- There is an effort from the head of Faculty of Engineering to accommodate and coordinate research activities and public services into one stop services.
- There is an effort of Faculty of Engineering to cooperate with the related institution within Local Government of NTT province to conduct SME development activities.
- The Government policy to concentrate the development in east Indonesia makes the effort to develop NTT more focused.
- The implementation of Regional Autonomy gives more authority to regional government to develop its SME.

Threats

- In facing globalization era, SMEs are required to have human resource professionalism and the effective, efficient and international standard management.
- High competition of similar products.
- There are some international agreement (AFTA, APEC and WTO) that should be implemented soon in multilateral trade.
- The opportunity of big scale and modern trade business located close to the traditional market.
- The condition of export market destination is very competitive. Besides that, it is often create some issues which are not related to the business, such as: human rights, environment safe, labor, dumping, subsidize democracy and others.
- Barrier to domestic security is also one of the constraints for SME development.

Chapter 4 ENGINEERING FACULTY COMPETENCE AND LINKAGE PROGRAM PERFORMANCE

4.1. COMPARATIVE UNIVERSITY COMPETENCE ANALYSIS

The engineering faculty competence and linkage performance is analyzed based on three parameters, i.e. *Teaching Staff Competence Mapping, Teaching Activity Competence, and Competence in Research Activities.*

The *Teaching Staff Competence Mapping* is performed by analyzing two indicators such as teaching staff composition by degree and teaching staff supply by study program. The *Teaching Activity Competence* is constructed by producing ratios between number of students to teacher supply, number of students to number of study programs, and number of students to number of research. Basically, the *Competence in Research Activities Comparison* is carried out to produce ratios between research activities, number of students, number of research center, number of laboratory, number of SME research and number of teachers.

The engineering faculty of UGM is top ranked with the highest teaching staff composition by degree, if compared to other engineering faculties. However, the teaching staff supply of this faculty is much lesser compared to the top ranked teaching staff supply by study program, i.e. the engineering faculty of UNRAM. In terms of the ratio of number of students to study program, the engineering faculty of UGM is the highest. With lesser number of students and higher number of research, the engineering faculty of UNDANA, is ranked as the top ranked engineering faculty. However, if all parameters is combined, the engineering faculty of UNHAS is the top ranked engineering faculty. The detailed description of this analysis result is presented below.

4.1.1. Teaching Staff Competence Mapping

There is no standard on ratio of number of teachers to a study program in an engineering faculty. The government only regulates the minimum number of teacher per study program. This section is describing the mapping of the strength of each engineering faculties of the universities in terms of number of teacher categorized by educational background/ degree per study program.

Table 4.1.1.1. Summary of Teaching Staff Composition (by degree)

2004-2005	Teacher with S1 degree	Teacher with S2 degree	Teacher with S3 degree	Total Teachers	Rating: No. of Teachers by degree			
					S1	S2	S3	Total
					15%	35%	50%	∑all
UGM	91	204	116	411	13.65	71.40	58.00	143.05
UNAND	29	97	19	145	4.35	33.95	9.50	47.80
UNHAS	127	104	30	261	19.05	36.40	15.00	70.45
UNM	83	59	5	147	12.45	20.65	2.50	35.60
UNRAM	17	114	5	136	2.55	39.90	2.50	44.95
UNDANA	33	35	2	70	4.95	12.25	1.00	18.20
Total	380	613	177	1,170				
Average	**63**	**102**	**30**	**195**			Average	60.01

Source: Field Survey at each University, 2005

From the table shown above, it is obvious that the number of teaching staff of Engineering Faculty of UGM (University of Gadjah Mada) exceeds the other Engineering Faculties in other universities. The Engineering Faculty of UGM employed 411 teachers from various level of educational background. The huge number of teachers is dedicated to perform teaching activities in 11 (eleven) study programs.

On the contrary, with only 3 (three) study programs, the Engineering Faculty of UNDANA (University of Nusa Cendana) employs 70 teachers. Although similar to Engineering Faculty of University of Mataram (UNRAM) which has 3 (three) study programs in its engineering faculty, the Engineering Faculty of UNDANA is the engineering faculty who employs the least teachers compared to others. This is due to some "contracted" teachers who are still taking further education. There is a dispute amongst UNDANA on the future of the engineering faculty which is planned to be managed under Math and Nature Science Faculty.

The Engineering Faculty of UNHAS (University of Hasanuddin) employs more S1degree holder teachers compared to other engineering faculty of other universities. Most of the teachers of the Engineering Faculty of UNHAS are alumni. There has been indicated that priority will be granted to UNHAS graduates if they are applying to become teachers to the university. The engineering faculty of UNRAM (University of Mataram) is the least engineering faculty which employs S1 graduated teachers (17 teachers). According to the faculty support staff, this was due to 15 (fifteen) teachers are still taking further education.

It is logical that the engineering faculty of UGM (University of Gajah Mada) become the most S2 and S3 graduated teachers employing engineering faculty (employs 204 S2 graduated teachers and 116 S3 graduated teachers). This situation is necessary to accommodate teaching activities its 11 (eleven) study programs of the engineering faculty in UGM. On the contrary, the least S2 and S3 employing engineering faculty is UNDANA (University of Nusa Cendana) which employs only 35 (thirty five) S2 graduated teachers and 2 (two) S3 graduated teachers. This condition is may be unfavorable, yet it is acceptable due to complex problem faced by the engineering faculty of UNDANA. The engineering faculty of UNDANA can not afford to employ more S2 and S3 graduated teachers due to several problems, such as:

a. There are only 3 (three) study programs in the engineering faculty which has small number of students.
b. It is not easy to get students due to low purchasing power of the province and low interest to get further education.

c. UNDANA has set a discounted tuition fee and extensive scholarship program (not only to top rank students but also to low financial capability families) to invite students, but not much result gained.

d. As the discounted tuition fee and extensive scholarship strategy is implemented, the revenue of the faculty is very limited. Therefore, the faculty could not afford to employ more teachers.

e. UNDANA has planned an extensive linkage program in 2006 - 2010 to generate more fund from royalty to support the teaching activity

From the number of teaching staff point of view, based on the scoring as applied in the table 4.1.1.1 above, the engineering faculty of UGM is ranked as the top engineering faculty and the least ranked is the engineering faculty of UNDANA.

