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Master's Thesis  
Academic Year 2023

A Neighborhood Treasure Hunt Game: Creating  
Engaging Weekend Activities for Children and  
Fostering the Sense of Community



Keio University  
Graduate School of Media Design

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A Master's Thesis  
submitted to Keio University Graduate School of Media Design  
in partial fulfillment of the requirements for the degree of  
Master of Media Design

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Abstract of Master's Thesis of Academic Year 2023

# A Neighborhood Treasure Hunt Game: Creating Engaging Weekend Activities for Children and Fostering the Sense of Community

Category: Design

## Summary

This study addresses the limitations faced by children aged 7-10 in terms of weekend activities and the challenges encountered by local shopping streets in Kasugai, Aichi. The research proposes a solution in the form of a map-based treasure hunt game. This design aims to not only stimulate children's motivation in the exploration of the neighborhood but also foster communication and engagement within the community. Findings from user tests reveal that children actively participate in the game, experiencing a heightened sense of autonomy, showcasing their abilities, and developing a stronger connection to their surroundings. Additionally, parents, shopkeepers, and community activity organizers actively contribute to the success of the initiative, fulfilling their respective needs and sharing common goals, thus contributing to their sense of community. This research paves the way for fostering vibrant neighborhoods where children can thrive and communities can flourish.

## Keywords:

service design, children's independent mobility, map design, community empowerment

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# Chapter 1

## Introduction

### 1.1. Background

Kasugai City, located in Aichi Prefecture, Japan, prides itself on being a family-friendly community that offers a range of favorable policies and support systems for child-raising families. However, despite these efforts, there are persistent issues that need to be addressed. Children in the city have expressed dissatisfaction with the limited local infrastructures and the lack of engaging leisure activities available to them, particularly during weekends. Parents, on the other hand, seek more options and opportunities to keep their children entertained and provide them with meaningful experiences in a safe environment. In an era where innovative electronic experiences abound, fresh and exciting encounters seem within reach. In the bustling metropolises, children are often surrounded by cutting-edge technological experiences. Despite the available technological advancements, it is crucial not to overlook the enduring issues faced by children and families in ordinary cities. The role that communities can play in child-rearing, the question of children's freedom of activities, and the ongoing discussions about safety all remain meaningful and relevant topics.

In parallel, narrowing down the focus on one of the local shopping street called Kachigawa shopping street, we noticed it has been facing challenges due to changes in the external business environment and internal demographic structure. The rise of e-commerce and large-scale retail establishments has led to a decline in foot traffic and customer engagement in the shopping street. Some businesses benefit from their association with large shopping malls, while many others experience a sense of crisis. In a city where transportation heavily relies on vehicles, the lack of parking spaces has been a persistent issue. Despite the advantageous proximity of the shopping street to tram stations, the absence of adequate parking facilities

remains a source of frustration. On the other hand, the shopping street regularly organizes activities that create a vibrant atmosphere, offering a variety of food and merchandise. However, the existing shops in the shopping street struggle to reap the benefits of these activities. This has adversely affected the vitality and sustainability of the local businesses, posing a threat to the overall health of the community.

Recognizing the interplay between these issues, this research aims to propose a service design solution that addresses the business issues of the shopping street, the structural challenges within the community, and the need for meaningful interactions for children. By focusing on the concept of a treasure hunt game based on the local shopping street, the aim is to create an engaging experience that not only captivates the children but also strengthens the bond between the community members.

To sum up, by combining elements of play, exploration, and community engagement, the proposed solution aims to transform the local shopping street into a more vibrant and interactive space that caters to the needs of children, while strengthening the ties within the community. Through careful observation, analysis, and collaboration with various stakeholders, this study aims to shed light on the potential of this service design solution in enhancing the well-being and sense of community in the neighbourhood.

## 1.2. Research objectives

The primary objective of this study is to address the limited range of weekend leisure activities available to children aged 7-10. Given the challenges associated with altering infrastructure and geographical conditions, service design offers a potential solution for enhancing the overall living experience by providing a greater variety of activity choices. Simultaneously, the design aims to foster intrinsic motivation among children to explore their local surroundings.

Adopting a service design perspective acknowledges that different actors have diverse goals, all of which can be satisfied within the same design ecosystem. Parents, who play an integral role in the lives of children within this age group, are expected to benefit from the proposed design as it addresses the issue of limited ac-

tivities and offers the possibility of a safer physical environment by providing more connections with community members. Additionally, the organizers of shopping street events, dedicated to empowering the local community, will be involved in the design process. Recognizing that commercial-based activities may not have a significant impact on children, this study explores the potential for child-specific activities to contribute to the overall empowerment of shopping streets. Moreover, store owners are interested in disseminating local information about their establishments and attracting more customers, which aligns with the value proposition that this paper aims to validate.

### **1.3. Thesis Structure**

This paper consists of five chapters. In the second chapter following this one, we discuss various studies related to treasure hunt games, categorizing them into three main types: A, B, and C. In the third chapter, we delve into the process of concept generation and refinement. The fourth chapter focuses on the validation and analysis of the value through the use of the final design prototype. Finally, in the fifth chapter, we explore the possible future directions of the research.

# Chapter 2

## Related Works

### 2.1. Motivate children's independent mobility

#### 2.1.1 Children's independent mobility

In recent years, there has been growing concern about the decline of children's independent mobility (CIM), which refers to children's ability to travel to and from places for educational, recreational, or social purposes without adult supervision. (Hillman,1990) [1] Research has shown that children today are less likely to walk or cycle to school or other destinations on their own than in previous generations. This decline has become a growing concern among parents, educators, and researchers alike, as it has been linked to negative impacts on children's physical health, social development, and overall well being. (Schoeppe et al.2013; Shaw et al. , 2015) [2,3]

Several factors have been identified as contributing to the decline in CIM. Physical environment, social environment, and socio-demographic characteristics are all related closely to the stimulation of children's independent mobility.(Marzi,2018) [4] One of the primary reasons is the perceived fear of crime and safety concerns among parents and caregivers. Parents are particularly worried about allowing their children to travel alone amidst traffic, which appears to be the most influential factor in their decision to restrict their children's independent mobility(Shaw et al. ,2015). [2] Media reports and public discourse often exaggerate the risk of child abduction and other crimes, leading many parents to believe that their children are not safe to travel on their own(Foster, 2013). Additionally, changes in urban design and transportation infrastructure have created environments that are less conducive to active travel and independent mobility, such as increased traffic, longer commutes, and fewer sidewalks. (Marzi,2018; Shafik,

2021) [4, 5]

To address the decline in CIM, researchers and practitioners have proposed a range of solutions. Page(2009) [6] believes that it is crucial to understand the factors that impact independent mobility in order to promote physical activity in children. Ideal social and physical environment that encourages parents and adult caregivers to allow children to engage in unsupervised physical activities outdoors can be the one of the crucial factor. Alongside this, it is equally important to encourage joint physical activity participation between children and parents. Eisenlohr(2023) contends that it is crucial to comprehensively evaluate and tackle the greater susceptibility of children to the hazards linked to urban settings to enable them to reap the advantages linked to CIM. [7] Foster(2013) uses empirical study to prove it can be helpful to develop programs that address these parental fears while also encouraging walking as a normal activity for children. [8] Meanwhile, the relationship between community environment and parental protection awareness is observed. Wray(2020) suggested that integrating natural features and play-oriented elements into outdoor areas could be a viable approach to enhance physical activity and foster social connectedness. [9] With the advancement of technology, it has become possible to acquire real-time location of children with the aid of positioning systems. However, a study has also relied on proximity detection in an attempt to use mobile technology to enhance parents' mental serenity with their children, which has been shown to vacillate between the extremes of trust and monitoring. (Ferron, 2019; Ribeiro.2021) [10, 11]

### 2.1.2 Self-Determination Theory and Motivation

Self-Determination Theory (SDT) is a popular framework used to explain human motivation and behaviour. It posits that individuals have three basic psychological needs: autonomy, competence, and relatedness. Autonomy refers to the desire to be in control of one's own life and decisions, competence refers to the need to feel capable and effective in one's actions, and relatedness refers to the desire to connect with others and feel a sense of belonging. (Deci & Ryan,2000) [12]The presence of external rewards diminishes intrinsic motivation and enhances extrinsic motivation, and the degree of response to this effect varies across games of different difficulty levels. [13]



The reason why SDT can serve as a useful analytical framework for CIM is that each of its components can potentially be supported by evidence in children's behavior. [14] Parental beliefs can influence children's autonomy in decision-making. Han(2022) highlights the importance of open communication, mutual trust, and recognizing children as active and capable agents in negotiating parental autonomy support and children's need for autonomy in the context of independent mobility. [15] Children's capabilities can manifest not only in their understanding of the surrounding road environment but also in their ability to comprehend and engage in play activities that involve the geographical surroundings. Additionally, the relationships children form with friends, family, and other community members are also observable aspects within the context of CIM. [16]

In educational settings, the frame of SDT is widely used to inspire educators better involve the students into classroom while keeping a smooth relationship between them. Methods to boost autonomy involve offering students choices in their learning activities, providing meaningful explanations for those choices, and recognizing and respecting their feelings towards the topics. Minimizing pressure and excessive control also contributes to fostering a sense of autonomy. To enhance competence, it is essential to provide feedback that focuses on individual progress and achievement rather than comparing students based on norms. Offering optimally challenging tasks can also help students develop a sense of competence and mastery. Finally, promoting relatedness involves creating a supportive and caring environment where students feel valued and respected, fostering a sense of warmth and connectedness within the learning community. [17]

## 2.2. Design with and for children

When designing with children, we need to take into account their unique needs and cognitive styles. They can act in different roles such as user, tester, informant, design partner and bring new perspectives and ideas, providing more possibilities for design. (Druin, 2002) [18] However, designing with children is also a challenging task. Their cognitive abilities, interests, and life experiences differ from those of adults, and we need to spend more time and effort understanding and respecting their thoughts in order to effectively communicate with them. [19]

Many institutions and educators have recognized the importance of designing with children and have adopted various methods. For example, a protagonist perspective is suggested by Iversen(2017), in which children are placed at the focal point of the design process, where they actively engage with real-world design problems. [20] The principal aim of this approach is to facilitate the development of their design skills and critical reflection on technology.

In addition, some designers use child-friendly design methods to create products and environments suitable for children, making it easier, safer, and more enjoyable for them to use. Benton(2019) explored the impact of game and instructional design on children’s learning and identified both usability issues and instructional components that support independent breakthroughs, highlighting the need for game designers to engage in formative evaluation and focus on designing for higher-order strategies and extrinsic instruction. [21] A trend towards involving developmentally diverse children in the design process is also observed through a systematic literature review, with high-functioning autistic children aged 8-12 being the most actively involved.(Börjesson,2015) [22] Verhaegh’s game involves running around and fosters social interaction among children. The primary objective behind designing it was to promote social interaction among players and encourage physical activity. Obtaining input from children at the early phases of the design was seen as a crucial factor for the design’s potential to be implemented smoothly. [23]

In map design, as children’s cognitive and thinking levels differ from those of adults, we need to personalize the map design for different age groups of children. It is discovered that most 5-9-year-old children (90%) were able to use path integration to create an egocentric representation of their journey back to the starting point, but they weren’t as precise as adults. Additionally, 64% of children in this age group could construct a cognitive map using path integration, allowing them to take shortcuts, and age didn’t impact their performance. (Bostelmann,2020) [24]The hypothesis of a sex difference in the extent of children’s home ranges and home area cognitive maps was investigated and supported; however, it was found that these differences disappeared when maps of areas with limited exposure for both sexes were created.(WEBLEY,1981) [25]

Silva (2019) notes the lack of consideration for children’s perspective in current

wayfinding apps designed for adults and cautioned that cognitive maps do not have the same physical properties as cartographic maps. [26] The study also highlights the role of landmarks in navigation and the need for further research on this topic, particularly in the context of designing locative and wayfinding systems for children. Four categories were formed by clustering the ten types of landmarks that were extracted from the children's "maps", which are: Newness, Cultural personalization, Infrastructure, and Natural Landscapes. (Silva, 2020) Community is a complex social phenomenon that encompasses a wide range of interactions, relationships, and activities. [27] In any given community, individuals possess diverse characteristics, connections, and interests, which can lead to both positive and negative outcomes. Various academic disciplines have attempted to understand the concept of community from diverse perspectives, and this study is situated within this research context. The investigation will begin by examining the interconnections between individuals, followed by a review of the relationship between people and their physical environment.

### 2.3. Treasure hunt game

According to Oxford English Dictionary, "treasure hunt" refers to A hunt for treasure; frequently figurative and transferred a game in which hidden objects are searched for, often by following a trail of clues. [28]

In recent years, there has been a surge in the development of innovative games that leverage mobile devices and location-based features to create immersive gaming experiences. They involve a blend of physical and virtual activities, with players moving to specific locations, interacting with digital simulations and characters, solving puzzles, and generating information related to physical objects. [29] Gentes(2008) demonstrated that solely relying on the concept of space is insufficient to comprehend and structure pervasive games. Instead, four key anthropological elements must be considered: the tangible city, the fictional city, the utilitarian city, and the urban events. Further anthropological observations can be essential for the pervasive game design methodology. [30] Design strategies for location-based performances involve utilizing the urban environment as a canvas, embracing ambiguity to create intrigue, and fostering social gameplay to engage

and connect with the audience. [31]

One of the crucial sites for conducting research and empirical tests related to location-based treasure hunt games are museums. Raptis(2005) reviews mobile applications used in museum settings, focusing on the impact of context on interaction. By analyzing existing apps within this context, the study emphasizes the need for considering multiple dimensions of context in effective interaction design. [32] A mobile-based treasure hunt for 9-10-year-olds in Portugal blends entertainment and education, providing an engaging way for children to learn about marine animals. The game's success was evident as children preferred the gamified approach to traditional guided tours. [33]

The importance of selecting appropriate spaces for an enjoyable learning experience and the role of user participation in shaping narratives are highlighted in these cases. These games offer opportunities to foster essential skills for modern life, such as problem-solving and teamwork. The continuously evolving technological landscape also merits investigation regarding its impact on user experience and learning. [29] Immersive experiences enrich participants' imagination and connect them to the human life lived in those places. As these stories refresh our perception, our appreciation of the significance of place grows. [34]

Paay argues that The concept of creating interactive stories and incorporating storytelling with locations is not entirely novel. What sets apart the innovation is the delivery of such media content over the mobile Internet, dynamically responding to users' locations and movements in physical space. [35] However, some other researchers believed that the interaction paradigm of these games tends to restrict outdoor play, which traditionally involves spontaneous social engagement. [36]

## 2.4. Social Capital and Sense of Community

### 2.4.1 Social capital and weak tie

Understanding the dynamics of community is therefore essential for promoting social cohesion and enhancing the well-being of its members. One important aspect of community dynamics is the concept of weak ties. According to Granovetter (1973), weak ties refer to the social connections that exist between individuals

who are not closely connected but have some degree of familiarity with each other. [37] Although weak ties may seem less significant than strong ties, they have been found to play a crucial role in people's well-being, as they facilitate access to new information, resources, and social support networks (Granovetter, 1973; Lin, 2001). [38] Meanwhile, Sandstrom and Dunn (2014) suggest that even social interactions with the more peripheral members of our social networks can enhance our well-being. [39] The researcher also found that the positive effect of weak tie interactions was greater on days with fewer daily interactions. Furthermore, the positive impact of weak ties was not limited to extraverts, indicating that interacting with a broad range of network members can benefit individuals who are low in extraversion. [40] Jose (2012) carried out a longitudinal study that examined the relationship between social connectedness and psychological well-being over time in a sample of 1,774 young people aged 10-15 years. [41] The findings suggest that a high level of global connectedness predicts well-being over time, while a reciprocal relationship exists at the domain level, particularly for family and school contexts. Young people who reported higher levels of social connectedness subsequently reported higher well-being.

