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i. Traffic problem caused by lack of public transport system and narrow road.
ii. People can't drive a car have difficulty to go shopping
iii. Children must go other area for higher education.
iv. Narrow land restrict to build new buildings and houses

In this project, we defined "revitalization" as improving these problems. We selected traffic problem as most important. The land problem is given environment, and has huge challenge to improve it. Causal loop diagram shows that the shopping and education problem will be solved by traffic system. While the interview, people mentioned about the traffic problem most frequently. According to the questionnaire responded by Tsuneishi residents, 60% people think that the traffic problem is the most important.

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CVCA included interview results shows us that these sub-communities have no relations each other. WCA result is similar.

As a result of concept generation, we reached "On Demand Bus" system as initial idea. On Demand Bus System is the public transportation system with flexible bus operation is regarding user demand. QFD result shows time to destination and distance to bus stop are key quality metric in transportation system design. In this phase this system seems suitable solution. In the next phase, we used Pugh selection to compare traffic systems. Both of On Demand Bus System and Car Sharing System show similar advantage, so we combined each advantage and propose new system.

On Demand Bus System has challenge on sustainable profit. The system is introduced in the many community, but almost all of these cases require the subsidy from local government. Usually 70% of incomes are subsidies. The system is very useful for substitute of the local fixed route bus, but it is difficult to operate for private enterprises.

From the study result we made, we recommend Hitch Life Community System. The system has a concept "we are all friends in Tsuneishi". The system is the membership carpool system in Tsuneishi utilize strong human network. A fundamental use-case is described below. Drivers and users made member registration first. A driver responds to a user's hitchhike usually. User interface is local SNS and Kairanban: a notice around from house to house in the neighborhood. A user can check operation status of a car and make reservation. A driver pick up users could earn local currency as incentive. Moreover, the system uses the bus already operated inside the Tsuneishi HD factory as a On Demand Bus in the high demands time as morning. Income source of the system is user's registration fee, advertise revenue on the car and sales of cooperation stores.

We carried out field survey of the French Covoiturage system as the system's benchmark. Covoiturage is the carpool system using SNS started by a venture enterprise. The system is intended to transport from a local city to other local city in French. At first, users and drivers
write their schedule and search for travel partner. Users have to negotiate with a driver from several days before. A user pays a part of highway cost and gasoline cost for a driver. Now, Covoiturage is a governmental promotion enterprise and has 1,000,000 users. In the early phase of this system, Tsuneishi HD will recommend their employee, which occupies the half of the daytime population in Tsuneishi area becoming a driver to provide drivers need in early phase.
We assume that student who attends school not located in Tsuneishi area will be major user in early phase.
Biggest risk of thinking has uneasiness to the responsibility and safety in case of a traffic accident. It seems that both user and driver feel anxious from result of questionnaire. As a countermeasure, evaluation system of the driver similar to covoiturage could be introduced.

<table>
<thead>
<tr>
<th>Notes</th>
<th>Student final reports</th>
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<tr>
<td>Group M</td>
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Group M
Abstract of your project theme

【Background】
TSUNEISHI Group is located in Numakuma-cho, the coastal area of Fukuyama city, Hiroshima. Its main business is shipbuilding and has been developed with the support from local community for more than 100 years since 1903. But one of the main issues is how to survive in Japan and continue to support the local economy because Korea and China have been expanded their building shares in the new shipbuilding industries recently. 

【Opportunity to Change】
TSUNEISHI has a plan to renovate its main office building and some company condominiums among the owned 50 of them. Moreover, it also has a plan to organize a smart grid infrastructure among the main office, the factories and company condominiums to reduce its energy consumption comprehensively.

We expect that if we can organize a smart community not only by ourselves but also together with the town and its residents, we might be able to revitalize the local community by its synergy effect.

【Target & Expected theme for ALPS】
To revitalize the local community by a symbiotic smart community between the company and the local people
1. How to inspire the local people to join the project.
2. How to produce synergy effects and activate the social life in the local area.

<Key Point>
1. What is the advantage for the local town and its people to join the project?
Group M

Project Title:
The Voyage of TSUNEISHI for the Next 100 Years

Theme:
Revitalization of the Local Community

Proposer Organization: Tsuneishi Holdings Corporation

Proposer Organization’s Supporter: Shinji WATADANI, Kazuhiro KANEMASA, Haruko IMOTO & Hiroko IKEDA

Keio Mentor: Toshiyuki YASUI & Akira TOSE

Members:
Erika IKEDA
Kohei TANAKA
Atsushi ATARASHI
Shigeo SUZUKI
Takafumi HARADA
Yuka YAMAMOTO

Graduate School of System Design and Management
Keio University
Final Report
The Voyage of TSUNEISHI for the Next 100 Years

ALPS Team M

TSUNEISHI HD
Erika Ikeda, Kohei Tanaka, Atsushi Atarashi, Shigeo Suzuki,
Takafumi Harada, Yuka Yamamoto

Graduate School of System Design and Management,
Keio University, 4-1-1 Hiyoshi, Kouhoku, Yokohama Kanagawa,
223-8526, Japan
1. Executive Summary

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3. Problem Statement

Following requirements were given from Tsuneishi Holdings, our proposer company. This requirement reflects the their history which developed with the Tsuneishi area for 100 years.