BOX:

Scoring Calculation:

a. basic assumption:
- *S1 graduated is granted as 15% of the total weighted average*
- *S2 graduated is granted as 35% of the total weighted average*
- *S3 graduated is granted as 50% of the total weighted average*

b. The calculation:
- *The number of teacher is multiplied by the "share" of the total weighted average, example*
  - *UGM: 91 x 15% + 204 x 35% + 116 x 50% = 143.05*
  - *UNHAS: 127 x 15% + 101 x 35% + 33 x 50% = 70.90*
  - *etc.*

To evaluate the load of teaching staff, it is imperative to calculate the ratio between the number of teachers and the number of study program. By comparing the number of teaching staff (classified by educational background level) to the number of study program, rating of each university based on teacher availability per study program can be identified. For this purpose, a similar scoring system is applied. The calculation of the rating is presented on table 4.1.1.2. as shown below.

Table 4.1.1.2 Summary of Teaching Staff Supply (by Study program)

2004-2005	Study Program (SP)	Teach. (S1) /SP	Teach. (S2) /SP	Teach. (S3) /SP	Rating: Teachers by Study Program			
					S1	S2	S3	Total
					15%	35%	50%	?all
UGM	9	10.11	22.67	12.89	1.52	7.93	6.44	15.89
UNAND	5	5.80	19.40	3.80	0.87	6.79	1.90	9.56
UNHAS	6	21.17	17.33	5.00	3.18	6.07	2.50	11.74
UNM	5	16.60	11.80	1.00	2.49	4.13	0.50	7.12
UNRAM	3	5.67	38.00	1.67	0.85	13.30	0.83	14.98
UNDANA	3	11.00	11.67	0.67	1.65	4.08	0.33	6.07
Total	31							
Average	5	12.26	19.77	5.71			Average	10.89

Source: Field Survey at each University, 2005

At average, an engineering faculty of a university which has 6 (six) study programs would have approximately 102 (one hundred and two) teachers with post graduate (S2) degree.

It is clear that the engineering faculty of UGM (University of Gajah Mada) leads the position whereas its engineering faculty has 11 study programs with more than 200 teachers with S2 degree.

Chart 4.1.1.a.

The engineering faculty of UNDANA (University of Nusa Cendana) has only 3 (three) study programs and supported with less than 50 teachers with S2 degree. With the same number of study programs, the engineering faculty of UNRAM has more teachers with S2 degree (more than 100 teachers) compared to the engineering faculty of UNDANA.

Chart 4.1.1.b.

Although the engineering faculty of UNHAS (University of Hasanuddin) and UNM (State University of Makassar) has 6 study programs, the engineering faculty of UNHAS has more teachers with S2 degree compared to the engineering faculty of UNM. The engineering faculty of UNAND (University of Andalas) has 5 (five) study programs which are supported by 97 teachers with S2 degree.

Chart 4.1.1.c

The mapping of the number of teacher with doctoral (S3) degree by the number of study programs is shown on a matrix below. Similar to the previous matrix, the position of UGM is quite strong which has 116 doctoral degree holders teaching. On the contrast, the engineering faculty of UNDANA has only 2 (two) teachers who has doctoral degree. The mapping of the number of teacher who has doctoral degree is more likely similar to the mapping of the number of teacher who has post graduate degree.

Chart 4.1.1.d.

From the matrix presented above, it is clear that UGM still leads the competition, whereas the position of the university is located at "Star" position (although more likely become "Dogs". The most interesting issue is that UNRAM has the best strength position in terms of achieving highest S2 Graduated Teacher to Study Program Ratio although has weak position in S3 Graduated Teacher to Study Program Ratio. This position is classified as "Questions". The main reason of being named as "Questions" is that it may lead to become "Star", "Dogs" or "Cash cow". It is

estimated that the position of UNRAM will become better and tends to become "Star' within the next two years as some of their teaching staff will return from S3 studies.

The ratio of S1 degree holder teachers to number of study program shows that Engineering Faculty in UNHAS (University of Hasanuddin) is the highest compared to other Engineering Faculty in other universities. The Engineering Faculty of UNHAS employs approximately 21 teachers per each study program. This is almost double to the average S1 graduated teacher per study program (approximately 12 teachers). Consequently, the ratio of S1 graduated teacher per study program of the engineering faculty of UNRAM (University of Mataram) is the lowest (approximately 6 teachers).

The ratio of S2 degree holder teachers to number of study program shows that Engineering Faculty in UNRAM (University of Mataram) is the highest compared to other Engineering Faculty in other universities. The Engineering Faculty of UNRAM employs 38 teachers per each study program. This is far higher compared to other engineering faculties, even Engineering Faculty of UGM (approximately 23 teachers per study program). The ratio of S2 graduated teacher per study program of UNDANA (University of Nusa Cendana) is the lowest compared to others (approximately 12 teachers per study program).

The ratio of S3 degree holder teachers to number of study program shows that Engineering Faculty in UGM (University of Gajah Mada) is the highest compared to other Engineering Faculty in other universities. The Engineering Faculty of UGM employs 13 S3 graduated teachers per each study program. This is far higher compared to other engineering faculties. The ratio of S3 graduated teacher per study program of UNDANA (University of Nusa Cendana) is the lowest compared to others.

Chart 4.1.1.2

As mapped on the chart 4.1.1.2., from the point of view teachers availability per study program, the engineering faculty of UNRAM (University of Mataram) has a better competitiveness

and competence compared to others. The second rank is the engineering faculty of UGM (University of Gajah Mada), which followed by the engineering faculty of UNHAS (University of Hasanuddin) in the third rank. And the lowest rank is the engineering faculty of UNDANA (University of Nusa Cendana).

Chart 4.1.1.3.

To evaluate more on engineering faculty of each university, the consultant team has conducted further analysis by elaborating the number of student and research which are described in the following section.

4.1.2. Teaching Activity Competence Comparison

The engineering faculty of UGM (University of Gajah Mada) has the biggest number of students (approximately 7,539 students) compared to other engineering faculties. On the other hand, the engineering faculty of UNDANA (University of Nusa Cendana) is the smallest number of students (478 students).

Table 4.1.2.1. Comparative Number of Students, Teachers, and Study Program

2004-2005	No of student	No of teacher	Study Program (SP)	Student/ Teacher Ratio	Student/ S. Program Ratio
UGM	7,539	411	9	18.3	837.7
UNAND	2,322	145	5	16.0	464.4
UNHAS	4,148	261	6	15.9	691.3
UNM	1,692	147	5	11.5	338.4
UNRAM	1,565	136	3	11.5	521.7
UNDANA	478	70	3	6.8	159.3
Total	17,744				
Average	**2,957**	**195**	**5**	**13.3**	**502.1**

Source: Field Survey at each University, 2005

It is obvious that with the biggest number of students and teachers has made the engineering faculty of UGM (University of Gajah Mada) become the top list of student to teacher ratio. Consecutively, the engineering faculty of UNDANA (University of Nusa Cendana) ranked as the lowest student to teacher ratio.

