Environmental Management
- A Socio-technical Approach -

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CONTENTS

Part 1: Concept - What is a Socio-technical Approach?
Part 2: Application - Sustainability of Electronic Products
Part 3: Practice - Service-Oriented Product innovation (SOPi)

A Holistic Vision

- Environmental Problems can not be solved only through Technological Innovation
- Environmental Problems/Solutions must be seen in the CONTEXT of all areas of human life ex. Socio-economic, Psychological, Philosophical

What is Sustainability?

Sustainability

Observation

Technology /Business

Economics, Politics, Sociology

Engineering/Business management

Human Behavior

Natural science

Ideology

Philosophy, Psychology
Part 1: Concept

A SOCIOTECHNICAL APPROACH:

MULTI-LEVEL PERSPECTIVE (MLP)

MULTI-LEVEL PERSPECTIVE

- Broad factors that indirectly influence a variety of regimes, e.g., environmental, social, economic, philosophical factors.
- Specific systems: shared cognitive routines, e.g., transport regime, recycling regime, product regime. Often stops engineers looking beyond their discipline.
- The place where radical ideas/technologies emerge.

Multi-level Perspective on Transitions
(Adapted from Geels, 2002).

- Increasing structuration of activities in local practices
- Socio-technical landscape (exogenous context)
- Socio-technical regime
- Niche innovations
- External influences: discourses (values expectations, competences, norms)
- Elements become aligned and support each other (e.g., technological changes, new materials, new design)
- New regime emerges
- Transition trajectories, e.g., transport regime, recycling regime, product regime
- Small networks of actors support transitions on the basis of expectations and visions
- Learning and delays: how are innovations adopted (co-construction)
SOCIO-TECHNICAL APPROACH TO ELECTRIC VEHICLE (EV) REVOLUTION

**Socio-technical landscape**
- Lifestyle/aging population/CO2 emissions

**Socio-technical regime**
- Current gasoline automobiles/Transport infra-structural system

**Niche innovation**
- Electric Vehicle technology

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**EV’S IN SOCIETY VERSUS AN EV-SOCIETY**

**Conventional approach**
EV’s in society = replacement of gasoline cars with EV’s without considering pervasive social issues (landscape level)

**Socio-technical approach**
EV-Society = EV’s are woven into the fabric (landscape) of society with the aim of changing the transportation regime as well as solving a range of environmental and social problems.

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**Multi-level Perspective on Transitions**
(Adapted from Geels, 2002).

- Increasing structuration of activities in local practices
- Socio-technical landscape
- Socio-technical regime
- Niche innovations

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**Current state**
- "Barrier-free" Car Society
- "Clean Compact City"

**Functional value of car**
- Less

**Change**
- Continuation of Current Automotive Society
- Versatile Car Society
Part 2: Application

A Socio-Technical Approach to Improving Sustainability of Electronic Products

A Social-Technical Approach to Improving Sustainability of Electronic Products

Step 1
Analyze Issues Related to REGIME of the System or Product

Step 2
Consider Possible LANDSCAPE Issues

Step 3
Create an INNOVATION that considers both REGIME and LANDSCAPE

REGIME

- Product Design
- Product Manufacturing
- Product usage
- Product End-of-Life
  - Most Challenging Issue-

The 3 R's

- REDUCE
- REUSE
- RECYCLE
  (Most complex challenge!)
Economic “Berlin Wall” between Business and Recycling
(an analogy with economic systems)

“Free Economy”
Not Circulating

“Socialist Economy”
Piling Up

Business  Berlin Wall  Recycling
(Not Procurement Manufacturing: Sales)  (UsageRecycling)

No recycling technologies can function effectively.

REGIME: Key Issues Lying Behind
Current Recycling Systems of Electronic Products

1-Recycling QCD
2-Recycling and Energy Saving Conflict
3-Invisible Flow

RECYCLING QCD

Q = QUALITY  Quality and Cost of recycled materials must be competitive with virgin materials.

C = COST  Recycling process must keep up with consumer demand.

D = DELIVERY  Recycling Systems Depend on Push Mechanism (i.e., amount of disposed and collected products.)

MANUFACTURING= QUICK RESPONSE DELIVERY

Manufacturing Systems Depend on Pull Mechanism (i.e., market needs/demands.)

