only had one hour to introduce and talk about the potential affordances of the MAZI toolkit, where they felt they probably required a week. Pilots also said they felt 'naked' without having any supporting material to describe MAZI to their audiences. They felt they were spending most of their time explaining what MAZI was, instead of how and why it was potentially important in the context of where they were presenting it.

Extra time was required to support publics and members of the pilot teams who had relatively low levels of technological literacy and/or familiarity with the use of online applications for collaborative working. For example, devices trying to connect to a MAZI zone could behave unexpectedly, so extra time was required to

help people with technical challenges related to their own equipment, such as clearing memory caches. Once the idea of MAZI and the potential to use it practically had been discussed, if communities didn't have the luxury of pilots acting as stewards, some of the communities were reluctant to commit to participate because of the perceived risk this posed in terms of negative comments being uploaded that could have an economic and/or social impact.

There were also technical challenges. Early versions of the toolkit had technical bugs, making some of the applications difficult to access for particular devices. Also integrating the MAZI toolkit with existing technology required an investment of time.

3.9 Summary of successes

The fact that the MAZI toolkit could act as an interactive web server, within seconds of powering it up, meant that it functioned equally well as a permanent install as it did for impromptu meetings and workshops. This directness and immediacy meant the toolkit functioned effectively as an archive, e.g. in the INURA conferences it successfully enabled conference participants to be able to immediately upload and download pictures and gave participants access to supporting presentations, reports and live versions of the timetable.

It also worked well for bringing people together and was reported to be a great success in terms of building trust and strengthening relationships. In some circumstances this resulted in pilots being able to identify a lot of common ground and scenarios for working together. When this worked well pilots reported having engaged individuals that wholeheartedly invested in the idea of MAZI, even to the extent that they independently choose to start promoting MAZI. Pilots said they felt these engaged individuals could set up their own MAZI zones with little to no assistance and could be left to their own devices for at least a year and a half. These 'champions' of MAZI were said to be so genuinely engaged that one pilot described them as demonstrating a real love for using the toolkit and a willingness to invest their time and energy, even to the extent that there wasn't any promise they would see the fruits of their labour.

The MAZI toolkit was also reported to be an effective boundary object facilitating conversations between the pilots and their communities. In the case of the temporary UnMonastery communities (Testlabs), it helped forge relationship with the local community; opening up lines of communication that helped the pilot team to informally turn workshops into effective knowledge exchange sessions. Hence it acted as an essential part of a pilot's arsenal for initiating conversations about the community itself and giving pilots a much broader understanding of the context in which they were working.

3.10 Bank of case studies categorised as pre-tech, training and use-case activities

The workshop gave us an indication of the mechanisms that were facilitating successful and challenging activities. Following on from this, and drawing from pilot deliverables, pilot activities were characterised as CMO configurations (Appendix C) and a cross-case analysis was carried out. This revealed that the activities were indeed quite different in focus and form but that pilots all had a blend of the following three characteristics (table 2):

1. Pre-tech – where pilots were engaging publics in conversations about their needs and wants, and concepts of DIY networking were introduced and debated (discursive aspects of MAZI). Could include participatory design activities and low-fi prototyping, and social networking.
2. Training – where pilots were arranging sessions to train members of their communities in the skills required to use the MAZI toolkit. Reflections on how discourse around DIY networking could be translated into operative action, with demonstrations and hands-on workshops. Practical, hands-on introductions to MAZI zones.
3. Use-case – where community members were engaged with a MAZI pilot, using DIY networking approaches, often including setting up and running their own MAZI zone. Use-case activities involved publics autonomously or supported by pilot team hosting a MAZI zone (or other DIY networking methods) to meet their community needs.

Appendix C contains a bank of case studies that was formed by reviewing the pilot deliverables and when partners were reported on activities for presentation in the MAZI handbook. Table 2 shows how the activities were classified as being pre-tech, training and/or use-case in their character.

Table 2, showing the different MAZI pilot activities grouped according to each type: pre-tech, training, use-case. (See Appendix for the full details of each activity.)

	Pilot activities	Pre-tech	Training	Use-case
Berlin pilot	The MAZI Archives	x	x	x
	Commons Evening School	x		
	Polylogue I	x		
	Keizanker			x
	Stadt von Unten (City from Below)			x
	National Museum Natural History Berlin	x	x	x
	Lause 10			x
Creeknet pilot	Friends of Deptford Creek	x	x	x
	Pink Palace	x	x	x
	Chus Eto	x		
	The Hoy Cafe and Steps	x	x	x
	Minesweeper	x		
	Collusion	x	x	x
	Solar Roller	x	x	x
	Babar Luck's Spaceship	x	x	x
	Undercurrents Gallery	x	x	x
	Karen Barnes	x	x	x
	Wonky Prong	x	x	x
	Central St Martins'	x	x	x
	MayDay Rooms	x	x	x
	Stowage Films	x		
	Tidemill Gardens	x		
	Creekside Discovery Centre	x	x	x
Kraftwerk1 pilot	Inura Conference	x	x	x

	Kunstwerk1 & Kunstwerk2			x
	WunderKamner	x		
	L200	x	x	x
	Hybrid Poster	x		
	CoHab	x		
	ParkPlatz		x	x
UnMonastery pilot	The Room: An Analogue Zone	x		
	Tsepelovo Infopoint	x	x	
	The Platanos Tree	x	x	
	Tsouflis Archive			x
	A community hub for the common good			x
	HTML Game Demo	x		
	Network Roulette	x		

The extent to which pilot activities could be characterised as predominantly pre-tech, training or use-case varied, with some activities moving through each of these aspects in their duration. Some clearly emphasised one aspect, while others might move between characteristics. For example, a pilot might have an introductory discussion with a group and workshop activity to understand community challenges and their experiences of digital technologies (a 'pre-tech activity'). This might lead to a neighbourhood group agreeing to use a MAZI zone in their local practice ('use-case activity'). However, this might in turn lead to a request for some training from the MAZI pilot team ('training activity') or on use, some community reflection and a shared conversation about digital privacy ('pre-tech activity'). These aspects were often used to complement each other (as illustrated in figure 5).

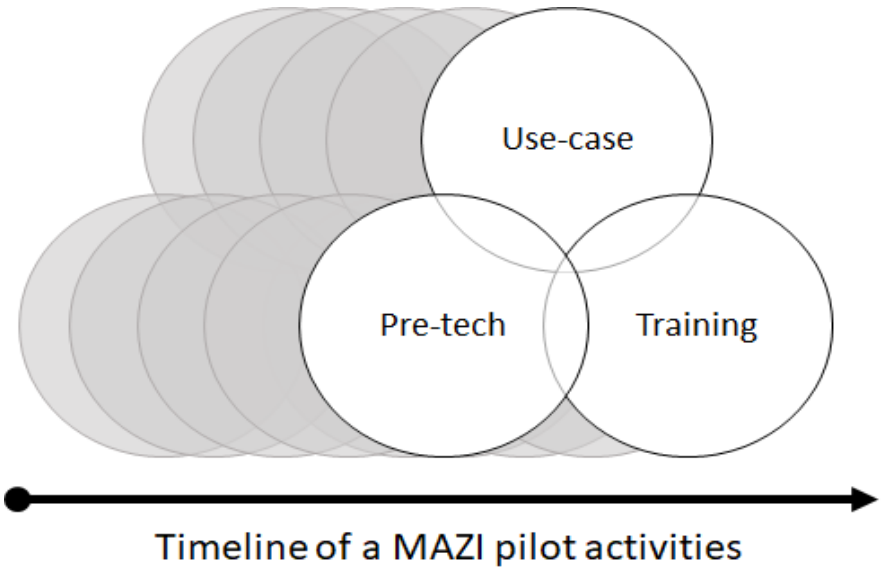

Figure 5, representing the interplay between the three characteristics of activities (pre-tech, training and use-case) through the duration of a MAZI pilot's activities.

3.11 Identifying generative mechanisms

By characterising activities as pre-tech, training or use-cases, we can offer insights into the types of mechanisms that have been used to facilitate different community actions. However, this doesn't provide an understanding of "what works, for whom, in what respects, to what extent, in what context and how" (Pawson and Tilley, 1997). RE offers us a way of achieving this by identifying the 'generative mechanisms' (i.e. 'triggers of change') that were responsible for the outcomes of activities (Pawson and Tilley, 2014). A 'generative mechanism' represents more than the mere use of a mechanism, it is an explanation of the critical incident during an activity where all the necessary elements are present to generate a particular outcome (or pattern of outcomes). To explain this, Pawson and Tilley (2014) use a gunpowder analogy, where the chemical composition of the gunpowder (mechanism) creates an explosion (outcome) when a spark is applied but only if the conditions are right: if the context is not right (the gunpowder is damp) the explosion will not occur. In section 5 we sought to find out what combination of context plus mechanism led to the outcomes? Why was the activity a success and/or a failure?

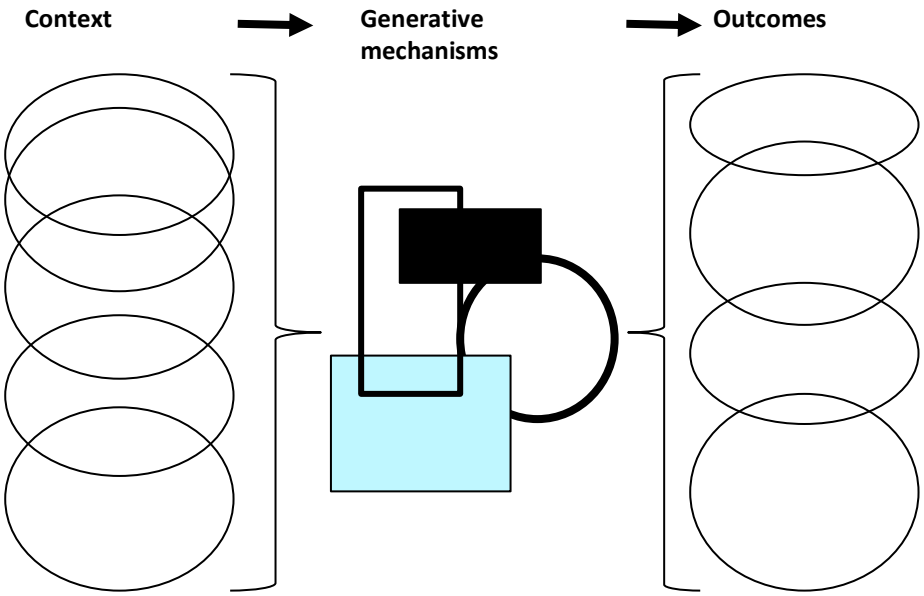

Figure 6, illustrating a situation where different 'generative mechanisms' are needed to enable overlapping contextual factors to generate overlapping outcomes.

To characterise what 'generative mechanisms' were responsible for the outcomes of pilot activities we drew upon Activity Theory (AT). AT with its background of exploring cultural and historical context, aligns well with our goal of understanding why mechanisms within specific pilots might work in some situations but not others. We used partners as expert witnesses and applied Activity Theory (AT) to analyse the feedback we received via interviews and deliverables.

4. Stage 2' - data analysis using Activity Theory

4.1 Activity Theory

Activity theory (AT) views human activity as object-oriented, mediated by tools and signs, and is social and historical in nature. It is interested in the mediation of human activity, which is said to transform during and because of this process. Through mediation, humans not only connect to the outside world but also change it and at the same time change the nature of the activity. It defines human activity as taking place in an objective reality, characterised by natural science and socially/culturally defined properties. The notion of historicity is important in activity theory. In the analysis, one must consider the broader cultural and historical context following the dialectical method and strengthening the importance of studying phenomena 'in the process of change' (Vygotsky 1978, pp. 64-65).

In line with the principles of AT, the following analysis has considered community partners to be socio-culturally embedded within an activity system. The unit of analysis was the pilot (of which there were four across MAZI). We explored the influence of the academic and community partners involved (identified as subjects in Fig.7) and the influence that their mechanisms had on their outcomes. In the analysis we sought to examine how carrying out the activities within different contexts was influenced by the mechanisms used. The analysis also provides descriptions that reveal the motivation of those participating and the activities.

The following figure illustrates the nodes that characterise the AT triangle and which helped direct the analysis of the pilot activities (figure 7).

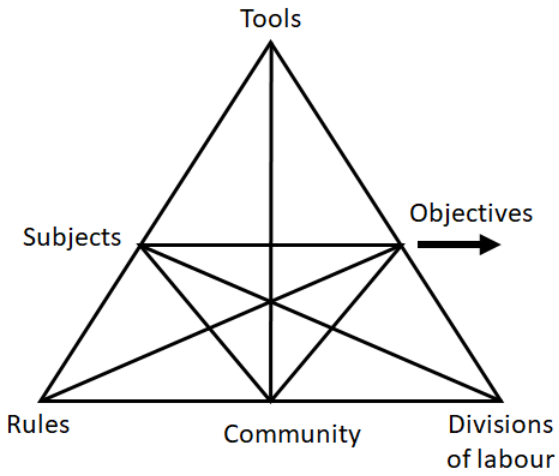

Figure 7, Engeström's model (1987), illustrating the range of factors considered to have an impact on an activity.

AT, like RE, assumes that there is a non-linear process between a subject's effort to use mechanisms and the achievement of objectives. Outcomes are instead mediated through the combined influence of mechanisms (referred to in AT as tools / artefacts / methods) and context (rules / community / divisions-of-labour). The following figure offers a conceptualisation of the logical relationship between Realist Evaluation's CMO's and the nodes on the AT triangle (figure 8).

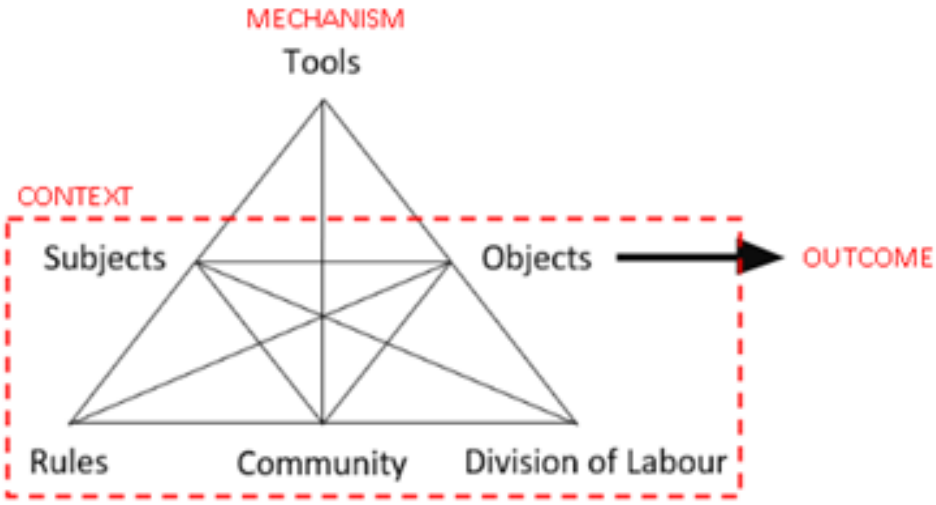

Figure 8, illustrating the relationship between the logic of Realist Evaluation's Context, Mechanism, Outcome configuration and the nodes on the Activity Theory triangle.

We used the nodes in the AT triangle to characterise each pilot as an activity system, where: Subjects represent the academic and community partners; Tools, represent the mechanisms used to engage members of the community (including the MAZI toolkit); Objects, represents the strategic goals and detailed objectives; and the Rules, Community and Divisions of Labour, represent the context in which the pilots were carrying out their various activities.

Feedback within deliverables (e.g. via reporting against the 6Ps), survey responses and baseline pilot variables within the DoW was mapped onto the AT triangle canvas (figure 9).

