Designing and Building communIT

Carlos, CA, Henrique Araujo de Aguiar
Cornell University
ca449@cornell.edu

Keith, KG, Green
Cornell University
keg95@cornell.edu

Gilly, GL, Leshed
Cornell University
gl87@cornell.edu

Trevor, TP, Pinch
Cornell University
tjp2@cornell.edu

Kevin, KG, Guo
Cornell University
kg344@cornell.edu

Yeolim, YJ, Jo
Cornell University
yj248@cornell.edu

ABSTRACT

Many subgroups in the US remain marginalized from, misunderstood by, or invisible to the larger communities they reside in. Technologies supporting community building, more generally, have focused on apps, but these apps can fall short of making visible and heard subgroups such as the LGTBQ+, immigrant, and black populations. In response to this shortcoming, we report on the design iterations and an early evaluation of communIT—an interactive artifact for making visible and heard subgroups towards building community. To inform the design of communIT, we conducted in our lab a design studio study (N=57), a co-design activity with a to-scale prototype (N= 12), and a co-design activity with a full-scale prototype (N=28). This paper offers a design exemplar of a large-scale, cyber-physical artifact that might support groups in shaping their identities, practices, and roles in the larger community.

CCS CONCEPTS

• **Human-centered computing** → Interaction design; Human computer interaction (HCI); Interaction devices; • **Hardware** → Emerging technologies.

KEYWORDS

Media architecture, Architectural robotics, Responsive environments, Cyber-physical systems

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1 INTRODUCTION

Local communities face daunting social, cultural, technological, and organizational challenges. In many local communities, subgroups such as the LGTBQ+, immigrant, refugee, and black populations are marginalized from, misunderstood by, or invisible to the mainstream of their larger, local community [45]. Heightened social mobilization around racial and sexual discrimination are indicative of a polarized society; as much as ever, subgroups need support in getting their voices heard by and ideas expressed in the larger community. In this context, we ask: How can an interactive cyber-physical artifact support marginalized, misunderstood, or invisible subgroups generate media and make this media visible and "heard" in the larger community? The literature elucidates this question.

Within the design and HCI community, prior projects on how artifacts participate on community building have primarily focused on the development and evaluation of software and apps, mostly for smartphones and screens installed in public spaces. A relevant example is CRM [1, 34], a system composed of a mobile app and information kiosk that helps homeless people to cope with several difficulties in a public shelter. Le Dantec [1, 34] points that CRM changed the existent socio-material relation in the shelter, reshaping the practice and dynamics of the staff and the residents. Such an effect renders CRM an empirical example of Latour's object-oriented democracy concept. The Cycle Atlanta [33] app is another significant example of an artifact that participates in community engagement. Bike riders use the app to input their trajectory and report issues on cycling infrastructure. The app participates in changing the relation between bike riders and the city administrators: the data generated by the collection of users is used by city administrator as a guide for infrastructure intervention. Besides CRM and Cycle Atlanta, other relevant examples are Memarovic's public display [37] stimulating social engagement among urbanites; numerous other displays situated in public spaces and used for community purpose (e.g. [3, 38, 54]) and civic engagement (e.g. [19, 52, 58, 59]); and media facades (e.g. [18, 62]) affording coordination and engagement of groups.

But while the examples above investigated the intersection between interactive technology and community engagement, they focus primarily on software and app for two-dimensional large screens on smartphones [17], kiosks [10, 15], and building facades [27]. communIT take inspiration from the collection of projects presented above, especially CRM system and Cycle Atlanta. Where we differ, however, is in the kind of artifact—a cyber-physical, architectural installation—given the lack of research on how such artifacts might support subgroups to create and share media within the larger community.

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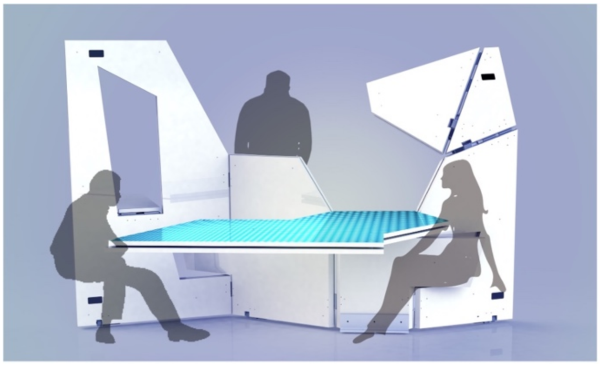

Figure 1: communIT's latest design iteration.

