

CHAPTER 6

STRATEGIC PLAN FOR DESIGNING THE PARTNERSHIP APPROACH

From the identification of an appropriate partnership model suitable for universities in Thailand, which is the first objective of this research, in chapter 5, this chapter will recommend strategies for a university to set up a particular partnership model to aid in the development of industry, which is the second objective of the thesis.

Based on the characteristics of Thai industries and universities and common features, benefits & weaknesses of Agency Model, the most suitable model for Thailand is Agency. In this chapter, the strategic for designing the partnership approach will be proposed. The analysis is based on the data gathered from industry-university partnership in various countries, and Thai industry and university characteristics.

6.1 Changing of Existing Relationship

From lessons learned from literature surveys, and characteristics of Thai universities and industries, the lack of trust between the various players—industries, and universities— proved to be a crucial issue. Industries and universities have different time frames, different cultures, and different motivations. Their understanding of knowledge, the knowledge generation process, and the knowledge utilisation process differs greatly. The challenge is to bridge the gap, to enhance the common understanding of what each side has, what each side wants, and what each side needs. Many industry university linkage activities succeed due to the leadership of people with position and vision, be they in the university, the industry, or the government.

From the findings in Chapter 5, the existing industry-university partnership in Thailand is Agency Model. Agency Model in Thailand is managed inefficiently as well there are few linkages with industry. For the reason that universities overseas which had chosen the Research-Oriented Park Model are the most successful in partnership with industry, the vision for industry-university relationship in Thailand is to create the successful Research-Oriented Park Model within 5 years.

The simple model in Figure 6.1 shows the process of changing the present conditions to the future better ones. Both universities and industries should recognise the status quo condition, the desired future characteristics, and the internal characteristics and external conditions, which do influence the relationship at present and in the future. Then they can determine the change strategy and steps for implementing the strategy.

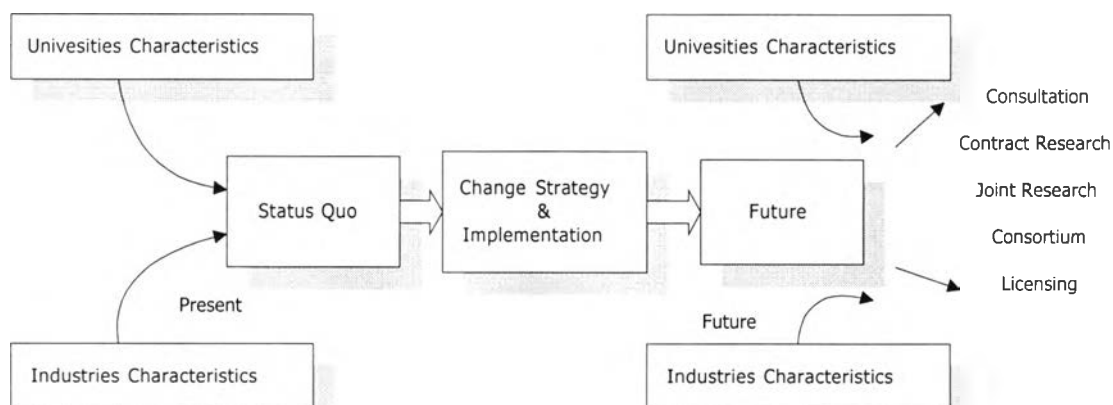


Figure 6.1: The Process Change from the Existing Relationship to the Desired Partnership with Industry

Each part of the model shown in Figure 6.1 is explained by the following items:

Universities Characteristics (status quo):

- Technological capabilities: innovative.
- Lack champion to support the partnership.
- Set up administrative agency, R&D implementing agency and supporting agency (Agency Model)

Industries Characteristics (status quo):

- Dependence on imported technologies.
- Do not recognise the importance of R&D.
- Do not wish to take risks with universities.

Status Quo:

- Agency Model. with inefficient management.
- Little linkage with industry.

Time Frame:

- 5 years.

Universities Characteristics (future):

- All members fully committed to partnership.
- Have champions in collaboration.



- Technological capabilities: supportive.

Industries Characteristics (future)

- Trust in universities' services.
- Innovation needs.
- Technological capabilities: innovative and supportive.

Future:

- Have various linking mechanisms.
- Research-Oriented Park Model.

In order to change the existing relationship, the strategic plans is recommended in Section 6.2.

