

# The Importance of Technology Management for Universities and Research Institutions

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The Importance of Technology Management for Universities and Research Institutions

## I. R&D, Technology Advancement, and Economic Growth



# I. R&D, Technology Advancement, and Economic Growth

Economy

"The primary economic rationale for a government role in R&D is that, absent such intervention, the private market would not adequately supply certain types of research," the Fed chief said at a Georgetown University conference Monday. But he added that, given current budget constraints, the U.S. needs to weigh its decisions cautiously.



Federal Reserve Chairman Ben Bernanke speaks during a conference at Georgetown University on Monday.

The White House and Democrats remain locked in a budget fight with Republicans. The U.S. government hit its \$14,294 trillion debt ceiling Monday, setting off political maneuvering to avoid a default before the beginning of August.

While the U.S. struggles to contain the deficit, President Barack Obama has been making the case for more government spending in research and innovation to boost growth. Mr. Obama wants to invest more in clean energy and information technology, as well as biomedical research.

Mr. Bernanke said innovation and technological change have played a role in lifting growth. He said the government also could help by trying to increase the ranks of U.S. students of science and engineering, as well as favoring immigration of skilled scientists and researchers.

Innovation and technical advances have transformed economies around the world over the past two centuries, Mr. Bernanke said. He noted how advances in semiconductor technology have, in recent decades, redrawn many fields, such as communications and health care.

The U.S. has seen many instances where federal research initiatives and government support helped technologies emerge in areas such as agriculture, chemicals, health care and information technology. The internet revolution of the 1990s was based on scientific investments made in the 1970s and 1980s.

Total public and private R&D spending in the U.S. has been fairly stable over the past 30 years at around 2.5% of gross domestic product, Mr. Bernanke said.

Though he didn't say it that was the right level, the Fed chief noted how some economists have argued that expanded government support for R&D could, over time, significantly increase economic growth.

"That said, in a time of fiscal stringency, the Congress and the administration will clearly need to carefully weigh competing priorities in their budgetary decisions," he added.

While the U.S. still leads in overall R&D spending, Mr. Bernanke said that in recent years, spending has increased sharply in some emerging-market economies, notably China and India.

R&D for Innovation and Technology Advancement

2.5% R&D spending of GDP / USA

R&D spending increased sharply in some emerging markets: China and India

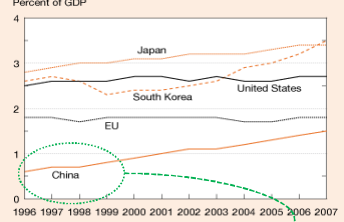
Federal Reserve Chairman Ben Bernanke's speech at Georgetown University / May, 2011



# I. R&D, Technology Advancement, and Economic Growth

Economy

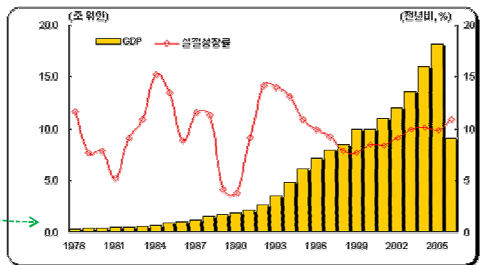
Figure O-3  
R&D expenditures as share of economic output of selected countries: 1996-2007



EU = European Union; GDP = gross domestic product  
NOTE: EU includes all 27 member states.  
SOURCE: Organisation for Economic Co-operation and Development, Main Science and Technology Indicators (2009/1 and previous years).  
Science and Engineering Indicators 2010

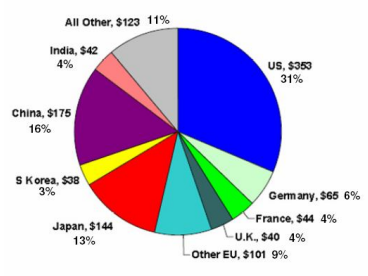
R&D expenditures of select countries

## GDP Increase of China



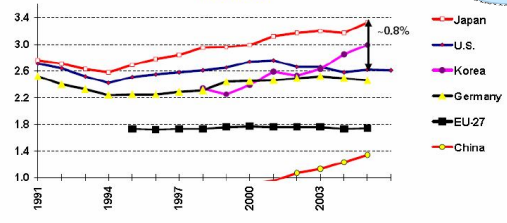
# I. R&D, Technology Advancement, and Economic Growth