To begin responding the question above, this paper presents the design iterations and an early evaluation of communIT, a cyber-physical environment for building community. The aim of communIT is to serve as a platform for subgroups of local communities to create and exhibit the products of this creation as a means of sharing with and building the larger community. communIT is an exemplar of "media architecture," [11, 22, 24, 39, 40, 44, 46] meticulously designed, interactive environments—from furniture scale to urban infrastructures—supporting and augmenting human activity, serving what Malcom McCullough identifies as "our basic human need for getting into place" [39]. Within libraries, community centers and other civic places (outdoor and indoor), we envision communIT cultivating, in William Mitchell's words, "fresh relationships, processes, and patterns that have the social and cultural qualities we seek for the twenty first century" [41]. (Figure 1).

2 DESIGNING COMMUNIT

2.1 Design Phase 1: The Elements of CommunIT

What are communIT's key design feature to support community members in creating and sharing content with the larger community? To explore this question, we examined existing interactive artifacts that we believe were close to what we envisioned about communIT, and draw three key design considerations that informed our design [42]. The first design consideration relates to the artifact's form and physicality/spatiality. Most of the research on existing artifacts includes non-buildings, such as urban furniture [43], architectural follies [20], large-scale screens [36], and large-scale installations [25]. Some of these artifacts are physically reconfigurable [20, 23, 25]. Also, these artifacts are installed in public and semi-public spaces, both outdoors [25, 36, 43] and indoors [28]. The second consideration is the selection and placement of analog and digital peripherals on this superstructure. Existing cyber-physical artifacts often include embedded speakers and displays [14, 25, 36]. Third, designers consider the activities and interactions people engage in when interacting with these artifacts. The two primary activities that are typically supported or augmented by these artifacts are playing [25] and creating and sharing media content [53].

We considered and explored these three design features throughout three design phases. In Design Phase 1, we further explored the elements that would comprise of this interactive artifact. In Design Phase 2, we investigated the ways in which communIT could shape the space, how people would occupy such space, and what kind of activities they would carry out. Lastly, in Design Phase 3, we explored the placement of IT elements onto the artifact's super-structure, and further examined the relationship between the artifact's physical configuration, its spatial arrangement and the activities caried out. We used physical models in the design exploration in all three design phases [57].

To approach communIT design, we used Archer's [6] traditional design thinking process widely used in architecture [5], planning [49], art [21] and HCI [64]. This systematic design process involves the iterative dialog among four fundamental tasks: problem analysis, solution synthesis, presenting, and testing [29, 63, 64]. For Design Phase 1 we conducted a design studio with architectural students. For Design Phase 2, we utilized CoDAS [26]—a variation of co-design method [8, 9, 30, 50] that relies on scaled props for collaboratively designing. Lastly, for Design Phase 3, we did a full-scale co-design activity.

2.1.1 Early Study 1: Early conceptualization in the design Studio. Seeking multiple and heterogeneous responses to the design problem, we conducted a design study in which we recruited 57 students (35 female, 22 male) from Clemson University, to design (individually) their own visions of communIT. We presented to participants the three key design considerations outlined above: the physical shape of their artifact, the placement of its electronic hardware, and the activities users would engage in. A member of our team then articulated to participants the design task: design an IT-embedded, non-building artifact at a large scale for a public space that brings people together, with the following three constraints:

- Constraint-1: Support three activities: (1) creating and sharing media content, (2) playing, and (3) a third activity of their choice that they envision for the artifact.
- Constraint-2: Embed IT components in the artifact.
- Constraint-3: Enable physical reconfiguration of the artifact to support human activity.

2.1.2 Study 1: Findings. Data included the designs produced by participants, and their explanations and rationales for the designs they produced. We analyzed and categorized the designs, finding two predominant architectural typologies [42]: blocks and partitions (Figure 2). For the block typology, one participant described that "each [block] of my design can be pulled apart into several differently shaped forms." For the partition typology, another participant described "wall-like [partitions] that define and separate spaces."

Most of designs generated by participants had elements that included a wall, a bench, a table and a canopy. Many designs afforded physical reconfiguration of the space, although few choose not to do so despite the requirement (Constraint-3). In the designs that did reconfigure, physical reconfiguring involved rotation, sliding, hinging and folding. Many participants expressed enthusiasm about the physical transformation of the spaces afforded by their design, as expressed by one student: "A transformable space seems

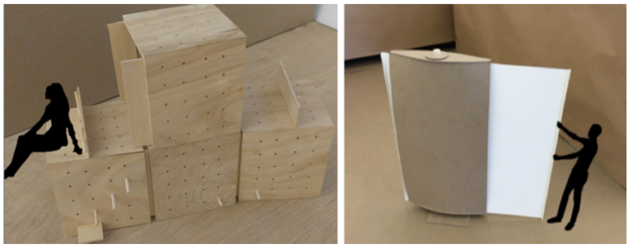

Figure 2: Design that came out of Study 1 fell into one of two typologies: blocks (left) and partitions (right).

more intriguing than a static one because it gives users a choice." Another participant remarked on "opening each flap, and changing the landscape and function of the place while discovering different uses. The space you saw yesterday may be a different one today."