6.2 The Proposed Strategic Plans

In order to improve industry-university partnership, the strategic plans focused on the three-phase plan are recommended to promote collaboration between universities and the productive sector. The proposed strategic plans are recommended as follows:

Phase I: The goal of phase I is to reform the universities' administrations and academic processes.

Phase II: The goal of phase II is to foster the relationship between industry and university through enhancing the existing Agency Model.

Phase III: The goal of phase III is to establish the Research-Oriented Park Model in each region of Thailand.

The recommended strategic plans are shown in Table 6.2. The details of each phase are described in Section 6.2 to 6.5.

Table 6.1: The Phases of Strategic Plan

Phase	Goal	Time Frame				
		Year 1	Year 2	Year 3	Year 4	Year 5
I	To reform the universities' administrations and academic processes.	↔				
II	Foster the relationship between industry and university through enhancing the existing Agency Model.		↔			
III	Establish the Research-Oriented Park Model in each region of Thailand.			↔		

6.3 Phase I

The goal of phase I is to reform the universities' administrations and academic processes within 2 years.

6.3.1 The Roles of Universities in Phase I

In this phase, it has become very clear that these agencies need to adapt a new role towards industry in the near future in order to address the credibility issue. Universities need to break away from their traditional administrative framework. The recent trend of corporatisation in universities allows them to function with less constraint and with the flexibility necessary to meet the various needs of industry.

The roles of universities in Phase I are as follows:

1) Self-assessment

Universities should assess themselves in many areas such as:

- Determine whether there is a critical mass of potential dues-paying members in an R&D intensive industry in the prospective focus area.
- Look inward to determine objectively whether there is strong leadership (especially the director of administrative agency and R&D implementing agency) in terms of technical, administrative, and boundary-spanning and commitment.
- Ask whether the leadership is experienced, has a network of contacts in the relevant industry, is respected and trusted by colleagues.
- Find faculty and industry colleagues who are willing to help.

- Determine faculty multi-disciplinary technical capability relevant to industrial needs in the prospective research areas.
- Determine the location of industry-university partnership centres. Institutions that are located near major economic centres should take advantage of the opportunities that their locations provide. Institutions that are not as well located may need to create opportunities.

2) Develop innovation policies and strategies

Every agency offices should have a mission statement which makes a clear contribution to the overall mission of the university. University's mission/vision/objectives/goals must support industry-university partnership efforts so that these efforts are not in conflict with other programmes. This needs to be supported by innovation policies governing ownership of intellectual property, conflict of interest and revenue sharing, for example. In addition, the agency offices should develop annual innovation strategies and evaluate their past performance.

Agency offices need to go beyond developing clear and effective mission statements, policies and strategies. They also need to ensure that they are understood and supported by university researchers, the industrial and financial sectors, governments and other relevant stakeholders. This requires a capacity to educate and build awareness through such measures as web sites, faculty courses and faculty orientation packages. The agencies' objectives may be started with the following objectives:

- To pursue fundamental engineering and scientific research having industrial relevance.
- To produce graduates who have a broad, industrially-oriented perspective in their research and practice.
- To accelerate and promote the transfer of knowledge and technology between university and industry.

3) Reorganise/design the structure of agencies

Designing an organisation involves choices. There is no single ideal organisation. Thus, most organisational theorists adopt a contingency approach to design issues, arguing the organisational features including structure, strategy and goals depend on a number of factors. However, from the studies, the principles for effective organisation structure of designing agency centres are recommended for industry-university agencies in Thailand (see Figure 6.2).

