Title	Red rescue project : Red rescue project
Sub Title	
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Publication year	2010
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Abstract	The American Global Positioning System (GPS) is widely used today. However, this satellite does not indicate accurate locations for the Japanese. Last September, Japan's launched its first location-based satellite, which is called the Quasi-Zenith Satellite (QZS). Since QZS makes rounds above the Japanese islands, it provides a location service even to those who are in an urban canyon or deep in a mountainous region. On the other hand, IMES technology can provide an indoor location-based service. If these location-based services are combined, the resulting system can save people's lives or make them more secure. ALPS Group3 designed the new Safety Security system, which directs victims of a natural disaster to a safe place by using QZS, GPS and IMES. NTT DATA CORPORATION started to develop this Disaster Countermeasure System using QZS. This project is called "Red Rescue" (Real-time Disaster Response using Small - Capacity Data from the Universe). ALPS Group3 also developed this system by using the ALPS tool method. One of the biggest advantages of this system is that users get the disaster information in real time. The Real-Time idea came from system robustness through the location-based information. We interviewed the people in charge of disaster control in the local government. As a result, Group3 understood that local governments obtain the latest information from their own connections, but they do not know how to share the information with all stakeholders like victims, police, and rescue teams, so there is no unified system in an emergency. A user who needs the latest information has to find his or her own connection to carry out a mission. From its research, Group3 understood that a new system needs the information integration tool, which corrects the hazard map and delivers the latest disaster news to one place, so that all stakeholders can utilize the disaster information anywhere and anytime. We called the solution an Integration Platform., and we confirmed that its development can best be accomplished by using Engineering Matrix, QFD I and II, and Cost/Worth Analysis. The Integration Platform defines the common specifications needed to manage the information, so that a user can use or see the information without having any special knowledge. From this system, a user can get real-time disaster information with a combination of current locations. The system also provides a structure for decision making. This is Red Rescue's strength. This report contains an analysis of the project's present state and information about the design of the integration platform and the development of a prototype and system design validation. As our ALPS project, Group3 propose the present state report and interview result. Group3 designed the integration platform's required functions. The system business plan was initially so high in cost that no investment returns would be realized until the third year after starting system. Since QZS can send short messages to many devices, the system can provide emergency escape information to a specific user. There is a possibility that the system can be broadened in the future. This document explains the solutions provided by the Red Rescue system. Each ALPS method follows our idea's availability and possibility. And we tried to develop one of the parts in system.
Notes	Student final reports Group 3
Genre	Research Paper
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=KO40002003-00002010-0099

Group 3

Group 3's Theme Proposed by NTT DATA CORPORATION

Theme 4:

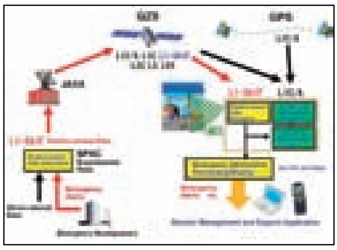
ALPS "safety and security" theme title: Red Rescue Project

Proposer Organization's Name: NTT DATA CORPORATION
Supporter Name and contact info: Tetsuya KUSUDA <mailto:kusudat@nttdata.co.jp>

Abstract of your project theme :
Red Rescue Project aims to develop a solution for real-time disaster response by sending alert messages to GPS devises such as PCs, PDAs, mobile phones and car navigation systems and showing flexible action menus depending on situations using small-capacity data from satellites and the receiver's location information. Our target media is QZS (Quasi-Zenith Satellite), the first Japanese positioning satellite, which will be launched in summer of 2010. We have started prototyping experiments on IMES (Indoor Messaging System) environment at Kyoseikan, Keio University. Red Rescue Project is a 3-year research project funded by MEXT since 2009. This project consists of NTT DATA(the main contractor), Asia Air Survey, PASCO, Keio University and SPAC Committee members. The project name derives from "Real-time Disaster Response using Small-Capacity data from the UniversE."

Challenges: (but not limited to)

- **User interface design**
  Safe and secure message design is needed for effective communications at disasters using location-based disaster management system.
  - Inducing effective actions at disasters using location information
  - Switching the normal mode and the emergency mode
  - Simple and easy messages and usages for elderly, children, etc.
- **Business model design**
  Disaster management is a highly-public field with many stakeholders. Sustainable business model is required.
  - New profitable location-based services at disasters
  - Revenue from other location-based services available at the normal period
  - PPP schemes
  - dual use of the communication media to reduce the cost



QZSS Experiment Environment

Source :
SPAC (Satellite Positioning Research and Application Center)
http://www.eiseisokui.or.jp/ja/pdf/forum_06/forum_06-09.pdf

Prototyping systems on IMES Environment

Left : Action menus are displayed, for the experimental use.
Right: 3D contents in Kyoseikan are available.

ALPS Final Report 2010

Group 3

PROJECT TITLE:
"RED RESCUE PROJECT"

Theme:
"Red Rescue Project"

Proposer Organization: NTT DATA CORPORATION

Proposer Organization's Supporter: Tetsuya Kusuda

Keio Mentor: Naohiko Kohtake

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1. EXECUTIVE SUMMARY

The American Global Positioning System (GPS) is widely used today. However, this satellite does not indicate accurate locations for the Japanese. Last September, Japan's launched its first location-based satellite, which is called the Quasi-Zenith Satellite (QZS). Since QZS makes rounds above the Japanese islands, it provides a location service even to those who are in an urban canyon or deep in a mountainous region. On the other hand, IMES technology can provide an indoor location-based service. If these location-based services are combined, the resulting system can save people's lives or make them more secure. ALPS Group3 designed the new Safety & Security system, which directs victims of a natural disaster to a safe place by using QZS, GPS and IMES.

NTT DATA CORPORATION started to develop this Disaster Countermeasure System using QZS. This project is called "Red Rescue" (Real - time Disaster Response using Small - Capacity Data from the Universe). ALPS Group3 also developed this system by using the ALPS tool method.

One of the biggest advantages of this system is that users get the disaster information in real time. The Real-Time idea came from system robustness through the location-based information. We interviewed the people in charge of disaster control in the local government. As a result, Group3 understood that local governments obtain the latest information from their own connections, but they do not know how to share the information with all stakeholders like victims, police, and rescue teams, so there is no unified system in an emergency. A user who needs the latest information has to find his or her own connection to carry out a mission. From its research, Group3 understood that a new system needs the information integration tool, which corrects the hazard map and delivers the latest disaster news to one place, so that all stakeholders can utilize the disaster information anywhere and anytime. We called the solution an Integration Platform., and we confirmed that its development can best be accomplished by using Engineering Matrix, QFD I and II, and Cost/Worth Analysis. The Integration Platform defines the common specifications needed to manage the information, so that a user can use or see the information without having any special knowledge.

From this system, a user can get real-time disaster information with a combination of current locations. The system also provides a structure for decision making. This is Red Rescue's strength.

This report contains an analysis of the project's present state and information about the design of the integration platform and the development of a prototype and system design validation. As our ALPS project, Group3 propose the present state report and interview result. Group3 designed the integration platform's required functions. The system business plan was initially so high in cost that no investment returns would be realized until the third year after starting system. Since QZS can send short messages to many devices, the system can provide emergency escape information to a specific user. There is a possibility that the system can be broadened in the future.

This document explains the solutions provided by the Red Rescue system. Each ALPS method follows our idea's availability and possibility. And we tried to develop one of the parts in system.

2. TABLE OF CONTENTS

This is list table of contents.

3. PROBLEM STATEMENT

It becomes difficult to get correct information when a disaster causes a break in the infrastructure, and the information transmitting system causes confusion. However, a system is needed to get accurate information in real time in order to ensure the safety of victims. Information identifying dangerous places and safe places is indispensable to those trying to evacuate victims to the safe place. Therefore, a system that describes the situation in the stricken area correctly and distributes it clearly must be designed.

