



Designing Life After Covid-19

Exploring Pathways to Increase
Social Connectivity

March 2023

This report results from Abigail Auwaerter's externship experience mentor by Andre Nogueira, PhD, co-founder and deputy director of the Design Laboratory at Harvard T.H. Chan School of Public Health (D-Lab). This experience reflects a partial fulfillment of the requirements for the degree of Master of Design in the IIT Institute of Design.



HARVARD T.H. CHAN | **D-LAB**
SCHOOL OF PUBLIC HEALTH

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Research Background

Designing Life After Covid-19 in India is a solution-oriented research initiative led by Andre Nogueira, Ph.D., and Patrick Whiteny at the Design Laboratory at the Harvard T.H. Chan School of Public Health (D-Lab). The goal is to explore ways in which design can help individuals and organizations be better prepared for future epidemics.

The Covid-19 pandemic caused widespread turmoil within organizations and the lives of individuals. The unprecedented health and safety measures implemented to mitigate the spread of the virus disrupted daily routines and forced individuals to make sacrifices to protect the health of themselves and their communities. From the disruption caused by the pandemic, we were able to expose inequalities and vulnerabilities within our society, compelling us to re-imagine how we live, work, and interact with each other.

As we move forward to live after Covid-19, our premise is that we can design policies, objects, environments, messages, and services to support individuals and organizations to build community resilience against the inevitable occurrence of future health outbreaks. This initiative has three interconnected projects:

- **Remember Now** was a remote ethnographic study that gathered 12,000+ micro-stories about how 1200+ people living across 15 countries coped with Covid-19. This phase results in opportunity spaces

and action areas by identifying variable relationships extracted from participants' stories, and then aggregating and visualizing them in a system map.

- **Sketch Tomorrow** is an ongoing series of ideation sessions where experts use their experience and results from Remember Now to quickly explore diverse conceptual ideas that range from organizations, services, and strategies to policies that can help us make the world a healthier place.

- **Prototype Future** includes experts in exploring bold policies that can help translate the sketches from the previous phases into interventions through prototyping and piloting endeavors.

As of March 2023, phase I has been completed, and phase II is underway. All research activities are being guided by two complementary design models: the Four-I and the Whole View.

The Four-I model helps multidisciplinary teams explore value-creation opportunities by considering the flow of various resources based on the interactions among diverse agents, integration of multiple systems, interconnectivity across levels, and iteration of interventions over time. The Whole View is a conceptual model of connected frameworks and methods that show the relationships among various forces influencing complex projects⁴. The Whole View integrates viewpoints of users, offerings, value creation, operations, and strategy around the purpose for making change. Please see the references for a better understanding of the models.

Project Summary

This report reveals opportunity spaces, action areas, and a new concept developed by graduate students from the IIT Institute of Design and the Harvard T.H. Chan School of Public Health. This work was informed by data collected in India during Remember Now by students and faculty from the NMIMS School of Design.

While the Remember Now phase helped us uncover many factors that affected participants during the Covid-19 pandemic in India, this report focuses on opportunity spaces and action areas related to participants' social relationships and their experiences when trying to maintain social connectivity. For example, most participants relied on digital platforms to safely stay connected, but many also shared how their experiences perpetuated feelings of isolation and loneliness.

This paradoxical tension prompted participants to use idle time during the lockdown to try other ways of increasing their social connectivity, including engaging in food-related hobbies and interacting with neighbors through their terraces. This behavior shift showcases an opportunity space for creating new systems capable of supporting diverse modes of social connectivity, including during intensive periods of enforcement of social distancing protocols.

This report presents findings from the Remember Now phase and a prototypical concept that resulted

from researchers exploring systems to strengthen social networks and increase social connectivity within communities.

The prototypical concept ROOT is a decentralized community gardening system for urban residents in India that encourages diverse people to learn new skills, connect in-person, exchange crops, and invest in local businesses. ROOT is designed to be a new infrastructure of modular systems that can be combined to support different activities. While the current state of ROOT focuses on four main activities (gardening, trading, consuming, and learning) the concept has the potential to expand its footprint into other action areas to increase social connectedness among Indian residents.

By embracing diverse experiences concerning both virtual and physical modes of interaction, ROOT aims to leverage social networks to increase individuals' commitment to their own personal health and community resilience to enhance preparedness for future health outbreaks.

Designing Life After Covid-19



From Turmoil to Transformation: Examining the Impacts of Covid-19

On March 24, 2020, Prime Minister Narendra Modi issued a mandated lockdown to the 1.3 billion people residing in India¹. The lockdown was a quickly implemented measure to mitigate the transmission of the Covid-19 virus by restricting individuals to their home confinement. Originally set to last 21 days, the lockdown was extended four times by the Ministry of Home Affairs (MHA), National Disaster Management Authority (NDMA), and Government of India (Gol) ultimately lasting until May 31, 2020².

Alongside the lockdown, India, similarly to other countries, addressed the rapidly rising Covid-19 cases using both mitigation and suppression strategies to control the spread³. This included targeting individual behavior with social distancing, contact tracing and quarantining, and reducing social interactions by closing public areas and restricting non-essential services.

Individuals and organizations had to adapt their activities, interactions, environments, and more to abide by the Covid-19 protocols and protect the health of themselves and the community. Although the Covid-19 pandemic and its subsequent public

health and safety mandates were not permanent, their disruptions to Indians' way of life have had lasting effects.

As India moves past the Covid-19 pandemic, it has the opportunity to explore: what if systems were designed to help individuals in daily life prevent or control future epidemics? What if we could learn from Indians' experiences during the initial phases of the lockdown to help individuals and organizations better prepare for future epidemics?

Designing Life After Covid-19 is an initiative that seeks to capture and learn from individuals' experiences during the 2020 lockdown to inform future public health interventions. Through stories, this work seeks to understand peoples' aspirations and frictions with systems during the Covid-19 pandemic and discover ways to help organizations better design objects, services, and environments to support and protect communities from future epidemics.

1. Vaishnavi Chandrashekhar, "1.3 billion people. A 21-day lockdown. Can India curb the coronavirus?", Science, American Association for the Advancement of Science, 31 March 2020, <https://www.science.org/content/article/13-billion-people-21-day-lockdown-can-india-curb-coronavirus>

2. The Hindu Net Desk, "India lockdown 4.0 guidelines | What's allowed and what's not?", The Hindu, THG PUBLISHING PVT LTD, <https://www.thehindu.com/news/national/lockdown-40-guidelines-whats-allowed-and-whats-not/article61655769.ece>

3. Chintamani Pai, Ankush Bhaskar, & Vaibhav Rawoot, "Investigating the Dynamics of COVID-19 Pandemic in India Under Lockdown." Chaos, solitons and fractals 138 (2020): 109988–109988.



Figure 1: Image taken by participant of a street in Kala Ghoda, Fort, Mumbai, Maharashtra.

Phase I: Remember Now

With much of the world's population impacted by quarantine orders or recommendations, we had an unusual opportunity to observe how people live, work, learn, and play while they pay attention to Covid-19. Our primary focus was on finding patterns of activities and behavior that support or prevent them from achieving their aspirations when coping with a pandemic.

Two ethnographic remote methods of data collection allowed us to capture the daily life activities of people who were coping with a pandemic: self-document diary and follow-up open interviews. The former invited subjects to photograph anything related to how their health, happiness, and prosperity have been compromised or enhanced by the disruptions happening around them. The latter involved field researchers asking the same pull of subjects open-ended questions about their diaries and capturing their stories.

Any place subjects found themselves in was considered relevant, including their own home, grocery stores, restaurants, hospitals, neighborhood clinics, drug stores, public parks, shopping malls, community gardens, religious temples, and others. Whenever possible, people were asked to

photograph the environment and the surroundings of the situation. Throughout the study, subjects also captured different solutions, including products, services, instruments, and tools, as well as creative initiatives that resulted from the virus disruptions. These ideas were also captured.

In India, a small team of designers, researchers, educators, and students from the US and India gathered data about Indians' experiences. The sample of participants included 56 Indians residing in different states within India during the initial mandated lockdown period that occurred between March and June 2020 (see Figure 2).

Data collected was cleaned and structured into micro-stories, coded through variable extraction methods, and aggregated based on variable correlations identified within participants' stories. To aggregate and visualize the correlations between variables, we used the Dynamics of Systems framework from the Four-I Model. This framework helps teams create dynamic maps that show population-level patterns from individual stories and surface perceived friction between people's aspirations and their ability to use available systems when trying to achieve their aspirations⁴.

Although no single pattern can represent the complexity of people's daily life during a pandemic, by deploying algorithms of efficiency, frequency, connectivity, influence, and strength of association for pattern identification on the aggregated data, we generated three key opportunity spaces with corresponding action areas which are present on page 8 of this report.

Phase II: Sketch Tomorrow

Using the results from phase I, a diverse team including public health, design, and public policy experts joined together for a series of question formulation followed by ideation sessions. The goal was to explore conceptual interventions to improve individual and public health in India. All ideation sessions were structured around key questions and related frameworks from the Whole View⁵. Such an approach enables teams to consider the content relationships between the viewpoints of users, offerings, value creation, operations, and strategy. By integrating these different viewpoints, the resulting concepts often reflect and are inclusive of the aspirations, interests, and needs of diverse stakeholders.

The following sections outlines what we have learned from collecting and analyzing the data from Phase I: Remember Now and the concept developed during Phase II: Sketch Tomorrow.

4. André Nogueira, "Interaction, Integration, Interconnectivity, and Iteration: A New Model for Designing Infrastructure Change," *She Ji: The Journal of Design, Economics, and Innovation*, 8, no. 4 (2022): 526-558.

5. Patrick Whitney & André Nogueira, "Cutting Cubes Out of Fog: The Whole View of Design," *She Ji: The Journal of Design, Economics, and Innovation*, 6, no. 2 (2020): 129-156. <https://doi.org/10.1016/j.sheji.2020.04.001>.

