

**Knowledge Economy
and
Intellectual Property:
Supporting Roles of Incubators
and Science Parks**

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World Intellectual Property Organization



Excerpt from an interview with John Doerr of top-tier venture capital firm, Kleiner Perkins Caufield & Byers...

- John Doerr: The old economy, you learn a skill. The New Economy is lifelong learning. The old economy is concerned with security; the new is risk-taking. The New Economy is job creation; the old is job preservation. **The old economy is capital equipment. In the new, it's intellectual property that matters.** The old economy is about the status quo. The New Economy embraces speed and change.



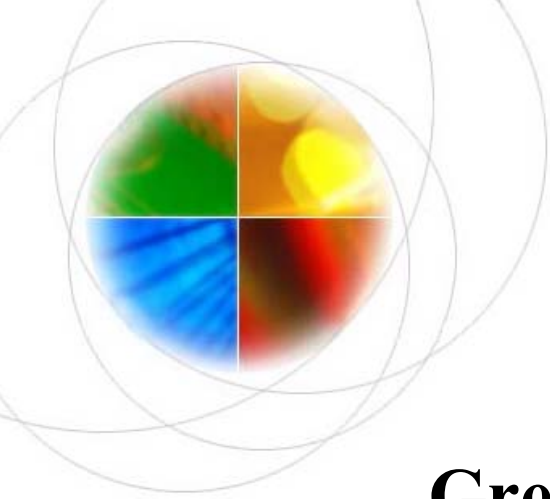
Excerpt from an interview with John Doerr of top-tier venture capital firm, Kleiner Perkins Caufield & Byers...

- The old economy is top down and highly regulated, and tends to be a zero-sum game: You win, I lose. **The New Economy is distributed, and instead of being highly regulated, we form public/private partnerships.** If the old economy is zero sum, the New Economy is win-win.



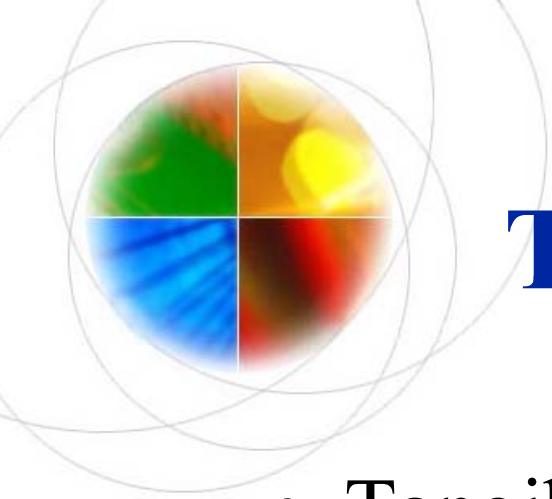
The Knowledge Economy (1)

- **Ability to create, access and use knowledge is becoming fundamental determinant of competitiveness**
- **Seven key elements of “Knowledge Revolution”**
 - **Increased codification of knowledge and development of new technologies**
 - **Closer links with science base/increased rate of innovation/shorter product life cycles**
 - **Increased importance of education & upgrading of skills of labor force, and life-long learning**
 - **Investment in Intangibles (R&D, education, software) greater than half of machinery & equipment investments in OECD**



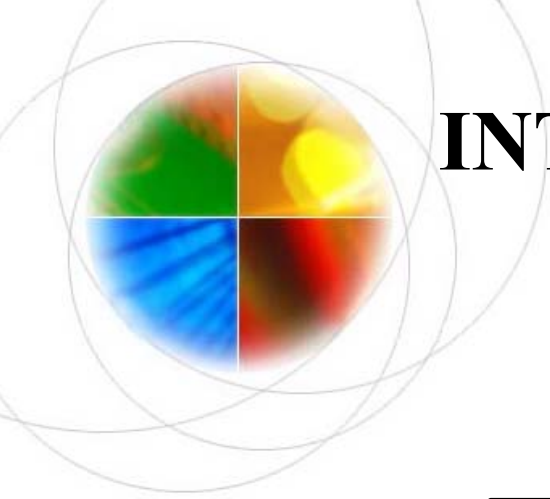
The Knowledge Economy (2)