The following issues were clarified after interviewing stakeholders:

- It is necessary to fill in information blanks in the time just after disaster and when one is gathering/transferring more complete information.
- It is important to coordinate with an existing disaster support system.

The biggest issue is that an information support system exists, but it does not do enough. Requirements following a disaster cannot be satisfied because there is little or unsatisfactory cooperation among various systems. Figure 1 shows the system segmentation between existing function and our target area.

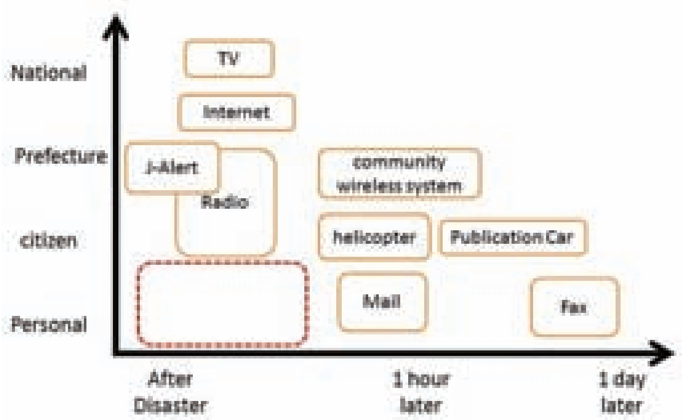


Figure 1: System Segmentation

Red Rescue tried to design the functions, which work after disaster happened for personal use. As a system development target, it is different from other systems because it provides:

- The ability to provide and distribute information through an integrated and unified system, which is currently not happening because there is no cooperation among systems.
- It allows users to obtain and offer precise information regardless of whether it deals with indoor or outdoor situations.
- It allows one to offer information in real time by filling a time lag until information can be provided by an administrative office.

4. ANALYSIS AND DISCUSSION OF ALPS METHODS

4.1 Scenario Graph

From the Scenario Graph (Figure 2), we analyzed the passage of time to recovery, starting with the time the disaster happened, and found that stakeholders may change, depending on the time axis. Then we defined a time range of a scenario. We assumed that the immediate support necessary after a disaster has occurred is to direct victims to evacuation routes and shelters or to show them the best route to the location of relief and to direct the actions of rescue teams.

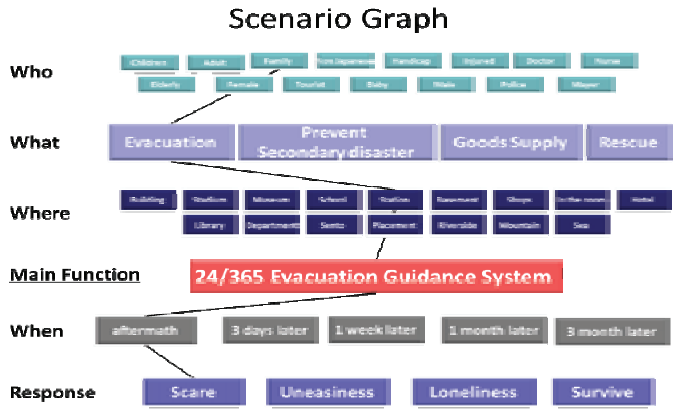


Figure 2: Scenario Graph

4.2 CVCA

We found that providing disaster information to victims and government is interactive, and support services, depending on the contents of the service, are provided by both corporations and government. In addition, we found that it is necessary to consider payment flow for the cost of disaster relief. Furthermore, we noticed that it is necessary to organize the information provided, so we created a platform for integrating information. We also investigated who should be operating the platform.

Alternatively, we focused on differenced in situations. I noticed that there are differences in information, services, and money flows in a normal situation and in a disaster situation. We were confused when we considered them all at once. As a result, we focused on the disaster case to create a well-organized summary (Figure 3). The CVCA was revised many times until the project ended.

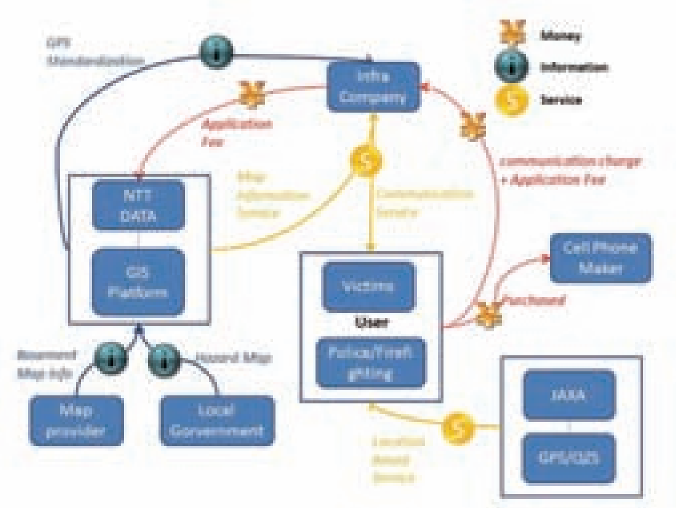


Figure 3: CVCA

4.3 Interview

We interviewed the following administrations (Figure 4) by email or phone. We observed that each administration has much disaster-prevention equipment and operational rules. Examples are: satellite mobile devices, instant national alert system (J-ALERT), administrative radio system, and disaster prevention information system. Interviewee also mentioned that it takes a long time to share the latest information, not only between police/firefighters and a city administration but also inside of the administration.

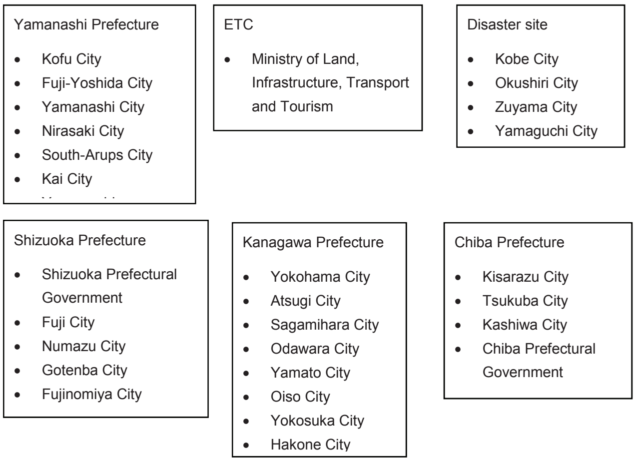


Figure 4: Interview

4.4 Prototyping Rapidly

The first idea for prototyping was to develop a balloon that could send information to victims and guide them to the refugee area. The first prototyping rapidly is shown in Figure 5.

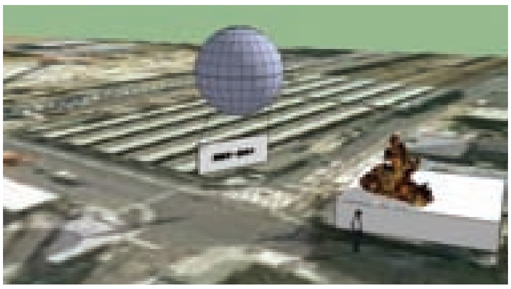
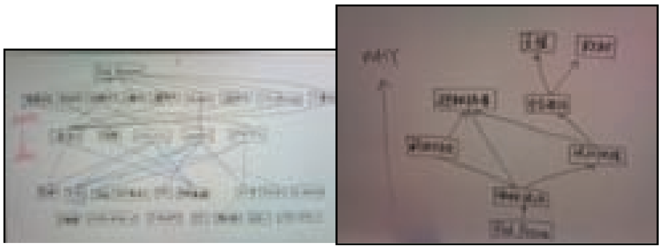


Figure 5: Prototyping Rapidly

We got the negative feedback about this idea from outside satellite professor. Therefore, many ideas based on developing a balloon for disaster contingency planning for the decade were considered to be failures. We understood that we needed to develop new ideas from information gained in our interviews.