=Mismatch Between:

PUSH MECHANISM/PULL MECHANISM
The “Dropped Sausage”

Can you pick it up and eat it?

Supermarket

OUT OF MANAGEMENT

- Products have not been “quality managed” during Usage-Stage
- Nobody has information regarding the quality of products when discarded (End-of-Life stage)

Invisible Flow

Japan’s recycling system 2004

Home Appliances (4 electric products)  | Personal Computers

Based on home appliances’ recycling law  | Based on the law for promotion of effective utilization of resources

Disposed ~20 million

Reclaimed

11.2 million

1.6 million air conditioners

3.8 million television sets

2.8 million washing machines

2.8 million refrigerators

Missing

~7 million

Invisible Flow

Japan’s recycling system in 2013

Home Appliances (4 electric products)  | Personal Computers

Based on home appliances’ recycling law  | Based on the law for promotion of effective utilization of resources

Disposed ~25 million

Reclaimed

16.4 million

3.6 million air conditioners

4.4 million television sets

4.4 million washing machines

4.0 million refrigerators

Missing

~8 million

2013 Fiscal year

0.9 million

0.47 million, home-use

0.42 million, office-use
Break Down the “Wall”

- Recycling Systems and Manufacturing Systems must be integrated
- Therefore the QCD of a Product must be controlled/managed

QUALITY MANAGEMENT

- Businesses must keep control of a product's QCD
- A product needs to remain within the management system

Well-Matched Economic System

(Barrier broken down)

Free Economy

Circulating

Business

Recycling

Recycling QCD

CONFLICT BETWEEN RECYCLING AND ENERGY SAVING

Conflict existed in some products which required high energy consumption at usage stage......

Change product to power saving type

Amount of Waste

Rapid Circulation of Product (RCP)

Energy Consumption in Usage Stage
Energy saving for assumed product type

Rapid Circulation of Product (RCP)

A Product Management System that:
- Encourages RCP
- Makes it easier for customers to upgrade products

Owing versus Leasing

• Customer ownership= Out of Management
• Customer leasing= Product remains within the management system at both:
  - User-Stage
  - End-of-Life Stage

Recycling QCD

Recycling QCD: Can we get the required quantity of recycled parts and materials which still have the necessary quality level when we need them?

<table>
<thead>
<tr>
<th></th>
<th>Products Owned by Customers</th>
<th>Products Leased to Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conventional</td>
<td>+Recycling Regulations</td>
</tr>
<tr>
<td>Quality</td>
<td>Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>Cost</td>
<td>Poor</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Delivery</td>
<td>Poor</td>
<td>Acceptable</td>
</tr>
</tbody>
</table>
### SUMMARY

Current recycling system (regime) of electronic products can be effective.

**BUT a number of issues have to be dealt with:**

- RECYCLING QCD
- INVISIBLE FLOW
- RECYCLING/ENERGY SAVING CONFLICT

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### Conclusion

To achieve recycling **QCD** we must modify entire product life-cycle systems by introducing:

1. **Innovative Product Design**
2. **New Sales and Service Patterns (Leasing)**
3. **Innovative Reuse and Upgrade Strategies**

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### Multi-level Perspective on Transitions

(Adapted from Geels, 2002)

**LANDSCAPE**: Sample of Philosophical, Psychological, Social Issues Related to Product Usage

1. **Philosophical**: What is garbage?
2. **Social**: An aging society
3. **Psychological**: A culture of overconsumption
4. **Environmental/Economic/Business/Education**
PHILOSOPHICAL QUESTIONS

1- At what point does an object stop being what it ‘is’ and start being ‘garbage’?

2- Does the concept of recycling encourage a ‘disposable culture’?

ONTOMETRY OF GARBAGE

To Be or Not To Be. That is the question.

SOCIAL ISSUES

AGING SOCIETY

Our children's life is not easy...

Percentage of Aged Population in Japan 1980-2055

Fact Data  Estimation

Over 65 years old

Over 75 years old
Why do we over-consume?

• Much of irrationality of our environmentally unsustainable behavior could be attributed to a ‘false-self system’ (Winter & Koger, 2004).

• Social/Psychological mechanisms drive consumer behavior that is irrational and unsustainable (Boven, 2003).