- **Greater value added now comes from investment in intangibles such as branding, marketing, distribution, information management**
- **Innovation and productivity increase more important in competitiveness & GDP growth**
- **Increased Globalization and Competition**
 - **Trade/GDP from 38% in 1990 to 52% in 1999**
 - **Value added by TNCs 27% of global GDP**

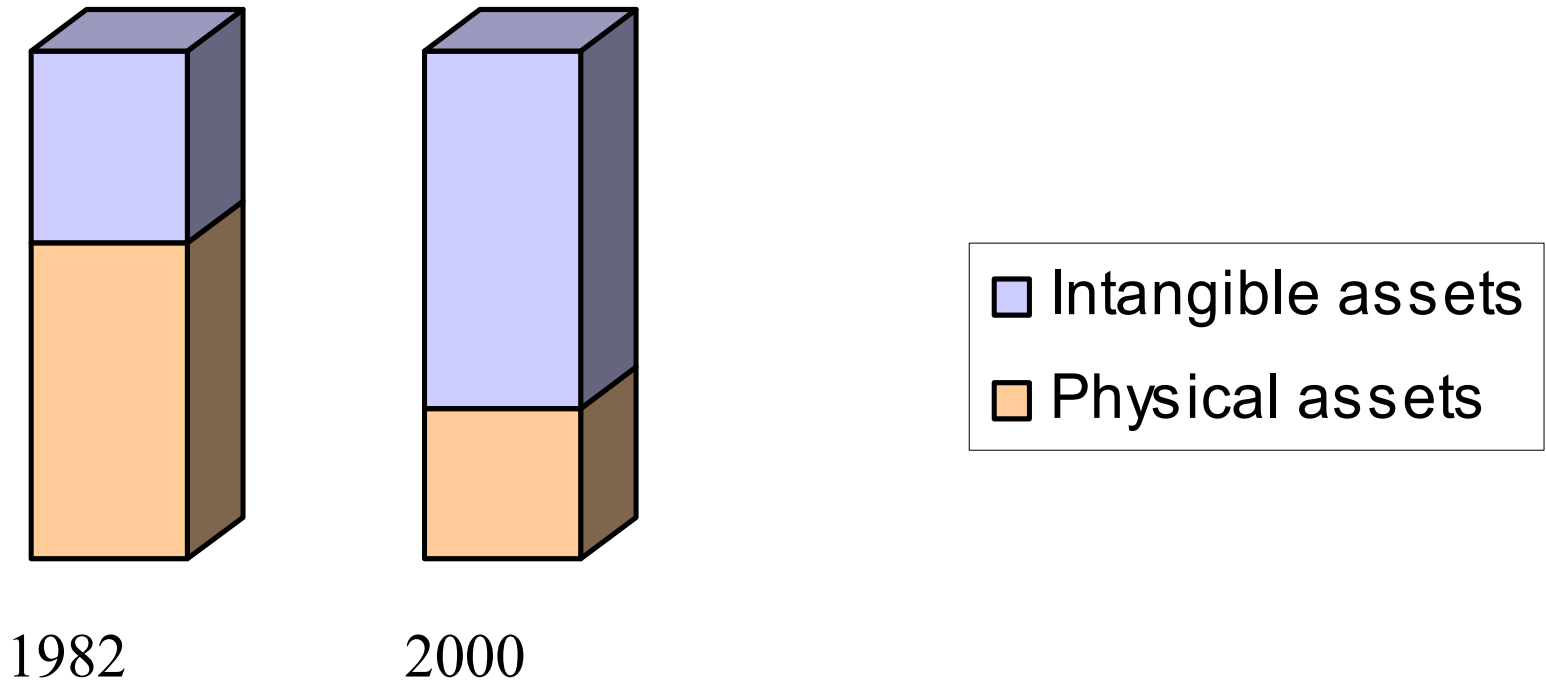


The Knowledge Economy (3)

- Tangible Vs. Intangible (including IP) assets
- Tangible assets: Land, Labor, Buildings, Equipment, Machinery, etc.
- Intangible assets: human capital, relationships, know-how, proprietary information, technology, copyrighted works, trademarks, designs, etc.