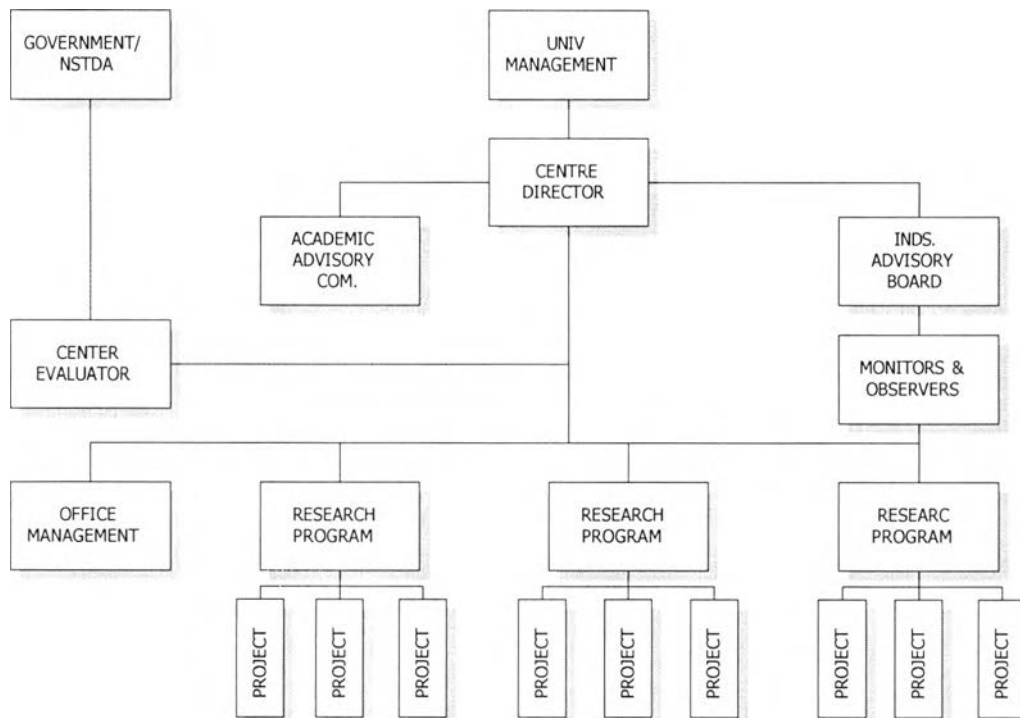


Figure 6.2: Proposed Organisational Chart for Industry-University Agencies

From Figure 6.2, the key role to agency success. She/he is responsible for the management and administration of internal operations, the research program and recruitment of industrial sponsors. The directorship should be a full-time position. Government or Thailand's National Science and Technology Development should include an evaluator who collects information by observation and surveys. Evaluators provide objective feedback on agency processes and outcomes to assist in refining operations and to anticipate problems. Industrial advisory board members represent the interests of their organisation within the centre. The typical members should be a manager in R&D, engineering, manufacturing, or similar function. They are responsible for reviewing and evaluating proposed and ongoing research projects, and acting as a key for information and technology developed within the centre.

4) Access to highly qualified personnel

To be successful, industry-university agencies require access to, or must be able to recruit and retain, highly qualified personnel. Their staff require an in-depth understanding of the academic, financial and industrial sectors. They should possess an unusual combination of research, business, legal, interpersonal and communication skills. These people are in short supply. Consequently, university agency offices need to offer training to their staff to develop the necessary combination of skill requirements. They also need to offer attractive salaries and incentive packages to retain employees actively pursued by firms.

5) Facilitate access to research funding.

Agencies for research services are generally the liaison between university researchers and sources of research funding. They need to be familiar with the

process for securing and administering research grants and contracts from both governments and firms.

6) Developing databases on S&T information and resources.

At present, there is no comprehensive directory of current scientific and technological research being undertaken in Thai university institutions. Some universities produce indexes of researchers and publications, but these lists are often incomplete and out of date. This makes it very difficult for companies to identify local expertise or technical resources to support their activities. Information on the achievements and research outputs of universities are required, but at present this is relatively inaccessible and incomprehensive. The databases should consist of universities' expertise, technical reports, conference papers, and services that universities can provide to industry. Added to these would be an inventory of other non-publishable research outputs such as computer software, engineering designs, technical specifications, patent, etc. This database should be made widely available to companies and government agencies.

7) Protect intellectual property

Agencies for research services require the capacity to quickly develop and implement appropriate intellectual property management strategies which may involve filing patents, registering trademarks and copyrights, negotiating trade secret agreements, etc.

The universities should form networks with other universities and research centres, both domestically and internationally, to identify opportunities for combining intellectual property from different research projects. Creating a portfolio of intellectual property is often required to create higher value-added innovations and to secure the interest of the industrial sector.

6.3.2 The roles of Industries in Phase I

On the part of industry, the productive sector also needs to do something to promote industry-university linkage for Phase I. In Phase I, industries should reform themselves to ready to cooperate with universities. Industry should change attitudes that means it should appreciate and utilise universities as a source of knowledge, new technology and personnel in a true spirit of partnership. At the same time, industry should participate more actively in university administration, curriculum development and forward planning. Industry and professional organisation could play a valuable role as forums for creating schemes of industry-university cooperation.

