# Research on Commercialization Management System Which Serve as the Infrastructure for Creating University Ventures

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Managing Director
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## Outline of Presentation

1. Abstract
2. Introduction of DBJ Capital and IP Development Fund
3. Problems in Creating University Ventures
4. Outline of the START Projects
5. The Commercialization Management System of the START Project of DBJ Capital
6. Case Studies of START Projects in DBJ Capital
7. An Application of Stage Gate Method in START Project
8. Conclusion

## 1.1 Abstract

Purpose of this presentation

1. To show what kind of commercialization management system is necessary for creating university venture.
2. To find out some lessons from case studies of commercialization management system in START projects.
3. To show the importance of management system and the project managers who promote business development in a pre-venture stage.

## 1.2 Abstract

Problems of present situation for creation of university ventures

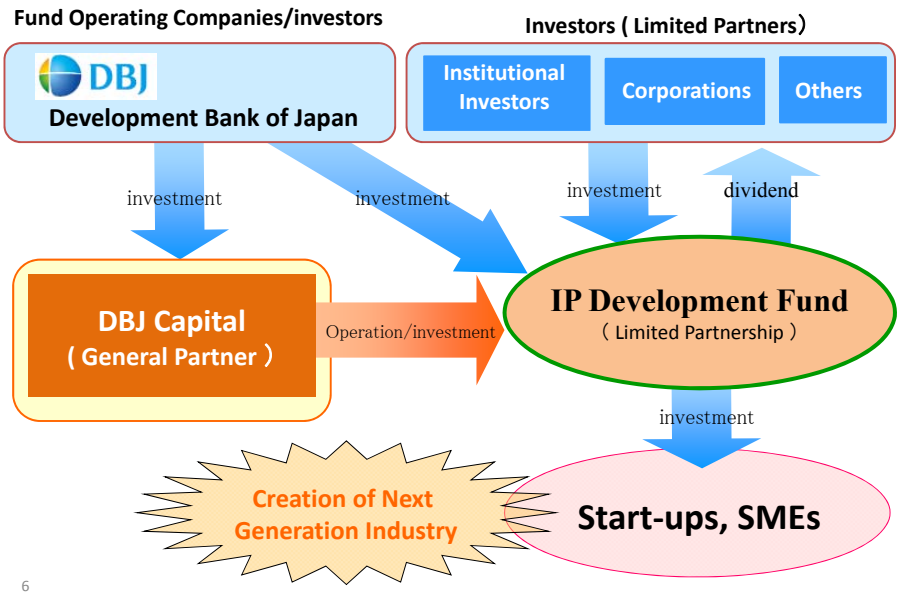
1. According to the report of METI in 2010, 1,800 university ventures have created in Japan and 24 companies were going to IPO. The Job creation of IPO companies were just above 1,300 persons. This figure is less than expected.
2. In order to create university ventures, 1) management team, 2) technology potential, 3) business design and model, 4) financing power, 5) business partnering, are important. However there is no recognition of these points in Japanese Universities' managers or business development section.
3. Subsidy program like GAP fund or POC fund is introduced for creating university ventures, in US and Europe. But there is few introduction in Japan.
4. There are no project manager, no management system in existing subsidy program in Japan except START projects.

## 1.3 Abstract

To find out some lessons from case studies of commercialization management system in START projects.

1. New trial for creating university venture in START projects has just begun since 2012. Ministry of education selected VCs as the business promoters. This program is different from existing subsidy program in many aspects.
2. DBJC has introduced some commercialization management tools, such as Business Model Generation, Stage Gate Model, etc. for START projects.
3. These tools would be effective for creating university venture. The commercialization management system would be easy to grasp the condition of the projects.

## 2.1 Introduction: Three Funds managed by DBJC



**山口　泰久**
（やまぐち　やすひさ）
Yasuhisa Yamaguchi

Managing Director
Investment Department
DBJ Capital Co., Ltd.

## CV

1986/3 Kyushu Univ. Department of Economics
1986/4 The Japan Development Bank (DBJ)
1995/6 University of Cambridge, Land Economy (M. Phil.)
2004/4 Head of Oitta branch (DBJ)
2006/6 Director, IP Developmane & Investment Inc.
2006/8 Establish **IP Development No1 Fund**
2008/2 Managing Director, IPDI Inc.
2010/6 Managing Director, DBJ Capital Co, Ltd.
2010/8 Establish **DBJ Capital No.1 Fund**
2010/10 Establish **DBJ Capital No.2 Fund**
2012/5 Selected Promoter of START Project (MEXT)
Now managing 3 funds (Total $65M) above.