<table>
<thead>
<tr>
<th>Kind of requirements</th>
<th>Content of requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirement of mission</td>
<td>Tsuneishi HD shall continues for 100 years with TSUNEISHI region and resident</td>
</tr>
<tr>
<td>Most important requirements</td>
<td>This system shall activate TSUNEISHI region</td>
</tr>
</tbody>
</table>

First, we made several visit to Tsuneishi area to gather residents' voice. Through the resident’s voice we gathered, we defined “Regional revitalization” in Tsuneishi area. We gathered many resident’s, employee’s, government’s and other stakeholder’s voice. As a result, we defined that we should solve the following five issues to revitalize the Tsuneishi area. Also we found their problems have structure as shown in below. Transportation issues are root problem in this area.

<table>
<thead>
<tr>
<th>Kind of requirements</th>
<th>Content of requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function of requirements</td>
<td>This system shall make transportation comfortable for elderly and children</td>
</tr>
<tr>
<td>Function of requirements</td>
<td>This system shall make education comfortable for Tuneishi residents</td>
</tr>
<tr>
<td>Function of requirements</td>
<td>This system shall make shopping comfortable for elderly and children</td>
</tr>
<tr>
<td>Function of requirements</td>
<td>This system shall make land use comfortable for Tsuneishi residents</td>
</tr>
<tr>
<td>Function of requirements</td>
<td>This system shall make communication comfortable for Tsueneishi residents</td>
</tr>
</tbody>
</table>
Fig. 3-1 Structure of Tsuneishi’s problems
4. Analysis and Discussion of ALPS Methods

1.1. Mind Map – When did you use this and how was it useful?

We use “Mind Map” to find out how we can solve the problem of Tsuneishi community. To revitalize the Tsuneishi community, we divided the way to solve for 4 parts, community, we di, Shopping, Education, Land usage o.

1.2. Project Priority Matrix - How did you choose what is constrained, optimized, accept?

<table>
<thead>
<tr>
<th>Feature</th>
<th>Constrain</th>
<th>Optimize</th>
<th>Accept</th>
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<tbody>
<tr>
<td>Cost</td>
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<td>Time</td>
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Our proposer company, Tsuneishi HD, is located in Hiroshima Prefecture. We have to go far to Tsuneishi. So, time is most constrained. We had a huge budget (¥100 million!!), so cost is Acceptable.
1.3. Scenario Graph - Explain how you brainstormed and selected your scenario(s).

Table 4-2 Scenario Graph

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<thead>
<tr>
<th>#/Col</th>
<th>1</th>
<th>2</th>
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</table>

We brainstormed and detailed the events [“Who, What, Where, When, How, Why”]. And we used excel to make the scenario in random order.

We selected the scenario as the following order.

- Does it have a reality? [in a cost and resource ]
- Is it interesting?
1.4. CVCA - While summarizing what you found by doing this tool, explain how you found those. Pay particular attention to any new stakeholder that you discovered.

We changed our “CVCA” for 3 times.

First, we had wrong stakeholders.

Second, we misunderstood the relations between Tsuneishi HD and Tsuneishi people. We thought that there were no relations. (But there were relations.

Finally we found out the right relations from the Interviews. Tsuneishi people hoped Tsuneishi HD to solve the problem to revitalize Tsuneishi community.

1.5. Interview Observation – Where did you visit? What have you learned? How did it help or change your project?

<<About traffic>>

- Difficulty in going to school
  - Too expensive
  - Poor transportation
    - Don’t come at short intervals
    - Finish early
- Need a car to go around
- Traffic jam
- Bad manner at driving
• Road isn’t good at driving: narrow road
• Dark road

<<About shopping>>
• Can’t do shopping with a light heart
  – Have to take a vehicle
• Main shopping center is located at center city
• Not easy at bringing the package for elder people
  – Elder people live in mountainous region
• Using COOP
  – Can’t decide the menu from day to day
• Using shopping help bus
  – Weak sustainability

<<About education>>
• Poor level at learning
  – Few school left
    • Students decrease
  – Top level school is only located at Fukuyama city center
• Few space at playing outdoors

<<About land>>
• Hang on their premises
  – Newcomer can’t live
• Few space left to park
• Poor sewage improvement
• Poor condition
• Good temperature to live

<<About communication>>
• Poor communication: generation gap
• Information about Tsuneishi
  – Want more information from Tsuneishi
• Young people don’t join in the event at Tsuneishi...
• We use “Shopping-Support Bus (Kaimono Shien Bus)” to communicate with the others.
  – Want more opportunity to communicate.
• Should use community center.
  – Want young people and Tsuneishi member to come...
• Want a opportunity to exchange of opinions with Tsuneishi member.

We went Tsuneishi for 6 times and interviewed 90 people who lived in Tsuneishi. We did it to figure out the NEEDs to revitalize the Tsuneishi communities.

First, we thought that the problems we have to solves are “Transportation, Shopping, Education, Land usage”, but after the Interviews, we found out the new problem, “Communications”.

1.6. Scenario Prototyping Rapidly – What did you try to test?

Fig. 4-3 Prototype

We used this Prototype [Fig. 4-3] when we had Interviews to stakeholders. We had a lot of opinions from them [1.5].
1.7. Value graph · What's surprising?

We could organize the value and found out that “On-Demand Bus & Shopping System” solves “Transportation, Shopping, and Land Usage” problems.

1.8. Function-Structure map · Explain the items that are connected more than others and whether that matches your expectations?