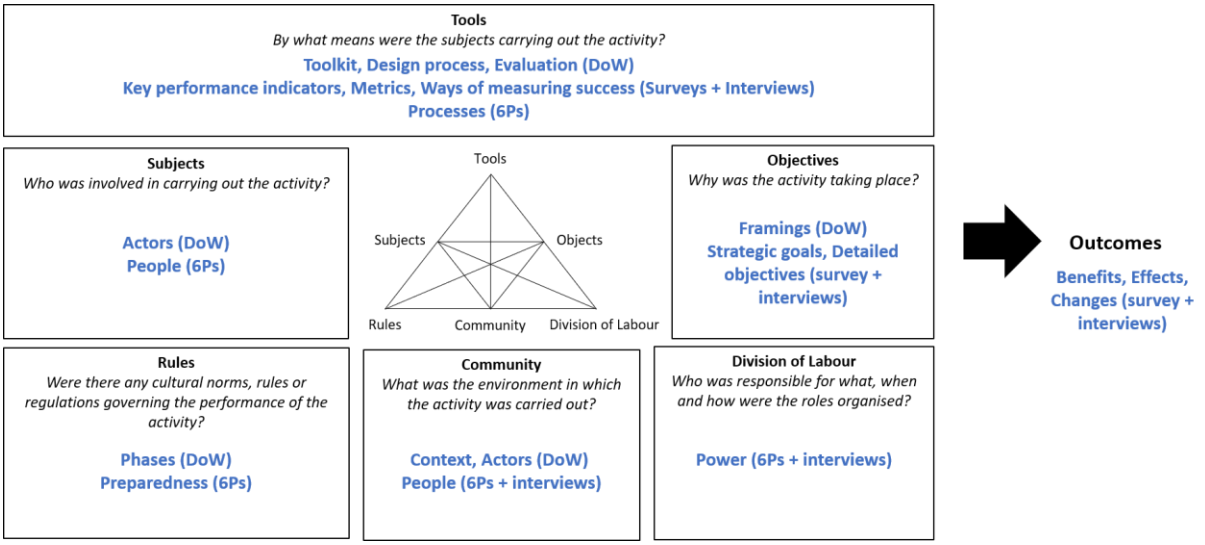

Figure 9, illustrating how different sections from the deliverables, surveys and baseline variables were mapped onto the AT triangle canvas.

Using this approach we were able to compare the pilots, determining how each node in the AT triangle was defined in the context of each of the MAZI pilots. Each pilot was characterised as an interdisciplinary relationship

between an academic and a community partner. Under the following headers we offer an interpretation of how each of the pilots compared in terms of the relationship between the community and academic partners (Subjects), the objectives of the pilots (Objectives), the mechanisms they used (Mechanisms), the setting in which the pilot activities were carried out (Context, which we defined as a combination of AT's Rules, Environment and Divisions of Labour) and any reasons pilots have had to believe there have been benefits, effects and changes (Outcomes).

The following summaries are drawn from interviews with pilot partners, and Deliverables 2.1-2, 2.4-5, 2.7-9, 2.10-11.

4.2 Pilot comparison: 'Subjects'

In the Berlin pilot the academic partner was a Doctoral Student (Berlin University of Arts) at the start and later an Associate Professor, and the community partner commenced as the founder of Common Grounds (the civil society platform for collective learning "Neighborhood Academy") and was also a Doctoral Student at the end of the pilot. They did not have a history of working together prior to the project and only the community partner had a history working with the pilot's stakeholders. Both partners were in different parts of the city but met face to face regularly. At the end of the pilot, both partners were heavily invested in a successful spin-off development that was directly related to work carried out by the pilot.

In the Creeknet pilot, the academic partners were a lecturer and a researcher at The Open University: the lecturer had worked on multiple DIY networking projects previously, but this was a new domain for the researcher. The community partner was the founder of SPC and was a pioneer of DIY wireless networking. One of academic partners and the community partner had worked together previously and had known each other personally for 15 years. Only the community partner had a history of working with the pilot's stakeholders prior to the project. They were all based in two different cities, approximately two hours train journey away from each other. Initially they would meet face to face weekly but towards the end of the pilot this became monthly, and the weekly meetings were substituted with email and phone calls.

In the Kraftwerk1 pilot, there were two academics and one community partner. The boundaries were blurred in so far that the community partner had also worked as an academic in a university. The two academics were also sharing an office in the housing cooperative together with the community partner and they were running NetHood, a non-governmental organisation that aligns with the aims of the pilot. Working in the same office meant that the partners met face to face regularly.

In the UnMonastery pilot there were two academics and two lead community partners. The UnMonastery Testlabs (temporary UnMonastery communities), were set up in different locations in the highlands of Greece. Each time they ran a Testlab they worked from a building provided by the members of the local community. In the Testlabs a community lead was supported by a small group of artists and activists who volunteered their time. The academic and community partners had not worked together previously, and the community partners had only engaged with the residents in one of the Testlabs prior to the start of the MAZI project. The two academics were based in Edinburgh, Scotland, and they visited each of the Testlabs on several occasions. Most of the communication was carried out via Skype and face to face whilst attending MAZI meetings and cross-fertilization events.

4.3 Pilot comparison: 'Objectives'

The MAZI pilots all shared the goal of engaging their communities with DIY networking and the potential use of the MAZI toolkit but they differed in their purposes for doing so (see Appendix B).

The Berlin pilot had the objective of sharing information and engaging local activist communities in discourse over digital rights to the city. This entailed a bottom up approach towards linking social, cultural and ecological aspects of urban life. Their strategy was to engage local activist groups with the opportunity for cross-fertilization of local initiatives and to use these as learning spaces for trialling how DIY networking could facilitate and function as a trigger for discussion (See D2.1-3).

The Creeknet pilot had the objective of enabling activities for connecting people together, sharing of information and initiating discourse about DIY networking. The goals were to explore what DIY networking tools and services would help mediate communications and whether this might be enabled by adding web-based services to the existing SPC wireless network (See D2.4-6).

The Kraftwerk1 pilot had the goal of developing knowledge (e.g. in the form of rules and guidelines for use within the MAZI toolkit), which would support existing participatory processes by acting as a triangulator / catalyst / facilitator for collective awareness. Their goal was to collectively produce knowledge, drawing from the lessons learnt from the well-established Kraftwerk1 and the newly developed NeNa projects for the purposes of developing future housing cooperatives (See D2.7-9).

The UnMonastery pilot had the goal of understanding how best to use DIY networking to help temporary communities to function efficiently, so they might identify and dissolution local social challenges. The goal was to create opportunities to help UnMonastery function efficiently and to help create opportunities for establishing contact, sharing of information, establishing discourse and generating knowledge (See D2.10-12).

4.4 Pilot comparison: 'Mechanisms'

The pilots used a range of common mechanisms for similar purposes. The Berlin and Kraftwerk1 pilots started by presenting conceptual design artefacts (including the Hybrid conference poster, Polyogue and the Hybrid letterbox) to engage peers at national and international conferences and workshops with the notion of DIY networking and the potential affordances of the MAZI toolkit. Beyond this all the pilots engaged in community mapping to understand the diversity of publics with which they were engaging. All the pilots engaged in a series of workshops that varied in focus and form, from open ended events only intended to initiate conversations, through to more structured workshops that aimed to give participants the skills they required to setup and run a MAZI zone. UnMonastery had already developed a social networking toolkit, including playing cards for group discussions and The Book of Mistakes. To support the maintenance of MAZI zones both the Creeknet and the Berlin pilot reported the use of a 'hotline', which the community and academic partner would maintain. All of the pilots expressed the value of identifying ambassadors within their communities to take on the role of local support for setting up, configuring and maintaining the community MAZI zone. All the pilots had large numbers of conversations that were purposefully kept at an exploratory (general understanding) level with their publics, and expressed the importance these had on the success of their pilots. For example, the Berlin pilot referred to the narrative they had developed as a key mechanism, while the Creeknet pilot stressed the value of using maritime metaphors in the design process to make technical jargon more palatable and relevant to residents.

4.5 Pilot comparison: 'Context'

In the Berlin pilot the focus changed in the first year from focusing on facilitating a debate around the lease related to the community garden "Prinzessinnengarten" to engaging several neighborhood initiatives in the district of Berlin-Kreuzberg. The initiatives shared a commitment to bottom-up development of community-orientated spaces, linking together social, cultural and ecological aspects of urban life. The Neighborhood Academy (NAK) remained the nucleus for deploying offline networking but the change in focus meant that workshops were held across the city, engaging artists, experts and members of the different initiatives in Berlin focussing on civic society actors invested in city issues.

The Creeknet pilot was also operating within an inner-city urban environment, experiencing the effects of gentrification (major residential building work) and debate around the construction of a major new sewer, with the community anticipating thousands of tons of waste to be removed by road and barge. During the pilot's lifetime, the physical landscape continued to change rapidly because of ongoing construction work, e.g. threatening the mooring rights of residential boaters. Communities were engaged based on their proximity to the Creek, but this later broadened to those further afield.

In the Kraftwerk1 pilot the focus was on engaging residents in a grassroots housing and workspace housing cooperative in Zurich, Switzerland. In Zurich they shared their knowledge and wealth of experience with

members of NeNa1 (another housing cooperative), Wunderkammer (creating open space for experimentation on various areas of innovation and sustainability), Openki (an open-source tool for local and self-organized knowledge exchange, mediating non-commercial educational opportunities), and broadened the reach to others further afield to ParkPlatz urban community garden and to L200 a hybrid central space in Zurich. This pilot had initiated two initiatives for knowledge transfer namely Co-Hab Athens (a group working for citizens' rights to housing in Athens), and INURA coop initiative within the INURA network. They shared their knowledge and wealth of experience with members of NeNa1, Co-Hab Athens, Wunderkammer and Openki. This pilot broadened their reach to others further afield towards the end of the project.

In the UnMonastery pilot the focus was on setting up Testlabs, living in a communal house within a village in the highlands in Greece. There were two Testlabs, each consisting of a lead community partner and a group of volunteers. Volunteers had limited experience of working together so the initial challenge was to work out how they could function effectively as an UnMonastery community and then to explore how they could address the needs of the local communities.

4.6 Pilot comparison: 'Outcomes'

In the Berlin pilot, the MAZI toolkit has been used as an integral part of the NAk infrastructure. The coordinating team as well as "teachers" of the academy used it as a tool in their work and other local initiatives were actively deploying MAZI and using it as a tool for broadcasting information to residents, updating them about local political struggles.

In the Creeknet pilot there had been success in terms of local MAZI zones being deployed across the area, and initial work of connecting to SPC's wireless network (OWN). There was also evidence of self-sustaining networks of MAZI-toolkit users (e.g. shown by MAZI participants attendance at SPC Wireless-Wednesday tech drop-in meetings, and evidence that members were both continuing to use MAZI-toolkits in their practices and peer-resolving issues). The MAZI toolkit had also been used to extend the capacity of some groups self-publishing, reaching out to new audiences, and engaging with new stakeholders regarding debates about local challenges.

In the Kraftwerk1 pilot, permanent MAZI zones were deployed (e.g. in the "Pantoffelbar"), attracting the attention of more than 20 residents. Contributions "*went beyond impersonal statements*" to include evidence of dialogues and playful interactions being initiated. The concept of DIY networking also became part of the narrative on NeNa1's visions and their use of technology. NetHood set up MAZI zones to network local shops. This came about when there was a new interest in Greece for developing a novel housing cooperative model. Moreover, the pilot facilitated the transfer of knowledge about activities and workshops at multiple INURA conferences.

In the UnMonastery pilot, there was both internal and external evidence of indicators and feedback that the pilot study had been successful. It had provoked UnMonastery to reflect on what they had learned and what they could change or improve about the way they operate in the future (e.g. building on their use of the organisation's workbooks, and the potential to revise the unMonastery group's own toolkit). External to UnMonastery's own work, the pilot team had published in academic conferences and journals. They had also been involved with the production/publishing of practical and theoretical resources, based on the experiences and findings of the pilot study (e.g. including good practice guidelines, sets of principles, accessible case study reports and manifestos).

5. ‘Stage 3’ - Insights enabling “togetherness” (MAZI)

This section reports on the factors affecting the pilot's ability to enable togetherness (MAZI), by using AT to characterise the pilots as four distinct activity systems.

We explain how we have applied the AT framework to reveal the conflicts and tensions between elements of the technical and semiotic levels of the pilots’ activity systems. We then explain some of the successes and challenges of using different mechanisms for achieving the pilots’ objectives. This is followed by a summary of the tensions, conflicts and generative mechanisms, which have been used to inform the insights for good practice presented in section 6.

5.1 Applying the Activity Theory Framework

Our reference to conflicts and tensions in this section reveals the richness, mobility and capacity of the pilots’ activity systems (referred to by Engeström (2011, p.74) as expansive learnings of “what is not yet there”).

The AT framework encourages a series of questions to be reviewed to verify definitions, and to explore potential conflicts and tensions characterising the mediation of activities through the interplay between mechanisms and context. The following questions were used as a structuring mechanism for interviews with pilots:

- Who was involved in carrying out the activity? (Subjects)
- By what means were the subjects carrying out the activity? (Tools)
- Were there any cultural norms, rules or regulations governing the performance of the activity? (Rules)
- What was the environment in which the activity was carried out? (Community)
- Who was responsible for what, when and how were the roles organised? (Divisions of Labour)
- Why was the activity taking place? (Objectives)
- What were the benefits, effects and/or changes resulting from the different activities? (Outcomes)

To further help uncover the conflicts and tensions the following questions were used to analyse the interviews:

- ‘WHAT?’ – What action was taken towards an individual or group goal or sub-goals of a type of activity?
- ‘HOW?’ – What was the operational structure of executing an action, picking up on the automated and unconscious (not concrete) way, according to the conditions surrounding the goals of a type of activity?
- ‘WHY?’ – What was the motive (need) representing the conscious social and personal meaning of a type of activity?

A thematic analysis of these interviews and deliverables enabled us to define what was meant by factors referred to in Engeström’s AT triangle. By exploring the relationship between the pilot design features and their objectives, revealing the conflicts and tensions, we were able to understand when and how mechanisms were effective at generating outcomes. In order to achieve this, we needed to distinguish between the technological and the semiotic levels of the different activity systems (as referred to in D3.9) (figure 10).

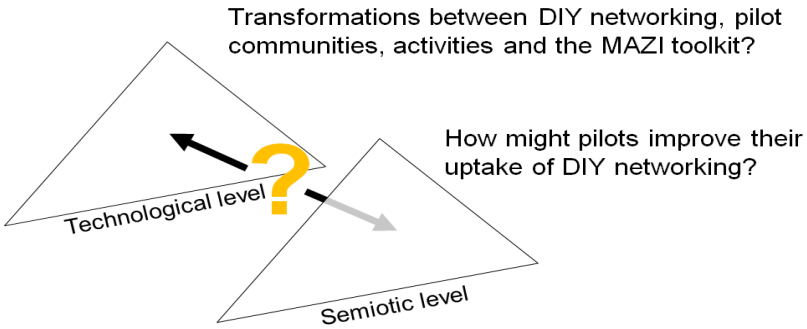

Figure 10, Illustration of using Activity Theory to identify tensions and conflicts between technological and semiotic aspects of an activity system.

The 'technical level' refers to the activity system that enables the existence and functionality of the soft and hardware components of the MAZI toolkit, and the 'semiotic level' refers to the social initiation and process of meaning-making and how meanings are created and communicated (McAndrew et al., 2010).

The following figure illustrates how carrying out multiple run-throughs of the data, using the AT triangle as a lens, enabled us to make some distinction between the technical and semiotic level of the activity systems (figure 11).

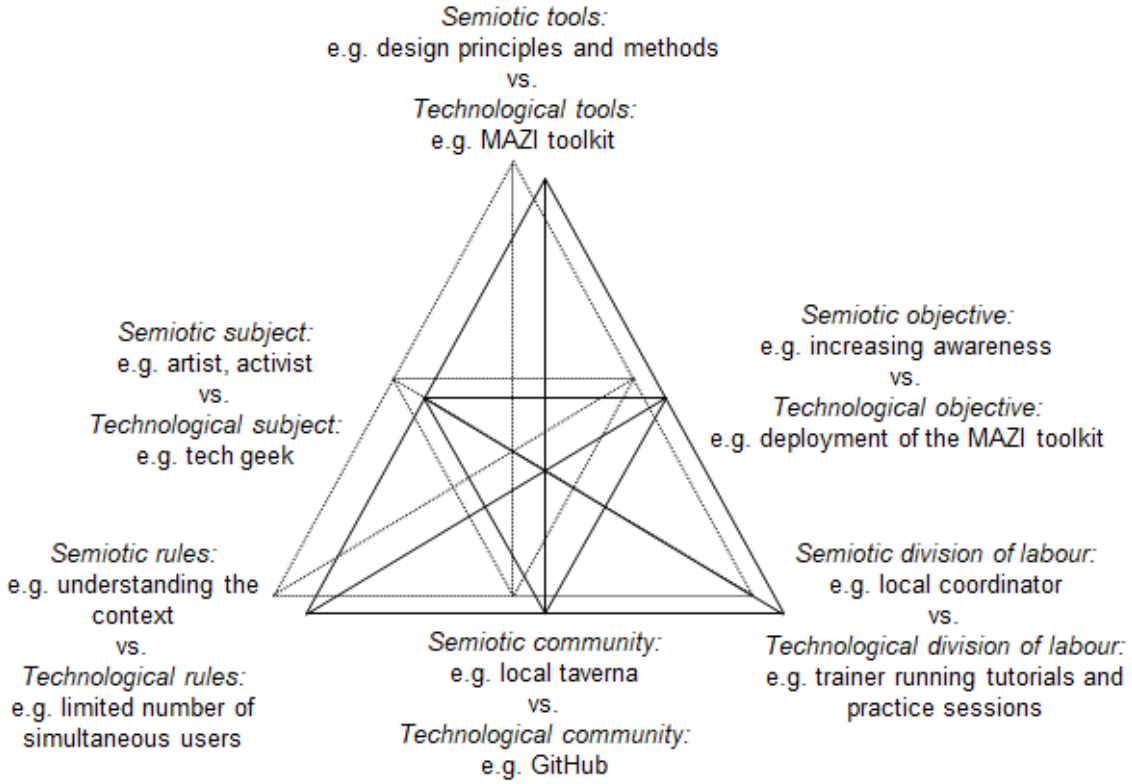

Figure 11, semiotic and technical levels of the pilot activity systems, with examples shown for each node, adapted from Blin and Munro (2008).