Chart 4.1.2.1

Even if it is divided into the number of study program, the engineering faculty of UGM (University of Gajah Mada) is placed at the top ranked engineering faculty with the highest student to study program ratio.

Chart 4.1.2.2

When combining the ratio of student per teacher and student per study program, the engineering faculty of UGM (University of Gajah Mada) is marked as "star". On the other side, the engineering faculty of is marked as "cash cow", due to small number of student and teachers involved in its 3 (three) study program of the engineering faculty. Marked as "dogs", the

engineering faculty of UNRAM (University of Mataram) is potentially tends to raise its position as "star".

The engineering faculty of UGM (University of Gajah Mada) has 30 (thirty) research center which make it a leader in possessing research center compared to other engineering faculties. Unlike the other engineering faculties, the engineering faculty of UNM (State University of Makassar) has only 1 (one) research center.

Table 4.1.2.1. Comparative Number of Students, Research Center and Research

2004-2005	No of student	No. of Research center	Student/ Research Center	No. of research	Student/ Research
UGM	7,539	30	251.3	77	97.9
UNAND	2,322	5	464.4	36	64.5
UNHAS	4,148	7	592.6	50	83.0
UNM	1,692	1	1,692.0	31	54.6
UNRAM	1,565	11	142.3	31	50.5
UNDANA	478	13	36.8	70	6.8
Total	17,744				
Average	**2,957**	**11**	**529.9**	**49**	**59.5**

Source: Field Survey at each University, 2005

Contrast to the other matrix, the matrix plot as shown in chart 4.1.2.3. should be read reverse. Since the third quadrant of the matrix, which is closer to "0" (zero) point representing a "star" position.

Chart 4.1.2.3

In terms of teaching activities involving teacher, student and research center, the engineering faculty of UNDANA (University of Nusa Cendana) placed as the "star", whereas the ratios of student per research center, student to research and student to teacher outstand the other engineering faculties. Of course, this does not indicate that the engineering faculty of UNDANA is the best amongst others. In order to decide which engineering faculty of is the best for linkage program, there must be other indicators to be considered, for example competence in research activities, especially SME research and development activities.

4.1.3. Competence in Research Activities Comparison

The competence of any engineering faculty to perform linkage programs should be primarily represented from its internal strength in qualified teachers availability and the capability to conduct research program. The previous section of this report has described the qualified teacher availability of all engineering faculties. This section will describe the capability of engineering faculty to conduct research and development program, especially linkage program for SMEs.

The significant parameter to denote the capability to perform research program are represented by

a. the ratio of total rating per study program,
b. the ratio of student per teacher,
c. the ratio of number of student per research center,
d. the ratio of student per laboratory,
e. the ratio of number of teacher per research,
f. the ratio of teacher per SME research,
g. the ratio of research per research center, and
h. the ratio of patent per research.

The first three parameters were discussed in the previous section of this report. This section will describe the last five parameters mentioned above. The summary of the ratios of the mentioned above parameters are presented on table 4.1.3 below.

Table 4.13. Compilation of Capability Parameters and Benchmarking

2004 - 2005 Ratios	? Rating/ Study Program	Student to Teacher	Student to Research Center	Teacher to Research	Teacher to SME Research	Research/ Research Center	Student/ Laboratory	Patent/ Research	Best MARK
UGM	15.89	18.34	251.30	5.34	-	2.57	15.08	9.09%	47.37%
UNAND	9.56	16.01	464.40	4.03	-	7.20	100.96	13.89%	37.23%
UNHAS	11.74	15.89	592.57	5.22	52.20	7.14	9.78	10.00%	52.00%
UNM	7.12	11.51	1,692.00	4.74	13.36	31.00	130.15	3.23%	39.46%
UNRAM	14.98	11.51	142.27	4.39	12.36	2.82	30.69	16.13%	51.53%
UNDANA	6.07	6.83	36.77	1.00	6.36	5.38	12.26	0.00%	41.60%
Average	11.61	15.17	264.84	3.97	30.79	4.40	16.90	8.47%	47.88%
Max	15.89	18.34	1,692.00	5.34	52.20	31.00	130.15	16.13%	
Min	6.07	6.83	36.77	1.00	-	2.57	9.78	0.00%	
Benchmark	15.00	20.00	2,300.00	8.00	100.00	35.00	200.00	100.00%	TOTAL
UGM	105.96%	8.28%	89.07%	66.72%	0.00%	7.33%	92.46%	9.09%	378.93%
UNAND	63.73%	19.93%	79.81%	50.35%	0.00%	20.57%	49.52%	13.89%	297.80%
UNHAS	78.28%	20.54%	74.24%	65.25%	52.20%	20.41%	95.11%	10.00%	416.02%
UNM	47.47%	42.45%	26.43%	59.27%	13.36%	88.57%	34.92%	3.23%	315.71%
UNRAM	99.89%	42.46%	93.81%	54.84%	12.36%	8.05%	84.66%	16.13%	412.21%
UNDANA	40.44%	65.86%	98.40%	12.50%	6.36%	15.38%	93.87%	0.00%	332.82%
Average	77.43%	24.17%	88.49%	49.58%	30.79%	12.58%	91.55%	8.47%	383.06%

Source: Field Survey at each University, 2005

The engineering faculty of UNDANA (University of Nusa Cendana) has the lowest ratio of teachers to research (1.00) compared to other engineering faculties. This means that the teaching staff has a strong dedication to its role both as teacher and researcher. Further if the ratio is broken down into more detailed, it is surprising that although supported by limited number of teachers and laboratory, the engineering faculty of UNDANA has the best ratio of the number of teachers to the number of SME researches. In short, the engineering faculty of UNDANA can be classified as superior in SME research.

Unfortunately, due to there is no SME research data, the performance of the engineering faculty of UGM (University of Gajah Mada) can not be measured. However, the engineering faculty

of UNHAS (University of Hasanuddin) has the highest ratio of teacher to the number of SME research. It is estimated that the fact of teachers in bigger university tends to overlook SME development was primarily caused due to the teachers are already occupied with his/ her teaching activity (and other side job). The number of teachers employed in bigger engineering faculties is bigger than the small ones. This has made the ratio become high and can be classified as unfavorable.

The engineering faculty of UNM (State University of Makassar) recorded a remarkable research to research center ratio, whereas approximately 31 (thirty one) researches has been made from one research center at average.