Geographic Distribution of Participants

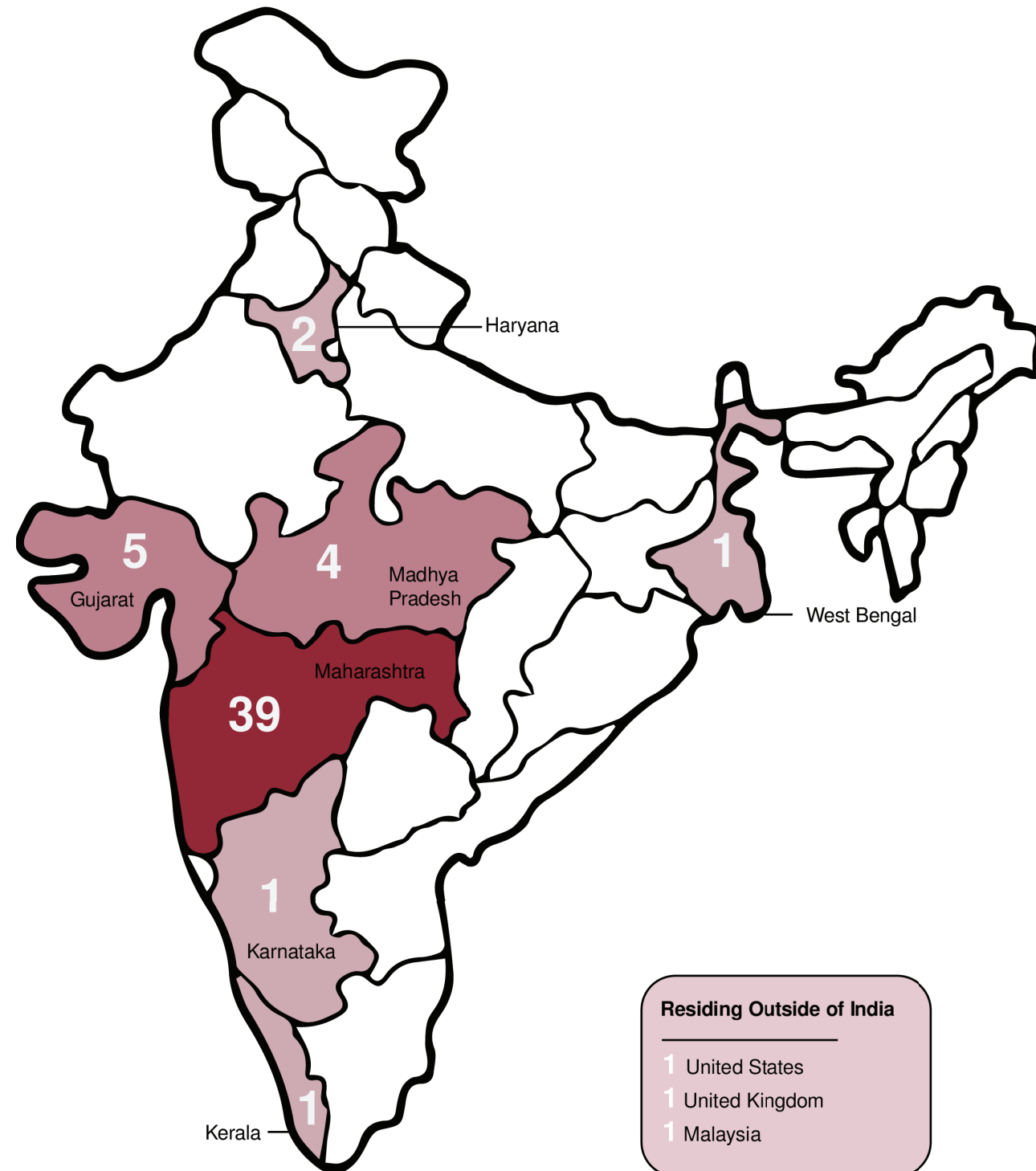


Figure 2: Map showing the geographic distribution of participants within the study.

Remember Now



Figure 3: Image taken by participant of their pregnancy in story #1.

Disruptions in Social Relationships during Covid-19 in India

While this initiative discovered many factors that affected participants during the Covid-19 pandemic in India, this report focuses on patterns of disruptions related to participants' social relationships and their experiences coping with barriers to social connectivity.

Figure 4 is a Dynamics of Systems diagram that represents a segment of the larger map containing approximately 300 variables generated from our analysis. The focus on the 14 variables being represented was achieved through the application of algorithms related to variable efficiency, connectivity, influence, frequency, and strength of association.

In this diagram, the colored circles represent the variables, and the arrows connecting them describe the nature of their interactions. The size of the variables indicates degree centrality with larger circles having a higher degree, or more connections to other variables, than smaller circles.

The thickness of the arrows shows frequency. Thick arrows indicate that more participants shared stories containing that correlation than others represented by thin arrows. Solid arrows indicate

the two variables have a positive correlation, and dotted arrows indicate they run in opposite directions or have a negative correlation.

For example, consider the variables "Level of concern for others' health" and "Number of in-person interactions" present in Figure 4. The two variables have a negative correlation which indicates that as participants' level of concern for others increased, the number of in-person interactions they had decreased. A participant's story shared after Figure 3 on page 8 and marked with a red circle provides more context as to what was causing this correlation.

"I almost getting used to being home since the first month of pregnancy. It was difficult to go outside because one would interact with many others. It was safe to stay at home because I had a baby in my tummy, and I had to protect the baby"

- Participant Story #1

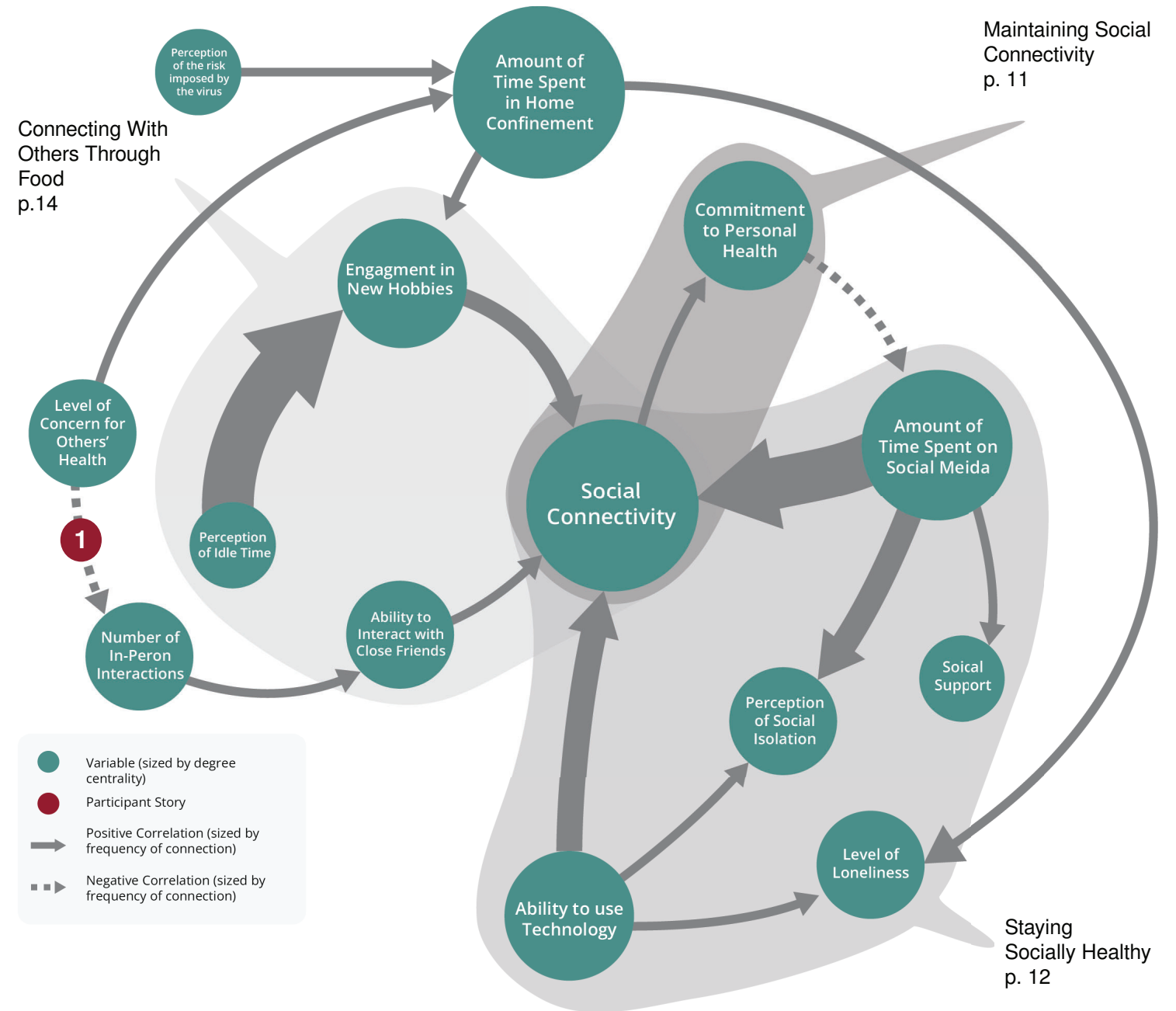


Figure 4: Overall System Dynamics Map.

Even though it was difficult for them, this participant was willing to stay at home to protect their pregnancy.

Based on the full story, they even kept themselves from visiting their mom who lived 15 minutes away from their home as they believed the risk was too high. This is a major behavioral shift in the Indian family culture that followed the perception that the lockdown guidelines of staying home reduced the risks of contracting or spreading the Covid-19 virus.

This story is a small demonstration of how some participants were willing to make sacrifices, such as reducing the number of in-person interactions they had, to uphold their values which in this case was their personal and familial health.

In Figure 4, variables with many inflow arrows represent barriers to behavior change while variables with a greater number of outflow arrows indicate drivers of behavior change.

Once identified, the barriers or drivers of behavior change helped us delineate opportunity spaces and determine the leverage points or action areas for conceptualizing prototypical ideas that could improve people's lives.

By aggregating variables from personal stories such as the one previously described, we were able to identify population-level patterns of experiences that represented the perceived friction between people's aspirations and organizational goals. In doing so, opportunity areas for purposeful change towards more equitable and sustainable systems were delineated.

The following section presents three patterns of experiences that have been highlighted on the dynamics of systems diagram (Figure 4) as opportunity spaces for designing interventions.