Similar to previous work [53], some participants suggested that communIT could be used to create and share content: "People could use this space to study, work and share ideas with others. We could, for instance, share a video about a project we created." Participants suggested that communIT could be used to support socializing [20] and leisure [16]; as one participant described: "By having my object on site, people will be encouraged to stop and socialize rather than just going through the area. I would like to see it as a dynamic, social space where people meet and spend some time together."

In addition to audio systems [43] and displays [36], included in similar systems in previous work, IT embedded in the designs produced by students included the Internet [56] and ambient lights [25].

2.1.3 Design Iteration 1. Informed by these findings, we refined Constraints 1 and 2, and added Constraint-4 for exploring the design of communIT:

- Constraint-1: Support for four activities: (1) creating and sharing media content, (2) playing, and (3) socializing, and (4) leisure/relaxation.
- Constraint-2: Embed IT components in the artifacts, including displays, audio systems, Internet, and ambient lighting.
- Constraint-3: Enable physical reconfiguration of the artifact to support human activity.
- Constraint-4: Consider two typologies: blocks and partition.

In the research team, we explored different candidate design concepts, one for each of the two typologies (Figures 3). Both our partition and block designs included movable aspects that fold and rotate, transforming the space and consequently, the kind of activities community members might perform. Through puzzle-making and problem-solving dialog [5] in the team, we gathered the key design features of an environment augmented with IT, and constructed an early understanding of the physical form and "volumetry" of this artifact.

2.2 Design Phase 2: Space, Occupation, and Activities

2.2.1 Study 2: Co-design with small scale props. Our two early designs from the first design iteration led the team to further define the problem space and especially the relationship between the physical space and the location of people's activities: How do people occupy the environment made by communIT? How can communIT support their activities?

To explore these questions, we conducted a co-design study with 12 students (6 female, 6 male) at Cornell University. In the co-design activity, participants worked with designers to physically organize design elements for communIT within an existing public space, and to envision the activities carried out with the artifact in this space. We used small-scale props made of cardboard to stimulate and engage participants in the co-design process (Figure 4). The props were representations of the key design elements recurring in the designs by participants in Study 1: screens, speakers, walls, benches, tables and canopies, as well as human figures. We constructed a scale model of a local public space to contextualize the physical site for the artifact.

Each co-design session took approximately 30 minutes and involved one participant and one designer from the team. We asked each participant to select an activity envisioned for such place (e.g. sharing content, playing, etc.). Then, the participant and the designer organized the small-scale props within the to-scale physical site model to support that activity. For instance, the co-designers would select the props co-designers believed necessary for the task, placed them within the site model, and manipulated the props to achieve the desired configuration (e.g. rotating, combining, and/or clustering them; see Figure 5).

During the session, the designer and student engaged in a conversation, captured via audio-recording. We also photographed the developing designs throughout the activity at instances where there was visible change. Additionally, we conducted a semi-structured interview asking participants to explain their designs.

2.2.2 Study 2: Analysis and Findings. The co-design study yielded 15 different design candidates. We analyzed these designs looking for possible indications about the physical organization and affordances of communIT. All 15 designs proposed multiple activities, and all divided the space in the physical site into micro-spaces, each matching an activity it supported or augmented.

These micro-spaces were created using various combinations of the small-scaled props (Figure 6). We found that each micro-space had different attributes, such as ambiance and levels of permeability and privacy. For instance, micro-spaces designed for group activities were bigger and with fewer physical boundaries compared to those designed for individual activities (Figure 7). One participant described the individual micro-space shown in Figure 7 (left): "I imagine this as a quiet, confined place, with these elements [canopy, wall] blocking direct contact and giving some privacy." On the other hand, the group micro-space in Figure 7 (right) was described by another participant as "a fluid, semi-fixed structure, not well defined. . .to allow more people to get in."

Some participants were especially thoughtful about the location and proximity of the micro-spaces they created. For instance, one micro-space designed to support "studying" was positioned close to another one designed for "working," but far from a third micro-space created for "playing." When asked about the potential of their designs for creating community engagement, many participants seemed positive; for instance, one participant envisioned people

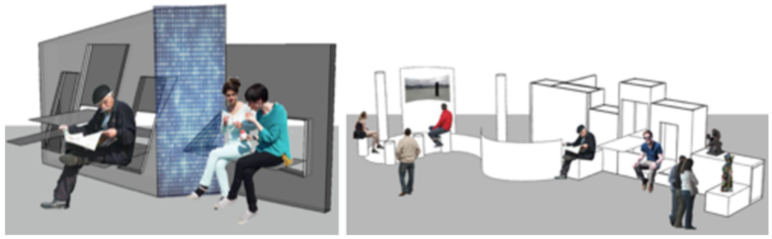

Figure 3: Design Iteration 1: partitions (left) and blocks (right).