Overconsumption Mechanism

FALSE-SELF SYSTEM:
I Am What I Consume

NICHES INNOVATION
SOLUTIONS MUST ADDRESS THE FOLLOWING ISSUES

• LANDSCAPE - Consumer behavior, aging society, environmental, economic, psychological and ontological mechanisms...

• REGIME - Current problems related to product recycling: QCD, energy saving, invisible flow...

• NICHES INNOVATION - ????????
NICHE INNOVATION =

SERVICE-ORIENTED PRODUCT innovation (SOPI)
-A creative style of leasing-

What are Service-Oriented Products?
(an analogy with the restaurant industry)

<table>
<thead>
<tr>
<th>Service (food)</th>
<th>Fixed course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hors D'oeuvre Appetizer</td>
<td>A set</td>
</tr>
<tr>
<td>Soup</td>
<td>B set</td>
</tr>
<tr>
<td>Main dish</td>
<td></td>
</tr>
<tr>
<td>Dessert</td>
<td></td>
</tr>
</tbody>
</table>

Hardware (dishes)

Customers pay money not for the dishes (hardware) but for the food and service. Dishes are used many times by many people. Customers choose a fixed course from the menu. The choices on the menu and quality of food are of primary importance for the customer.

An Approach to SOP Business
(Servicification of a Product)

1. Choose a product
2. Create services and fixed courses or ‘menus’ that have a positive impact on Regime and Landscape issues

An Approach to SOP Business
(Servicification of a Product)

3. Make attractive/creative service menu appealing to customers
   - Customers: New benefits they couldn’t get by owning the product. For example:
     - Product can be exchanged/updated easily
     - No responsibility that comes from ownership, such as recycling at the product’s end-of-life stage
   - Company: Increase profitability
     - Product stays within ‘management system’
Comparing SOP innovation with Conventional Products

<table>
<thead>
<tr>
<th>Customer</th>
<th>Conventional products</th>
<th>SOPi’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose</td>
<td>Product specifications</td>
<td>“service” menu</td>
</tr>
<tr>
<td>Purchase</td>
<td>Hardware</td>
<td>Service (Hardware rental)</td>
</tr>
<tr>
<td>Replace</td>
<td>Buy a new one</td>
<td>Exchange for updated model</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Business</th>
<th>Conventional products</th>
<th>SOPi’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profit</td>
<td>Product sales</td>
<td>Service provision</td>
</tr>
<tr>
<td>Manufacture</td>
<td>Assembling parts</td>
<td>Combining module</td>
</tr>
<tr>
<td>Post-use</td>
<td>Disposal/recycling (Low QCD)</td>
<td>Reuse/recycling (Acceptable QCD)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relation between business and customers</th>
<th>Conventional products</th>
<th>SOPi’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak (in post-sales periods)</td>
<td></td>
<td>Strong (until use-period ends)</td>
</tr>
</tbody>
</table>

SOPi and LANDSCAPE

- The concept of SOPi is not just ‘product leasing’
- SOPi’s can have a significant impact on LANDSCAPE issues: Aging population
  - Lifestyle mobility
  - Consumer behavior
  - Environmental impact

SOPi’s impact on REGIME and LANDSCAPE

SAMPLE OF SOCIO-TECHNICAL REGIME ISSUES:

**Quality Cost Delivery:**
An SOPi will always be under company management

**Energy Saving:**
Products can easily be exchanged for new energy saving models (RCP)

**Invisible Flow:**
Financial benefit for the companies and customers to reclaim products

Sample of Socio-technical Landscape Issues

**Purchasing behaviour:**
Attractive service menus can change the consumer behavior of customers
- Provide new ‘sales’ opportunities for businesses
- Stimulate the economy

**Demographic Factors:**
Companies can create ‘service menus’ that provide extra support for an aging population, modern lifestyle choices...

**Philosophical:**
SOPi encourages consumers to question what is means to own something, i.e., ‘ownership=responsibility’
CONCLUSION

1) To improve sustainability we need to think holistically

2) Being locked in Socio-technical REGIMES can prevent innovation

3) An awareness of the Socio-technical LANDSCAPE can open ‘windows of opportunity’ few more radical innovations

4) From a Socio-technical Multi-Level Perspective, SOPI’s can improve the sustainability of electronic product consumerism on multiple levels

Related Publications
- Fujimoto, J; Poland, Dean: 'Sustainable Approach To Automobile Society.' Sustainability: Science, Practice and Policy. Frequent 2015.