We could use “Function-Structure map” when we focused on “On-demand Bus and Shopping System”. We could organized the sub-systems to solve the *Tsuneishi* problems.
1.9. Design of Variety

Fig. 4-6. shows this system’s components. This system is made of some existing and variety components. We appropriate components from function for realizing operation scenario. So this system is very feasible and has low development cost.

![Diagram of system components]

1.10. Environmental Complexity/Recyclability

In this system, scope of application is local area that is TSUNEISHI region. So this system analysis is a little different from general CVCA, QFD, and CWA because we have to consider local individuality. Resident of TSUNEISHI area can be divided by generation. Many elderly people is feeling benevolently. But many young people is unconcerned. There is a wide divergence of opinion among each generation. By considering each generation, we got data correctly for CVCA, QFD and CWA.

1.11. Serviceability

We have main 5 modes are membership, activation of communication, transportation, shopping (incentive for user) and source of earnings in this system. Most important modes
are 2 modes are activation of communication and transportation. Their modes are solution of TSUNEISHI's problems. But their modes needs to be treated about matter of mode operation by other mode. Therefore we added other 3 modes because most important 2 mode are treated.

Table 4-3. Type of mode

<table>
<thead>
<tr>
<th>Mode</th>
<th>Function of mode</th>
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<tbody>
<tr>
<td>Mode1</td>
<td>Transportation</td>
<td>Solution</td>
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<tr>
<td>Mode2</td>
<td>Activation of communication</td>
<td>Solution</td>
</tr>
<tr>
<td>Mode3</td>
<td>Membership</td>
<td>Treat mode1,2</td>
</tr>
<tr>
<td>Mode4</td>
<td>Shopping (Incentive for users)</td>
<td>Treat mode1,2</td>
</tr>
<tr>
<td>Mode5</td>
<td>Source of earning (Incentive for operator)</td>
<td>Treat mode1,2</td>
</tr>
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</table>

1.12. Quality Scorecarding

We defined some parameter and transfer function as quality scorecarding.

**Biggest Y**: Population of Tsuneishi area

**Big Y**: Activation of Tsuneishi area: Convenience of Trasnportaion, Education, Shopping and Land usage.

**Important X**: Meaning of transportation, providing opportunity of communication, number of house, number of parking

**Noise Z**: Economic condition, Declining Birthrate and Aging Population, Disaster

**Transfer function**: Analysis of population

1.13. Design of experiment

Table 4-5 is Requirement and V&V Matrix shows relationship between requirement and V&V plan. Basically Verification plans are made of Observation. But we did not decide criteria for verification because this criterion depends on current condition. And Validation plans are made of Questionnaire.

1.14. Design Structure Matrix

Our system is social system using Technology. Although our system have Technical system, in this time mainly our proposal is Architecture of social system. Therefore we can not use this method for detail of our system. So we show Design Structure Matrix for general system design we can use.
Table 4-4. Design Structure Matrices

<table>
<thead>
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<th>Decision task for values and management criteria</th>
<th>Item 1</th>
<th>Item 2</th>
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Item list

<p>| Item 1 | VOX |
| Item 2 | Analyzing “As is” |
| Item 3 | Clarification of problems |
| Item 4 | Analyzing “To be” |
| Item 5 | Making operation senareo |
| Item 6 | Designing architecture |
| Item 7 | Designing subsystems |
| Item 8 | Planing V and V process |
| Item 9 | Integrate of subsystems |
| Item 10 | V and V |
| Item 11 | Planing of realization |</p>
<table>
<thead>
<tr>
<th>ID</th>
<th>Kind of requirements</th>
<th>Object</th>
<th>Content of requirements</th>
<th>Validation</th>
<th>Verification</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Requirement of mission</td>
<td>All</td>
<td>Taunoishi HD shall continues for 100 years with TSUNEISHI region and resident</td>
<td>Questionnaire</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Most important requirements</td>
<td>All</td>
<td>This system shall activate TSUNEISHI region</td>
<td>Questionnaire</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Function of requirements</td>
<td>resident</td>
<td>This system shall make transportation comfortable for elderly and children</td>
<td>Questionnaire</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Function of requirements</td>
<td>resident</td>
<td>This system shall make education comfortable for elderly and children</td>
<td>Questionnaire</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Function of requirements</td>
<td>resident</td>
<td>About traffic volume</td>
<td>–</td>
<td>Observation</td>
<td>TBD (Deciding criteria)</td>
</tr>
<tr>
<td>1</td>
<td>Function of requirements</td>
<td>resident</td>
<td>About level of education</td>
<td>–</td>
<td>Exam by NEXT</td>
<td>TBD (Deciding criteria)</td>
</tr>
<tr>
<td>1</td>
<td>Function of requirements</td>
<td>resident</td>
<td>About kind of school</td>
<td>–</td>
<td>–</td>
<td>TBD (Deciding criteria)</td>
</tr>
<tr>
<td>1</td>
<td>Function of requirements</td>
<td>resident</td>
<td>About number of school</td>
<td>–</td>
<td>–</td>
<td>TBD (Deciding criteria)</td>
</tr>
<tr>
<td>2</td>
<td>Function of requirements</td>
<td>resident</td>
<td>This system shall make shopping comfortable for elderly and children</td>
<td>Questionnaire</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Function of requirements</td>
<td>resident</td>
<td>About time to store</td>
<td>–</td>
<td>Observation</td>
<td>TBD (Deciding criteria)</td>
</tr>
<tr>
<td>3</td>
<td>Function of requirements</td>
<td>resident</td>
<td>This system shall make land use comfortable for elderly and children</td>
<td>Questionnaire</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Function of requirements</td>
<td>resident</td>
<td>About dimension of non-use land in TSUNEISHI region</td>
<td>–</td>
<td>Observation</td>
<td>TBD (Deciding criteria)</td>
</tr>
<tr>
<td>4</td>
<td>Function of requirements</td>
<td>resident</td>
<td>This system shall make communication comfortable for elderly and children</td>
<td>Questionnaire</td>
<td>–</td>
<td></td>
</tr>
</tbody>
</table>
1.15. QFD

This is QFD for our system. QFD result shows time to destination and distance to bus stop are key quality metric in transportation system design.

