Quick App Business Challenge: HUAWEI

Lappeenranta–Lahti University of Technology LUT

2023

Team 1

ABSTRACT

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Report

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This report was the combined effort of LUT University course Open and Collaborative Innovation and Huawei in a Telanto Challenge. The topic that was selected was to explore the dynamics of Quick app in different use cases and propose a solution idea(s) of a Quick app focused on a specific goal to Huawei. The chosen goals in this challenge were emerging markets and sustainability, the final solution was based on the sustainability goal.

There are several challenges with the current mobile applications like the need to download an entire app for a single time use, difficulty finding the correct app for different purposes, and excessive storage usage of phones to name a few. Quick apps aim to provide a new platform innovation landscape where a type of lightweight apps can be easily installed for one time use. Furthermore, megatrends like emerging markets and sustainability offer opportunities for platform solutions like Quick apps. This study aims to explore new dynamics of Quick apps and provide a solution idea to Huawei.

An extensive literature review and analysis was carried out on open innovation tools and methods, service innovations and platforms, Quick apps, Huawei and use cases related to the goals of the challenge. Open innovation frameworks were used to approach the challenge, such as the Business Model Canvas and Open Innovation Funnel. The chosen method used in the study for the generation of ideas was the open innovation idea funnel.

As a result of the study, a Quick app solution including a prototype was presented to Huawei. The solution idea was presented with a high-fidelity prototype, value proposition, go to market strategy, revenue model, market, competitor, and stakeholder analysis as well as a qualitative user research study. The solution focuses on a hyperlocal community model where residents can exchange goods, services, information on the platform that can also extend to local businesses and sponsors. The final solution was comprehensive, fulfilled the goal requirement and can be considered in the next phase for MVP implementation.

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1. Introduction

Mobile applications (apps) have fuelled the growth of digital business transformation and provide services for today's users to facilitate almost all aspects of their daily lives. Despite the increasing number of apps, there is a growing reluctance of smartphone users to download full-size apps, which has become a concern for mobile app ecosystems. (Cheng, Schreieck, Wiesche, Kremar, 2020; Schreieck, Ou, Krcmar, 2022; Liu, Xu, Ma, Liu, 2019) The over-abundance of apps can result in app-fatigue and the process of installation acts as a barrier for mobile users. Downloading, installing, and storing an app on one's device significantly hinders the user experience, user acquisition and user retention. For services of infrequent or one-time use, the question remains whether native apps still offer an up-to-date solution. (Schreieck et al., 2022)

While these challenges portray the current situation in the West, in the East new platform innovations are emerging. In China a growing phenomenon of lightweight micro-apps known as Mini-Programs have taken rise and illustrate the potential future landscape of digital mobile platforms. (Schreieck et al., 2022) In 2018, the main Chinese smartphone makers Huawei, Xiaomi, OnePlus, and others unveiled the Quick Apps standard. Quick Apps are small, portable programs that don't require installation to run. They can be readily produced on the Web and run as native applications while inheriting the advantages of both native apps and Web apps. (Liu et al., 2019)

This study provides a Quick App solution for Huawei during an Open and Collaborative Innovation course at LUT University. Huawei competes in leading the global information and communications technology (ICT) infrastructure and smart devices provider. In 2019, it was estimated that Huawei was the second-largest smartphone provider in the world, overtaking Apple. (Huawei, 2019) Huawei presented the challenge to explore new ways in which Quick Apps help users and businesses leverage the digital world. The challenge was to focus on a specific goal and delve deeper into Quick Apps in the light of that goal, providing a solution or idea(s) proposal as an outcome of the study to the company. The initial chosen goals for this challenge were emerging markets and sustainability, from which the final solution prototype focused on the sustainability goal. Different tools, resources and literature for open innovation are utilised and described in this report. The final idea solution was presented in more detail in the later part of the report, and different use cases and ideas

are outlined in the study that could be useful to Huawei. In the following chapters, we discussed our initial goals, motivation backgrounds and how Quick Apps might play a role in the future solutions.

1.1 Emerging markets

Digital technologies have transformed and brought new opportunities globally. The telecommunication industry has expanded itself to all corners of the world, including emerging continents like Africa and Latin America. But these places confront several difficulties, including the difficulty of accessing inhabited rural areas, expensive expenses, and inadequate infrastructure. (Saadeh, 2022) According to a study conducted in 2022 by Ferrari et al., the absence of connectivity in rural areas as well as residents' mistrust and fear of technology are the biggest obstacles to the adoption of ICT solutions. Additional major obstacles included the price of technology and regulatory problems with data control. (Ferrari, Bacco, Gaberm Jedlitschka, Hess, Kaipainen, Koltsida, Toli, Brunori, 2022) Affordability and skills were the two main obstacles standing in the way of people in Africa owning a mobile phone in 2019, according to Statista (Statista, 2019).

Compared to the global average of 60%, the internet penetration rate in African countries is the lowest at 39%. These findings indicate a considerable difference in internet connectivity between urban and rural areas, with over 200% greater smartphone usage in rural areas than in urban areas. The importance of developing digital infrastructure, such as LTE and 5G, increases as the African economy expands. These technologies pave the way for an information society that is more inclusive and integrates digital technology into all facets of daily life, including transportation, communication, education, health, and energy. Technology has shortened distances, secured lives and livelihoods, made better opportunities available, increased banking security, and impacted growing GDP. It is a driving force for progress and innovation within the African regions. The mobile ecosystem has supported over 3 million jobs and contributed to public sector funding. (Sadeeh, 2022)

While there are several challenges faced by emerging regions, there is also immense potential for these areas to adopt new digital technologies. In fact, mobile internet traffic as a percent of total web traffic is 75.16% in Africa, largest of all continents, compared to the global average of 59.72%. (Statista, 2022) Dependence on mobile internet access far above global averages, and below average data usage increase the need for mobile technologies

that could have huge utility (Oxford Analytica, 2018). With native experience but less data usage, lower cost, higher retention rates and easy access online and offline (Huawei, 2023), Quick apps could have great potential in such markets.

1.2 Sustainability

In recent years, environmental and social topics have become important, consumers are opting more and more towards environmentally friendly products and services. Moreover, the regulatory and political environment of companies globally has become tougher with an increasing number of countries implementing mandatory environmental/ESG regimes. (Wen, Gao, Yu, Ho, 2022) However, sustainability is no longer just seen as a rule to follow; rather, it is seen as a chance for firms to profit from new business initiatives. One of the key forces behind value creation in both organizations and society at large is the application of sustainability and service innovation techniques. (Calabrese, Costa, Ghiron, Tiburzi, Pedersen, 2022)

The on-demand economy is growing where consumers are increasingly more interested in various services. Servitization has been gradually taking over industries affecting not only service-based businesses but also product-based businesses. In the past years, interest in sustainable service innovations has been increasing rapidly in all industries and businesses, one example is sharing platforms. This growing interest in sustainable services is fathomable, as there are several avenues in which sustainability can become profitable for companies: stakeholder engagement, risk management, improving innovativeness, financial performance, reputation, customer behaviour and loyalty, and attracting and engaging employees.

Various industries have been disrupted by the technological developments and the exploitation of digital possibilities. Technological development and new innovations, such as Quick apps, can also open new possibilities for sustainable service innovations, sharing economies and the circular economy. Quick access to resources, conveniences, and possibilities is where Quick apps can be superior comparing to native apps. Additionally, Quick apps can have most of the functionalities that native apps have (QR code reading, payment, connection, sensors activity and more), therefore, to take advantage of it, we would need a solution that can solve a relevant problem to motivate users to start adopting Quick

apps. Ideally, on a larger scale, it would need to sustain a business model and bring revenue streams to party involved, while not compromise on user's experience and safety.

2 Content

The following section consists of the team approach, tools used and practical arrangements regarding solving the challenge. Theoretical findings are also included in this section.

2.1 Team approach

The main approach of our team was to investigate the features/activities of Huawei Quick apps and found out the best idea/solution that could leverage off its strengths and eliminate certain weaknesses. At the beginning of our challenge, we created innovation idea funnel where we filtered our directions and ideas following the important steps such as strategy alignment, ideation selection, solution development, validation, and conclusion. During the process, we constantly refined our solution design and business model canvas. Additionally, to get a good overview from background research, we used PESTEL analysis for Huawei and SWOT analysis for Quick apps. We also applied idea evaluation matrix, value proposition matrix and root cause analysis during evaluation phase after client's feedback.

We worked together as a team and our objective was to fulfil the requirements from Huawei while having fun learning at the same time. In the beginning of this project, we decided how to work as a team and agreed on our common grounds when it came to our Ways of Working, such as "working together and also individually", "trust and open communication, respecting others in com and schedules", "be proactive", "Don't be afraid to ask", "No idea is 'bad' ideas", etc. We also decided to use several tools to facilitate our communication, such as Telegram for in-time messages, Pitch.com for presentation and Miro board for collaboration.

We arranged weekly meetings over Microsoft Teams to keep everyone up to date with the project's progress and ensure that everyone was aware of their responsibilities. Before each meeting, we set clear meeting objectives and tasks to achieve good results during the limited time. This helped keeping the meetings focused and productive. During the meeting, each team member can discuss their individual tasks, progress overview, and ideas toward the progress or final products. We found it extremely helpful to share our work and thoughts

asynchronously by using Miro board. Before starting every meeting, we set the agenda in the Miro board and tried to complete all items. Our teamwork's all activities and plan are listed on Miro board, and everyone updated their task on there. We also set up feedback sessions with our client/mentor regularly and received valuable instruction from them.

Sometimes we had faced challenges in organizing the weekly meetings. It was difficult to get all the members at a given time, but we rescheduled the meeting later and tried not to skip any. Furthermore, we continued unimportant discussions on Telegram. Thanks to that, we kept up with our schedule and saw no delay in our project timeline. To create prototypes from the wireframes, we used Figma and use Google Sheet to collect end-users' opinion for validation phase. Besides, we used other resources like Lutpub and Google Scholar for research articles and it helped us find relevant information about our solution and challenges.

2.2 Theoretical findings

The theoretical findings are discussed in this section regarding open innovation, innovation idea funnel, business model, open business models, ecosystems, platforms and sustainable service innovations and platforms.