Maintaining Social Connectivity

Although the government was successful in implementing strategies to solve specific issues, such as the lockdown to mitigate the spread of the virus, this work revealed several opportunities to further integrate more systemic considerations, including those related to the social determinants influencing the health of people living in India.

Social networks are essential to the health of individuals and communities. The services these networks provide such as social connectivity, the degree to which an individual feels a sense of belonging to a social relationship or network, have been shown to be linked to positive mental, physical, and emotional health⁶. Other benefits of high social connection include stronger gene immunity and increased longevity.

Aligned with the documented health benefits that social connectivity provides, many participants of this exploratory study shared their perception of

6. Dr. Emma Seppala, "Connectedness & Health: The Science of Social Connection," Stanford Medicine: The Center for Compassion and Altruism Research and Education, 8 May 2014, <http://ccare.stanford.edu/uncategorized/connectedness-health-the-science-of-social-connection-infographic/>

such positive outcomes. This is represented by the social connectivity variable having a high frequency and high connectivity with other variables (see Figure 5). Many participants sought to increase social connectedness during the lockdown period demonstrating its value among participants.

Along with the high frequency and number of variable connections, social connectivity was also a driver for participants to commit to their personal health (see Figure 5). One participant conveyed this through their recount of returning from a trip.

*“My brother had covered all our luggage with a film of clean sheets. **We did not want to throw it in the dustbin as any sweeper would have touched it and in case of any virus, he would have got it, which would have been a major threat to my entire social network.** We came back home and cleaned ourselves and our stuff with a proper product, tracked our health for a few weeks and noted if we were showing any kind of symptoms.”*

- Participant Story #2

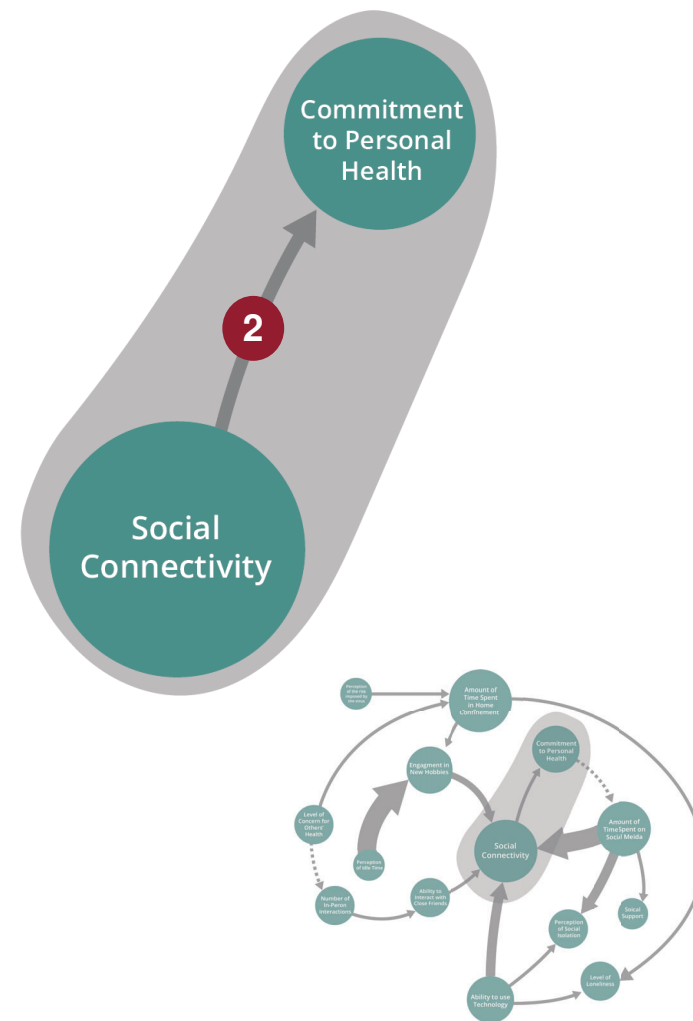


Figure 5: Partial network diagram with focus on social connectivity and commitment to personal health.

There was this communal aspect associated with the well-being of participants in this study. Likewise, many participants were motivated to take care of their health to support others in their social network and community. In the previous story, participants' experience involved taking extra precautions such as covering their luggage to protect others in their community (Figure 5). When participants felt socially connected to their community, they were more equipped to follow the Covid-19 protocols.

Social connectivity's significance in driving commitment to participants' personal health for the benefit of the community is an opportunity area organizations can consider when creating and implementing strategies related to public health.

What if the protocols implemented to combat the spread of the virus had considered this aspect of social connectivity? As seen among stories, social connectivity encourages people to behave in a way that protects their health while helping the community. But how might Indian organizations help address both immediate health outcomes (the spread of a new virus) and long-term health outcomes (social isolation) through integrating social connectivity into their public health protocols?

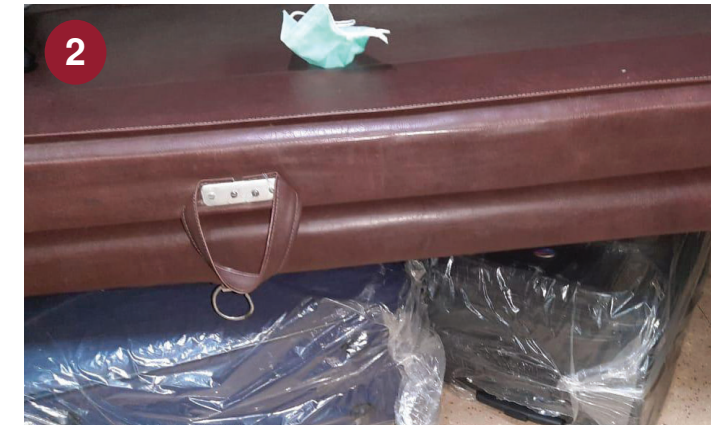


Figure 6: Image taken by participant of luggage after returning from a trip, story #2.

Staying Socially Healthy

Restrictions during lockdown kept people confined to their home and limited their ability to access their social networks in-person as they normally would. In response, participants heavily relied on digital technology to connect with others and maintain their social health while confined at home during lockdown (see figure 7). Digital technology provides access to social support networks. For example, while separated from their significant other, one participant looked to social media platforms for support.

“First when the COVID-19 ban started I thought I was the only one in this kind of situation. But when I found out about a group on Facebook, I was amazed. I realized there were thousands of others in the same situation, who were trying to work around this travel ban.”

- Participant Story #3

Digital platforms allowed this person to connect with others in a similar situation from across the country and access support during a difficult time. Other participants used digital platforms and technology to stay connected with their families.

“I have cousins in the US and my close family is not here. One of my cousins was getting married and only a few family members were able to attend in-person.. But because New York had just introduced Zoom Weddings, we were able to participate and took up on this opportunity.”

-Participant Story #4

While digital technology and social media platforms provided an effective support for people to quickly solve the issues surrounding staying connected, as the novelty of virtual interactions wore off, many were reminded of the circumstances of the lockdown that they were in.

As the pandemic progressed, the effectiveness of virtual interactions to stay socially healthy decreased, and instead began to increase participants’ perceptions of social isolation and levels of loneliness.

At that time, many participants just as quickly realized the inability of digital technology to be long-term solutions.

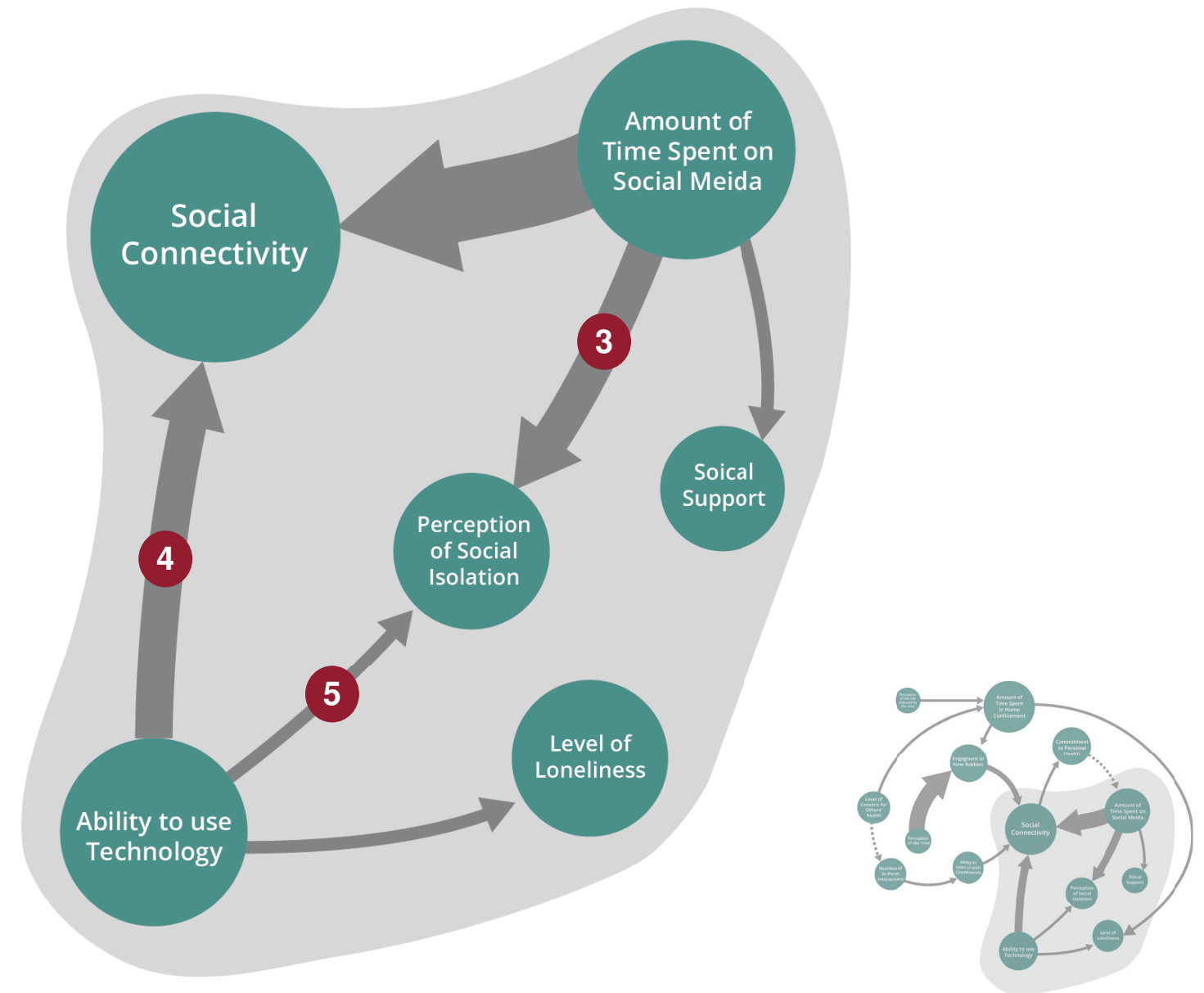


Figure 7: Partial network diagram with focus on social connectivity, ability to use technology, and amount of time spent on social media.