Although has the second lowest of research to research center ratio, the engineering faculty of UNRAM (University of Mataram) has recorded a remarkable performance in their effort to obtain patent. Almost 16.13% of the research being made by the engineering faculty of UNRAM, is registered for patent. This figure is exceptional.

The compilation of capability parameters and benchmarking of the engineering faculty of UGM, UNHAS, UNAND, UNRAM, UNDANA and UNM is drawn into bar chart as shown on chart 4.1.3.4. presented below.

Chart 4.1.3.1.

To get clear picture of linkage program performance in terms of the capability of each engineering faculty, the consultant team has converted the scale of capability parameters into a comparable scale, i.e. scaling into percentage of expected benchmark.

Chart 4.1.3.2.

By mapping the compilation of capability parameters and benchmarking into a concluding matrix as presented below, the engineering faculty of UNHAS is recorded as "star". The second place is the engineering faculty of UNRAM.

As being mapped in the chart presented above, the capability of the engineering faculties are ranked as follows:

Rank 1.	The engineering faculty of UNHAS	score: 52.00
Rank 2.	The engineering faculty of UNRAM	score: 51.53
Rank 3.	The engineering faculty of UGM	score: 47.37
Rank 4.	The engineering faculty of UNDANA	score: 41.60
Rank 5.	The engineering faculty of UNM	score: 39.46
Rank 6.	The engineering faculty of UNAND	score: 37.23

4.2. *POTENTIAL SOURCE OF REVENUE THROUGH LINKAGE PROGRAM*

4.2.1. Faculty Budget

Main source of university budget is provided by National Government through Department of Education. As numbers of engineering faculty student continuously increased overtime and at the same time there is a strong demand for a high quality of university, additional budget is required. Without presenting statistical figure, there is a wide gap between annual available budget and needed budget, which cannot be provided by National government. Another problem found at faculty of engineers is there is wide gap between annual budget for education and research (80 to 20%).

Table 4.2.1 Budget Allocation for Research Program and SME Development

Engineering Faculty	Budget Allocation (% of total)	
	Research Program	SME Development
UGM	10% of total budget	0% of research program
UNAND	15% of total budget	5% of research program
UNHAS	20% of total budget	10% of research program
UNM	10% of total budget	15% of research program
UNRAM	15% of total budget	20% of research program
UNDANA	10% of total budget	20% of research program

Source: Consultant Team based on Interview

4.2.2. Donor/ Foundation

To solve some of the gaps problems in allocating its budget for SME development, the universities are taking various collaborations with private sectors especially with large companies, for example, joint research with BPPT, LIPI, international and national donors. To some extent, some university begins to develop its own subsidiary corporation/ institutions to manage research fund from third parties.

All of these collaboration and efforts are large part in its design increase research and extension capabilities of university. The recent effort made by University of Indonesia (UI), University of Gajah Mada (UGM), Institut Teknologi Bandung (ITB) and Institut Pertanian Bogor (IPB) are seriously planning to become university research center (URCs).

Recently in September 2005, the Coordinating Ministry of Economy and Industry has come into an agreement with 8 (eight) engineering faculties of respected state universities to collaborate in rural infrastructure development project which is financed by ILO. The 8 universities involved are UGM (University of Gajah Mada), ITB (Technology Institute of Bandung), UNRI (University of Riau), UNDAYA (University of Udayana, Bali), UNRAM (University of Mataram), UNTAN (University of Tanjung Pura, West Kalimantan), UNTON (University of Tondolako, North Sulawesi), and UNHAS (University of Hasanuddin).

The main role of the selected engineering faculties is to carry out a special study program for rural government officers. UNRAM (University of Mataram) is selected as an engineering faculty who will provide Diploma Program in Spatial Planning and Regional Master Planning. UGM (University of Gajah Mada) is selected to provide the post graduate program (S2 degree), and ITB (Institute of Technology Bandung) will carry out the doctoral degree program.

4.2.3. Collaboration with Private Sectors and R&D

The strength of UGM is that it has the most rich study programs on engineering fields as compared to any other target engineering faculty. Presumably, UNHAS and UNAND have proposed more higher patents because these two engineering faculties have a strong track record in collaborations on research with local industries such as large cement industries in West Sumatra (Semen Padang) and a couple of cement industries in South Sulawesi (Semen Tonasa and Semen Bosowa). On the other hands, UGM has made extensive collaboration with state owned enterprises (SOEs), such as PERTAMINA, PLN, PT TELKOM, etc.

The collaboration policy between local corporations and the local university varies among universities. Generally speaking, larger engineering faculties become the less interest they have in SME development. UGM has strong collaboration with private sector and big industries, but has "limited" or "not strong" collaboration with SMEs. The engineering faculties of universities in eastern Indonesia have more attention to SME development rather than large industries.

There is a reasonable explanation about the higher interests in SME development for smaller universities in Eastern Indonesia. This tendency can be explained because internal budget from tuition fees can be increased if the purchasing power of the people is improved. Therefore the engineering faculties of smaller universities are paying more attention to SME development. On the other hand, they have no other choice to do so because there are not very few large corporations in their regions. Further, large corporations tend to come to big universities rather than to smaller ones.

4.2.4. R&D, Innovation and Patent (IPR)

There is no another way for Indonesia to build its long term industrial competitive strength without improving technology capability for industries, including SMEs. As a comparison, the Chart 4.1 shows how weak Indonesian research capacity is compared with other countries.

National government was only allocated 0.25% of Gross National Products to R&D, which is equal to Rp. 1.25 billion for all research in Indonesia. LIPI received it Rp. 225 billion, BPPT has about 68 billion, LAPAN 20 billion, and the rest goes to other research institutions. In order to increase R&D capability, chairman of LIPI and other institutions jointly proposed that local government should allocate at least 2% of annual budget for local R&D.

Chart 4.2.4.1
Research and Development (R&D) Budget Allocation, Selected Asian and Developed Countries

Sources: (1) Umar Anggara Jenie, Chairman of LIPI, Bisnis Indonesia, October 11, 2005
(2) Newspaper, The Economist, October 8, Vol 14 2005

The ideas of the development of URCs are that the university should develop a strong basic and applied research capability for technological generating activities.

In order to pursue this objective, each faculty or university should prepare:

(1) High qualified researches in various science areas,
(2) Significant improvement on total funding for research activities by collaborating for any external institutions that could provide skill and funding.

If all of these efforts contributed to the research capacity and capability, it would create a much more balance between education and research activities in the university programs.

The Intellectual Property Right (IPR) in Indonesia is essentially comprises of two major elements:

(1) Copyright,
(2) Industrial property right.