**Shares of Total World R&D, 2007**  
Billion \$  
Total World R&D = USD 1,124 billion



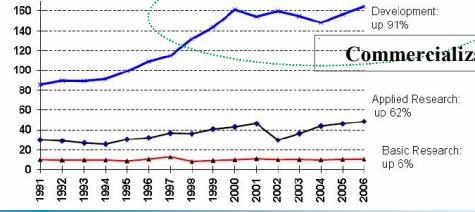
Source: AAAS - The American Association for Advancement of Science  
<http://www.aaas.org/spp/rd/world07.pdf>

**Trends National R&D as % of GDP**  
1991-2006



Economy

**Trends in U.S. Industry R&D: 1991-2006**  
Expenditures in billions of constant 2006 dollars

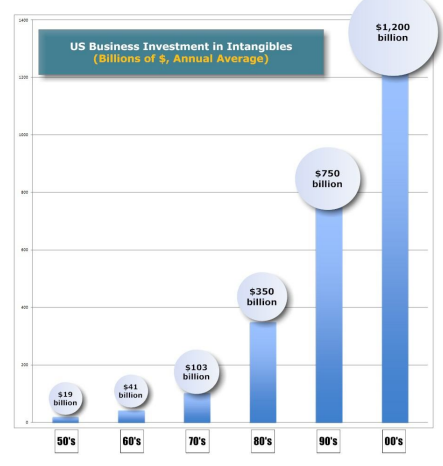


Commercialization



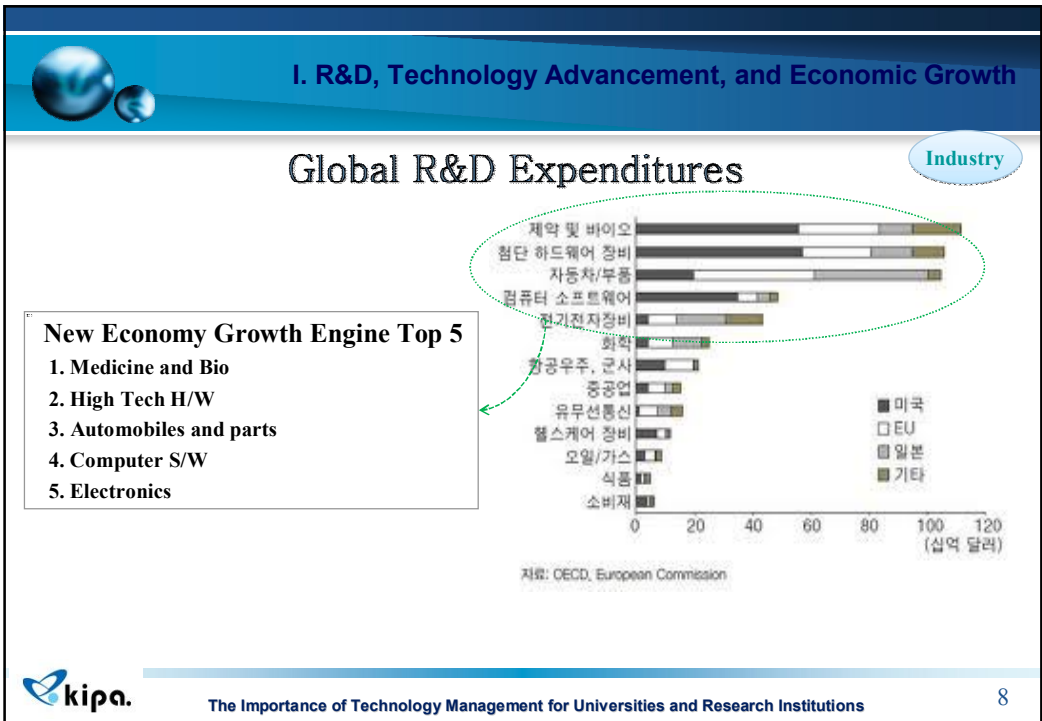
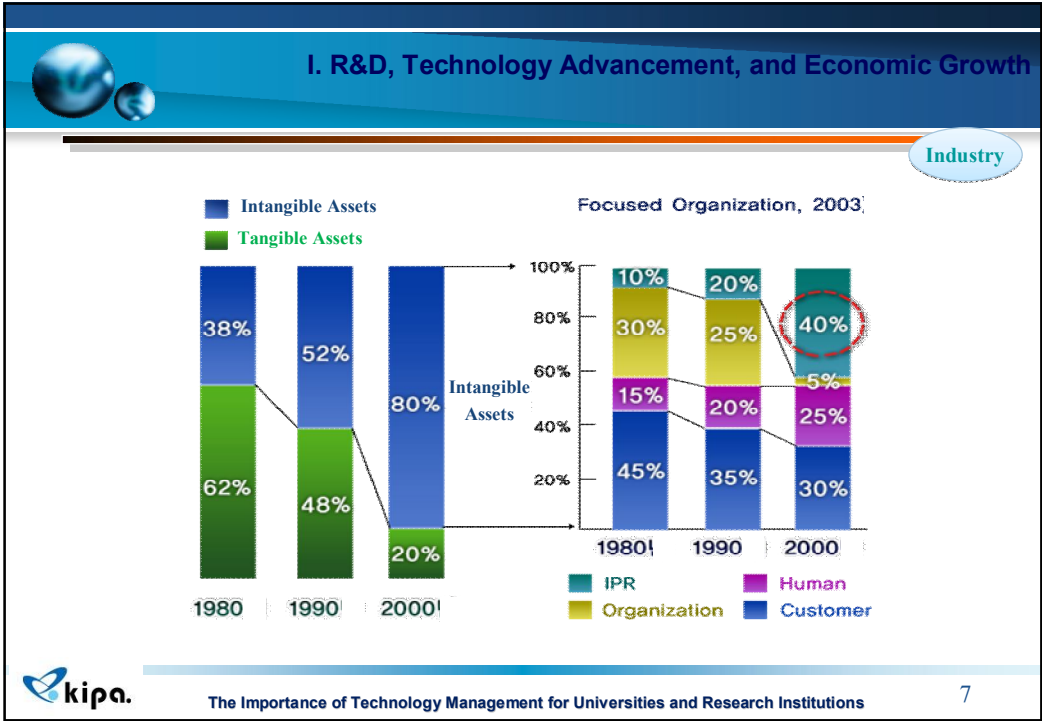
# I. R&D, Technology Advancement, and Economic Growth