“When the lockdown started and everybody was on a group call, so even we had one where my husband got me in with his friends. We enjoyed a glass of wine with the group and it was fun. I guess everything in the beginning was fun but then after that things got boring because we don’t know till when it would last”

-Participant Story #5

After realizing the constraints of technology to stay connected, some participants started looking for new ways to connect with others without sacrificing the safety of themselves or others.

For example, those who had a terrace in their home started to use it for social activities; it gave residents the opportunity to establish healthy, in-person interactions because it enabled proper social distance.

The semi-public and outward facing nature of the terraces allowed for neighbors to connect with each other, engage in social activities and keep their community strong, especially during difficult times.

According to participant’s stories, there were no rigid social expectations, as anyone can enter that communal space.

Some people even became regulars and developed a deeper sense of belonging that didn’t exist until that change in behavior. Due to the design of the space, participants were also able to use their terrace to connect and show community support.

“I started going on the terrace during lockdown, and that’s where I made my new friends. My building has a lot of elderly people, and I am now friends with three of them. It started with sharing a cup of tea and later they would tell me their life stories and teach me Kannada. My neighbors were also happy when I started spending time with them as they had always felt left out by young couples in our building. We all used to share recipes and food with each other.”

-Participant Story #6

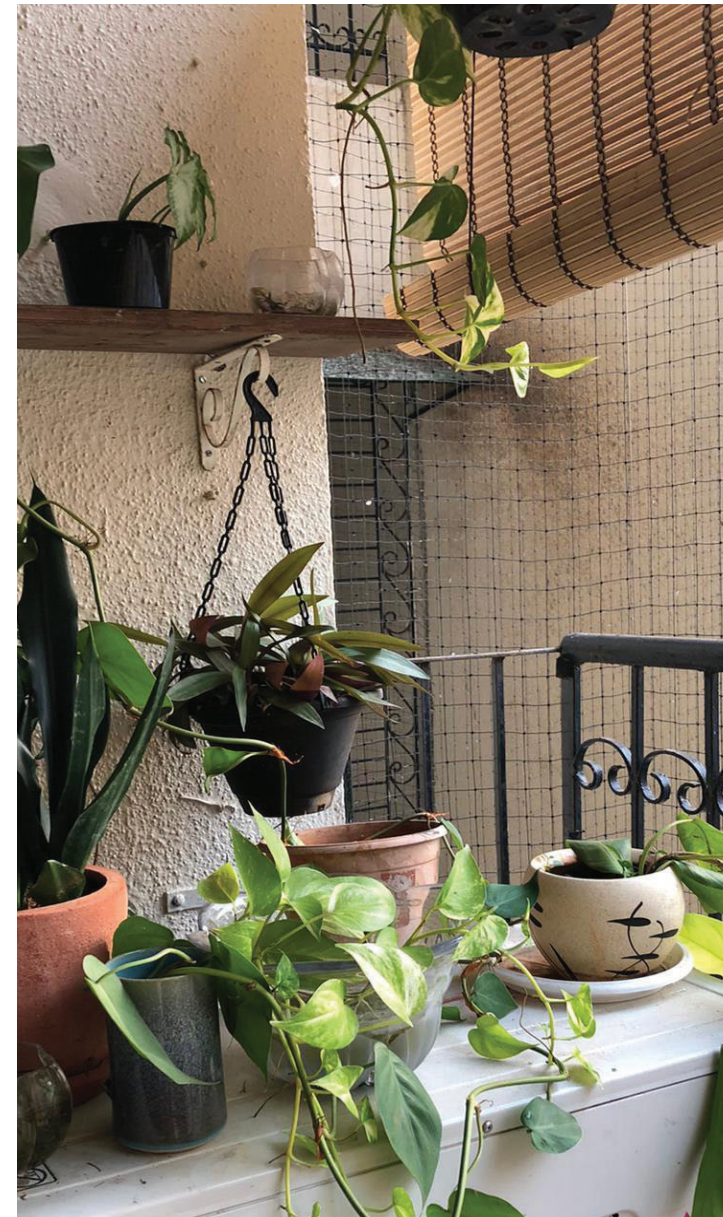


Figure 8: Image of participants’ terrace garden during the lockdown.

The utilization of the terrace demonstrated participants’ desire for in-person interactions, regardless of the digital technology available to stay socially healthy. Terraces were one of many options that provided participants with a space to be outside, connect with others safely, and engage in activities that they could share with others.

Indeed, people relied on virtual interactions because there were no ways to safely interact with others in-person. But, the utilization of the terrace demonstrated participants’ desire for in-person interactions, regardless of the digital technology available to stay socially healthy connected. Terraces were one of many options that provided participants with a space to be outside, connect with others safely, and engage in activities that they could share with others.

What if there were other ways to stay socially healthy without putting others’ health at risk? Could the prevalence of feelings of isolation and loneliness be reduced through utilizing spaces like terraces for safe in-person interactions? If so, how?

Connecting With Others Through Food

Regardless of the medium - whether in-person or digital - participants relied on social activities to connect with others. While some searched for new ways to do old things, such as reactivating book clubs, the perceived abundance of time gave many the permission to explore new hobbies or to focus on activities they were interested in but didn't have time to start.

Not surprisingly, a significant part of our sample took a chance at food-related activities. Many were motivated by friends, family, and others in social media to change their behaviors. These behavioral changes increased people's social connectivity and strengthened their networks. One participant decided to try cooking after encouragement from their mother.

“After coming back home from the hostel I had a lot of free time during the lockdown before my online college started. So, my mother told me to try my hand at cooking as I haven't really cooked before. So, I thought why not? I cooked with my mother, and it was a good bonding time spent with her as well.”

-Participant Story #7

In addition to the social dimension of food-related activities such as cooking, baking, and gardening, participants used food as a way to strengthen their emotional connections. Most people are able to eat everyday. Often, this daily activity involves others and is surrounded by memories, feelings, and desires.

In the early stages of the pandemic, this was no different. Food-related activities caused many mood swings, both positively and negatively. For example, some people miss what they had before, such as a regular meal with their loved ones. Others found cooking a way to feel gratitude for life, show support for others, nurture relationships, and help people feel better. For example, one cooked for their in-laws to help them feel better.

“My in-laws soon started feeling extremely low after staying at home for so long. So we tried lifting their mood by making their favorite dishes”

-Participant Story #8

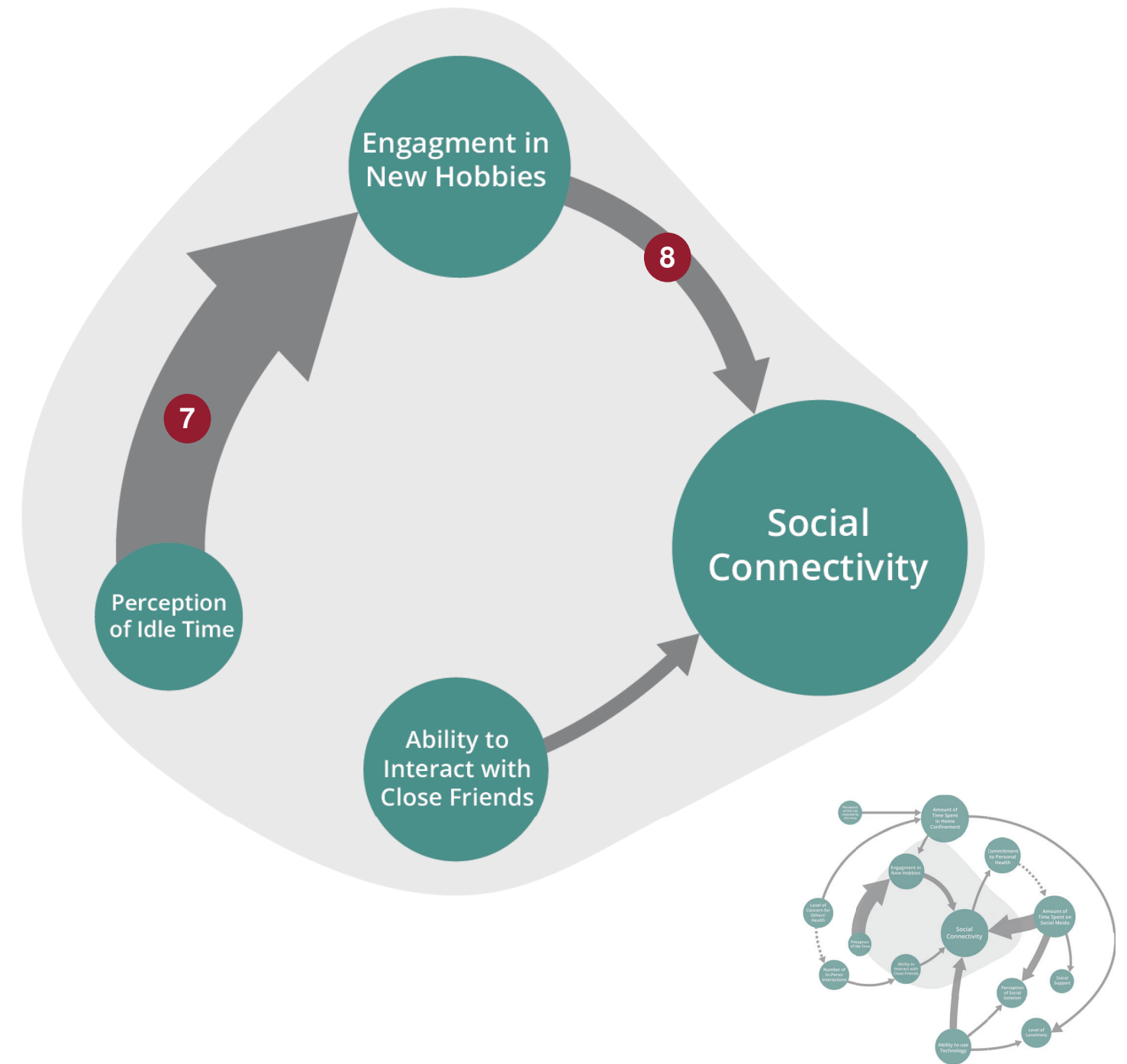


Figure 9: Partial network diagram with focus on social connectivity, perception of idle time, engagement in new hobbies, and ability to interact with close friends.