Another important aspect of community dynamics is the relationship between people and their physical environment. Commercial activities and events are two key factors that can influence people's attachment to their place of residence. Commercial activities, such as local shops and markets, can foster a sense of community identity and belongingness by providing opportunities for social interaction and cultural exchange (Oldenburg, 1982) [42]. Moreover, events such as festivals, fairs, and parades can help to create a sense of place by showcasing the unique characteristics and traditions of a community and contribute to place branding, which is the process of creating a positive image of a place in the minds of its residents and visitors (Kavaratzis & Hatch, 2013). [43] Walters(2018) sees local community event narratives can serve as a valuable resource for place branding practitioners to attract like-minded potential new residents, as these narratives tell stories about the local community's identity and values. [44] Braun(2013) categorizes the role residents play into three aspects in place branding: they shape the place brand through their characteristics and behavior, add credibility to promotional messages as ambassadors, and are essential for the political legitimacy

of place branding as citizens and voters. [45] By promoting a positive image of a community, place branding can enhance its attractiveness and competitiveness, leading to economic and social benefits for its members.

In conclusion, weak ties, commercial activities, events, and place branding are all important factors that influence the relationship between people and their physical and social environment. The existing literature suggests that weak ties contribute to well-being in interpersonal connections. Due to the limited duration of this study, it is difficult to confirm the benefits of weak ties in adolescent development. This study aims to investigate the weak ties between residents, and examine how the connections between permanent shop owners, who stay in a permanent manner, and visitors in the community can provide a sense of security during the child-raising process. Additionally, this study relies on monthly activities in the shopping district, which contribute to attachment to the neighborhood. Accordingly, the expectations of the organizers of the shopping district activities and the values embedded in the proposed design will also be analyzed in the context of the relationship between people and their physical environment.

### 2.4.2 Sense of community

The concept of sense of community has received significant attention in the field of community psychology. McMillan (1986) proposed a framework that highlights four key elements of sense of community: membership, influence, integration and fulfillment of needs, and shared emotional connection. This framework has been influential in guiding research and practice in community development. [46]

According to McMillan, membership refers to an individual's perception of belonging and identification with a specific community. It encompasses the feeling of being included, accepted, and recognized as a valued member. Influence refers to a mutual process. That is, community members know that their opinions will bring about changes in the community, and they know that they are influenced by the community. Integration and fulfillment of needs capture the extent to which individuals feel that their needs for social interaction, support, and resources are met within the community. It reflects the availability and accessibility of various services, amenities, and opportunities that contribute to individuals' overall well-being. Lastly, shared emotional connection reflects the presence of strong affective

bonds, trust, and solidarity among community members. It encompasses a sense of shared history, values, and collective identity.

To measure sense of community, researchers have developed various scales and instruments based on McMillan's framework. Several objective items were created through a deductive approach to assess individuals' sense of community towards their city of residence. [47] Other examples include the Sense of Community Index (SCI) developed by Chavis et al. (1986) [48].

In conclusion, McMillan's framework of sense of community has guided research and practice in understanding and measuring the key elements of membership, influence, integration and fulfillment of needs, and shared emotional connection. These measures provide valuable insights for community development and interventions aimed at enhancing individuals' sense of community and well-being.

# Chapter 3

## Design

### 3.1. Design Concept

This design is a sticker collection game conducted in a physical space. Children follow the instructions on the designed map to visit designated stores for sticker collection. The game is based on monthly events held in the shopping street called Koboichi. The primary design intention of this game is to incorporate elements of self-determination theory to promote children's independent mobility. In addition, this design concept recognizes the importance of engaging other stakeholders, such as parents, shop owners, and community members, by considering their perspectives and incorporating features that address their needs and concerns.

The design thinking process [49] has been adopted as the methodology for this research. This methodology has gone through many iterations and been demonstrated in a large number of studies. Some researchers introduced different step names, and some people tried to update one logic by making small modifications. The frame adopted in this study contains 3 main steps, which are and inspiration, ideation and implementation. The following 3.2 will be introducing the process of inspiration and ideation, followed by 3.3 and 3.4 introducing the prototypes. The last step, which is the user test, will be elaborated in Chapter 4.

#### 3.1.1 Children as the Primary User

This design focuses on children aged 7-10 years old, who have been identified as the primary users of the design. The purpose is to empower these children with more autonomy and meaningful engagement opportunities during the monthly events, fostering their personal growth, creativity, and overall well-being.

This study originally centers on primary school students aged 6 to 11 years



old, who are identified as the key users of the designed interactive experience. Based on observations and interviews, it was determined that children aged 4 were too young, lacking the cognitive ability to actively participate in the interactive experience. Similarly, children aged 5 were found to be too young for meaningful engagement. While children aged 6 demonstrated potential, their concentration levels were a concern, and parents often expressed unease about leaving them unattended. On the other hand, 10-year-olds exhibited a good understanding of the event but did not require the same level of support as younger participants. Furthermore, children aged 11 years old display a higher level of autonomy and independence, demonstrating that they are capable of exploring and engaging in activities on their own without the need for constant guidance. Thus, children aged 6 to 10 were deemed ideal for this design.

To gain a comprehensive understanding of the children's needs, interests, and behaviors during the monthly events, the study employs two primary research methods: behavioral observation and structured interviews. The methodologies will be introduced in the next chapter.

By focusing on this age group, the design aims to address the observed limited autonomy and reliance on external guidance. Empowering children with more autonomous decision-making and engagement opportunities can foster their personal growth, creativity, and well-being. Moreover, considering children's unique needs, interests, and cognitive abilities allows for the development of tailored experiences that resonate with their developmental stage and promote meaningful interactions within the shopping street community.

### 3.1.2 Considerations for Other Stakeholders

Based on the principles of service-dominant logic, it is important to consider the needs and goals of various stakeholders in order to create a design ecosystem that satisfies multiple actors simultaneously. The identification of these stakeholders relies on careful observation and understanding of the on-site conditions.

Parents, as inseparable companions of children in the targeting age group, also face the challenge of insufficient activities for their children. The proposed design aims to address this issue, while also taking into account the safety concerns of parents during the parenting process. This includes factors such as transportation,

familiarity with the community, the presence of outsiders during shopping street activities, and the impact of social news from other regions. The design explores the potential for establishing a connection between parents and shops through the different requirements of stickers.

Furthermore, the organizers of the shopping street events, who are dedicated to empowering the shopping street, are important stakeholders. They are concerned with whether the design effectively conveys the atmosphere of the shopping street activities to achieve a publicity effect. Additionally, the design should provide value that benefits the children and families who are the main participants in these events.

Store owners also have their own interests in the design. They desire the dissemination of local information about their stores and an increase in consumers and potential customers. This aspect of the design aims to validate the value provided to the community.

It is important to note that participants of the celebration, who have no direct connection with the children's independent mobility or the design, are also stakeholders. While their interview data is primarily used as evidence of the community atmosphere and the selection of target users, they are not considered a central part of the value verification process.

By considering these various stakeholders, the design aims to create a comprehensive ecosystem that addresses their specific needs and contributes to the overall success of the project.

## **3.2. From research field to ideation**

### **3.2.1 A first look at Kasugai City**

Kasugai City is located in the northeastern part of Aichi Prefecture. The city has a highly convenient transportation network, including easy access to Gifu Prefecture and adjacent to the Nagoya Airport. In addition, Kasugai City has a housing subsidy system and a childcare support system under the slogan "Kasugai

for children and Kasugai for child rearing ”. <sup>1</sup>

In terms of demographic structure, the proportion of the population of each age groups in Kasugai City also shows a response to the call of the policies. According to the data reported by the Statistical Report of Kasugai City in 2021<sup>2</sup> and the General Statistics Office<sup>3</sup>, the percentage of children under the age of 15 is 11.8% nationwide, while the percentage of children under the age of 15 in Kasugai City is 13.4% of the total population. among children aged 5-9, which is the focus of this research, they account for 4.01% of the population nationwide, while in Kasugai city proportion of children in this age group reaches 4.54%. The quantitative nature of the demographic data and the qualitative nature of the policy reveal the vitality of children as an essential part of the city, as well as the problems hidden behind.

During the preparation phase and initial field visits of our research, we obtained fundamental information about the research context. This information encompasses several key aspects. Firstly, we discovered that transportation within the city predominantly relies on private vehicles, yet there is a scarcity of parking lots available. Next, there are newly opened large shopping malls in the local area, which can be accessed by bus, albeit with limited frequency. Moreover, the residents utilize the free shuttle bus service provided by the shopping mall for various other purposes. The shopping mall, being a new comprehensive commercial facility, also seeks to support local businesses, although identifying an effective entry point has been facing some challenges.

### 3.2.2 Kachigawa shopping street as research field

With approximately 90 stores, including retail, restaurant, and service establishments, Kachigawa shopping street exhibits a diverse mix of businesses. Some

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- 1 Kasugai City Website [https://www.city.kasugai.lg.jp/shisei/seisaku/seisaku\\_sonota/1006053/index.html](https://www.city.kasugai.lg.jp/shisei/seisaku/seisaku_sonota/1006053/index.html) (access date 2023.02.02)
  - 2 Kasugai City Statistical Book <https://www.city.kasugai.lg.jp/shisei/gyousei/toukei/1027890.html> (access date 2023.02.02)
  - 3 Statistics Bureau, Ministry of Internal Affairs and Communications <https://www.stat.go.jp/data/jinsui/2021np/index.html> (access date 2023.02.03)

have thrived for generations, while others have recently emerged or relocated to the area. This dynamic composition demonstrates both stability and adaptability within the shopping street.

Notably, the "Koboichi" fair, held on the third Saturday of every month since 2003, stands as a testament to Kachigawa shopping street's appeal. This fair attracts numerous visitors from neighboring areas, featuring not only local merchants but also stalls from outside the region. With an array of food and beverages, target practice activities, handmade goods, and local products for sale, the fair caters to a wide range of visitors spanning various age groups.

In order to gain insights into the economic conditions, challenges, and initiatives undertaken by shopping streets nationwide, the Small and Medium Enterprise Agency conducts surveys every three years. As revealed in the 2021 survey on the current situation of shopping streets, regarding the recent business conditions of shopping malls, 1.3% of respondents answered that they are "prospering" and 3.0% answered that they are "showing signs of prosperity. On the other hand, 36.5% of respondents answered that their shopping malls are "declining" and 30.7% answered that they are "in danger of declining.

During the project team's initial field observation of Kasugai City and its shopping streets, including Kachigawa shopping street, several initial challenges became apparent which appears to be coherent with the survey mentioned above. Firstly, in Aichi Prefecture, which has a car-oriented society, the availability of parking spaces is of paramount importance. However, many shops in Kasugai City struggle to secure adequate parking facilities due to the associated maintenance costs. Additionally, these shops heavily rely on social media platforms as their primary means of promotion and raising awareness about their businesses. Consequently, they are actively exploring strategies to enhance visibility and attract customers. Furthermore, while Kasugai City boasts numerous shopping streets, our visits and interview responses revealed that Kachigawa Shopping Street emerges as the most vibrant commercial district, while many others have unfortunately succumbed to closure.

Therefore, the feasibility of shopping streets as a research field becomes evident through these factors. By delving into the social dynamics, economic factors, and urban planning aspects of shopping streets, researchers can gain valuable insights.

Moreover, studying shopping streets like Kachigawa Shopping Street provides an opportunity to identify effective strategies for revitalization and contribute to the improvement of urban commercial environments.

### **3.2.3 Coborec: A service design to shorten distance and promote revitalization**

In this section, a promotional magazine "COBOREC" aimed at contributing to making the Kachigawa Shopping Street a beloved presence for the local residents will be introduced. The "COBOREC" is designed by the same project with this research. Regardless of shops' affiliation with local communities, they all desire for the shopping street to become a "beloved presence" in the region. Therefore, it becomes essential to generate repeat customers. The most crucial type of repeat customer is the local residents who find the shopping street easily accessible. Thus, the previous research aims to design the promotional magazine "COBOREC" to bridge the gap between the local residents and the shopping street.

#### **Design Process and Development of "COBOREC"**

The design process of "COBOREC" involved conducting ethnographic and interview surveys to gain a deep understanding of the Kachigawa Shopping Street's context. Based on these surveys, a concept was formulated, and mock-ups and low-fidelity prototypes were created through pilot studies to refine the design concept. The design focused on seven elements: "Shopkeeper's photo and name," "Shopkeeper's thoughts and store introduction," "Store interior introduction," "Information on whether children are allowed in the store," "Impressions and thoughts of the authors regarding the shops," "SNS information," and "Free space." The "COBOREC" magazine, containing these elements, provided the local residents with insights into the shopkeepers' thoughts, dedication, and the diversity of the shopping street.

To ensure the effectiveness of "COBOREC," user studies were conducted, targeting both the target persona (local residents) and the actors of the shopping street. Through interviews with individuals closely matching the target persona and using the final prototype, it was confirmed that "COBOREC" and the au-

thors' activities were favorably received by both the shopping street and the local residents. It was also observed that the local residents discovered new aspects of their fellow community members, which led to increased interest and engagement. Furthermore, unexpected values were identified, such as reflecting on past memories while reading "COBOREC" and sharing them with others, which facilitated communication and social interaction.

### **Results and Insights for Further Research**

The concept of "COBOREC" focused on promoting the "people of the shops," conveying the charm of the shopping street, characterized by "human warmth" and "connections with people," to a wider audience of local residents and bridging the gap between them and the shopping street. Acknowledge that while the research did not directly observe an increase in daily visitors or customer attraction, it represents an essential first step towards solving the current issues faced by the shopping street.

The insights derived from this research indicate that the design of "COBOREC" represents an important step towards addressing the problem faced by the store. However, in order to comprehensively tackle the challenges of the shopping street, it is essential to establish relationships with other stakeholders. Building upon the valuable information obtained from previous research, this study aims to continue addressing the concerns of the shopkeepers. Simultaneously, it also seeks to explore alternative approaches and consider other strategies. By engaging with various stakeholders and adopting a multi-faceted approach, a more comprehensive solution can be developed to further alleviate the issues faced by the store and contribute to the overall revitalization of the shopping street.

#### **3.2.4 Volunteer Activities and Ideation**

##### **Volunteer Activities**

On September 16, our field research began at the parking lot next to Yamaguchi CAMERA, where we met up before 9am. We were then taken to the committee office to change into blue volunteer clothes. Returning to the parking lot, we joined other volunteers who were also dressed in the same attire for the event.