The roles of industries in Phase I are recommended as follows:

- 1) Establishing good relationships on personal basis with universities starting locally.**
- 2) Enhancing existing training activities and consultancies to form basis for research relationship.**

- 3) Establishing or improving industry's ability and technological capability to incorporate and use research results.
- 4) Exerting greater effort to forge stronger ties with universities.
- 5) Being more aggressive supporters of universities rather than passive end-users of universities' products/services.

6.3.3 The Roles for Government Support in Phase I

The government is an essential, indispensable element of industry-university linkages. The government is crucial to improving the environment for industry-university linkages. The roles of government in phase I are recommended as follows:

- 1) Finding status of firms in different industry sectors and establish industry priority areas and target programs.
- 2) Increasing spending on science and technology and on information technology infrastructure, which is very crucial to supporting industry-university linkages.
- 3) Establishing committees/associations for government-industry-university.
- 4) Aggressive initiating programs for industries to invest in research and development activities.
- 5) Providing tax relief or tax incentives to companies who continuously support industry-university linkage.
- 6) Planning reward systems for creativity.
- 7) Formulating policies and mechanisms on national R&D priorities and increase the capacity in utilising university-developed technologies.
- 8) Examining the intellectual property rights system to encourage local designs and inventions. At present, intellectual property rights system is heavily under-used. This could either be because the existing system does not offer appropriate protection for local industry or that companies do not fully understand the benefits of the system. Therefore, government should advocate changes to the IPR system by sponsoring a broad-based study of users, beneficiaries and non-users.
- 9) Being more supportive towards the technical and management skills development of both sides as well.

A government that expects to enhance development and technology transfer must be willing to provide support and devote substantial resources to research and the establishment of an efficient field delivery system. Thus government may intervene anywhere in the technology generation—diffusion continuum.

6.3.4 Performance Indicators

Performance monitoring and the measurement of success has been a subjective process for centre director and operators. Of greater importance is the use of performance as an aid to management by assessing the impact of management strategy

and action, short and long term objectives can be met with an assessment as to the value of particular management initiatives and programs. The challenge for director of research agencies is to develop a set of performance indicators that are measurable and permits adequate reporting of performance to interest groups, and also provide information to management.

- Average response times to service to industries.
- Efficiency of using the places, buildings, laboratories, equipments, etc.
- Rank in R&D management of international comparison of science and technology indicators.

6.4 Phase II

The goal of Phase II is to foster the relationship between industry and university through enhancing the existing Agency Model within 2 years.

6.4.1 The Role of Universities in Phase II

In Phase II, universities need to acquire a greater understanding of business. In order to do so, they need to improve their outreach mechanisms and commit resources and efforts to develop linkages with industry and society. They need to expand the roles and channels of the agencies to be as a focal point to service the industries. Most of projects contacting with industries should be went through the agencies. University personnel should be encouraged to work with industry through incentive schemes, which explicitly reward university staff that reach out to meet the needs of industry. To increase opportunities for interaction, information on university capabilities and resources need to be widely disseminated to industry.

The role of universities in Phase II are recommended as follows:

1) Well-defined and understood community needs.

It is crucial that agency offices be world class in their ability to screen and evaluate research-based innovations in order to identify those with commercial potential. Universities must clearly understand local needs to develop appropriate and evolving programmes that not only meet current needs but continue to meet needs as the change over time.

Agency offices also need to walk the floors and help academic researchers recognize when their discoveries or inventions have commercial potential. Without such assistance, opportunities to realize innovations are lost because researchers are understandably less familiar with the needs and opportunities in the market place.

2) Develop marketing plan and promote the universities service to public.

Marketing plan is necessary in attracting the industrial sector to be a partnership. Develop a marketing plan based on university inventory results and a target area based on the university's major competitors and their targets, the university's areas of excellence, and geography. After developing marketing plan, universities have to promote their services. Moreover, they have to publicise the agencies as focal point to service to industry aggressively.

3) Expand universities services.

To foster the relationship between industry and university, universities should expand their services to various types. They may expand their services to provide support for business processes, create new business opportunities, etc.

4) Have effective relations with the public research institutions.

Having effective relations with the public research institutions is essential. The research team can carry out the research with the help of researchers from the public research institutions.