Figure 4: Small-scale props for co-design, Study 1.

"getting connected with the [artifact] and with what others are doing within [it]."Another participant offered: "the interaction would spring from the setting because of the installation: the screens and the interactive ceiling would create an inviting atmosphere for socialization. The interactive lights work as a portal, where people enter in the social mode." These accounts reflect the co-designers' hypothesis that communIT would attract people and foment social interactions which, to us, implies community engagement within the physical space.

In sum, Study 2 yielded additional information about the physical constitution and arrangement of the cyber-physical space, and its correlation with certain activities people envision engaging in. We did not, however, find evidence of relationship between each activity and the IT elements within each micro-space. This suggested that the same IT elements could be reused to support multiple activities.

2.2.3 Design Ideation 2. We used the findings of Study 2 to once again refine our design constraints, this time adding a fifth constraint:

- Constraint-5: Create micro-spaces and consider how they support the activities.

Following our new list of constraints, the team engaged again in our own design of communIT. Our goals in this iteration were to (1) further investigate the physical form of communIT and the affordances of each of its configurations; and, (2) explore the creation of various micro-spaces and the location of the IT elements within them. We engaged in exploring different combinations of positioning, combining, and clustering of the different props to yield micro-spaces that matched the human activity envisioned for the artifact.

At this stage, we took inspiration from origami and its variant kirigami—origami that, as a rule, allows for folding and cutting along the lines of the folds. We explored how kirigami changes the affordances of the artifact to create various micro-spaces. Figures 8 and 9 show some of our design explorations of the block and partition typologies using kirigami; for the block concept, we pulled apart the resulting kirigami to create the blocks.

We critically reviewed both candidate designs, being mindful of the design constraints and the core objective of community building, and chose the partition concept following the rules of kirigami to further iterate. Two key shortcomings of the block design were: (1) its relative incapacity to readily define micro-space boundaries; and (2) its relative incapacity to create micro-spaces using a limited number of blocks. Two key strengths of the partition design using kirigami were: (1) its economy in making micro-spaces—one plane, when folded, can accomplish much of what we sought in a configurable design; and (2) its capacity to serve as, at once, a functional and a sculptural artifact that may prove enticing to those encountering it.

2.3 Design Phase 3: The Artifact's Physical Configuration, and the Spatial Positioning of IT and Activities

2.3.1 Study 3: Co-design with full-scale prototype. Next, we aimed to understand possible configurations of the prototype, including folding and positioning of analog and digital hardware, and the activities these configurations afforded.

At this stage, we fabricated a full-scale communIT wooden prototype (Figure 10), and the analog and IT peripherals were likewise full scale; to allow quick mounting and unmounting of larger, more cumbersome, or otherwise costly peripherals (e.g., a large display), we used a printed image of the peripheral mounted to a rigid, lightweight panel. Peripherals included displays, speakers, lights, and even coat hooks and clocks. Altogether, we included multiples of 15 different peripherals to locate on the prototype superstructure. We used Velcro for quick attachment of peripherals.

We recruited 28 students (18 female, 10 male) from Cornell University to participate in fifteen 30-minute sessions, with two participants per session. We positioned the prototype in a public outdoor space of the Cornell campus for the study. Given weather conditions, we moved the prototype to an indoor public space for about half of the sessions. At the session, we introduced participants to the prototype and the peripherals and asked them to: (a) physically manipulate the prototype's moving panels, determining the ideal physical configuration to support a specific activity (e.g. sharing content); (b) attach the peripherals onto the prototype's surfaces

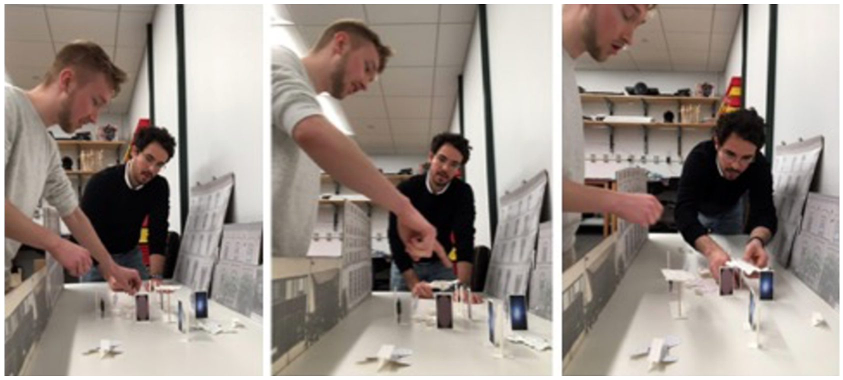

Figure 5: Co-designing communIT (Study 2).

