Disclosing Activities by inventors and Commercialization: a case of Japanese company A

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Technology = idea

Finding Application fields is indispensable for commercialization
Do technologies have inbuilt application fields?

Case 1) PARC of Xerox Co.
   → They failed to find application fields for their state-of-art technologies.
      (Instead of PARC, Apple and Sun microsystems did)

Case 2) DuPont
   → They succeeded in commercialize nylon because they could find appropriate application fields (hose, stockings).
Finding appropriate application fields is important for commercializing new technologies.

According to open innovation, disclosing technologies to outside organizations could be useful in order to find appropriate application fields.

However, there are still some questions unanswered;

- Can we disclose technologies to people randomly?
- Is there any effective and efficient way to find appropriate application fields?
Research Questions

- To whom and in what manner should the inventors disclose their technology in order to win approvals (in spontaneous projects)?

```text
Active/effective disclosure activities → Winning approvals → Success of commercialization of technologies
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Methodology

- A questionnaire survey conducted from December 2007 to February 2008.
- The subjects are 106 senior researchers working for research institute of Electronics maker, Company A.
- We asked them to remember projects in which they had been involved, and what happened in the development process, especially how they disclose their technologies to others.
- We just focus on “spontaneous research (39 cases).
  - 21 projects succeeded in commercialization and implementation of the operation,
  - 18 projects failed in commercialization.
  - 6 researchers joined both successful projects and failure one.
- We tested them with
  1. Mann-Whitney U-test and a Student’s t-test. (comparison between successful projects and failure one)
  2. Multiple regression analysis (causal relation)
## Highlight of results (1)

<table>
<thead>
<tr>
<th>Category</th>
<th>Variables</th>
<th>Successful projects average (n = 15)</th>
<th>Failure projects average (n = 12)</th>
<th>unpaired student t-test</th>
<th>Mann-Whitney U-test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characteristics of projects</strong></td>
<td>No. of project members#</td>
<td>2.133</td>
<td>1.167</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Certainty of application field of technology</td>
<td>1.571</td>
<td>2.333</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td><strong>Characteristics of the activities for seeking application fields</strong></td>
<td>No. of persons who engage in seeking application field#</td>
<td>3.000</td>
<td>1.900</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Timing of disclosure, inside</td>
<td>2.467</td>
<td>3.583</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Timing of disclosure, outside</td>
<td>3.000</td>
<td>4.083</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Various members to whom technology is disclose, inside</td>
<td>4.200</td>
<td>2.333</td>
<td>* *</td>
<td>* *</td>
</tr>
<tr>
<td></td>
<td>Various members to whom technology is disclosed, outside</td>
<td>4.286</td>
<td>2.333</td>
<td>* *</td>
<td>* *</td>
</tr>
<tr>
<td><strong>Parties to whom inventors disclose their technology</strong></td>
<td>R&amp;D for business unit inside +</td>
<td>0.700</td>
<td>0.300</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sales, inside +</td>
<td>0.500</td>
<td>0.100</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New product development and marketing, outside +</td>
<td>0.857</td>
<td>0.143</td>
<td>* *</td>
<td>* *</td>
</tr>
</tbody>
</table>

Statistically significance 0.5%>,  ** 0.01%>  Answers are graded on the basis of Likert 5 point-scale
Research Model for multiple regression analysis

- Disclosure activities
- Departments to whom researchers disclose their technologies
- Characteristics of projects (Control variables)
- Obtaining approval in the organization
1) Departments to whom researchers disclose their technologies

- Inside + Outside organization
  1. R&D dept.
  2. R&D for business unit dept
  3. New product development and marketing dept.
  4. Sales dept
  5. Intellectual property and law dept.
  6. Production dept.
  7. Upper level of R&D dept.
  8. Upper level of business unit

We got answers on these questions in the form of dummy variables (0-1 data).

Total 16 departments
### Variables

- **Independent Variables**
  - (1) Departments to whom researchers disclose their technologies
  - (2) Disclosing activities
    - number of persons who engaged in seeking application fields,
    - timing of disclosure to inside/outside organizations
    - variety of persons to whom inventors disclose their technologies (inside/outside)

- **Control variables**
  - (1) the number of members who join the projects,
  - (2) the inventors’ successful experiences,
  - (3) the variety of members’ backgrounds,
  - (4) the degree of uncertainty on application fields of the technology,
  - (5) attractiveness of technology from the standpoints of rival companies
  - (6) satisfaction with budgets that they are provided

- **Dependent variables**
  - the degree of approval of the project,
Highlight of the multiple regression analysis (2)

<table>
<thead>
<tr>
<th>Characteristic of the activities for seeking application fields</th>
<th>Model 1 (n = 39)</th>
<th>Model 2 (n = 39)</th>
<th>Model 3 (n = 39)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of persons who engage in seeking application field</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parties to whom inventors disclose their technologies</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Evaluation of models</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependent variable is “Obtaining approval for going business”</td>
<td></td>
<td></td>
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</tbody>
</table>

The numbers indicate standard partial regression coefficient statistically significant.
Results

- The projects that have a larger number of members tend to succeed in getting approval.
- However, in terms of the number of persons who engage in exploring applications and disclosing their technologies, it is preferable to have lesser number of people working on the projects.
- The inventors should disclose their technologies to a variety of people. However, the departments to whom they disclose should be limited to a few.
  - Inventors should not show their new technologies to the upper-level employees of their companies’ R&D departments.
- Disclosing technologies to outside organizations could be sometimes effective in acquiring approval in the companies.
  - When the inventors disclose their technologies to “departments of new product development and marketing of outside companies,” the success rate would increase.
Analysis

- Inventors have to choose the width and parties to whom they disclose their technologies.
  - ○: department of product development and marketing outside the organization
  - ×: upper level of R&D department in the organization
Guess Why ???

• “Not Ordered Syndrome ?”
  ◦ Bosses tend to hate the projects that start without their orders.
  ◦ Bosses tend to destroy spontaneous projects.
• Outsiders’ views give fresh insight to the projects.
• Outsiders give the credit to the projects.
• Will “Detour strategy” work for winning approval?
Further discussion

- We need to check the direction of causal relations (getting approval → disclosing activities or vice versa ?)
- Can we generalize the results ?
  (need more data)
THANK YOU FOR YOUR ATTENTION.
Distributions of research area

Success projects:
- a: 25%
- b: 25%
- c: 15%
- d: 15%
- e: 10%

Failure projects:
- a: 18%
- b: 29%
- c: 23%
- d: 12%
- e: 18%

* Statistically the difference is not significant