The industrial property right consists of patent trademark, industrial design, and integrated circuit design and chips variety. There are two important national laws of national for managing intellectual property right in Indonesia:

1. Law No. 14 year 2001 on Patent, and
2. Law No. 7 year 1994 on Binding Agreement related to World Trade Organization which concludes trade related property rights (TRIPs).

To implement these two laws, there are two Presidential Regulation No. 16, year 1997 and No. 15 year 1997 on Paris Convention for protection of industrial property. Formerly, there were two government regulations No. 34 Year 1991 and No. 11 Year 1991 administers the issues. At departmental level, there are 7 (seven) regulations issued by Ministry of Justice and Human Rights.

The following is the general national model on how an individual, university or industrial society can apply for IPR.

Chart 4.8
Application Flow of Copyrights or Patent Rights

Source: Adopted from Directorate of Information Technology

It is important to make a note, when a university, faculty, or researchers invented a particular design or technology funded by university or by university in collaboration with private sectors or any external institution and would like to process to arrange copyright and patent right of the invention, there are following possibilities:

(1) Without any initial agreement between researchers within the university, the patent right or copyright benefit will fully goes to the university. If there is initial binding agreement, then university could make a certain share of benefits received from that copy or patent rights when application is started.

(2) If the application got through in one round without any objection from national and international industrial communities, it will require at least (the minimum months) 36 months. If not, it has to wait and go to another cycle which is time consuming, hence more money needed to regain the application process to the final decision from Department of Justice and Human Right, which is centrally organized in Jakarta. This process will take another 3 years to get the final approval of IPR,

To get through IPR process it has passed through many official tables and desks whereas become the most probable cause of why it take long time and need more fund.

The IPR processing charge is set forth on the table presented below:

IPR - PATENT REGISTRATION CHARGES
Non Tax State Revenue - Government Regulation (PP) No. 50/2001

Patent (Normal Rate)			Non Tax State Revenue	Simple Patent/ Special		
USD	IDR			USD	IDR	
	575,000	/application	1. Patent Application		125,000	/application
			2. Substantive Investigation		350,000	/application
	2,000,000	/application	a. Profit			
	900,000	/application	b. Non Profit			
	40,000	/claim	3. Sur-charge due to claimants		40,000	/claim
	450,000	/request	4. Patent type/ request revision		450,000	/request
	3,000,000	/request	5. Appeal Request		3,000,000	/request
			6. Former Inventor Documents			
	1,000,000	/request	a. Profit		1,000,000	/request
	450,000	/request	b. Non Profit		450,000	/request
	75,000	/request	7. Priority Right Certificate		75,000	/request
	100,000	/letter	8. Official Letter to get sample		100,000	/letter
	100,000	/request	9. Request to shift patent application		100,000	/request
	150,000	/patent	10. Patent Shift Registration		150,000	/patent
	100,000	/request	11. Application identity data change		100,000	/request
	150,000	/patent	12. Patent holders change		150,000	/patent
	1,000,000	/request	13. License act registration		1,000,000	/request
	5,000,000	/request	14. Patent Consultant Registration		5,000,000	/request
	60,000	/request	15. Patent Listing Summary		60,000	/request
	5,000	/page	16. Official Copy of patent document		5,000	/page
			17. Investigation			
	150,000	/subject	a. Domestic Patent Register		150,000	/subject
100.00		/subject	b. Intenational Patent Register	100.00		/subject
100.00	**15,305,000**	**/subject**	**TOTAL**	**100.00**	**12,305,000**	**/subject**

	IDR-Original	Additional/ claim (IDR)	18. Annual Patent Registration Renewal		IDR-Original	Additional/ claim (IDR)
IDR,y1	700,000	50,000	a. Year 1, after patent application registered	IDR,y1	700,000	50,000
IDR,y2	700,000	50,000	b. Year 2, after patent application registered	IDR,y2	700,000	50,000
IDR,y3	700,000	50,000	c. Year 3, after patent application registered	IDR,y3	700,000	50,000
IDR,y4	1,000,000	100,000	d. Year 4, after patent application registered	IDR,y4	1,000,000	100,000
IDR,y5	1,000,000	100,000	e. Year 5, after patent application registered	IDR,y5	1,000,000	100,000
IDR,y6	1,500,000	150,000	f. Year 6, after patent application registered	IDR,y6	1,500,000	150,000
IDR,y7	2,000,000	200,000	g. Year 7, after patent application registered	IDR,y7	2,000,000	200,000
IDR,y8	2,000,000	200,000	h. Year 8, after patent application registered	IDR,y8	2,000,000	200,000
IDR,y9	2,500,000	250,000	i. Year 9, after patent application registered	IDR,y9	2,500,000	250,000
IDR,y10	350,000	250,000	j. Year 10, after patent application registered	IDR,y10	350,000	250,000
IDR,y11	5,000,000	250,000	k. Year 11, after patent application registered	IDR,y11	5,000,000	250,000
IDR,y12	5,000,000	250,000	l. Year 12, after patent application registered	IDR,y12	5,000,000	250,000
IDR,y13	5,000,000	250,000	m. Year 13, after patent application registered	IDR,y13	5,000,000	250,000
IDR,y14	5,000,000	250,000	n. Year 14, after patent application registered	IDR,y14	5,000,000	250,000
IDR,y15	5,000,000	250,000	o. Year 15, after patent application registered	IDR,y15	5,000,000	250,000
IDR,y16	5,000,000	250,000	p. Year 16, after patent application registered	IDR,y16	5,000,000	250,000
IDR,y17	5,000,000	250,000	q. Year 17, after patent application registered	IDR,y17	5,000,000	250,000
IDR,y18	5,000,000	250,000	r. Year 18, after patent application registered	IDR,y18	5,000,000	250,000
IDR,y19	5,000,000	250,000	s. Year 19, after patent application registered	IDR,y19	5,000,000	250,000
IDR,y20	5,000,000	250,000	t. Year 20, after patent application registered	IDR,y20	5,000,000	250,000
	62,450,000	**3,900,000**			**62,450,000**	**3,900,000**

Source: Directorate of Information Technology

Given that all of time consuming and mind blowing funding needed to IPR process, it is doubtful that any engineering faculty or university would be encouraged to assist the patent application for SMEs. Therefore, in order to make IPR with patent as one source of university revenues, it will be required a strategy on how to define and simplify the process of IPR application, while also how to decide the royalty sharing among individual researcher(s), engineering faculty, university and other stakeholders.

It is crucial to gain IPR and Patent Right in order to get significant source of revenue from the research or research product. There must be two consequences from any research or research product, whereas experiencing failure or success. In the case of success story, the university would take the benefit (financially or non-financially, such as good reputation). However, when a failure is experienced, the university is the one who will take the risk or absorbing risk (or neutral to risks).