The management members consisted of people from younger to older age groups.

Our first assignment was to set up and secure the tents. Mrs. Deguchi, our guide, then led us around the area. As we walked, I noticed the shop owners setting up their tents and displaying their goods. Deguchi is running a store filled with cactus-themed items, including jelly bars, soda water, and cactus noodles. Eventually, we helped move some food and set up her tent.

After completing our task of covering up the road signs, we returned to our volunteer base and were pleasantly surprised to receive our first gift of the day: a hand-knitted chain for masks. Packages of chains were laid out in front of us, allowing us to choose our preferred design.

Folding paper plane was an event accompanying the Halloween event in the following month. Part of a rectangular piece of paper served as the entry ticket to the Halloween event, and after removing the ticket, we were left with a square piece of paper. By folding and perhaps coloring the square, a paper plane can be created, although it did not resemble a conventional paper plane to me.

The first individuals who approached us to fold paper were a group of elderly ladies. I assisted by handing them scissors and glue, and they successfully completed their creations. As the day progressed, we received crepes and cucumbers, and we were even treated to cactus jelly bars as snacks. In the afternoon, the number of children swelled, and they exhibited great enthusiasm for folding paper planes and attempting to make them soar through the air. Some children were exceedingly shy when their parents asked if they wanted to make a paper plane, responding with silent nods after multiple inquiries. On the other hand, certain children displayed assertiveness and clear preferences, confidently selecting the materials they wanted to use and expressing their desire to employ their own scissors and tape.

The quantity of children interested in folding paper planes became too numerous for me to keep track of. I repeatedly demonstrated the folding method, and by the end of the day, my vocabulary became jumbled. As the festival drew to a close and the final performances were about to conclude, Ao-chan (approximately 6 years old, I presume) expressed her weariness of watching the same performer repeatedly and astonishingly managed to predict every move he would make.

The mayor's unexpected appearance took place while I was engrossed in teach-

ing origami to the children. Suddenly, a group of formally dressed individuals began conversing behind me. As the child's paper plane neared completion, the formal conversation behind me concluded, and a group photo session commenced. I unwittingly took a picture with the mayor without knowing his identity. Eventually, as the mayor departed towards the open bar, I discreetly inquired about his identity and learned that he was indeed the mayor of the town.

Towards the end of the day, we had fulfilled the requests of almost all the children who wanted paper planes, bringing our instructions to a close. We then engaged in conversations with the children. They excitedly shared that they had purchased new slime and wanted to teach me how to become slime masters as well. It was intriguing to witness their enthusiasm for various activities, such as traveling to Tokyo, trying tapioca drinks, and sampling unfamiliar foods, although they did not seem particularly interested in the show.

Before concluding our activities, Serena and I visited a coffee shop called Momotoki, which indeed lived up to its reputation. Once our time at the event came to an end, we carried our belongings back to the warehouse. I found myself merely holding up my camera and following the others. We made a stop at a takoyaki shop and listened to their stories before returning to the committee office to change back into our regular clothes. While waiting, as we had shown great interest in cactus-related food, Deguchi, the committee member, arranged for us to have a dinner featuring dishes made with cactus. During our wait, they kindly bought us water and snacks. At the end of the day, we were given various items from the day's sales, such as small bags and coin purses.

To summarize, our role essentially involved babysitting the children, while simultaneously experiencing the warm and hospitable nature of the local residents. Although I have only jotted down some rough notes and haven't organized them coherently, a few thoughts emerged. It seemed that the children in the area desired novelty and new experiences. While attracting tourists might not be necessary, incorporating additional symbolism into the festival itself could be worthwhile. Furthermore, when considering the concept of "connecting people to people," it became evident that the local residents already shared strong bonds with one another.





Figure 3.1 The status of first volunteer work at Koboichi

### Ideation Introduction and Methodology

In the pursuit of creating meaningful experiences for the local children within the context of our project, an ideation session was conducted after the completion of our fieldwork. With a clear understanding that the local children constituted our primary target audience, the aim of the ideation process was to develop engaging and innovative activities that would not only draw inspiration from the vibrant shopping street but also align with the harmony of the community. By harnessing the collective creativity and expertise of our project team, the ideation session sought to generate fresh ideas and concepts that would offer the children unique and memorable experiences.

The ideation process was conducted utilizing a collaborative and iterative approach, drawing upon the diverse perspectives and expertise of the project team members.

### Idea Evaluation and Selection

The ideation session resulted in the generation of seven main categories of activities. These activities were proposed with the aim of providing unique and engaging experiences for the local children, incorporating elements from the shopping street and the festive ambiance observed during the fieldwork. The proposed

activities are as follows:

#### 1 Festival Related Activities

- Collaborate with local elementary schools to set up booths where children can engage in their preferred activities.
- Introduce a pseudo-currency system, distributing tokens during the festival for children to manage and use for toys, food, and activities.
- Create a dedicated section within the festival space specifically designed for children's participation.
- Enable children to sell their own handicrafts or assist local shop owners.
- Encourage children to imagine and depict their visions for future matsuri celebrations.

#### 2 Educational Purpose Activities

- Organize overnight stays for children at various nighttime attractions such as museums or aquariums.
- Develop educational activities that differ from local tutoring or English language schools.
- Facilitate interactions between local children and kids from sister cities.
- Conduct workshops on the history of the town or local traditions.
- Provide opportunities for vocational learning experiences.

#### 3 Physical Activities and Games

- Arrange wide spaces for games like tag or hide-and-seek.
- Organize dances or Bon dances (traditional Japanese dances) that might have been popular in the past.
- Host sports competitions beyond traditional sports events.
- Create mystery-solving activities.
- Organize a color run event inspired by the Indian festival of Diwali.
- Facilitate inter-school sports competitions.

#### 4 Hands-On Activities and Crafts

- Offer activities where children can freely paint walls or floors using non-toxic paints.
- Guide children in creating their own Pythagorean switches (contraptions that move balls using everyday objects).
- Introduce crafting sessions corresponding to different monthly lunar themes.
- Organize exhibitions to showcase children's artwork and creations.
- Conduct thematic crafts workshops, such as origami, ice cream stick crafts, and drawing.

#### 5 Media/PR Related Activities

- Assign children the task of reporting on the festival's happenings in a newspaper-like format.
- Produce documentaries for children, creating a series of episodes.
- Organize hero shows or performances.
- Encourage children to explore and report on notable landmarks or attractions in the Kachigawa area.

#### 6 Cactus-related Activities

- Engage children in cactus harvesting activities.
- Encourage imaginative play involving product planning.
- Collaborate on developing restaurant dishes.
- Facilitate cactus-themed decoration projects.
- Organize a Saboten fashion show for kids.

#### 7 Food

- Conduct cooking and confectionery classes to promote food education.

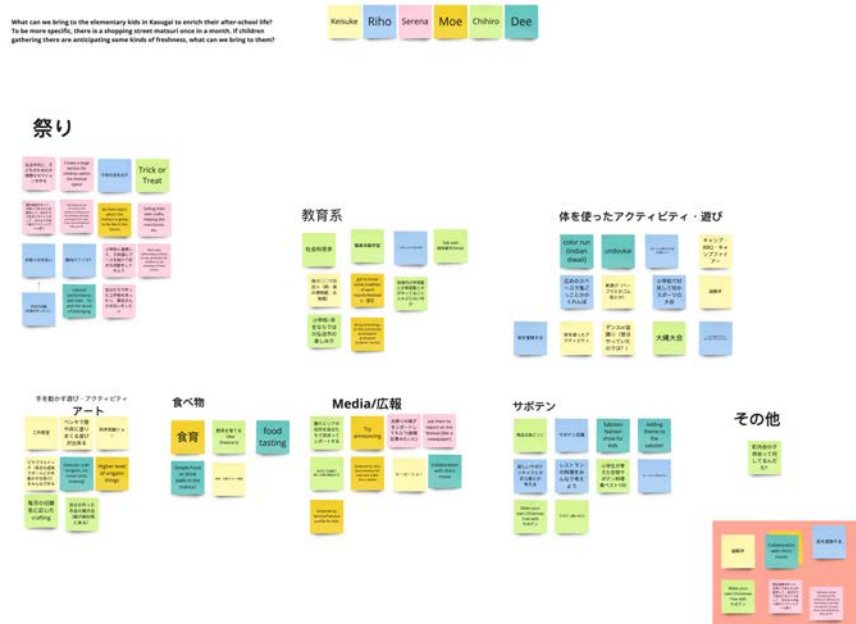


Figure 3.2 The ideation board

## The Formation and Exploration of Idea

The idea selection process involved several stages of evaluation and refinement to identify the most suitable concept for the project.

In the initial stage of idea generation, a diverse range of ideas was selected, including puzzle-solving, collaboration with film shooting idea in the same project field, adventuring through the streets, and making one's own Christmas tree with cactus. These ideas were subjected to the first round of evaluation based on criteria such as feasibility, realism, and suitability within the context of the event.

Following the evaluation, a subset of ideas that met the criteria and exhibited potential for success were selected for further consideration. The second round of evaluation focused on factors such as novelty, active engagement of participants, and fostering connections between individuals. After careful deliberation, the idea of a treasure hunt, specifically a sticker rally, emerged as the most compelling choice.

During the refinement phase, various existing activities and forms were explored

to enhance the selected idea. It was determined that the sticker rally would incorporate elements from treasure hunts, offering participants an exciting and interactive experience. This combination of existing activities, coupled with the novelty of the sticker rally, ensured a fresh and engaging event for the target audience.

Furthermore, another idea that emerged during the selection process was the concept of an online exhibition. This idea involved encouraging children to capture their perspectives of the Koboichi through photography. The photos could then be uploaded to an online platform, resembling an interactive gallery, where the children's unique viewpoints and experiences of the event could be showcased. By incorporating the online exhibition concept, the project aimed to provide an additional avenue for children to actively participate and express their creativity. This idea not only embraced the digital era but also allowed for the preservation and sharing of their Koboichi memories beyond the physical event.

### **3.2.5 Existing local activities targeting children**

The purpose of this section is to document and analyze the activities with children as their target audience observed in the community during the event period, as they provide an ideal opportunity for ethnographic observation. By studying these activities, it's possible to gain insights into the age-specific behaviors, social interactions, and preferences of the local children. This analysis will involve examining the mental models of the children and their responses to these activities. Through these observations, we can gather evidence to better understand their desires and aspirations. Additionally, it is important to note that pre-existing forms of activity were intentionally excluded from consideration in this study, as the focus was on providing novel experiences to the children that they had not yet encountered. By exploring these unique activities and their impact on the community, this chapter aims to contribute to our understanding of the local children's experiences and aspirations.

### The paper airplane event combined with Halloween

The first activity is an Origami Paper Airplane Workshop that took place in September when we were volunteering in the neighborhood. It was initiated and independently organized by one of the event organizers responsible for all the design related work. The organizer came up with the idea of introducing this activity to the local children, as it offered a novel experience with cylindrical-shaped paper airplanes. The primary purpose of the workshop was to engage children in a creative and interactive experience, allowing them to learn the art of folding paper airplanes while fostering their imagination and dexterity.

The workshop took place in a designated area within the neighborhood, typically the headquarters center of the organizers in an open space. The organizer provided paper sheets with instructions on how to fold cylindrical-shaped paper airplanes. Children, accompanied by their parents or friends, were invited or get attracted by the poster to participate in the workshop. The organizer and volunteers demonstrated the folding techniques person by person, and the participants followed along, creating their own paper airplanes. After completing the folding process, the children had the opportunity to paint on the paper plane if they want and eventually launch their paper airplanes and engage in friendly competitions.



Figure 3.3 The paper airplane event status

The Origami Paper Airplane Workshop attracted a wide range of participants, primarily children with the involvement of some parents. Many children attended the workshop accompanied by their parents, while others came with their friends.

The activity facilitated interactions among children who were previously unfamiliar with each other, fostering new friendships and social connections. The success and popularity of this workshop were evident from the subsequent Halloween event, where a significant number of participants showed up, indicating the lasting impact and positive impression of the paper airplane activity.

During follow-up interviews conducted six months later, the majority of the children expressed vivid memories of the workshop and expressed their fondness for the activity. Their positive feedback indicated that the workshop had successfully captured their interest and provided them with an enjoyable and memorable experience.

To sum up, this origami event exemplified the effectiveness of incorporating engaging and hands-on activities for children within the neighborhood. By fostering creativity, social interaction, and lasting memories, the workshop contributed to a vibrant and connected community environment, making it a valuable addition to the array of activities targeting children in the neighborhood.

### **Orange Ribbon Motorcycle Experience**

This activity is organized by Orange Ribbon, an organization dedicated to preventing child abuse. They set up a display of motorcycles in an open space within the neighborhood. Children have the opportunity to sit on the motorcycles, which are designed to look cool and exciting, and take photographs. The main purpose of the Orange Ribbon Motorcycle Experience is to raise awareness about child abuse prevention while providing an enjoyable and interactive experience for children.

The event takes place in an open space designated for the display of motorcycles. Orange Ribbon volunteers and staff members ensure the safety and proper handling of the motorcycles during the activity. Children, accompanied by their parents or guardians, are encouraged to approach the motorcycles, sit on them, and pose for photographs. Additionally, the organizers distribute informational pamphlets to parents, highlighting the importance of child protection and providing resources for further support.

The event attracts children of various ages, typically ranging from 5 to 12 years old. It appeals to their sense of curiosity and adventure, allowing them to engage with the motorcycles in a safe and supervised environment. The gender ratio of



Figure 3.4 The Orange Ribbon event status

the participating children was relatively balanced, and both boys and girls showed interest in it.

### The Easter egg hunt

The third activity is an Easter Egg Hunt organized by a local English and Japanese speed-reading teacher. She single-handedly supported and organized this event. Originally running her own shop, she took advantage of the festive occasion to set up a tent and hide colorful eggs on the grassy area in front of her store. The primary objective of the Easter Egg Hunt was to provide an enjoyable and engaging activity for children while incorporating language learning elements. Additionally, the event served as a promotional opportunity for the teacher's classroom courses, allowing her to introduce her educational programs to the parents.

The Easter Egg Hunt took place in the vicinity of the teacher's store, utilizing the surrounding grassy area. The organizer hid a total of 26 eggs, each containing a different letter of the alphabet. Children were given the option to search for and collect either three or five eggs, with varying corresponding prices. After the hunt, the letters found by the children were used to earn points, which could be exchanged for corresponding prizes. The event concluded with the teacher



distributing information about her classroom courses to the parents.

Despite being organized solely by the teacher, the Easter Egg Hunt attracted a significant number of participants. The promotion efforts and word-of-mouth resulted in an increase of approximately five students in her classes in March. Even on a rainy day, during the two-hour period when the author assisted with the event in April, more than ten children actively participated in the Easter Egg Hunt. The majority of participants were girls. The motivations for children's participation in the Easter Egg Hunt were primarily driven by autonomous decision-making as well as parental encouragement and awareness of the event. Both factors were equally present in influencing children's involvement. However, there was one boy who displayed a strong desire to participate but was prohibited by his parents. Their reasoning was that the rainy conditions would make the grassy area dirty.