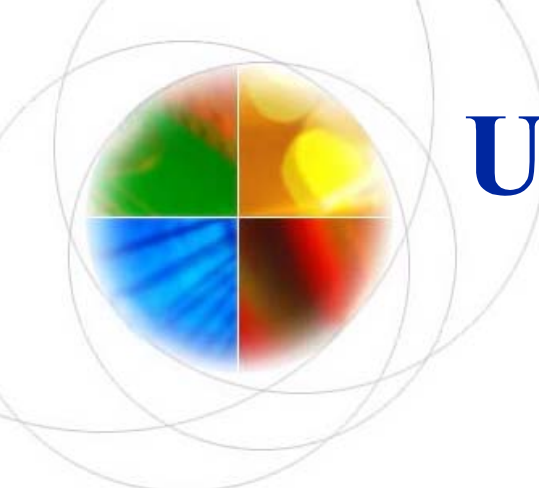
INTANGIBLE ASSETS AS % OF TOTAL ASSETS OF US COMPANIES



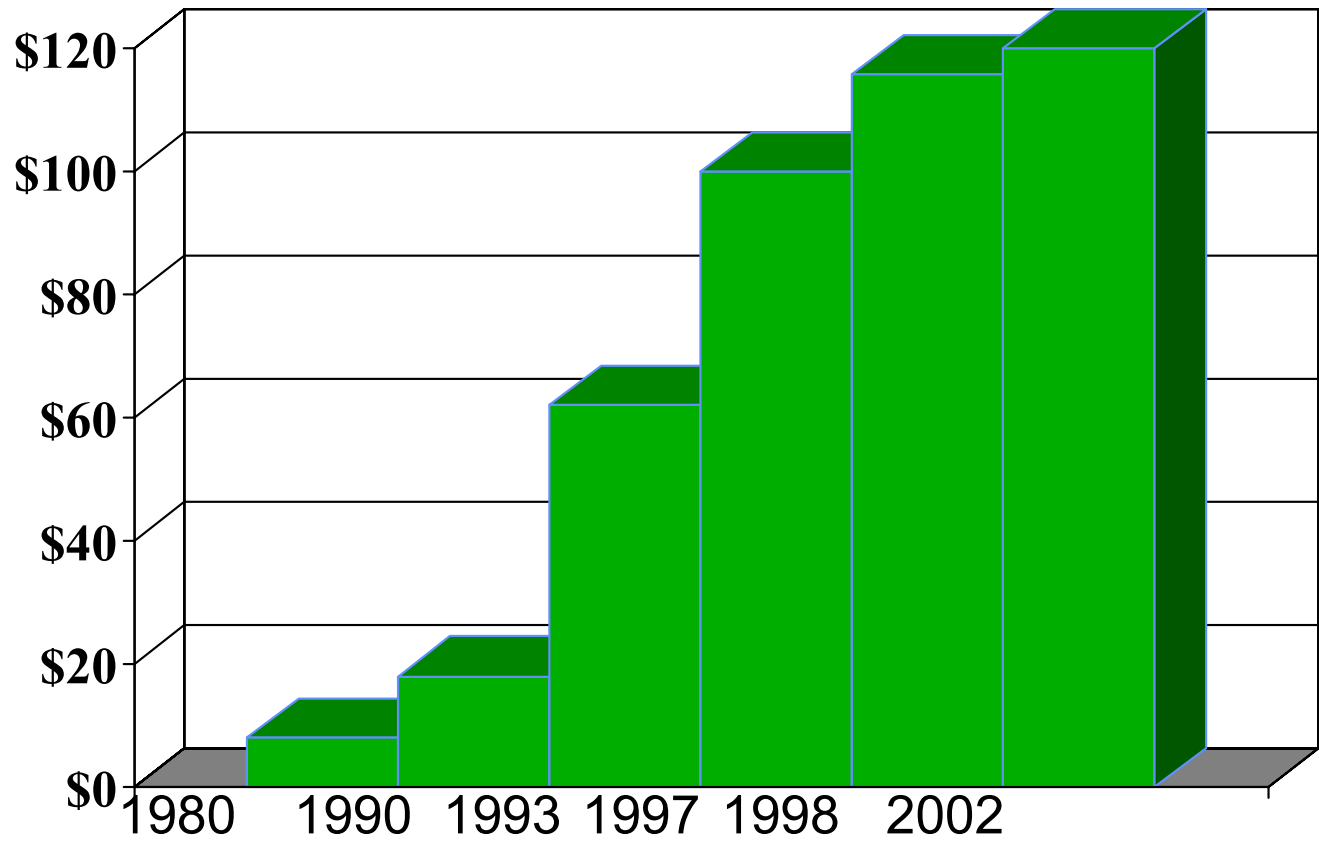


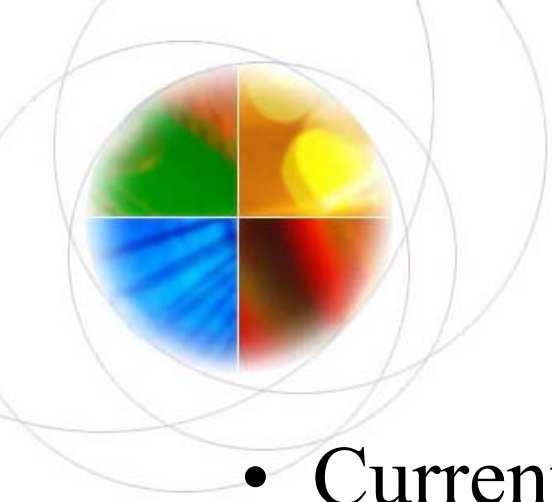
Intellectual Property in the Knowledge Economy

- Since 1993 patent applications at the European Patent Office have grown by 8.3% a year (14% for biotechnology)
- IBM earns over US\$ 1 billion a year from patent licensing revenues
- Over 80% of the market value of Microsoft derives from its intangible assets, especially its IP assets
