Security Management in the Internet Era

15th: Final Presentation (2)
January 19, 2012

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Schedule

01st (09/22) Course Description
02nd (09/29) Cloud Security (1)
03rd (10/06) Cloud Security (2)
04th (10/13) Military use of the cyber security technology and its issues
05th (10/20) IPv6 Security
06th (10/27) Guest Lecture (Joichi Ito)
07th (10/27) Personal Information and Security (1)
08th (11/10) Personal Information and Security (2)
09th (11/17) Evaluation of Security Risk
10th (12/01) Guest Lecture
11th (12/08) Guest Lecture
12th (12/15) Midterm Presentation (1)
13th (12/22) Midterm Presentation (2)
14th (1/12) Final Presentation (1)
15th (1/19) Final Presentation (2)

Final Assignment

Please identify the issues to be resolved in our society and
How CPS(Cyber- Physical Systems) can be utilized to solve the problems.
Furthermore, by utilizing this system, make clear case for new problems.
Answer should consider the following points.

- Technology
- System
- Education
- Promotion of taking risk while proceeding it

Supplementary Note

- Slides in English and Presentation in English
- 20-minute presentation
- 15-minitus question and answer

Presentation schedule

- 12 Jan. Final Presentation
  - Group 1 and 2
- 19 Jan. Final Presentation
  - Group 3 and 4

Group 3

The IT system for resolving the environment problems

Budi Rahmadya (NAIST)
Yusuke Fujiwara (NAIST)
Naofumi Higuchi (SFC)
Hokuto Hoshi (SFC)

The Environment Problems

There are many environment problems in the world.
For example,

- Decrease of tropical rain forest
- Waste Problem
- Exhaustion of natural resources

and so on.

The Environment Problems

- Decrease of tropical rain forests

The tropical rain forests are treasuries of various species and sources of the oxygen in the atmosphere by the photosynthesis.
They are rapidly decreasing by cutting for the wood resources and cultivation.

The decrease of the forests may cause
- the progress of desertification
- the extinction of many species
- increase of carbon dioxide as greenhouse gas

The Environment Problems

- Waste Problem

The countries consume a large amount of resources and dump many wastes. Such a human activity cause serious problems.

- The preparation of the land for the dumping grounds
- The environment pollution by the wastes.

The Environment Problems

- Exhaustion of natural resources

To maintain the high living standard, we consume large amount of natural resources. For example, oil, natural gas, metal, and so on. However, the deposits of these resources aren't infinite.
When the natural resources are completely exhausted, our living standard will retrograde to the level of the Middle Ages.

The Environment Problems

These environment problems threaten our daily life and subsistence, so we must resolve them.

To resolve the environment problems

The environment problems result from the human activity of production and living.

To resolve the problem, each individuals must know the current actual conditions and promote the ecology movement.

The IT system can contribute to the resolution of the environment problems.

The contribution of the IT system

The IT system can contribute to the problem in terms of following points.

・The IT system can collect the environmental data from various sensor and enables us to recognize the current actual condition of the environment by the IT network.

・When each individual promotes the ecology movement, the IT system can visualize the effect of an individual's behavior and the contribution to the whole condition.

We suggest an IT system for resolving the environment problems.

The points of this system

We discussed this system in terms of following four points.

1 The technologies themselves.

2 The social systems at the introduction of this IT system.

3 The education for the user.

4 The benefits against the risks.

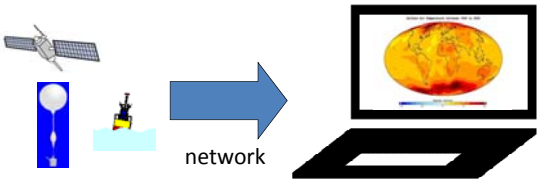
The technologies

The point is "realization".

・First step – the realization of the current condition

-Collection of the environmental data from various sensor

-Broadcast the collected data through the network like Internet



various sensors

visualization of current condition

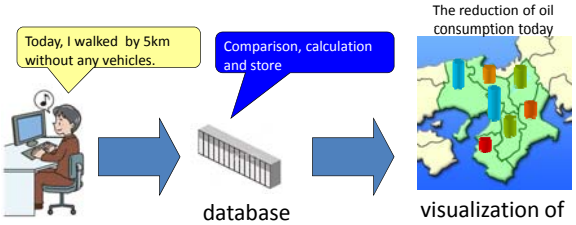
The technologies

・Second step – the realization of the effects

-Input of daily ecology movements into the system

-Comparison of the result with the database which stores the basic data of the ecology movements

-Visualization of the total effects of the ecology movements



input

database

visualization of total effects

The technologies

・The technical issues

To achieve this system, the following two issues must be resolved.