In conclusion, by engaging children in a fun and interactive search for hidden eggs, the activity fostered their letter recognition skills and encouraged their participation. The event also served as an opportunity for the teacher to expand her student base, as evidenced by the increased enrollment following the promotion. Overall, the Easter Egg Hunt proved to be a valuable activity that successfully combined entertainment, education, and community engagement.



Figure 3.5 The Egg hunt event status

### Discussion on existing events

The three activities serve as evidence of the existence of child-oriented events within the local community, affirming the viability of targeting children as active

participants. Moreover, these activities provide an ideal setting for ethnographic observation, facilitating meaningful dialogues that contribute to a deeper understanding of children’s age group, needs, and motivations. The diversity in activity types, ranging from the engaging motorcycle display by the Orange Ribbon organization to the creative origami airplane workshop and the interactive Easter Egg Hunt, showcases the breadth of existing event offerings that cater to the interests and developmental stages of children. Conversations with the organizers also shed light on their aspirations to create meaningful experiences for children and the challenges they face in implementing such activities. Overall, these findings highlight the significance of child-centered events in fostering community engagement and enhancing the well-being of children in the local context.

### 3.2.6 To digitize or not to digitize the gaming experience

In today’s rapidly evolving digital landscape, the question of whether a game should be digitized has become increasingly pertinent. The advent of technology has revolutionized various aspects of our lives, including the way for children to enjoy entertainment. It’s necessary to consider the factors involved in determining the need for digitizing games and delves into the specific context of geography-related games targeting children.

In recent years, there have been notable efforts to integrate digital elements into geography-related games designed for children. [11] [50]Zhao(2022) proposes a "Parent-Child Participatory AR Treasure Hunt Game" in a nature education park, combining gamification and education. By utilizing AR technology, diverse plant-related AR content enhances the gaming experience within the botanical garden. Evaluation experiments with parent-child pairs show their cooperative engagement and enjoyable learning of plant knowledge. [51] Sato(2020) propose a geocaching experience using the landscape features. The aim is to create an engaging treasure hunt by replacing GPS information with visual cues and quizzes presented through a smartphone app. Focusing on the underground passages near Shinjuku Station as a validation subject, which is known for its complex structure and serves as a major transportation hub, Sato aims to create a "dungeon-like" experience suitable for treasure hunting, enhance the experience through quizzes based on signage and landmarks, and evaluate the user experience through the

development of a smartphone app. [52] Iga(2019)’s survey indicated that 85% of parents struggle to shop with their children in malls due to their lack of purpose and resulting boredom, so she proposed the implementation of a treasure hunting game as a solution. Two field studies were conducted to design and test the game, with the initial study demonstrating that it successfully provided children with a specific objective but posed challenges for parents in terms of shopping. Subsequently, their second study revealed that the redesigned treasure hunting game effectively fulfilled the individual purposes of both parents and children.

To gain deeper insights into the impact and effectiveness of digitized geography games for local children, interviews were conducted with local parents. Regarding the incorporation of electronic elements into the activities, parents indicated that children typically acquire their own mobile phones after reaching upper elementary grades. However, these grades are generally above the targeted age range of our intended audience. Moreover, parents expressed the belief that the shopping street activities provided a valuable opportunity for outdoor engagement and emphasized the importance of allowing children to moderate their exposure to electronic devices. Concerns were raised about potential safety hazards that could arise from simultaneous screen usage and walking. On the other hand, Y, one of the organizers responsible for activity design, expressed the perspective that predefining the need for electronic experiences was unnecessary. It was suggested that the focus should be on determining the desired outcomes and the target audience first, and then finding the most suitable means of presentation accordingly.

Based on the various contexts associated with this particular location and timing, it can be concluded that integrating electronic experiences may not be necessary and that the absence of such elements could potentially enhance the overall experience. It is deemed favorable to prioritize activities that promote active participation, independent mobility, and social interaction, aligning with the goals of the shopping street event and catering to the preferences and well-being of the children involved.

### 3.2.7 Overview of the design journey

The process undertaken in this section has revealed the potential of the local shopping street as a valuable research field. Recognizing the need for effective promotion, a team member focused on addressing the concerns of local shop owners and developed promotional materials that approached the issue from the perspective of community members.

Subsequently, the ideation process unfolded, driven by the realization that children present a significant target audience for engagement. Two ideas were carefully selected, taking into account existing activities and validating the feasibility of creating events specifically for children, which are the treasure hunt collection event and the online exhibition of Koboichi in children's eyes. Through interviews with local parents, it was determined that electronic solutions were not preferred. The insights gained from these interviews informed the decision-making process.

Moving forward, the next steps involve the creation of simple prototypes to further validate the value of the chosen ideas. This iterative approach will enable the refinement and enhancement of the selected activities, ensuring they effectively meet the needs and preferences of the target audience.

## 3.3. Pilot Study in Hiyoshi

### 3.3.1 Purpose and expected outcome

The purpose of this pilot study is to create an initial version that clarifies the foundational map settings and basic flow. The elements and criteria identified during the design process will assist in the development of subsequent prototypes. In the design phase, the focus is on uncovering points of connection with other stakeholders and exploring possibilities to create interactions.

In terms of the process, the first step is to design a map that is tailored to the pilot study location. This map will be used for an initial round of user testing to validate the necessity of various design elements and assess the overall effectiveness of the design in promoting independent mobility. Both questionnaires and interviews will be employed as methods of data collection.

By conducting this pilot user study, we aim to gather valuable insights and

feedback from users, allowing us to refine and enhance the design. The study will also help identify any potential challenges or areas for improvement that may arise during the implementation of the design.

### 3.3.2 Design elements



Figure 3.6 The first prototype used in the pilot study

#### Illustration-styled map

The paper-based map serves as the most significant component. The illustrations on the map will include pictures of landmarks, characters, constructions plants that are relevant to the area being mapped. Considering children need simpler routes for attraction, as well as a simple start for further cultivation possibilities, the overall design is completed under the clue of visually appealing and easy to follow, with the key information clearly highlighted. Accuracy of scale is not considered in this designed map compared to strictly followed maps for navigation

use. The store-related information and area-related information is presented in a manner that is as realistic as possible.

### **Rule descriptions in text and illustration**

The introduction comes step by step. Each step is illustrated with both illustrations and text. While giving instructions, it also implies the flow of the entire activity, that is, read the map to decode, go to the designated store, get stickers, complete the collection and finally get name written on the signature board as rewards. There is no requirement on the order of going to the store, thus no specific instructions on the order of collection activity.

### **Mascot according to the designated place**

Mascot works as the main clue, which indicates the place to be visited in the form of dialogue. In this case, the mascot of Kasugai city are three cactus since the production of cactus in Kasugai city ranks first in Japan. The distinctive image is used to guide the children involved in the activity and to attract attention visually. Meanwhile, representing the city, mascot has its own meaning, which helps to develop a subconsciousness of increased attachment for the Kasugai city.

### **Text prompts introducing designated stores**

The first function of the textual introduction is to present information, telling participants where they should go given that design. The second function of the text, the information contained in it, such as the introduction to the store, is to bring the store and the participants into a closer connection on a basic level.

### **Blank spaces reserved for collection activities**

This purely functional area is used to collect activities to be carried out. Three blank squares indicating the place to put stickers will be placed in scattered corners based on a sense of balance.

### **Free-drawing signature board**

The reward at the end of the activity is an essential part of the game design. The signature board was set up in the area where the materials were distributed, and the children had the freedom to sign with pens after completing the game was explained verbally at the beginning. The signatures or messages on the board can serve as a form of personal recognition and validation, which can bring meaningfulness to the recipient.

### **3.3.3 Method**

The participants of the user experiments were selected considering the diversity and the different levels of familiarity with experimental environment. Testing area was then set with necessary equipment, which are the preparation of materials, setup of signature plates and arrangement of stickers. Experimenter explained the objectives and rules of the game to the test participants. When the participants were playing the game, an ethnographic research method is adopted. Notes are taken on their behavior, real-time feedback and difficulties they encounter. After finishing all the process, participants were asked for their thoughts and opinions on the game based on semi-structured interview and the completion for designated questionnaire for further value validation.

### **3.3.4 Implementation**

The location chosen for the pre-test is on the first floor of the Kyosei Building at Keio University. There were three participants who helped to conduct the test. The first participant, female in her 20s, was familiar with the site and quickly began exploring it after obtaining a map and telling the experimenter what she had seen and recalled from the site in the past. The second participant, a male student in his 20s, had superficial knowledge of the site and maintained a high degree of randomness in his actions during the overall process. The third participant, also a female student in her 20s, interpreted the map as suggesting a sequence of exploration. All three participants successfully found the three designated stores and collected the stickers to complete the experiment. They

were then invited to fill out questionnaires and answer questions related to the experimental material and the experimental process.



Figure 3.7 The status of the pilot user study

### 3.3.5 Value Validation and Design Criteria

**Value1 A treasure hunt game map may motivate exploration in the designated area**

In terms of user journey as a whole, repetition of the words “adventure” and “exploration” when asked to describe the overall activity in the questionnaire shows that this part of the overall proposed value was conveyed to the participants. In addition, the participants’ verbal expressions of “I wouldn’t have come here if it weren’t for this game” and “I thought I was familiar with this place, but I found a corner I didn’t know about” fit the definition of exploration which is the action of travelling to or around an uncharted or unknown area for the purposes of discovery and gathering information.

Among the utility of each element, firstly, the map itself constructs the panorama by providing location information, successfully framing the space and laying the foundation for exploration. Second, the usefulness of the text prompt in providing information was confirmed. Participants agreed that they could understand the information provided by the text and help shorten their distance with the store. Furthermore, the participants were able to understand the collection behavior, which was constructed by the blank space, as a complete process on which all collection activities were based.



### Design Criterion

Instructions for non-designated locations can be appropriately omitted to achieve better focused effect of highlighting the designated destination. Another fact is that a short step-by-step introduction helps participants better understand the entire process of the game flow.

### **Value2 The proposed treasure hunt game may help foster smooth connection between participants**

Based on the prior fieldwork, the anticipated participants in this study were the children and the accompanying parents or friends. During the ethnographic observation, the experimenter and the participant maintained a child-parent-like relationship, with one party being the subject of the activity participation and the other party acting as a companion. In the experiment, the dialogue between the experimenter and the participant centered on the game itself, including whether the understanding of the map was accurate, how to proceed next, the location of the stickers and the direct feeling of the designated place, through which the value can be validated.

As for the elements designed in the specific map, the positioning of the designated stores and the setting of the text prompt play a decisive role, since reading and decoding them is the basis for participating in the activity. The interaction between the participants and the experimenter is based on this willingness to decode. In addition to this, the signature board part also supports this proposed value, as is expressed in the participants' confirmation and attempts to write the content.

### Design Criterion

The advice that the design draws from is that the specific content of the text should be maintained at a level of difficulty that the target user can read, and that occasional incomprehension can facilitate learning and communication.

**Value3: Treasure hunt game may event may develop a sense of familiarity and belongingness which contribute to place attachment.**

Participants showed an increase in their ratings of the level of understanding of the research field. Both the information provided by text and the information provided by the illustrations had the effect of increasing the level of understanding, with the textual information receiving more positive responses in terms of usefulness because of specificity.

As for the role of specific map elements, the participant R, who originally thought she was familiar with the field, still discovered the unknown territory during participation in the experiment and drew unexpectedness from the game. This has implications for the site selection of the game, which requires a more refined selection to increase the game experience for those who are already familiar with the field. In addition to site selection, the mascot component demonstrates the effect. During the interviews and observations while the experiment was in progress, participants made quick reactions to him, such as showing “It’s him, i know him” “People will definitely resonate with it”, which also served to introduce place attachment and promote a sense of belongingness. And, it remains a open choice for participants to initiate dialogue or not with shop owners. In the feedback, we realized that effective communication is still a key factor in promoting place attachment, so that further process setting and dialogue facilitation are pending.

**Design Criterion**

The use of mascot image can be maintained as a easy access to local feature as well as an emphasis on local identity. Hints to local stores to carry out conversations would be more helpful to increase place attachment if they were strengthened.

**3.3.6 Findings and limitations****Map modification**

Based on the facts observed in the preliminary user study and the suggestions received, various improvements were made to the Kasugai version of the map.

- 1 the omission of illustration for irrelevant stores
- 2 the compression of textual information to facilitate the understanding of the target users
- 3 the addition of a textual version of the rules and the adjustment of the guide in a step-by-step format
- 4 the reduction of the scale accuracy requirement and the clarification of the theme of the child-oriented map design

### **Process Refinement**

The process improvement is divided into aspects. The first one works on the setting of stickers and communication with stores. Considering the objective that a closer relationship with the stores is expected, the placement of the sticker collection campaign is set according to the specific requirement of each store, thus reaching the desired communication effect. Secondly, the amount of information that text prompt can provide is limited, so that the way of displaying more information about stores through digital media will be explored.

### **Discussion**

The preliminary user test was carried out to identify the six elements that appeared in the map and their utility, as well as to clarify the proposed value and to categorize the contribution of each element to the proposed value. The feedback and suggestions were used to improve the design elements and processes to clarify the value that could be provided.

In the future, user tests will be conducted in the field to validate the value from the children's perspective. Meanwhile, value for other related actors, which are parents, shop owners and the shopping street revitalization association can be also better validated.

This study also left limitations. First, the preliminary user study was conducted on a small group of people, which may limit the generalizability of the results. Second, there is a discrepancy between the field of the preliminary user study and the field of the final design. Although both have a shopping street-like setting

in terms of geography, further validation of the value needs to be done in the designated field.

Also, parental consent needs to be sought when children are used as participants in the experiment. Moreover, real-world research often lacks the controlled conditions of laboratory experiments, making it difficult to isolate the impact of a single factor. The possibility exists that fieldwork experiments cannot be observed ethnographically on a case-by-case basis, so more effective ways of recording and validating need to be explored.

### **3.4. First Prototype for Kachigawa**

#### **3.4.1 Purpose and expected outcome**

The first version of the prototype outlines the objectives and key components of developing the game in the field setting. The primary aims of this prototype are twofold: first, to actualize the project and assess its feasibility in the local context, and second, to provide a tangible representation of the project's objectives and intended impact to the local community.

To achieve these goals, progress will be made in the following areas. Firstly, based on the conclusions drawn from the previous design criteria, a new version of the Kachigawa map will be developed. Secondly, improvements will be made to the specific gameplay process, particularly the sticker acquisition process. Additionally, having a design prototype will facilitate smoother communication when presenting the design to relevant stakeholders and allow for more specific feedback regarding feasibility. Finally, conducting relevant interviews and engaging with different stakeholders will help construct a preliminary framework for validating the intended value and lay the groundwork for the final version's value validation.