**Investment in Non-Traditional Assets in the US**  
Source: University of Maryland



Industry







## I. R&D, Technology Advancement, and Economic Growth

### 내년 중소기업 R&D예산 7200억 수준으로 확대된다

발행일 2011.08.31 김준배기자 joon@etnews.com

#### 오늘의 주요뉴스



#### [AD] 자동차 부품, 재료 제조업체 국제 전시회 참가사 모집 Tokyo Big Sight

내년 중소기업 연구개발(R&D) 예산이 7000억원을 넘어선다. 청년 스타트업(Start-Up) 창업 활성화, 대기업 체계 연구개발 공동 R&D 예산이 크게 늘 것으로 보인다.

김중권의 국무총리는 31일 서울 삼성동 코엑스에서 열린 '제1회 중소기업 기술혁신대전(이노테크소 2011)'에 참석, 차세대 R&D 예산 증가를 7000억원 이상으로 대폭 늘린다고 말했다. 김 총리는 예산 확대와 관련 "금융위기 후 촉발이 빠른 경기회복을 이끌어 갈 수 있었던 데에는 중소기업 역할이 컸다. 그 기저에는 높은 (중소기업) R&D투자율과 기술혁신 시스템 등이 있었다"고 설명했다.

김중권의 발언으로 기획재정부와 내년 예산 협의회에 있는 중소기업협회 관계자도 "중소기업 예산도 인건비에서 '재정부에서도 일자리 창출 효과가 큰 중소기업과 중소기업에 관심이 크다. 내년도 R&D 예산 증가율이 두 자릿수를 나타낼 수 있을 것"이라고 기대감을 나타냈다. 중소기업은 올해보다 15% 가량 늘어난 7200억원 이상을 기대하고 있다.