Table 4-6 QFD phase I

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Weight for customers</th>
<th>Industrial Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>be easily accessed</td>
<td>9</td>
<td>1 9 9</td>
</tr>
<tr>
<td>safe</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Reliable</td>
<td>3 3</td>
<td></td>
</tr>
<tr>
<td>not far from house</td>
<td>3 9 3</td>
<td></td>
</tr>
<tr>
<td>make a periodic</td>
<td>1</td>
<td>9 3</td>
</tr>
</tbody>
</table>

Score 36 18 108 93 93
Relative Score 0.1 0.1 0.4 0.4

Table 4-7 QFD phase II

<table>
<thead>
<tr>
<th>Industrial Metrics</th>
<th>Weight by I</th>
<th>Parts Features</th>
<th>Score</th>
<th>Relative Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Features</td>
<td>0.1</td>
<td>3 3 9 9</td>
<td>2.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Money</td>
<td>0.1</td>
<td>9 3 3 9 3</td>
<td>0.6</td>
<td>0.5</td>
</tr>
<tr>
<td>Distance</td>
<td>0.4</td>
<td>9</td>
<td>7.3</td>
<td>0.1</td>
</tr>
<tr>
<td>Time</td>
<td>0.4</td>
<td>3 9 0</td>
<td>1.9</td>
<td>0.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>Relative Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>0.1</td>
</tr>
<tr>
<td>0.1</td>
<td>0.1</td>
</tr>
</tbody>
</table>
5. Design Recommendation

After several visits to Tsuneishi Area, we have found out that there is a strong demand for convenient local transportation system. We have thus proposed “Tsuneishi Hichlife System,” which resolves transportation issues of Tsuneishi area. In addition, we have carefully designed the system to enhance communication among Tsuneishi people, because we learned that there are potentially strong ties in Tsuneishi community but that communication among sub-community is not active; e.g. among different generations, among people from different small areas and among Tsuneishi people and Tsuneishi holdings. We believe that revitalizing local community requires active participation of local residents and that activation of communication among them is essential. We believe this system would help Tsuneishi people to understand their local area and local community well and hope that they will revitalize Tsuneishi area on their own. Fig. 5-1 shows “AS IS” of Tsuneishi area and Fig. 5-2 shows “TO BE” of Tsuneishi Area.

“As is” situation from VOC

Fig. 5-3  Tsuneishi Area  “As Is”
Please note that we have designed the system to minimize the initial investment and to balance revenue and expenditure, because the current Tsuneishi population is not large enough to have effective investment. We have also included several sub-systems which make the whole system more attractive and help increase revenue. We believe this proposal will be effective for establishing “Smarty Cities” suited for Japanese rural areas.

1.1. Overview of Tsuneishi Hitch Life System

Fig. 5-3 and Fig. 5-4 show the overview of “Tsuneishi Hitch Life System.” As stated in the previous section, the system has been designed both to improve local transportation system and to enhance communication among Tsuneishi community. For the transportation part, we have proposed a system based on “Hitch Hiking.” This is intended to complement existing transportations sytem such as taxies and on-demand bus system which Tsuneishi holdings is planning to introduce. For the communication part, the system provides social events where the users of the system can familiarize each other. The system also provides SNS system for local residents and conventional communication channels including P2F, telephone, message boards, etc can be utilized. And system use case is attached to Appendix.
The following is a short description of Hitch-Hiking usage, which is the core concept of the system.

- User (needs registration, needs fee)
  A user can subscribe the system to get a user card. By presenting the card to a driver and...
if negotiation can be made, the user can ride the car. The user can earn usage points, which can be later changed into regional currency.

- **Driver (needs registration, no fee)**
  A driver subscribes the system and gets a driver card. When a user presents a card to the driver, the user and the driver negotiate the destination. If the negotiation is made, the driver takes the user to the destination.
  A driver can get re-imbursement for car insurance, to promote the usage of the system and to increase safety. The user can earn usage points, which can be later changed into regional currency.

- **Tsuneishi Hitch Life System Corporation (Tentative name)**
  A company to manage the entire system, including membership management, regional currency management, etc.

- **Affiliated Shops**
  Tsuneishi area shops participating in this system. When a user and a driver shops at one of the shops, they can get discounts. The shops accept regional currency.

- **Hitch Life Network**
  A social network among participants of the system managed by Tsuneishi Hitch Life System Corporation. The participants can know each other well. At social events, the participants can sell/buy local products.