Comparing and contrasting the technical and semiotic levels of the pilots' activity systems enabled us to explore how the tensions and conflicts were initiated and whether these were resolved. The semiotic level offered insights into the importance and meaning of different approaches (mechanisms) that were present within the activities carried out by the MAZI pilots. The technical level, on the other hand, offered insights into how hardware and software tools (also mechanisms), were deployed for achieving the objectives carried out by the pilots. By acknowledging and interpreting the meanings offered using different mechanisms, participants were enabled to navigate their way towards generating specific outcomes. To achieve this, the pilots' focus was very much on the influence of context. Thereby recognising that the same mechanisms in two different contexts (e.g. working with different groups, or different settings) can carry different meanings (both within and between the MAZI pilot activities).

Our analysis of the pilot activity systems emphasises the relationship between pilots' design features on objectives and how this was influenced by the pilot's' ability to navigate through the distinct yet overlapping semiotic and technical levels of their activity systems. These are intended to exemplify the conflicts and tensions observed in the dialectical relationship between the nodes of the AT triangles.

The following subsections contain some of the key conflicts, tensions and mechanisms used within the pilots' activity systems.

5.2 Review of each of the pilots' activity systems

The following subsections review the conflicts and tensions observed across the pilots' activity systems. The academic partners were working predominantly at the 'technical level' with the community partners working predominantly at the 'semiotic level'.

5.2.1 Berlin pilot

The activity system was characterised by a technical academic partner and a semiotic community partner ('subjects'), with experience of designing, developing and using technical and semiotic mechanisms ('tools'), respectively, engaging technical competent communities ('community') in the city of Berlin, regarding issues related to the citizens' rights to the city ('object').

The Berlin pilot was the first to start in MAZI, so they had the challenge of engaging publics with the MAZI DIY networking concept and the MAZI toolkit while still coming to an understanding themselves. That is, there was a tension between the subjects' understanding of the technical toolkit and the actions they needed to take to achieve their technical objective:

> "*In the beginning it was rather abstract because none of us really knew what the MAZI toolkit will be and there was this idea that you could use networking technology and DIY. You can control your data, and this can be local, without the Internet. There were these things in the Description of Work but there was no practical experience with it, or there were no case studies that we could refer to, or people already saw or experienced it.*" (Skype interview)

Near the beginning of the project there was a change in legal status of the Prinzessinnengarten community garden, which meant that the pilot's technical and semiotic objectives had to be revised (see D2.1). The academic and community partners had to think creatively about how they would realign their objectives with the needs of the wider activist community.

By this point, it was also the pilot's experience that there was some resistance to the use of DIY networking technology and the technical MAZI toolkit from within the groups with which they were engaging. To overcome this, the academic partner led on the use of a series of conceptual DIY installations, presenting these at conferences and workshops. This helped the pilot to engage in conversations about what was meant with offline DIY networking, which informed how they pitched MAZI to the pilot's local community. In parallel to this, the community partner used their experience of applying semiotic mechanisms to lead the pilot in a direction that was responsive to the needs of the communities. This entailed carrying three types of workshop that purposely avoided an explicit focus on the technical MAZI toolkit and engaged both the community and the pilot team in discussions about what MAZI meant to them and how it might be used:

> "*First one was sitting in a room with people saying what are we actually doing? We tried to cluster the activities that we were doing in our different initiatives. What is that we are doing? That was completely pre-tech. There was not any technology in the room apart from personal computers, but not even that.*" (Skype interview)

The second one we still kept the technology out, but we had the hybrid letter box and the RPi [Raspberry Pi computer] just to show what these things are but we did not talk about how we used the MAZI. We started talking about what do we understand under informing learning or creative learning. What is it we are learning? What is we are actually doing in these learning processes? How are we learning, what's the important thing we are learning? Somehow in these conversations we said come let's just brainstorm how we can use MAZI but still it was just completely on paper." (Skype interview)

> "*In the third workshop it was more an internal workshop, saying out of our situation, what are we doing here, using these categories of organisational structures, topics, communication forums? And using our understanding of community learning, what do we need from MAZI? And that was the developing process for the MAZI archive*" (Skype interview)

After the workshops, there was the need to train the community in how to use the technical MAZI toolkit. There was still the sense that they needed a means of doing this that would allow the communities to lead the

conversation. To address this, the pilot devised a series of 'unboxing' workshops, which let the conversations be led by members of the communities and allowed the pilot to test the accessibility of hardware and software components. Also, at the end of each session the participants each got to take away a MAZI toolkit with them:

> "*For most deployments, the format of "unboxing" was used. On the one hand, this do-it-yourself format enables a deeper understanding of the technology and approach of the project. On the other hand, sharing a space where participants are able to see and touch the different components of the MAZI, was chosen to take away anxieties and reservations towards technology, allowing for a situation where we together "open the black box", putting away our fears of breaking anything.*" (D2.2, p19)

This approach of carrying out a series of workshops that took participants from engaging with semiotic, toward more technical mechanisms was an important strategy for the culture of the community that they were engaging. This helped the pilot overcome the potential conflict of being simply wanting to convert the communities to become MAZI users. Instead it let the communities lead the way with regards to identifying the value of using the technical MAZI toolkit:

> "*We didn't want to come in and say look we can help you, can guide you to the light [...] It was a very sceptic community that we were entering, very idiosyncratic and closed up in some way. So, it was much more important to go in and say look there is something we would like to talk about and we can learn from each other and try to establish a vocabulary or a shared interest around topics, not necessarily technology. It was topics of self-organisation and independence from all these MAZI values. Bringing them to the table and saying look this is stuff you are also talking about in a completely different context, so wouldn't it be fun to see if there are overlaps [...] [T]hat was the pitch that was worked out and that was very much championed by [community partner] and by [their] experiences*" (Skype interview)

In parallel to the pilot's efforts to overcome the resistance to using the technical MAZI toolkit, global events (including Brexit, General Data Protection Regulation etc.) resulted in Berlin becoming a hub for technology start-ups, having an impact on the cost of property and thereby politicizing conversations over the use of technology in the fight for rights to the city. Overtime this was said to change the nature of the community. It changed the discourse from scepticism and resistance, to an enthusiasm to learn about DIY networking technology and how to use the technical MAZI toolkit (e.g. how to resolve concerns over data privacy):

> "*Berlin is becoming a tech start-up hub, impacting the real estate market, so the things we tried in the beginning, going to people that are very involved in critical urbanism perspective and to try to explain to them that technology is interesting to think in this context, this was very tedious in the beginning because 'ahh what do you want me to publish, that has nothing to do with me'. So, three years ago it was a whole different set up and today nobody would ask this question, it's right out there on the table. Not because of us but because we were part of this journey [...] so it's a development that is bigger than us which happened in the duration of the project*" (Skype interview)

During this period of disruption to the local community, the academic partner attributed a lot of the success to the community partner's ability to implement the semiotic mechanism of balancing the need to operate in a reactionary way, whilst managing expectations. The former afforded the pilot the ability to have meaningful conversations with the local community regarding the potential value of DIY networking and the technical MAZI toolkit. The latter, on the other hand, meant that the pilot knew when to temper their efforts so as not to overburden their community and initiate unsustainable MAZI zones:

> "*Of course, I feel the constraints about the communities and people we are working with have by just that they don't have so much time, they are mostly working in their free time and everyone is close to a slight burn out*" (Skype interview)

> "*[...] of course, it sometimes disappointing when you feel like that you know there is so much potential there, through the person's interests, through the community at hand, through the space that they are running, that you think ahh you just need such a little push and it would just spin off the chart. And it doesn't happen because people don't have the time [...]*" (Skype interview)

> "*[...] sometimes it frustrating that we have not been able to push further [...] it would be very easy for me to go in and say tweak this, upload it, fulfil it, but that would be me becoming the MAZI caretaker in their space and not one of them doing it [...] and that's not sustainable*" (Skype interview)

The narrative that the pilot developed was also said to be one of their most important semiotic mechanism. This enabled them to navigate from having conversations about meaning making to explicitly talking about how, when and why communities could use the technical MAZI toolkit:

> "*[...] also, our narratives, our pitch basically, how we argue MAZI, or how we sell MAZI, the ideas behind MAZI to others [...] has developed over the last two and a half years*" (Skype interview)

> "*Also, the political narratives [...] much more refined because stuff happened during this period [...] so many things that happened that politicised the topic but also our own thinking around it, I mean it got much more developed. Three years ago, it was very rudimentary*" (Skype interview)

5.2.2 Creeknet pilot

The activity system was characterised by a semiotic academic partner and two technical (academic and community) partners ('subjects'). They had experience of designing, developing and using technical tools and some experience employing semiotic mechanisms ('tools'). The pilot was set in an area of rapid urban development, engaging individuals and community groups working or living in or near Deptford Creek. Members of the engaged community were characterised as being predominantly semiotic with little technological skills ('community'). The purpose was to promote DIY networking as a means of giving local people a voice through enabling self-publishing, and independent use of the MAZI toolkit ('objective').

Prior to the start of the pilot, many of the members of the community either knew the community partner professionally (as a subscriber to the community partner's services) or personally. The initial challenge was introducing the MAZI project to the community, the academic partners, and the community partner's new role as a representative of an EU-funded project.

> "*We recognise that if a project is seen as an outside intervention with no lasting value, it would most likely be rejected or ignored.*" (See D2.4, p32).

> "*OU would be seen as outsiders without their support*" (D2.5, p40)

This was perceived as an initial conflict between the rules, divisions of labour and objectives characterising the existing informal (semiotic) relationships versus the more formal (technical) relationship as a representative of a bureaucratic organisation. To overcome this, the community partner introduced the semiotic mechanism of running a series of weekly informal drop-in workshops called 'MAZI Mondays'. These emphasised creating a relaxed environment to introduce the academic partner, the MAZI project and eventually the technical MAZI toolkit to the community. For those that did not attend the MAZI Monday workshops, the academic and community partner would meet them at a local community hub or at their place of work.

The strong personal relationship and the ability of the community partner to draw upon the semiotic rules of comradery, for example, helped. Even so, some of the members of the local community found it difficult to see the value of an offline network when they already had access to the Internet. There were also several other existing grassroots social networks that were requiring an investment of their time and energy to engage. However, the rapid rate of physical and political change in the local geographical area heightened members' awareness to the possible affordances of offline DIY networking:

> "*MAZI as a project, and the concept of an 'offline network' has not been straightforward to communicate. While a minority of the groups we talk to have encountered community-based approaches to networking (in some cases as subscribers to SPC's services), online access is generally ubiquitous in the Deptford Creek area, and introducing an alternative has to clearly show a definitive purpose to address a localised need*" (D2.4, p.32)

> "*we recognise there are many existing grassroots social networks, and communication tools already being used, and the case has to be made for engaging with an additional set of tools. It cannot be taken for granted that groups will wish to do so: as one participant noted "I will always ask why" (regarding committing to taking on another tool).*" (D2.5, p.33)

The required technical competency in DIY networking (albeit quite low) was still too high for some, making them feel that use of the technical MAZI toolkit was beyond their reach. To overcome this tension, the community partner introduced semiotic mechanisms, such as regular informal catch-ups combined with maintaining an open hotline. These allowed members of the community to seek technical assistance as they tried to engage with the technical MAZI toolkit. This combination of semiotic and technical mechanisms was important. It meant that the pilot could overcome the challenge of a greater level of trust being required to entrust valuable community resources to a local networked service, compared to maintaining a MAZI zone infrastructure:

> "*A greater level of trust and belief in the sustainability in a system is required before people are willing to expend energy and entrust valuable community resources to a networked service that holds community knowledge than agreeing to help maintain an infrastructure (Mulholland et al. 2009)*" (D2.5, p33)

> "*SPC's established reputation in the neighbourhood encouraged attendance and curiosity, but the groups are pragmatic in their uptake of new tools.*" (D2.5, p33)

To overcome the inevitable conflict the academic and community partners' understanding of the links between those they were engaging, the pilot used community mapping. Initially this was used as a semiotic mechanism (in the form of analog maps) and later as technical mechanism (in the form of digital maps):

> "*This has led the pilot team to start exploring more formal methods of recording and sharing the landscape of groups, starting with the Kumu community mapping software platform. This will enable us to represent the richness of information that we are gathering and show potentially multi-layered linkages.*" (D2.4, p32)

Community mapping proved to be an effective semiotic and technical mechanism for improving the transparency of links between members of the community. There was an aspiration that this would become a useful resource that could be passed on to members within the community. However, the time that was required to maintain the digital maps meant that this wasn't feasible in the long run:

> "*Key observations so far are that this is a time-consuming process and has to be managed sensitively. We are contacting small, often voluntary groups and individuals who have many demands on their time and are not familiar with the purposes of our project, hence there has to be a gradual process of building trust and confidence.*" (D2.4, p32)

The pilot purposely characterised technical references in terms of maritime metaphors. This was in keeping with the character of the community and helped the pilot overcome the potential conflict of using overly technical language to explain the relevance of DIY networking:

> "*To encourage participation and ground our work in a local narrative we [...] [used] maritime metaphors as a conceptual framing to help explain the value of DIY networking.*" (D2.5, p33)

> "*This metaphor was taken up by boaters and we were asked to produce a QR code on a flag that when viewed through a QR code reader would resolve to an image of a pirate flag- this suggestion from one of the most technologically reticent of our participants. We were assured that flying a Jolly Roger flag on boats is illegal and they liked the idea of using technology to obscure the true meaning of their flag.*" (D2.5, 39)

To cope with the conflict of being passionate about wanting to help members of the communities succeed, whilst having to be pragmatic about the fact that not everything would work within the timeframe of the project, the community partner used their experience of supporting similar grassroots initiatives. This involved the use of the strategy of trying to support as many initiatives as they could, whilst being careful about the expectations they created so these could be managed within the timeframe of the project:

> "*When you feel the tug of feedback - when you feel it (the project you're supporting, activity that you've initiated or are helping) 'floats. Something taking off at a great trajectory is frightening, however, when you see something gaining its own momentum and buoyancy, it's great. Until that point, you're holding it and sustaining it, you're holding it up and it is working through you putting in your energy – you can't do this forever. Something is successful when it 'floats' of its own accord, the participants are maintaining it themselves. The sense of success comes when you feel that the 'tide is in and the boat floats. There can be an ebb and flow of progress: it's ok if it goes down but that you have the sense that it will re-float with time. These are signs of success.*" (Interview)

Time and the perceptions of what might be possible within the timeframe of the project was a factor that had to be managed. This was necessary to avoid disappointments becoming a source of conflict in the communication between the pilot and the community. To address this, the partners had to temper some of their conversation about possible uses of the technical toolkit, so they could ensure they could manage expectations.

5.2.3 Kraftwerk1 pilot

The activity system was characterised by a technical and a semiotic academic partner and a semiotic community partner ('subjects'), both with experience of designing, developing and using both technical and semiotic mechanisms ('tools'). The pilot was based in a housing cooperative in Zurich, Switzerland, reaching out to residents and to the broader housing cooperative movement and other urban activists via national and international workshops and conferences. Members of these communities had varying levels of technical competency ('community'). In general, the purpose was to find ways of using DIY networking to encourage democratic participation ('objective').