## Characteristics of Investment

1. Broad sourcing for investment companies using by global and variety of network
2. Diversification of Investment among several fields of technologies
3. Special selection by using IP data base covering 8 million patents over the world
4. Good due diligence both technology and marketing using original network
5. Hands on support including CEO, CTO and managers in companies
6. Good investment record (IPO, M&A)

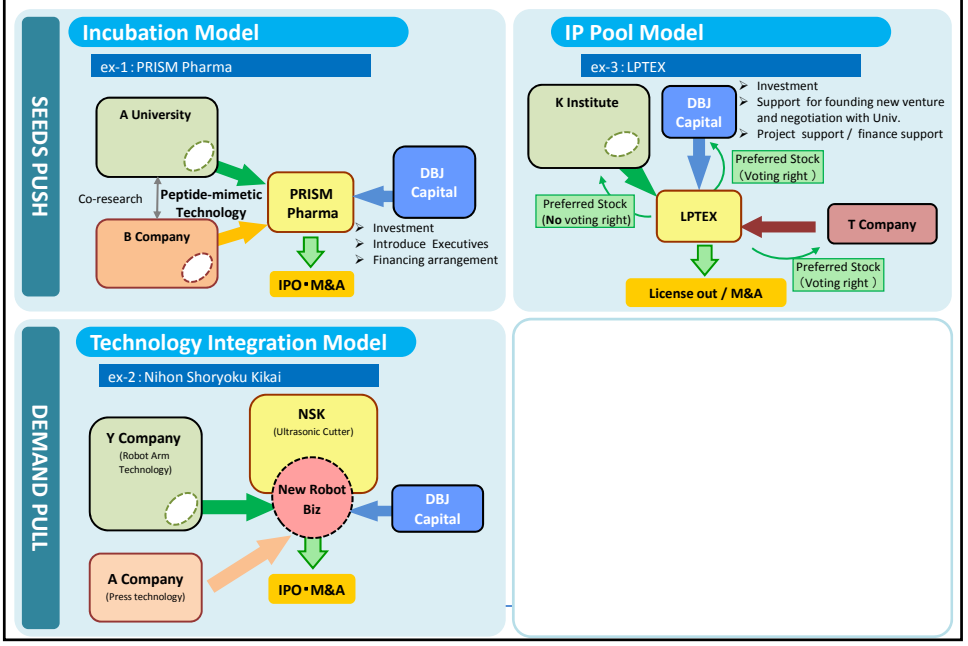
## Investment Record

**Healthcare, Bio Science**
PRISM Pharma
SymBio (**JASDAQ**)
Aisei Pharma (**JASDAQ**)
Gene Techno Science (Mothers)
MCI (M&A)
**Environment, Energy**
Ohcera
IP Power System (M&A)
Berg-erath (**JASDAQ**)
Renova
Greentech Solution
**IT, Communication, Game**
Gumi
Springsoft
Groova
**Manufacturing**
LPTEX
Technoflex
Shinkey
Visco Technologies
Nihon Shoryoku Kikai
**Service, others**
360ip
Emergency Asistance Japan (**JASDAQ**)
Shinko Matai (M&A)

## 2.2 Contents of Business Support by DBJC

| | 1 month-2 month | 3 month～1 year | 2～3 years | 3～5 years |
|---|---|---|---|---|
| | Ⅰ. Evaluation of IP & Technology | Ⅱ. Discussion of Commercialization | Ⅲ. Investment | Ⅳ. Hands on | Ⅴ. Exit |
| Contents | ➢ Technology Targeting, Market Analysis<br>➢ Business Image Development<br>➢ Analysis of IP and Technology<br>➢ Further Analysis by Specialist, Evaluation of Selected IP and Technology<br>➢ Business Model Generation<br>➢ Attractiveness of Value Proposition | ➢ **Selection of Key Person and team, Biz. Formation**<br>➢ Reconsideration of Value Proposition<br>➢ **Tech Marketing and Set for Biz. Strategy**<br>➢ **Creation of Business Plan**<br>➢ Negotiation with IP Holding companies and universities<br>➢ Creation of Venture Company, Selection of entities like CO., LLP, LLC, SPC etc. | ➢ Due Diligence<br>➢ Risk analysis for tech, market and human resource<br>➢ Setting up the Capital Policy<br>➢ Setting Milestones for Risk Control<br>➢ Application of Class Share<br>➢ Investment Decision by Investment Committee | ➢ Business Development<br>➢ **Technology & Sales Marketing**<br>➢ **Introduction for Customers, partners**<br>➢ Sales Agent Strategy<br>➢ **Introduction of Management Persons**<br>➢ Introduction of Specialist<br>➢ Technology Matching<br>➢ Support for Licensing, Research Partnering<br>➢ Milestone Investment<br>➢ **Support for Financing**<br>➢ **Budgetary Control Actual vs. Forecast** | ➢ IPO・MBO<br>➢ License out<br>➢ Buy back<br>➢ Sales |

## 2. 3 Three Business Model for Creating Venture Business




## 2.4 Three Business Model for Creating Venture Business

**IP Incubation Model**

- A common model. This model let start-up start business utilizing IP.
- Most of college spin-offs/research institute spin-offs are following this model.
- Most of them failed commercialization even when they had strong IP/technology.
- Many IP/technologies died before obtaining POC.