5) Seek sponsorship from industries for university research

Steps in seeking sponsorships from industries for university research agencies suggested by Gray and Walters (1999) are as follows:

- a) Targeting. The greatest source of leads is always personal contact. The centre director, industry advisory board members, faculty, graduate students, administration should list their network of contacts as potential customers.
- b) Contact. The goal here is building a foundation for a cooperative working relationship. At the first meeting, repeatedly describe how the university can help the company, while discussing major problem areas, new areas, how the two organisations' capabilities complement each other, and how much money is available for research. Don't discuss particular projects at the first meeting.
- c) Explore. Two way communication is key. Potential customers are encouraged to express their needs and how they hope to benefit from partnership, while sales people learn as much as they can about the potential customer and begin to suggest ways the partnership can help meet the expressed needs. Information exchange and answering questions should lead to a visit.
- d) Collaborate. Once the potential customer has a complete picture of the services being offered and the sales person fully understand the customer's needs.
- e) Confirm. If all goes well, confirming the partnership is a logical conclusion to the collaborative process. The develop proposal. The proposal should positive and brief. In a few pages, explain university

ideas, how it will help the company, how long the project will take, and how much it will cost. Make a second appointment to discuss the proposal. When technical details have been agreed upon, settle all issues regarding costs, policies, patents and publication rights to avoid problems later. Patience, persistence, a positive attitude, and an understanding of how the university can help the industry are key factors.

- f) Assure. The level of communication after agreement must intensify, not diminish. The industries must be assured that their satisfaction is not just part of the sales, but agencies philosophy. Industry advisory board members are encouraged to communicate any concerns. The centre evaluator can conduct an entry interview to give industries to express their ideas, and the centre director should schedule a visit to industries' facility.

- 6) Maximise the value of the public investment in research.

Agency offices should instead endeavour to maximise the value of the companies which license their innovations and maximise the value of the companies they create. If they are successful in maximising their clients' value, universities will maximise the economic and social returns to Thailand as well as to themselves. In the post-partnership phase, universities require the capacity to manage equity portfolios over an extended period.

- 7) Expand the network of industry-university partnerships to the national and international level.

Globalisation increasingly drives company strategies because national boundaries are no longer seen as limiting factors in company development. Therefore, link industry and academic R&D activities in a particular area of science and technology is necessary and should expand the network of industry-university partnerships to the national and international level.

- 8) Study feasibility for setting up research-oriented parks in Thailand's university and academic institutions.

In order to approach research-oriented park in Phase III, universities should study the origins, principles, objectives, operations of various science and technology in various countries, and the feasibility of setting up research-oriented park in Thailand.

6.4.2 The Role of Industries in Phase II

In Phase I, the recommend for industry is industry initiatives to reform itself to ready for corporate with university. In this phase, the industry should bridge the gap between industry and university relationship that make it feel trust in university service. Phase II is steps for industries plan the research collaboration with universities.

The 22 steps that follow are offered primarily as a checklist of general operating principles to guide company team planning and actions in such cooperative research deriving from interview results. It would be a mistake to view these in a narrow, rigid

manner. Rather, they should be evaluated for relevance and harmony with the interests of both partners.

- 1)** Develop a clear understanding of the organisation's technical and business objectives, strengths, and weaknesses prior to research project formulation.
- 2)** Set up a mission statement that clearly defines the general objectives and strategies of the industry-university collaboration program. These must be aligned with the company vision and business purpose. The statement should describe the benefits sought from the university relationship. When the objectives are accepted and approved by management, they become a standard by which the relevancy and accomplishment of more specific project objectives and actions may be measured.
- 3)** Develop a plan and a set of criteria for screening, ranking, and selecting projects that offer highest potential value and portfolio balance versus company needs and limitations.
- 4)** Seek the counsel and active support and participation of functional managers, business teams, and technical professionals who may have a stake in the research.
- 5)** Develop a classification procedure that categorises the research activities/areas to be covered, and allocate an appropriate percentage of the budget to each category.
- 6)** Select company technical liaisons with the same care as the projects, based on their competence in the project field, communications and interpersonal skills, and understating of company needs.
- 7)** Develop a set of criteria for university selection based on track record, enthusiasm for project, flexibility, quality of students, previous cooperative associations, and so on. Give preference to university with geographic proximity (other factors being comparable). This will result in more frequent contacts at the working level, contributing greatly to the effectiveness of the project.
- 8)** Be open-minded and flexible in dealing with the universities' need/mandate to publish or otherwise disseminate the information generated by their research.
- 9)** Work cooperatively with the faculty member in preparing a research proposal that outlines project goals, directions, and milestones that are satisfactory to both parties.
- 10)** Maintain an open mind in evaluating the merits of university ideas, approaches, and accomplishments relative to those developed in-house.
- 11)** Set challenging, attainable objectives and milestones, but maintain flexibility in adjusting project priorities and directions based on the research output.
- 12)** Tailor the terms sought in the negotiation to the needs of the company and to the nature of the project. Previous company agreements can serve as model in identifying key issues and developing company positions. Provide