The academic partners were new members of the Kraftwerk1 community, so they had to rely on the community partner to act as a gatekeeper. This was perceived to be a conflict both in terms of the roles being played and what this meant from the perspective of managing divisions of labour:

> "*...being an insider and outsider at the same time. And it seemed clear that the success of the pilot would depend on how the pilot team will manage to balance between these roles and their "privileges*". (D2.8, p31)

To overcome this conflict, the technical academic partner put themselves forward to take part in community events and through this was able to engage in conversation about MAZI and its potential use within the community:

> "*It happened that one of the members of [name] cooking group was absent and so [name] found the opportunity to become an active member and help with serving, cleaning, and other small tasks [...] It was the first time he felt like being part of the community [...] [and] two of them happened to be the people that were also engaged in our aforementioned events and also technically savvy and like-minded in terms of the importance of open-source software, etc. The discussion went fast to MAZI*" (D2.8, p31)

Early in the project the pilot had also understood the importance of using semiotic mechanisms for defining the objectives of the communities, before moving onto conversations about meeting the pilot's technical objectives. That is, getting people to experiment and use the technical MAZI toolkit:

> "*An important lesson from the first phase of the pilot in Zurich is that local communities should better be accessed not as potential users of the technology but rather [...] engage in their activities and genuinely explore the local needs and understand to what extent technological approaches can provide solutions to real problems.*" (D2.7, p44)

Both the technical and semiotic partners recognised the potential contradiction that might occur if they were to impose their impressions of how the toolkit should be used by the communities. As such, they made a conscious effort to manage this conflict by ensuring they framed the technical MAZI toolkit as a mechanism that had defined rules and roles, which the community were invited to use to meet their needs:

> "*[The] MAZI toolkit should not only be a technological toolkit but also one that defines the rules and roles in processes where the technology comes into action.*" (self-reflection exercise, D3.11 Appendix IV and D2.9, p37)
>
> "*We don't bring a solution to local communities. We bring the knowledge of tools that could be transformed to solutions, if better understood by a few key local actors*" (self-reflection exercise, D3.11 Appendix IV and D2.9, p37)

Effort was also made to take the time required to understand the needs of their community. They used semiotic mechanisms in the hope of increasing the possibilities for cooperation. For example, they identified ambassadors, organised guided tours, developed hands-on experiences during onsite workshops and ensured they employed the skill of active listening to facilitate meaningful conversations. This emphasis placed on the use of semiotic mechanisms and ensuring they created a suitable physical environment for residents to engage with the technical MAZI toolkit, was motivated by the understanding that they needed to overcome the potential conflicts that would arise if they were seen to be "pushing" the technology onto a semiotic community:

> "*[...] "technology pull" instead of a "technology push" [...] partly motivated by some unforeseen difficulties in the toolkit implementation (like the captive portal functionality) but it is now judged by the team as the most appropriate anyway, an assumption validated by the increasing engagement of people in MAZI Zones which were initially thought of as failures, and the increasing number of external groups that wish to experiment with the MAZI toolkit*" (D2.9, p39)
>
> "*Designing the physical presence and/or environment of a MAZI zone proved to be crucial toward its sustainable future. That brought to our attention the concept of a 'living lab' [...]*" (D2.9, p40)

Early in the project this was more of a challenge because the level of technical competencies required to use the technical MAZI toolkit, making it essential the pilot first rely on semiotic before introducing technical mechanisms:

> "*[...] version 1.8 [...] allowing for the very first-time non-technology-savvy people to set-up their own local networks. Attempting to promote this technology before reaching this state in communities already stressed from the numerous participatory tasks would risk losing the interest of people too early in the process.*" (D2.7, p44-45)

Another conflict that the pilot experienced relatively early in the project was having to negotiate the legitimacy of setting up a MAZI zone in the housing cooperative. Residents already had access to the Internet and Kraftwerk1's intranet. On the other hand, the community partner had great success using a MAZI zone to coordinate with delegates attending a series of INURA conferences located in offline environments:

> "*The concept of a MAZI zone as a scheme of DIY networking is very difficult to understand for most people. One main reason is that people are now used to have internet everywhere, really everywhere. And they can do on it whatever they want to do. To understand a necessity or at least an advantage compared to existing uses offered constantly through internet is an enormous challenge if not almost impossible. Also, the 'internet-industry' works with endless resources to develop constantly new needs no-one asked for and some really useful. For me, the most enlightening moments of the MAZI zone were the deployments in the internet-free INURA retreat in Cuba and in Warsaw by collecting pics and offering documents such as minutes, reports etc. I really enjoyed deploying the mobile MAZI zone a lot."* (D2.9, p39)

During the project, the pilot experienced a greater interest from stakeholders wanting to know more about how to setup housing cooperatives and the advantages of using DIY networking and the MAZI toolkit. When MAZI was presented at national and international conferences and workshops the pilot received a lot of positive feedback. However, the increased attention that the residents of Kraftwerk1 received from external initiatives meant that residents become "burnt out" and less receptive to the idea of engaging with intervention such as MAZI:

> "*On the one hand, our assumption that the cooperative housing model would be interesting to understand and translate in different contexts was overwhelmingly verified through the initiation of multiple knowledge exchange initiatives in Europe during the duration of the project. [...] On the other hand, when we started the project, we did not understand the extent of the burn-out of Kraftwerk1 and other similar communities, because of various initiatives and individual researchers visiting, interviewing, and observing their everyday life. So, the knowledge framing as initially conceived did not prove engaging for the residents of Kraftwerk1*" (D2.9, p38)

5.2.4 UnMonastery pilot

The activity system was characterised by two technical academic partners and two semiotic community partners based in different countries across Europe ('subjects'). The academic partners were experts in the area of design and had access to colleagues who were more hands on with the computational aspects. The community partners were experienced in the design, development, and use of semiotic mechanisms ('tools'). The pilot consisted of two UnMonastery Testlabs located separately in two rural villages in the highlands of Greece, with limited access to the Internet ('community'). The objective of the pilot was to use the technical MAZI toolkit to help them operate efficiently as they used their conventional semiotic mechanisms to serve their local community ('objective').

Using the first Testlab as an example, the initial conflict occurred because UnMonastery did not have anyone on their team who could speak the same language as the local community and the UnMonastery community was largely semiotic with limited technical skills. The limited technical skills were addressed by a technical community partner from the Creeknet pilot visiting the Testlabs. This was a success for UnMonastery community, helping them to overcome the conflict of not having appropriate, reliable Internet connection, whilst at the same time wanting to collaborate using networking tools. As a result, the technical MAZI toolkit was a great success within the UnMonastery community, because it enabled them to continue to collaborate using the kind of networking tools they would otherwise being using across the Internet:

> "*The primary idea was to use the Mazi zone in the house for our own purposes, because we are used to using networking tools, because we all live in different places. So, we do prefer to collaborate in open documents, in shared documents, even when we are in the same building [...] [It was an] excellent bridge between not having appropriate, reliable Internet connection, and at the same time, that we are work there, and to want to collaborate using networking tools.*" (Skype interview)

UnMonastery was quite aware of the potential conflicts that can occur between visiting and host communities if suitable care is not taken to respect the local politics of a community:

> "*Understanding the political climate is one of unMonastery's specialisms. To lightly overstep the rift between the people and their elected representatives is not possible*" (D2.10, p25)

To manage this, UnMonastery had developed a suite of semiotic mechanisms, whereby the focus was on developing personal relationships and avoiding generalisations. UnMonastery also placed an emphasis on themselves as a semiotic community to ensure they were learning from their experiences (e.g. by regularly updating their Book of Mistakes). They placed an emphasis on the value of personal relationships, tried not to generalise 'people' and made it one of their rules not to introduce technological responses to community needs that were not derived from within the context of the local community:

> "*Talking with diverse local people and hearing their views and stories is very important in this process [...] ensuring that any technological responses were derived from within the context of the local situation rather than imposed from outside.*" (D2.11, p47)

UnMonastery saw the technical MAZI toolkit as a great opportunity to meet the needs of the local community, because the goal was to collect information and then find ways of digitising this without putting it online. From this perspective, the technical MAZI toolkit, with its offline capabilities, was a good fit. It offered UnMonastery and the local community an opportunity to 'play' with ideas. Ultimately, this represented a middle ground

whereby UnMonastery could manage the conflict of being seen to be exposing the local community to the potential threats of the Internet, by drawing upon the affordances of the MAZI's offline capabilities:

> "*What we wanted to do is to collect information and find ways, like digitise the knowledge and digitising the information about the place. But trying not to put it online. So, basically we were hoping that MAZI's going to be this excellent solution to pulling the village in the 21st century without actually shoving everything online.*" (Skype interview)

> "*In an attempt to avoid the colonialist approach of 'arriving with goodies', the group has a non-tech, gradual and granular approach of slowly evolving trust and relationships, however, the ultimate goal is to allow very local needs to be connected to a global depository of knowledge and practices. The MAZI toolkit may enable the unMonastery to avoid playing the role of networking evangelists, only to get more people losing their control over their privacy, their data, and seriously limiting their control over their future, while co-create 21st century solutions to local issues*" (D2.10, p25)

The UnMonastery team had been able to create several MAZI zones, including maps of the local area and an herbarium documenting the medicinal properties of plants they found in the community. However, despite this success they didn't have input from members of the local community. Attempts were made to try to address this. For example, MAZI zones were left running in the house whilst UnMonastery were away from the village. However, on return the coordinator found these in an unusable state and their limited technical skills meant they were not able to resolve the issue:

> "*Complete chaos. Two Raspberry Pis, maybe three. One was impossible to access because the main page, [...] we released a little more later, that the cards got damaged just probably because of the proximity of the Raspberry Pis next to each other ... So, basically what happened, I unplugged everything. And I proposed that we make a MAZI, a working MAZI zone. We had a room they used for working.*" (Skype interview)

The coordinator couldn't seek help from MAZI's technical partner because of the lack of Internet access. They also didn't have a member of UnMonastery who could speak Greek. In response, the coordinator started to create semiotic version of the applications that would have otherwise existed within the technical MAZI toolkit: mirroring their affordances so that residents in the community would still be able to engage with the notion of a MAZI zone.

> "*[...] we made a space on the wall for it. And had the signage was in Greek. And Valeria went out and collected stories and information from people in various, basically they were collecting interviews. And they put the documentation on the wall. So, we really had the MAZI as an analogue archive, which was actually really nice. And it looked like, first time it became visible what we are doing, and it became much more tangible for ourselves what we are doing.*" (Skype interview)

This was also facilitated by the arrival of two UnMonastery members who could speak Greek. Eventually the technical community partner from the Creeknet pilot also arrived, helping UnMonastery to resolve the technical challenges with the technical MAZI toolkit and help digitise some of the analog content. In the end, the activity was deemed to be a great success in terms of meeting the pilot's semiotic objectives (e.g. increasing awareness of DIY networking and building trust):

> "*My personal opinion is that the MAZI zone was useful for us because it allowed us to collect information without feeling that we are putting everything immediately out to the public sphere. We had control over the stuff we were collecting, and we have kind of a conversation with the villagers about how much to make public on the internet.*" (Skype interview)

UnMonastery were able to leave the village with a box containing the stories they had gathered using the analog MAZI zone, a USB drive with a digital record and a website with some of this content. The residents also expressed a great appreciation for what UnMonastery had achieved, invited the community partner to return and informed her that the village had created a separate accommodation that they were making available for anyone else who wanted to come and provide a similar service for their community. Moreover, a local resident had volunteered

to run and maintain an up to date version of the technical MAZI toolkit, for meeting the semiotic and technical objectives of the community:

> "*I finally found a person who is in the village regularly. She doesn't live there but her parents are there, and she is there all the time. She loved the thing, so I gave her two workshops. Now there is a MAZI zone in the school and she is taking care of it*" (Skype interview)

The experiences of the first Testlab were carried over into the second Testlab. They made sure that there was a member of their team that could speak Greek. They also placed an emphasis on the use of semiotic mechanisms before they moved on to introducing the technical toolkit. In addition, they recruited a local ambassador within the local community that could help them build relationships with the residents:

> "*It's having someone who understands the context in which we are arriving and the community in which we are in. They were working with us alongside us to also explain to us because we had a very short period of time and we had done our own scoping but to help navigate the situation easier. [...] That was the one difference from Kokkinopoulos and it was a mechanism of some sorts because also it filled a level of trust from the beginning.*" (Skype interview)

The following section critically reviews the conflicts and tensions referred to and the generative mechanism that were responsible for the pilots being able to achieve their objectives.

5.3 Summary of pilot findings

In this section we summarise and compare across the four pilot sections above. Reference is made to the observed conflicts, tensions and generative mechanisms.

The way the community perceived the interdisciplinary relationship between the community and academic partner was a tension that had to be managed because of the potential conflict between the rules, divisions of labour and objectives. Affiliation with the community partner, however, was the main generative mechanism for enabling the academic partners to gain access to members of the local communities. This raised the tension of needing to invest time in gaining trust and building relationships, which in turn raised the tension of proximity for those that were not living in or near the communities that the pilots were engaging.

The ability to develop and maintain a narrative for engaging communities was a generative mechanism that was explicitly referred to by the Berlin pilot, but something that each of the pilots were observed at engaging with in different ways. The Berlin and the Kraftwerk1 pilots used conceptual artefacts (such as the Hybrid Letter Box and the Hybrid Conference Poster) and the UnMonastery and Creeknet pilot presented the technical toolkit as an autoethnographic tool at a conference. All the pilots used informal conversations, weekly meetups, workshops etc. as generative mechanisms for informing their understanding of how their communities valued DIY networking and MAZI. The learning that came out of these activities informed the Creeknet pilot, for example, that they should be using maritime metaphors to frame their conversations in the context of their local community.

The interdisciplinary nature of having an academic and a community partner was a key generative mechanism that contributed to the success of the pilots, providing academic partners access to the community. This was not an easy task, however, and was a common source of tension reported across the pilots. It required the community partners to temper their instinct to initiate actions with long term goals. On the other hand, it required the academic partners to temper their desire to only engage in initiatives that were explicitly related to the project objectives. This combined effort, however, acted as a generative mechanism for balancing the need to operate in a reactionary way, whilst ensuring expectations were managed within the scope of the pilot, e.g. by purposely avoiding initiating unsustainable MAZI zones. Moreover, it was essential for alleviating the tension of the academic partner being an '*insider outsider researcher*' (Kraftwerk1 pilot). It was also essential to a mix of disciplinary backgrounds so that the skills were available to carry out both technical and semiotic mechanisms for engaging communities.

During MAZI, a series of global events resulted in politicizing the notion of using the technical MAZI toolkit. Communities became more aware of the potential threats to their existence. In the case of Berlin, Kraftwerk1 and the Creeknet pilots, this resulted in a shift from initial scepticism and resistance to an enthusiasm to learn about DIY networking technologies and the potential to use the technical MAZI toolkit. A key generative mechanism in these pilots was the presence of a founder of a trusted organisation that aligned with the values of the members of the communities being engaged. This finding was also confirmed within UnMonastery who reported the importance of having access to an 'ambassador' and having a member of the UnMonastery community that could speak the same language and had an understanding of the norms of the residents they were engaging.

Maintaining a good relationship between the subjects and the community was a tension experienced across all the pilots. A common generative mechanism was to start with semiotic mechanisms before slowly moving towards more technical mechanisms was something that resonated across all four pilots. This involved a process of relationship building, in terms of gaining the communities' trust, but also a process of educating the community and the community educating the pilots. In the case where the pilots were wanting to educate the communities, the focus was on conveying the affordances of the technical MAZI toolkit. When the communities were educating the pilots, the focus was on getting the subjects in the pilots to understand the communities' challenges, wants and needs. What this analysis has revealed is that the success of the MAZI pilots has depended on their ability to prioritise the latter (understanding the communities) and to have the skills and ability to know when to employ the former (educating the communities). That is, the understanding how to employ semiotic mechanisms to gain the trust, respect and confidence of their communities and the awareness (and cultural intelligence) to know when they should employ technical mechanisms (e.g. maintaining a service hotline) aimed at training and supporting communities to independently setup and maintain their own MAZI zones.

There was a tension between the perceived relevance of an offline technical MAZI toolkit in a community that has access to the Internet. Where the technical MAZI toolkit was used in an offline environment with little or no Internet connectivity, it was very popular. For example, in the case of Kraftwerk1 using it in the INURA conferences, and Creeknet's success at getting the technical MAZI toolkit to be adopted for teacher training in Zambia. The technical MAZI toolkit also functioned efficiently as a generative mechanism for negotiating the type of information that should be put online, e.g. allowing the UnMonastery pilot to engage their community by 'playing' with ideas before these were placed on the Internet. To overcome the scepticisms of an offline network in an internet-accessible environment, however, requires the generative mechanism of focusing on the use of semiotic mechanisms and moving towards more technical mechanisms.

The following section offers insights that have enabled togetherness (MAZI) for informing best practice and presents these strengthening and complementing the insights published in the MAZI handbook (D4.8).

6. 'Stage 4' - insights informing best practice whilst using the MAZI toolkit

The previous section presented the conflicts, tensions and generative mechanisms observed within and between the activity systems. This section concludes the comparative evaluation by presenting the evidence generated from this comparative evaluation of the MAZI pilots strengthening and complementing the insights from the MAZI handbook. The following subsections offer insights affecting best practice for engaging communities with DIY networking and the use of the MAZI toolkit.