In participants' stories, food connected people through activities such as growing, cooking, consuming, or sharing it. Although many people found in food a way to strengthen their social networks and meet several of their emotional needs, others faced severe constraints posed by the lockdown, such as limited space and access to produce. These and other factors, such as loss of jobs, exacerbated food insecurity, especially among the most vulnerable populations.

For example, some kids relied on school meals to access nutritious food. With schools closed, many families could not provide the necessary amount and variety their children needed. But what if public health protocols leveraged food-related activities as a strategy for maintaining people's social, emotional, and physical health?

For one, encouraging food-related activities could increase the frequency of interactions and strength of social networks, which would likely lead to an increase in social connectivity among people. As it has happened before (for example with the Victory gardens) a program supporting the development of urban farms or community gardens can increase food production in times of crisis and improve access to nutritious food.



Figure 10: Image taken by participant cooking with mother in story #7.

Conclusion

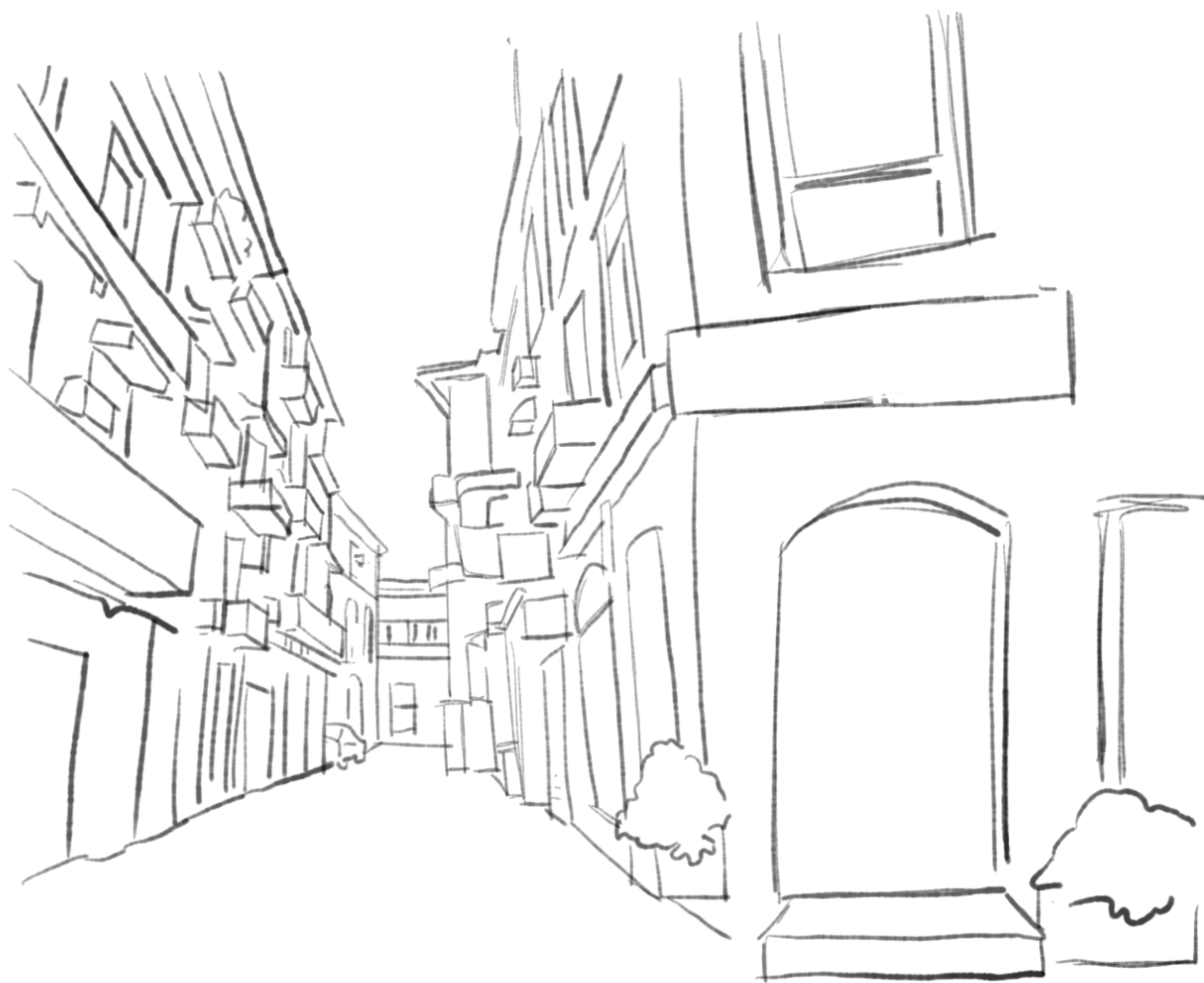
The Remember Now phase uncovered three opportunity areas from the disruptions to Indians social relationships caused by the Covid-19 pandemic. For some participants, feeling social connectedness motivated them to commit to their personal health to protect the health of their community. A future design could encourage people to commit to improving their health of themselves and protecting the health of their community by increasing their feelings of social connectedness.

Many participants found digital technology to be an insufficient way to stay connected as they began to try new ways to safely interact with others through using their outdoor terraces. There is an opportunity to use private terraces as spaces to connect with others in the community.

Lastly, most participants felt they had the idle time to engage in new hobbies and found food-related ones (e.g., gardening and cooking) as valuable ways to connect with others. Based on this pattern, food-related hobbies could be great activities to encourage community members to get together and connect.

The following section, Sketch Tomorrow, will use these findings and opportunity spaces to develop a prototypical concept for Indian urban residents.

Sketch Tomorrow



How might we use hobbies as a way to connect Indian urban residents and increase social connectivity?

Future interventions will have higher chances to improve people's life if they help increase social connectivity. In turn, these interventions must find ways to integrate and provide access to the structural systems (social networks) and functional systems (received and perceived social support) necessary for helping people commit to their personal health while improving community health. This systems must allow for people to achieve such goals without compromising the ability of organizations to prevent or mitigate the spread of infectious diseases.

In Sketch Tomorrow we explored new systems that could increase social connectivity among Indian urban residents, improve community health, and improve preparedness for future epidemics. In considering optimal interventions to increase social connectivity, we formulated the following three criteria based on the patterns across participants' stories identified in the Remember Now phase.

Help people maintain hobbies using both digital technology and physical resources.

Although hobbies were used to occupy the perceived abundance of idle time during the lockdown, they provided a way for participants to connect with one another despite being separated.

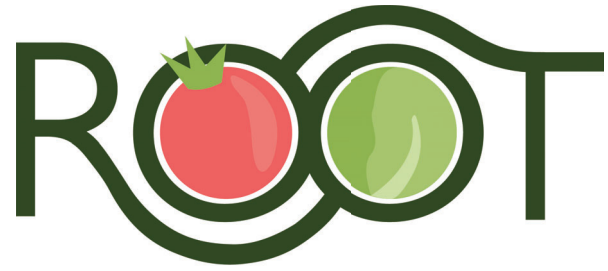
As India moves into life after Covid-19 and urban residents have more responsibilities and obligations to manage, they may have less idle time to engage in hobbies. While in-person modes of interaction are preferred, a design solution should consider ways that they can use digital technologies and physical resources to support Indian urban residents to maintain hobbies.

Incentivize individuals to make new connections with others in the community.

The skew toward virtual interactions amplified by the lockdown contributed to the high levels of loneliness and perceived social isolation seen. The utilization of digital platforms to maintain social connectivity was a useful solution for the context of the lockdown. However, it is not a sustainable replacement for in-person interactions. Many participants shared these virtual interactions reduced the number of opportunities for participants to connect with their local community. For some participants, feeling connected to the community had the power to motivate them to commit to their personal health. For this reason, a design solution should incorporate ways to incentivize Indian urban residents to make new connections with others in the community.

Utilize different private and public spaces to host healthy activities and interactions.

Even when participants were unable to meet in public spaces, some found other spaces to meet such as their private terraces. In participants' stories they found ways to transform a private terrace into a semi-public meeting and activity space. As Indian urban cities are densely populated and have limited space for new developments, a design intervention should think about the spaces that could be activated and how a system could be designed to occupy a variety of private and public spaces.



Hybrid Community Gardening

For urban residents who want to learn new skills and connect with others in their community, ROOT is a community gardening system that utilizes both digital platforms and physical hubs to help residents engage in gardening together for a more socially healthy community. Unlike traditional community gardens, ROOT is a hybrid system, where each resident has their own plot at home and then uses our digital technology platform to meet and exchange produce in person. This structure provides residents access to a network of resources, support, and interactions they need to stay connected and be successful while saving them time and space.

To demonstrate the diversity of offering components and value created by the ROOT system, this report presents four areas in which action can be taken and illustrates activities undertaken by various stakeholders in specific situations within these areas.



Figure 11: Sketch of ROOT system with all four action situations.

ROOT Integrates Various Stakeholders To Create Value

While the ROOT system is targeted toward residents, there are many other valuable stakeholders within the local community. Figure 12 is a value web, a framework part of the Whole View that shows the value exchange between key stakeholders within the ROOT ecosystem. Expectedly, not all stakeholders will interact in every action situation. Nevertheless, in every action situation, ROOT is able to create value not only for the stakeholders involved but for the community as a whole.