4.5 Value Graph

From the fail of Prototyping Rapidly, we created a value graph (Figure 6-(a)), and customer requirements (Figure 6-(b)) became clear, based on the interviews with local government officials.



(a) Value Graph (b) Customer Requirements

Figure 6

The Value Graph is a tool that allows users to understand information and aids their evacuation activities. Next, we listed the functions that would satisfy each customer's requirements and grouped them. Finally, we proposed Engineering Metrics (Figure 7) for each item.

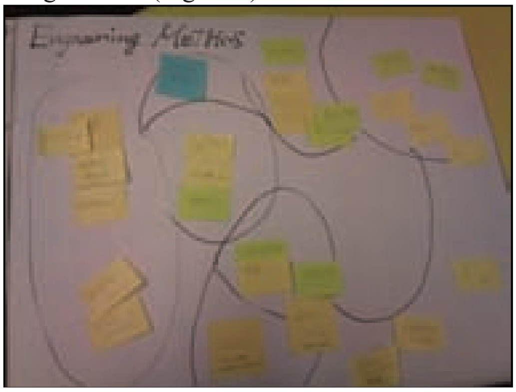


Figure 7: Engineering Metrics

As a result, we found that functions to satisfy individual customers' requirements are already present, and we realized that a key point for our project is to react to the customers' requirements by combining the existing functions

4.6 QFD I

After grouping customer requests, we defined those that were repeated by several municipal offices and made them a high priority. We decided the QFD phase1's customer weight based on these results. The most important customer requirements were the following two items. "Get real-time information" and "organize the information collected earlier."

We did the QFD phase1 based on these customer requirements and engineering metrics that we defined. As a result, we realized that the "reflection speed of centralized management of information" is the most important item in this project. The result follows in annex.

4.7 QFD II

We did the QFD phase 2 (Shown in annex) based on functions that we defined from a value-graph analysis. We realized that "construction of information platform" and "using GPS/QZS satellite system" are the most important functions in this project.

4.8 Cost Worth Analysis

Cost worth Analysis is shown in Figure 8. We understood that the cost of new product development (Part 1) and infrastructure costs (Part 2) were substantial. On the other hand, we found that using existing satellite capabilities and using QZS with additional functions would have about the same cost. In addition, existing items (Part 7) have no cost.

Part #	Solution Element	Cost	Relative Worth * *From QFD Phase II	Relative Cost	Cost / Worth
1	Gathering information remote control system	¥100,000,000	6%	21%	3.28
2	Installation of street video cameras	¥80,000,000	6%	17%	2.62
3	Construction of one centralized information platform	¥50,000,000	24%	10%	0.44
4	Using existing satellite system.	¥100,000,000	18%	21%	1.17
5	Using GPS/QZS satellite system	¥100,000,000	23%	21%	0.89
6	Using existing facility (Radio, CATV, FM, etc.)	¥50,000,000	12%	10%	0.90
7	Using the existing GPS receiver	¥1,000	11%	0%	0.00
	Total Cost	¥480,001,000	100%	100%	

Figure 8: Cost worth Analysis

From the results of Cost-Worth Diagram (Figure 9), we clarified the following two points: the cost of using the existing GPS receivers to get location information is reasonable and the cost of constructing one centralized information platform can upgrade capabilities and functions.

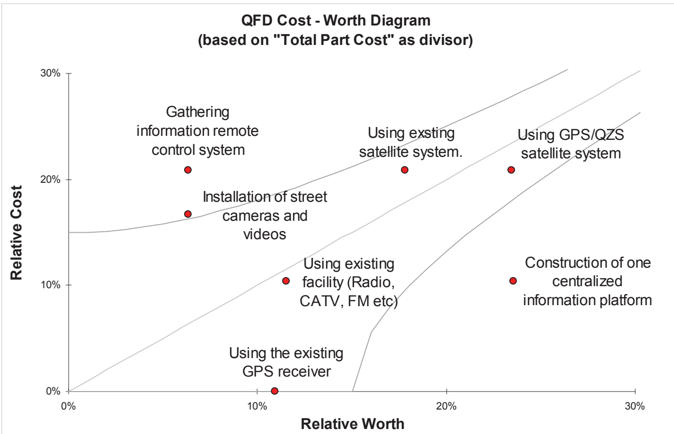


Figure 9: QFD Cost-Worth Diagram

4.9 FMEA

We considered the robust of our application receiver with FMEA analysis. First, we analyzed the USE CASE based on the prototype which we have proposed. Then we considered the Failure modes for each action steps. From the results, we understood the following: the Red Rescue application needs a strong receiver because it provides a service, and users must be able to connect to this service at any time.

4.10 Designs for Variety

Red Rescue, a newly developed system, is a platform for integrating a variety of information. We considered standardizing the platform interfaces. The system may be able to provide the necessary information to the user in real time, depending on each user's environment or situation, by linking location information with information provided by companies and the government. Information terminal products and related technologies can work if they meet the interface requirements. In addition, the system can respond flexibly to update the map information and new related technologies.

4.11 Quality Scorecarding

Quality Scorecarding is the tool, which validates our ideas or other tool's result. It was easy to define the tool because we had analyzed each element using several tools and organized them.

TO BY USING → Biggest Y

Robust → Control

FMEA → Noise, etc.

In defining the transfer function, we noticed that we need a breakdown for each element and must quantify them in order to evaluate them. We were able to define the evaluation criteria at the time of system operation.

4.12 DSM

Group3 found the interactive relationships among each of the tools that we used. We noticed that one analysis output could influence the output of the different tools. Following this feedback cycle, the concept of our project became clearer. The following are assignments and our responses:

- Group3 chose the task-based DSM, which is best for this project because our aim is to create a model of the social system.
- The key point for our project was from review of the stakeholder to review of the user requirement.

4.13 OPM

OPM defines system boundary. System includes integration platform and device application.

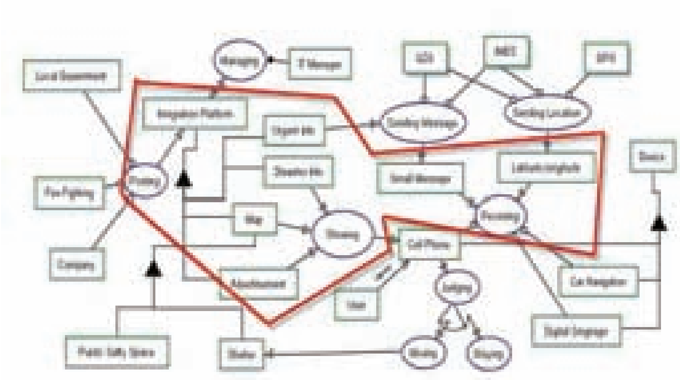


Figure 10: OPM

5. DESIGN RECOMMENDATION

Group3 recommends that Red Rescue needs two major functions:

1. To provide one central integration platform to store various location-based information used in both disaster cases and normal cases
2. To provide an application for equipment (smart phone, car navigation, and so on) to show the results of an integration platform

Use Case of the Red Rescue is shown in Figure 11.