2.2.1 Open Innovation

Covid pandemic reminded and reawakened interest of many companies of the massive potential open innovation can provide which was seen as a sudden burst of open innovation across different companies and industries. The open innovation model can still be seen as a highly beneficial model for organizations to acquire success in a long run whilst there is a dynamic and quickly evolving market environment (Torkkeli et al., 2009; Johnson et al, 2020). (Dahlander & Wallin, 2020) Open innovation (OI) was initially characterized by Chesbrough (2003) as a paradigm that contends that companies should utilize and nurture both internal and external ideas and channels to market, as they go on their quest to enhance their technology. Few years later, Chesbrough et al. (2006) redefined the term to the use of available knowledge inflows and outflows to boost internal innovation and broaden markets for outside application of innovation, respectively. Later Chesbrough et al. (2014) added elements on top of the definition from 2006, that open innovation is fragmented innovation process and the process mechanism the process uses should be aligned with the business

model of the company. The OI process is usually demonstrated as a funnel-shaped diagram which has three different phases: 1. Research, 2. Development and 3. Commercialisation. Process starts from the ideation at research phase from where the most promising ideas pass through to the development and commercialisation phases. They key thing for the funnel-diagram is that the company's borders that represent the funnel, are not solid but porous that allow ideas, knowledge, and technologies to pass in and out of the firm in all stages of the innovation process. (Mortara et al., 2009; Chesbrough et al., 2014) According to Chesbrough et al. (2014) there are three different types or directions of purposive knowledge flows: 1. Inbound, 2. Outbound and 3. Coupled open innovation which is the combination of outflows and inflows between actors in the innovation process.

Instead of solely depending on internal resources as in the usual closed innovation model, the use of open innovation enables the matching and integration of resources between the organization and external partners. It gives the firm a chance to address its business difficulties and enhance its capacity for innovation. According to Mortara et al. (2009), faster time to market for products (especially for businesses that appear to need the highest rate of innovation), the availability of new technology, and access to business competences were found to be the three largest benefits of OI. (Chesbrough et al., 2006; Mortara et etl., 2009; Torkkeli et al., 2009; Chesbrough et al., 2014; Dahlander & Wallin, 2020).

2.2.2 Innovation Idea Funnel

Innovation idea funnel is being used nowadays for visualization and outlining a holistic innovation process to figure out great ideas amongst good ones (Institute for Manufacturing, 2009; Maurya, 2018). Generally, the funneling process is a linear one-way, step-by-step progress where after each stage the number of ideas is reduced as the process proceeds through the "gates" to the next stage. (Institute for Manufacturing, 2009; Hakkarainen & Talonen, 2014; Maurya, 2018). It usually consists of different steps like strategy alignment, ideation, selection, and validation. Strategy alignment is about setting constraints and background for the process going forward: who is the customer and what do they do, and then also what are the goals for the process. In ideation phase companies need to let lots of ideas enter the innovation idea funnel as it has been found that only little parts of ideas (1 to 3000) turn out to be productive and successful (Stevens & Burley, 1997; Institute for Manufacturing, 2009; Scott, 2010; Hakkarainen & Talonen, 2014; Strategyzer, 2019). Due to this reason subsequent or bad ideas need to be screened out as early as possible. This will

save on time, money, and effort for the company. (Hakkarainen & Talonen, 2014; Strategyzer, 2019) In the validation stage the best idea (s) are tested in real world setting to see if the idea is actually and wanted (Institute for Manufacturing, 2009; Hakkarainen & Talonen, 2014; Maurya, 2018) Validation stage should help reduce the uncertainty of new business ideas with solid testing (Strategyzer, 2019). Overall, the objective of the innovation idea funnel is to bring an organic idea into a real-world concept and finally into a final product, while simultaneously discarding unfruitful concepts through screening between development stages. (Institute for Manufacturing, 2009; Hakkarainen & Talonen, 2014). Figure 1 below depicts roughly the main activities that may go into each phase of the Innovation Idea Funnel.

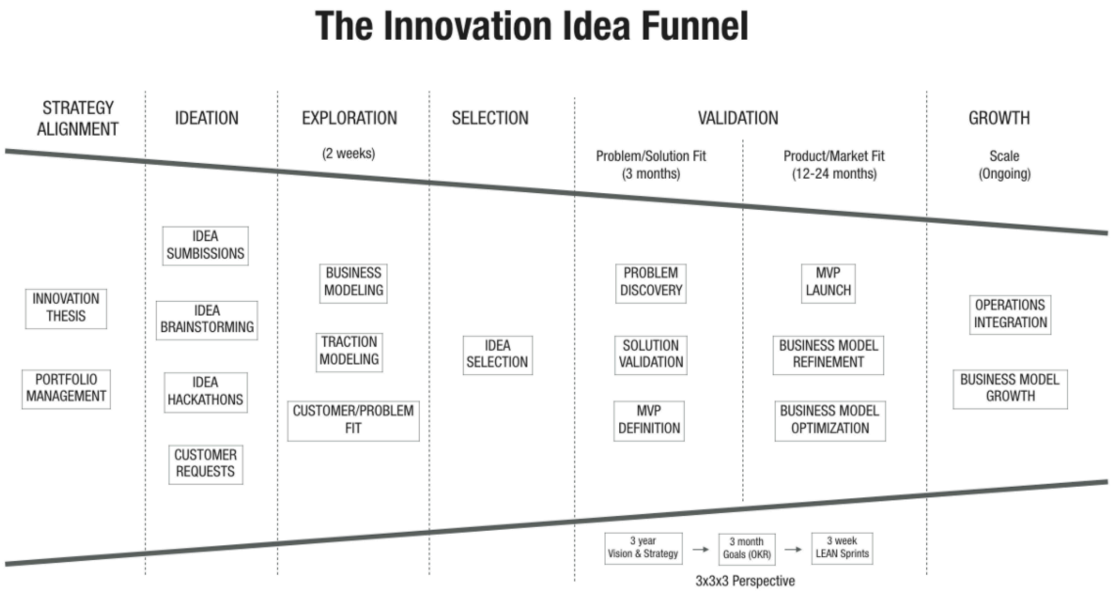

Figure 1. The Innovation Idea Funnel (LEANSTACK Blog, 2018)

2.2.3 Business Model and Open Business Models

The definition of the phrase "business model" in Osterwalder & Pigneur's (2010) book Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers is "the rationale of how an organization creates, delivers, and captures value." Teece (2010) compared the business model to the means by which a company can generate, bring, and seizes value. The way one organization "does" business could be summed up as its business model (Amit & Zott, 2012). Business model creation process serves as a blueprint to execute actions that aligned with strategy by making use of the organizational systems, structures,

and logistics. The Business Model Canvas is a nine-block model that can be used to build business models. The Business Model Canvas is a nine-block model that can be used to build business models. The first blocks, key “Partners, “Activities”, “Resources”, then "Customer Segments," following by "Value Propositions," then "Channels," "Customer Relationships," and most important "Revenue Streams," "Cost Structure," address the four main pillars of a business: customers, offering, infrastructure, and financial viability. They explain the reasoning behind how a business expects to provide value and generate revenue in its conclusion. (Osterwalder & Pigneur, 2010)

According to Chesbrough (2006) traditional closed business models are becoming less effective every year in today’s quickly evolving, dynamic and interconnected world (Johnson et al, 2020) where businesses need to adopt and stay open to stay competitive. This way firms can get the most out of OI and unlock all their economic potential (Chesbrough, 2007). But instead of just opening up a specific function of their business model, firms are in the process of redesigning all the aspects of their business models instead of just research and development for example (Weiblen, 2014). Open Business Models are business models that employ an 'openness' mechanism for organizing and sharing the value created by the business and can be defined as “describing the design or architecture of the value creation and value capturing of a focal firm, in which collaborative relationships with the ecosystem are central to explaining the overall logic” (Chesbrough, 2006; Zott & Amit, 2010; Weiblen, 2014). In both descriptions, for the creation of value, collaborative relationship is the central and key part. Open business models capture value by systematically collaborating with outside parties. Value creation and capturing can take place by utilizing outside ideas within the company (inbound) or by offering and commercializing ideas, expertise, goods, technologies, or intellectual property to third parties (outbound). (Osterwalder & Pigneur, 2010) Organizations can use open business models to solve entrepreneurial or business challenges (Benyayer & Kupp, 2017). They can help companies tap into new sources of innovation and generate new revenue streams. Companies can also reduce their costs and accelerate their time to market by leveraging open business models. The hard part with open business models is that companies need to balance the benefits of openness with the risks of giving away too much control or diluting their brand. (Chesbrough, 2006)

2.2.4 Ecosystems, platforms – sustainable ways to operate in a digitalized world.

The political scheme and aspiration seem to have been set to enable development of cleaner product and service innovations. Since the global goals should support transition from linear consumption economy to circular economy, saving natural resources and decreasing excess production (Stahel, 2016), there is also a huge business potential for companies to create service innovations that play a critical role in combating climate change and accelerating circular economy. Global competition in this transformation is driving companies to re-invent their business models from product-based to service-centric, adding value to their products with related services (Kindström & Kowalkowski, 2015).

In addition, the on-demand economy is growing, and consumers are increasingly requiring new services related to online marketplaces, transportation, and food delivery for example, as in Appendix 1. Moreover, new service-based businesses combining the existing assets, products and services, such as Airbnb for example, are emerging in the lists of largest companies in the world. Digitalization is accelerating this direction of development (Cenamor et al., 2017).

As in the history, the boundaries between service and product distribution have been more divided. During the last decades, especially latest years, the boundaries have been blurred and servitization has been taking over almost all industries. Service innovation has been leading the development in various industries affecting both service-based businesses and product-based businesses. Service has been replacing and replenishing product business, and service has been replacing service businesses (which have been renewing and digitizing their services). (Kindström & Kowalkowski, 2015; Djellah et al., 2017).

2.2.5 Sustainable service innovations and platforms

Sustainable service innovations are required to maintain the planet viable. Circular economy is aiming to change the mindset of “take-make-dispose" to keeping up the highest value of products, components, and materials – creating regenerative economy. During the last decades the interest in research and exploitation of sustainable service innovations has been emerging, addressing all industries and businesses. Sitra (2019) categorises sustainable service innovations to five categories: Extension of product lifecycle, Product as a Service site for sharing, Resource efficiency, recycling, and renewable resources. The role of

digitalization and technology is often utilized in each category, but especially in the categories of Product-as-a-service and Sharing platforms. (Calabrese et al. 2018).

These models adopting service-oriented service strategy builds on the use-oriented PSS. Value is based on the service and functions the service provider can serve. The ownership consumption changes the way of consuming: companies are not providing the product and customers are not getting the ownership of the product, but the use of product and the provided services. In action this includes models such as sharing, renting, leasing, pay per services, re-using and so on. (Calabrese et al. 2018).

Platform ecosystems is still evolving field of research interest yet has raised a diverse interest from technological perspective to governance and business design (Jacobides et al. 2018). A platform is a business that specializes in establishing connections between customers and value-adding outside suppliers. The platform provides an open, participatory architecture for these interactions as well as the governance framework. The platform's primary objective is to facilitate matches between users and allow for the exchange of goods, services, or social currency, therefore generating value for all users. (Albats, 2021 based on Parker et al., 2016).

Technological development has enabled possibilities for new kind of business models and solutions. The exploitation of digital possibilities has resulted in the disruption of multiple fields of industry, and in new spheres of the sharing economy. Sharing economy on the other hand serves as an umbrella for multiple models of business and various forms of interaction between people, companies, and governments. Platform solutions counter the current trend of shifting economies of scale from supply to demand. (Albats, 2021).