중기부 관계자는 중소기업과 함께 연구개발 예산을 늘려주는 R&D 협력 부문이 증가할 예정이다. 지난해 1000억원에 달했던 중소기업 R&D 부문인 창업성장기술개발예산은 1100억원 수준이 될 것으로 예상된다. 산학연 공동 기술개발과 대기업과 협력 R&D도 각각 올해보다 100억원과 200억원 늘어난 1300억원과 1100억원에 이를 것으로 전망된다. 김 장관은 "대기업과 중소기업, 산학연 등 이해관계분야가 기술개발 지원을 확대해야 한다"고 강조했다.

기술혁신대전은 2일까지 열린다. 올해는 대한민국 기술인재대전과 함께 개최된다. 중소기업과 특성화대학교 기술인재인 상호 이해증진을 통해 중소기업 인력난을 완화하고 기술인재가 배우자는 사회공헌을 조성하겠다는 취지다. 부대행사로 '중소기업 아이디어 경진대회'(1일) '전국동아리경진대회'(2일) 중소기업 홍보영상물을 제작 지원하는 '중소기업 오픈 스튜디오(2일)' 등이 펼쳐진다. 특성화대 미이스터고 학과 대상 채용박람회, 유명인사 멘토링 그리고 스마일폰으로 멘토 연구를 하는 '업 콘서트' 등도 진행된다.

김준배기자 joon@etnews.com

Industry

\* Source: Small & Medium Business Administration of Korea

	2007	2008	2009	2010	2011	2012
R&D Budget (USD Millions)	360	430	487	560	628	720

### Gov.'s Budget Increases for Co-op R&D

- \* University and SME
- \* Public R&D Institutes and SME
- \* Large Enterprise and SME



The Importance of Technology Management for Universities and Research Institutions



## I. R&D, Technology Advancement, and Economic Growth

Industry

Major Accounts		2011	2012	Increase
Co-op R&D	Univ.-SME	1,200	1,300	8%
	Large Com.-SME	900	1,100	22%
Start-up R&D		950	1,100	15%

\* Small & Medium Business Administration of Korea

- Leading Product Innovation
- Diversifying Business
- Promoting Start-ups
- Creating Jobs

## R&D for Business and Social Issues



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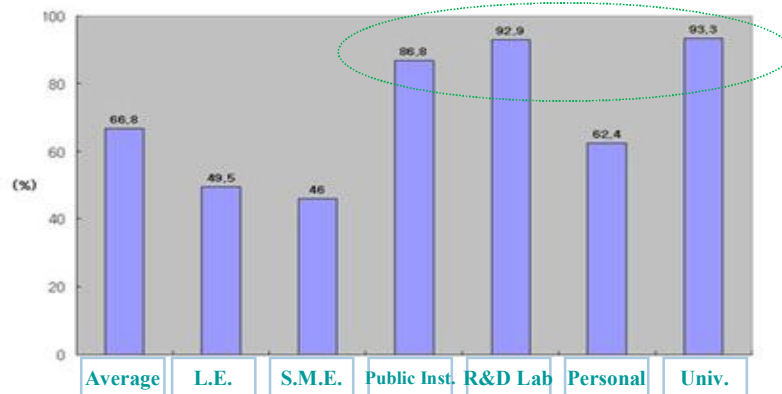


## II. IP and Technology Management for Commercialization



## II. IP and Tech. Management for Commercialization

Dormant Patent Rates of Institutes in Korea (2005)