4.3. SOME IMPLICATIONS OF LINKAGE PROGRAM: INDUSTRIAL TECHNOLOGICAL CAPABILITIES (ITC), AND GAP ANALYSIS

4.3.1. Industrial Technological Capabilities (ITC)

For the last decades, Singapore is the most successful country among ASEAN countries in developing industrial technological capabilities for SMEs. This city-state has consistently applied a strategy of market mechanism intervention to improve its SMEs development. Thailand has developed industrial linkages between large corporations with SMEs which are based on the market mechanism where market linkages developed in the form of sub-contract arrangement but it is still remain below Singapore industrial technological capability performance. It was not introduced "deletion program" to develop sub-contract arrangement in the industrial technological capability (ITC) development. (Thee, 2005).

In 1980s, the Government of Indonesia (GOI) launched three types of policy linkage programs to improve ITC of SMEs:

a. promoting foster parent firm for SMEs development, so called "bapak angkat" system,
b. sub-contract arrangement between large and small industries, and ,
c. promoting Nucleus Estate System (NES) between large plantation and small farms.

The approach of the program is emphasized not so much on voluntary market system, but rather based on public services pushed by government. However, there were some successful case but overall performance of the programs was failed to achieve its objectives: to lift up SMEs. This was caused by the absorption capacity of SMEs for technology was low and needed to be improved.

The list of SMEs problem encountered as presenter in chart 1 on page 2 (chapter 1), is very useful to analyze the grass root of the problem. The problems encountered by SMEs can be categorized into two factors. The first factor is internal incapability, which comprises of incapability in production techniques/ expertise, supply/ stock of basic/ raw material and managerial skills. The second factor is external performance driven such as marketing (could also classified as internal if its related to marketing efforts undertook by the human resources of the SMEs) and market competition. The problem of capital shortage becomes an underlying factor which can be classified both internal and external.

Capital shortage as stated in the chart (based on DG SMEs and Cooperatives, 2004), concludes the need of financing aid for internal uses (such as equipment/ machinery procurement, to maintain inventory level, to pay human resources, to finance operational costs, to get further education/ training, etc.) and for external uses (such as to do exhibitions, to get IPR, to register the product, etc.).

In order to enabling SMEs to have better access for technological capability, the industrial and academic community should play important roles both as "technological support services" and actively working on the supply side in developing SMEs on entrepreneurial and technological capability as source of competitive advantage in the global market as found in Taiwan.

As in the case of Indonesia, ITC of SMEs were relied heavily on public institutions (government agencies) which is less effective as compared to the industrial demand and supply driven for ITC. The framework of ITC of SMEs explained above can be used to understand the linkage of SMEs with university. The strength of university/ engineering faculty on knowledge and technological generating providers can be improved and utilized as bridge to the gap for ITC of SMEs development.

To measure the effectiveness of a linkage program, it is obvious that the measurable indicator is increase in profit and improving market size. The consultant team has selected 10 samples of SMEs in each target provinces. The initial prerequisite of the sample is 5 samples of SMEs experiencing linkage program and 5 samples of SMEs without experiencing linkage program. However, this targeting could nor be performed as expected due to different industry distribution scheme, interest of the academic community, and limited time frame for the survey.

Table 4.2
Comparative SMEs Performance in Five Different Provinces
Based on Survey Sample taken in September 2005

Province	Sample of SMEs with and/or without linkage (n)				Difference/ Benefit Gained
	Total (n)	With	Without	Potential	
Jogyakarta, UGM	10	0	0	10	0%
West Sumatera, UNAND	10	0	0	10	0%
South Sulawesi, UNHAS,UNM	10	5	5	0	55%
West Nusa Tenggara, UNRAM	10	4	4	2	84%
East Nusa tenggara, UNDANA	10	2	1	7	48%

The benefits of having linkages are marginally higher than those SMEs without linkages. These imply that SMEs (in this case, SMEs do not necessarily linkage with Faculty of Engineer) have pick-up the advantages and benefits from what they learned and captured with any linkages programs chosen.

This research result provide us clues that (1) individual, SMEs does not working independently and (2) if university develops a well linkages with local government would promote

the growth of SMEs. The problem, however, as data and result of interview show although there is strong involvement of individual teaching staff on SMEs development, it was found a wide gap of faculty engineering R&D with the ITC of SMEs. This has to be bridging through various programs conducted by faculty of engineering.

4.3.2. Gap Analysis

As mentioned in the earlier of this report, the summary of interview with local government, engineering faculty officials and sample of SMEs, an interesting issue arises as i.e. there is still a wide gap on linkages between SMEs expectation with the public services provided by local government and/or the engineering faculty.

Chart 4.8
The Summary of Gap Analysis between ITC of SMEs with University and Local Government Works

Some identified factors that could influence the existing gap between ITC of SMEs and engineering faculty/ university and/or local government are:

(1) From the beginning of the development of Research & Development Center of engineering faculty or university was not designed to accommodate activities related to SMEs development

(2) Although the long term objectives are focused, the involvement of each stakeholder in SMEs development is rather sporadic and uncoordinated. And to some extent, the result may bias due to no follow up activities or unclear profit sharing from the exhibition. The invitation to SMEs to join the exhibition may not be disseminated/ socialized properly or the invitation becomes a compulsory which in turn the willingness to join from the SMEs are weak (at best still "up and down" passion).

(3) Budget limitation in part of local government and university c.q. engineering faculty to develop a formal long term linkages program,

(4) Besides performed weak coordination, the government is very often unintentionally create either difficult licensing or time consuming legal documentation process in various areas

(5) To some extent, most of the universities c.q. engineering faculties are not strongly familiar to handle the ITC of SMEs. However, there is an indication this may have

changes recently. The engineering faculties are now begun to be aware of establishing a solid connection of their program on ITC of SMEs.

In order to implement a program to reduce the expectation gap between SMEs and university c.q. engineering faculty, there are several strategic options could be undertaken:

a. Capability improvement of human resources in the engineering faculty

b. Improvement on the planning of R&D activities and industry sector selection.

c. Improvement for SMEs practitioners in entrepreneurial skill covering management, bookkeeping/ financial management and information technology

d. Improvement on user friendly applied technology and its technology absorption.

e. To involve local government in their regulatory function and budget allocation for R&D (to allocate funding of 2-3% from total annual regional budget for SMEs development).

f. The R&D at engineering faculty should be part of faculty study programs included in the polytechnic school.