Platforms function as a two-sided market, providing a platform for various groups of people (stakeholders) to co-operate and the co-operation creates transactional value for the platform (Albats, 2021). The value generation, value delivery, and value capture dimensions of a platform's business model each serve potential stakeholders in distinct ways. (Täuscher & Laudien, 2018).

The platform itself holds no value and the value monetization is a crucial element of the process of launching a platform business. The decision on whom to charge is vital, as the platform should generate value for each stakeholder it serves. Common monetization techniques include transaction fees, charging users for more access, charging third-party producers for community access, and charging for better curation. (Albats, 2021).

Jacobides et al. (2018) identified a platform ecosystem to present one of the three research streams of ecosystems, where the focus is on how stakeholders organize around a platform. Quite a lot on the research on platforms has been done in the context of software development and marketplace type of settings for videogames and software providers, and multi-sided markets have been explored on its own. (Jacobides et al. 2018).

2.2.6 Sustainable business case

A business case for sustainability would be a decision to invest in sustainable business model integrating sustainability into company's operations, offering and value proposition. Consequently, this investment on sustainability should create also financial value and accumulate into a company's profit within a certain period. There are several mechanisms recognized, how sustainability can be a business case i.e., transform into company's revenue or cost saving. To develop a sustainable business case, several factors must be taken into consideration, and the most important is to drive stakeholder's engagement to scope our risks, and improve the financial performance with innovation opportunity, ideally from customers and internal employees. In the next chapters, we will discuss how our solution can address those aspects and provide a detailed plan how to win over the market with insights about the current situation (stakeholders, competitors). (Whelan and Fink, 2016)

3 Open innovation in action

In this study the open innovation funnel was utilized as the team's approach in solving the challenge and generating one final idea solution for Huawei. The innovation funnel was used to create a more structured approach for the generation and refining of ideas and consisted of six different phases, 1. Strategy, 2. Ideation, 3. Selection, 4. Development, 5. Validation and 6. Conclusion (Figure 2). During Feb 2023, we mainly looking for concepts exploration and refining, combining our ideas, preparing meetings with mentor and client to understand the product better. Then in March, we spent a large amount of time refining and grouping the potential concepts, explored different business model for each of them and discussed in detail for voting. After that, we moved ones with client's feedback and used April to continue with development, validation with real end-users and looked into the potential market with

different stakeholders and competitors. Lastly, we conclude our solution with recommendations, known limitation and next steps for it.

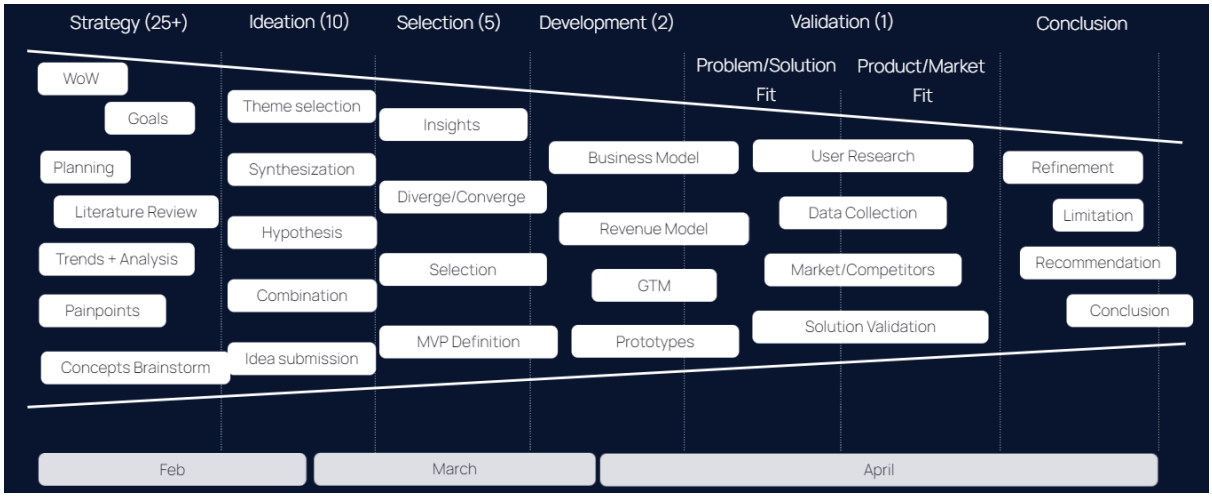

Figure 2. Our Open Innovation idea funnel activities and timeline from Feb-April 2023

3.1 Strategy

The team began with 1. Strategy phase by familiarising themselves with the Ways of Working of the team. The scheduling and weekly meetings were agreed upon at the very beginning and were adhered to with few to no exceptions every week, in-time messages were used to reschedule meetings and general communication. A collaborative environment was prioritised as a key to success where all ideas were welcomed. Open communication and client/mentor feedback were seen as crucial for the success of the challenge and were used throughout the process to refine the ideas and direction. The strategy phase also consisted of setting the general goals and planning for the challenge, making sure each team member was on the same page. An extensive literature review was conducted on Huawei and its demography, Quick apps/Mini apps, future trends, as well as analysing competitors and the market. Current problems that drive the Quick app solution were identified. A SWOT and PESTEL analysis were carried out for Quick apps and Huawei. During this first phase, we came up with more than 25 concepts, directions, and problems we wanted to explore further, then we voted based on team's interest and familiarity. (Appendix A. Concept exploration)

3.2 Ideation

After the initial research, the team went on to phase 2. Ideation. At this stage, several different ideas were generated by the team members. The idea journey consisted of four subprocesses including idea generation, elaboration, championing, and implementation (Černe, Kaše, Škerlavaj, 2022). Rather than following a fully structured idea journey setup with predetermined steps in generating, absorbing, synthesizing, and evaluating ideas, the team followed a combination of structured and unstructured approach where the idea journey included predetermined steps but was open to changes along the way, interpersonal dynamics also played a role. Structured idea journey steps were used as they result in better team-level innovative solutions (Černe, Kaše, Škerlavaj, 2022). To refine the approach, the focus was shifted to the main ideas related to the goals emerging markets and sustainability. Ideas were further hypothesised, synthesised, and combined until the decision for the 10 ideas for submission was reached within the team through voting.

3.3 Selection

In the 3. Selection phase we continued combine and discuss more using diverge and converge method to find the best 5 ideas chosen within the team to present to Huawei. Following feedback from the company, two main ideas were chosen for the next phases: an Education App for the emerging markets theme, and a Community App for sustainability theme. Both ideas were investigated further with literature review and the generation of design thinking user journey's, business model canvases, competitor matrix, and value proposition matrix. The idea evaluation matrix was used to determine which idea will be taken further for development and validation, where theme relevancy, problem solving, Quick app capability, revenue feasibility, novelty, sustainability, practicality, and market size of each solution were scored from a scale of 1-3 (Figure 3). After receiving company feedback, the Community app was taken to the 4. Development, 5. Validation and 6. Conclusion stages which will be discussed more thoroughly in section 4 of this report.

1. Normal 2. Good 3. Great

Ideas	Theme relevancy - Related to selected goal	Problem solving - Does it solve a real problem?	QuickApp capability - How much QuickApp strengths contribute?	Revenue feasibility - Can it make profit?	Novelty - Has it been done before?	Sustainability - Environment + society	Practical - Can it be done right away?	Market size - How big is the market size?	Total - Weighted Score
Education App	2	2	1	1	2	3	1	2	19
Community App	2	2	2	2	2	2	2	2	22

Figure 3. Idea evaluation matrix and weighted score

For reference, here is what we discovered with the Education App, details can be found in Appendix 4.

Africa's educational system is changing at an unprecedented rate because to technology, which also makes instructional materials accessible to less fortunate students at low cost. There is a growing need for forward-looking, innovative teaching and learning approaches that expand the access to online learning resources (UNICEF, 2021). The Education App aims to provide a solution with the key value propositions to provide educational content, courses, and lessons for emerging markets. The app is a platform that connects learners with teachers and enables learning anywhere, offline. Content can be downloaded according to one's learning plan. Due to the highly lightweight and optimizable nature of the app, there is low need for processing power and storage space on devices, making it optimal for rural areas with limited mobile resources and infrastructure. The fluent and easy user experience makes the app easy to use for all regardless of the level of digital knowledge and skills. The app allows to explore and discover new learning paths and even makes peer-to-peer knowledge sharing possible by transferring content from device to device through NFC technology. AI could also be integrated into the app to further enhance its educational potential, it could be used for features such as feedback, grammar checks, translations, etc.

Another key element of the Education App is the utilisation of multi-purpose learning hubs which aim to connect local teachers and learning groups, offer a place for downloading the app and educational content, and giving access to mobile devices. Recycled or used phones could be transported to African rural areas and used in the learning hubs in combination with the Education App.

The key stakeholders for the app are universities and schools, partnerships, development organizations, cities, and local communities. The app works on a godfather concept/ incentive program where subscriptions can be donated, certificates can also be earned from the app. Key competitors were identified as Mwabu & Moodle App, Khan Academy, edX and TocaLab, which provide learning possibilities that are suitable for emerging markets and are most like the Education App. Other competitors include well-known apps like DuoLingo, however, these types of apps only provide content for a specific subject area like learning languages. What makes Education App unique is its availability and easy usability anywhere, as well as the broad scope of quality educational content available.

3.4 Development, validation & conclusion

The 4. Development stage consisted of low- and high-fidelity prototyping for the Community App, as well as a more detailed user journey generation (Appendix 5). The business and revenue models and go-to-market plan were refined. In the 5. Validation stage, market and competitors for the sharing economy, specifically products and services sector of the sharing economy, were mapped out. User research and data collection in the form of a qualitative questionnaire were conducted to validate the solution. Finally, a conclusion with limitations and recommendations on the next steps for the app were presented.

4 Solution presentation: Community App

The key value proposition is related to its unique proposition of hyperlocal aspect and the increased sense of community. The sense of community and interactions withing residents have been declining since Covid pandemic and in some countries, we don’t even greet our neighbours anymore. With Community App, we can bring in the people again by giving people a platform where they can foster communication, collaborate, and create events for their neighbours to increase the community sense even further. With Community App, users can also benefit from their near proximity and their neighbours in the building by lending/sharing of different gadgets, offering or requesting helps with tasks or by supporting local businesses in the building. The fact is, people are now living smaller in taller buildings, and the need for smaller housing is increasing as we move forward. Community App

counters this problem of lack of space and need to buy. Many times, some gadget is just needed for one time or very rarely, so it is not necessary to have it laying around in your storage taking part of already low amount of storage space. Community App also combats sustainability constraints and problems with overconsumption by reducing the need to buy, and increasing the lifetime of gadgets as others can use them. In this way, Community App fosters the approach of sharing economy and creates deep value for all participants in the platform. It brings together the hyperlocal community with the local businesses/promoters, to together share and sponsor each other and give the ability to enjoy atomic living: community, assets, and services every day. Especially the hyperlocal community aspect together with the broad range of different features available, is what distinguishes Community App from the competitors. Figure 4 represents different factors building up the solution ecosystem, and how they co-benefit from Sharing, Connecting and Sponsoring.