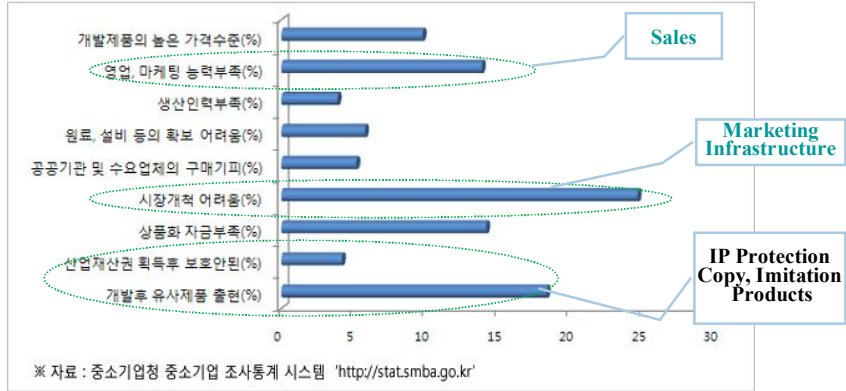






## II. IP and Tech. Management for Commercialization

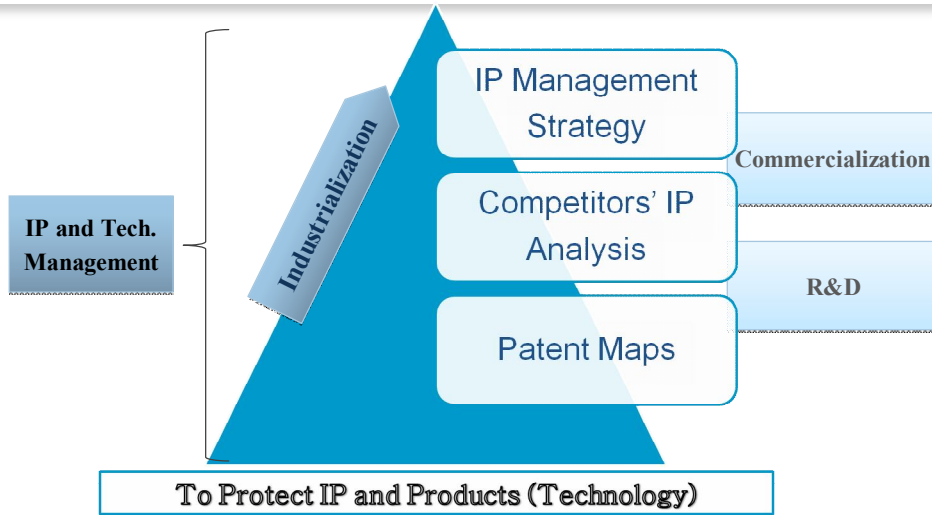
| 신제품 개발 후 상품화 추진 시 애로사항 (2007) |



### Difficulties in Commercialization



## II. IP and Tech. Management for Commercialization



## II. IP and Tech. Management for Commercialization

## II. IP and Tech. Management for Commercialization

### Local Gov. Pusan, supports IP Management Consulting

**부산시, 중소기업 5곳에 'IP전략 전문가 지원'**

【부산=뉴스시스】 최성진 기자 = 부산시는 (사)부산테크노파크를 통해 지자체 인력을 기업경영에 활용하기 어려운 중소기업에 민간 전문가를 파견해 기업 의 IP 경영전략 수립 등을 돕는 민간 IP 전략 전문가 지원사업을 실시할 계획이 라고 24일 밝혔다.

이 지원사업은 당시(2014년) 300명 미 만 인력 기업경영에 취약한 중소기업 의 IP 경영전략을 개선하기 위해 민간 IP전략 전문가를 지원해 IP를 활용한 경영 기술 브랜드 등의 문제 해결방안을 찾 아주는 기업 맞춤형 IP경영컨설팅이다.

IP경영은 특허, 브랜드, 디자인 등의 지식재산 기업의 자산으로 활용하는 경영 전략을 통해 수익을 창출함으로써 기업 가치를 높이는, 공동 출생을 의미한다.

시는 올해 부산지역 중소기업 5곳을 선정해 IP경영컨설팅 비용 6000만원을 지원 할 계획이다.

기업경영은 지원금의 20%이내로 특허소지기업 특허혁신동유망기업 부산시 선 도기업 등이, 공동출생은 5000만 원 이하이다.

이번에 지원할 IP경영컨설팅은 기업현장에서부터 전략수립 및 실행방안 제시까 지의 과정을 IP경영전략, IP경영전략, F&A, 운영, F&A 등 체계적으로 구분해 지원할 방침이다.

민간 IP 전략전문가는 IP서비스 전문업체 소속의 IP경영전문가와 변호사, 변호사, 특허정보 분석가, 기술거래 관리자, 기술거래사, 기술전문가, 브랜드 및 디자인전문 가, 금융 및 회계전문가 등 다양한 전문가로 구성된다.