**IP Integration Model**

- This model let existing SMEs/start-ups start business utilizing IP held by large corporations.
- As concept of Open Innovation disseminates, the number of this model has been increasing. Large corporations are interested in this model because this model utilize sleeping
- By utilizing this model, SMEs/start-ups can buy time.

**IP Pool Model**

- For this model, unused patents are pooled for convenience for user companies. User companies use pooled patent paying licensing fees, while, patent holders receive fees depending on the holding ratio.
- Patent trolls became an issue. Some funds appeared which just pool patents seeking for licensing fees, without engaged in any business. Such a business caused many cases.
- Some companies establishing SPCs which deal with patent and discuss IP utilizaiton and IP sales.

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## 3. Problems in Creating University Ventures in Japan

**1. Management Team**
Good management team, Mentoring, Succession of management knowhow from entreprenour.

**2. Lack of IP/ Technology Matketing**
Knowhow of marketing, Approach for global market

**3. IP/ Technology Management**
How to find out the technology which has good potentioal,.
Lack of competitive strategy, Business model

**4. Lack of Financing at seed stage**
Lack of money at seed stage

**5. Open Innovation: Lack of utilization of external resources**
Partnering with external resources, Lack of business promotion.

## 4.1 START Projects (Start-ups from Advanced Research and Technology)

### About START Projects

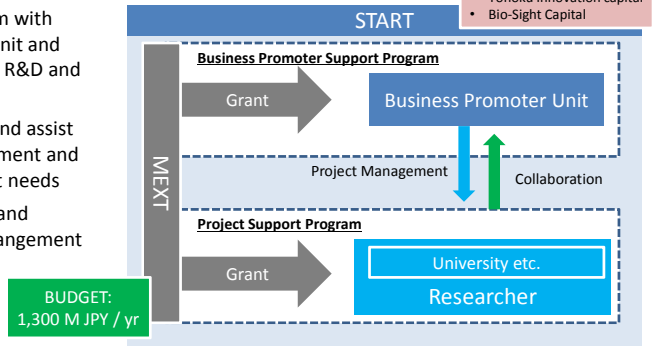
MEXT

The purpose of START program is to commercialize "high-risk but high-potential technology seeds" developed by the university researchers by utilizing the support and know-how of business promoters.

- Operated by MEXT*
- Begun from 2012
- Business promoters unit:
  - Form the project team with business promoters unit and researchers, and plan R&D and business plan
  - Manage the Project and assist the business development and R&D based on market needs
  - Launch the start-ups and support financing arrangement

Business Promoter Units
- DBJ Capital
- JAFCO
- UTEC
- WERU Investment
- Tsukuba Technology Seed
- Tohoku Innovation capital
- Bio-Sight Capital

### Scheme of START Program




*MEXT: Ministry of Education, Culture, Sports, Science and Technology

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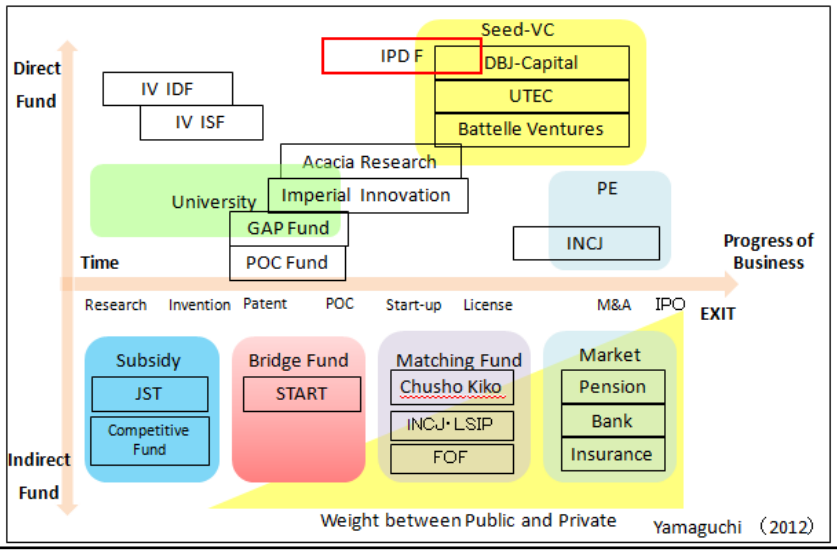
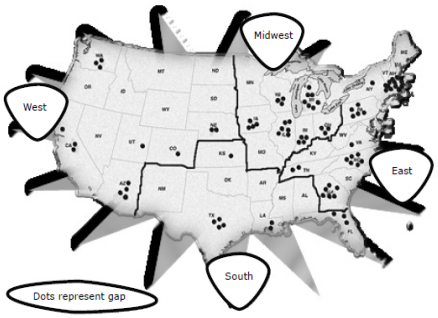
## 4.2 Background of START Projects