Figure 4. Solution Platform Ecosystem

4.1 Features

Community app is a good platform to facilitate interaction with neighbours in a simple and low commitment way. It's designed to launch quickly and give instant results to residents of a community. Residents scan the QR code from the building hallway and launch the app instantly. They can establish individualized apartment profiles with data, activities, and other details if they wish. They can connect and view other profiles in the same community.

We have designed our community app with many interesting features that will greatly benefit the community members such as social feed, discussion forum, groups and calendar events, list of assets and service, order, and service management etc. Pictures of the app prototype can be found in Appendix B. Community App screens and features.

Community residents can view assets/services near their community for sale or rent. It shows the availability time so that the user can be concerned about the confirmation date for this resource or service. All the items are displayed in categories according to the display so that the required items are easily found. Resident can message each other for enquiries and agree on details before committing to an exchange. This will also enable users to earn more from what they already owned, either assets, skills, knowledge, or kindness.

Discussion forums are another key feature of our community app that enables users to connect, share ideas and engage in conversation with others in their community. It is a space where users can create and participate in topic-specific discussions, an open space for users to share and discuss any topic of interest. Anyone can find new information to participate in social interaction using the social feed. Community residents can also create groups using this app based on community members' interests, hobbies, or locations.

Additionally, we also have the building calendar where users can create events RSVP, view events on specific days, set up requests for certain period with various views (day, week, month), and other service availability. Order and service management and Payout are important features of our community app that facilitate transactions between users. This feature enables to offer or request service, manage orders, and communicate with customer. The Payout option allow user to receive payments for services or assets ordered.

Overall, Community App act as a sharing platform for users to interact, communicate, and transact with one another in a smooth and effective way through facilitating Digital Twin and Servitisation transformation on current tangible assets and intangible services.

4.2 Competitors

During our research for Community App's market and value proposition, we found out that there are already several direct and indirect competitors on the market. Some of them offer similar solution than ours at certain extend, however, the aforementioned value propositions and our defined approach are what differs us from them. All the recognized competitors can be seen in the Appendix 2 matrix which has the level of functionality in the Y-axis and the level of hyperlocal community sense in the X-axis. As we can see from it, our biggest competitors that come close in the level of functionality as well as in the level of hyperlocalness are Nextdoor from the US, local Facebook neighbourhood groups all around the world and Olio from the UK.

Nextdoor differs from Community App by being a more social media type app for the neighbourhoods than being based on the hyperlocal products and services lending/renting/selling aspect. Nextdoor is usually used for reporting, news, asking advice and events in the neighbourhood. In addition to this, Nextdoor then has the marketplace section for selling and giving away stuff, but no payments can be done in the application. Nextdoor is local but the hyperlocal aspect in the Nextdoor is not that high level as they focus to become a social media platform and marketplace that takes advantage of geographic location data. (Nextdoor, 2023).

Olio is a platform that is heavily based on sharing, renting, lending, or giving away gadgets and stuff. People and companies can also give away/donate food to the locals through Olio. Olio helps people to get rid of unneeded stuff and makes decluttering fast while reducing waste, sustainability constraints and helps the neighbourhood at the same time. Olio has global userbase of more than 7 million users worldwide. (Olio, 2023) However, users on Olio are doing exchange to strangers on the platform, and not who are living within the same building. For this reason, we sustain more trust on the platform from users' own community.

Facebook neighbour or residential area groups are probably something that everyone is familiar with. At least in Finland, almost all neighbourhoods have some kind of local groups and most of them are active on certain levels. These group can be used to connect with neighbours, participate in local community, offering help or support, sharing information, and discovering new recommended places or businesses nearby. (Meta, 2021) Even though Facebook neighbourhood groups are popular, they are rather limited by the features usually,

sometimes by the capabilities of the app and sometimes the limits set by the moderators. Additionally, it remained as a social media platform with declining engagement recently.

Another competitor to Community App is different Libraries of things that are all around the world but most actively in the US (Local Tools, 2018; Renewable Matter, 2021). The concept is nothing new and there were tens of active libraries of things already in 1970s in the US (Renewable Matter, 2021). These libraries of things mainly only offer sharing or lending of items between strangers within an area, but more recently they are also about bringing people and communities together by different events. Probably, the most known one is the London's Library of Things that has many self-service kiosks spread around London (Renewable Matter, 2021; Library of Things, 2023). Libraries of things are hyperlocal due to them being city wide and usually people from anywhere can contribute or use the service. However, Communty App can win over if we champion the building aspect.

4.3 Market size and Go-to-Market plan

The value of global sharing economy in 2021 was around 115 billion US dollars and the market is expected to continue rapid annual growth (32 % GAGR) hitting the level of around 600 billion already in 2027 (Statista, 2023). According to Statista (2022) in 2022 the revenue distribution of sharing economy provides globally by region was mostly concentrated to Americas which represented 57% share. Europe was the second largest region with little bit over 19% share while the rest of the world represented about 24%. From this we can see that the sharing economy market is much more mature and saturated in the Americas while Europe is much smaller still. As earlier mentioned, sharing economy consists of many different sectors and types of services or products. That's why we cannot take the whole market as our expected total addressable market (TAM). Community App operates in the products and services sector of the sharing economy which is not one of the biggest ones. If we expect that 5% of the Europe sharing economy TAM is the share of products and services, we come up with approximately 28 billion market size. If we even further split this into the market sector of hyperlocal products and services market in Europe with assumption of it representing niche market of 3%, Community App's priority market adds up to total market potential of 840 million. Therefore, we believe Europe is a great market entry for the app.

We have created a Go-to-Market plant for Community App's conquest of Europe. In 2024 we want to start with launching the MVP (minimum viable product) to the market and follow

it up with experimentation and improvement projects in 2025. In the start we want to focus on our idea customers; new construction buildings, “Green” -driven buildings and individual building residents who are interested in supporting their residents' community. Year 2026 will be solely focusing on user growth and scale up worldwide. User acquisition would be done through partnerships, contracts, and project biddings between buildings. Also, marketing in different medias and word-to-mouth will be an important factor driving our user growth. Scaling with the help of building managers, building constructors and bigger user communities will bring up opportunities to grow even faster.

4.4 Business model and revenue model

A business model canvas framework (by Osterwalder and Pigneur) was chosen to be utilized to describe the core of the business model in order to assess the commercial viability of Community App. The goal of the business model canvas is to give a broad perspective of how value is created and captured by the company; in our case, this includes taking the sharing economy and sustainable business practices into account. Details for our business model canvas is in the Appendix 3.

As the solution serves multiple stakeholder groups there are multiple revenue streams to give a try on. It is common for platform businesses to leverage revenue from multiple sources as the value creation for different stakeholders is different. Different motivations for stakeholder groups should be evaluated when planning the revenue structure, in our business model we approached the revenue logic from two perspectives: who would be willing to pay for the app and at what stage?

Since the lock-in and retention rates seemed to be the most crucial factors of the successful mobile app, the decision of the app to be free of charge was preferred. Still the value for the user is in the transactions and it is also a natural step for payment to occur when there is money moving already. From the software provider perspective, the monthly recurring revenue on the other hand provides the most benefit, since it enables the possibilities to estimate the money flows, but also to scale up the service level accordingly. On the other hand, the possibility for customization services was identified as a potential approach to secure the attractivity and enable lock-in value for local communities, which speak on behalf of providing custom services as well. These three are complementary to each other. Table 1 below details our revenue models and suggested initial pricing.

Table 1. Revenue models for Community App

Revenue Model	How it works?	Suggested pricing
Contract-based per building	Building association can consider paying for the building tenants	Building with 30 apartments can be charged upward €99/month
Token-based transactions	Representing Token of Kindness, to exchange on the platform	€2/token, users can set how many their assets worth
Customization services	Whitelabel the app to customize and integrate with existing smart system in the building or community	€5.000+/app depending on the customization with recurring maintenance fee.

4.5 Validation

In this validation phase, we asked 10 end-users who live in apartment buildings how likely they are to recommend community app to a friend. We got some good feedback from them. 30% are very likely to recommend it, 40% are likely recommend, 20% are sure because they think the features are helpful as they haven't seen before, and the remaining 10 percent recommend probably because it is personally relevant. We received recommendations result from people with different backgrounds, 8 nationalities, single families and those aged 21 to 30 in 5 European countries. The details of the answer can be found in Appendix C. Participants Answer. Here are our insights based on the open-ended questionnaires:

Most people want to offer help but hesitate to come forward. In these circumstances, community app would work better as anyone who want to volunteer themselves can post through this app. Similarly, anyone who needs help does not need to go to door-to-door, rather, they can just ask everyone by posting in this app.

They use the app as needed or on average once/twice per week. When asked about asking neighbours for help through the app, many of them volunteered to help, while others asked once, occasionally, or never.

Our participants agreed that Community App is a great tool to communicate with neighbours. It is intended to use between the residents of different flats living in the same building blocks. If anyone needs help or want to borrow something he can ask his neighbours

through this platform. For example, if he/she wants to interchange his/her laundry or even sauna shift, he could easily ask through this app. However, it could only happen if most of the residents accept this app and use it on a regular basis as economies of scale is important for the app to sustain its activity. People will adopt the app if they feel any shortage in other platform e.g. Facebook groups. Therefore, the app must be built from the community trust, have a user-friendly approach, and at the same time must offer unique features to compete with other system.

Apart from this, one of the biggest challenges is that different types of people from various cultural background and ethnicity lives in the same block of building. Therefore, it would be difficult to communicate between neighbours if any of them don't speak the common language. However, these differences also offer great opportunity for residents. As there are many different professionals would be living in the building, they could exchange their services, can make extra income, or just simply offer their services for free to their neighbours. For example, if someone has problem with their car, they can get it checked out if a car mechanic who lives in the same building agrees to help with at certain price.

When we asked about the features of the Community App, someone replied that the event calendar is good and its functions can display all events in one place, someone else loved the UI/UX of it since it is easy and straightforward to open. Someone likes the feed function which helps the user to access it easily.

Moreover, we also asked what confused them the most about the community app. Someone said if the chat was for everyone or just between two people. Someone else mentioned if the app is exclusive for apartment buildings or is it a public platform? Additionally, someone was confused about the message features if they would get spam from other apartments and if the information of the users would be kept confidential. Finally, to conclude this validation phase, we believe that the average score of 3.9/5 app recommendation proves that Community App is a feasible solution that could be explored further.

5 Discussion

In this chapter, we reflect our solution fit to the goal, and limitations of our research. Furthermore, we also discuss the future of the solution, and our thoughts during the process.

5.1 Solution/Quick app fit matrix

We utilized our SWOT analysis on Quick app nature to determine the fit of our solution. It was clear that Community App managed to take advantage of several Quick app strengths and eliminate its weaknesses at the same time. Table 2 depicts our findings of its fit matrix.