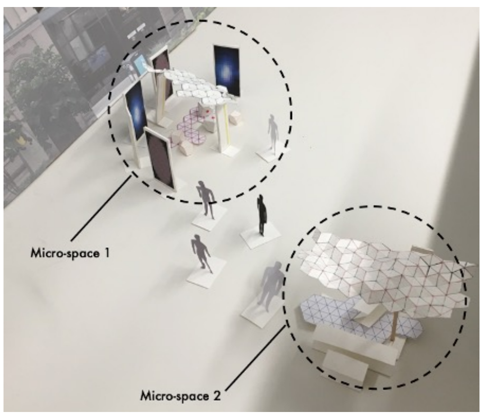

Figure 6: One of the co-design outcomes of Study 2 with two distinct micro-spaces.

Figure 7: Two micro-spaces: one for individual activity (left) and one for group activity (right).

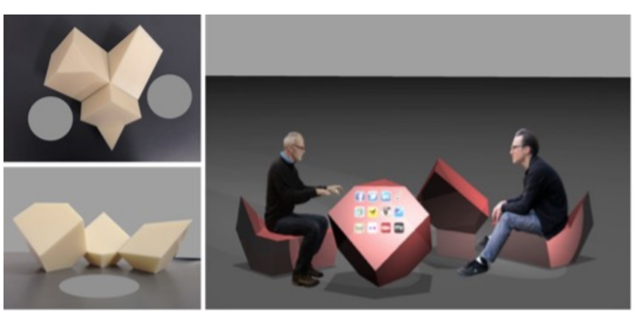

Figure 8: Design exploration of blocks using kirigami.

Figure 9: Design exploration of partition using kirigami.

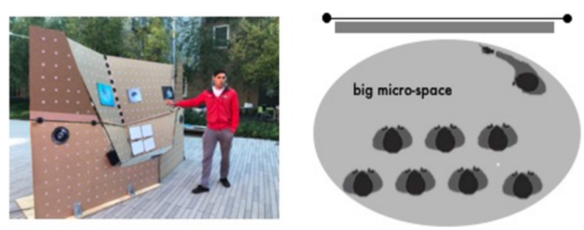

Figure 10: Participants reconfiguring the full-scale communIT prototype.

to communicate to us which peripherals would support a given activity, and where the peripherals should be located to best do so (Figures 10, 11, 12, 13).

2.3.2 Study 3 analysis and findings. We analyzed the 15 different designs produced in the co-design activity, finding five recurring design patterns. Each design pattern suggested a particular relationship among the following elements: the physical configuration of the artifact, the size of micro-spaces, the activities participants would engage in, and the positioning of the peripherals on the artifact's surfaces. These design patterns are analogous to the pattern language elaborated in Alexander et al.'s A Pattern Language [2].

Figure 11 depicts what we call Design Pattern 1. On the left is the actual design, and on the right a corresponding schematic drawing (top view) that we created to synthetize this pattern. The

Figure 11: Design Pattern 1: students' design (left) and our corresponding schematic drawing (right).

Figure 12: Design Pattern 2 - students' design (left) and schematic drawing (right).

Figure 13: A researcher and two participants co-designing the location of IT elements.

gray bubble in our schematic drawing refers to the micro-space—the area of influence of the Design Pattern. In Design Pattern 1, the artifact was configured in an upright position (i.e. all panels folded to form a wall-like structure). Participants ascribed the following activities to this configuration: sharing content (e.g. presenting and lecturing), playing videogames, and watching movies. The IT elements selected were displays and an audio system. In addition to these elements, a few participants who created designs relating to Design Pattern 1 also positioned a white board to scribble and draw.

One participant described this as, "a huge interactive wall that people can use to present work and ideas to others." When asked

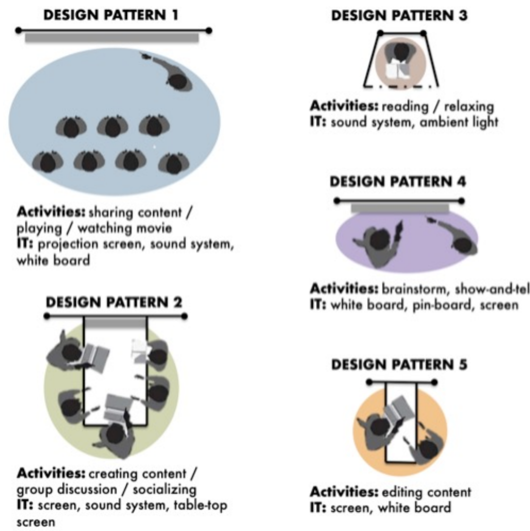

Figure 14: The five Design Patterns found in Study 3.

to further elaborate on how people used his design (Figure 11, left), and how many people would engage with the space, the participant offered that, ". . .for instance, a person can give presentation to a group of people there [pointing at spot few feet afar, in front of the artifact], let's say 6 or 8 people. . . but people can also use this as a huge screen to watch a movie. . . or they can even use this as an interactive screen to make artwork."