### 1.2. Revenue Model

Qualitative analysis of the revenue model is shown in Fig. 5-5. It should be noted that the system fully utilizes currently available resources (Fig. 5-6) and that the initial investment can be made minimum.
Qualitative Revenue/Expenditure Analysis

<table>
<thead>
<tr>
<th>Income</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in sales of affiliated shops</td>
<td>Partial payment of drivers’ car insurance</td>
</tr>
<tr>
<td>Increase in the sales of insurance</td>
<td>Membership Management</td>
</tr>
<tr>
<td>Increase in the sales of gas</td>
<td>Regional Currency Management</td>
</tr>
<tr>
<td>Membership Fee</td>
<td>Reward for Artists who prepare advertisement</td>
</tr>
<tr>
<td>Advertisement</td>
<td>Management fee for sales in the car</td>
</tr>
<tr>
<td>Commission for sales in the car/social events</td>
<td>Social Event management</td>
</tr>
</tbody>
</table>

Fig. 5-7  Revenue model of Hitch Life System

Using of existing systems...

Fig. 5-8  Components available for Hich Life System
1.3. Description of subsystems

This section describes add-on sub systems which make the entire system more attractive and improve profitability.

1.3.1. Sales/Advertisement in the car

This subsystem is intended to promote business in the cars used for hiking. Local goods can be sold in the cars and this promotes local-production/local consumption in Tsuneishi area. Advertisement can be made inside the cars. The overview of the subsystem is shown in Fig. 5-7 and an example of advertisement in the car is shown in Fig. 5-8.

Overview of “Sale in the car” and “Advertisement in the car”

Aim of this subsystem

- Incentive for drivers
- Promoting local communication
- Preserving local culture (local production and local consumption)

Fig. 5-7 Overview of Sales/Advertisement in the car
1.3.2. “Art on the car” subsystem

This subsystem is intended to increase revenue by placing artistic advertisement on the cars. This could be more effective if the advertisement is created by younger artist. Such cars with advertisement can be an appealing to wide variety of people and can be an important sightseeing resources. We should also note that this subsystem would supports younger artists’ activity. In addition, if we sell a car with advertisement at a lower price, drivers might be willing to driver such “eye-catching” paintings. The overview of the system is shown in Fig. 5-9.
1.3.3. EV experiments
Tsuneishi holdings is making an intensive experiment on Electric Vehicles. Incorporating those vehicles in the Tsuneishi High Life system will be an effective experiment for the entire system. This could also be a good starting point to start exploring “Smart Tsuneishi” with renewable energy.
1.4. Cover range of Transportation system

Recommendation System is one of transportation system. The cover range is divided on User Density and Trip Distance\(^{[2]}\), show below fig.

Fig. 5·11 Cover range of Transportation system
6. Competitive Analysis

Our business model is “Public Transportation operated by residents themselves”. Income resources are advertisement revenue and registration fee. The initial cost is very low because we use existing resources such as SNS and the bus already operated inside the Tsuneishi HD factories. Required investments are new local event and issue of local currency. NPV for 5 years is 144,691yen. Our systems main goal is Tsuneishi area revitalization and required cost structure is balance of income and expense. Result of NPV analysis shows that our proposed system satisfied our criteria. Table: NPV analysis

<table>
<thead>
<tr>
<th>Cash Flow</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>year</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
</tr>
<tr>
<td>Ad revenue</td>
<td>240000</td>
</tr>
<tr>
<td>Registration Fee</td>
<td>48000</td>
</tr>
<tr>
<td>outcome</td>
<td></td>
</tr>
<tr>
<td>SNS (e.g., Facebook) Karanba</td>
<td>0</td>
</tr>
<tr>
<td>Local event</td>
<td>100000</td>
</tr>
<tr>
<td>Changing Local Currency</td>
<td>259200</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-59333.3333 -27777.8 11574.07 67515.43 152713.5 144691.9</td>
</tr>
</tbody>
</table>

Table 6-2 forecast assumption

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Registrant</td>
</tr>
<tr>
<td>1000 members (30% of the population) for 5 years</td>
</tr>
<tr>
<td>Ratio of car holders</td>
</tr>
<tr>
<td>80%</td>
</tr>
<tr>
<td>Use frequency</td>
</tr>
<tr>
<td>120 freq/year person</td>
</tr>
<tr>
<td>Amount of Local Currency</td>
</tr>
<tr>
<td>21600yen/year person</td>
</tr>
<tr>
<td>Ratio of Local currency used</td>
</tr>
<tr>
<td>25%</td>
</tr>
<tr>
<td>Ratio of cooperator Ads</td>
</tr>
<tr>
<td>5%</td>
</tr>
</tbody>
</table>
7. ALPS Roadmap and Reflections

Our roadmap is following: Fig. 7-1.

First, we got requirement analysis. Before VOC & VOX, we thought if we create communities with diversity, Tsuneishi community will revitalize. From VOC & VOX, we found out that there are 4 problems to revitalize the Tsuneishi communities. The
problems are lack of “Transportations, Shopping, Educations, and Land Usage”, not only about population decreases or less diversity. This is our “Aha” experience.

In the process of “2 Architecting & Design”, we felt Oops from fieldwork. There are lots of existing assets, so we tried to use these: the local communities, public hall and services. From this, we can reduce our initial costs. And the transportation problem is the biggest one: we designed our system focused on “Transportation”.

Finally, we found out! There is fifth problem, lack of “Communication”. This is our Eureka experience. So we re-designed the system focused on “Communications and Transportations”.

We re-designed our system for several times, so we re-acted process 6 to process 7 for several times.