Table 2. SWOT analysis – Solution fit matrix

<table>
<tr><td colspan="2">SWOT analysis</td><td>Community App</td></tr>
<tr><td>Strengths</td><td>Weaknesses</td><td rowspan="2">Community App can be quick to install and use on demand and load its content faster and integrate with other platforms. It also sustains better engagement when more users are on the platform sharing meaningful interaction and contents.</td></tr>
<tr><td>- Quick to install.
- No on-device storage
- Integration with other
- Deep links possibility
- Low cost
- Easy to acquire users.
- Faster app loading</td><td>- Low engagement
- High churn
- Low awareness
- Limited monetization
- Only on Huawei device</td></tr>
<tr><td>Opportunities</td><td>Threats</td><td rowspan="2">Community App can be disposable so users will have no problems trying it out and test. It can also scale and penetrate market quickly, and accommodate advertisement in-app. If developed right, it won’t cost much to acquire users and increase commitment. Security & privacy concerns can be eliminated with encrypted data.</td></tr>
<tr><td>- Quick to open.
- Disposable
- New market expansion
- Open-source developers
- Advertising</td><td>- High competition
- Low commitment
- Competition with Native apps
- Cost for educating users.
- Security & privacy concerns</td></tr>
</table>

5.2 Limitation

For the worldwide expansion of Community App there will be some challenges ahead. Especially, the big and appealing market of China is hard to research and estimate due to limited available research on the market (at least in English). Data collection and feedback

methods of our project were also limited, based on our resources, we got a handful number of responses. The feedback was qualitative with open-ended questionnaires so quantitative data would complement the assessment and validation stages. Personal background/context and bias likely had an impact on our assessments when scoping out the best ideas and when developing the best solution with Community App. In the validation phase feedback also, there was some variations in the qualitative answers, so the social contexts between participants had played a role. Time constraints in the project had an impact in developing and sharpening the idea further. If more time would have been available to work with the idea of Community App QuickApp, we believed even more detailed plan and assessment would have been feasible.

5.3 What's next?

With that being said, we believed the next steps or paths forward for Community App are towards scaling up and adding the platform/improving. We want to make Community App available for the whole Android MiniApp ecosystem and possibly also Apple's version instead of just Huawei's QuickApp. On top of this, the decision to make Community App source code open source and make API available, will give the ability for people to create more content on the platform to deliver more value for all participants. Users can create their own version of the building's app and tailor it more to their specific needs. These will ensure the possibilities for increasing the pace of scaling and customer satisfaction. In addition to these ideas, we think that an addition of building knowledge chatbot would be something that would be worth implementing to the platform. This could be done by leveraging AI and large language models like Open AI's GPT-4 to help residents more easily get access to information about their proximity, building knowledge and everyday life surrounding them. Lastly, several buildings can connect and share their assets and services on the platform upon agreement, creating an even bigger hyperlocal, as we call it, a virtual neighbourhood.

5.4 Group reflection

In the final meeting, we conducted a retrospective session where we reflected on our processes and the journey over that last 3 months. We believed what went right for us was our communication, meetings schedule and agenda. We also had a great result, with good

feedback from both mentor and client. We exercised a lot of analysis frameworks, done extensive research into relevant topics, and had a clear set of roles and goals from the beginning. However, we understood our balance of workload could have been better, agenda could have been defined clearly and the team commitment could sustain toward the end. With that being said, we found the challenge interesting, insightful and the knowledge we picked up along the way about Quick app technology and its potential is significant. We acknowledge the important of collaboration and open communication in teamwork, especially for this course about Open Innovation. Some of us found it beneficial to adopt different tools, such as Miro for information sharing, Figma for prototype design and Pitch.com for professional deck. Overall, we had a great time collaborating over the course of 3 months, and we learned more about the Open Innovation process, and applied what we know from the course to our idea development and research. We believe the knowledge we gained from this real-life challenged will be a great resource in our future as a reference what and what not to do. We want to express our gratitude toward our mentor for his support and guidance, and our client for their valuable feedback at our important milestones.

6 Conclusions

Building a community application is not easy as the competition from other social platform apps is huge. Our group had the focus specifically in the business potential evaluation as well as targeting the main challenges given by Huawei - sustainability. Our Community App solution was developed based on extensive research in different aspects, from concepts exploration, problem definition, value propositions, prototype development and idea validation over the course of 3 months. We believe Community App can champion the sharing economy on a hyperlocal level, and digitalize community interactions in a more sustainable way, that can benefit all parties involved: residents, local businesses and authorities.

The idea of Community App is promising as a Quick App. We have investigated its strength, weaknesses, and our end users pain points, and how we could position in the market. We realized its potential for European communities – like cities or states – to be piloted as a solution to tackle the emerging issues like missing sense of community and overconsumption, while saving cost on sustainability education and advertisement. Additionally, as the market is a "large blue ocean" with only few fish, we believe in a big potential for the platform's market share, especially in central and southern countries in Europe.

However, the application itself without users has no value, which increased the risk as the entry barrier is huge in the beginning. Therefore, we suggest connecting with more stakeholders to enable the platform in a small scale within the city and replicate the results to adapt to social norms and users' feedback. This would again speak on behalf of co-operative piloting, to secure good start, share the risk and get enough users to enable transactions between them. To enable this, we strongly advise to leverage UNESCO Sustainable Development Goals (SDG) 11 and 12 to work with city developers, local authorities, promoters to develop the platform in a structured way. Open-source potential can play a role to expand the app coverage and incorporate different revenue models to build a sustainable business model. Additionally, the app can be expanded into Android ecosystem and available on more devices to capture an even larger customer base.

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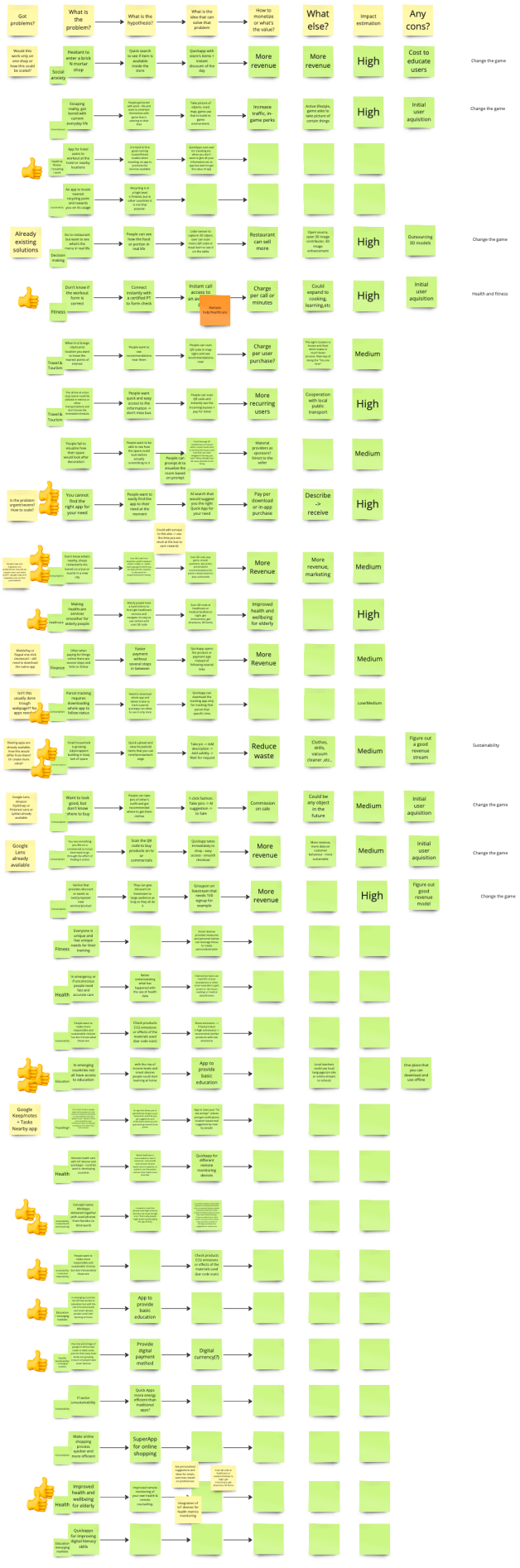
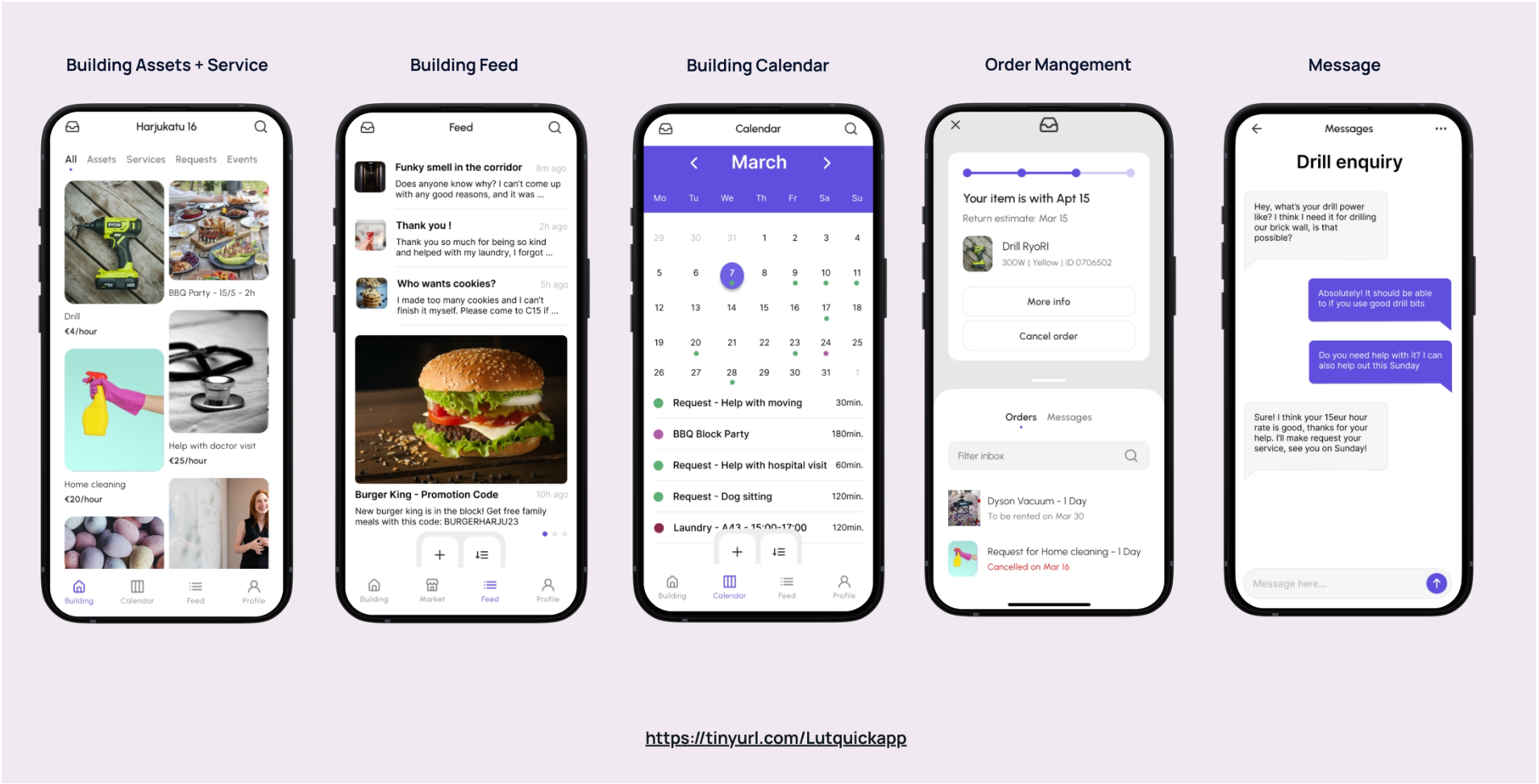
Appendices