Chapter 5 CONCLUSION AND RECOMMENDATION: TOWARD STRENGTHENING LINKAGE PROGRAM

5.1 CONCLUSIONS

Based on the discussion and finding presented in Chapter 2 to 4, some major conclusions can be extracted as follows:

1. In analyzing the engineering faculties' competence, there are 3 parameters used in this study, namely: Teaching Staff Competence Mapping, Teaching Activity Competence and Research Activities Competence. As the result, the engineering faculty of UGM is top ranked with the highest teaching staff composition by degree, if compared to other engineering faculties. However, the teaching staff supply of this faculty is much lesser compared to the top ranked teaching staff supply by study program, i.e. the engineering faculty of UNRAM. In terms of the ratio of number of students to study program, the engineering faculty of UGM is the highest. However, in terms of the number of research per student, the engineering faculty of UNDANA is ranked number 1 iamong the 6 target universities.

2. Concerning budget allocation, it was found that there was a wide gap between annual budget for education and research activities among the 6 universities. Indonesian national government only allocated about 0.25% of GDP for R & D activities. Likewise, the universities allocated the budget more for education (about 80%) than for research activities (about 20%). In order to increase the budget for research activities, especially for SME development, the universities have carried out some collaboration with large institutions, such as: BPPT, LIPI, international/national donors. Some target universities have also carried out extensive collaborations on research with large state owned enterprises or private companies such as PERTAMINA, PLN, TELKOM, Semen Padang, etc. The nature of collaboration between target

universities and private sectors are varies. In general, the larger Engineering Faculty with strong collaboration with private sectors has limited collaboration with SMEs, while the Engineering Faculties of smaller universities have been paying more attention to SME development.

3. IPR and Patent Right as one source of the university revenues is less facilitated, since the registration process takes a lot of fund and time. It will be required a strategy on how to define and simplify the process of IPR and Patent application. An IPR rule needs to be defined clearly in order to protect the research staff who made the invention and to decide the royalty sharing among the individual researcher, engineering faculty, university and stakeholders.

4. To measure the effectiveness of a linkage program, profit and market size are used as the main indicators. It is shown that all samples of industries in target provinces which implemented the effective and efficient linkage program have obtained positive benefit on their performance, such as higher revenue or market size. The clues are (1) SMEs does not working independently and (2) if university develops effective linkages with local government , it will promote the growth of SMEs. The problem, however, as data and result of interview show, although there is strong involvement of individual teaching staff on SMEs development, a wide gap can be observed between the engineering faculty's R&D and the Industrial Technology Capabilities (ITC) of SMEs. This gap should be bridged through various linkage programs conducted by faculty of engineering.

5. Some of identified factors that could influence the existing gap between ITC of SMEs and engineering faculty/ university and/or local government are:
   (1) From the beginning of the development of Research & Development Center of engineering faculty or university was not designed to accommodate activities related to SMEs development
   (2) Although the long term objectives are focused, the involvement of each stakeholder in SMEs development is rather sporadic and uncoordinated. And to some extent, the result may bias due to no following up activities or unclear profit sharing from the exhibition..
   (3) Budget limitation in part of local government and university especially engineering faculty to develop a formal long term linkages program,
   (4) Local government is very often unintentionally create either difficult licensing or time consuming legal documentation process in various areas
   (5) Most of the universities especially engineering faculties are not familiar with handling the ITC of SMEs although there have been some positive changes recently..

5.2. Recommendations

Finally, the major recommendations are elaborated as follows:

1. The existing condition where most SMEs remain weak in Industrial Technological Capabilities (ITC) is indeed challenges for increasing competitiveness under free economy, where SMEs need to improve its efficiency to the highest level through mastering new technology or upgrading old technology and enhancing entrepreneurships. In this context, university especially the faculty of engineering should play a strategic role to supply the new technology for industrial community. This brings a new challenge for Faculty of Engineering to develop and improve these technological capabilities.

2. The key for success to have a sustainable linkages program between university and industrial community would mainly depend on building the framework of incentive system, technological capability and institutions (organization) that could carry out the mission for improving industrial development through R&D. There is no other way out for SMEs development without

developing its industrial ITC. One of the most effective incentive systems for university to implement R&D activities for industries is to establish a solid Intellectual Property Right (IPR) rule between university faculty staff and industrial community. The research staff that made the invention should be well arranged and protected. The incentive system could be translated into set of institutionalized rule at university and faculty level, which could enhance the transfer of technology to SMEs.

3. Based on the result of the survey in Chapter 3, it shows that the SMEs who are making collaboration through linkage program make more benefits compared to the non collaborated SMEs. However, its technical transfer scope as well as process should be improved so that it can bring maximum benefits to SMEs within limited resources.

4. It is recommended to strengthen the role of university including faculty of engineering on R&D development by intensively searching a new technology or upgrading old technology for SMEs through: (a) reorganizing the faculty study program with well prepared research plan and activities from too much focused on collaboration with large corporations by taking more seriously to the development of SMEs, and (b) increasing university budget allocation for technological generating linkages programs. For the latter, the university should ask provincial government to allocate at least 2% of annual budget.

5. It is recommended to develop a linkages program between universities with SMEs by preparing a specific expertise through developing SMEs center under faculty of engineering that could function for such as improving skilled-design, information technology management, improving management product quality according to industrial standard. In this linkage program framework, university and faculty of engineering should strengthen their own R&D capability and capacity to carry out a continuous invention that technically could be transferred for SMEs development. All of these activities could work only if university extends collaboration with private sector or local government and organize a series of training program by providing upgrading technological capability and marketing skill for increasing common benefits.

6. As far as the context of technology transfer program for improving ITC of SMEs is concerned, it should be supported by external financial assistance for providing adequate (fixed) working capital, especially for those start-up companies or expansion of existing firms.

7. At the national level, government of Indonesia could take collaboration with Japan International Cooperation Agency (JICA) in working with mobilizing resources especially for those university which have better resources and nation wide network such as University of Gadjah Mada (UGM), Bogor Agricultural University (IPB), Bandung Institute of Technology (ITB), University of Airlangga (UNAIR) Surabaya, University of Indonesia (UI) etc, to develop a program focused on SMEs development through several types of linkage programs.

添付資料３（７）JICA側のプレゼンテーション内容（藤井団員、小野澤団員）

藤井団員プレゼンテーション

EXPENDITURE

School of Engineering Tokyo Institute of Technology

Cooperative Research

School of Engineering Tokyo Institute of Technology

Offices for Cooperative Research of Tokyo Tech

Office of Industrial Liaison

- Cooperative Research Contract

Technology Transfer Liaison Office

- Patent Application
- Technology Transfer to Industries

School of Engineering Tokyo Institute of Technology

Industry-University-Government Partnership

RECS International Inc.