**IP Management Consulting for SMEs**

**USD 55,000 Per SME**

**Program Contents**

- IP and Management Diagnosis
- IP and Technology Strategy
- IP Industrialization Strategy
- IP Portfolio Building Strategy
- IP Management System Building

The Importance of Technology Management for Universities and Research Institutions

15

## II. IP and Tech. Management for Commercialization

## II. IP and Tech. Management for Commercialization

### IP Management Strategy Consulting Process

**IP Management Diagnosis**

- IP and Finance
- IP and HR
- IP and Customer
- IP and R&D
- IP and Innovation

**IP Strategy**

**IP Management**

- IP Vision and Missions
- IP Commercialization
- IP Portfolio
- Brand Management Strategy
- Design Management Strategy
- IP Budget
- IP Risk Management
- IP Cost Management
- IP Organization Plan
- IP Management System

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16



## II. IP and Tech. Management for Commercialization

Case I

### How to Approach IP Management Strategy

Benchmarking The Role Model Enterprise

Analyzing Competitor's IP Strategy

Analyzing Company's Own IP Competitiveness

**Synaptics**

Dispute (2006): US\$825,352

Settlement (2008): US\$543,591

Unit: 천달러

1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011

Legend: 매출 (Sales), 매출증가 (Sales Increase)

Products: Synaptics, Synaptics Biometrics, Synaptics SecureSense, Synaptics SecureKey, Synaptics SecureTouch, Synaptics SecureID, Synaptics SecureSign, Synaptics SecureView, Synaptics SecureScan, Synaptics SecureSense, Synaptics SecureKey, Synaptics SecureTouch, Synaptics SecureID, Synaptics SecureSign, Synaptics SecureView, Synaptics SecureScan

The Importance of Technology Management for Universities and Research Institutions