Tables

Appendix A. Concepts exploration

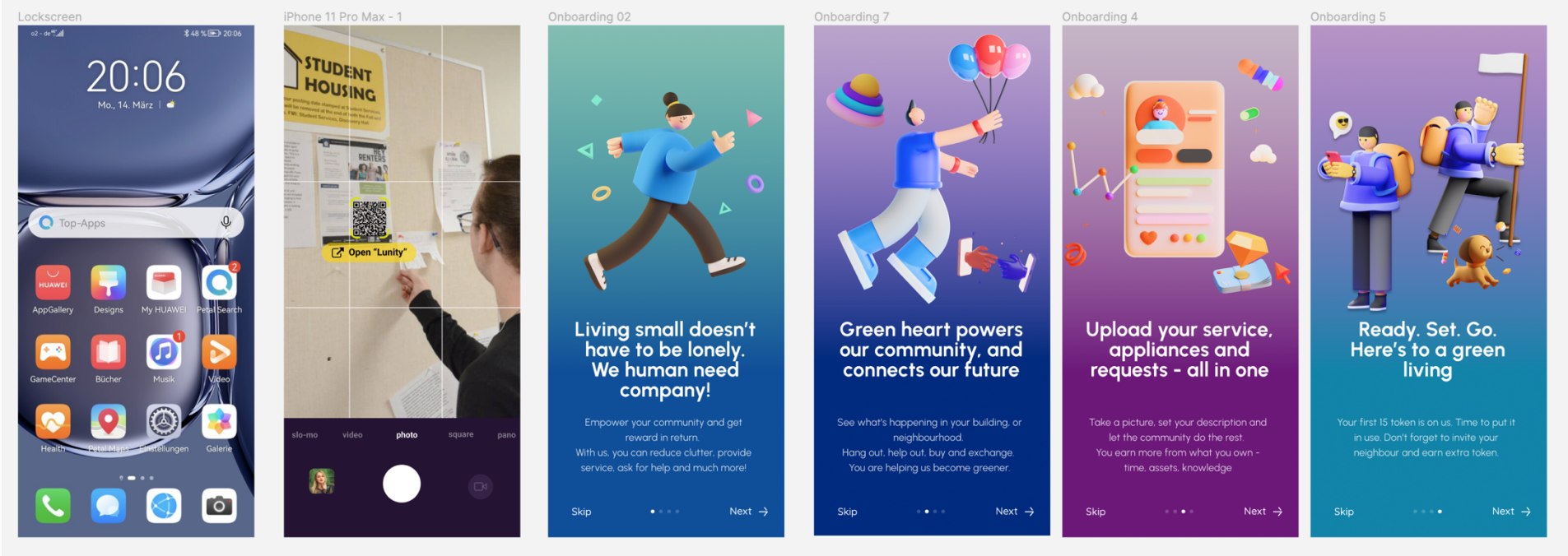

Got problems?
What is the problem?
What is the hypothesis?
What is the idea that can solve that problem
How to monetize or what's the value?
What else?
Impact estimation
Any cons?
Would this work only on one shop or how this could be scaled?
Social anxiety
Hesitant to enter a brick & mortar shop
Quick search to see if item is available inside the store
Quickapp with store's items + instant discount of the day
More revenue
More revenue
High
Cost to educate users
Change the game
Increase traffic, in-game perks
Active lifestyle, game asks to take picture of certain things
High
Initial user aquisition
Change the game
Already existing solutions
Decision making
Go to restaurant but want to see what's the menu in real life
People can see how the food or portion in real life
Restaurant can sell more
Open source, Gamification, Contributor, 3D image enhancement
High
Outsourcing 3D models
Change the game
Fitness
Don't know if the workout form is correct
Connect instantly with a certified PT to form check
Instant call access to an ai
Charge per call or minutes
Could expand to cooking, learning,etc
High
Initial user aquisition
Health and fitness
Travel & Tourism
People want to find accommodations near them
People can scan QR code in map (gps) and see accommodations near
Charge per user purchase?
Medium
Travel & Tourism
People want quick and easy access to the information -> don't miss bus
People can scan QR code and instantly see the incoming buses + pay for ticket
More recurring users
Cooperation with local public transport
High
People fail to visualize how their space would look after decoration
People want to be able to see how the furniture look before actually connecting to a
People can prompt AI to fill their room based on prompt
Material providers as sponsors? Dress to the seller
Medium
Is the problem urgent/severe? How to scale?
You cannot find the right app for your need
People want to easily find the app to their need at the moment
AI search that would suggest you the right Quick App's for your need
Pay per download or in-app purchase
Describe -> receive
High
Could add surveys to this also -> use surveys to get as much at the ban to earn rewards
Don't know what's the best restaurants etc, turned on a pizza or turned on a new city
More Revenue
More revenue, marketing
Medium
Making healthcare services more smooth for elderly people
Improved health and wellbeing for elderly
High
Finance
Faster payment without several steps in between
More Revenue
Medium
Sort this usually done trough webpages? No apps needed
Low/Medium
Figure out a good revenue stream
Sustainability
Google Lens, Amazon recommendations, Pinterest, Lens or Lyteai already available
Want to look good, but don't know where to buy
Commission on sale
Could be any object in the future
Medium
Initial user aquisition
Change the game
Google Lens already available
Scan the QR code to buy products or for commercials
More revenue
Medium
Initial user aquisition
Change the game
More revenue
High
Figure out good revenue model
Change the game
Fitness
Everyone is unique and has unique needs for their training
Health
In emergency or if personalized people need to educate care
Better understanding what has happened with the use of health data
Check products CO2 emissions or effects of the materials used (bar code scan)
In emergency countries not all have access to education
With the rise of income levels and technology more could also learning at home
App to provide basic education
Local teachers could use local knowledge to make it public (travel to school)
One place that you can download and use offline
Google Keep/notes + Tasks Nearby app
Health
Quickapp for different remote monitoring devices
Check products CO2 emissions or effects of the materials used (bar code scan)
App to provide basic education
Provide digital payment method
Digital currency(?)
IT sector unsustainability
Quick App-store energy efficient than traditional apps?
Make online shopping process quicker and more efficient
SuperApp for online shopping
Health
Improved health and wellbeing for elderly
Improved remote monitoring of your own health & remote counselling
Integration of IoT devices for remote health monitoring
Quickapps for improving digital literacy skills

Appendix B. Community App screens and features



https://tinyurl.com/Lutquickapp

Splash screens



Appendix C. Participants Answers

Questions	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9	Subject 10
Pre-prototype walkthrough: To gauge interest, backgrounds, and motivation for using the solution										
Who you are? Age, where you live, with someone or alone, work?	A Master student, 30, Lahti, live with family, Chinese-origin	I am a Software Engineer, middle age, I reside in Helsinki with my family, studying and working, Russia-origin	21, Helsinki, flatmate, working customer service, Finnish-origin	27 Helsinki, male, single household, Vietnamese-origin	30; Helsinki (Rastila); I live with someone (household of 2); I work full time (Hybrid), Uruguayan-origin	28 Helsinki, single, male, Vietnamese-origin	37 Vantaa, male alone, Finnish-origin	21, Den Haag Netherlands, Undergraduate, Singaporean-origin	22, Aachen Germany, Undergraduate, Vietnamese-Chinese-origin	young professional, 28yo, The Hague, The Netherlands, living alone, working in private administration, Slovakian-origin
How often do you ask for help from neighbours?	Never	Rarely, only when looking some information about our landlord.	Not often	Rarely	Never	Once	Never	Not at all	Not very often.	Sometimes

How often do you provide help to neighbours ? Are you willing to? How?	Never but willing to	Rarely, sometime lend them skewers. I am not willing but I am ok with it.	Sometimes. I'm willing to help them if they need any help. I could take their dog for a walk or borrow something to them.	Sure if needed	I help my downstairs neighbor take the baby trolley up and down the stair when I see her, but nothing else. I would be willing to as long as it matches my schedule. I would buy groceries for an elder neighbor (did that for two neighbors in my building back in Uruguay) or help with tasks to bring things to their door or outside their homes, not sure if I'd be comfortable helping inside their apartments.	If needed, sure	Not sure, maybe if there is a need, and if im free	We have a group chat for my apartment and floor, people needing help can post their concerns there.	If they ask for help, sometimes in a shared group chat.	Sometimes

During the prototype-walkthrough: To elicit the solution's feedback and collect data on the apps' strength and weaknesses										
What did you like the most about Community App? which features?	Event Calendar is good. I could know such information, especially kids event.	I like it overall, design and calendar with events.	It's a cool, new and different app. I like how it looks. It's simple but nice for eye.	User friendly, easy to navigate around. Good idea Best feature: laundry time booking	I like that you can have a community feed (like reddit) without having to make a Whatsapp group with your neighbors or something like that (not too keen sharing my phone number with everyone in my building). I also like that it seems you can request help and hope maybe someone will accept it.	Good UI/UX and straightfow ard, in general I like how it is easy to open. But not sure about security. I like that I can borrow machines from neighbors	good looking, I like the UI, can see myself looking more at the calendar and feed, but the building assets less	The feed function makes it easy to access information about local businesses and discounts.	The calendar functions that display all the events and happenings in one place.	I think it is very useful app for all people. The most interesting feature for me is sharing appliences, food. It is also useful to know what events are happening since I do not like noise and I can be away at the time. Or in a rare situation can go to an event an socialize. I like that elders are included and can ask for help with certain services from neighbours. Also, the calendar feature is interesting, maybe