・The standardization of data

・The collection of ecology movement's data

The technologies

- The technical issues – the standardization of data

The sensors which collect the status of the environment have different property each other. It is impractical to adopt sensors of single vender. When plural vendor's products are adopted, the following must be taken into consideration.

- Providing the form of the data from the sensors.
- Adjusting the sensors to get the same result by measuring plural samples.
- Definition of the basic data of the ecology movements

The technologies

- The technical issues – the standardization of data

Definition of the basic data of the ecology movements

Example:

- The reduction amount of the trees which are cut down by using recycled paper or wooden products
- The amount of metal recycling per an electrical appliance

The technologies

- The technical issues – the collection of ecology movement's data

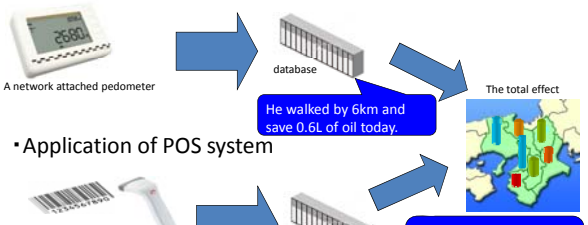
To visualize the whole effects, this system must collect the ecology movements' data of all user's. It is desirable that the data collection processes are automated as highly as possible to get accurate data.

The technologies

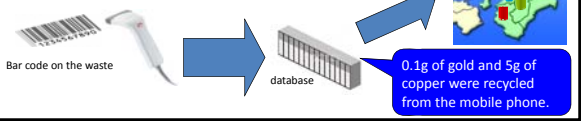
- The technical issues – the collection of ecology movement's data

The examples of the way how to collect the data

- Usage of the sensor which is attached to the system.



- Application of POS system



The social system

- Standardization of the visualization system and environmental assessment.

- Economic incentives that advance the promotion of this system and ecology movements like tax reduction and subsidy

The education for the users

The important points in this field are

1. **Education Background**
   Education background in accordance with the job.

2. **Experience**
   Good experience can support the work.

The education for the users

3. Human Error and High operating cost
Human error and high operating cost can be prevent or reduce by user education.

prevent or reduce

User Education

The education for the users

4. Training

Training for employees to be master/introducing new technologies being use.

The benefits

•From company's point of view:
- Consumption is visualized and make possible to cut waste more effectively.
- The database can also use in other systems.

•From people's point of view:
- Can take more interest in ecology movements and fix their behaviors.

•From environment's point of view:
- Many resources will be re-used and be cut.

The risks

•From company's point of view:
- •Management cost of Monitoring systems
  - •these systems is introduced only for environmental problem?

- •Privacy policy of collecting data

•From people's point of view:
- Behavior's feedbacks will make harder to consume
  - "All of my behavior will make CO2 …fmm…"

Conclusion

1. 1. This system visualizes the current condition and the effects of ecology movements. To achieve this system, we must solve the following two issues -the standardization of data and the collection of ecology movement's data.

2. In order to promote the use of this system, the standardization of the environmental assessment and economic incentive.

3. Educational background and experience of the users is important for solving environmental problems.

4. Human error and high operating cost can be prevent or reduce by user education.

Conclusion

5. By training, employee can be more expert or familiar with the technology that will be use.

6. Visualization of the consumption, reduction of the waste, and application of the database for other purpose.

7. The further promotion of the ecology movements from many points of view.
There are some risks such as the cost, privacy and security, and reduction of the consumption.
However, these risks can be relievable by more robust system.
They are insignificant than the one of the environment problems.