- Indirect fund by public sector can support early process of commercialization
- Exit strategy of VC diversifies such as IPO, M&A, Licensing etc.




## 4.3 GAP Funds in US



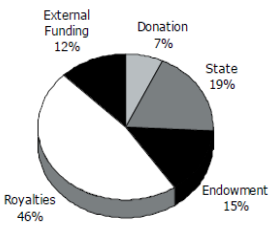

**Midwest (14)**
Case Western University
University of Chicago
University of Illinois
Indiana University
Iowa State University
University of Michigan
Michigan State University*
Michigan Technology University
MUCI Fund (State of Michigan)
Northwestern
Purdue University
Washington University-St. Louis
Wayne State University
University of Wisconsin-Madison

**East (18)**
Academy Funds
Beth Israel Deaconess
Boston University
Columbia University
Cornell Institute
Emory University
University of Georgia
Georgia Tech
Life Science Greenhouse of Central PA
University of Massachusetts
Massachusetts Institute of Technology
New York University
University of North Carolina
Penn State University
University of Pittsburgh
University of Pennsylvania*
Vanderbilt
Virginia Tech

**South (7)**
University of Florida
Florida State University
Manhattan Holdings, LLC (State of Kansas)
Tulane
Texas A&M University
University of Texas-Austin
University of Texas Medical

**West (11)**
University of Arizona
Arizona State University
University of California System
California Technology Institute
Colorado University
University of Nebraska
Stanford University
University of Southern California*
University of Utah
University of Washington RF
RCT BioVentures

**Percentage Total of Each Initial Funding Source**

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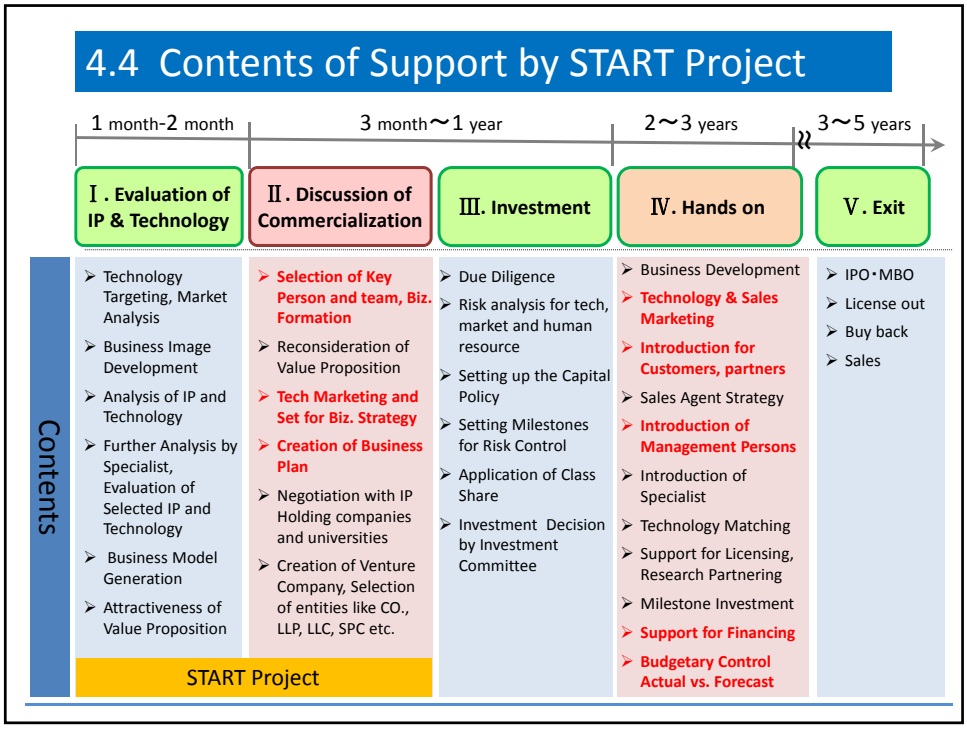
Source：'Mind The Gap' Office of Business Development, Minesota Univ.