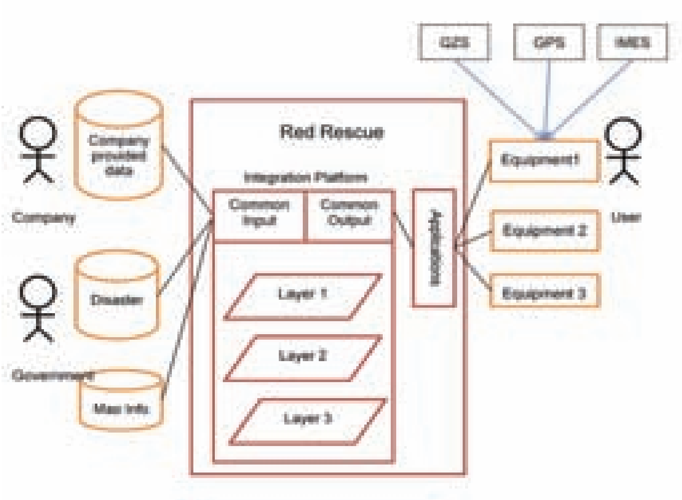


Figure 11: Use Case

Integration platform means that the system gathers basic map, current location, danger zone or other location information using a one-stop node. To use the defined input/output format, all users can access the same timely and accurate information. The system also can load the latest information to a one-stop database.

Red Rescue provides an application that shows the basic map or location-based information, which came from an integration platform. A user can see the latest disaster information on a device, such as a smart phone or a car navigation system, and receive suggested escape routes to a safety zone. All information will be mashed up into one central system and optimized. Then the system sends the customized information to users.

To conclude, the Red Rescue is an integrated platform that is capable of integrating location information by using GPS／QZS／IMES; optimizing the information packets according to users' requirement, and sending information to users real-timely.

6. COMPETITIVE ANALYSIS

This section describes how a system can be financed from development to operation.

The value of the system is to offer important information to the user (a victim, rescue party) at the time of a disaster. The revenue generates the installation fee of the application. We estimate that development will cost 100,000,000 yen for research and development expenses, 300,000,000 yen for plant and equipment investment, and 20,000,000 yen to hire personnel. We calculated that the project's value is 2,174,670,000 yen for the first five years by adding the numbers in the premise mentioned above and calculating the NPV at the juridical per person tax rate of 40%.

Red Rescue NPV is shown in Figure 12.

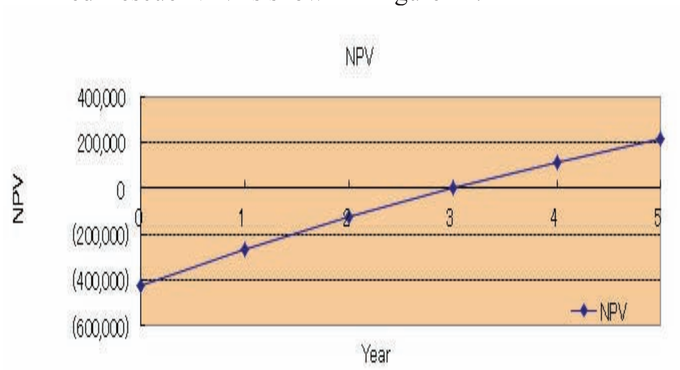


Figure 12: NPV

To complete this project in the next five years, the large-scale map information must be updated for the new position reporting service.

KDDI uses GPS based on pre-set map information and gives the disaster report free, but this system operates in real time at the point where information is updated, and this can be an element of differentiation that will help us compete with other companies.

7. ALPS ROADMAP AND REFLECTIONS

Roadmap of ALPS project is shown in Figure 13.

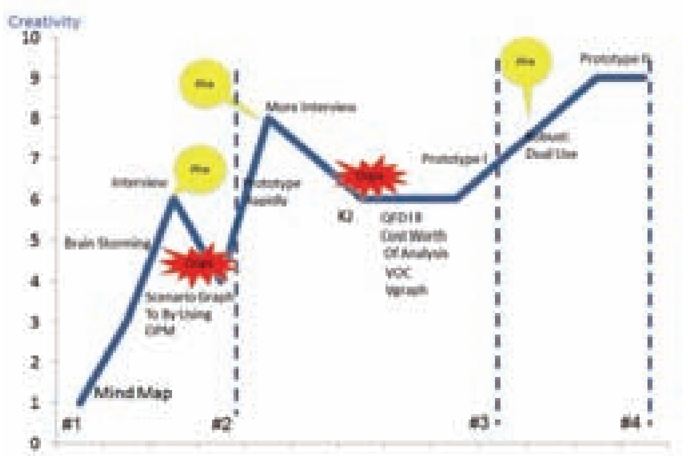


Figure 13: Roadmap

A couple of "Aha" moments occurred during interviews. Our solution came from asking stakeholders to analyze the problem, current situation, and idea.

8. CONCLUSION AND FUTURE WORK

8.1 Current problems

Because the Red Rescue system emphasizes integrating versatile real-time information into a single platform, the following difficulties should be considered in order to accomplish the project and make the system available.

If a disaster occurs, we assume that immediately afterwards, there will be a temporary vacuum of disaster information before the system is updated. There are two possible solutions to the problem:

A) Speed up the efficiency of the rescue and information gathering team on the spot.

B) Improve the operational efficiency of the Red Rescue.

However, the first solution would require negotiations and asking for assistance from the government and many other organizations; therefore, we will not discuss it here and will focus more on the second one. In order to achieve the target of elevating the operational and transmission efficiency, the following future work is being considered.

8.2 Future Work

There are several recommendations for future work on the Red Rescue project can be considered. They are divided into four categories:

A. Location Based Service (LBS) and network related
B. Implementation related
C. Peer-to-peer communication for mobile nodes
D. Increase database efficiency

A. Location Based Service (LBS) and network related

1. Data transfer: Implementation of a faster data-transfer method is required. To deal with real-time data, the performance of the network speed is important.
2. Implementation of Bluetooth as wireless access technology can be either supplementary or as a substitute for the wireless LAN access technology.

B. Implementation related

1. Extension of the database: The functionality of the available location-based services largely depends on the amount of information in the database. We have to care the extension of the database.
2. Better error handling: Not all possible errors are currently properly handled by the applications. Two improvements are possible, for example, provide feedback for the user with respect to the occurred error;

C. Peer-to-peer communication for mobile nodes

Peer-to-peer communication between mobile nodes can be considered to be a desirable extension of the Red Rescue project, but the peer-to- peer architecture is currently not possible due to hardware restrictions. However, if we implemented Bluetooth as a wireless technology, these restrictions would probably be solved.

With the wireless LAN technology, it is also possible to implement peer-to-peer communication for mobile nodes. For example, within the client-server architecture, a mobile node can query the database server for a certain device. Depending on the information returned concerning this device, the mobile node may decide to communicate directly (peer-to-peer) with this device.

D. Increase database efficiency

The efficiency of the database influences the amount of time needed to generate response and notification messages. We should also consider increasing the overall efficiency of the database application, especially with respect to the storage of and searching through the information in customized lists.

8.3 Schedule

The schedule for the Red Rescue Project is as follows:

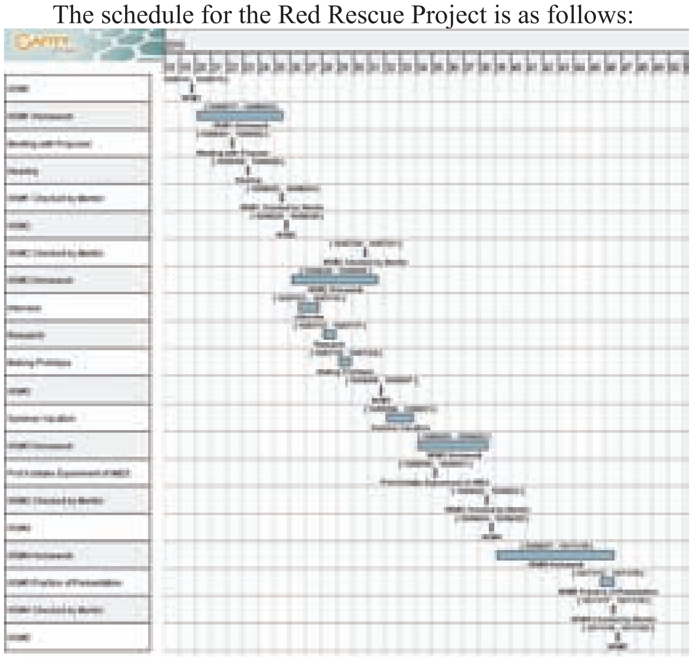


Figure 14: Roadmap

9. ACKNOWLEDGMENTS

ALPS Group3 would like to thank Mr. Tetsuya Kusuda, Mr. Munetaka Kimura from NTT DATA CORPORATION for project valuable feedback and review of status and giving the reference. In addition, Group3 would like thank Prof. Naohiko Kohtake to review the presentation and give the reliable mentorship. Three coaches really saved us.