#### **3.4.2 Developing the prototype**

##### **Following the criteria**

There have been several modifications made to the design based on the concluded criteria. These modifications aim to enhance the overall experience and under-

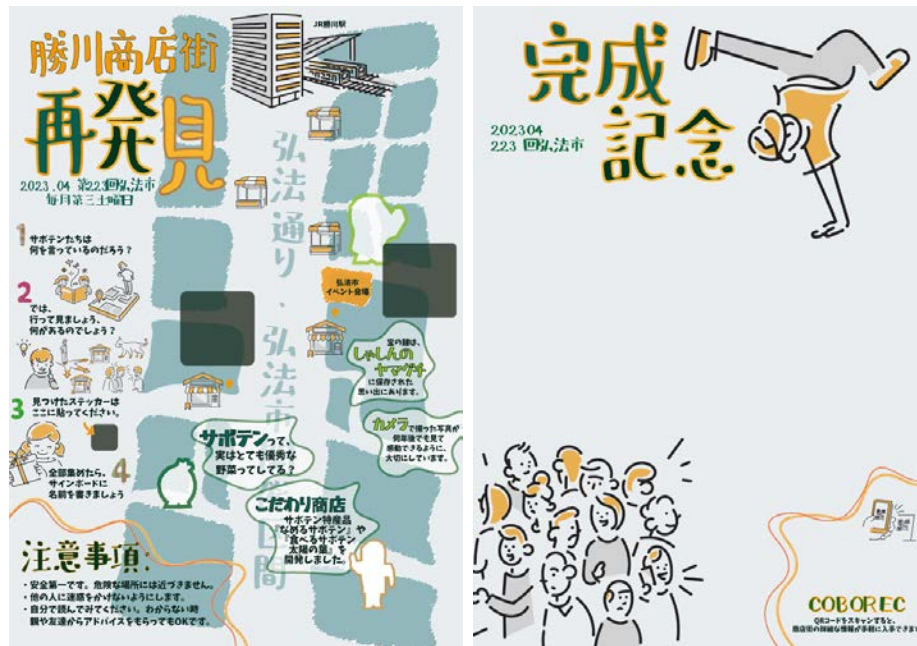


Figure 3.8 The map prototype for Kachigawa shopping street

standing of the participants. The following are the key aspects of the design changes:

#### 1.Omission of Non-Specific Location Images

To draw more attention to the desired stores that children should enter, we have omitted the representation of non-specific location images. This modification highlights the presence of the intended stores and creates a stronger visual impact. Additionally, the map has been simplified, allowing for larger font sizes in the prompts associated with specific stores, accommodating more information.

#### 2.Step-by-Step Rule Introduction

To provide a clear understanding of the rules, we have incorporated a step-by-step rule introduction. This approach benefits both the organizers, as they can follow a structured explanation of the rules, and the participants, who can comprehend the rules even without explicit instructions. Furthermore, visual illustrations have been added to the rule introduction to aid in better comprehension.

#### 3.Reduction of Text Content

To improve the overall clarity and avoid information overload, we have reduced

the amount of textual content. By streamlining the text, we aim to enhance the participants' ability to grasp essential information effectively.

### **Extra Modification**

In addition to the modifications aligned with the criteria, there are other changes that have been implemented to further enhance the overall experience. These changes, although not directly related to the criteria, aim to address important considerations. The following are the key changes made:

1. Addition of Precautions

To ensure the safety, we have included a section on precautions. These guidelines serve as a fundamental guarantee of safety for all participants. By providing clear instructions and highlighting potential hazards, we prioritize the well-being and security of everyone involved.

2. Modification of Map Behavior

To create a more immersive and engaging experience, adjustments have been made to the map. The map is intentionally designed to be less accurate in terms of strict direction and proportion. This modification is intended to add an element of exploration and intrigue to the activity. However, the main venue where the event is held is prominently highlighted on the map, allowing participants to easily identify and navigate towards the central location.

### **3.4.3 Data Collection**

#### **Feedback from parents**

##### **Interviewee 1**

The interviewee expressed a slight sense of anxiety of letting children move alone due to recent social news. However, she is confident in the kindness of the people in this community. Her familiarity with acquaintances and growing up in this area alleviates their worries.

##### **Interviewee 2**

The interviewee mentioned enjoying weekend activities such as visiting parks and having meals with their family. She couldn't think of any other event-like activities but expressed a sense of security in letting her 4-year-old daughter freely

explore the community due to her familiarity with the area. She also saw this as an opportunity for their daughter to make friends.

#### Interviewee 3

The interviewee stated that one of the reasons for moving to this area was the appeal of the shopping street. Her ultimate goal in becoming familiar with the community is to have children taken care of by the local community members. She believe that attending events allows parents to go together or for the child to go alone, thus directly achieving her goal. She also mentioned that parents with babies find it challenging to visit certain shops like bars, creating difficulties in building connections. She hope to take the treasure hunt game as an opportunity to visit stores she wouldn't normally go to.

### **Feedback from shop owners**

#### Interviewee 1

The interviewee mentioned that there used to be a stamp colletion event at Koboichi. Children quickly understand the game's rules and often ask for the answers instead of actively searching for the characters. The owner preferred children to stay outside the shop, but if they are accompanied by parents who could potentially be customers, they are welcome to enter. The shop may set different requirements to receive stickers, such as bringing parents along or other criteria. The possibility of taking a photo was also considered.

#### Interviewee 2

The interviewee stated that the shop is usually busy on Koboichi days, so it is not necessary for children to enter the shop. Her main goal is to be remembered as a souvenir shop when people need to purchase souvenirs, rather than expecting daily visits from customers. Whether children come with their parents or not, it does not significantly impact their business.

#### Interviewee 3

The interviewee mentioned that half of their shop space is occupied by children's books, making them enthusiastic about children visiting. They are willing to help if stamp collection activities are carried out and are not concerned about too many children entering. They agreed with the observation that people attending Koboichi events rarely enter the shops that originally exist on the street.

#### Interviewee 4

The interviewee stated that considering the store's overall interior structure, it is suitable for children to enter the display section but not the space to have meals. She has little impression of the previous stamp rally event, but giving stickers to children who come to talk is not difficult or burdensome. The main focus is to make children happy, so the perspective of profit is not the primary concern.

#### Feedback from shopping street event organizer

The leader of the organizer group mentioned that the initial intention behind the stamp rally was to bring happiness to children and encourage them to visit the stores. She expressed a desire for the paper materials to provide a tangible experience for those who cannot be present, such as grandparents or parents. The activities aim to create opportunities for individuals who may have some interest but lack the motivation to participate. Children may proudly show their maps to classmates, showcasing their weekend activity. The interviewee also suggested that illustrations can help create an atmosphere and attract children, potentially combining them with the map. She proposed adding additional information on the reverse side of the paper. The impression of the "3rd Saturday" is crucial to convey subconsciously.

#### 3.4.4 Design Criterion

Based on the interviews conducted with parents, shop owners, and the shopping street event organizer, several key insights can be derived.

##### **Design Criterion 1 Foster a sense of community engagement and security for parents**

Firstly, parents expressed a mix of anxiety and confidence regarding community events. They valued the opportunity for their children to explore the community and make friends. Familiarity with the area and knowing acquaintances provided a sense of security. The map will try to highlight familiar landmarks and community spaces to create a sense of familiarity and security for parents. We will also strive



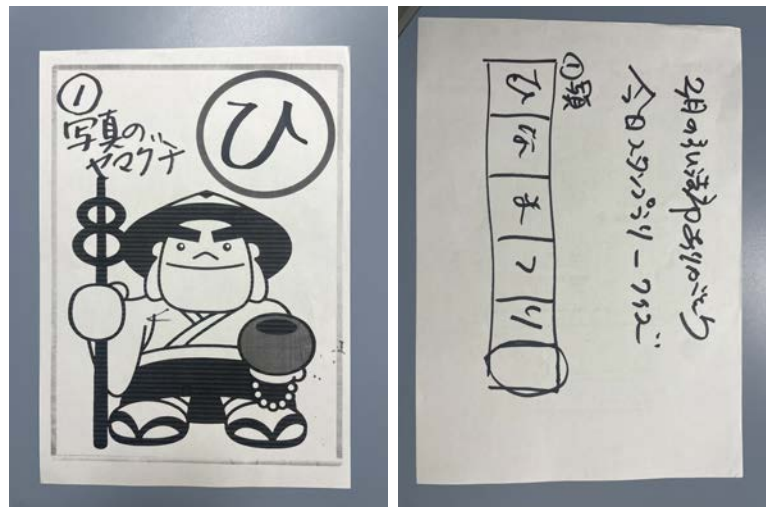


Figure 3.9 Paintings that simulate previous stamp rally event

to facilitate communication between parents and shop owners to enhance mutual understanding and trust, ultimately improving overall safety.

**Design Criterion 2 Accommodate the preferences of shop owners regarding children entering their shops.**

Shop owners had varying perspectives on children entering their shops during the stamp rally event. Some preferred children to stay outside, while others welcomed them when accompanied by potential customers (parents). It was noted that previously children quickly grasped the game's rules and often sought assistance rather than actively searching by themselves. The map may indicate which shops welcome children during the event. Specific icons or symbols used to represent shops that encourage participation will be considered to make it easier for children and parents to identify these locations. The prompts provided on the map will emphasize ways in which parents can actively participate, such as accompanying their children or offering support and guidance.

**Design Criterion 3 Create an inclusive and attractive experience for a wide range of participants**

The shopping street organizer emphasized the goal of bringing happiness to children and creating opportunities for them to visit stores. They expressed a desire to make the activities inclusive and attractive to a wide range of participants. The use of illustrations to enhance the atmosphere and engage children was also highlighted. The map will incorporate visually appealing illustrations and graphics that engage children and create an immersive experience. At the same time, we will pay attention to the presentation of the time and location event information.

**Design Criterion 4 Emphasize the importance of variability and avoid easily obtainable answers**

Based on previous collection activities, it has been realized that incorporating variability and avoiding readily available answers are crucial. To encourage active participation, it is essential to ensure that participants personally navigate to the specified locations. Clues or hints will be strategically placed to guide participants, encouraging them to actively explore and search for the designated locations rather than relying on easily accessible answers.

**3.4.5 Findings and Limitations**

Our findings regarding the improvements made to the map and the adjustments in the game flow reveal that these changes have been relatively effective. The revised map is clear, informative, and visually appealing, providing key information to the participants. While the modifications in the game flow have shown promising results, it is crucial to further refine them based on the specific requirements of each store involved. Furthermore, the presence of previous sticker collection event indicates that the feasibility of the similar activities is highly attainable.

The interviews revealed the importance of community engagement, creating a sense of safety and familiarity for parents, and accommodating the preferences of shop owners. The stamp rally prototype should aim to address these aspects by fostering a welcoming environment for children, encouraging parental involvement, and incorporating visually appealing elements. Additionally, considering

the changing dynamics of the shops and the shopping street itself, the prototype should be adaptable and responsive to evolving needs and interests. However, it is important to strike a balance by introducing variations in the activities to avoid making the outcomes too predictable.

Nonetheless, it is essential to consider the perspectives of other stakeholders. Child safety emerges as a prominent concern from parents, and measures need to be taken to ensure a secure environment for the young participants. Meanwhile, leveraging the event as a promotional tool poses its own challenges and necessitates careful planning and execution.

Despite these positive findings, several limitations need to be acknowledged. The process of tailoring the activities to meet the specific requirements of different stores will require extensive interviews and may prove challenging to implement individually. Moreover, since our primary target audience is children, it is imperative to identify research and experimental methods that are suitable for this age group.

## **3.5. Final Prototype for Kachigawa**

### **3.5.1 Purpose and expected outcome**

After actively listening to the needs and desires of stakeholders, we have finally reached the stage of creating the final prototype. The main purpose of this prototype is to improve based on their requirements. This includes streamlining information, emphasizing shopping street branding, and customizing the demand for. Additionally, We will explore suitable approaches to tackle the concern that parents have, which are challenging to solve solely through a map, such as safety issues.

Another primary objective of this iteration is to evaluate if the design successfully validates the values for children. Specifically, we will assess whether the design promotes independent mobility by fostering autonomy, competence, and relatedness.



Figure 3.10 The Final Prototype

### 3.5.2 Developing the prototype

#### Following the criteria

1. Streamlined Information The textual information has been continuously simplified to provide a smoother reading experience for children. This ensures that the necessary details are presented in a concise and clear manner. Additionally, the illustrations have been unified in style, creating a cohesive visual experience.

2. Emphasis on Parent-Shop Interaction In handling the shop information, we have made efforts to highlight the interaction between parents and shop owners. This encourages meaningful engagement and fosters a sense of community within the activity.

3. Variability Due to limited shop interviews and the monthly nature of the map, variability was not extensively incorporated in this iteration. However, future considerations will be made to introduce variability and surprises to enhance the overall experience.

#### Extra Modification

1. Reduction in the Number of Shops To facilitate smoother user testing, the number of shops has been reduced from three to two. This adjustment ensures that the user testing process is more manageable and allows for focused feedback.

2. Updated Illustration Style The overall illustration style has been updated to create a more unified and cohesive visual presentation. This ensures that the illustrations align with the desired aesthetic and contribute to an engaging experience for participants.

### 3.5.3 Service ecosystem and the identification of stakeholders

#### Children in Kachigawa area

This study focused on children aged 7-10 years old, who were observed to be the main participants in the Koboichi based on ethnographic observations. They show a limited autonomy, reflecting on being able to understand the information to a certain extent while relying on external guidance for the activity routine.

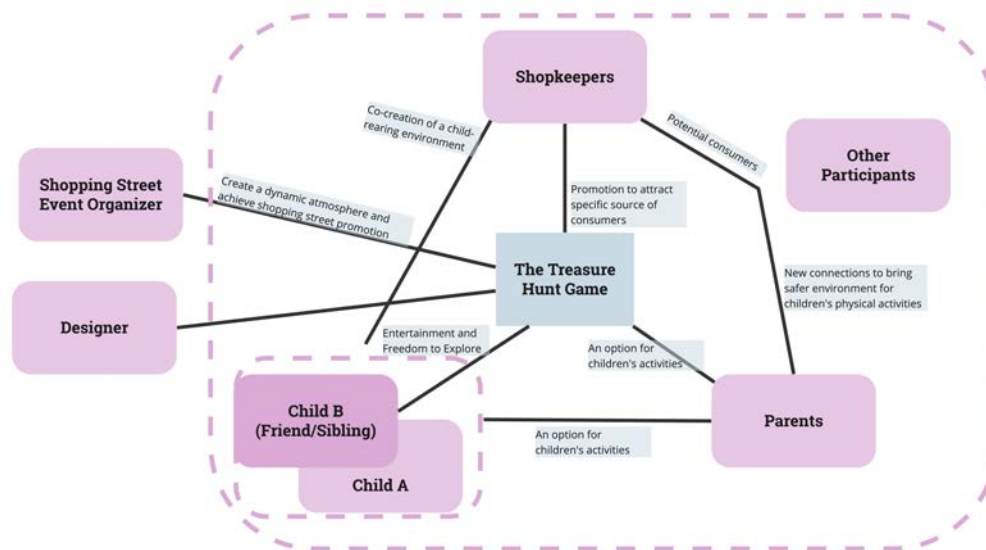


Figure 3.11 The service ecosystem

Spending most of the time visiting the temporary tent stores that only appear during the Koboichi period, the children paid relatively little attention to the stores that already existed on the shopping street. The performance at the event aimed at entertainment succeeded in attracting a large number of children to sit in the first row. There were also children who were unimpressed by the performance, describing the next movement of the performer to the first-time volunteers and clearly expressing their boredom. Children who traveled with friends showed strong bond between each other, while children who traveled with parents showed different patterns across families, with both parents and children being observed to take the lead in the interaction.