- Value of the Coca-Cola trademark > US\$ 50 billion



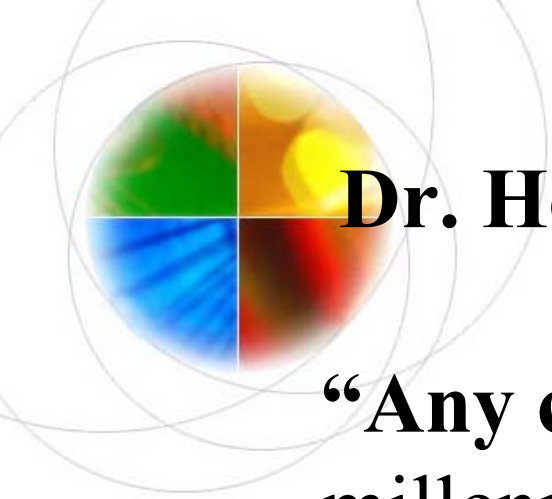
US Patent License Royalties (in billions of US\$)





Example: Philips

- Current IPR Portfolio:
 - 95,000 patents worldwide
 - based on 20,000 inventions
 - approximately 3,000 new filings every year (up from 870 a decade earlier)
 - 22,000 trademarks
 - 6,000 designs
 - 2,000 domain names



**Dr. Horst Fischer, Corporate Vice President,
Siemens AG**

“Any company wishing to prosper in the next millennium will also have to efficiently manage its IP portfolio”.