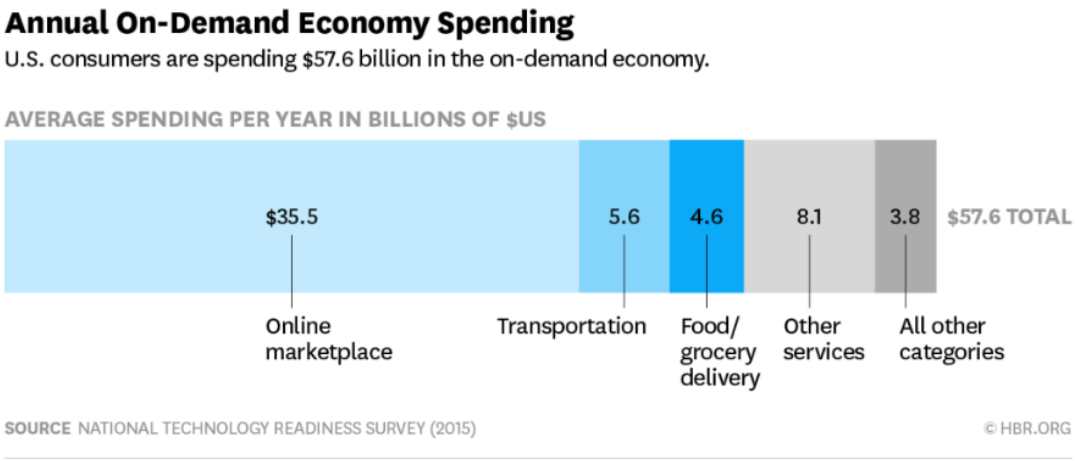
										can be used for cleaning of common areas (if not arranged by building management with external company).
What confused you the most about Community App?	I appreciate the help among neighbours but paying for some service seems to be not good for me	Nothing	Are the chats for everyone or are they just between two people.	Some personal shipping items and restaurant ads. Is this an app for the apartment building exclusively or is it a public platform? What is the implementation ? If it is not used by most or all of the tenants in the building it wouldnt make	The Assets tab doesn't tell me much, is that for renting out items? selling items? When opening the drill post it doesn't tell me who owns it and from which apartment number. I might have beef with someone and I'd like to know who I'm renting from	So far so good, but more features might be confused in the future	nothing, but what's in the profile?	The calendar looks a bit spammy - there are some events I do not care about.	The exchange: This requires everybody to post about every tool/item that they have to make it useful. How do I know what tools of mine are in demand?	I dont necessarily like that we can be messaged as an apartment, I think I would prefer to have it as a request in general, rather than individual messages. Or maybe it can be set up by each person's preference.

				much sense to use (especially with laundry booking)	before requesting to rent.					
Post prototype-walkthrough: To gain more insights, app interest and engagement level										
On a scale from 1 to 5 (1=not at all likely, 5=very likely), how likely are you to recommend this product to a friend?	3	5	4	5 but maybe not to friends but the other tenants in the building as per point above.	4	4	5	2 - I don't think I would personally use it.	3 - it's a nice app, but very similar feature to a Facebook Group	4 on recommending to a friend.
How frequently would you use this product?	Maybe once a week to check latest event	As needed	I would probably use it pretty often for borrowing something. Ladders etc.	As needed ? depending on the feature	2-3 times a month	Several per weeks if needed	when im bored at home, which is all the time	Rarely.	Not frequently, probably once or twice a month	I would use it 3-4 time a month, maybe more frequently depending on other users.
What features are	It is better to integrate	Free things	Nothing yet	The current set up is simple and	The community feed seems great,	Nothing yet, but if	options to fetch stuff	No additional features.	A large group chat would be	I would maybe like something to

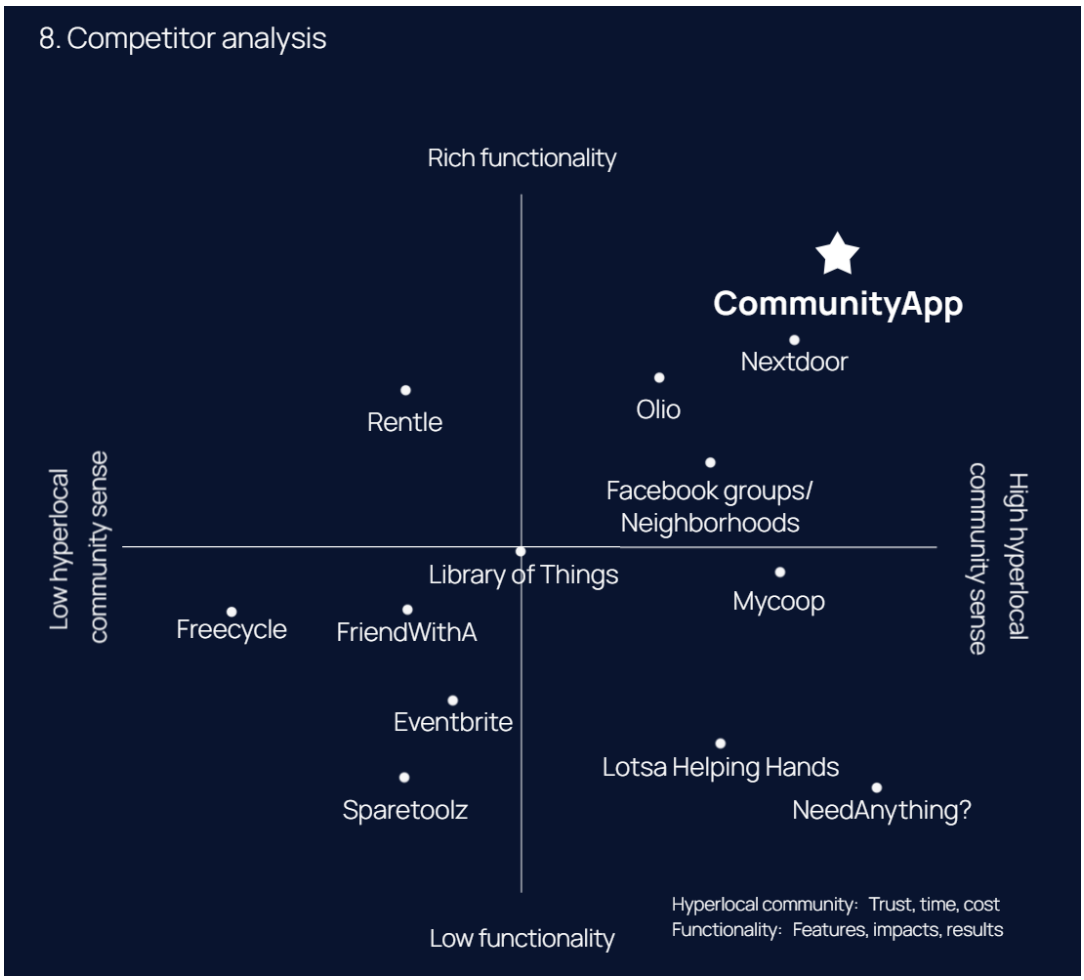
you looking for in Community App?	Community App with some existing electric lock systems, like Kulku I am currently using for my apartment.			good. Can add more based on user demand.	as well as the Requests for help, as a neighbor might feel more inclined to help when they know the extent of the request from my post (I also say how much I'm willing to pay I guess)	more features coming to make more money, would be nice	at door so people can come to me, not me bring it to them		ideal for direct communications and announcements.	communicate with neighbours about noise (rather than calling police), some cleaning features. However, everything I have mentioned, can be set up in calendar feature and in messaging individual members in the app. How are elderly going to use it if they are not so skillful with technology. And is this app going to be paid or free to download.

Figures

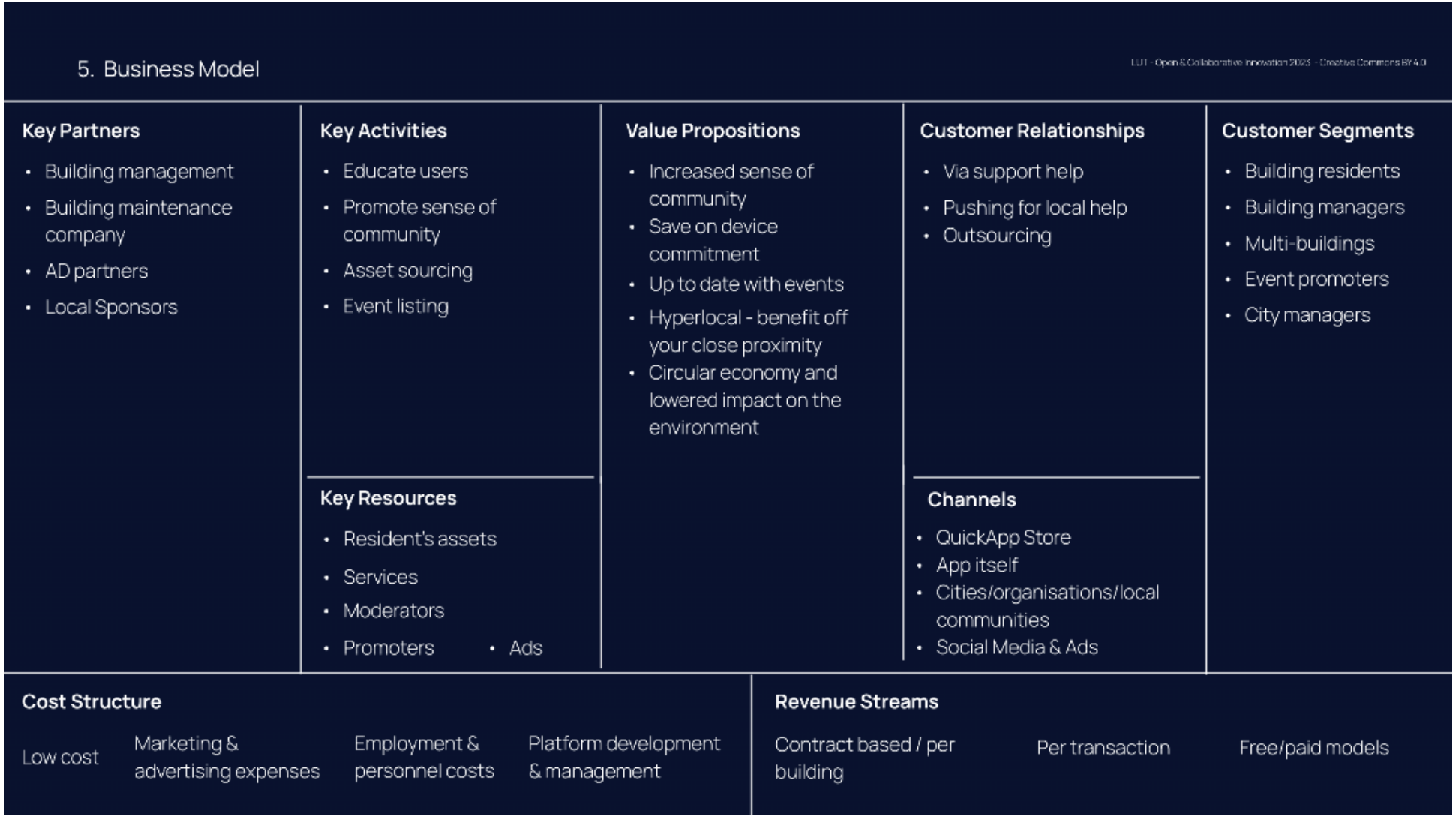
Appendix 1. Annual on-demand economy services spending (Colby and Bell, 2016).