ANNEX A

QFD I

Customer Requirements	Customer Weight	Engineering Metrics: **Feasible range of patrol**	Instalation range of devices which collect data automatically	Speed which reflect information into a hazard map	Speed of centralized management of information which someone gathered	Speed which reflect information into a disaster counter manual	the accuracy of positioning measurement system by GPS	Possible range which transmit information	Impact resistance	Available time during a power outage
To gather information in real time.	9	9	9	0	0	0	1	0	9	9
To arrange collected information promptly	9	1	1	9	9	9	3	0	0	0
To get an accurate location information of collected information.	3	3	3	1	0	0	9	0	0	0
To transmit accurate information to victims ASAP	3	1	1	3	9	3	0	1	9	9
To send necessary information to a necessary person.	3	0	0	3	9	3	0	9	9	9
To report soon to the top	1	0	0	3	9	3	0	0	0	0
To decide the priority level of correspondence.	1	0	0	3	9	9	0	0	0	0
To send evacuation conduct information.	1	0	0	9	9	9	0	0	0	0
	Relative Weight	11%	11%	12%	17%	12%	7%	3%	14%	14%

QFD II

Engineering Metrics	Phase I Relative Weights	Solution Elements or Enabling Functions: An excellent vehicle to the bad road driving performance	Remote control device which collect information	Satellite system. except GPS	Installation of street cameras and videos	Construction of one centralized information platform	Using Quasi-Zenith Satellite (short message and positioning function)	Effective use of disaster applications of mobile phone	Disaster radio / FM broadcasting / CATV etc.	Disaster information transmission service which using the existing GPS receiver
Feasible range of patrol	11%	9	9	3	0	0	0	0	0	0
Instalation range of devices which collect data automatically	11%	0	0	0	9	0	0	0	0	0
Speed which reflect information into a hazard map	12%	0	0	0	0	9	0	0	0	0
Speed of centralized management of information which someone gathered	17%	0	0	0	0	9	0	0	0	0
Speed which reflect information into a disaster counter manual	12%	0	0	0	0	9	0	0	0	0
the accuracy of positioning measurement system by GPS	7%	0	0	0	0	0	9	0	0	0
Possible range which transmit information	3%	0	0	0	0	0	0	0	9	9
Impact resistance	14%	0	0	9	0	0	0	0	3	0
Available time during a power outage	14%	9	9	9	1	0	0	9	1	9
	Relative Weight	14%	14%	17%	7%	23%	4%	8%	5%	9%

NPV CALCULATION

Initial Cost	Development Fee	¥300,000,000
	Operational Fee	¥100,000,000
	Infrastructure Fee	¥200,000,000

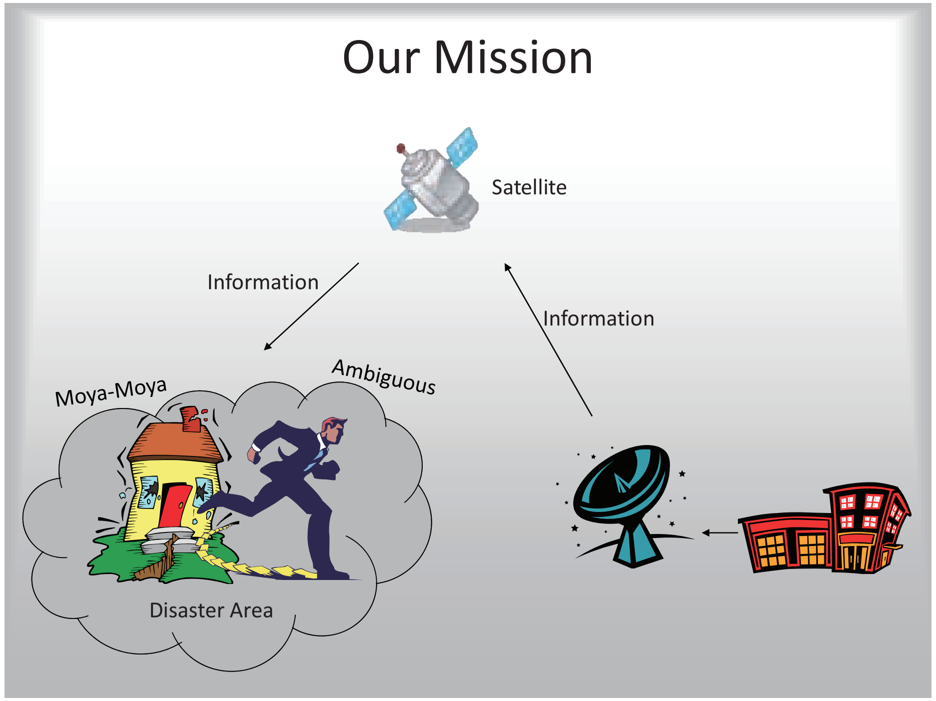
Return Calculations

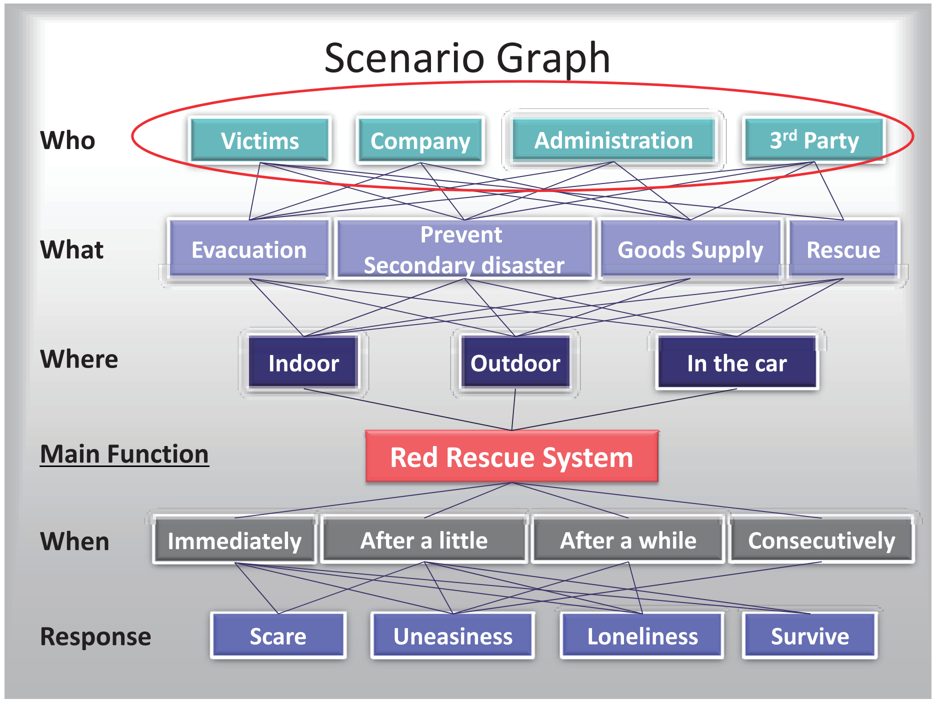
We expect that NTT Docomo users will buy the Red Rescue Application. The new model has to automatically include the application. Current users don't need the application, but some users will buy the application.