The first action situation will focus on the value exchange between residents and the government. The second action situation will show the value exchange between residents. The third will demonstrate the value exchange between restaurant owners and residents. Lastly, the fourth action situation will explain the value exchange between gardening experts and residents. In the following pages, we show how the ROOT system is made up of a collection of system components that can be combined to support the specific interactions within the stakeholder ecosystem.

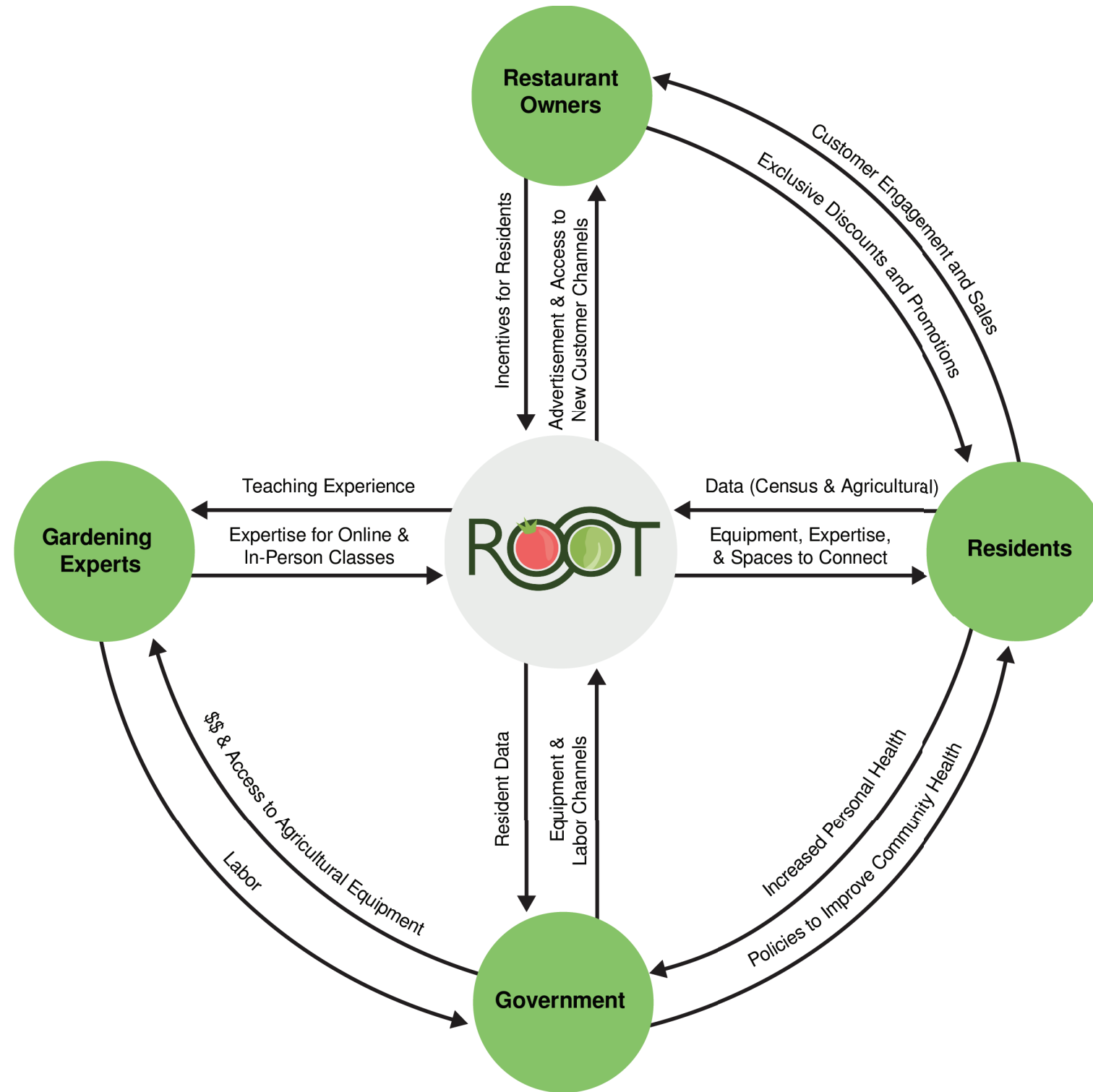


Figure 12: Map of Value Exchange Between Various Stakeholders within the ROOT System

ROOT's Interconnected System Generates Unique Offerings

The ROOT system is an interconnected network made up of a diverse set of system components characterized as people, objects, environments, messages, and services. These components can be assembled in various ways to create value. Figure 15 is an Anatomy of Systems diagram that showcases the system's components, the activities it enables, and the impacts it creates through these activities based on its purpose. This diagram was produced from the Four-I model and populated with components, activities, and impacts derived from the design principles on page 17.

The following pages present four action situations, each highlighting activities that generated value for ROOT's stakeholders considering specific situations. While only four main action situations are presented, the system was conceptualized to be flexible and accommodate other activities in response to the interests of stakeholders in utilizing its components to drive impact and purposeful change.



Anatomy of ROOT System

How To Read

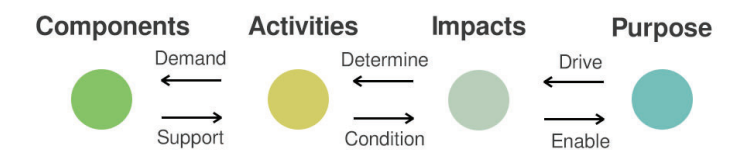
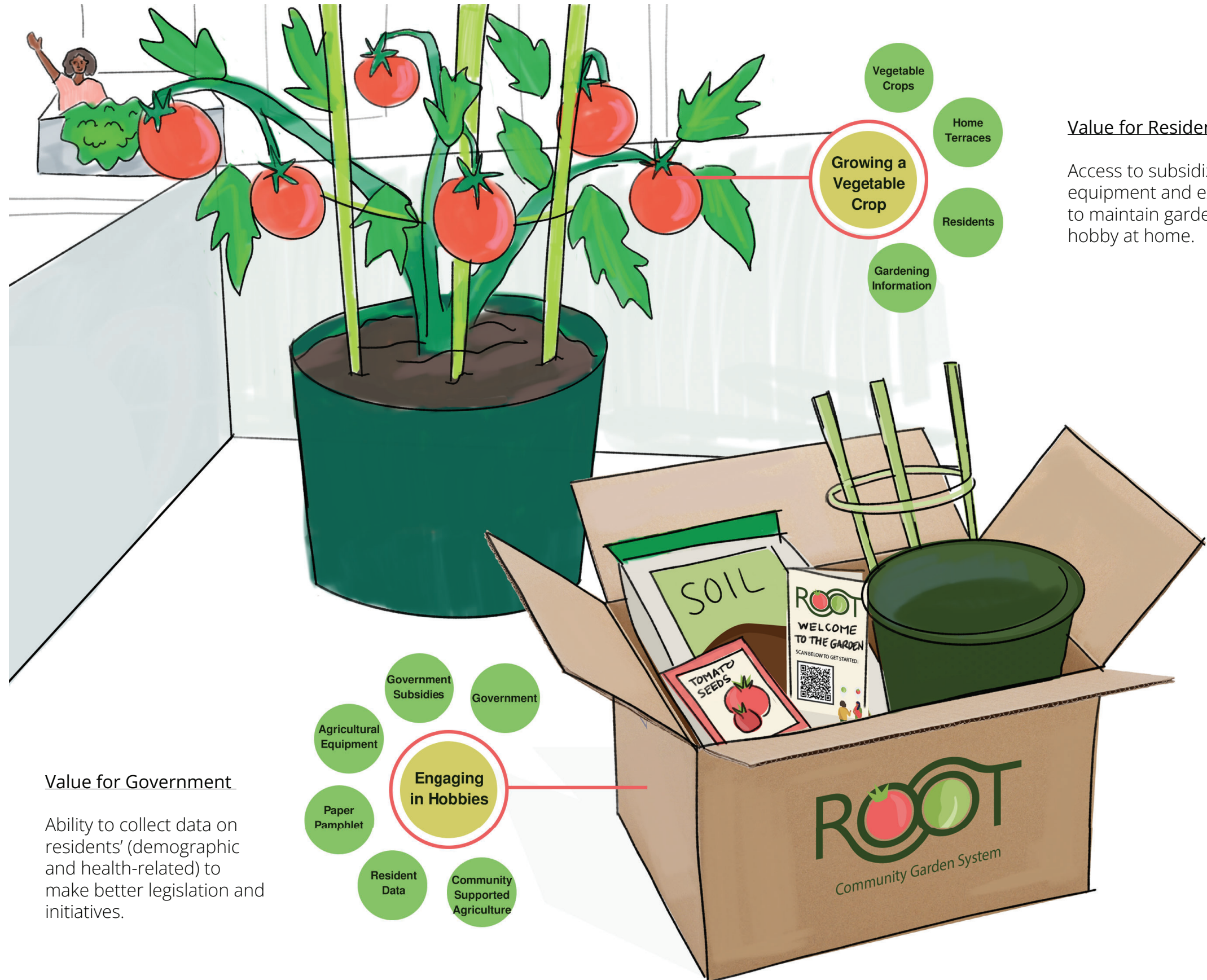


Figure 13: Anatomy of ROOT System diagram.

Gardening on Home Terraces using ROOT Starter Kits

In this action situation, the activities and components are intended to condition the impacts of a decrease in social isolation, levels of isolation and provide greater access to social support to enable the purpose of encouraging individuals to commit to their personal health. Through engaging in hobbies and growing one type of vegetable can join a community supported agriculture system with less time and space than traditional community gardening programs.

Residents and Government officials can exchange value through using ROOT Starter Kits, packages for residents that contain all the agricultural equipment needed to grow a single vegetable crop of their choice and start their own garden at home. The Government invests in the ROOT system which allows residents to access ROOT starter kits at a subsidized cost. In exchange, the Government can ask residents to provide relevant data, such as demographics, that can help the Government make better legislation and other initiatives.



Value for Residents

Access to subsidized equipment and expertise to maintain gardening as a hobby at home.

Value for Government

Ability to collect data on residents' (demographic and health-related) to make better legislation and initiatives.