17

## II. IP and Tech. Management for Commercialization

### Benchmarking Leading Companies

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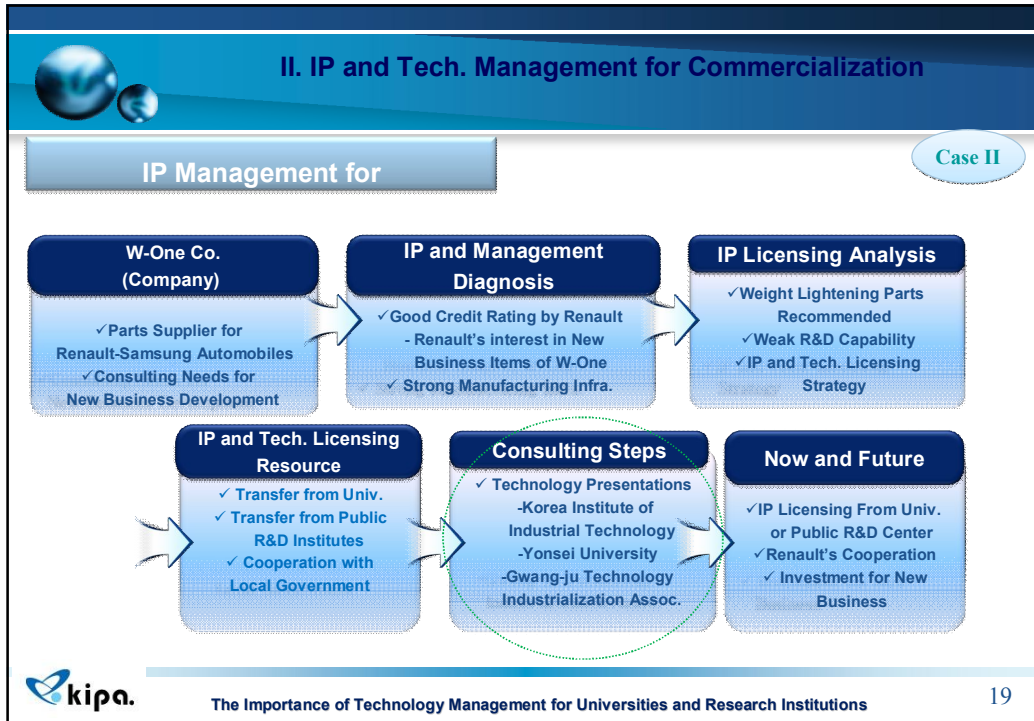
    graph TD
      RDC[R&D Commercialization] --> IPO[IPO]
      RDC --> SI[Sales Increase]
      SI --> PD[Patents Dispute]
      PD --> PDSet[Patents Dispute Settlement]
      PDSet --> NPL[New Patent Licensing]
      NPL --> NP[New Product]
      NP --> SIPP[Strong IP Portfolio]
      SIPP --> GLC[Growing Leading Company]
      GLC --> RDC
  
```

**Factors of IP Management**

- IP Strategy
- IP Dispute Solution
- Investment
- Marketing

The Importance of Technology Management for Universities and Research Institutions

18



## The Importance of Technology Management for Universities and Research Institutions

### III. IP and Technology Management for Universities and Research Institutions

**kipa.** 20



### III. IP and Technology Management for Universities and Research Institutions

#### The amount of technology held and transferred by universities and public research institutes (2008)

\* Source: Ministry of Knowledge Economy, 2009.

	Tech. holding amount		Tech. transfer amount		Tech. transfer rate	
	Accumulation	2008 year	Accumulation	2008 year	Accumulation	2008 year
Total	66,720	14,470	15,703	3,212	23.5%	22.2%
Public Research Institutes	36,837	6,466	11,151	1,919	30.3%	29.7%
University	29,883	8,004	4,552	1,293	15.2%	16.2%

“Low Technology Transfer Rates”



### III. IP and Technology Management for University and Research Institutions

#### ➤ Low Level of Commercialization in Korea

✓ Many patented technologies lie dormant: **61%**

\* Portion of patented technologies that are commercialized: **38.9%**

\* Portion of patented technologies that are successfully commercialized: **19.9%**.

\* Major commercialization difficulties:

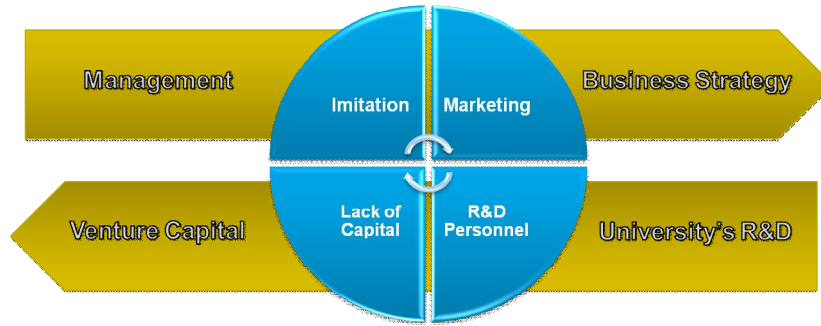
- lack of capital (34.3%);
- marketing (18.8%);
- imitation (12.4%);
- technology and research personnel (9.9%).

KIPA's Research, 2010

☞ Only a minority of patented technologies are commercialized and very few make profits.

### III. IP and Technology Management for Universities and Research Institutions

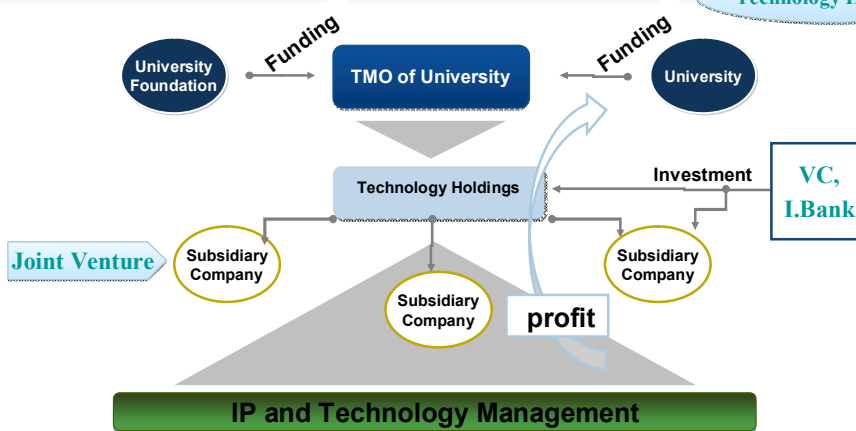
Technology Holdings