	Detail	Value	Other
1	Number of NTT Docomo Users	100,000,000	
2	Rate of users who change cell phones	10%	
3	Rate of current users who buy the application	1%	
4	Profit from application sales	¥50	
5	New and changing model	¥250,000,000	1 X 2 X 4
6	Buy Application	¥25,000,000	1 X (2+year) X 4
7	Maintenance Fee (annual)	¥10,000,000	
8	Return Value (1st Year)	¥265,000,000	
9	Investment Value (Total)	¥420,000,000	
10	Internal Fee in Investment Value	¥100,000,000	
11	Usage Years	5 years	
12	Corporate income tax	40%	
13	Allowance	20%	

Group 3’s Final Presentation Slides


Red
Rescue
Group 3
Real-time Disaster Response using Small-Capacity data from the Universe
Final Presentation
Proposed by
NTT Data


Our Mission
Satellite
Information
Information
Moya-Moya
Ambiguous
Disaster Area


Scenario Graph
Who
Victims
Company
Administration
3rd Party
What
Evacuation
Prevent Secondary disaster
Goods Supply
Rescue
Where
Indoor
Outdoor
In the car
Main Function
Red Rescue System
When
Immediately
After a little
After a while
Consecutively
Response
Scare
Uneasiness
Loneliness
Survive


Interview List
32 stakeholders

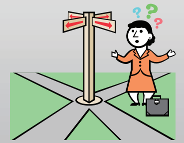
What's happening ?

Be too time-consuming, causing expansion of the disaster!!

Can not transmit accurate information to victims ASAP !!

Can not arrange collected information quickly !!

Can not gather information in real time !!



Can not send necessary information to a necessary person !!

Can not get an accurate location information of collected information !!

Why time-consuming?

- What we understood from the result of interviews:
  - Different kinds of information are confused
  - too many types of terminal devices
    - Analog and Digital complex
  - Information is too complicated
  - Time lag of information

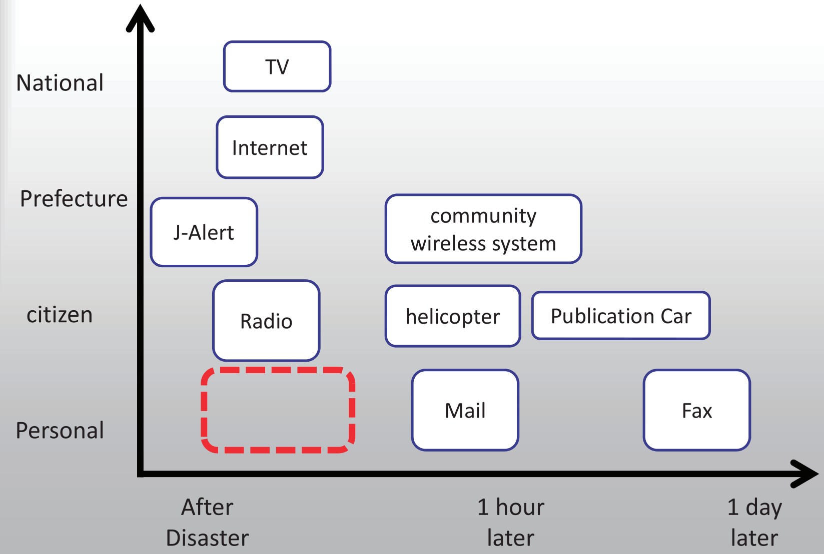
Red Rescue System

TO	Guide users to destination properly
BY	Acquire real-time location information Provide required information on one single integrated platform
Using	Function of GPS／QZS／IMES and information-integrated platform

"Red Rescue System" is…

"Real-time disaster protection system by using location information (QZS/GPS/IMES)"

Compare with other services

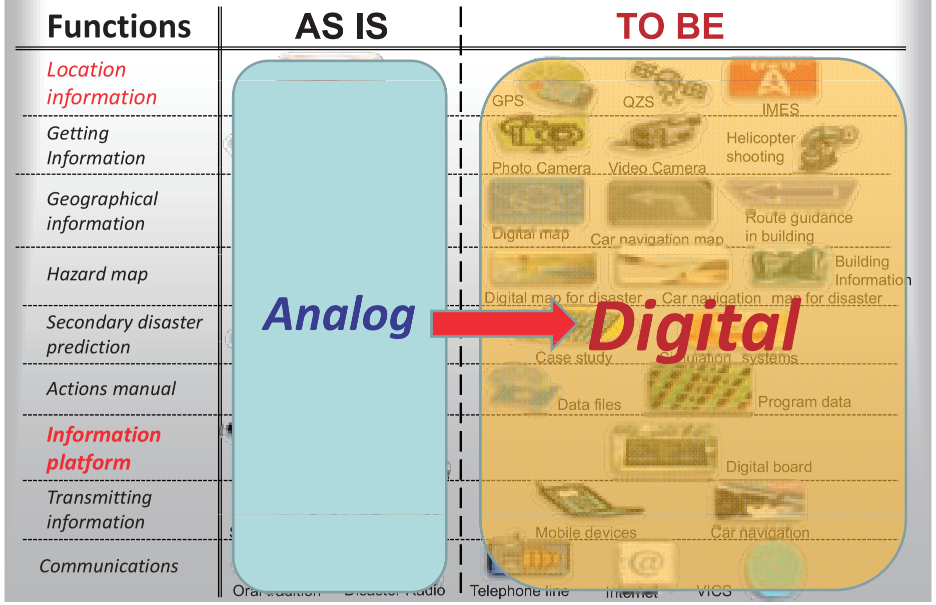


Requirement Scope

Requirement	Customer Weights			
To support reconstruction	Low	Moderate	Moderate	High
To receive the goods supplied	Low	Moderate	High	Moderate
To help rescue	Moderate	High	Low	Low
To determine safety	Moderate	High	Low	Low
To identify risk areas	High	Moderate	Low	Low
To instruct evacuation	High	Moderate	Low	Low
To understand the current status	High	Moderate	Low	Low
Time series	*Immediately*	*After a little*	*After little*	*After much*