6.1 Valuing the time spent with communities

A significant theme characterising the experiences of taking part in the MAZI project was the greater than expected lead-in time required to initiate action both at the project level (between the academics and community partners) and at the community level (between the pilots and their publics). This revealed the important role of the use of bridge building, boundary objectives and the willingness for researchers to 'get their hands dirty'. In short, to get involved in such an inter and trans-disciplinary research project requires an investment of time both at the project and the community levels, which should be acknowledged and respected. Depending on the context, this might be spread over days, months or even years, spent building relationships with the community and their representatives. Equally it might be by regular contact, periodically, nurturing relationships and allowing people to re-establish contact if they miss some meeting points. The key lesson here is that if this is recognised early in the process then it can pay dividends in terms of building strong relationship. This can help the project overcome the inevitable difficulties that will occur, e.g. because a strong working relationship allows for a community to shift their attention elsewhere but then return to working on MAZI when they have time available later.

6.2 Recognising the importance of stories and storytelling

Like the importance of time spent with communities, stories are a valuable resource for revealing and contextualising the communities' needs. The language publics use reveals their hopes, desires and dreams of the community. This essentially is about understanding the context where the technology will be embedded. Each of the MAZI pilots to a greater or lesser extent spent time putting themselves in a position to hear their publics' stories and interpreting their significance. This enabled them to speak the language that their communities could understand, requiring the pilots to think critically about how the stories they were hearing spoke to the needs and motivations of their publics.

6.3 Designing collaborative activities

The 'participatory research' approach taken by MAZI has shown that shared activities break down inhibitions and create opportunities for conversation. Taking part in activities with the community increased the likelihood of the pilots having conversation. Depending on the size and composition of the community that the pilots were working with, more formal visual or participatory methods could be used in discussion sessions and workshops. One technique that was found to be particularly good at creating conversations was "community mapping". Community mapping encouraged participants to describe and illustrate the relationships and connections (formal and informal) that existed within a community. The creation of these maps acted as a catalyst or a prompt for conversations between participants and with project members. Moreover, taking part in such collaborative activities was reported to take away the stress from conversations and let the activities flow more naturally. The lesson offered here is therefore to design activities that allow collaboration between technical partners and communities to stop work in silos, build trust and break-down well-established assumptions.

6.4 Embracing opportunistic conversations

It was important for pilot teams to be open and not dogmatic in the conversations held with publics. Having an agenda created a structure for conversations and communicated pilots' professionalism and respect for their

publics. However, being prepared to relax or even let that agenda go so the conversations could flow in the direction publics chose was essential for revealing new understanding about a community. The decision of when conversations should be flexible enough to allow conversations to take an unexpected course and when the conversation should be refocused. This was a personal act of judgment by pilot team members in the specific situations, but it appears that the more time spent with a community the more the risk of misunderstanding the needs and wants of the community is reduced.

6.5 Adding value rather than adding work

Rarely did pilots report that their publics immediately saw the same benefits when they were initially faced with MAZI as a new approach. Different participants saw alternative possibilities, and the subsequent range of benefits was unevenly spread across a community. Recognition of such a disparity was important as the relationship between the pilots and their publics developed. By successfully addressing these disparities, trust could be enhanced. A shared language was essential for identifying benefits for the participants but being open to understanding that benefits to various communities was also essential for exploring the possibilities through new activities. This is also related to the novelty of the concept and understanding that there won't be uniformity in reception of the concept. Technical partners need to be prepared to face this disparity and manage expectations.

6.6 Understanding the location

Knowing the physical location improved the pilots' understanding of the context and motivations of the community. For example, taking part in guided walks with residents helped build an understanding of locations with significant meaning and the relationships publics held to different settings. In some instances, the changing physical and political environment was desirable, whereas in others it was something that the community was struggling to come to terms with.

6.7 Identifying key roles, guises and actors needed in the operationalisation of DIY

The roles people can adopt within a MAZI zone can change over time. This change can be either gradual or rapid depending on the circumstances. Different activities can also cast the same actors in different roles. Building relationships between the academic and community partners and between them and the community based on trust and transparency was essential for the MAZI pilots, so they could help their publics recognise, and indeed understand, the importance of such changes in the dynamics of a group. To facilitate this pilot demonstrated the importance of using mechanisms such as workshops and informal gathering set in locations that are familiar to the community being engaged.

6.8 Learning languages and vocabularies

The creation and construction of clear, mutual understandings required the shared understanding of learning languages and vocabularies. Using metaphors in keeping with the context of the engaged community, for example, helped. This required pilots to invest a lot of time to build mutual understandings of what was a productive and meaningful activity. The result was reciprocal relationships characterised by a shared understanding of a technology (i.e. DIY networking) and of a given context (e.g. mountain communities in Greece). Hence, understanding the context and establishing the shared (working) language is essential.

6.9 Respecting others' capital

It is vital to recognise that every individual and group brings something valuable and important to an activity. The ownership of both tangible and intangible assets must be recognised and respected throughout the relationship. On initial contact, finding ways to learn from your community is more important than finding

opportunities to educate your communities. Also having affiliation with a community partner and ambassadors can be an effective mechanism for gaining access to members of a local community.

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Appendix A: Results of Workshop with MAZI Pilots Exploring the Success and Challenges of Pilots' Key Activities

Below are the transcriptions of the 'memorable activities' chosen by MAZI project partners at the evaluation workshop, Volos, Greece (July 2018). In addition to the four pilot partner teams (Berlin, Creeknet, Kraftwerk1, UnMonastery) members of the UTH technical team were also present at the workshop and were invited to record reflections from their perspective.

Berlin pilot: Working with neighbourhood institutions with a constant special presence

Context: Deployment started out as a cooperation with the ASH and Berlin Pilot Team (BPT). One of the teachers of ASH is also a social worker in Kiezanker and closely connected to Berlin Kiez. They used MAZI as a research tool (Archive) and the interviews as activating tool (2017).

Interviews are featured in public events of the neighbourhood. The MAZI is integrated in several funding proposals as a locally owned, locally limited technology. The centre or specially the social worker we engaged with, serves as MAZI-Multiplier and connection point for the other people (two) working with MAZI.

In the centre only, the Archive has been used. With others, Next Cloud and photo upload has been used in a Mobil-MAZI or MAZI-Mobil (2018)

Methods: Contact came initially over another university. Common Grounds had had some previous contact.

More formal approach workshop format:

- Information Workshop and MAZI - Setup workshop with ASH - teachers and students
- Follow-up workshop and troubleshooting

Staying invested beyond the reach of MAZI

- Telephone "service - hotline" by Andreas
- Staying invested in process by turning up at student presentations and public presentations of results

Staying invested / access / building common agency / trust

- Common Grounds and Kiezanker + Bizim Kiez started collaborating in other activities. Analog network building or urban neighbourhood initiatives in coordination with borough administration. This strengthened the common ground or common agency and helped built trust
- Berlin-Pilot-Team (BPT) advised and gave support during the writing of funding proposals without having a monetary stake in the developed projects.
- Stayed in contact and upheld "service hotline"

Challenges: We developed a very early stage MAZI (version 1.6.5), which was still very buggy**.** The archive app was hard to use for iPhone and some students had problems with it. Some phones had bad microphones (or due to android versions) so the outcome of interviews was frustrating**.** Updating the 1.6.5 MAZI to 2.2.4 MAZI was not possible so BPT did this manually by transferring all the data to a new MAZI**.** The group felt "naked" with a lack of analog information and a physical artefact for the MAZI. This was produced and given to them in 2018.

Successes: The social worker was interacting with the tools on the MAZI whole heartedly and became a "pusher" of MAZI. The MAZI is alive and kicking after a long period of time. The discourse about decentralized, locally managed technology was adopted or integrated in their own narrative, also making a connection between the nature of MAZI and the ongoing conversation on tech-companies effect on gentrification in the neighbourhood. The Kiezanker is having new conversations with other people about MAZI serving as a small MAZI-hub on its own.

Berlin pilot: Organised community without constant physical presence - storytelling activity:

Context: MAZI zone version 1.8.5 was deployed in May 2017. A close affiliation with Chair for Urban Design (CUD) of the Technical University who were doing interviews around the Dragoner Areal. This material was presented in the "Plauiring - Garage" - a small garage servicing a base for the initiative. They used guestbook at 2 events and an archive for the interviews.

Methods:

Entering a known space

- We worked with two people imbedded in the initiative but close to Common Grounds and the MAZI Project.
- SUV has been part of the Neighborhood Academy and are close to the work we do.

Formal approach / building trust

- Members of SUV were part of the community outreach and co-creation process in 2017. Circulating the topic of technology without being explicit. Three rounds of workshops focusing on the topic of collective learning (2016).
- Unboxing Workshop (MAZI, 2017).
- We tried MAZI Sundays to try to bundle all questions (this did not work).
- "Service hotline"

Challenges: The main challenges were the lack of resources by the initiative and that they felt "valued" without analog information and a clear physical presence of MAZI. Another challenge was that the group didn't have a continuous physical presence at the space. They are not there regularly and therefore the local restraint of the MAZI was a problem that was easily solved.

Successes: The two events using guestbook were partly successful. The interest in the topic is there but the tool itself is not adequate. If they would be able to connect to their local MAZI remotely this tool would be interesting since there is no internet on the space and they would like a constant presence in the space

Creeknet pilot: Solar Roller - Southeastern London Community Energy - offline festival - insite in situ at events as demo of how to deploy MAZI

Context: Energy Coop raised funds to install solar panels on schools in Lewisham and Greenwich. It also hosts regular energy poverty cafes where local people collect information plus support about how to reduce costs and carbon footprint by changing suppliers and selecting green options. Also included in outreach and operational model for hire is a mobile solar array (1kmw/h) transported from event to exhibition on a vehicle trailer. In addition, LED lighting and 12v sound system.

MAZI Activation: MAZI toolkit used to build information system for mobile solar that would publish data stream of utility (lux/kw/h) vs energy stored and then utilised at event. This information is published on both the Internet website and local network. Supporting material, reference, manuals for use and log of use, images and interviews.

Challenges: Working outside; communicating the value; usability in the field (light levels) training for volunteers; integration with the existing technology.

Creeknet pilot: Babar Luck's Spaceship - musician - caustic – mystic – an example of working with an individual

Context: Babar has often attended SPC Wireless Wednesdays Workshops to learn about and improve his basic computer skills. He wanted to create a platform to take on tour that would allow audiences to view his music recordings and support him by purchasing CD's, he also invites messages and upload of images and bootlegs.

Paul Clayton helped Babar in set of tutorials and practice sessions to familiarise him with the toolkit and adoption for configuration. The Babar Luck Spaceship is now on tour and continues to evolve and grow in confidence.

Babar is part of a huge network of performers who work independently and below the poverty line but are determined to promote peace and harmony, critical thinking than challenge expectations. He is also willing to step further out of his relative comfort zone to meet new people and share knowledge. He identifies MAZI as a tool he can work with and promote. Other musicians have already contacted him to find out more.

Success: "He genuinely wants to help and show love for something he might not see the results of"

Challenge: His learning curve, digital literacies.

Creeknet pilot: REVERSO MAZI - an example of working with groups

Context: An invitation to collaborate with CSM resulted in a visit for 10 days to Sao Paulo in Brazil. In response to their proposal to share Archives, Photogrammetry and other network publishing tools we prepared a MAZI toolkit with pre-translated options and illustrative examples which were to be offered to groups in a package of hardware, Pi, Solar, Battery and software for each.

Distributed spaces: Occupied houses and favelas of Sao Paulo.

Activity: Daily visits to fresh community situations where introductions and explanations in Portuguese required patient and careful interaction. The outcome of each day was concentrated into the next (and backups) and translated. Each visit included a tour and introduction to the 'distributed space'.

Challenges**:** language / translation; travel / timetable; oversold expectations; under resources and misunderstood but lovely people. Reverso was immensely complex and challenging combination of all my skills and slamming but great fun.

Kraftwerk1 pilot: Kunstwerk1 in Pantoffelbar in order to enhance collective facilitation for participation

Context: The Pantoffelbar (slippers bar) is a common space, sometimes also open to the public with other events). The Mazizone is deployed as a hybrid tool, in order people can upload & download pictures but also the pictures are meant to be printed and added to the exhibition on the wall in the space. Some events around the exhibitions such as vernissage or walk-in happenings were organised. The hybrid exhibition was launched under the names of Kunstwerk1.1, 1.2, 1.3; Additionally an "Internet salon", with 2-3 times invitations was organised. But the interest faded out after this.

Challenges: Most challenging was mobilising people as many have busy lives and engage in other projects of Kraftwerk1 or civil society. This was not clear from the beginning. On the other hand people are used to critical critical thinking. So, this involves also coming up with something new, technological, as a Mazizone. Getting people familiar with no internet was an aim of the Mazi project and people in Krafwerk1 are interested in such approaches. On the same time in 2015 Wifi was installed in Kraftwerk1s common rooms and the portal/intranet started in 2016.

Success: Success depends also on the aim/purpose. A Survey in spring 2018 whether the hybrid exhibition should continue – resulted in a yes, but...! They wrote down their answers through the hybrid letter box. Whereas people expected more change in the exhibition the pilot team expected them to upload and contribute to the exhibition***.*** During the football world cup 2018 the next exhibition was uploaded pictures from last year's neighbourhood tournament, sharing a collective event in the common space; The tournament organisers on the same time provided a next cloud space in the internet with all the photos. The Pantoffelbar Mazizone is a permanent deployment for entertainment; pleasure; art; play; gathering and community building.

Kraftwerk1 pilot: INURA Warsaw

Context: Deploying INURA.zone, not talking much about MAZI. Extending the use of the zone through guided tours. The conference organisers offered 30 city tours in Warsaw. Later also in retreat. The Mazizone has become an archive for the INURA network for sharing pictures, papers, talks, reports etc.

Challenges: It were not the same people as in the Havana retreat. This meant to restart convincing people using it. Also, to keep the battery going with a solar panel in rainy days in order to keep the raspberry pi active on the tours was a challenge. The raspberry pi could be only in one tour at once but there were 6 parallel tours happening. Have people join editing minutes. People were short of time.

Success: Immediate upload of pics during the tours. At the end of the conference 19 persons uploaded pics from 25 (out of of 30 tours in total). People downloaded pics from previous INURA conferences we provided beforehand. Uploaded minutes. Success had mainly to do with participation of target groups in the action. Categories: simulation city tour; documentation/archive; exchange of documents; mobile.

Kraftwerk1 pilot: INURA Havana

Context: Using the MAZI zone for workshop, inspiration exchange in a conference***.*** Very interesting was the deployment in a completely internet-free environment in the South of Cuba. About 50 people attended and 20 made use of the MAZI zone***.*** The raspberry pi was in function 28 hours in 2 days – It was even deployed at the beach. MAZI zone was used with Etherpad for setting up collectively the programme and for uploading pics, presentations, docs.

Challenges: Convince people using it. People are super busy in the conference, but with the internet free environment for 2 days there was kind of a thrill in using the MAZI zone.

Successes: People were not on their email during the conference of 6 days. MAZI one became kind of an alternative to the Internet. Etherpad turned out to be very efficient in collectively setting up the programme of the conference retreat - people used it even to look up the programme - also at the beach where workshops were postponed people they were dispersedly hanging out could look up the changes. Categories: prioritisation of information; meeting/workshop simulation; exchange of documents (pics, reports, presentation); mobile.

UnMonastery Pilot (UnMonastery): Testlab - collaboration - long term success

Context: Internal Testlab system, storing documentation. Collaborative writing. Teaching the Testlab about the use of MAZI (indirect) by practice. Observational learning about how to build a toolkit for “Testlab” co-working, co-living.

Methods: Workshops - explanations early in the Testlab. Co-working sessions, 1to1 tutorials for extra help.

Challenges: Inside-outside issues. How much to see, share? Local - hyper-local. Integrations with existing infrastructures – externals. Needed more applications. Technical difficulties with adding these

Success: Great tool to improve collaboration between the group. Direct accessibility to tools and ways of working - this developed overtime. Navigation worked well

UnMonastery Pilot (UnMonastery): Platanos - most challenging - awareness intervention

Context: An instance of the guestbook in the framing of the “all knowing” Platanos Tree in the centre of the local community. Designed as a demonstration to take place during a local community event. Residents left messages on the public Guestbook using their own mobiles. Messages to the Tree/to visitors, statements.

Methods: Personal guidance by the Testlab researchers - for visibility. Choosing a busy day. Going out into the local community. Guestbook - easy to use. Further applications

Challenges: Technical challenges – small. People wanting to do things that were not possible. Small issues to do with actual use - tech. Showed potential barriers to use.

Success: Took some residents from background awareness to deeper engagement. Encouraged thinking about actual possibilities. Demo.