Figures 12 and 13 show designs that reflect Design Pattern 2. A participant in session 6, described the configuration in Figure 12 as "a big-shared table to work and study." Another participant (session 8) with a similar design had an expanded view of its functionality, stating that "I don't want the space to be 100% for study only; people can sit here and socialize. [It's intended to be] more open, more social."

Overall, Study 3 advanced our understanding about communIT's three main components: the physical and spatial arrangement of the artifact; the activities people would engage in with the artifact; and the location of IT hardware on the artifact. This understanding is summarized in Figure 14, which presents a schematic of all five Design Patterns resulting from the co-design activity of Study 3 (note, in the figure, the use of color to code the different micro-spaces that define each of the five Design Patterns).

2.3.3 Design Iteration 3. We used the five Design Patterns found in Study 3 to, once again, reiterate our own design of communIT. Our main design objective was to create a reconfigurable kirigami artifact that could capture the characteristics of the five Design Patterns in various combinations. After extensive design exploration, we reached a design candidate that we judged met this objective and the various constraints as developed over the course of the various user studies and design tasks. We named this iterated design of communIT, "Design Iteration 3" (Figure 15 and 16). Each physical configuration of Design Iteration 3 yields different combinations of the five Design Patterns, and consequently different arrangements

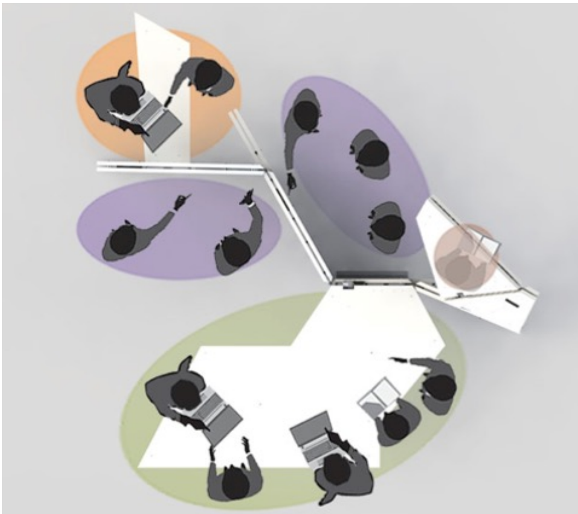

Figure 15: Plan view of communIT, configuration 2.

of activities, micro-spaces, and attributes. For example, "configuration 1" has a combination of four different Design Patterns, each with their own activities, micro-spaces, and information technology components embedded in it. Figure 15 depicts the plan and elevational views of our iterated design, Design Iteration 3 configured as what we call configuration-2 that combines Design Patterns 2-5.

2.3.4 Full-scale Prototype Fabrication. We are currently fabricating a full-scale prototype of Design Iteration 3 (Figure 17-20). The fabrication of a full-scale prototype requires designers to specify the materiality and dimensions of the artifact. One of our decisions involved the composition of the panels (Figure 18-19): two layers of Polystyrene foam CNC'd from a 4 ft by 8 ft insulation board. The layers are spaced 0.5 inches apart using 3D printed plastic spacers, forming a hollow core that both reduces overall weight and allows for wires to run through the panels.

Figure 17: communIT's full-scale prototype.

The two faces of the foam "sandwich" are 0.06-inch thick, translucent, acrylic sheets, laser-cut to the geometries designed. The two faces of communIT are different. On one face of communIT, behind the acrylic, are embedded strips of LED lights. Embedded into the foam with the help of grooves milled into the foam sheets, each strip of LEDs is 2.56 inches apart vertically from each other with a total of 22 rows of LEDs. The translucent acrylic permits the embedded LED lights to glow and diffuse (Figure 20) to create a large and foldable lower-resolution display. Also embedded into the wall are four USB powered speakers.

3 EXPANDING COMMUNIT TO OTHER GROUPS: A PILOT STUDY

Our aim for the communIT project is, again, to create a cyber-physical platform installed in underused public spaces for building community. We envision communIT doing this by engaging those