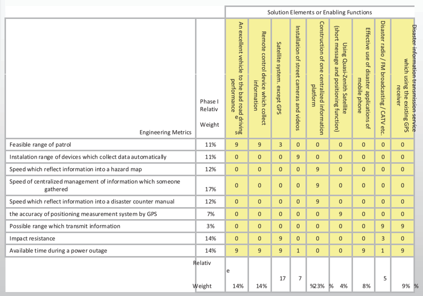
Needs

AS IS – TO BE

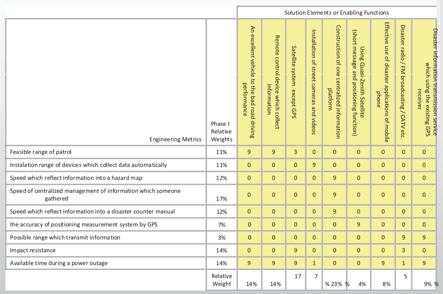


System Scope

QFD I

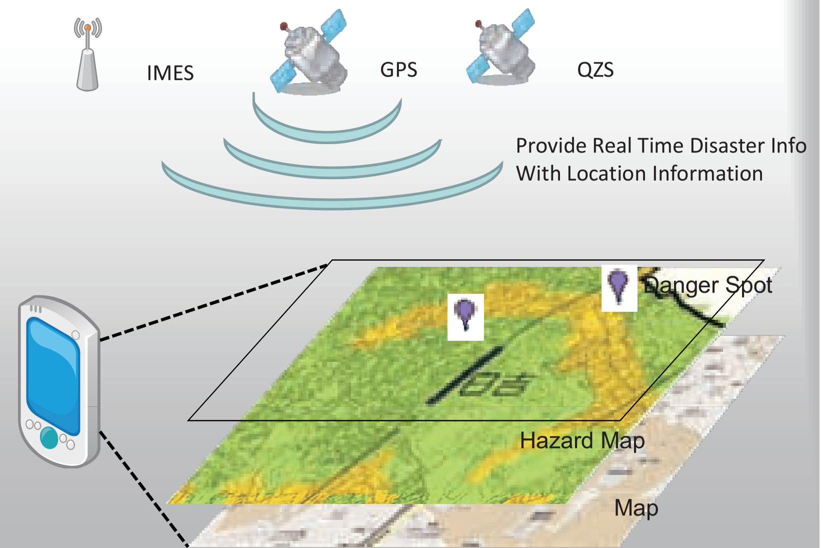


QFD II

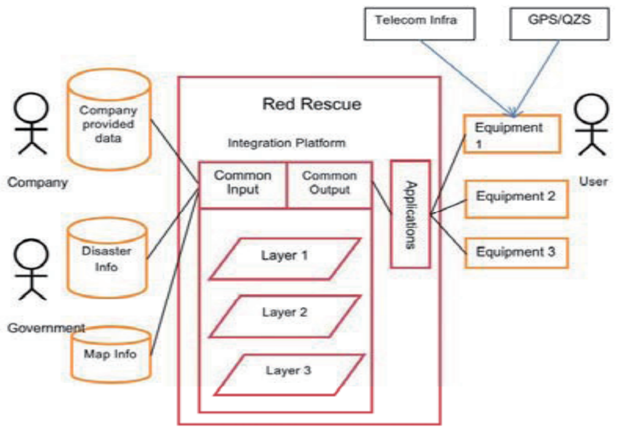


One centralized information platform needs

What is Red Rescue?



Use Case



Immediately after earthquake…

Guidance to evacuation area starts immediately

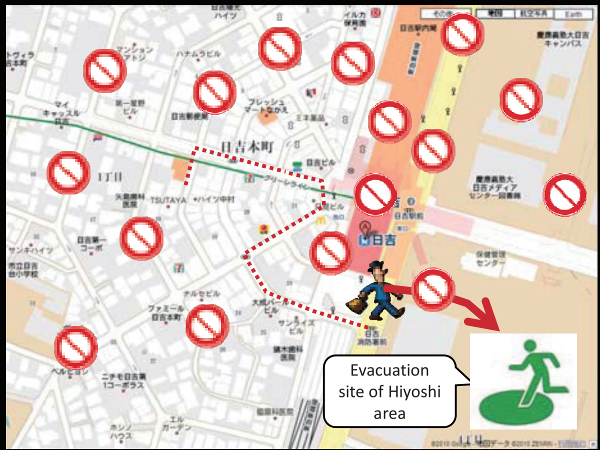
5 minutes after …

Surrounding information is updated real-timely

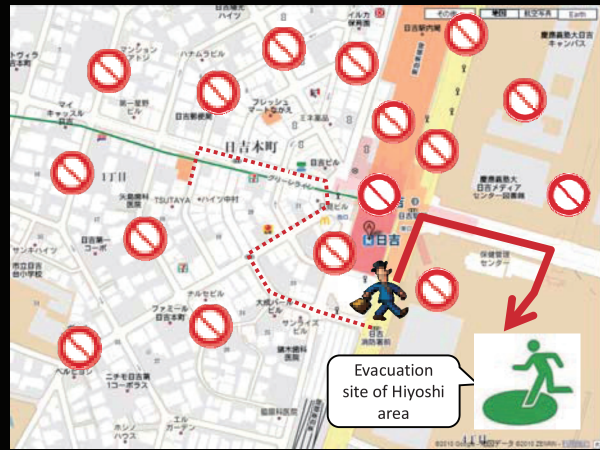
5 minutes after …

Corresponds with the real-time information and update the evacuation route.

10 minutes after …



10 minutes after …

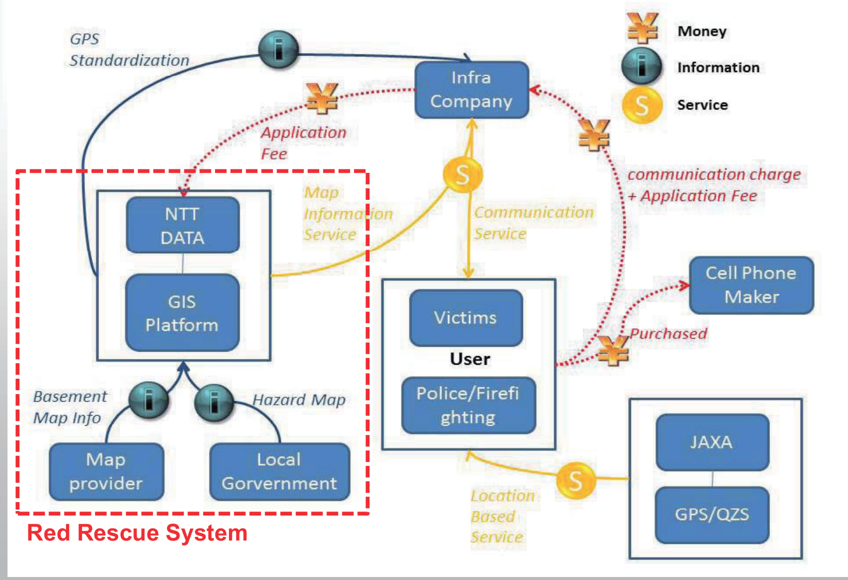


15 minutes after …

Quick and safe evacuation is achieved!!

Tried to develop Prototype

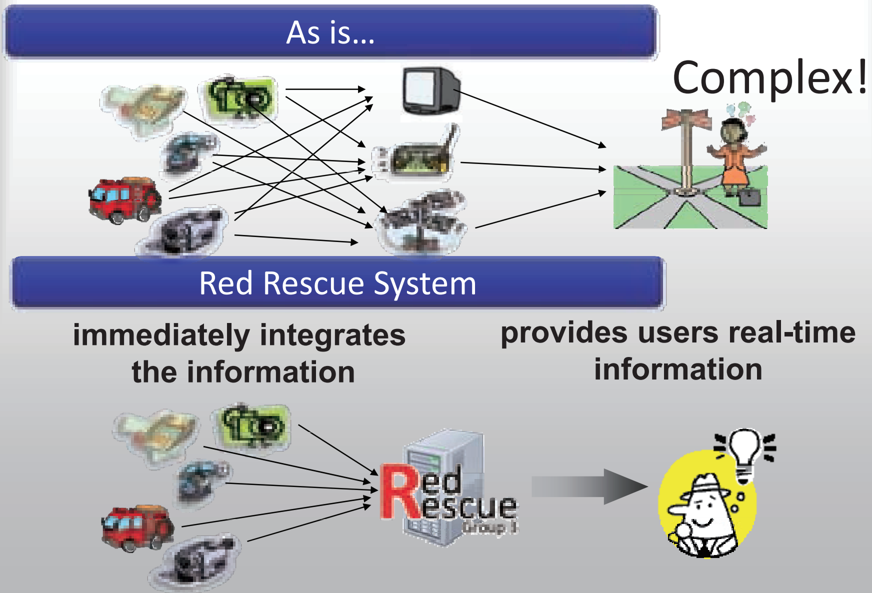
CVCA



System Usefulness

- The accuracy of location information
- Upgrading the real-time information
- Robustness
  – Updating basic map or hazard map
  – Diversifying terminal units and applications.