After the lecture, the class will be divided into 4 groups. Each group will be given a product.

PART 1:
Aim: Apply the Multi-Level Perspective (MLP) to the product and create a Service-Oriented Product Innovation (SOPI)

PART 2:
Aim: One group tries to persuade another group to use their SOPI

PART 1: GROUP WORK

Step 1:
Consider/discuss each group member’s ‘experience’ of using your group’s product:
- Where do you buy such a product?
- How does the product impact your lifestyle?
- What feelings do you have towards the product?
- What do you do at the product’s ‘end of life’?
Step 2:
Transform your chosen product into a 'Service-Oriented Product innovation' (SOPi)

- Develop an innovative and attractive 'Service Menu'

Your SOPi 'Service Menu' must address the environmental/socio-technical issues outlined in the lecture.

- Consider how your SOPi will impact issues related to the REGIME level of the Multi-Level Perspective (MLP):
- QCD, Invisible Flow, Energy Consumption (RCP), New Technologies
- Consider how your SOPi will impact issues related to the LANDSCAPE level of the Multi-Level Perspective (MLP).

How do these issues open 'windows of opportunity' for the success of your SOPi?

- Aging population, Modern Consumer Lifestyle/Behavior, Economy, Environment...
- Consider any other social, psychological, philosophical issues that may be related to your product.

PART 2: INTER-GROUP ACTIVITY

Step 1:
Present your SOPi to another group. Persuade the other group to adopt your SOPi by promoting your 'Service Menu'.

Step 2:
Give critical feedback on each group’s SOPi.

Consider how your SOPi benefits the company, customer and environment and society?

****WHEN DEVELOPING YOUR ‘SOPi’, BE AS CREATIVE AND IMAGINATIVE AS POSSIBLE****

Group Discussion/Task

- Individual group discussion:
  develop SOPi

- Intergroup presentation:
  Compare: which SOPi is feasible

  (Critical feedback)

PURCHASING BEHAVIOR IN JAPAN
Methodology of Survey

- February 2010
- Through Internet (web survey)
- Conducted on over 1,200 people

Purchasing Behavior (I)

<table>
<thead>
<tr>
<th>Answer</th>
<th>Strongly acceptable</th>
<th>Little acceptable</th>
<th>Little unacceptable</th>
<th>Strongly unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point</td>
<td>+3</td>
<td>+1</td>
<td>-1</td>
<td>-3</td>
</tr>
</tbody>
</table>

Q1 Do you want to buy something which you feel emotional attachment?
Q2 Even if a price is high, do you want to buy something which you can use for a long time?
Q3 Do you buy something suited to your hobby and your sensitivity?

Purchasing Behavior (II)

| Q4 Do you want to avoid a loan and a debt when shopping? |
| Q5 Are you happy to increase your savings. |
### Attitude Towards Consumption and Lifestyle (I)

Q1 Do you want to extend the human relations and to associate with various kinds of people?
Q2 Do you sometimes act according to seeing others’ facial expression?
Q3 Do you want to have a high regard for old friend?

### Attitude Towards Consumption and Lifestyle (II)

Q4 Do you act considering the future?
Q5 Do you want a risk-free lifestyle?
Q6 Do you want to live at your own pace, without straining yourself?
Q7 Do you want to have laid-back life, if you have enough income to live on?

### Top 10 What Goods& Service People Want to Have

<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PC</td>
<td>4.4</td>
<td>4.4</td>
</tr>
<tr>
<td>2</td>
<td>Fashion</td>
<td>5.5</td>
<td>5.6</td>
</tr>
<tr>
<td>3</td>
<td>Domestic Travel</td>
<td>5.5</td>
<td>5.7</td>
</tr>
<tr>
<td>4</td>
<td>Domestic Travel</td>
<td>5.5</td>
<td>5.7</td>
</tr>
<tr>
<td>5</td>
<td>Domestic Travel</td>
<td>5.5</td>
<td>5.7</td>
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<tr>
<td>6</td>
<td>Domestic Travel</td>
<td>5.5</td>
<td>5.7</td>
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<tr>
<td>7</td>
<td>Domestic Travel</td>
<td>5.5</td>
<td>5.7</td>
</tr>
<tr>
<td>8</td>
<td>Domestic Travel</td>
<td>5.5</td>
<td>5.7</td>
</tr>
<tr>
<td>9</td>
<td>Domestic Travel</td>
<td>5.5</td>
<td>5.7</td>
</tr>
<tr>
<td>10</td>
<td>Domestic Travel</td>
<td>5.5</td>
<td>5.7</td>
</tr>
</tbody>
</table>