4.4 Contents of Support by START Project
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Ⅰ. Evaluation of IP & Technology
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Contents
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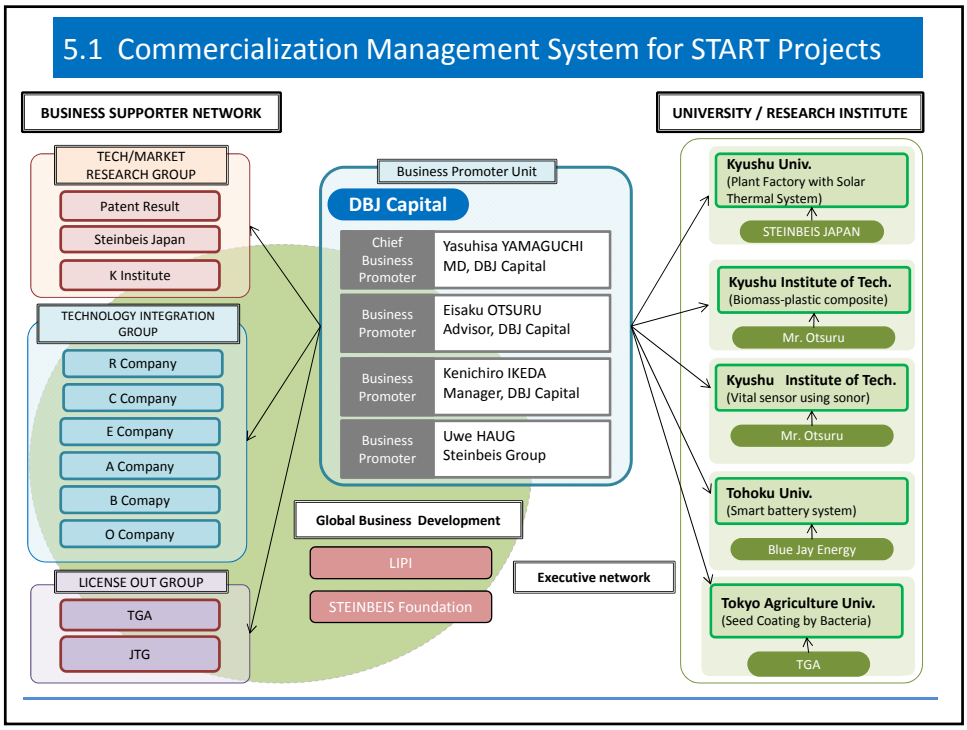
Business Image Development
Analysis of IP and Technology
Further Analysis by Specialist, Evaluation of Selected IP and Technology
Business Model Generation
Attractiveness of Value Proposition
Selection of Key Person and team, Biz. Formation
Reconsideration of Value Proposition
Tech Marketing and Set for Biz. Strategy
Creation of Business Plan
Negotiation with IP Holding companies and universities
Creation of Venture Company, Selection of entities like CO., LLP, LLC, SPC etc.
START Project
Due Diligence
Risk analysis for tech, market and human resource
Setting up the Capital Policy
Setting Milestones for Risk Control
Application of Class Share
Investment Decision by Investment Committee
Business Development
Technology & Sales Marketing
Introduction for Customers, partners
Sales Agent Strategy
Introduction of Management Persons
Introduction of Specialist
Technology Matching
Support for Licensing, Research Partnering
Milestone Investment
Support for Financing
Budgetary Control Actual vs. Forecast
IPO・MBO
License out
Buy back
Sales


5.1 Commercialization Management System for START Projects
BUSINESS SUPPORTER NETWORK
TECH/MARKET RESEARCH GROUP
Patent Result
Steinbeis Japan
K Institute
TECHNOLOGY INTEGRATION GROUP
R Company
C Company
E Company
A Company
B Comapy
O Company
LICENSE OUT GROUP
TGA
JTG
Business Promoter Unit
DBJ Capital
Chief Business Promoter
Yasuhisa YAMAGUCHI MD, DBJ Capital
Business Promoter
Eisaku OTSURU Advisor, DBJ Capital
Business Promoter
Kenichiro IKEDA Manager, DBJ Capital
Business Promoter
Uwe HAUG Steinbeis Group
Global Business Development
LIPI
STEINBEIS Foundation
Executive network
UNIVERSITY / RESEARCH INSTITUTE
Kyushu Univ.
(Plant Factory with Solar Thermal System)
STEINBEIS JAPAN
Kyushu Institute of Tech.
(Biomass-plastic composite)
Mr. Otsuru
Kyushu Institute of Tech.
(Vital sensor using sonor)
Mr. Otsuru
Tohoku Univ.
(Smart battery system)
Blue Jay Energy
Tokyo Agriculture Univ.
(Seed Coating by Bacteria)
TGA