“For this reason it has become essential that every manager in the enterprise - not just those working in the corporate legal department - appreciates and understands not only what IP is, but how it can be more effectively exploited.”



Survey of IP Commercialization in the (Canadian) Higher Education Sector, 2001

<http://www.statcan.ca/english/research/88F0006XIE/88F0006XIE2003012.pdf>

Table 8. Researcher requirement to report IP: universities

	Always	Sometimes	Never	No policy on reporting	No such IP at the institution	Total
	Number					
Inventions	28	21	10	14	12	85
Software or databases	13	34	14	19	5	85
Literary, artistic works, etc.	13	22	24	23	3	85
Educational materials	13	32	18	21	1	85
Industrial designs	14	15	15	19	22	85
Trademarks	14	13	11	22	25	85
Integrated circuit topographies	14	14	14	18	25	85
New plant varieties	11	17	7	19	31	85
Know how	7	18	13	32	15	85



Definition of Science Park (IASP)

*A Science Park is an organization managed by specialized professionals, whose main aim is to **increase the wealth** of its community by **promoting the culture of innovation** and the **competitiveness** of its associated businesses and **knowledge-based institutions**.*

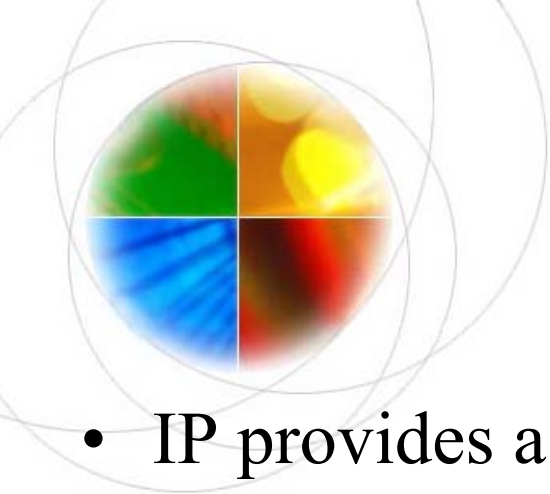
*To enable these goals to be met, a Science Park **stimulates and manages the flow of knowledge and technology** amongst universities, R&D institutions, companies and markets; it **facilitates the creation and growth of innovation-based companies** through **incubation and spin-off processes**; and **provides other value-added services** together with high quality space and facilities*



Innovation Hub (TIH)

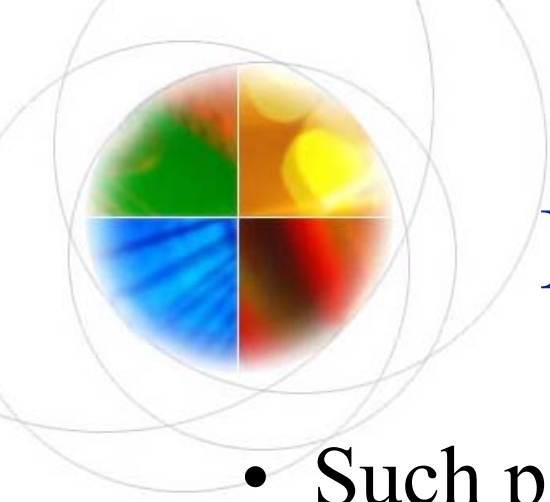
http://www.blueiq.co.za/project_innovationhub.asp

The Innovation Hub (TIH) is being established as the first internationally accredited Science and Technology Park in Africa as an initiative to enhance the innovative and growth capacity of high-tech companies in the local economy. It is creating a cluster of knowledge-intensive industries that will also provide a strong foundation for the **creation of intellectual property and its commercialization**. This supports the broader development of smart industries within the Province that, by definition and as the result of international pressure, must continually improve and innovate. Hence, if Gauteng is to develop as a smart Province, the first step is to ensure that a pipeline is created to foster innovation and drive the development of business activity linked to new **intellectual property**.