### Survey Summary

- **Characteristics of young Japanese people**
  - Value “communication” over “money”.
  - Prefer to purchase ‘services’ rather than purchasing goods such as car, TV, and AV equipment.

- **Reasons for these characteristics**
  - Grew up surrounded by an abundance of material goods.
  - Born into the “Internet and Mobile” era.
**Questionnaire Survey: Purchasing Behavior**

**SAMPLE OF SURVEY QUESTIONS**

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### Purchasing Behavior

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Strongly acceptable (+3)</th>
<th>Little acceptable (+1)</th>
<th>Little unacceptable (-1)</th>
<th>Strongly unacceptable (-3)</th>
<th>Total points of individual group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you want to buy something which makes you feel emotional attachment?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Even if a price is high, do you want to buy something which you can use for a long time?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>Do you buy something suited to your hobby and your sensitivity?</td>
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<td></td>
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<td></td>
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<tr>
<td>4</td>
<td>Do you want to avoid a loan and a debt when shopping?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Are you happy to increase your savings?</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

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### Attitude towards Consumption and Lifestyle

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Strongly acceptable (+3)</th>
<th>Little acceptable (+1)</th>
<th>Little unacceptable (-1)</th>
<th>Strongly unacceptable (-3)</th>
<th>Total points of individual group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you want to extend the human relations and to associate with various kinds of people?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Do you sometimes act according to seeing other people’s facial expression?</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Do you want to have a high regard for old friends?</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Do you act considering the future?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Do you want a risk-free lifestyle?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Do you want to live at your own pace, without straining yourself?</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7</td>
<td>Do you want to have a laid-back life, if you have enough income to live on?</td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

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### Goods & Service Desirability

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Top 10</th>
<th>Point</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fashion (clothes)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Domestic travel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Eating out</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Book</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Music (CD, concert)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Watching movie</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Car</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Personal computer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Watch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Foreign language learning, licenses getting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Mobile music player such as iPod and Walkman</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Asset management (stock, financial product)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Museum (art, history, ethnographic, transportation, science) travel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Game (Soft, equipment)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Tableware</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>AV equipment such as blue-ray recorder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Bicycle including one with electric assist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>International travel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Audio equipment such as amplifier, speaker and player</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Camera</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Television set</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Manga (comic book), animation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
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<td>Stationery</td>
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<td>Communication equipment such as mobile phone and smart phone</td>
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<td>Electronic equipment such as computer and printer</td>
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<td>31</td>
<td>Furniture, interior decorating</td>
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<td>32</td>
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<td>Home electrical appliances</td>
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<td>Antiques</td>
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Creating Innovative Systems for SOP’s:
EX.
DUAL TRACEABLE OWNERSHIP SYSTEM (DTOS)

OWNERSHIP=RESPONSIBILITY

Dual Traceable Ownership System (DTOS)

1. Individual consumer has complete ownership of the product
2. Company has complete ownership and the consumer rents the product

Consumer Ownership

1. An identification number corresponding to the owner.
2. When transferring ownership during product use, the owner has to follow a set of procedures laid down by law.
3. When discarding the product, the owner takes responsibility for the recycling process. For example choosing an appropriate recycling trader.
4. If the product is discovered in an illegal situation, such as a ‘black market’ recycling process, the owner will receive a severe penalty.

Company Ownership

1. The consumer pays money not for the product itself, but for the services or functions which the product provides.
2. The consumer can enjoy the product without worrying about its disposal. The company or ‘seller’ will take responsibility for all the recycling duties that come with ‘ownership.’
3. Through an identification code system, the product and its parts can be easily traced back to the company.
4. It may be possible for the consumer to receive new services quickly and at minimal or no extra cost