## 5.2 Management System for Selection START Projects

### Screening by Patent Score and Stage-Gate Model

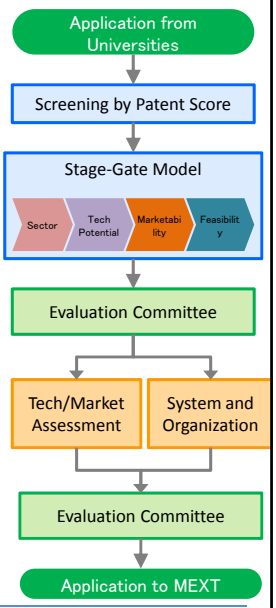
- Screening by Patent Score※
- Screening by Stage-Gate Method (Sector preference, Potential of Technology, Marketability, Feasibility)

### Technology Assessment, Marketability Analysis and Check of the Promotion System

- Technology Assessment and Marketability Analysis by Specialists
  - Superiority, Competition, Patentability
  - Market information, Marketability
- Check of Promotion System and Organization
  - Assignment of Business Promoter
  - Partnership related with business

### Introduction of External Evaluation Committee

- Evaluation Committee comprised by Professor, Specialist and Business Experts
- Evaluation of Technology Assessment and Market Analysis
- Discussion of the contents of Stage-Gate methods




※Patent Score: Patent evaluation score provided by Patentresult Ltd.S

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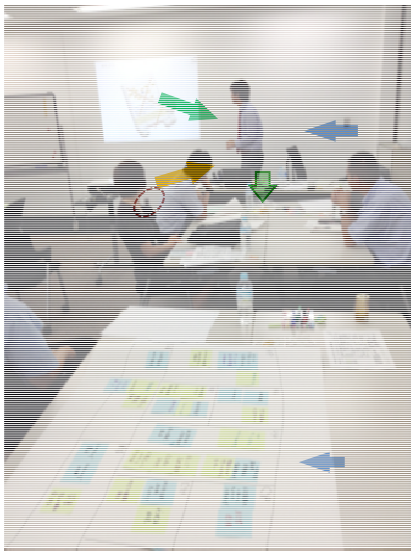
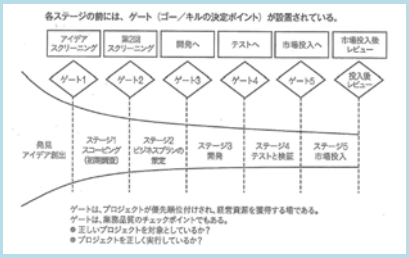
## 5.3 Project Management Tools

Business Model Generation



Stage-Gate Model



R&D Management tool by SHB way

## 5.4 Management Organization in Each Project

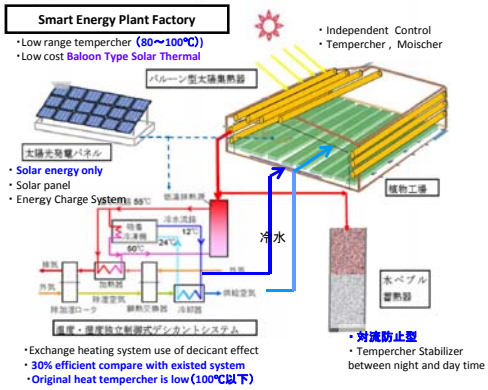
| Kyushu Univ. Prof. Hamamoto | KIT Prof. Nishida | Tohoku Univ. Dr. Yamamura | KIT Prof. Sato | Tokyo Agri Univ. Prof. Shinohara |
|---|---|---|---|---|
| Smart Energy Plant Factory | Biomass Composite Using Bamboo Powder | Smart Battery System with Redox Flow Battery | Development of Vital Sensor | Bio Pesticides and Seed Coating Technology |
| Development of plant factory which is not necessary of electricity and water | Development of biomass composite which combination between resin and bamboo powder | Development of smart battery system using novel cells which are composed as redox flow battery | Development of vital sensor which uses sonar mechanism | Find out useful microbe and develop seed coated by bio pesticide |
| **Prof. Yanagi**<br>➢ Experience of project management in huge engineering maker<br>➢ Establishment of the collaboration study group in Kyushu Univ. | **Mr. Ohtsuru**<br>➢ He was the head of the Oita factory of SONY.<br>➢ Broad experience of incubation of new business<br>➢ Broad network in electronics field | **BJE**<br>➢ CEO of Blue Jay Energy is Mr. Soga who is serial entrepreneur in Silicon Valley<br>➢ Broad experience of management as CEO<br>➢ He has experience to sell his company to Apple., negotiate with Steve Jobs. | **Mr. Ohtsuru**<br>➢ He was the head of the Oita factory of SONY.<br>➢ Broad experience of incubation of new business<br>➢ Broad network in electronics field | **TGA**<br>➢ Towada Greentough Agroscience is a licensing company. Very few broker which is specialized in bio pesticide field<br>➢ This company has good technology of seed coating<br>➢ Broad network with US pesticide maker |
| **Steinbeis Group**<br>➢ Steinbeis is the largest tech transfer institution in a world<br>➢ Provision of management tools | | | | |