Figure 14: Sketch of Action Situation #1 with overlay of value exchange, activities, and components.

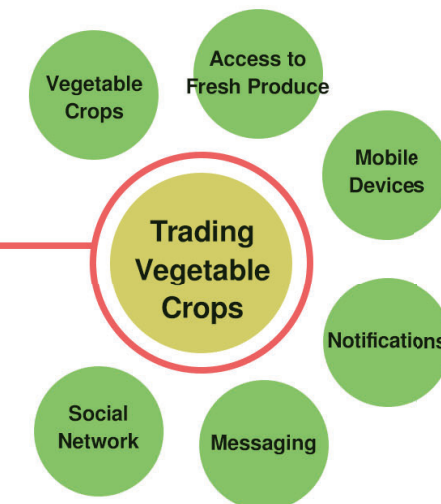
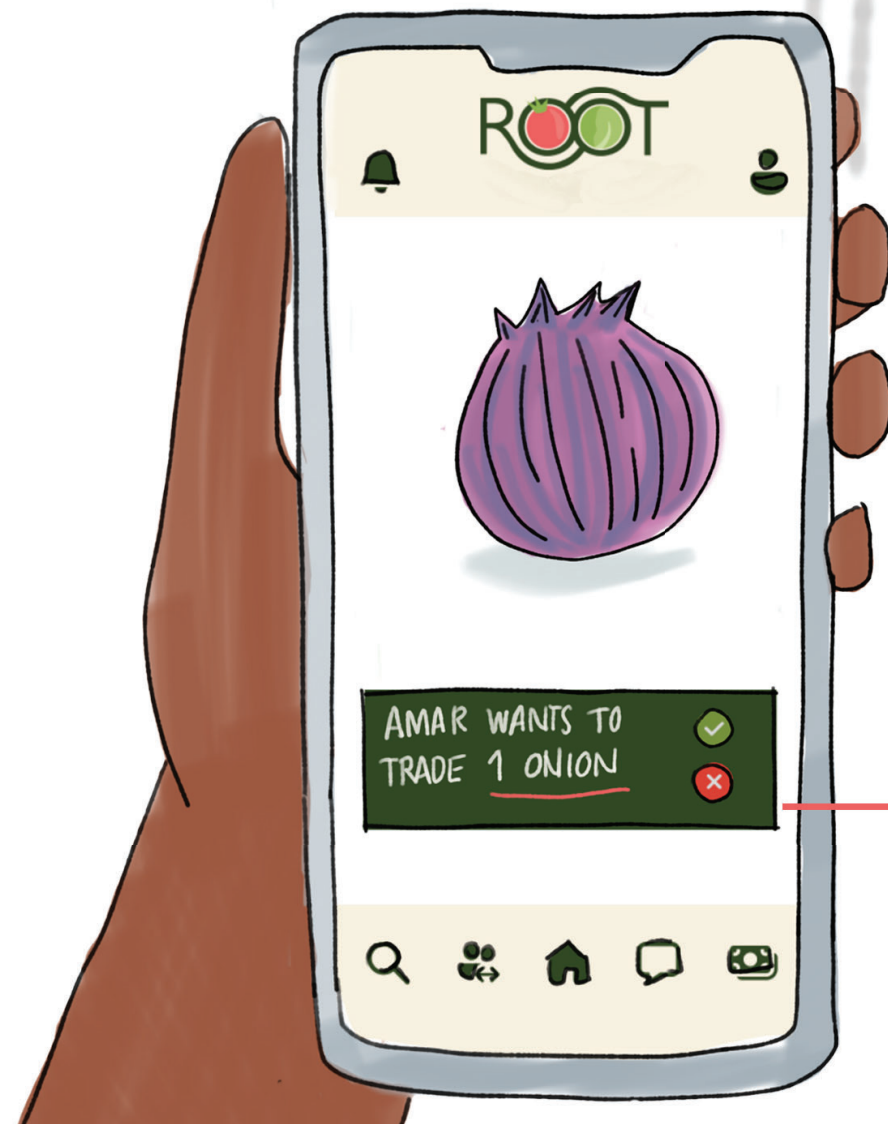
Trading Vegetables With Other Residents Using the ROOT App

In this action situation, the activities and components are intended to condition the decrease in social isolation, levels of isolation, and strengthening of social networks to increase social connectivity among residents. Through using the ROOT app to trade vegetable crops in-person, residents can share knowledge and socialize with other residents.

This also creates value for Residents, as they can access a wide range of fresh produce and they can also build new connections within the community and gather knowledge from cooking tips to how to improve their health and wellness from their neighbors.

Value for Resident

Can share and learn new recipes, gardening tips or other nutrition, health and wellness information.



Value for Resident

Can access a wide variety of fresh produce without having to have the time and space to grow it.

Figure 15: Sketch of Action Situation #2 with overlay of value exchange, activities, and components.

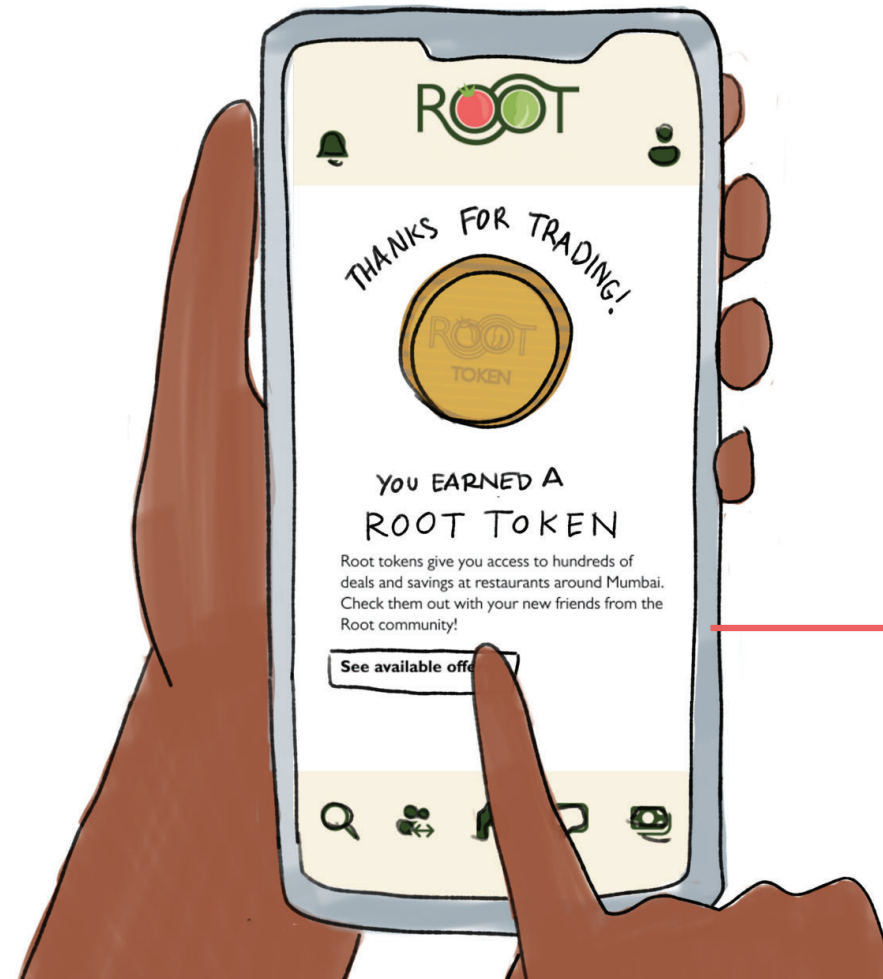
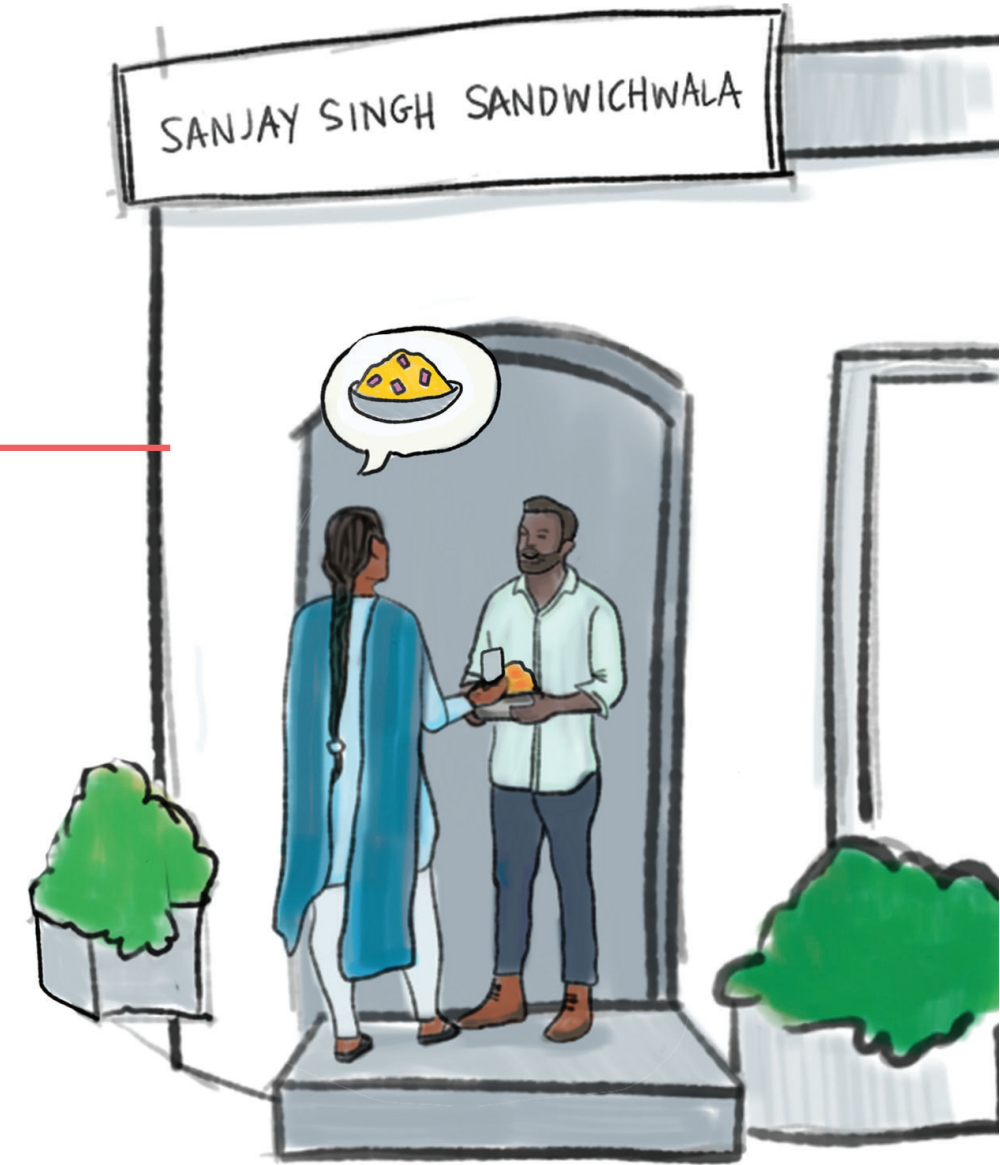
Redeeming ROOT Tokens at a Local Restaurant

In this action situation, the activities and components are intended to condition the support of local businesses to build community resilience against future epidemics. Through being active participants in the trading system, residents can earn ROOT tokens that can be used at local restaurants to unlock exclusive discounts and promotions. This encourages residents to invest in local businesses and increase the strength of their community.