### Parents in Kachigawa area

The condition for children aged 5-9 to participate in various activities in Koboichi is being brought to the venue by their parents. For the target audience concerned in this research, children of age 5-9 need to be brought to the venue by their parents before they can participate in various activities in the shopping street. The premise for parents to take their children to the shopping street is to plan

and look forward to parent-child activities during weekends. Kasugai, meanwhile, is known as a bed town where many people move to the city when they get married, have children, or change jobs. Especially for new comers in Kasugai, raising children in this city is a spontaneous choice, through which various types of experiences that are consistent with parenting are pursued when they make their decisions.

### **Shop owners in Kachigawa shopping street**

The stores and owners form the core part of the shopping street as a commercial facility. In interviews with neighborhood residents, the shopping street leaves a warm and positive impression, especially on the ease of conducting dialogue and the friendliness with new residents. However, in line with the overall shopping street situation in Japan, the shopping street is facing crises due to the changes in the external business environment and internal demographic structure. Although the new shopping center has the intention to help the local economy and actively cooperate with local stores, the result is not able to reach every store in the shopping street. One of the keyword seized from the interview is lack of cohesion. Their perception of the area over the years has shown them that the use and dependence on the shopping street is draining away. On the other hand, the opening of new shopping center is also an impact on the visitor of the shopping street. Although the new shopping center has the intention to help the local economy and actively cooperate with local stores, the result is not able to reach every store in the shopping street.

### **The revitalization association**

The Kachigawa Shopping Street Revitalization Association organizers are committed to the monthly event Koboichi which is held on the third Saturday of each month. The event started in 2003 and has been held over 200 times. At this stage, Koboichi itself is in a stable state since the merchant participants do not change much from month to month. The organizer's job remains to maintain the overall stability of the event, internally to collect a certain amount of participation fees internally and maintain communication with store owners; at the same time, externally to disseminate information through the setup of the website, the

production of flyers, and the promotion of social media with the help of the volunteers. The organizers used their sense of responsibility and work to keep the event running on one hand, and on the other hand, they infected the participants with the enthusiasm of regional attachment and got help from many actors.



# Chapter 4

## Value Validation

### 4.1. Methodology

#### 4.1.1 Purpose and expected outcome

The main purpose of this study is to verify whether participants can experience the sense of autonomy, competence and relatedness, which are three enablers of intrinsic motivation under the frame of self-determination theory, in the whole proposed game process, so as to motivate children's independent mobility.

Through the user test and interviews, the study also aims to explore additional aspects related to the design's value validation. This includes examining parents' considerations of safety issues in children's independent activities and understanding the attitudes of shopping street event organizers towards providing children-oriented activities.

#### 4.1.2 Participant Recruitment

Children aged 7-10 lived in Kasugai City and participated in the shopping street event of the month. The participants in the study are children who are attending Koboichi. They will primarily attend the study accompanied by their parents, but they will be encouraged to participate independently. However, if parents wish to accompany their children, their presence will be respected. It is also possible for siblings to participate together, as long as at least one child falls within the ideal age range. Note that the research team has already built a bond with the local community members and will only engage with those that are happy to participate.

### 4.1.3 Application of Self-Determination Theory

To measure motivation through self-determination theory (SDT), several well-established scales have been developed and utilized in previous studies. For example, General causality orientations scale(GCOS) aims to evaluate an individual's level of three distinct motivational orientations which are considered enduring aspects of personality. The Emotion Regulation Inventory (ERI) is a tool used to evaluate the management and control of negative emotions. [53] [17] [54]

However, these scales have primarily catered to quantitative research approaches. Given the specific focus on children as the research subjects, the limited sample size, and the primary aim of validating the value of the design, a qualitative research approach has been predominantly considered in this study.

While quantitative scales may not entirely align with the objectives of this research, they can still serve as valuable references. Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS; Chen, Vansteenkiste, et al., 2015) [55] [56]incorporates a well-balanced combination of items that assess both satisfaction and frustration. The Intrinsic Motivation Inventory (IMI) is a tool designed to measure the subjective experience of participants in laboratory experiments, specifically related to their engagement and motivation towards a particular activity. The Learning Climate Questionnaire(LCQ) is commonly employed in relation to specific educational environments, such as a particular college or graduate-level class, to gather relevant information. By combining insights from established scales and tailored interviews, this methodology aims to suitably explore self-determination theory within the specific context of children participants. Referring to these three established scales, the interview towards children to validate the motivation gains its structure. Additionally, we will pay attention to ensure the comprehension level of the children is taken into account, allowing for a more comprehensive understanding of their experiences and perspectives.

## 4.2. Implementation

### 4.2.1 Designated Stores Included

Store A, offers a unique selection of vintage books and handmade crafts. The owner and his wife, who are passionate about their business, have also conducted workshops for children. Their dedication to providing engaging experiences for children reflects their commitment to fostering creativity and learning within the community. With their warm and enthusiastic approach, they create an inviting atmosphere that encourages visitors to explore the treasures of literature and craftsmanship.

Store A was chosen based on the alignment between the children's developmental environment and the overall community atmosphere, which corresponds to the central objective of this research. Located on the second floor of a coffee shop, Store A did not directly benefit from the high customer flow generated by Koboichi, as discussed in the previous interview. Additionally, the requirement to remove shoes and ascend stairs to access the coffee shop posed a potential barrier for hesitant visitors, potentially resulting in them perusing the display space on the first floor and leaving without entering Store A. Thus, the store relies heavily on word-of-mouth promotion and establishing strong connections with local residents to enhance its appeal. These factors contribute to the desired sense of popularity and a strong presence among the community members.

Store B is a specialty shop known for its cactus-related products. The owner, who is deeply connected to the community, has been involved in various activities to promote local engagement. The store's emphasis on cactus and regional identity adds to the unique character of the shopping street. The owner's passion for cultivating a sense of regional pride is evident, as they strive to create an environment where visitors can not only appreciate the unexpected usage of cactus but also feel a strong sense of belonging within the community.

The selection of store B was influenced by the owner's dynamic involvement during Koboichi. The owner often participates in other events outside the store or assists the organizers in coordinating contacts. For the owner, engaging with the community by staying in a familiar tent or roaming around during the event holds greater appeal compared to remaining inside the store and waiting for customers.



Figure 4.1 The status of the pilot user study

The primary goal for Store B is not to increase the actual visitation rate but to establish a significant presence in the minds of the community members. This allows the owner to maintain connections with the community and leverage the event as an opportunity for sustained engagement and interaction.

### 4.2.2 Workshop Procedure

This section outlines the step-by-step process followed during the workshops, including the facilitators' actions, places included, the anticipated time, and the anticipated behaviour for all the participants.

### 4.2.3 Implementation status

In the user test implementation, various stakeholders were involved. Three participants, labeled as C1, C2, and C3, contributing to valuable insights. Additionally, three individuals, referred to as C4, C5, and C6, took part in structured interviews, providing essential perspectives. To maintain anonymity, the parents of these children were assigned identifiers as P1, P2, P3, P4, P5, and P6, with two additional parents designated as P7 and P8. Furthermore, two stores, S1 and S2,

Table 4.1 User test procedure

Procedure	Location	Time
The organizer briefly explains that this is a treasure hunt game and that they could leave their name on the signature board as a reward after finishing the game.	At the reception desk	2 minutes
Participants with their friends or family go to the designated store by reading, understanding and decoding the information on the map.	At the shopping street	2 minutes
Participants will find the sticker A that has been placed at the entrance of store A beforehand and paste it on the paper. (The order can be exchanged with the next step.)	At store A	3 minutes
Participants will find the sticker B that has been handed to the store B's owner beforehand and paste it on the paper.	At store B	3 minutes
Participants have completed the collection activity. They will go back to the operator's desk.	At the shopping street	2 minutes
Participants are rewarded with a chance to sign the signature board and the pen to sign and draw by showing the map to the operator.	At the reception desk	3 minutes
Operator will interview the participants and their parents about the experience .	At the reception desk	15 minutes

played significant roles in the user test and were previously interviewed to understand their perspectives. The event organizers, O1 and O2, were also crucial stakeholders, facilitating the test and providing support during the process.

C1's parents were originally engaged in relaxed conversations with their friends, standing by a round table and enjoying beverages. Their children occasionally joined in the conversation with them. Afterward, the two kids would disperse to play, and after a while, they would return to their parents. The parents' attention was mostly focused on their friends, and their conversations with the children revolved around encouraging them to explore on their own in the community. When we asked if they would allow their children to participate in the activity, they gladly agreed. After introducing the game rules to C1, he immediately set off. The mother carefully read through the consent form before signing it. The child explored the activity individually, and upon completion, engaged in the signature reward by drawing.

For C2 and C3, consent was obtained from the guardians of these two children before the test. The two participants and their parents later reached out the organizers. The test rules were explained, and a map was distributed to both the child and their guardians. The parents demonstrate the will to participate together and obtain the understanding of the process so the participants and their guardians together proceeded to visit the designated stores. During the process, the parents followed from a distance to minimize influence.

C4, C5, and C6 are the interviewee of structured interviews. Information was initially gathered from the interview with their parents. With parental consent, the children were asked if they were willing to answer a few simple questions. Questions were tailored based on the children's age and level of attention, primarily focused on the map and the event. Alternatively, the children were invited to participate in a drawing activity to express their experiences and thoughts.

### 4.3. Insight from different actors

Based on on-site ethnographic observations, continuous volunteer work in the research field and feedback obtained during the prototype development phase, the following value structure is proposed.

The main objective of this study is to provide children with an enjoyable weekend experience while motivating their independent mobility through the perception of autonomy, relatedness, and competence. The data sources for the children are behavioral observations and simple interviews, which follow the following framework:

*Autonomy* To what extent does the treasure hunt map design allow children to personalize their routes and activities, promoting a sense of autonomy and self-expression? Can the design of step-by-step instruction enhance children's sense of ownership and control over their independent mobility decisions?

*Competence* Can the treasure hunt map design incorporate challenges and goals that align with children's developmental capabilities and promote a sense of mastery? Can children gain a sense of accomplishment from successfully reading map information? Does knowing where a particular store is located help children's confidence and contribute to the sense of competence?

*Relatedness* In what ways does the treasure hunt map design foster social connections and interactions among children during independent mobility activities? Is it possible to facilitate collaboration, cooperation, or shared experiences among children through this activity?

Simultaneously, focusing on other stakeholders related to children and connected with the field, this research aims to address the issue faced by parents when their children participate in such activities, by enhancing community connections to increase parenting security. It also aims to provide shop owners with connections to potential customer groups and improve store advertising effectiveness. Additionally, it aims to facilitate the overall promotion of shopping street event by addressing safety concerns related to children's activities and incorporating them into the event's publicity.

### 4.3.1 Children Participants

The first participant, C1, was a 7-year-old boy. There was an area just beside the reception desk where a stand up bar was held and people were standing and drinking. The participant's parents were there, consuming alcoholic beverages. The participant, along with his elder sister, actively moved around the vicinity. The family is regular attendees of this monthly Koboichi event.



Figure 4.2 C1 in the user test

Two additional participants, C2 and C3, both aged seven, consistently attended the monthly event due to their proximity to the shopping street location. The two girls were always accompanied by their respective mothers and appeared as a cohesive group. C2's mother would bring along her younger sibling, although their significant age difference limited the observable interaction between them.



Figure 4.3 C2 and C3 in the user test

## Behavior observation

### Autonomy

As for the first participant C1, the presence of autonomy can be evidenced by the initial step of selecting whether or not to participate in the activity. As the invitation to involve children in the activity necessitates parental consent, obtaining permission from parents was prioritized. Subsequently, the voluntary participation of the children became a crucial factor. This can be assessed through both verbal indications and behavioral manifestations. On one hand, verbal responses shed light on their willingness to participate, while on the other hand, the evi-



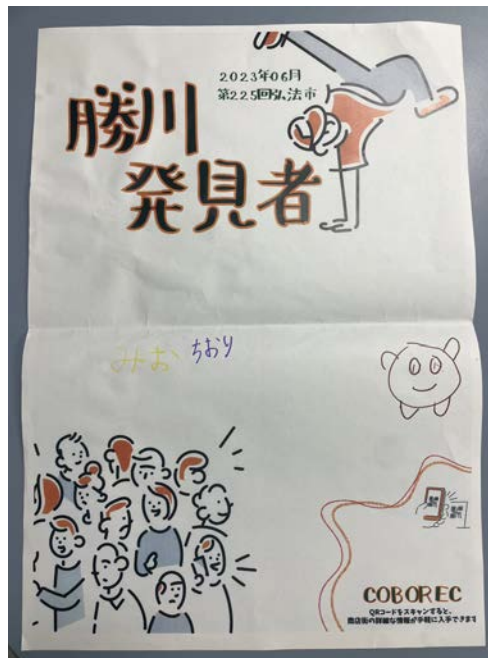


Figure 4.4 The finished version of signature board in the user test

dent eagerness and unusual display of patience in comprehending the rules upon receiving the map substantiate his inclination towards engaging in the game.

Another source of C1's autonomy was the freedom to decide which specific store to visit first. With the presence of the map, C1 had the opportunity to explore the two shops within the shopping street. C1 deliberated upon the choices available and ultimately decided on the order. He slowed down the speed when realizing the first shop is close by and stopped at the entrance, demonstrating their ability to make independent decisions based on personal preferences and interests.

The participants also possessed the freedom to choose whether to participate individually or together with his siblings. C1's autonomy was derived from the decision of whether or not to join with their family members. C1's sister, who was present alongside, served as an ideal subject for user research as well. When we inquired whether C1 preferred to participate alone or with their sister, he quietly expressed his desire to participate independently to his mother. C1's preference for independent participation was respected by their mother and, naturally, accepted by us as the organizers.

However, considering C1's inherent strong motivation for exploration, even when not actively participating in the event, our observations at the reception desk revealed that he actively engaged in exploring the surrounding environment. The presence of a map itself provided him with options for destinations, including shops within the existing shopping street that didn't get much attention during the Koboichi period. Nevertheless, purely from the perspective of autonomy, his potential destinations were limitless, and the existence of the map to some extent imposed limitations on his choices. For a child who already possesses intrinsic motivation and the autonomy in activities, the experiential value offered by the map would outweigh its value in terms of promoting independent mobility.

As for the next group of participant C2 and C3, similar to C1, they also exhibited the freedom to choose whether to participate in the activity and the freedom to select which store to visit. They exercised their autonomy by deciding whether or not to join the event and independently deciding which specific store to explore.

While their mothers were present, the non-interference approach allowed C2 and C3 the freedom to participate at their own pace, with their mothers observing from a distance. This freedom was not limited to this particular activity but was also observed in their previous play experiences in other different settings. When their mother was being interviewed in the past months, the two girls moved around within sight. Thus, they consistently enjoyed the autonomy to explore and engage in activities independently, with minimal interference from their mothers.