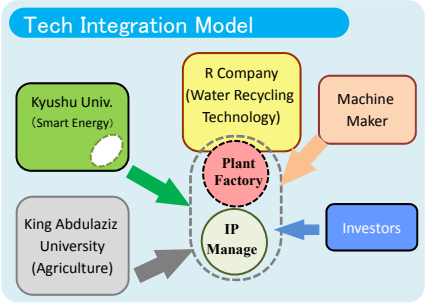
## 6.1 Development of Smart Energy Plant Factory — Kyushu-Univ. (Dr. Hamamoto)

### Outline

1. Smart energy plant factory does not need electricity, water supply.
2. We would like to apply this plants for the middle east countries which need the independent supply of water and electricity.




### Business Network



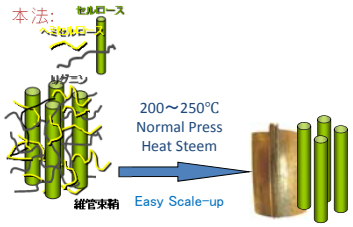

- We are developing the demo plant in Japan.
- We will create the venture which promote the sales of this plant factory. This venture will control the licensing business. At first. This venture will change to the engineering company after getting sufficient knowhow.
- The promoter introduce the partners such as R company which has broad achievement in engineering and operation of plant factory, and S foundation which has global networks and tech transfer achievement.
- Commercialization management system is applied to this projects.

## 6.2 Development of Biomass Composite

Kyushu Institute of Technology (Prof. Nishida)

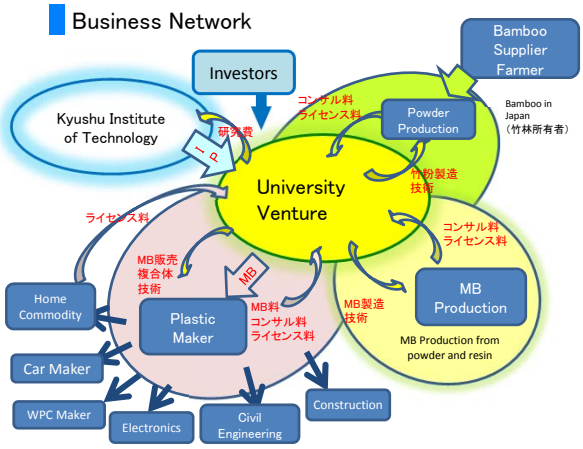
### Outline

1. Development of the biomass composite made by existing resin and unused plants like bamboo.
2. In Japan, there area many un-used plants like bamboo. Using this plants, we will provide cheaper composite than existing plastics.





### Business Network




- This project is applied technology integration model.
- University venture will be composed as fabless company.
- Not only bamboo but also bugass, stem of palm, corn and sugarcane, can be applied to new biomass composite. South East Asia is good place to develop this biomass composite.

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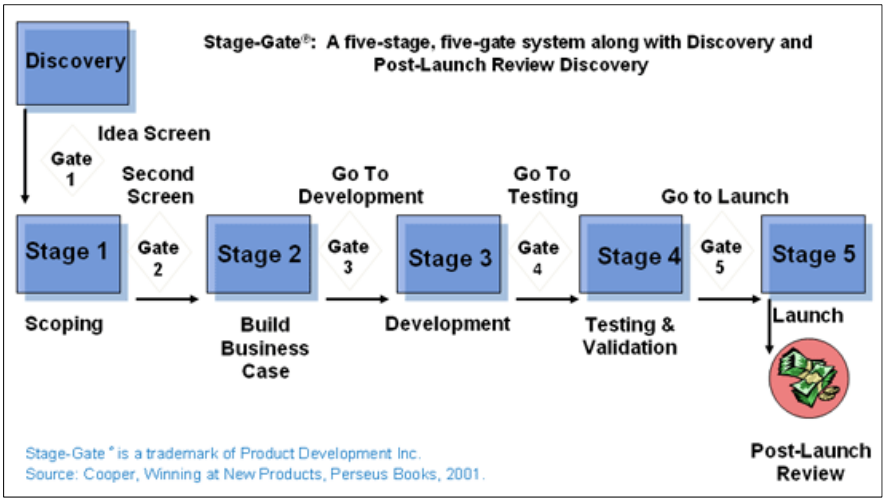
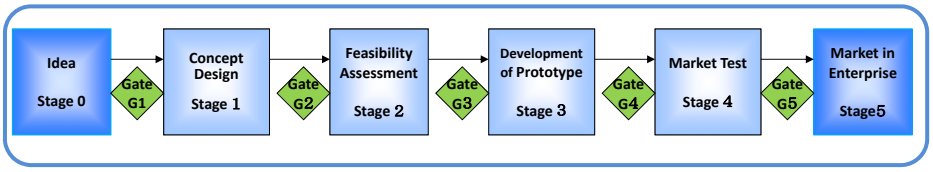
## 7.1 Stage Gate Model by Dr. Cooper