Residents and Restaurant Owners are both able to benefit from this situation. Restaurant owners have channels to market and opportunities to retain new customers. At the same time, residents' access to discounts and promotions allows them to explore new prepared food and local businesses.

Value for Restaurant Owners

Access new customer engagement and can increase sales.



Value for Residents

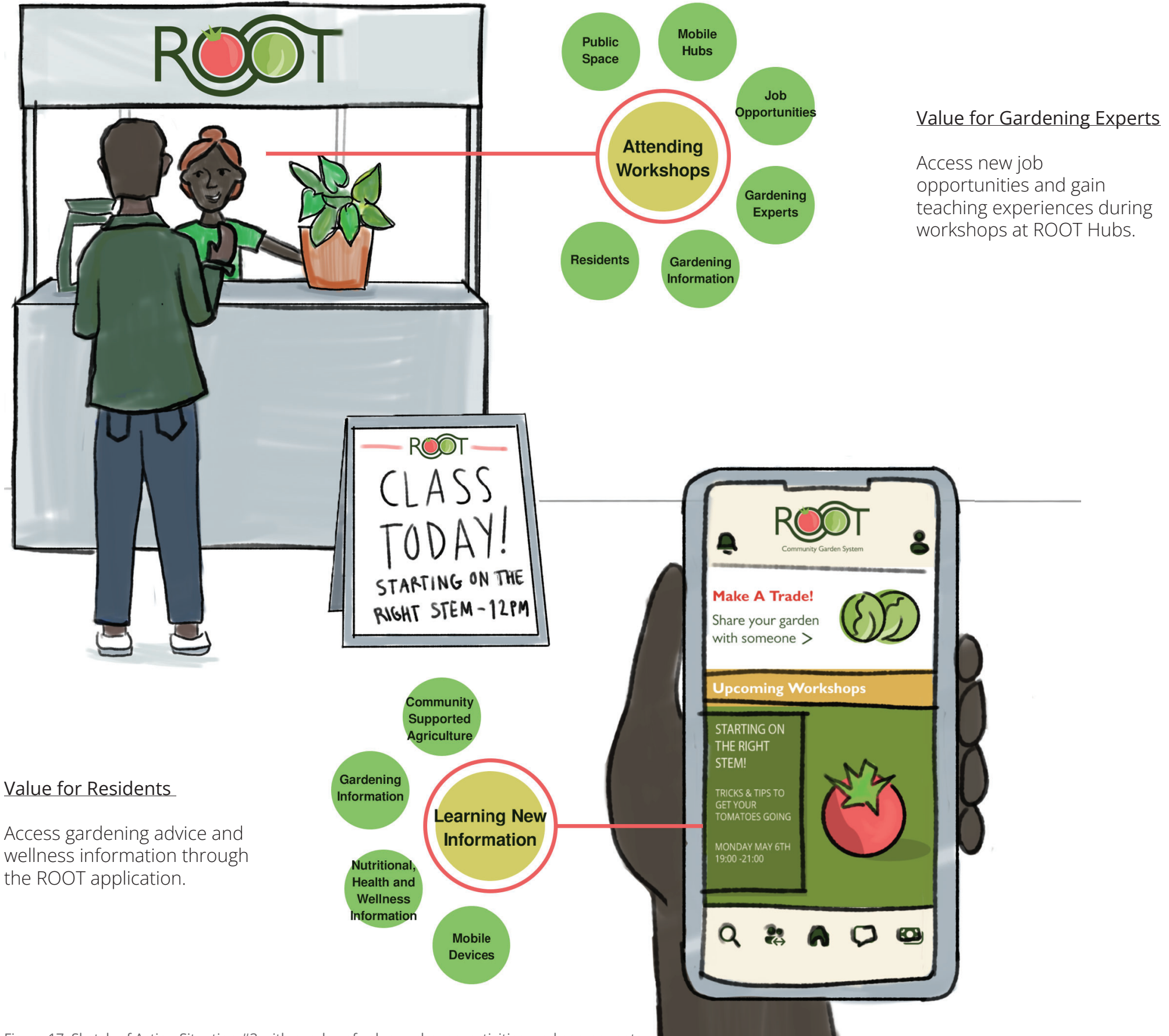
Access exclusive discounts and promotions to local restaurants.

Figure 16: Sketch of Action Situation #3 with overlay of value exchange, activities, and components.

Learning New Information from Gardening Experts

In this action situation, the activities and components are intended to condition the creation of jobs and access to support to enable community resilience against future epidemics. By having access to gardening, nutritional, health and wellness information on both the ROOT app and at ROOT Hub workshops, the community members have reliable channels to be prepared to or seek out public health information.

Residents and Gardening Experts are both receiving value in this situation. Residents have access to reliable information and 1:1 expertise to help them maintain gardening as a hobby or even learn something new. Gardening Experts can practice teaching about gardening and access new job opportunities.



Value for Residents

Access gardening advice and wellness information through the ROOT application.

Value for Gardening Experts

Access new job opportunities and gain teaching experiences during workshops at ROOT Hubs.

Figure 17: Sketch of Action Situation #3 with overlay of value exchange, activities, and components.

Prototyping Future Offerings

On the previous pages, action situations with activities that created value for ROOT's stakeholders were supported by a system of diverse components assembled to support their desired interactions. While four main activities were presented there is an opportunity for further exploration. As a connected system, new offerings activate components in different ways to drive impact and ultimately led to purposeful change.

In the Anatomy of Systems of this page this diagram, the red highlighted circles and lines illustrate how the ROOT system can increase social connectivity among residents (Action Situation 2). Accordingly, Value Web 2 situates how the represented assemblage of the system components reflects specific interactions between stakeholders within the ROOT ecosystem exchanging value created by this system.

The ROOT system is a concept that can now be prototyped to further learn its effectiveness in increasing social connectivity, residents' commitment to their personal health, and building community resilience against future epidemics.



Anatomy of ROOT System

How To Read



Example - Action Situation #2
Trading Vegetable Crops with Other Residents using the ROOT App



Figure 18: Anatomy of ROOT System diagram with an overlay of the interconnectivity present in Action Situation #2.

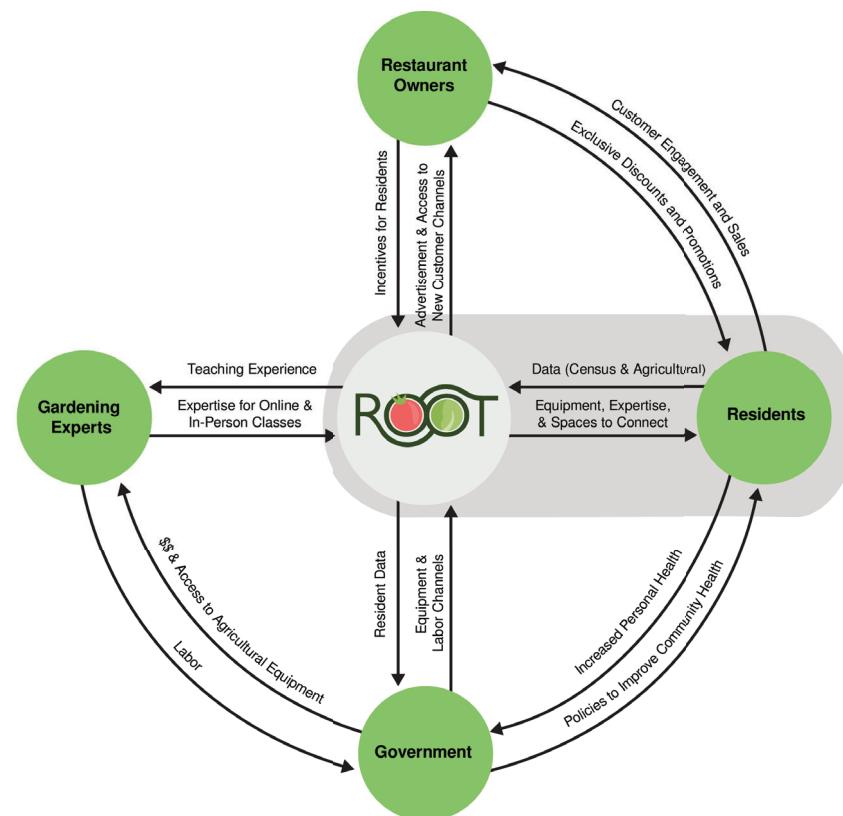


Figure 19: Stakeholder Value Map with overlay of value exchange between residents in Action Situation #2.

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Designing Life After Covid-19

Exploring Pathways to
Increase Social Connectivity

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This report results from Abigail Auwaerter's externship experience mentor by Andre Nogueira, PhD, co-founder and deputy director of the Design Laboratory at Harvard T.H. Chan School of Public Health (D-Lab). This experience reflects a partial fulfillment of the requirements for the degree of Master of Design in the IIT Institute of Design.



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