UnMonastery Pilot (UnMonastery): Tsepelovo Workshops - most successful - participation design

Context: To connect with residents - offer skillshare. To teach about networking. Bi-weekly workshops given by Testlab members to the local community. Explain the MAZI approach to explain the presence of the Testlab.

Methods: Having a neutral space to invite people to. A local coordinator to tell the residents about the events and invite the - local social media and posters. Feedback to Testlab a documenting the workshop in the local language. Iulia - writing reports. Documenting issues. Explanations & documentations of the toolkit. Hands-on. Leading discussions of how it could be used.

Challenges: Getting people committed to turning up. Fear of responsibility of managing the zone. Worries about the impacts to the local community. Commercial / economic worries from the residents. Uneven access. Tech/knowledge/education of the residents. Time - lack of (2.5 months)

Success: Nice to see the collaboration between the residents themselves - they mentioned this themselves. Success of the development of a mapping book/magazine project. 2 concrete projects were developed to a good level of completion. Archive task enabled links to be built between Testlab and residents.

UTH Technical team: Work Package 1:

Success: One of the success stories during the development process was the interaction between the development team and the users/communities and the continuous release of new versions that addressed real community challengers.

Git hub was the main platform for reporting issues which could be reviewed, commented by the development team or other users and build in this way an interactive relation.

In addition, after the first months of the project, the necessity of an automated update process was identified to allow users to follow the development process. This was one of the first important additions in the toolkit and worked successfully until the end of the project.

The usage of GitHub for reporting issues (except from uploading our code) and the automated update process with one click, enabled the real co-creation of the toolkit with its actual users and produced a social toolkit by communities for the communities.

Challenges – the captive portal story: The captive portal page is the first interaction of our users with the toolkit. It is the first page they see when they connect to the MAZI zone. This alone renders the page one of the most important in terms of design, content and ways of appearance. We have changed a few mechanisms before we ended up in the latest one, since there is not a standard software or way of implementing the functionality and so we should build it from scratch. After hearing lots of different views regarding the content of this page as well as regarding how much intrusive or not it should be.

The MAZI toolkit's captive portal functionality is still being improved to provide the best possible resolution.

Using an existing open-source mechanism with great features but not implemented to work with our other software without any adjustments. The challenge to adjust this mechanism to the "MAZI concept" technically as well as regarding its behaviour (intrusive or not) was and remains big.

Challenges – integration of sensor support: One of the pilots needed to sense the environment through their MAZI zone, except from using the other local applications of course. This required several sessions of discussions between the pilot and the dev team to understand the requirements and design the integration.

It resulted to a new great feature - support for on-demand sensors integration from users - that was not planned or described in the DoW, but helps a lot the specific pilot as well as other communities with similar needs.

Appendix B: Results of Survey on Objectives and Measures

Table 3: Partners response to a survey administered at the beginning of Year 3 asking pilots to confirm the status of their strategic goals, detailed objectives, key performance indicators, metrics, examples of positive outcomes, and examples of useful ways of measuring success.

	Neighbourhood Academy (UdK /CG)	CreekNet (OU/SPC)	Kraftwerk1 (NH/INURA)	UnMonastery (NU/UM)
Strategic goals	G1: Piloting MAZI in the bottom-up development of community-oriented spaces that link together social, cultural and ecological aspects of our urban life. G2: Explore how MAZI can foster the cross-fertilization of local initiatives G3: Locating local engagement and activism as spaces of learning G4: Explore how the use of DIY networks can trigger a discussion on Digital Rights to the City	G1:Enabling community groups along Deptford Creek to capture and share information about activities, local challenges, and generate discourse G2: Exploring the extent to which DIY networking technologies can facilitate this communication process G3: Investigating the value of adding local web-based services to the existing SPC wireless network G4: Playful exploration of current state of DIY networking tools and services currently available to understand potentials for implementation	G1: Support existing participatory process in Kraftwerk1/NeNa1 G2: Act as triangulators/ facilitators/ catalysts in collective awareness processes in Kraftwerk1 G3: Develop rules and guidelines for the use of the MAZI toolkit in social processes G4: Collectively produce knowledge on lessons learned from 20 years of Kraftwerk1 and from the first steps of NeNa1, to be used in different environments outside Switzerland. G5: Participate in the current development of an operational concept for future cooperative housing projects (NeNa1), including network and social infrastructures	G1: Exploring the extent to which DIY networking technologies can be relevant and useful to the work of unMonastery, particularly the contexts of "temporary communities", and working "alongside local communities to contribute towards the identification and dissolution of local social challenges". G2: Exploring the use and design of DIY technology toolkits, with a particular focus on collective and participatory activities. G3: Supporting the work of unMonastery in accordance with the unMonastery aims, in order to contribute to knowledge and understanding of this practice.
Detailed objectives	O1 (G1): Test how MAZI can be used to make information, networks and experiences in the Prinzessinnengarten and some of its users accessible to a broader audience in the garden and neighbourhood. O2 (G1): How can MAZI foster communication between different actors concerning specific spaces or neighbourhoods. O3 (G2): Other local initiatives become interested in MAZI and local DIY networks. 05 (G4): Initiatives cooperating in the project gain interest in the relationship between rights to the city and digital ownership.	O1: To understand whether MAZI fosters engagement and discourse around networked technologies and the role self-provisioning of networked technologies might play in overcoming local sustainability challenges O2: To see the extent to which information exchange is facilitated by groups self-publishing using the MAZI toolkit O3: To work with an environmental organisation to see how DIY tools can improve their collection of data and engagement with local schools	O1 (G1): Engage residents in interactions through the MAZI toolkit both inwardly (sharing information between residents) and outwardly (sharing knowledge with outsiders building new similar projects) O2 (G2): Organize events that bring together experts in cooperative housing projects with those interested in creating new projects in different contexts O3 (G3): Bootstrap the creation of a network of experts for translating Zurich's cooperative housing models for the Greek reality. O4 (G4): Include knowledge developed in MAZI at NeNa1's "operational concept" documents on	O1 (G1): To develop, through co-creation, scenarios of possible and potential use of DIY networking technologies within the unMonastery context. These scenarios are intended to reveal themes and understandings, rather than necessarily being practical or functionally realistic i.e. using critical/speculative design methodology. O2 (G2): To understand and articulate good practice and design recommendations for the development of participatory DIY technology toolkits. O3 (G3): To understand and articulate the

		O4: To understand the take-up and use of MAZI tools when incorporated into neighbourhood locations O5: To encourage the onward promotion of DIY networking and MAZI as an approach to self-provisioning of networked services O6: To engage with other MAZI pilots and consortium members and exchange best practice around DIY networking	technology for sustainable urban living O5 (G5): Explore the further development of the functionality of Kraftwerk1's Intranet platform in order to better understand the organization of the cooperative and the affinity to IT.	potential role of DIY networking for unMonastery, particularly in addressing local challenges.
Key performance indicators	KPI01 (O1): How often and how is the NAk MAZI used within the NAk KPI02 (O1): Do people outside the NAk-core (i.e. teachers, residencies, public) use or want to use the MAZI to collect/archive information? KPI03 (O1): Is the NAk MAZI being used as a tool for learning? KPI04 (O1): What do visitors of the Laube/ Prinzessinnengarden think about the presentation of Information from the MAZI? KPI05 (O2): What types of applications have been deployed? KPI06 (O3): Do other initiatives show an interest in MAZI? KPI07 (O3): Do other initiatives decide to deploy own MAZIs? KPI08: (O5): Are topics of digital rights to the city being discussed in cooperating initiatives?	KPI1: Are groups engaging with Creeknet during the pilot? KPI2: Are groups engaging in topics around ownership and control of their own networks? KPI3: Are groups trying a deployment of the MAZI toolkit after initial engagement? KPI4: Are groups independently adapting or promoting MAZI onwards?	KPI1 (O1): Participation of people in organized events and further engagement in related activities KPI2 (O1): Engagement of Kraftwerk1 residents in the MAZI zones deployed on the premises KPI3 (O2): Diversity and richness of information shared through hybrid interactions around the MAZI Zones. KPI4 (O2): Impact of MAZI activities on the overall quality of participatory processes KPI5 (): MAZI team's participation in related initiatives and working groups outside our project KPI6 (): Successful integration of MAZI concepts in NeNa1's operational concept documents. KPI7 (): Actions and events demonstrating the creation of a network of experts participating in the Greek project. KPI 8 (): Exploring the use of MAZIzones at INURA conferences in Bucharest, Havana and Warsaw including outreach to communities and groups.	KPI1 (O1): Publishing and presenting, through appropriate outlets (e.g. website, exhibition), clearly articulated and understandable scenarios that generate useful feedback. KPI2 (O2): Production and dissemination of knowledge on good practice in DIY technology toolkit design and participatory use. KPI3 (O3): Production of knowledge that is considered relevant and useful to the unMonastery communities.
Metrics	M1 (KPI01) - What MAZI applications are in use? M2 (KPI01) - How many administrators are taking care of the MAZI?	M1: How many groups have engaged with Creeknet during the pilot? M2: What kind of topics are discussed in	M1 (KPI01): Number of participants in events M2 (KPI02&3): Engagement ratio (how many people from those interacting with the pilot keep participating in	M1 (KPI01): The quality of feedback that is recorded in response to the developed scenarios. M2 (KPI02): Measurements of

	M4 (KPI01) - How is the mazi used by non-administrators? M5(KPI02): Number and role of different 'interviewers' M6(KPI02): Number of contributors of information (can also be just texts, photos etc.) M7 (KPI06): How many interested initiatives have contacted pilot-team for more information? M8 (KPI06): How many initiatives/org have participated in hands-on activities? M9 (KPI06): Number of people/initiatives taking part in WS M10 (KPI07): How many initiatives deploy own MAZIs	Creeknet conversations? M3: What do local groups think about being able to add their information to DIY self-publishing networks in and around the Deptford Creek area? M4: How many groups have tried a deployment of the MAZI toolkit? M5: Would people recommend MAZI toolkits to other people? M6: What changes (of any) have we noted as a result of MAZI in groups with which we have engaged?	similar actions and related communications) See D2.9 appendix P. Pantoffelbar Parkplatz? INURA Havana / University of Havana M3: Number of interactions during the MAZI Zone deployments (e.g., letterbox cards) M4: Survey the social acceptance of the MAZI technology and its role toward our strategic goals (participation and collective awareness) M5: Number of related events, working groups, networking activities outside the project, in which MAZI team organized or invited to participate M6: Dissemination activities (blog posts, tweets, articles, working documents) and their corresponding impact M7: The size and diversity of the network of experts being created around the knowledge transfer project.	"reach" of published resources on toolkit design. M3 (KPI03): Qualitative feedback from (unMonastery) individuals, gathered through interview and/or other methods.
Examples of positive outcomes	1. The NAk MAZI is an integral part of the NAk infrastructure. Coordinating team as well as "teachers" of the academy use it as a tool in their work. 2. Another initiative deploys a MAZI and uses it to communicate with the residents around their space. They use it as an information-tool and a broadcaster for their political struggle.	1. Evidence of debate around DIY networking with groups engaged 2. MAZIzones deployed on OWN nodes in the Deptford Creek area 3. Self-sustaining network of MAZI-toolkit users (e.g. shown by ongoing attendance at SPC Wireless-Wednesday tech drop-in meetings and evidence that members are both continuing to use MAZI-toolkits in their practices and peer-resolving issues) 4. Evidence of use of MAZI toolkit extending capacity of one or more groups who have participated in field trials, e.g. ability to self-publish, reaching out to new audiences, engaging new stakeholders/ policy-makers in debate around their challenges.	1. A MAZI Zone deployed at Kraftwerk1's "Pantoffelbar" attracts the attention of more than 20 residents whose contributions go beyond impersonal statements and generate dialogue and playful interactions. That is to be measured during the implementation between March-May 2018. 2. The concept of DIY networking becomes part of the narrative on NeNa1's visions of the use of technology. Until now, in the 'Koch mit' application booklet (2017 p.19) NeNa1 added the concept of cooperative use of IT, also in terms of shared software and storage space. Currently NetHood is promoting the use of the MAZI zones in the neighborhood for networking small shops. 3. A number of events are organized in Greece toward creating new groups and initiatives that wish to develop a novel cooperative	1. Internal to the project: Indicators and feedback from the unMonastery community that the pilot study work had value. 2. Internal to the project: Reflections on what was learned, and what could be changed or improved for the future, in order to build on the work. (A new BoM; use of the workbooks, revision of unMon toolkit) 3. External to the project: Published contributions to academic conferences and journals. 4. External to the project: Producing/publishing practical and theoretical resources based on the experiences and findings of the pilot study such as good practice guidelines, sets of principles, accessible case study reports, manifestos.

		5. Evidence of engaged MAZI participants promoting MAZI independently to other individuals/groups 6. Evidence of MAZI supporting participants in overcoming local challenges	housing model. The monthly meetings of the CoHab and Exarcheia Neighborhood Association. 4. Knowledge transfer on actitivites of the communities in workshops at INURA conferences. Deployment of the MAZI zones. Successful use of Etherpad in organising workshops, presentations and discussions in remote places of Romania and Cuba. Enhanced access to and use of documents, programme and photos in internetfree environments. INURA Warsaw: Demonstration of Mazizone in front of all participants. Everyday deployment of the Mazizone in full assembly as well on tours and in retreat See D2.9 appendix I, p.43	Examples: http://urbanixd.eu/documents-publications/

Appendix C: Bank of Case Studies Configured as Context Mechanism Outcome Configurations (CMOs)

The following activities are a sample of those that have been carried out by each of the MAZI pilots. The sample was selected by the partners when they contributed activities for consideration in the handbook and whilst attending a focus group during a MAZI project meeting.

Berlin pilot activities

'The MAZI Archives' (Berlin Pilot)

CMO: Context: NAK's desire to capture and share knowledge and discourse; Mechanism: Interview archive; Outcome: Knowledge made accessible and workable in support of a vivid civic discourse

The Neighborhood Academy (NAk) receives and works with individuals and initiatives whose encounters and conversations are fundamental to the body of content created by the Academy. The challenge lies in capturing and sharing the knowledge and discourses. A physical recording artefact was developed, helping create an interview scenario, and a digital application that provides the platform for the content (protocol, questions, tags, recorded answers) to be archived. NAk can engage in conversations to make knowledge accessible and workable, supporting a vivid civic discourse about socio-ecological transformation, urban and rural bonds, rights to the city and collective learning.

'Commons Evening School' (Berlin Pilot)

CMO: Context: Desire to activate neighborhood to imagine different, desirable futures for public land for future generations; Mechanism: MAZI zone + Archive + WordPress + Ethapad; Outcome: participatory development of knowledge

The Commons Evening School started in late 2017 to ensure the longevity of the Berlin-based Prinzessinnengarten (urban garden) as a space for collective, civic, and informal learning processes, open for and managed by neighbours. Within the format "Desire production: 99 years Prinzessinnengarten", the goal was to activate the neighbourhood to imagine different, desirable futures for this piece of public land for generations to come. A locally installed MAZI zone, serving as an archive and information point, in and through which all the activities were documented and presented. The WordPress module served as representative outlet of the initiative and different Etherpads for meetings. Communal storytelling, collective mapping and the participatory development of knowledge bases through public talks, research projects and other formats.

'Polylogue I' (D2.1) (Berlin Pilot)

CMO: Context: Desire to interact users with offline networks; Mechanism: Polylogue, workshops, open Wifi network, text messaging; Outcome: Space for thoughts, questions, claims and nonsense to stand next to each other

In parallel to the work of setting up and conceptualizing the pilot work, the UdK-Team started experimenting with different formats of designed interactions between users and offline networks. The pilot was invited to host a workshop at a media arts festival on the topic "off-the-cloud". An interactive installation and a hyperlocal message feed called Polylogue I created in Berlin as part of a MAZI pilot study. It operated through an open WiFi network, where users in reach of the wireless signal could send text messages, which get printed immediately on a paper roll from one box and then runs to another box, where the messages get shredded. The greater the number and the speed at which visitors contribute to the feed, the more short-lived a single message becomes. The Polylogue offered space for thoughts, questions, claims and nonsense to stand next to each other, contradicting or complementing through juxtaposition. Since its appearance it was showcased at a various international meetings and conferences.