Masato Onozawa, Consultant

2005/10/26 RECS International Inc. 1

Introduction

- Partnership among university, industry and community have become an attractive strategy for building healthy economy in many part of Japan;
- Each stakeholder sees significant opportunity to utilize their own resources; and
- The stakeholders, at the same time, faces many challenges to realize fruitful outcomes from the partnership.

2005/10/26 RECS International Inc. 2

Examples in Japan (survey in FY2004)

Category	Higher Ed. Institutions in Japan				Responded to the Survey				
	Univ.	Tech. College	Other research Inst.	Total (A)	Univ.	Tech. College	Other research Inst.	Total (A)	Ratio (B/A*100%)
National Univ.	89	55	4	148	89	55	4	148	100.0
Private Univ.	775	3	-	778	637	3	-	640	82.3
Other Public Univ.	128	5	-	133	69	4	-	73	54.9
Total	992	63	4	1059	795	62	4	881	81.3

Source Ministry of Education, Culture, Sports, Science and Technology

2005/10/26 RECS International Inc. 3

No. of Japanese universities implementing partnership projects (FY2004)

Category	University Responded				University Implemented Joint Research				
	Univ.	Tech. College	Other research Inst.	Total (A)	Univ.	Tech. College	Other research Inst.	Total (B)	Ratio (B/A*100%)
National Univ.	89	55	4	148	76	53	3	132	89.2
Private Univ.	637	3	-	640	110	2	-	112	17.5
Other Public Univ.	69	4	-	73	38	1	-	39	53.4
Total	795	62	4	881	224	56	3	283	32.9

Source: Ministry of Education, Culture, Sports, Science and Technology

2005/10/26 RECS International Inc. 4

Number of R/D projects partner with private sector & Univ.

FY 年度	National Univ.		Private Univ.		Other Public		Total 合計
	No of Projects 実施件数	Annual Increase 前年比 (%)	No of Projects 実施件数	Annual Increase 前年比 (%)	No of Projects 実施件数	Annual Increase 前年比 (%)	
2000	4,029		Data N/A	-	Data N/A	-	-
2001	5,264	31%	Data N/A	-	Data N/A	-	-
2002	6,767	29%	Data N/A	-	Data N/A	-	-
2003	8,023	19%	850	-	382	-	9,255
2004	9,378	17%	938	10%	412	8%	10,728

Source: Ministry of Education, Culture, Sports, Science and Technology

2005/10/26 RECS International Inc. 5

Revenue generated by partnership in FY2003 and 2004

Category 大学種別	No. of R/D Projects 共同研究開発プロジェクト数		Revenue 収入(1,000yen)	
National Univ.	(79)*1 223 *2	前年比 +282%	(427,655) 415,997	前年比 +97%
Private Univ.	(106) 247	前年比 +233%	(115,569) 124,893	前年比 +108%
Other Public Univ.	(0) 7	-	(0) 1,619	-
Total	(185) 477	前年比 +258%	(543,224) 542,509	前年比 +100%

Note *1 numbers in ( ) indicate data from FY2003
*2 number without ( ) indicate data from 2004

Source: Ministry of Education, Culture, Sports, Science and Technology

2005/10/26 RECS International Inc. 6

Revenue from partnership (national univ.)

FY 年度	Revenue 総売上 (1,000yen)	対1999年比 (FY1999=100%)	前年対比 Annual increase (%)
1999	191,443	100	-
2000	260,786	136	136
2001	205,924	108	79
2002	251,744	131	122
2003	427,655	223	170
2004	415,997	217	97

Source: Ministry of Education, Culture, Sports, Science and Technology

2005/10/26 RECS International Inc. 7

Examples of partnership

Shade grown organic coffee from Mexico Packaging was designed by a private art college in Kyoto.

Chair for disabled person designed by an art college in Sendai

New design methods utilizing post and beam structural design developed jointly by a univ. in Shizuoka

2005/10/26 RECS International Inc. 8

Why has the cooperation become attractive?

- Law promoting Technology Transfer from Universities to Industry (since 1998)
- Competition among higher education and research institutions (as the result of privatization of public institutions).
- Agility in R&D (Private sector needing knowledge accumulating in the higher ed.)
- Viable break-through for stagnating local economy of Japan by creating new industry with competitive edge using resources

2005/10/26 RECS International Inc. 9

Type of Partnership

- Joint Research
  - Researchers from private corporations, etc., and professors from national universities may conduct research on basis of an equal partnership on research topics with mutual interests.
- Grant and Endowment
  - Grants and Endowments refer to the financial donation made to national universities by private corporations, etc., or individuals for the purpose of scientific research or enhancing educational activities.Endowed chairs can be held and Funded Research Departments set up with such grant contributions.

2005/10/26 RECS International Inc. 10

Incentives to Industry

- Provision of subsidies and soft loans for joint R/D project with universities.
- Tax exemptions up to 25% of grant and endowment contributed to universities.
- Support to recruitment and HR development.
- Access to technological information

2005/10/26 RECS International Inc. 11

Benefits for university

The partnership will provide

- Opportunities to link research and field applications through market-oriented R/D projects;
- Opportunities to promote university's resources (ie. HR, intellectual property, R/D capability) to industry;
- Opportunities to develop further HR and other capacity; and
- Sources of revenues other than tuitions.

2005/10/26 RECS International Inc. 12

Benefits for government

The partnership will provide

- Viable economic activities linking local resources and expertise;
- Employment opportunities;
- Bring about the capacity development of local population through the product development resulting from the R/D projects; and
- New sources of tax revenue if successful.

2005/10/26 RECS International Inc. 13

Organizational Arrangements

2005/10/26 RECS International Inc. 14

Roles of TLO and Industry

2005/10/26 RECS International Inc. 15

Role of Local Government

2005/10/26 RECS International Inc. 16

Challenges

- Partnership is only a product of "pier to pier" matching – more systematical (and comprehensive) approach may be needed,
- Insufficient coordination among stakeholders – role of ICC is much greater,
- Partnership is not a part of regional economic development strategy, and
- Seed-driven or need-driven partnership?

2005/10/26 RECS International Inc. 17

We need to to clarify the following:

- Roles and functions of ICC defined?
- Institutional arrangements (rules, regulations and procedures.) completed?
- Needs in industry identified?
- Are seeds in university identified and accessible to industry?
- Concrete support from local, regional and central governments available?
- Leadership (will) and personnel available?

2005/10/26 RECS International Inc. 18