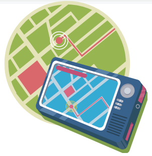
Our Solution is…



Unresolved Issues

- **Have to think about sustainability !!!**
  Even when no disaster occurred,
  the system can make the running costs.
- ***Seamless indoor and outdoor positioning***
- ***Evolution of the location Information***
  – Accuracy / Height / Range / etc.
- ***Evolution of the means utilized***
  – New Products
- **Socialize of the location Information**
  – Personalized information /
  Customized information in context

(idea) Dual Use



One single integrated platform including :

- Application for disaster evacuation and guidance system
- Application for commercial and life support

Future Development Example

Future outlook of Location-Based-Business

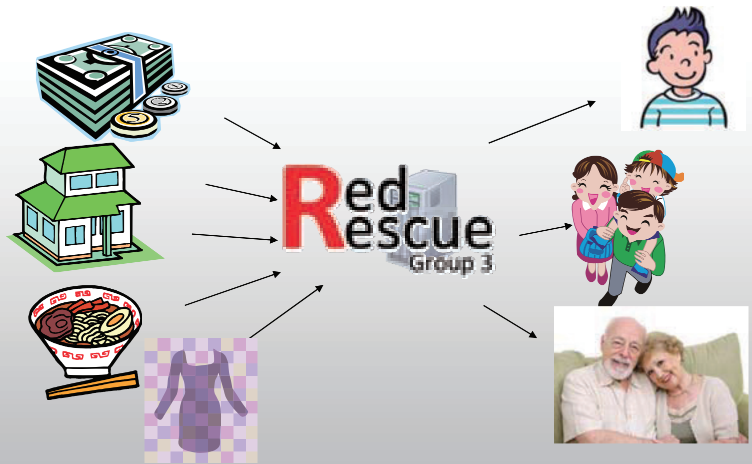
Geo Media
(Twitter / SNS /AR : Augmented Reality / etc.)

Map Info Service
Town Info Service

Sports (Marathon / Cycling / Triathlon / etc.)

Games (Geography-based game)

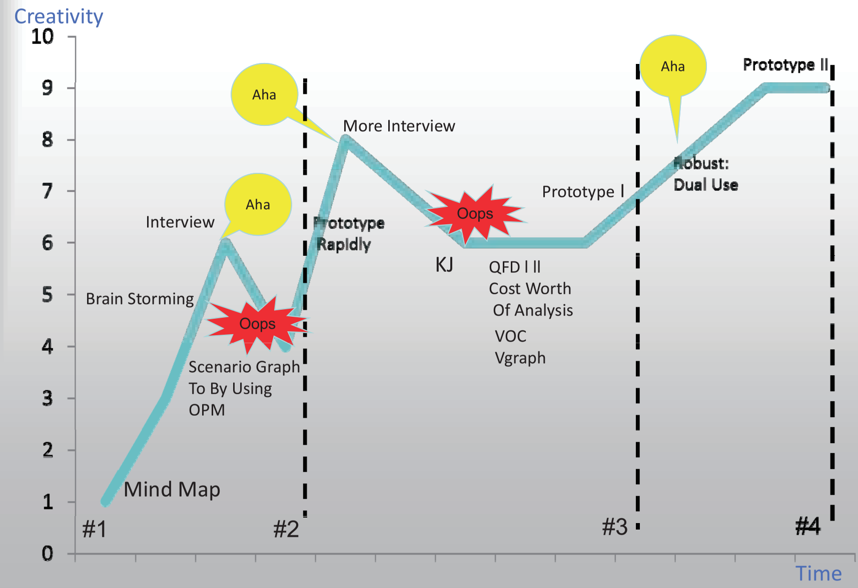
Our Recommendation is…



Optimize the information acquired ➡ **Send customized information to individual**

Q & A

Road map



QFD I

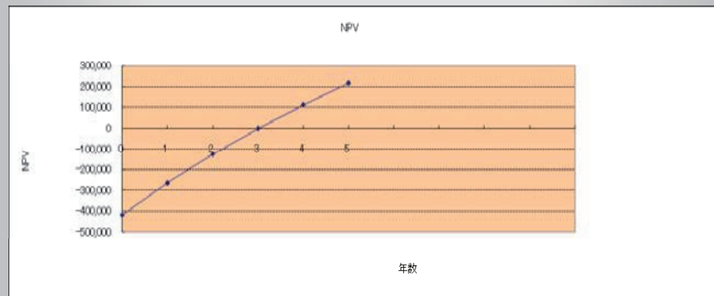
Customer Requirements	Customer Weights	Feasible range of patrol	Instalation range of devices which collect data automatically	Speed which reflect information into a hazard map	Speed of centralized management of information which someone gathered	Speed which reflect information into a disaster counter manual	the accuracy of positioning measurement system by GPS	Possible range which transmit information	Impact resistance	Available time during a power outage
		Engineering Metrics								
To gather information in real time.	9	9	9	0	0	0	1	0	9	9
To arrange collected information promptly	9	1	1	9	9	9	3	0	0	0
To get an accurate location information of collected information.	3	3	3	1	0	0	9	0	0	0
To transmit accurate information to victims ASAP	3	1	1	3	9	3	0	1	9	9
To send necessary information to a necessary person.	3	0	0	3	9	3	0	9	9	9
To report soon to the top	1	0	0	3	9	3	0	0	0	0
To decide the priority level of correspondence.	1	0	0	3	9	9	0	0	0	0
To send evacuation conduct information.	1	0	0	9	9	9	0	0	0	0
	Relative Weight	11%	11%	12%	17%	12%	7%	3%	14%	14 %

QFD II

Engineering Metrics	Phase I Relative Weights	An excellent vehicle to the bad road driving performance	Remote control device which collect information	Satellite system. except GPS	Installation of street cameras and videos	Construction of one centralized information platform	Using Quasi-Zenith Satellite (short message and positioning function)	Effective use of disaster applications of mobile phone	Disaster radio / FM broadcasting / CATV etc.	Disaster information transmission service which using the existing GPS receiver
		Solution Elements or Enabling Functions								
Feasible range of patrol	11%	9	9	3	0	0	0	0	0	0
Instalation range of devices which collect data automatically	11%	0	0	0	9	0	0	0	0	0
Speed which reflect information into a hazard map	12%	0	0	0	0	9	0	0	0	0
Speed of centralized management of information which someone gathered	17%	0	0	0	0	9	0	0	0	0
Speed which reflect information into a disaster counter manual	12%	0	0	0	0	9	0	0	0	0
the accuracy of positioning measurement system by GPS	7%	0	0	0	0	0	9	0	0	0
Possible range which transmit information	3%	0	0	0	0	0	0	0	9	9
Impact resistance	14%	0	0	9	0	0	0	0	3	0
Available time during a power outage	14%	9	9	9	1	0	0	9	1	9
	Relative Weight	14%	14%	17	7 %	%23%	4%	8%	5	% 9%

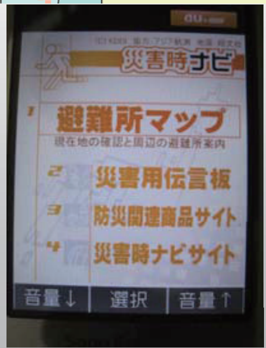
Red Rescueのビジネスモデルとしての妥当性

法人税率40%、割引率20%でNPVを算出したところ、
この5年プロジェクトは21億7467万円の価値と算出された。



現在、KDDIがプリセットされた地図情報をもとにGPSを用いて
緊急災害情報提供のサービスを行っている。
対して本システムはリアルタイムに情報が更新される点に新規性があり、
他社との差別化の要素となり得、優位性を持つと考えられる。

Existing System



避難所までの誘導

Q: 避難所マップはルート案内できますか?

印刷　× 閉じる

A: ルート案内はできません。
なお、避難場所や駅などの地点情報を目的地に設定することで現在地からの目的地まで直線（赤いライン）と直線距離を表示することができます。