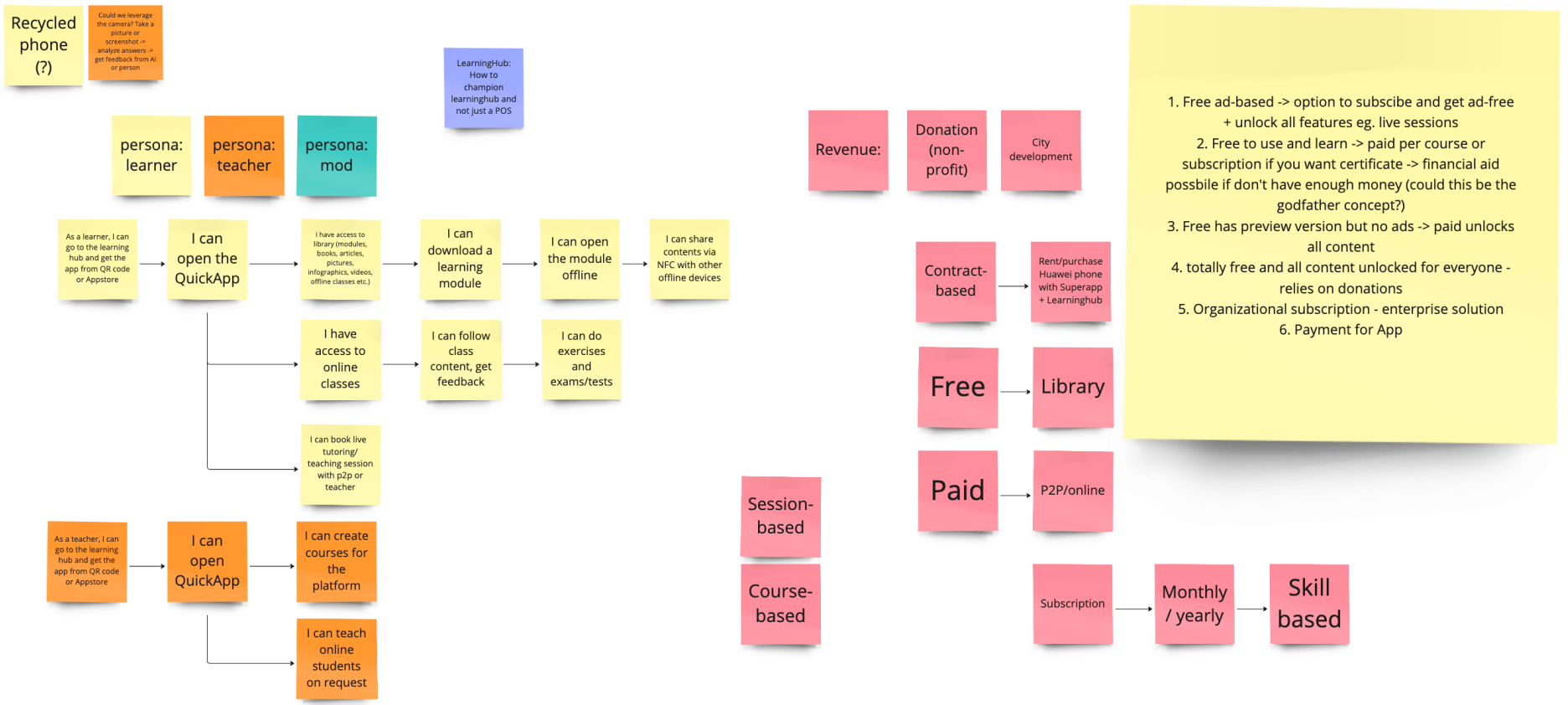
Appendix 2. Competitor analysis for Community App



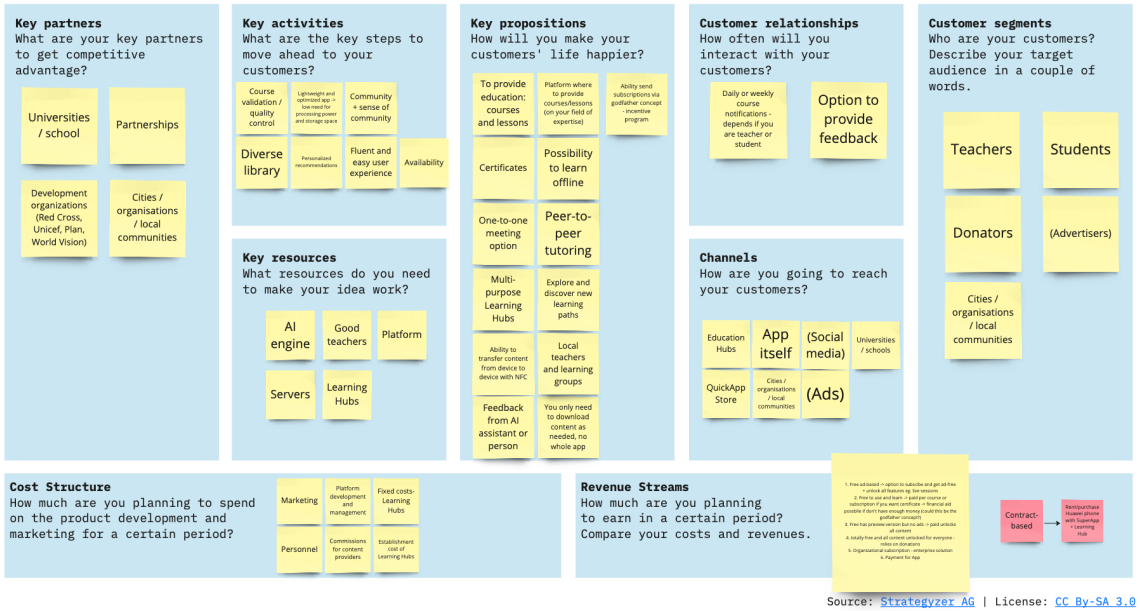
Appendix 3. Business Model Canvas for Community App.



Appendix 4. Education App exploration



The Business Model Canvas



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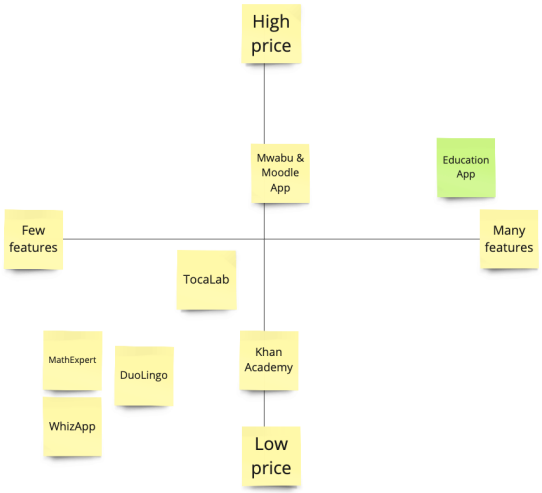
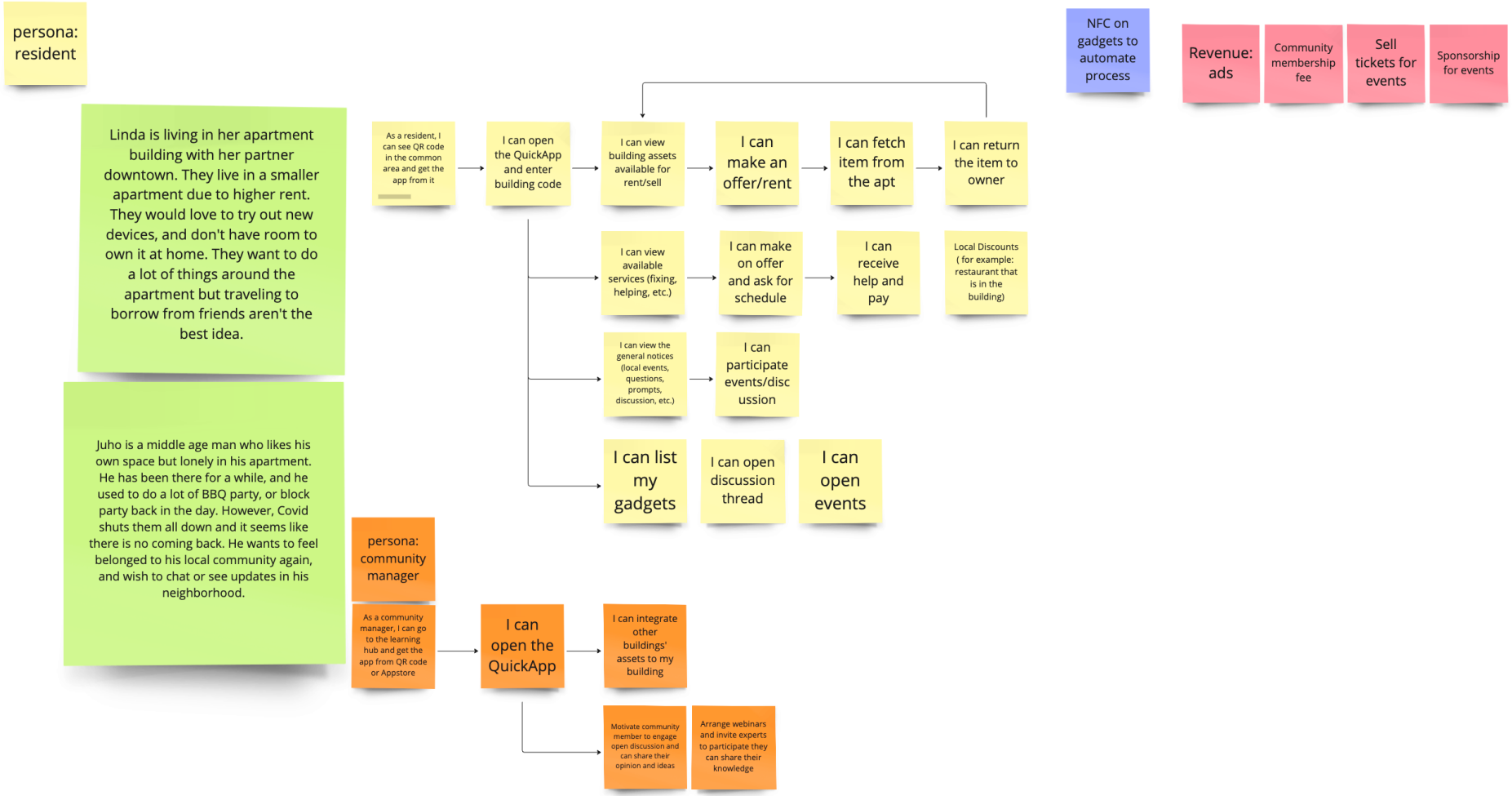


Appendix 5. Community App persona, user journeys and features, value proposition



Value Proposition Template