Group 4

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01.19.11

Long-Term Secure Private Information Preservation and Protection - The Information Bank -

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A Sharp Increase in Digital Personal Information

The Integration of Cyber and Physical Worlds

Expected Ages of Social Computation and Paper-less Society

1.1 Big Trends ; the Upcoming Generations of Cloud Computing and "Big Data"

A Sharp Increase in Digital Personal Information

Not Only Digital Images, Videos But Also Financial Transactions, Medical and Other Social Records

The Integration of Cyber and Physical Worlds

Ubiquitous Computing and Smart Environment

Expected Ages of Social Computation and Paper-less Society

Universal Services using Networks and potential Societal Optimization

1.2 Expected Problems of Upcoming Generations of Cloud Computing and "Big Data"

Responsible Management of Digital Personal Information (which is huge and ever-expanding its size)

Making Management Standards of Long-Term Personal Information / Digital Personal Belongings Preservation

Secure Access, Reliable Customer Authentication, Fast Search Algorithms and Reasonable Data Organizing Schemes

1.3 The Current Situation ; A Rapid Expansion of Personal Information

An Increase in Quantity of Personal Data

A Wide Variety of Personal Information

An Increased Need of Security

An INCREASING Need of Storage - especially in the Long Term

2. The Definition of Personal Information

1. Personal diary, photos, videos and other forms of information which are shared solely by the account holders, their family members and friends.

2. Passport numbers, credit card histories, tax records, health and medical records which can be required officially or by other organizations.

3. Personal digital belongings i.e. digital music collections, digitalized books, purchased or downloaded media files which were created by other people and corporations.

3. The Essential differences between Information Bank and Existing services providers

Why we simply can NOT leave all the problems to the existing cloud service providers

1. A Sharp Increase in the amount of personal and other digital data
2. Expected Society's Adaptation of Ubiquitous Computing technologies, smart and personalized Medical Services
3. Technical issues ; Effective Search Algorithms, the Limit of Computing Power, relatively Short Lifespan of storing devices and Distributed File Management and Broken File Recovery, Energy Consumption.

3. The Essential differences between Information Bank and Existing services providers

Cloud services may fill the needs...

1. cloud services aim to share or get more convenience.

2. IB aims to ensure in long-term

3. IB provides heritage management service

Information Bank takes care about succession and deletion.

ex1. Delete all your data permanently when you die.

ex2. Inherit your data to your daughter when you die.

3. The Essential differences between Information Bank and Existing services providers

	The Information Bank	Existing Cloud Storage Services
Primarily Purposes	Long-term / Permanent Preservation	File Sharing and Temporal File Storage
Service Charges	Once Every 3, 5, or 10 years	Weekly, Monthly or Annually
Optimized for	Medical Records, Financial Transactions, Contracts and other Official / Legal Documents AS WELL AS Photos, Diaries, Purchased Digital Products	Editable and Shared Documents
Options	Succession / Inheritance, Online Information Banking (for shopping, medical care etc.)	None

4. Main Technical Issues

1. Personal Authentication
- existing online authentication
  - visit a physical branch building of the Information Bank

2. Physical Limits of Computing Devices
- Computational Power
- Needs of Efficient Search Algorithms and High-Speed Parallel Processors
- Physical Lifespan of Storage Devices

3. Distributed Data Management
- Efficient and Network-friendly Transfer
- Distributed Storage and Backuping

4. Efficient Energy Consumption

5. Sustainability of the Services

Running Cost / Charging Policies

1. Ranging Prices of Preservation
Personal Information I. e.g. Photos and Diaries etc.
Personal Information II. e.g. Credit Card Hitories etc.
Personal Information III. or Purchased Digital Belongings

Higher Charge

Lower Charge

2. Extra Services and Options
More storage capacity
Insurance or renewal of insurance
Online Accessability
Upgrading Storage Technology

} Extra Charge

5. Succession and Deletion

As a Default Setting, the Stored Information is Ensured Permanently

Each Customer has to Decide which data s/he inherits and which deletes after a certain period of time

The Ranges of Inheritance

Personal Digital Belongings can/should be a SUBJECT to INHERITANCE TAX

The Tax rates differs from Information to Information, yet is generally approximately 10% of the market value at the time of inheritance

6. Insurance

In case of Data Loss and Leakage, the Information Bank makes a COMPENSATION in cash.

The Ranges of Compensations differ in accordance with the sort of Stored Information

Personal Information I.
Personal Information II.
Personal Information III.

The Customer can also subscribe additional Insurance Packages

7. Conclusion

Toward the Upcoming Generations of Social Computing and the Information-Integrated Society

We Propose the Information Bank, which

is responsible for Digital Information Preservation.

works on background and supports the upcoming ubiquitous and paper-less society

can contribute to the so-called “societal optimization”.

Our Aim in This Presentation is to Establish a Long-term RESPONSIBLE Digital Data Handling Scheme

Thank You Very Much For Your Attention!