![Hitch Life System](image)

**Fig. 7-2** the history of our system

**Table 7-1** difference of each systems

<table>
<thead>
<tr>
<th></th>
<th>traffic</th>
<th>shopping</th>
<th>education</th>
<th>space</th>
<th>communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-Demand Bus</td>
<td>🌟</td>
<td>🌟</td>
<td></td>
<td>🌟</td>
<td></td>
</tr>
<tr>
<td>Shopping-Whenever</td>
<td>🌟</td>
<td>🌟</td>
<td></td>
<td>🌟</td>
<td></td>
</tr>
<tr>
<td>Hitch Life</td>
<td>🌟</td>
<td>🌟</td>
<td></td>
<td>🌟</td>
<td>🌟</td>
</tr>
<tr>
<td>Hitch Life Community</td>
<td>🌟</td>
<td>🌟</td>
<td>🌟</td>
<td>🌟</td>
<td>🌟</td>
</tr>
</tbody>
</table>
We changed our system about transportations for 4 times.

First, we designed “On-Demand Bus” system. Using this system, we don’t have to use a car, so we thought the space of car parks can reduce. But from the voice of Tsuneishi people, shopping problems are needed to solve.

We improved our system to “Shopping Help System- Shopping Whenever”. We could solve the shopping problem from this, but this system didn’t have enough sustainability. It is unprofitable.

We improved to “Hitch Life” system. This system solves “Communication” problems. But we thought the communications will not be active so decided to change again.

Finally we arrived to “Hitch Life Community” system. We took “Pugh concept selection” and joined our systems.
8. Conclusion

We proposed the new system make Tsuneishi HD sustainable for 100 years with TSUNEISHI region and residents, covers following two points.

➢ Our proposal is Regional revitalization of the TSUNEISHI area.
  • We proposed “Hitch-Life Community” systems
  • We strategically architected subsystems such as EV experiment, Regional Currency, in car “News board” community

➢ Our proposal which are NOT “policy without software (ハコモノ)” and “technical unbalance (技術偏重)”
  • We recovery and sustain “relationship” (=social capital)
  • Our proposal is Global innovation not from the Tokyo but from TSUNEISHI.
  • Our proposal is towards the global level trendsetting center of art or EV technology.
  • In our proposal Transportation and Communication together support to solve issue.

9. Future Work

We carry out questionnaires survey to have a response from Tsuneishi people. 150 people answered. From this questionnaires, we understood Tsuneishi residents need to revitalize the Tsuneishi area and most important problem is transportation. So our system’s target is correct. But we also understood our system has some problems such as safety. In order to realize our system, strengthening an insurance system or strengthening the means for activation of communication are required.

Q. Do you think Tsuneishi have to revitalize the communities?
A. Over 80 % people thought they need to revitalize their community.
Q. What do you want? What facts is lack to revitalize *Tsuneishi* community?
A. Transportation is most needed. But from the Interview, we found out communication is most needed in deep layer. So we tried to build the system which focused on transportation and communication.

Q. Why don’t want to use?
A. The drivers are afraid of their safety. So we tried to develop the system which all people can feel safe.
Q. When do you want to use?

A. Almost people answered they want to use instead of public transportation service: when go to school, shopping or hospital. And they answered they want to use this system for 1 time per week.

Fig. 9-4

Fig. 9-4 is 100 year grand design for TSUNEISHI Area. In terms of 5 problem, we propose ideal situation for TSUNEISHI area. We hope our proposal become trigger of TSUNEISHI development.
Fig. 9-5. 100 year grand design for TSUNEISHI Area

Summary of proposal so far
Acknowledgment

Tsuneishi Holdings has been always supporting us during the project. We would like to thank President Kambara for proposing the project topic. In particular, we would like to thank Mr. Kanemasa, Ms. Imoto, Ms. Ikeda, Mr. Yamamoto and Mr. Watatani, who have been always with us at ALPS workshops and while we visited Tsuneishi. Thanks are also to Tsuneishi people, including Tsuneishi community center, who helped us understand Tsuneishi well and spent lots of time discussing issues in Tsuneishi. SDM people, particularly Assistant Professor Tohse and Professor Yasui, gave us insightful comments and support. We would like to express our deep gratitude for all who helped us.
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Appendix

This is our system's usecase.

System Use case 1
Member registration

Use scenario

**Passengers registration**
1. Passengers apply for this system and be evaluated.
2. Passengers apply for insurance for some trouble.
3. If accepted, passengers receive Members card and start to use this system.

**Driver registration**
1. Drivers apply to this system and be evaluated.
2. Drivers apply for insurance for some trouble.
3. If accepted, drivers receive Members card and start to use this system.

System Use case 2
Activation of communication

Use scenario

**Passengers**
1. Passengers offer to use transportation via PC or phone or circular and so on to THL.
2. THL look for appropriate transportation for passengers.
3. THL advance appropriate transportation and tell passengers meeting point.
4. Passengers use transportation advanced

**Drivers**
1. Drivers are offered to take on passengers by THL and THL tell drivers meeting point.
2. If drivers assented, drivers go to meeting point take on passengers.
(As is obviously, passengers can also use Hitch hike directly)
System Use case 3
Transportation

Use scenario
COM between SNS and Real
(For example other generation communication)
1. User write some message to other users on SNS(or other digital tool).
2. Call center translate to Analog com tool(phone, circular or notice board and so on)
3. User can communicate with Analog tool user
4. And If User want to directly meet to communicate with other user, User can use transportation of this system.
5. And THL also introduce appropriate person you want

System Use case 4
Use as a mean of shopping use case Incentive for User

Use scenario
Receive Community money
1. When driver took on passenger, deliver receive Community money from THL.
2. Community money is saved in user’s account.
3. Driver can use Community money at shop in Tsuneishi region.