## 7.2 Original Gate Setting of Stage Gate Model




| | |
|---|---|
| **Gate 1 Screening of idea** | **G11 Fitness for the portfolio**<br>**G12 Potentiality of technology**<br>**G13 Attractiveness from market aspect** |
| **Gate 2 Technology potential** | **G21 Quality of R&D planning**<br>**G22 Competitiveness of technology in market**<br>**G23 Realization of technology**<br>**G24 Patent score** |
| **Gate 3 Move to Prototype** | **G31 Accuracy of R&D planning**<br>**G32 Realization of IP strategy**<br>**G33 Marketability assessment**<br>**G34 Project management methodology**<br>**G35 Partnership with supply side and demand side**<br>**G36 Clarification of POC**<br>**G37 Prototype and experimental research** |
| **Gate 4 Market test** | **G41 Reinforcement of competitiveness**<br>**G42 Candidate of CEO**<br>**G43 Business model**<br>**G44 Business plan**<br>**G45 Trial sales or first client**<br>**G46 Market analysis by sample**<br>**G47 Scale up for mass production** |
| **Gate 5 Market in** | **G51 Management team**<br>**G52 Effectiveness if business model**<br>**G53 Establishment of supply chain**<br>**G54 Evaluation or feedback from first client**<br>**G55 Evaluation from market test**<br>**G56 Coverage from weak point**<br>**G57 Establishment of exit strategy**<br>**G57 Feasibility of total business plan** |

Source: DBJ Capital

## 7.3 An Assessment of START Projects

| | Progress 1 : Beginning – 5 : Finished<br>Quality 1 : Low – 5 : Excellent | A University | B University | C University | D University | E University |
|---|---|---|---|---|---|---|
| G1 | Fitness for the Portfolio | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G1 | Potentiality of technology | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G1 | Attractiveness from market aspect | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G2 | Quality of R&D planning | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G2 | Competitiveness of technology in market | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G2 | Realization of technology | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G2 | Patent score | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G3 | Correctiveness of R&D planning | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G3 | Realization of IP strategy | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G3 | Marketability assessment | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G3 | Project management methodlogy | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G3 | Partnership with supply side and demand side | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G3 | Clarification of POC or spec target | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G3 | Prottype and experimental research | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G4 | Reinforcement of compettiveness | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G4 | Candidate for CEO | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G4 | Business model | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G4 | Business plan (sales and cost estimation) | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G4 | Trial sales or first client | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G4 | Market analysis by sample | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G4 | Scale up for mass production | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G5 | Management team | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G5 | Effectiveness of business model, value proposition | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G5 | Establishment of supply chain | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G5 | Evaluation or feedback from first client or trial | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G5 | Eavaluation and feedback from market test | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G5 | Coverage from weak point | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G5 | Establishment of exit strategy (trade sale, liscecing etc) | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| G5 | Feasibility of total business plan (investor's demand) | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |

Source: DBJ Capital

## 8. Conclusion

1. The recognition of essential point for creating venture business such as 1) management team, 2) technology potential, 3) business design and model, 4) financing power, 5) business partnering, is still low level by management of universities and business development sections.
2. In a stage of pre-venture, project manager who promote business development is important. START project is the first program which introduce the project managers for creating university venture.
3. The process of creating university venture is clarified by management tools, such as Business Model Generation, Stage-Gate Model, etc. These management tools should be introduced to Universities.
4. Commercialization management system becomes easy to grasp the condition of the projects. Several participants like researcher, clerk of university, business promoter, external specialists can recognize each responsibility.
5. The management tool like Stage-Gate Model should change continuously to achieve the outcome of business creation.
6. Effectiveness of the management system should be evaluated at next step.

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