incentive to the university team by offering a royalty for any commercially successful discovery.

- 13)** Maintain observation for patentable discoveries and take the initiative in developing patent filing strategies, including foreign filing, with the assistance of both partners' legal departments or intellectual properties institute.
- 14)** Insist on the opportunity review prepublication papers and other forms of public disclosure of the research results. Such disclosure prior to domestic filing may bar the acquisition of a patent in key foreign countries.
- 15)** Ascertain that the project objectives are understood, and then allow the university investigator the freedom to pursue these as he wishes.
- 16)** Maintain observation and active interest in the continued relevance of the work in progress. Develop a strategy for communicating research progress. Schedule regular written reports and meetings to review project status, issues, and future directions.
- 17)** Weigh the potential risks and rewards of disclosure. Convey in writing information that can contribute significantly to the speed/quality of the research. This should be done subject to faculty member acceptance and under conditions specified in a confidentiality agreement.
- 18)** Enlist management's support and the involvement and commitment of cross-functional company members who may benefit from the research results.
- 19)** Develop a plan to enhance understanding and support for the enterprise through periodic summary review of project accomplishments with the senior and functional managers as well as the professional staff.
- 20)** Adapt and relate evaluation criteria to end results that are valued and that fall within the control of the respective partner.
- 21)** Develop ways for recognising and rewarding contributions and achievements by company and university members of the project teams.
- 22)** Investigate the nature and eligibility for federal or state-supported assistance and/or matching funds for company-university research grant, contract, or collaborative projects.

6.4.3 The Role for Government Support in Phase II

At the same time, the government should support both sides of universities and industries in Phase II. The role for government support in Phase II is recommended as follows:

- 1)** Flexible government programs enough to help new ventures in commercialising advanced technologies developed by universities.
- 2)** Direct promote the linkage activities and mechanism by technical advisory support, financial and fiscal incentives for promising activities, and fiscal incentive for corporate charity and other support for increased private sector participation in university.

- 3) Funding support for collaborative projects.
- 4) Develop information links and facilitate partnership.
- 5) Promote industry-university linkage management skills.
- 6) Devise and operate programs to make technologies that university-derived technologies have appreciable utility to many national programs as well as the industrial sector readily available to all users.
- 7) Introduce explicit programs to enhance regional cooperation in the area of industry-university collaboration.
- 8) Promote the trend toward life-long learning and ongoing and continual education—especially in the science and technology areas.
- 9) Support investment in the information technology infrastructure to facilitate personnel and communications development, especially in areas that are conducive to industry-university collaboration.

There should be a joint-task force between university, industry, and the government to pave the way for mutual cooperation. This task force could work to set a clear and encouraging policy framework, to consider issues and problems, and to engineer solutions.

6.4.4 Performance Indicators

Performance indicators provide a mechanism to measure and report performance. The application of performance indicators are integral to the management reporting process, they also act as a marketing aid and assist in negotiations with employees or financial supporters. Consequently, the management value of indicators is not fully utilized because of the subjective use, or abuse by managers and the community. To gain the absolute benefit of performance indicators requires the implementation of appropriate management techniques.

The recommended performance indicators for Phase II are:

- Number linking mechanisms or types of university service to industries.
- Number of joint research with the industrial sector.
- Income of research agencies.
- Number of employees in research agencies.
- Rank of international comparison of science and technology indicators.

In addition to performance indicators, benchmarking is another measuring success. Benchmarking is an appropriate technique to determine what is 'the way of best of the best' and therefore what is acceptable as an indicator of success. For benchmarking to be meaningful it has to occur against other research agencies at a number of levels, including:

- Locally- against competitors in the region.
- Regionally- against research agencies of similar age, size and political system.
- Globally- in terms of 'world best practices'.