Sales aboard a car
1. Shops in Tsuneishi region offer to sell something to THL.
2. THL offers to sell something to drivers.
3. Drivers sell something to passengers.
System Use case 5
Use as a source of earnings use case
Incentive for TSUNEISHI GP

Use scenario
Run the advertisement
1. THL is accepted an order about commercial from company wants to merchandise.
2. THL orders the advertisement to young artist and so on.
3. THL orders to run the advertisement to users(for running the advertisement in the car or outside car), Analog communication tools(circular and so on), Digital communication tools(start page of wifi internet and so on)
Group M’s Final Presentation Slides
The Voyage for the Next 100 Years
~To revitalize the Tsuneishi community~

~EN-gine to Sail for the Coming Chartless Century~
“EN-couragement, EN-gagement, EN-powerment”
Endeavor for Empathy endues the Community-Enhancement.

E. IKEDA, K. TANAKA, S. SUZUKI, T. HARADA, Y. YAMAMOTO, A. ATARASHI
Keio University / Graduate School of System Design and Management

Contents
- History of the our project
  - The requirements…
  - What we have done is…
  - What is the issues of Tsuneishi?
    - From the Interviews ~what do they want?~
    - From the questionnaires ~what do they want?~
  - The system to solve the problems
    - ...
- To solve the issues
  - The details of new system
    - Overview/CONOPS
- For next 100 year
  - Conclusion

What we have done is...
6 visits to Tsuneishi !!

June
- Our project started

July
- 1st VOC
  - Found out the 4 issues (transportation, shopping, education, land use) to solve.

August
- Show our prototype 1st: Restructured new system.
- 2nd VOC: Found out the fifth issues >> lack of communication.

September
- 3rd VOC
- Show our prototype 2nd: Re-designed new system.

October
- Questionnaire to Tsuneishi citizen and Tsuneishi member.
- Re-designed the new system.

November
- Had a presentation to the Tsuneishi HD and Tsuneishi citizen.
- Re-designed the new system.

The requirements
- How to produce synergy effects and activate the social life in the local area? (共力: Synergy)
- How to inspire the local people to join the project? (共生: Symbiosis)

How to produce synergy effects and activate the social life in the local area?
(共力: Synergy)

How to inspire the local people to join the project? (共生: Symbiosis)
From the interviews...

We figured out the NEEDs to revitalize the Tsuneishi communities.

- Target
  - Citizen and Tsuneishi member
- Time
  - From July, 2011 to October, 2011

<table>
<thead>
<tr>
<th>Interviewed stakeholders</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citizen (Adult) at Tsuneishi</td>
<td>30</td>
</tr>
<tr>
<td>Citizen (Child) at Tsuneishi</td>
<td>15</td>
</tr>
<tr>
<td>Tsuneishi HD Executives</td>
<td>30</td>
</tr>
<tr>
<td>Officer of the Fukuyama City Government</td>
<td>2</td>
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<td>Officer of the Kashiwazaki City Government</td>
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</tr>
<tr>
<td>Others</td>
<td>10</td>
</tr>
</tbody>
</table>

Voice of Customer... part1

- **<<transportation>>**
  - Difficulty in going to school
    - Too expensive
  - Poor transportation
  - Don’t come at short intervals
  - Finish early
  - Need a car to go around
  - Traffic jam
  - Bad manner at driving
  - Road isn’t good at driving: narrow road
  - Dark road

- **<<education>>**
  - Poor level at learning
    - Few school left
    - Students decrease
    - Top level school is only located at Fukuyama city center
    - Few space at playing outdoors

- **<<shopping>>**
  - Can’t do shopping with a light heart
    - Have to take a vehicle
  - Main shopping center is located at center city
  - Not easy at bringing the package for elder people
    - Elder people live in mountainous region
  - Using COOP
    - Can’t decide the menu from day to day
  - Using shopping help bus
    - Weak sustainability

- **<<land usage>>**
  - Hang on their premises
    - Newcomer can’t live
  - Few space left to park
  - Poor sewage improvement
  - Poor condition
  - Good temperature to live

Voice of Customer... part2

- **<<communication>>**
  - Poor communication: generation gap
  - Information about Tsuneishi
    - Want more information from Tsuneishi
  - Young people don’t join in the event at Tsuneishi...
  - We use “Shopping-Support Bus (Kaimono Shien Bus)” to communicate with the others.
    - Want more opportunity to communicate.
    - Should use community center.
      - Want young people and Tsuneishi member to come...
      - Want a opportunity to exchange of opinions with Tsuneishi member.

From the questionnaires...

![Graph showing survey results]

- **Do you think whether we need to revitalize the Tsuneishi communities?**
  - Don’t have to: 4% (Never 1%)
  - Need to: 29%
  - So so: 14%
  - Want to: 52%

Over 80% people think they have to revitalize their communities.

Total answer: 150 people
What we found from there is...

- From the interview…
  - Their needs!! traffic problems and communication
- From the questionnaires…
  - The traffic problems are 1st needs.

Transportation and Communication are core issue!!

The history of our system

Discuss the bus stop location with Tsuneishi people

We solved shopping issues

Not profitable…
The history of our system

Not sustainable…

Profitability improved!!