'Keizanker' (Berlin Pilot)

CMO: Context: Centre fighting for tenants and small business owners rights; Mechanism: MAZI zone + interview archive tool; Outcome: Collection of viewpoints, anecdotes, stories, thick descriptions of socio-cultural ecosystem. Identification of a MAZI multiplier

The Neighborhood Centre Kiezanker ("neighbourhood anchor") in Kreuzberg, Berlin, closely linked to a tenant and neighbourhood initiative "Bizim Kiez, active in fighting for the rights not only of tenants but also small business owners. The centre is open to the public on most weekdays and is a place of gathering for families, language pupils, local initiatives, and interested publics. Staff members of the centre are professionally tied to the Alice-Salomon-Collage for social work and neighbourhood accompaniment. A MAZI zone was set up for a seminar in the collage, where the students used the MAZI-Archive tool to make interviews with neighbours on the question: "What constitutes the neighbourhood for you?" Use of the interview tool initiated a collection of viewpoints, anecdotes and stories of locals and visitors alike, showcasing a thick description of the neighbourhood as a culturally and socially rich ecosystem. These were subsequently featured in public events of the neighbourhood centre. The tools were also integrated into several funding proposals as a locally owned, spatially embedded technology. The centre and specifically one of the social workers became a MAZI-multiplier and connection point for other actors looking to integrate alternative approaches to network technology within their social work.

'Stadt von Unten' (D2.1&2) (Berlin Pilot)

CMO: Context: Initiative working on re-communalization and self-organisation of public space; Mechanism: MAZI + Guestbook; Outcome: Researchers & activists responding to residents ideas, wishes, fears and suggestions

Stadt von Unten, an initiative working in Berlin on the topic of re-communalization and self-organization. They are specifically invested in a space in the centre of Kreuzberg in Berlin. The space (so called Dragoner Areal), 4.7 acres of land, was owned by the German federal government and was set out to be sold to the highest bidder. The initiative took a definite stance against the privatization, arguing that the land had to be left in public hands to be used for 100% social, 100% payable, 100% rented and 100% public for housing and spaces of small businesses. The sale was stopped, and the land was given back to the city of Berlin. The borough of Kreuzberg declared it a development area (Sanierungsgebiet) with special mention towards social environmental protection (Milieuschutz). Since then, the Initiative Stadt von Unten (City from Below), has been opening up temporary spaces on the grounds of the Dragoner Areal to activate the surrounding neighborhood to take part in the imagining and planning for the space. A MAZI zones was set up in collaboration between researchers and activists, utilizing the guestbook application to serve as a blackboard for ideas, wishes, fears and questions of residents and other involved stakeholders to be shared and displayed towards a transparent and open, participatory planning process. Having the MAZI zone genberated a lot of excitement about using it in the family and neighborhood center for the purpose of meeting some of the local needs.

'National Museum of Natural History Berlin' (D2.2) (Berlin Pilot)

CMO: Context: Museum with an interest in engaging communities with scientific procedures and discourse; Mechanism: MAZI zone; Outcome: Visitors and scientists share anecdotes, stories and experiences

The project "Visitor participation at the Museum für Naturkunde" develops participatory processes and tools that involve different social communities into scientific processes and discourses. The participatory tools are meant to enable visitors to inform themselves about research at the museum and bring their own knowledge, thoughts and ideas to it. The goal was to create guidelines and recommendations obtained by the experiences during this project for the design of participatory processes with specialists and non-specialists at scientific institutions, and the use of participatory elements in public space. The MAZI toolkit was used to create an interactive installation that allows both visitors as well as scientific staff to share anecdotes, stories and experiences in relation to the exhibits on show in the museum. The installation was designed by Bianca Herlo and Fabrizio Lamoncha of Design Research Lab at Berlin University of the Arts. The project became an important preliminary to the planned rearrangement of exhibition halls and education facilities at the Museum für Naturkunde, as well as to further research of participatory projects in scientific processes and discourses.

'Lause 10' (Berlin Pilot)

CMO: Context: Plans for a Google startup campus politicized "rights to the city" and discussions around technology development; Mechanism: MAZI zone as an activist community wireless network; Outcome: Live streaming of events and broadcasting information to people outside of venues

Several urban activist initiatives have formed in the light of Google announcing to open a Start-up campus in a highly dense and already gentrified neighbourhood in Berlin-Kreuzberg. Their activities and the subsequent mobilization of neighbours have closely interlinked and politicized relationships between the topics of "right to the city" and relevant discussions around technology development. With curiosity and knowledge present in their own community, these activists appropriated and developed their own community wireless networks utilizing the MAZI platform. Activists were able to live streaming events to a larger audience not fitting in the venues, or broadcasting texts and other informational material to the public using a "MAZI-mobile" in the context of demonstrations.

Creeknet pilot activities

'Friends of Deptford Creek (FDC)' (D2.4; D2.5) (Creeknet Pilot)

CMO: Context: Boating community facing threats to mooring rights, with limited access to the Internet; Mechanism: MAZI zone; Outcomes: Members engaged in self-publishing, expressed an interest in the use of networked tools to collect, share and disseminate information amongst members to organise, and externally to promote their rights

FDC, a group representing the interests of a boating community in the Deptford Creek, London. Led by community activist and boat builder, who coordinates living and working amongst the houseboats, to maintain access to the water and promote mooring rights. Rapid redevelopment and a recent change of ownership threatened access to the boats. The rate of property development was also outrunning their capacity to respond and resist planning developments. Access to conventional internet connectivity and online services that might support this activity, however, was limited. Their goal was to enable the diverse community to come together, share information and resources, record their activities and present their case to the wider world. SPC attended FDC meetings and set up a MAZI zone for maintaining a collective memory and sharing and promoting resources. Active participants using tools demonstrated in MAZI toolkit via SPC's server to support group's activities, engaged with self-publishing. Active interest in using networked tools to collect, share, and disseminate information amongst members around these challenges, and to externally promote their rights. James (SPC) helped setup a website for the group (http://friends.deptfordcreek.net/).

'Pink Palace' (D2.5) (Creeknet Pilot

CMO: Context: Community centre in a social housing scheme wanting to increase sharing of information and knowledge among tenants; Mechanism: MAZI zone; Outcomes: Limited evidence of tenants using it as a community information exchange

The Pink Palace is a community centre in a social housing scheme, Crossfields Estate. SPC supports this organisation by supporting their internet infrastructure. There is a desire was to increase the level of information and knowledge sharing amongst the tenants. Installed V2.0 of MAZI toolkit. Limited evidence of its use was found with tenets starting to use it as a community information exchange.

'Chus Eto' (D2.5) (Creeknet Pilot)

CMO: Context: Request for help setting up a MAZI zone for Amazonian rural community; Mechanism: TranslateWiki and MAZI zone; Outcomes: Emphasised the need for easy access translation tools in the MAZI toolkit

The pilot received a request for MAZI zone for Amazonian rural community via Chus Eto, a Brazilian photographer, educator and activist Language support became an important issue for Creeknet. TranslateWiki had been adopted by the MAZI technical team for its ability to enable community sourced translations without coding expertise. The use of TranslateWiki was powerful for encouraging wider uptake and the importance of enabling easy translation processes for the MAZI toolkit.

'The Hoy Cafe and Steps' (D2.5) (Creeknet Pilot)

CMO: Context: Coordinated effort to reclaim an access to a river course; Mechanism: MAZI zone and local venue, collaboration between different groups and individuals; Outcomes: sharing of information, knowledge and triggering discourse about role local networking technologies might support local activities

Local café (The Hoy Café) owns a small strip of land and steps with access to Deptford Creek independent of largescale development. The cafe was being used as a base for MAZI-Mondays community engagement meetings. The goal was to engage not only visitors, but also locals, in considering Deptford Creek's geography from a different perspective, and to elicit associated local stories that could then be gathered and disseminated by a MAZI Zone in the vicinity. A MAZI zone was set up at the Hoy Café and James (SPC) coordinated a clean-up of the access to the Creek. The owner of the café was enthusiastic to engage with activities and gave access to the historic Hoy Steps. The clean-up of the Hoy Steps brought together different individuals and groups around a very hands-on yet analogue DIY networking activity. This acted as the bridging point for introducing how local networking technologies might support local activities, enabling contact between people who might otherwise not meet, sharing information and knowledge, and triggering discourse.

'MAZI-Monday Meet-ups on the Minesweeper' (D2.4&5, D3.2&6) (Creeknet Pilot)

CMO: Context: Community of artists living on a boat needing to raise awareness and funds to maintain their existence; Mechanism: MAZI-Monday meet-ups; Outcomes: conversations, stories and reminiscences of people, places and social and cultural events

A community of artists living and working on an ex-Navy wooden minesweeper boat with precarious mooring rights, aiming to raise funds to repair the boat, and offering access to a screen-printing studio and an art gallery. Hosting MAZI-Mondays: open access workshops were hosted to engage locals with the goals of the Creeknet pilot. Meetings on the boat raised several conversations, stories and reminiscences of people and places, social and cultural events. For example, it revealed that a long-term resident filmmaker had been capturing images over decades and had footage of former industries. It was also a catalyst for attracting the initial Deptford Creek MAZI enthusiasts. However, when the Minesweeper suffered a tragic fire it became uninhabitable and the focus of the community ended up shifting to survival.

'Collusion' (D2.6) (Creeknet Pilot)

CMO: Context: Busy schedules and the need to make use of time whilst travelling; Mechanism: MAZI zone; Outcomes: demonstrated value of collaborative authoring tools and autonomous offline networks

Lead community partner for MAZI (SPC) was also a participant in the 'Doomsday Blockchain' project commissioned as part of Collusion arts funding, UK. Because of busy schedules there was a desire to use travel time as efficiently as possible. SPC introduced the MAZI toolkit while on a train as a note taking device for this project's meetings. A temporary Workshop MAZI zone demonstrating the use of collaborative authoring tools, and emphasizing the value of autonomous, offline networks.

'Solar Roller' (D2.5, D3.4) (Creeknet Pilot)

CMO: Context: Promotion of mobile solar powered energy unit at festivals; Mechanism: MAZI zone powered by renewable energy; Outcomes: demonstrated value of offline networking tools for promotion in outdoor, autonomous powered scenarios

South East London Community Energy (SELCE) is an energy cooperative. SELCE raised funding to install solar panels on schools in Lewisham and Greenwich and hosts regular 'energy poverty cafes' to support residents' energy needs. It has an outreach and educational programme with a mobile 'Solar Roller' trailer, making a set of solar panels available to provide clear energy for park events and festivals. The Solar Roller also has a wireless router to provide internet access in the field. A MAZI Zone was customised and added to present Solar Roller-specific information, reporting on the solar panels' energy capture and usage, inviting comments and providing information about SELCE's energy cafes and other activities. The MAZI Zone, powered by the solar energy collected by the Solar Roller offers WiFi visitors a set of interaction options; a Guestbook, a Sensor monitor (connecting to the Solar Roller's systems), a Blog and Photo library. As the roller has travelled to different

locations and situations, it has enabled the SELCE team to collect a record of these events and record the progress of the project, as well as welcoming contributions from festival visitors.

'Babar Luck's Spaceship' (D2.6) (Creeknet Pilot)

CMO: Context: Portable promotion of musician's activities at events; Mechanism: MAZIzone and co-design process; Outcomes: Tool for distributing samples and publicising, change in methods for promotion; further interest in similar offering for other musicians

Babar Luck, a local musician in Deptford, London, home of the Creeknet MAZI pilot study, has been interested in finding ways of reaching out to his audience and promoting his music and philosophy while he is performing at festivals and in venues. Babar wanted to create a platform to take on his travels that would allow audiences the opportunity to leave messages, upload images and recordings of performances as well as make selections of his recorded music available to promote current products and advertise forthcoming gigs. Initially through the regular community drop in 'MAZI-Mondays' hosted at SPC, and then with individual training sessions, Babar worked with the Creeknet team to setup and customise a MAZI zone as "Babar Luck's Spaceship". Working with Babar emphasised the importance of giving people the time and space to explore what a MAZI zone might be, as well as providing training and support to give new users the confidence to take ownership of their own MAZI Zone. Babar's taken the Spaceship out to events, and other musicians have become interested and asked SPC to help them set up a similar MAZI zone to help them promote their musical activities. Four more musicians have now requested a MAZI zone.

Undercurrents gallery (D2.4&5, D3.3) (Creeknet Pilot)

CMO: Context: Archiving of events and arts in music and arts venue; Mechanism: MAZI zone, conversations in community setting; Outcomes: archive in public space, change in method for capturing and archiving records of events

The Birds Nest pub located at the end of Creekside functions as an international music and arts venue. The pub hosts live music and an art exhibition space named "Undercurrents Gallery" showcasing emergent, underground and more established visual artists. The Bird's Nest pub was interested to explore real time image and event publishing to a timeline blog, a custom captive web portal and publishing of event information. A MAZI zone hosting the Undercurrents gallery (Birds Nest), managed and run by a community participant with the support of SPC. Generation of initial interest and hosting a MAZI zone. Wider debates around DIY networking resonated with many of the participants and encouraged the setting up of an archive on the MAZI zone to capture memories, stories, images, and other media about the Minesweeper Collective's boat that burnt down.

'Karen Barnes' (D2.4&5) (Creeknet Pilot)

CMO: Context: Mobile promotion of art and engagement with public; Mechanism: MAZI zone with external sensor (camera), individual training sessions, MAZI-Mondays; Outcomes: exploration of MAZI zone with camera, skills and expertise gained by artist in digital archiving and self-publishing

Karen Barnes is local musician, artist and famous pinhole camera photographer. She regularly performs and exhibits her pinhole camera photography at the Undercurrents Gallery. Karen was interested in exploring the use of DIY networking to engage people with her art as she pushes her large camera obscura around the streets of Deptford. A portable MAZI toolkit was installed in her camera obscura. A camera was embedded into the obscura but due to changes in the status of the camera obscura engagement with the MAZI zone was minimal. Karen now maintains the MAZI zone in the Undercurrents Gallery.

'Wonky Prong' (D2.5) (Creeknet Pilot)

CMO: Context: Promotion of community gardening activities; Mechanism: Outdoor MAZI zone with external camera, individual training sessions, MAZI-Mondays; Outcomes: exploration of limits of offline networking in outdoor community setting, community engagement around wildlife image capture, skills and expertise gained by gardener; recognition of complexity of independent management of MAZI zone

Wonky Prong was a community gardening project that was in the Crossfields Estate, Deptford Deptford. The original intention was for Terry, the gardener, to use DIY networking to capture wildlife activity in the garden and share this with residents and those passing by. Terry was given training and encouragement to set up a MAZI zone in the community garden. In the end a MAZI zone could not be deployed permanently in this site because there wasn't access to power and internet, and there were concerns about theft. The MAZI toolkit was redeployed on the window ledge of Terry's flat to capture images of wildlife visiting a window ledge bird feeder. Terry reported using the toolkit to share the images with other residents, which opened up conversations about local wildlife.

'Central St. Martins' (D2.5&6, D3.4&12) (Creeknet Pilot)

CMO: Context: DIY networking to extend arts practices and education; Mechanism: MAZI zone customisations and camera, workshop training; collaborative design groups in community settings; Outcomes: Reimagined arts education, community archiving, social networking, organisational and normative change in working practice

Central St. Martins School of Art (CSM), London exploring how DIY networking might be employed in their practice. Collaboration with 3D design course. Exploration of supporting community knowledge sharing and photogrammetry. MAZI toolkit with SPC customisations (Berryboot, WordPress, Twine). integrating MAZI zones as virtual studios for students, connecting with Creeknet groups e.g. through working in Tidemill Gardens, introducing students to Babar Luck, political organisation of contract cleaners. Working with leaders of favelas (informal urban settlements) in São Paulo, Brazil to investigate if the MAZI toolkit camera could be used for photogrammetry (creation of 3D composite images from multiple 2D camera shots) and collection of community stories.

'MayDay Rooms' (D2.5&6) (Creeknet Pilot)

CMO: Context: social activist archive seeking autonomous tool for cataloguing and sharing knowledge; Mechanism: MAZI zone, individual training; Outcomes: exposure to DIY networking tools, unexpected appropriation (MAZI as archive tool), onward promotion of MAZI to other archivists.

MayDay Rooms, London community centre engaged in social action and archiving. Interested in setting up a catalogue of new acquisitions and archiving existing resources. SPC worked with archivist to prepare and populate MAZI zone Next Cloud documents repository with a set of collected archives. Resulted in the exploration of DIY networking tools, integrating MAZI zones as archive and cataloguing tool, promoting MAZI to other archivists. MayDay rooms have taken MAZI forwards as an archiving tool, and independently begun to work with 56aInfoShop, another social archive, using MAZI to help make their resources accessible.

'Stowage Films' (D2.6) (Creeknet Pilot)

CMO: Context: Archiving and display of image archive for local film maker; Mechanisms: MAZI zone, MAZI-Mondays, individual training; Outcomes: MAZI as an image archive, dissemination of community memory, training in digital archiving

Gordon Cooper, a retired film maker, has documented the Deptford Creek area in photos and film since the 1970s. Gordon is a long-term participant in SPC's Wireless Wednesdays. Gordon had a backlog of pictures that he wanted to share to make people aware of the changes that have occurred because of gentrification over the last 60 years. The use of a MAZI zone to archive Deptford images and films. Exploration of DIY networking tools, integrating MAZI zones as meeting self-publishing and promotional tool, connecting with range of Deptford Creek community groups through MAZI-Mondays.