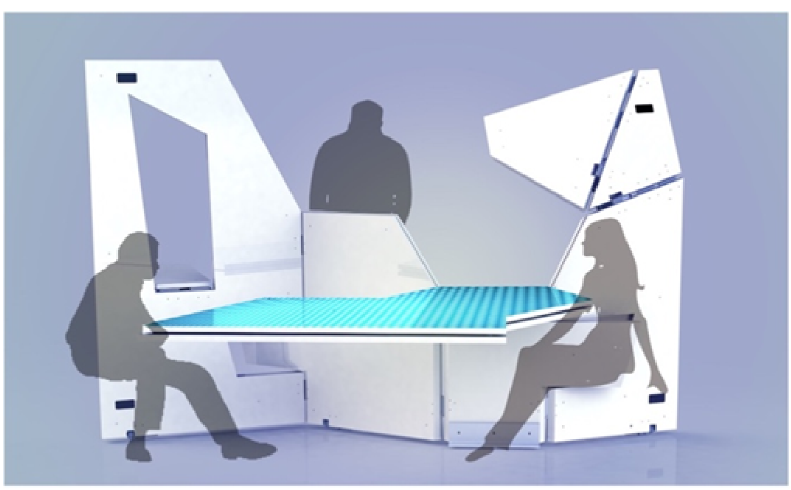

Figure 16: Elevation view of communIT, configuration 2.

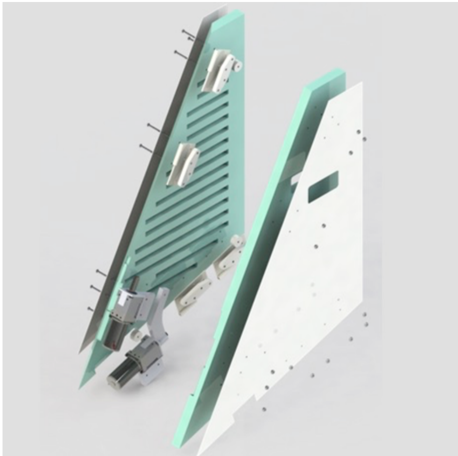

Figure 18: An "exploded" 3D render of one of communIT's panel showing its composition.

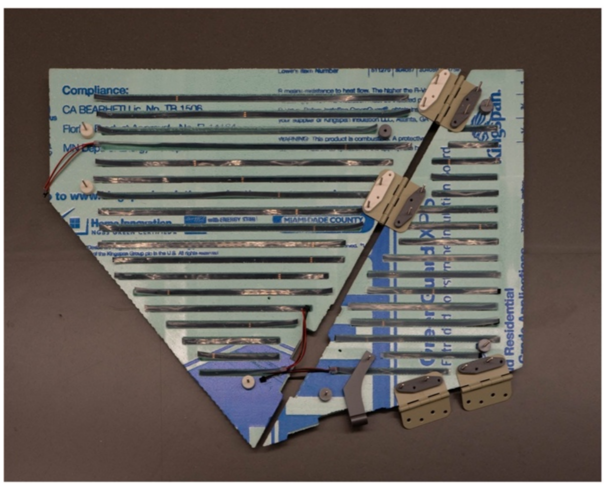

Figure 19: One panel (physical model) showing the material composition of communIT's panels.

community groups that may feel misrepresented by, misunderstood by, or largely invisible to the larger community.

To explore the promise of communIT, we conducted a pilot-study with another targeted user groups within the local community: high school students from a rural school in "Middle America" (Figure 21-23) The objective of the pilot study was twofold: (1) to learn how the community group would use communIT to support their group activities, and (2) to learn what role communIT might play, in the view of the participating group, in sharing their products and building community. The pilot-study was part of a high school course assignment in media arts scheduled for a two-week period. 28 students in 8 groups participated, and all students gave their consent to do so. Each group was provided a scale model of our Design Iteration 3 (the full-scale prototype was not yet fully developed). Additionally, each group received to-scale human figures that enabled them to play-act interactions with the prototype-model. We asked each group to accomplish the following: (1) identify a physical site in their community that they thought was apt for installing communIT; (2) co-create content (e.g. images, videos, electronic music, comics, animated gifs) of their choosing that communicated an issue of their interest or concern; (3) for each of the co-creation activities, create a photo collage that shows how they envision communIT supporting their co-creation; and (4) present their outcomes to our team and teacher (Figure 21).

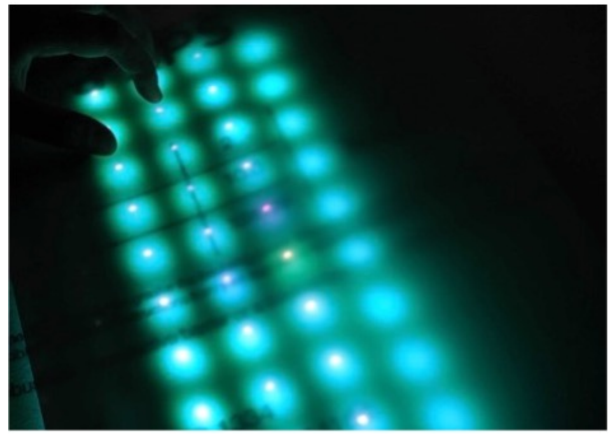

Figure 20: communIT's panel with embedded interactive lights.

Figure 21: Students presenting their outcomes.