6.5 Phase III

The goal of Phase III is to establish the Research-Oriented Park Model in each region of Thailand within 3 years after implementing Phase II. Research-oriented park is an important element in the spatial distribution of economic development. A research-oriented park provides the services to carry out the innovative activities such as education and training, information, patenting, licensing, entrepreneurial services, commercial promotion, financing and venture capital, etc. Each stage of growth of research-oriented is recommended as follows:

First Stage: focuses on developing a park with emphasis on marketing a new high tech real estate location. Strong commitment from the government is necessary to succeed in this initial stage. The research university plays a major role in attracting high-tech and knowledge-based firms.

Second Stage: emphasises on the process of cross-fertilisation to link the key persons in each composition of the park. This stage involves the grooming and interaction of links.

Third Stage: involves the conversion of ideas into entrepreneurial projects and then finding investors with seed money to fund the projects. In addition, sustaining emerging firm requires an environment conducive to entrepreneurship. Such an environment has to be equipped with favourable financial and capital market policies, strong educational system, facilities that include networking, etc.

In order to succeed in implementing each stage, the following strategies are recommended to succeed in its management.

- The leaders for research-oriented park are very important for the success of park. A park should have visionary leaderships and the president of the university should become a strong supporter of industry-university partnerships.
- The mission of park should be clear and significant strategies have to follow the mission.
- The rental site fee including research equipment should be set in slightly cheaper level than average rental office in the city.
- The park has to develop a marketing strategy appropriate for the region in which it operates.

- The park should identify the opportunities emerging in the region of its operation and also attempt projection of future trends. These opportunities may be evaluated against the local strengths and wherever improvements are possible with extended tie-ups, such alliance should be explored.
- The park should create a database of the profiles of the finest companies and communicate the same to other parks in a bid to investigate into assessable for fostering links.
- The park have to promote cooperation and collaboration in research development among companies and organisations in areas of mutual interest, especially those relevant to economic and social development.

6.5.1 Performance Indicators

Performance indicators or success measures are essential tools in the management of any business. Performance indicators for the research-oriented park will need to satisfy a large number of specific interest groups, including universities, inventors, companies of all sizes, governments, bankers and the community.

In determining the appropriate measures of success, the recommended issues that manager or director of park should identify may include:

- Number of technology transfer (primarily outward from the universities).
- Number of loss of the most capable researchers to other countries – the brain drain, and the reversal of this process.
- Number of creating employment opportunities for graduates and post graduates.
- Number of successful companies in technology based industries.
- Number of increasing the development of high-value added industries (mainly manufacturing).
- Rank of international comparison of science and technology indicators.

This factors will become the long term success indicators for the parks, along with a number of business indicators relating to the operational performance of the park. These include returns on investment, profitability and debt ratios. The park manager will be responsible for the identification of the measures of success to be used and for the measures that are required to satisfy the collection of interest groups that have an involvement in the park and its outcomes. Operationally, this will require the identification of specific performance indicators for one or more interest groups.

Constant monitoring of the performance of international “best practice” of benchmarking is needed. The benchmarking may emphasis against non-Thailand parks and Thailand parks, as well as against policy of governments in regard to regional development, employment and economic growth.

In sum, there are three phases to approach Research-Oriented Park Model, which is the model that are the most successful in partnership with industry. The summary of each phase are shown in Table 6.2 .

Table 6.2 Summary of Each Phase to Approach Research-Oriented Park Model

Phase	Goal	Time	Output	Performance Indicators
I	Reform the universities' administrations and academic processes.	2 years	More efficiency university operation, R&D oriented industry with more innovative capabilities	<ul style="list-style-type: none"> - Average response times to service to industries. - Efficiency of using the places, buildings, laboratories, equipments, etc. - Competitive S&T rank in R&D management
II	Foster the relationship between industry and university through enhancing the existing Agency Model.	2 years	A number of university services, cooperative researches, successful Agency Model	<ul style="list-style-type: none"> - No. of linking mechanisms - No. of joint research with industrial sector - Income of research agencies - No. of employees in research agencies - Competitive S&T rank
III	Establish the Research-Oriented Park Model in each region of Thailand.	3 years	Research-Oriented Park	<ul style="list-style-type: none"> - No. of technology transfer - No. of loss of the most capable researchers to other countries - No. of successful companies - Development of high-value added industries - ROI, profitability and debt ratios - Competitive S&T rank