In the sticker selection process, an intriguing characteristic displayed by the girls was their desire to be "the same." This inclination towards conformity and sameness was not limited to this specific activity but had also been observed in various other activities. While participating in the Easter Egg hunt event, although the two girls received different points, they still tried to maintain a high degree of consistency when choosing presents. The pursuit of "the sameness" can be seen as contrary to autonomy, as it suggests a tendency to conform to the preferences and choices of others rather than asserting their own individuality.

### **Competence**

First, after a brief explanation, C1, C2, and C3 all demonstrate an understanding of the rules of the game. This is due to our careful design for the target age group

(7-10 years old). Even as 7-year-old participants, they were able to successfully understand the setting and rules of this sticker collection game. Their ability to adapt and understand a certain degree of complexity is demonstrated. Since the stamp rally event has a cultural background in Japan, the children's ability to understand the alternation is also demonstrated during the understanding process.

Second, the children displayed their exploratory and decision-making abilities while navigating towards the designated stores. They attentively observed their surroundings, used the map's instructions and features to identify and choose the correct stores. They showed their spatial awareness and sense of direction by precisely navigating towards their intended destinations.

Furthermore, the participants all exhibited their collaboration and communication skills. When faced with challenges or getting lost, they engaged in mutual communication, sharing information with other participants to seek assistance and problem-solving. Also, the facilitators served as an ideal target for the participants to ask for help. As for C2 and C3, they effectively collaborated with each other, sharing their thoughts and opinions, leading to the right way to go.

Lastly, during the process of drawing and writing on the signature board, the children showcased their creativity. C1 held the pen steadily, skillfully drawing his favorite pattern while C2 and C3 writing their names on the board. They displayed the precise hand movements and proper understanding of the reward, along with confidence and self-expression in their artwork.

Through these detailed action descriptions, we can observe the children's decision-making abilities, spatial orientation skills, collaboration and communication skills, as well as their creativity. These demonstrated competencies favor their active participation in the activity as well as their motivation in community exploration.

## **Relatedness**

First, as for C1, who participated alone, making interactions with their parents the most evident expression of relatedness. The parents originally focused on conversations with adults where valuable discussions with their children were scarce. C1 would occasionally seek attention from their mother, engaging in idle interactions. However, in the initiation stage of the game, there were positive and meaningful communications between C1 and his mother, as she explained the

rules and encouraged active participation.

Moving on to C2 and C3, although their previous interactions with their parents observed were limited, the fact that they were invited to participate through their mothers implies a form of communication related to their involvement. The primary demonstration of relatedness for C2 and C3 was observed in their interactions with each other. They communicated about routes, directions, and sticker choices, always walking side by side. The conversation was smoothly constructed and the shared experiences can become an integral part of their collective memories.

Additionally, relatedness can also be observed in their interactions with the stores. Although the interaction designed for this purpose was not successfully carried out this time, it was possible to measure the extent of relatedness in that context.

## Structured Interview

### Autonomy

All three participants expressed a sense of autonomy in their decision-making during the treasure hunt. They had the freedom to choose which shops to visit and the route to follow, indicating that they had control over their own choices and actions during the activity.

### Competence

The participants' responses demonstrated varying levels of confidence and competence. Participants C1, C2, and C3 expressed confidence in their ability to complete the treasure hunt successfully. While C1 knew one of the places on the map, C2 and C3 had a basic understanding of the text and were familiar with one of the locations. However, participants C4 to C6 did not take part in the actual testing but were interviewed based on the map itself. Among them, C4, a 10-year-old, had a general understanding of both locations, while C5, a 5-year-old, found it challenging to be interviewed but showed interest in joining the conversation when topics of personal interest arose. C6, a 6-year-old boy with

his 4-year-old sister beside, required assistance from their mother to read the map and the text. However, both children showed strong interest in the stamp rally activity, especially the part of sign their name on the signature board.

### **Relatedness**

When asked about participating alone or with others, participants provided mixed responses. Participant C1 expressed that being alone was not very enjoyable and sought the facilitator's help during the activity. In contrast, participants C2 and C3 expressed great satisfaction and enjoyment in participating together with their close friends. They valued the social aspect of the activity and the opportunity to engage with their friends while exploring the treasure hunt.

#### **4.3.2 Parents participating in shopping street activities with their children**

A total of seven parents participated in the interviews, labeled from P1 to P7, providing valuable insights into their experiences and perspectives regarding the design. P1 to P3 correspond to the parents of participants C1 to C3 respectively. Several key values emerged from the interviews with the parents, indicating the positive impact and significance of the treasure hunt activity.

The physical aspect of the activity was valued, with parents appreciating the opportunity it provided for keeping their children active. Parents recognized the importance of physical engagement for their children's overall well-being.

- Boys at this age most need events that move their bodies.(P1)
- Appreciates the activity for keeping kids active.(P3)
- Desire workshop events ranging from physical activities to hands-on activities.(P5)
- Needs an opportunity for children to be dropped off in a local area where the elderly gather.(P7)

Another value highlighted was the treasure hunt's role in assessing children's knowledge of the community. Parents discovered through the interviews that

their children's familiarity with the neighborhood was not as extensive as initially assumed. This insight emphasized the potential of the treasure hunt, along with the accompanying map and interview process, to serve as tools for evaluating and enhancing children's understanding of their local environment.

- Realizes through the interview that her daughter's knowledge of the community is not as extensive as initially thought. (P2)
- Considers the interview and the map as potential tools to assess her daughter's familiarity with the community. (P2)
- Expresses a need to channel children's extra energy in combination with testify the cognition level of her son.(P7)

The treasure hunt activity was seen as an opportunity for social interaction, fulfilling the needs of parents who desired conversations and connections with other adults. Parents expressed their satisfaction in engaging with community members, including shopkeepers and other participants, through the activity. This aspect of the treasure hunt fostered a sense of belonging and promoted community cohesion. For example, opinions as following have been shared:

- Considers the activity suitable for her needs as it allows her to chat and interact with other adults while her child participates independently.(P1)
- Highlights the convenience of having a connection with shop owners, particularly when restroom facilities are needed.(P4)
- Desires opportunities to engage in conversations with shopkeepers.(P5)
- Values familiarity with store owners and adults responsible for maintaining order at each location.(P6)

Furthermore, the treasure hunt activity stimulates discussion on security issues. The majority of parents were regular attendees of Koboichi, leading to a sense of safety regarding neighborhood relationships and familiarity with various individuals. However, a subset of parents expressed concerns regarding safety issues, as the participation of external individuals during the Koboichi event introduced an element of instability.

- Considers the activity suitable for her needs as it allows her to chat and interact with other adults while her child participates independently.(P1)
- Values the presence of her older child when the younger one explores, indicating a sense of security.(P4)
- Feels uneasy when people from outside the neighborhood attend weekend events.(P5)
- Highlights the importance of being able to locate parents individually in case of any accidents.(P6)
- Does not express significant concerns about safety.(P7)

In addition, some issues were mentioned sporadically. P7 mentioned that the treasure hunt activity also served as a catalyst for community development and intergenerational connections. Additionally, P4 expressed comfort in knowing that there was a clear plan in place for addressing any accidents or emergencies, as indicated by the provision of contact information and the ability to locate parents individually if needed.

### 4.3.3 Shopkeepers Involved

Two main shops are involved in this round of user test, as previously introduced in the earlier sections. Regarding the first shop, Shop A, it is challenging to analyze its value in context due to the absence of its staff members. However, based on the participants' behavior, such as all participants, C1,C2 and C3, mentioning their unfamiliarity with this shop, we can infer its advertising effectiveness. The repetition of this shop's name by the participants indicates some level of awareness.

Shop B already enjoys a certain level of recognition. Firstly, the nature of its business, specializing in cactus-related products, sets it apart and contributes to its uniqueness. Customers have specifically called to confirm the opening hours and made dedicated visits, while others have come through word-of-mouth, taking the opportunity of the Kachigawa event to visit this shop intentionally. Secondly, the shop owner plays an active role within the shopping street, maintaining contacts and connections with various individuals, thereby creating a strong sense of presence for the shop.

Both C2 and C3 have a general idea of the shop B's location, but the key factor for their awareness is the prominent cactus display at the entrance, as the shop sign is positioned higher and may not be within the children's field of view. The same applies to C1, who recognized the shop's location upon seeing the cacti at the entrance, despite having a general sense of direction.

In conversations with the shop owner of Shop B, it became apparent that visibility and recognition were crucial for the shop's success. The owner expressed a desire for the shop to be known and recognized by genuine visitors who appreciated its offerings, rather than receiving random or unnecessary visits. The confirmation of the shop's presence and visibility brought satisfaction. This highlights the importance of advertising effectiveness and customer recognition for both Shop A and Shop B.

#### 4.3.4 Koboichi Organizers

Organizers recognize the importance of creating meaningful experiences and exploration chances for children participating in the event. They acknowledge the need for constant updates and iterations to provide fresh and memorable encounters. By designing engaging activities and facilitating social interactions, organizers see the potential for the game to leave a lasting impact on participants' memories and their connection to the event and the community.

- I also noticed the children here for the first time when designing the activities. It is indeed a good choice to connect the community by letting them infect the people around them when they are active.(O1)
- - The participation of other children in the treasure hunt further attracts additional participants, as kids are drawn to activities that involve social interaction.(O2)
- Similar activities have been organized in the past. Although some of the activity's original significance was diminished as children quickly learned the rules and shared answers, it is not necessary to be overly concerned about the original activity.(O2)



The design also allows organizers to introduce new and unique elements to the local area, offering residents and participants something they have not experienced before. This emphasis on showcasing novel aspects contributes to the vibrancy and diversity of the event, enhancing its overall appeal.

- Instead of solely focusing on creating entirely new elements, I aim to showcase novel aspects that have not been seen in the local area before when thinking about the Origami event. And the same thinking path is witnessed in the proposed treasure hunt game.(O1)
- I find the atmosphere and the sense of purpose in serving a specific audience to be highly valuable.(O1)
- Children who are constantly seeking new experiences and engaging in iterative processes will create memories associated with this activity and the community.(O2)

The original stamp rally activity, along with its connection to the Buddha statue, cultivates a sense of regional identity and place attachment among participants. By incorporating elements that symbolize the local area's identity, in this case which are the cactus, organizers contribute to a stronger sense of community pride and belonging.

- Previously, I was impressed by the enthusiasm of the local community and volunteered my assistance. I have been involved in event management for an extended period, including managing the social media accounts. It is highly possible to cultivate a sense of belonging in this community, especially we can rely on the help of some symbols.(O1)
- The purpose of the previous activity is twofold: to familiarize participants with the neighborhood and to provide opportunities for children to freely engage in activities.(O2)
- In the original activity, children would visit a Buddha statue to collect stamps, fostering a sense of regional identity. While the new map design does not incorporate elements of the Buddha statue, the presence of cactus still contributes to the sense of regional identity.(O2)

### 4.3.5 Other Stakeholders

In addition to the three stakeholders closely involved with the children mentioned earlier, there are other individuals closely connected to the local shopping street's monthly event, including the participating vendors operating in temporary tents and ordinary visitors. These individuals exhibit a distinct but distant connection with the children, perceiving and understanding the local ambiance and environment in their own ways. Interviewing them provides valuable insights from a relatively objective perspective to evaluate the evident value that the design can bring and discuss the perceived value in context by these individuals.

#### **Vendors operating in temporary tents**

The interviewee U, identified as a vendor operating in a temporary tent, provided valuable insights on the significance of children in creating a lively atmosphere. The interviewee found the sticker collection to be an enjoyable activity. She reminisced about past events, such as the tradition of making and distributing rice cakes during the New Year, which had generated excitement among the children. In comparison to other weekend activities like visiting parks or having meals as a family, she perceived the monthly event as distinct. She expressed hope that her four-year-old daughter could seize this opportunity to make new friends and engage in a social environment.

#### **Local TV reporter**

The interviewee V is a reporter from a local TV station who has been actively covering the shopping street for two weeks. Through numerous interviews and extensive video footage, the interviewee has accumulated a substantial workload. However, this experience has enabled the reporter to develop a deep sense of empathy towards the cohesiveness and enthusiasm exhibited by the people in this shopping street. The Koboichi, serving as a window, acts as a valuable channel to bring people together and reflect the unique customs and traditions of this vibrant shopping street.

### **Invited Visitor**

The interviewee W resides in a neighboring city within the same Aichi prefecture. She owns a small shop and utilizes social media to promote her business. On the contrary to Kachigawa shopping street, the shopping street in her locality suffers from a state of disrepair and desolation, thus lacking regular activities. Through her participation in Koboichi, she finds an opportunity to easily showcase her products and increase visibility. The activities in the shopping street where she resides are limited, and without personal acquaintances, it becomes challenging to gain insights into the local situation. Therefore, the opportunity to exhibit her products in this connected community is perceived as highly valuable, providing a sense of comfort and fostering a stronger sense of relatedness within the community.

W was invited to participate in the shopping street event by one of the organizers who happened to be a friend. This organizer actively helped promote the interviewee's products to acquaintances. As a result, the interviewee expressed a strong sense of the lively and vibrant atmosphere present in this community. She perceived the shopping street as an ideal environment for raising children, offering a combination of lively activities and organizers who genuinely exhibit goodwill. Feeling grateful to experience such a dynamic atmosphere, W acknowledged the positive impact it had on nurturing children.

## **4.4. Discussion**

### **4.4.1 Motivate children's independent mobility**

#### **Autonomy**

The treasure hunt design empowers children first by providing them with opportunities to exercise their decision-making skills. Through the freedom to choose their own path, children are given the autonomy to make independent choices and navigate the treasure hunt according to their preferences. The interviews revealed that children expressed a sense of excitement and satisfaction when they had the freedom to decide which store to visit first or which route to take. This autonomy not only fosters a sense of ownership and control over their experience but also

encourages them to take responsibility for their actions. This sense of independence contributes to their confidence, and ultimately motivate them in exploring local areas.

### **Competence**

The treasure hunt design serves as a platform for children to develop and showcase their competence. Through the challenges presented in the treasure hunt, such as reading and understanding the map, locating specific stores, and completing tasks, children are provided with opportunities to demonstrate their skills and abilities. The interviews with children revealed their confidence in their capacity to complete the treasure hunt successfully and their belief that they can understand the information provided in the game. This sense of competence not only boosts their self-esteem but also encourages their intrinsic motivation to actively participate in the activity. Moreover, the engagement in the treasure hunt allows children to acquire new knowledge about the neighborhood, local businesses, and community resources, expanding their understanding of the environment and fostering a sense of mastery in navigating their surroundings. By promoting competence, the treasure hunt design empowers children to develop and showcase their abilities, enhancing their overall well-being.

### **Relatedness**

The treasure hunt design fosters a sense of relatedness among children by providing opportunities for interaction and collaboration. Children have the chance to engage with their peers, parents, facilitators and members of the community. The interviews revealed that children expressed enjoyment and excitement when participating in the treasure hunt with their friends. Additionally, the treasure hunt encourages children to interact with shop owners and local residents, creating connections and a sense of belonging within the community. These social interactions not only enhance their sense of relatedness but also contribute to the development of their sense of belonging with the community. By fostering a sense of relatedness, the treasure hunt design facilitates connections with different people, contributing to a fundamental accumulation of social capital.