#### University owned Enterprise and Management

### III. IP and Technology Management for Universities and Research Institutions

Technology Holdings



#### IP Valuation and Funding IP to Subsidiary Company



### III. IP and Technology Management for University and Research Institutions

#### Tech. Transfer

<표9> 대학별 기술이전 실적 상위 10개 대학(2009)

(단위 : 명, 건, 백만 원)

순위	대학명	기술이전건수	기술이전료	건당 기술이전료
1	서울대학교	90.0	3,053	34
2	인하대학교	23.0	1,905	83
3	한양대학교	37.5	1,619	43
4	고려대학교	88.0	1,502	17
5	연세대학교	43.0	1,472	34
6	부산대학교	67.9	927	14
7	강원대학교	38.0	907	24
8	성균관대학교	30.0	895	30
9	중앙대학교	29.0	846	29
10	전남대학교	33.0	675	20

주1) 기술이전건수 10개 이하 대학은 순위에서 제외함.  
주2) 대학 순위는 기술이전료 기준으로 선정

#### Technology Holdings

#### ● 서울대 저주회사 자회사 설립계획

(단위: 억원)

연도	2009	2011	2013	2015	2017
자회사 (누계)	9	21	36	43	52
매출	45	420	1,350	4,340	12,5420
순익	-	33	108	347	834

#### Tech. Holdings

Seoul National University (2009)	Tech. Transfer	Tech. Holdings
Sales Income (USD 1,000)	3,053	4,500
Commercialized IPs	90	9



### III. IP and Technology Management for University and Research Institutions

#### Technology Holdings

University	Established	Capital (Cash / IP) / USD 1,000	Subsidiary
1. 한양대	2008.7.24	총 4,425 (현금:2,000/ 현물:2,425)	6
2. 서울대	2008.10.29	총 7,821 (현금:3,570/ 현물:4,251)	7
3. 삼육대	2008.10.29	총 500 (현금:157/ 현물:343)	1
4. 서강대	2009.1.13	총 2,947 (현금:600/ 현물:2,347)	2
5. 경희대	2009.4.15	총 538 (현금:184/ 현물:354)	1
6. 강원대 (5개연합)	2009.4.15	총 3,453 (현금:2,262/ 현물:1,191)	9
7. 고려대	2009.8.18	총 9,421 (현금:4,000/ 현물:5,421)	4
8. 인천대	2009.10.29	총 1,551 (현금 : 600/ 현물 : 951)	2
9. 동국대	2010.2.22	총 1,000 (현금 : 320/ 현물 : 680)	1
10. 부산대	2010.2.22	총 2,652 (현금 : 1065/ 현물 : 1,587)	3
11. 단국대	2010.9.6	총 111 (현금 : 20/ 현물 : 91)	
12. 동신대	2010.10.8	총 674 (현금 : 200/ 현물 : 474)	3
13. 조선대	2010.10월	총 470 (현금 : 200/ 현물 : 270)	
Total 13 Tech. Holdings		총 35,563 (현금 15,178/ 현물 20,385)	Total 39 Subsidiaries





## IV. The Importance of IP and Technology Management for Universities and Research Institutions



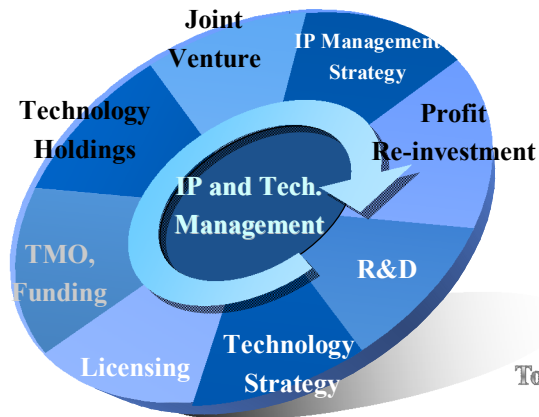
## IV. The Importance of IP and Technology Management for Universities and Research Institutions

### Sustainability of R&D to Commercialization





#### IV. The Importance of IP and Technology Management for Universities and Research Institutions



#### The Importance of Technology Management for Universities and Research Institutions

**Thank You!**