Managing Innovation (1)

- IP provides a key tool for managing the flow of knowledge and an instrument to promote systematic sharing/cooperation and partnerships/alliances between and amongst firms, universities, and R&D institutions through:
 - licensing
 - cross-licensing
 - strategic alliances
 - joint ventures
 - franchising
 - character merchandising



Managing Innovation (2)

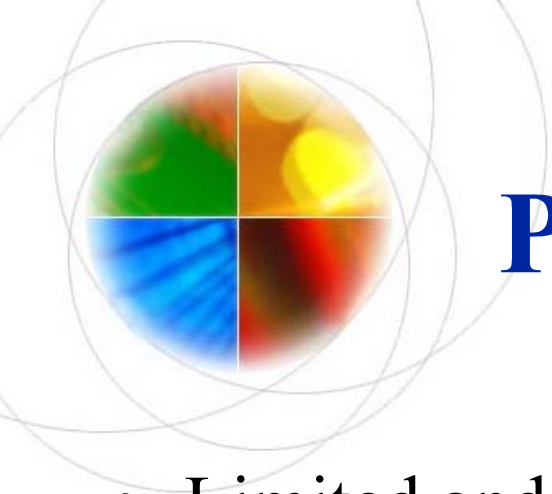
- Such partnerships/alliances create real time information and knowledge flows to:
 - Access new markets
 - Earn additional revenue
 - Obtain “freedom to operate”
 - Exploit complementary IP assets
 - Expand existing business
 - Commercialize a new product/services



Managing Innovation (3)

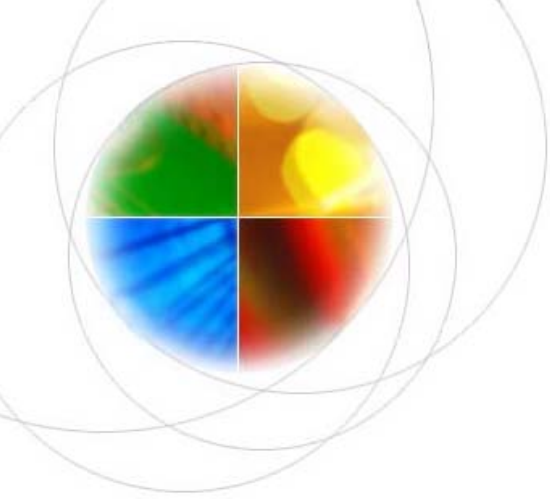
IP management includes decisions on issues such as:

- What, where, when and how to identify, protect and maintain a company's IP assets
- Proper auditing and valuing IP rights.
- How best to exploit IP assets
- Ownership, transfer and gifting of IP assets
- Steps for ensuring that you are not infringing IP rights of third parties
- If, when and how to enforce your IP rights and deal with IP conflicts and disputes



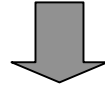
Public-Private Partnerships

- Limited and decreasing public funding of research: Private sponsorship and licensing income may be the way forward
- Public Good argument: innovative research results that are useful for society should not remain on laboratory shelves
- Competitiveness of a company may be enhanced by using R&D results of publicly funded research institutions
- Relevance: Researchers should work on practical R&D projects of real value to industry