### 4.4.2 Effect of Community Empowerment

#### Membership

The treasure hunt design harnesses the power of the map to strengthen the sense of boundary, identification, and common symbol, which are three of the components contribute to the membership within the community. Whether it is the physical limitation of the event itself, or the enhanced functionality of the event with regional characteristics, it serves the community awareness of the participants. The map serves as a unifying symbol that embodies the collective identity and shared experiences of community members.

However, it is important to acknowledge that emotional safety is an ongoing concern, particularly among parents. Our interviews highlighted their need for reassurance and trust in the community environment. Addressing this aspect and fostering emotional safety should be a continued focus in future design.

Furthermore, while personal investment is encouraged through active participation in the design process, it is important to recognize that the current design may not fully showcase this aspect. Finding ways to amplify individuals' contributions and sense of ownership in the treasure hunt can further enhance their personal investment, ultimately deepening their connection to the community.

#### Influence

The influence of the community on the stakeholders participating in the treasure hunt design cannot be overlooked in terms of providing a foundation for meaningful interactions. Within this dynamic community context, individuals find a common ground for communication and problem-solving. The community's influence on the stakeholders becomes a driving force that shapes their contributions, propels their dedication, and reinforces their commitment to building a stronger, more cohesive community.

As for the influence exerted on the community, parents' active involvement in the design process allows them to voice their concerns, share their perspectives, and exert influence on community decisions, ultimately shaping the community to better meet the needs of families and children. As active participants, shopkeepers enhance the overall experience by offering prizes, fostering conversations,

and aligning their business practices with community values. Organizers, driven by their passion for community development, shape the design to align with local needs and aspirations. By collaborating with community members and incorporating their ideas, we are able to ensure that the treasure hunt reflects the collective voice of the community thus make members aware of their impact on the community.

However, it is important to acknowledge that the current design may have limitations in fully capturing the potential influence of stakeholders on the community. Enhancements in the design process can involve more inclusive decision-making, active dialogue, and collaborative initiatives that allow stakeholders to exert a more substantial influence on community affairs.

### **Integration and fulfillment of needs**

The coincidence of the treasure hunt with the original activity serves as a testament to the fulfillment of the organizers' wishes. As discussed earlier, the original stamp rally activity aimed to familiarize children with the neighborhood while providing opportunities for independent exploration. By incorporating the treasure hunt into this existing framework, the organizers effectively meet their objectives of creating engaging experiences for children.

For parents, the treasure hunt provides a purposeful experience tied to their role in parenting. Their goal is clearly manifested based on the fact that they expect the local area as a place for child-rearing and that they bring their children to participate in the shopping street activities. While responding to their expectations, the design also prepares them for children's activities and connections with the community. This integration of parenting goals with community activities strengthens the functionality of the community by promoting a supportive environment where parents feel empowered in their child-bred process.

Similarly, the treasure hunt fulfills the needs of shopkeepers within the community. As previously mentioned, the interviews revealed that merchants desired various connections with local residents. Through their engagement in the proposed game, children and their families become familiar with the local businesses, thereby increasing the potential for ongoing support and building lasting relationships.

### **Shared Emotional Connection**

Through early interviews and government's commitment to creating a child-friendly community, it becomes evident that the target users of this game align with the shared goal of cultivating a suitable environment for children's upbringing. The stakeholder interviews conducted with parents, shopping street event organizers, and shopkeepers all underscored their alignment in wanting to create an environment that nurtures children's growth. Parents expressed their desires for their children to explore and engage with the community, emphasizing the importance of interactive experiences and connections with local residents. Organizers and shop owners echoed these statements, highlighting their enthusiasm for providing meaningful activities and fostering positive interactions within the community. This convergence of emotions creates a shared emotional connection rooted in the collective goal of enhancing the well-being and development of children within the community.

#### **4.4.3 Limitations**

Apart from discussing the proposed value, we have also identified some issues during the user test. These issues were extracted from the actions and operations observed during the implementation of children's activities. Although they do not align completely with our proposed value and the main contributions intended by this study, they still caught our attention throughout the entire user test. We believe that each of these issues can be explored individually within relevant theoretical frameworks. In this paper, we will only address the identified problems and the insights they provide for our design.

#### **The directionality of the map**

One significant finding pertains to the orientation of the map. During the map design phase, the issue of accurate orientation was not adequately considered. We selected the most prominent symbol, the JR Kachigawa station and positioned it at the top of the map, which proved to be helpful. The children relied on the station directions to support their sense of direction. However, since the orientation of the map was opposite to the walking direction of the stores involved in this

time, the children became confused. Hence, it became evident that the benchmark question should not only focus on identifying landmarks but also encompass considering the directions involved throughout the entire walking process.

When discussing potential solutions, one relevant theory that could be applied is cognitive mapping theory. According to this theory, individuals create mental representations of the spatial environment they navigate, which aids in orientation and wayfinding. In the context of the map design, incorporating cues that align with the children's actual walking direction could enhance their cognitive mapping and spatial understanding.

### **Children's attention to text information**

During the user test, children's cognitive understanding of game rules primarily comes from oral instructions. After the oral introduction is concluded, they may believe that they do not need to continue reading the extensive game procedures. Despite incorporating visual aids in the form of images for annotation, they still find reading laborious.

Another portion of textual information comes from the instructions, which emphasize safety and avoiding causing trouble to others. Similarly, this information is not read attentively. It appears more like a disclaimer from the organizers rather than a genuine concern for children's safety.

The focus of children's attention and their reading abilities are closely related to this issue. Theories related to children's concentration is need for integration. In order to address this problem in the game design, it is essential to provide detailed oral instructions for the game rules, preferably including safety-related reminders.

### **Determination of designated stores**

Regarding the involvement of shops in the game, our observation shows the volatile business hours of the participating stores. While one of our aims was to provide advertising benefits to stores that may not have gained significant visibility during the event, it became evident that the unpredictable nature of their business hours posed challenges.



In terms of potential solutions, in the context of the game design, it would be beneficial to establish effective communication channels with the participating stores to ascertain their business hours and ensure their availability during the game. This could involve conducting door-to-door interviews or implementing a system where stores update their operating hours regularly. While initial investment, such as time and effort, may be required to establish these communication channels, it could potentially mitigate the issue of stores being closed during the game and enhance the overall advertising impact.

# Chapter 5

## Conclusion

### 5.1. Conclusion

This study introduces a proposed treasure hunt activity situated in the Kachigawa shopping street, with the primary aim of providing an engaging weekend activity for children that fosters their independent mobility. Additionally, a secondary objective of this research is to empower the various stakeholders within the community who have significant connections with the children, thereby cultivating a stronger sense of community.

Through early volunteer activities, we gained initial insights into the community. Despite facing common challenges of shopping streets such as store closures and a noticeable decline in vitality, the monthly event called Koboichi in the Kachigawa shopping street demonstrated resilience. Through empathetic observations, we recognized that in this child-centric city, the activities in the shopping street provided a place for children to engage but struggled to innovate within existing paradigms. New activities were eagerly anticipated by the children. Additionally, the potential for Koboichi to contribute to community cohesion was also uncovered. Thus, we defined this problem as the to create engaging activity for children while empower the sense of community.

Subsequently, the project members combined the contextual factors with ideation, resulting in two ideas deemed most suitable among numerous alternatives. One idea was a treasure hunt game, while the other was an online exhibition of children's art works. Further conversations with parents revealed a recurring desire for physical activities for their children. Considering the favorable geographical environment of the shopping street, the idea of a treasure hunt game was solidified. Furthermore, recognizing that most children in this age group were not yet engaged with smartphones, our focus was on creating a map-based treasure hunt

game rather than a digital one.

During the prototype phase, the first prototype helped us identify the essential elements that the map should include and their functionality. Feedback received highlighted the sense of adventure that the game could evoke. The second prototype was developed based on a local map. On one hand, the map allowed us to further refine the functionality of each element and align the visual presentation towards a design for children. On the other hand, it served as a tool to explain the game flow and confirm the desired roles and effects from various stakeholders, leading to discussions on further improvements.

In the final stage of value validation, we primarily observed children's behavior and conducted structured interviews. The structured interviews combined various questionnaires used in SDT research and were adapted to the cognitive level of children in this age group. In terms of autonomy, assessing children's initiative to participate in the activity was challenging since they were invited to take part in the testing. However, their autonomous decision-making process regarding the choice of paths and the order of visiting stores was evident. In terms of competence, their understanding of the game rules, analysis of textual and pictorial information, and familiarity with the geographical locations of local stores were fully demonstrated. One minor limitation we identified was that children around the age of 7 did not fully concentrate on reading, which could be considered a negative factor in demonstrating competence. In terms of relatedness, the connection with parents was initially showcased, while children who participated together exhibited strong bonding and dependency.

Regarding other stakeholders, we conducted semi-structured interviews to ascertain the perceived impact of the activity on their sense of community. The bi-directional influence between them and the community, the fulfillment of different needs, and the sense of belonging and involvement derived from participating in community activities were highlighted. However, one aspect that was not emphasized sufficiently was the individual contributions made by participants to the community during the activity.

## 5.2. Limitation

This study also presents several limitations that need to be acknowledged, which can guide future research and improvements.

Firstly, in terms of offering diverse activities to children, we conducted only one user test due to constraints such as weather and time. While this test provided valuable insights, it limited our ability to assess the effectiveness of the game in multiple contexts and interactions. Although the interview activities we conducted on rainy days also received valuable opinions from the interviewees, there is still a gap between the results and the actual user experiments. To ensure a comprehensive evaluation, it would be beneficial to conduct tests over a longer period, enabling participants to visit different stores each month and engage with a wider range of people.

Secondly, regarding the sustainability and extensibility of the game, there is further potential for exploration. Assessing the feasibility of integrating the game into regular events and expanding its reach to involve more stakeholders would enhance its potential value. Given that different shopping streets have their own unique operating conditions, and internal interactions also have different styles, it is very necessary to understand the different internal conditions before promoting them. Both the participation status of shops and the attitude of organizers during regular activities are important factors for the smooth development of activities. The universality that this research can bring lies more in map presentation and game flow.

Lastly, the local connection and contextual factors present challenges. Language barriers may hinder effective communication and understanding, potentially leading to misunderstandings. Additionally, the reliance on established connections for store visits may limit the exploration of a broader range of stores and community members. To address these limitations, it is crucial to establish stronger connections within the community, fostering open and inclusive participation.

## 5.3. Future Work

### Conducting Long-Term and Multi-Context Evaluation

To overcome the limitations of a single user test, future research should consider conducting tests over a longer period and in various contexts. Given the nature of this field, leveraging the assistance of Koboichi organizers can be one of the solutions. Building upon their understanding and willingness to adopt this design, effective communication between them and the stores, as well as continuous updates and iterations of the design, would facilitate further experimentation. This would enable a more comprehensive assessment of the game's effectiveness and its impact on children's engagement and interactions.

### Exploring Sustainability and Extensibility

Further exploration is needed to assess the sustainability and extensibility of the game. Future research could focus on integrating the game into more shops and expanding its reach to involve more stakeholders. Additionally, investigating the participation status of shops and the attitude of organizers during activities on regular basis would contribute to the smooth development and long-term success of the game. Also, understanding the unique operating conditions and interaction styles of different shopping streets is crucial for successful implementation.

### Overcoming Communication Barriers

To address the challenges posed by language barriers and reliance on established connections, future research should emphasize establishing connections within the community and more techniques on cross-cultural communication. The assistance of individuals familiar with the local environment and those with specialized knowledge of children's cognitive abilities in the relevant age group would be highly valuable. By enhancing communication channels and promotion approaches, the game can become more accessible and inclusive to all members of the community.

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# Appendices

## A. Consent form provided for children participant's parents

### 勝川商店街再発見 宝さがしワークショップ 研究参加承諾書

#### 概要

勝川駅前通商店街内における宝さがしゲームを通じて、地域での子育てを支援したい商店街各店舗と、子どもたちの自主的な地域探索を促すことを目的としています。

#### ワークショップ主催・協力

本ワークショップは慶應義塾大学大学院メディアデザイン研究科の閑プロジェクトが主催し、勝川駅前通商店街振興組合の協力を得ています。

#### ワークショップ参加対象者

春日井市在住の7～10歳で、保護者の許可を得ている人。宝さがしゲームそのものはお子さん単独での参加を想定していますが（ただし保護者の許可を得ている場合のみ。主催者も随時追跡します）保護者の方が同伴を希望される場合は、その意向を尊重します。また、対象年齢より幼い弟妹がいる場合は、兄弟姉妹に同伴する形で一緒に参加することも可能です（ただし保護者の許可を得ている場合のみ）。

#### ワークショップの中身（全体で30分）

内容	場所	所要時間
主催者が、宝さがしゲームの概要を説明します。	受付デスク	2分
参加者は、友人や家族と一緒に、地図上の情報を解読しながら指定された店舗を探し当てます。	商店街内	2分
A店とB店からシールを探し出し、台紙に貼り付けます。	A・B店	6分
シールを全て集めたら、受付まで戻ってきます。	商店街内	2分
完成した地図を受付で見せることで、サインボードにサインをしたり、絵を描いたりできる特典があります。	受付デスク	3分
参加者と保護者に宝さがし体験について、主催者がインタビューをします。	受付デスク	15分

Figure A.1 Consent Form

**ワークショップ参加に伴う権利について**

参加は完全に任意であり、理由を提示することなくいつでも離脱することができます。参加を取りやめる場合、データの削除を希望することができます。また、COVID-19 やその他の感染症の懸念が多い場合は、いつでも希望に応じて不参加を選択できます。参加中、疲れを感じたらいつでもその意思表示をして自由に休むことができます。

**ワークショップ記録の保管とプライバシーについて**

ワークショップ実施中にとった行動・インタビュー内容はすべて録画録音記録されます。収集したデータは、最長5年間の期間、関係プロジェクトが管理するクラウドストレージに保存されます。録画音声記録は、参加者の顔や名前が特定できないように匿名化されます。これらは、研究者が研究発表をする場合と、本ワークショップ開催協力先の広報・報告のための使用、ワークショップ開催を支えてくれた組織の広報・報告のための使用を想定しています。

(※慶應義塾大学プライバシーポリシーに関しては <https://www.keio.ac.jp/ja/privacy-policy/> よりご確認ください。)

**承諾項目**

下記項目について同意確認のチェック (✓) をお願いします。同意しない場合は、飛ばして構いません。

- ☐ 上記の研究概要を読み、理解しました。
- ☐ この研究の参加者であることに同意します。
- ☐ 自分の個人情報が上記の研究目的のために使用されることに同意します。
- ☐ 個人情報は5年間保管され、慶應義塾大学プライバシーポリシーに従って取り扱われることを理解しています。
- ☐ 自分の情報の機密性と匿名性が保持され、いかなる研究成果においても個人を特定できないようにして使用されることを理解しています。
- ☐ 本ワークショップにおいて、活動が録音・録画されることに同意します。

日付： 2023 年          月          日

保護者氏名：

参加者氏名：

Figure A.2 Consent Form2