September version 1

The history of our system

Activate communication between *Tsuneishi* people

October version 1

The history of our system

Design the system to solve all 5 issues

October version 2

Designed the system which:
1. promotes communication with each others 
2. is sustainable

<table>
<thead>
<tr>
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<th>space</th>
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</tbody>
</table>
Validation of Proposed System

Results:
☆ Driver’s view
  - **Safety**: Don’t want to drive with stranger
  - Heavy workload... (Mental and task)
☆ Passenger’s view
  - Don’t need; we have own car
  - Too far to meeting place

Why don’t want to use? (Concern) (from Drivers)

![Graph showing reasons for not wanting to use](image)

**Found**: If it’s safe, users want to use system

**Issue**: How to ease driver’s workload

Feed back from *Tsuneishi*...

- Comments on *Hitch Life Community System*
  - Idea is good but...lack of details.
    * Sustainability...?
    * Who use this system...?and how many ?
      - Most of *Tsuneishi* people are senior (not enough drivers)
    * How to communicate with each others...?

So we re-designed our system...

- Comments on *Hitch Life Community System*
  - Idea is good but...lack of details.
    * Sustainability...?
  - Most of Tsuneishi people are senior (not enough drivers)
  - How to communicate with each others...?
In daily life, it is inconvenient for elderly and children in Tsuneishi region. Transportation issues adversely affect to other 4 issues.

Everyone is friends with “Hitch Life”
System overview

- Resident's transportation demand
- Existing communities

Tsuneishi Hitch Life network

- Community money sub system
- Shopping function in cars subsystem

Communication System
- SNS function
- Art festival function in cars
- Community party function

“Newsboard” in cars and ad subsystem

TSUNEISHI EV car subsystem

Tsuneishi Hitch Life community, inc. (operational company)

- New model of local community
  - regional economic effect
  - New communication
  - THD earning

Using of existing systems...

- Taxi Company
  - On-demand Bus function
  - This function uses ready made taxi company

- Tsuneishi Hitch life Community, inc (THL)
  - Commercial function
  - This function run advertisements to the car etc.
  - On-demand Bus function
  - This function uses ready made taxi company

- Hitch hike car function
  - This function extends and uses the information system of the existing company.
  - Operation function
  - This function presents a suitable means of transportation.

- Membership function
  - This function manages member information and insurance.

- "Newsboard" in cars and ad subsystem
  - Ready made communication tools
    - PC Mobile phone, Circular, News board and so on
  - Hitch hike car

So, Feasible and Low Development Cost

For example

Covoiturage

"Co(cooperation)+Voiture(car)+Voyage (trip)"

In this system, the user can find a hitchhike partner easily on the Internet.

Number of user
1 million domestic user

User 3 major purposes
cheap, ecology, chance to meet

Yamamoto-san

Covoiturage

Hitch hike car function

Real Network event

PC Mobile phone, Circular, News board and so on

Analog Communication function

Digital Communication function

Social network function

This function uses the existing SNS.

Member control and insurance function

This function manages member information and insurance.

Commercial function

This function runs advertisements to the car etc.
Main 4 use scenarios

1. Transportation
2. Member registration
3. Activation of communication
4. Incentives

1. Member registration
“Safe, Secure, and Reliable”
- Membership system build reliability.
- Copes trouble by insurance.

2. Transportation
“Low cost and convenient”
- User friendly interface: Multiple choice of communication device.
- Meet their demand: Combination of Taxi, On-demand, and Hitch-hiking
- Cost reduction for Tsuneishi group by reducing Tsuneishi in-company traffic.

3. Activation of communication
“Everyone is friends”
- Activating Communication builds strong ties
  - Activating communications with other generation
  - Networking events
4. Incentive
“This system has many incentives”

- Free of charge for hitchhike
- The driver can get regional currency
- Regional currency activate local economy

• Other option to enhance sustainability
  – Advertisement (ad)
  – Sightseeing

Summary

- Regional revitalization of the Tsuneishi area
  – Proposed “Hitch-Life Community” system
    - Strategically architected subsystems:
      – EV experiment
      – Regional Currency
      – In-car “News board” community
    - Proposal which are NOT “policy without software” and “technical unbalance”
    – Recovery and sustain "relationship" (= social capital)
    – Global innovation not from the Tokyo but from Tsuneishi.
      - Towards the global level trendsetting center of an art or EV technology
      - Transportation and Communication together support to solve issues.

Acknowledgements

We gracefully acknowledge the valuable co-operations and supports by the Tsuneishi HD, the proposer of this project, and all related residents of the Tsuneishi

Thank you for your listening!
Appendix 1
Detail of Use case

From the questionnaires...

Do you think whether we need to revitalize the Tsuneishi communities

- Don't have to: 4%
- Never: 1%
- Need to: 85%
- Over 80% people think they have to revitalize their communities.

The students need to spend lots of time for commuting → lots of family move to central Fukuyama...

And elder people have difficulties in shopping – bus stops are far → Elder people go out less often...

Tsuneishi Hitch life Community. Inc

System Use case 1
Member registration

- Hitch life community/ Operational function
- Member control function

Passenger

- Amusement Parks, ATM machines, Department Stores...

Driver

- Need to spend lots of time for commuting
- Over 80% people think they have to revitalize their communities.

Total answer: 150 people
System Use case 2
Activation of communication

System Use case 3
Transportation

System Use case 4
Use as a mean of shopping use case
Incentive for User

System Use case 5
Use as a source of earnings use case
Incentive for TSUNEISHI GP