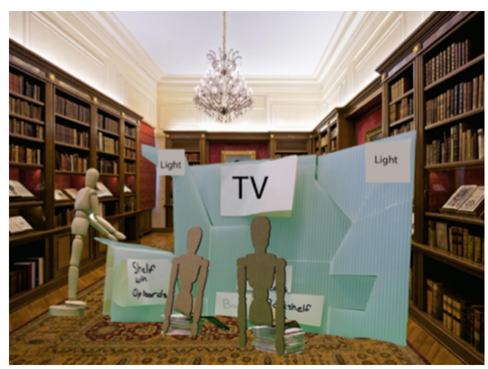

Figure 22: A participant's photo collage showing communIT in a library.

Figure 23: Participants envisioned communIT integrated with tablets and other digital resources.

We analyzed the students' products and found that students identified sites for communIT within their public library and parks and within their school (Figures 22 and 23). Students recognized communIT as a tool to create, share and retrieve content. For instance, one student offered that communIT "would give workers and students access to online content. . .online courses, and Google classroom. This is for people who don't have access to internet or computers."

Following the full-scale fabrication and the early pilot study, we will engage in an extended series of participant studies with many of the aforementioned, targeted groups, using our communIT "prototype-3," installed within the most traversed section of a main public library. Following from the pilot study, we seek to learn how other community groups use communIT to support their group activities, and what role communIT might play building community.

4 DISCUSSION

This paper reported on the outcomes of a series of user studies, co-design activities, and multiple design iterations that develop our understanding of the potential integration of IT in an artifact at "environmental-scale" to build community. Through the phases of study, we investigated communIT's physic-spatiality, its embedded peripherals, and its functions. User studies suggested how people might use communIT. Overall, users and designers alike envisioned communIT as a media-making platform to create, share and consume content. The user studies also indicated the kind and placement of analog and electronic/digital peripherals for communIT. We found that this selection and placement varied according to the uses envisioned by participants. Regarding communIT's material aspect, we aimed to interpret the reasons behind participants design decisions rather than literally following (without understanding) their designs. At least for our team, a design is not simply the middle ground of all of the participants' designs; we instead drew on participant input "clues" informing for us the design characteristics of the artifact in relation to certain functions. The physical and spatial arrangement of the artifact, therefore, also varied according to the uses participants envisioned. For instance, when participants envisioned communIT for collaborative uses among larger groups, participants tended to produce spaces physically larger and with less-defined physical boundaries. Spaces for supporting single users tended to be more enclosed, spatially.

Design problems of the kind undertaken here are wicked [49], under-structured [55], ones that do not produce a singular solution or "one best way" [47]. The design process presented in this paper is, therefore, one among many possible paths we could have taken in what me be characterized as a Research through Design [64] investigation. Likewise, our current design iteration (Prototype 3) is one of innumerable possible design responses. For instance, communIT design would have been a completely different artifact had we selected the "block" typology instead of the "partition" one. Artifacts are but one particular response to a particular problem framing [29, 47, 63]. As a consequence, the problem framing, not just the design responses, equally influences the direction of the design trajectory. Our future user studies and design iterations will consequently alter the communIT design in expected and unexpected ways.

This paper also reported on a pilot-study with a local group to have an early understanding of how the group would use communIT and what role communIT might play in community building. Participating students envisioned communIT as a platform to discuss issues relevant to their group, and also as a mean to communicate their views to the broader community audience on such issues as LGBTQ+ identity and rights.

5 CONCLUSION

For some [1, 12, 13, 35], community forms when the community recognizes, raises and discuss issues and their consequences. In this community action, artifacts can potentially play a role in building community. This potential is made evident, for instance, in Latour and Weibel's notion of "object-oriented democracy" [32] which might characterize the capacity for communIT, an object drawing people to it, to at the same time gather people around issues and their consequences.

With communIT, the broader impact we strive for is articulated eloquently by Eric Klinenberg in "Palaces for the People: How Social Infrastructure Can Help Fight Inequality, Polarization, and the Decline of Civic Life":

> "People forge bonds in places that have healthy social infrastructures—not because they set out to build community, but because when people engage in sustained, recurrent interaction, particularly while doing things they enjoy, relationships inevitably grow." [31]

But while Klinenberg champions public libraries as social infrastructure to reanimate social and civic lives, we know that the emergence of, especially, social media and (some) other smart technologies have reduced the importance of public, material spaces as loci for civic discourse and for addressing community challenges [4, 7, 48, 60]. More promising is the potential of embedding IT in the fabric of the physical world [16, 51, 61]. As a cyber-physical, reconfigurable environment, communIT is our way to bridge cyberspace and bricks-and-mortar to build community. For communities—the building blocks of our nation—communIT offers a capacious, meaningful home to interactions that promises to define community.

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