'Tidemill Gardens' (D2.6) (Creeknet Pilot)

CMO: Context: DIY networking to provide a voice for protestors, archive of redeveloped space; Mechanisms: Community engagement, photo recording, photogrammetry, archiving; Outcomes: Failed social engagement, image archive, social networking

Occupation protestors offered a MAZI zone to tell their story and promote their cause. Rebuffed, people concerned about what MAZI is (the project). SPC later visited to collect images recordings of the gardens for

photogrammetry archiving with Central St. Martins. A local resident overlooking the Gardens has offered to host a MAZI zone as an archive. A MAZI zone to broadcast in the local area, stories and to promote the cause. While the DIY philosophies align, initial engagement was not successful, with protesters resistant to the idea of using a MAZI zone. There was suspicion about the motivations of the MAZI team and concern about MAZI's funding

'Creekside Discovery Centre' (D2.4, D2.5, D2.6) (Creeknet Pilot)

CMO: Context: Environmental centre seeking to extend engagement with visitors and enhance offering; Mechanisms: Customised MAZI zone with external sensors, training workshops, collaborative design; Outcomes: Environmental data collection system, extending local network, enhancing organisational offering, stimulating local debate

Creekside Discovery Centre (CDC) is a voice for nature conservation in the Deptford Creek area, inviting members of the community to find out more about the nearby river course and the surrounding area through low tide walks. They are keen to collect data about the changing conditions and find out if urban infrastructure projects are influencing the river and urban wildlife. MAZI partners worked with CDC to build and deploy a Raspberry Pi Zero based sensing system that collects river temperature through sensors and makes it available to CDC for onward distribution. This enables visitors to carry out data-based research projects; to stimulate community debate about local environmental conditions; and to inform conversations about the effects of the changing urban landscape. Enabling the data to be displayed through a MAZI zone has the promise to enable neighbourhood conversations around environmental data at a very local level, without the need for internet connections and maintaining control over how it is shared.

Kraftwerk1 pilot activities

'INURA conference' (Kraftwerk1 Pilot)

CMO: Context: Attending a conference without Internet; Mechanism: nomadic MAZI zone + Next Cloud + Ethapad + solar power bar; Outcome: sharing photos, documenting guided tours, creating an intimate and trusting environment

Attendance at three INURA conferences in Bucharest 2016, Havana 2017 and Warsaw 2018, Philipp Klaus, the secretary of INURA, proposed to make use of a 'nomadic' MAZI zone. Members are known to be sensitive with respect to sharing photos and documents online. MAZI zone with the use of NextCloud for file sharing and archiving, and Etherpad, to organize the retreat program and take collective notes during workshops etc. Including also an archive with material from previous INURA conferences like photos, slides, and documents. When possible, the Raspberry Pi was powered by a solar power bar. Only four out of the twenty-nine tours were not covered/documented, which is a big success considering the intense program and interestingness of activities. The nomadic character within the conference of the inura.zone, being used 'in the backpack' the MAZI zone provided for a more intimate and trusted environment, and the archive created on it will be accessible only during future conferences, giving participants another reason to be present in the INURA conferences

'Kunstwerk1 & Kunstwerk2' (Kraftwerk1 Pilot)

CMO: Context: Engaging residents in a housing cooperative; Mechanism: permanent MAZI zone + hybrid (digital & physical) letter box + Next Cloud + Guestbook; Outcome: use of MAZI as a simple digital representation as opposed to a complex set of applications

After a few months celebrating the past of Kraftwerk1, it was time to celebrate its future. The Kunstwerk2 is a follow-up version of the installation. After feedback from the participants the exhibition was refreshed to curate a series of exhibitions with photos under a specific relevant theme, and the MAZI Zone will play the role of a supporting digital layer. This MAZI Zone was designed and developed by INURA Zurich Institute and NetHood. It is permanently installed in Kraftwerk1's Pantoffelbar, a social space within a cooperative housing complex. It was initiated as a hybrid (digital and physical) exhibition of the early days of Kraftwerk1 (The Sofa University), inviting residents to contribute photos from later times, which would be then printed and influence the evolution of the physical exhibition. The hybrid exhibition implemented simply with a NextCloud folder for collecting photos, In

addition, a Guestbook is also available in the local network, which is mostly populated with photos and cards from the times that hybrid letterbox is installed. The new splash page of the Pantoffelbar local MAZI Zone invites now people directly to the Next Could photo sharing folder, made even more explicit through the chosen SSID and URL: gruempi.photos. The idea that a MAZI zone is literally a simple digital representation of the visible exhibition with more photos, and the possibility for upload instead of a more complex set of applications.

'Wunderkammer' (Kraftwerk1 Pilot)

CMO: Context: Open garden with no Internet; Mechanism: Hybrid letterbox + interview archive; Outcome: Collective awareness

The Wunderkammer MAZI zone was initiated through two real needs. The first was the framing of Wunderkammer, an open urban garden in the outskirts of Zurich, as a space for innovation and sustainability. The second, was the lack of Internet connection. In the first installations we experimented mostly with the Hybrid Letterbox - a physical posting box that transfers a handwritten message to a digital platform, so the issue can be spread effectively, and discussions can emerge around it - and the interview archive, an application for recording speech. Being a new "actor" in this area, Wunderkammer is very interested in creating collective awareness through playful and engaging approaches.

'L200 neighborhood space' (Kraftwerk1 Pilot)

CMO: Context: Neighborhood space on a very busy street in Zurich; Mechanism: permanent MAZI zone + Nexxt Cloud + Ethapad; Outcome: photo sharing, editing collective notes, passers-by post messages without guidance

L200 neighborhood space is located at Langstrasse 200, http://langstrasse200.ch, on one of the busiest and most urbane streets at the heart of Zurich. This recently created urban node has the potential to become the ideal placeholder for a wide variety of hybrid space experiments hosted on the permanent MAZI zone installed already, by the name "l200.digital". Having the same physical and online address is part of the design choices that express its hybrid identity. As a first use of the MAZI toolkit, the hybrid whiteboard is an application that is already facilitating the internal collaboration of the L200 members, including photo sharing (NextCloud) or for editing collective notes during or after events (Etherpad). The fact that the MAZI Zone is used as the offered Internet access for all guests, makes it much easier to engage them in "local" digital interactions. Also, the engagement of passers-by is facilitated by the accessibility to the street level through the large windows and the convivial atmosphere in the neighborhood. For instance, a short experiment displaying a local Etherpad page titled "playground" on the public screen, with information on how to connect, engaged quickly four-five strangers that wrote on the pad without our guidance. Such quick adoption without active encouragement has not been experienced in previous efforts during workshops or other events. In such a free environment, however, the need for moderation makes the maintenance of the street-facing part of L200.digital a real challenge, and this is ongoing work integrated in the overall design of L200 as a hybrid urban node.

'Hybrid poster' (Kraftwerk1 Pilot)

CMO: Context: Poster presentation at a conference; Mechanism: hybrid poster + projecting photos from the conference + Next Cloud; Outcome: people uploaded photos and considered it to be an interesting innovative approach

NetHood team attending a conference towards the start of the MAZI project. The first MAZI Zone deployed by the NetHood team (Ileana Apostol and Panayotis Antoniadis) was a hybrid poster on MAZI's interdisciplinarity framework. The poster was "hybrid" in the sense that it included a projection of a collection of photos taken (and directly uploaded to the MAZI Zone) through the conference, and of course the Raspberry Pi hanging next to it. People found interesting this innovative installation for a poster session and listened carefully to the idea behind the MAZI toolkit, and its potential role as a "boundary object" in interdisciplinary and transdisciplinary research. They even uploaded some photos to the NextCloud folder for the event, under our guidance. To make the MAZI Zone more interesting we were uploading photos throughout the event, and when there were no people next to our poster, we were projecting a slideshow of recently taken photos.

UnMonastery pilot activities

'The Room: An Analogue Zone' (D3.8) (UnMonastery Pilot)

CMO: Context: Constantly changing UnMonastery team wanting to build trust with residents and address local issues; Mechanism: use of a MAZI zone as an autoethnographic tool + use of a room as a walk-in MAZI; Outcome: making the invisible visible generated trust and appreciation for the hard work carried out

The unMonastery group has been working with a small local community in a rural area of continental Greece for two years. A small, although constantly changing team has been returning to the local community of Kokkinopilos and engaging in multi-dimensional relationship building and collaborative planning. Our primary goal was to build trust and lasting relationships with the local community, and in exchange for the use of one of their many empty buildings, contribute to addressing some of the issues the local community shared with us. We ended up using the MAZI Toolkit as an auto-ethnographic tool, which respects data protection and privacy concerns by storing all information on a local network, while allowing for a visibility of our work in progress - however, in Kokkinopilos, a small Raspberry Pi did not make our work visible. To engage with the community, we decided to transform our workroom into a walk-in analogue MAZI Zone - a physical place to collate people's thoughts and local knowledge. We marked the walls with the various projects we were planning to do (on the MAZI Zone) and invited people from the local community to come and contribute. This move made our work both visible and comprehensible in the local community. Our reputation as hard workers rose, as people who did come could see what we were doing, making what was a hidden workplace into a comfortable walk-in archive (with a kettle and a sofa). We had stories, photos, comments and notes stuck on the wall, under different headings. We turned a rotting blackboard into a hand-made local map (painted it white first and drew the area) and added points manually. It was extremely satisfying to work in this way, and we found it much easier to explain what we were doing to our local 'supporters'.

'Tsepelovo Infopoint' (UnMonastery Pilot)

CMO: Context: Remote community in Greece dependent on income from tourism; Mechanism: workshops + MAZI zone; Outcome: provision of an information point for tourists explaining about local notions of hospitality, location of landmarks, trekking trials etc.

Tsepelovo is a mountainous community located in Northern Greece where nowadays the sustainability of the inhabitants depends mostly on tourism. Whilst staying in the local community the UnMonastery group organised a series of MAZI workshops and a 'Tsepelovo infopoint' was one of the projects developed during these collaborative sessions. The residents decided that a local network could help to share information with visitors and create a shared resource for the community. A MAZI zone holding information hoped to serve as means of assisting the permanent residents in the community who are in direct contact with, and facilitators to those visitors and update (eksynxronisi) pre-existing traditional notions of hospitality. Located in the municipality office at the centre of the local community the MAZI toolkit was customised to include a map with key landmarks and local businesses in the community. The InfoPoint also includes information on six trekking trails that start and end in Tsepelovo, a brief history of the community and the wider region and a space for news about local events and activities

'The Platanos Tree' (UnMonastery Pilot)

CMO: Context: Engaging a remote rural community in Greece with the idea of using technology in a community context; Mechanism: MAZI zone + Guest Book + Posters + meeting point in a community square; Outcome: uploading images, awareness of collective decision making and decentralized democracy

This MAZI Zone installation took place in Tsepelovo, a mountain community in northern Greece during a residential MAZI pilot study visit by the unMonastery group. From discussions during workshops, the idea of the "Platanos" emerged as an idea to raise awareness of the technological possibilities of the MAZI Zones, and to try out the technology in-situ. The plane tree, or platanos in Greek is a permanent feature of many community squares, called the "plateia", in mainland Greece. The squares often include the community church and a water spring, and so the shade of the platanos provides a focal point for gatherings. People say that if the platanos

could speak it could tell you everything about the community. It was decided to build a MAZI Zone around this concept in the main square of Tsepelovo during a public gathering, based around one of the applications of the MAZI toolkit; the Guestbook application. The Platanos installation enabled visitors to leave the Platanos tree a message during the gathering so that others could log in and see it. The installation was programmed and built and uploaded to the Raspberry Pi during a process of collaborative learning about the technical aspects of the toolkit itself. Although the Guestbook was chosen to be simple to understand and interact with, there were some deeper ideas influencing the overall concept to a certain extent, including ideas around collective decision making and decentralised democracy. Residents could upload an image and type a short text message using their own mobile devices. The presence of the MAZI Zone was promoted with posters around the community. The impression gained during the event was that people did enjoy the experience and the provocative nature of the concept opened opportunities for discussions about possibilities for the use of this type of technology in the community context.

'Tsouflidis Archive' (UnMonastery Pilot)

CMO: Context: Creating digital versions of the of archives from a local cultural association accessible to locals and visitors; Mechanism: MAZ| zone + archive of photos + downloadable version of local magazine; Outcome: Photos were uploaded, the MAZI zone became a permanent feature accessible from anywhere in the community square

Most villages in Greece have a local cultural association run by volunteers and collectively funded by residents. Theses associations hold a rich resource of stories, anecdotes, recipes and images of local culture and history from the past to the present day. Unmonastery set up a MAZI zone to host a digital version of part of archive collected by the Tsepelvo's cultural club that would be accessible to locals and visitors. The archive included hundreds of photographs and the downloadable issues of the magazine "En Tsepelovo" published by the club three or four times a year. The first version was exhibited in the local gallery which had remained closed for many years. Many people brought photographs from their personal collections to upload to the catalogue. The zone is placed in a building belonging to the cultural association and accessible from anywhere in the community square.

'A community hub for the common good' (UnMonastery Pilot)

CMO: Context: Turning a house into a community hub for people serving the local community; Mechanism: MAZI zone in English and French + WordPress + Ethapad + iframe; Outcome, communal storytelling through the sharing of information about the house and projects.

Turning a community hub into a house serving the common good, for organisations working on the common good, while serving the local community. An association is in the process of being formed to bring together all individuals and organisations who are interested in taking part of the project. The plan is to map the social, entrepreneurial, cultural and communal characteristics of the local community, and develop concrete plans how the house can play an active role in the life of Coulanges, as a physical space (community house, co-working space, open living room) and as a hub for visitors, connected to interesting initiative throughout Europe. The MAZI zone that we built for the house is in two languages - French and English - and provides information about the building, about the project, and allows communal storytelling using the Etherpad application. We even made a recipe book, since the ideas is to offer the place for close-knit communities who cook and eat together. One special feature we used here is to use iframe to make the Etherpad editable and readable in the WordPress environment, so people don't need to leave the familiar interface of WordPress to add to the documents.

'The HTML Game Demo' (UnMonastery Pilot)

CMO: Context: An exhibition and educational show to engage audiences with DIY technology; Mechanism: MAZI zone + WordPress + HTML game + physical QR code + smartphone; Outcome: people could engage with very little instruction and this led to discussions about how the game was hosted and the use of MAZI

WordPress website was created and hosted on the MAZI Zone, providing a link to a simple "Flappy Birds" game, written in HTML. The interaction was kept very straightforward, just tapping on the touchscreen to fly the bird through obstacles. This meant that people could interact with very little instruction. The game was presented at exhibitions and educational demos to invite audiences, especially children, to interact and engage with the

technology. A smartphone was provided so that it was easy for visitors to try out the game straight away. This then led to discussions about how the game was hosted on the zone, and how people could access the game via the WiFi network through the browser on their own smartphone. A physical QR code was provided so that people could navigate straight to the MAZI Zone website to play the game. This MAZI Zone was built at Edinburgh Napier University.

'Network Roulette' (UnMonastery Pilot)

CMO: Context: An exhibition and educational show engaging audiences with DIY technology; Mechanism: 3 x MAZI zone + physical QR code; Outcome: people get to experience navigating wireless networks

Network Roulette is a game-based exhibition installation developed at Edinburgh Napier University based on the MAZI toolkit. Each Raspberry Pi in the installation is a unique, individual WIFI network zone, providing access to the media stored upon it. The piece consists of three Raspberry Pis, firstly a 'master' element, the white unit, that manages the users' access to a WiFi network via their mobile phones or other personal devices. Once connected, the white unit serves a web page, built in HTML, to the user's phone. The second and third units, red and black, are independent WiFi zones with their own data storage for media files. This media can only be accessed when the user is connected to the respective unit's WiFi zone. To interact with the installation, the user must connect to the white unit's WiFi network and navigate the browser to the URL: http://10.0.01. This can be achieved either by typing the URL into the mobile browser bar or by scanning the QR code provided as part of the installation. Once the user has successfully connected to the first network (white), the user's phone displays a roulette wheel game consisting of red and black segments. As a result of spinning the wheel, the white unit will randomly connect the user's device to either the red or the black unit's network. Each of these networks contains a gallery of different images that reflect either a red or black theme. In addition, each plays a related piece of music that is streamed to the user's device via the local network. Once the users have viewed the images and listened to the music, they can disconnect from the specific network and return to the original roulette wheel game to spin again.