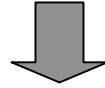


“Technology Push” Model of Innovation

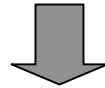
Basic Research



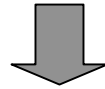
Applied Research



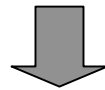
Invention



Development

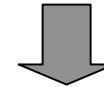


Production

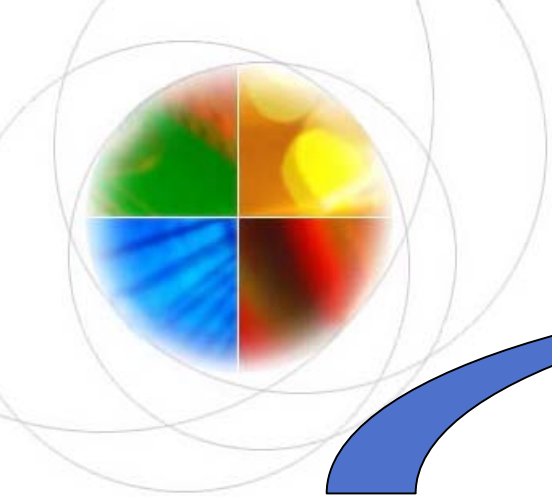


Commercialization

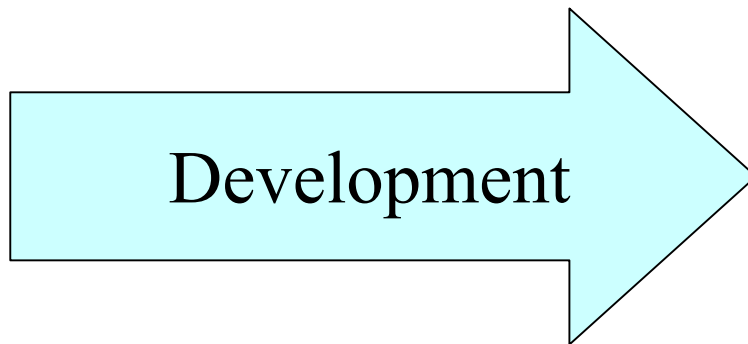
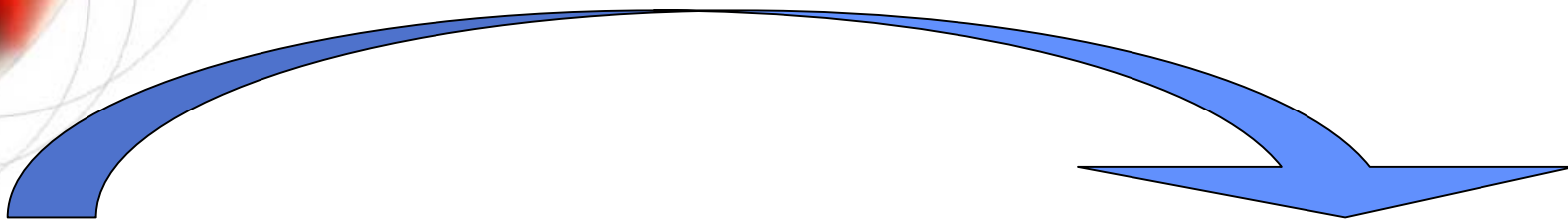
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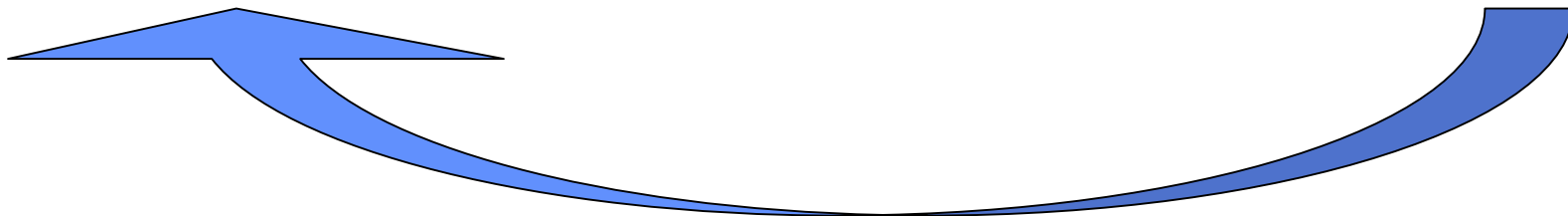
Profit

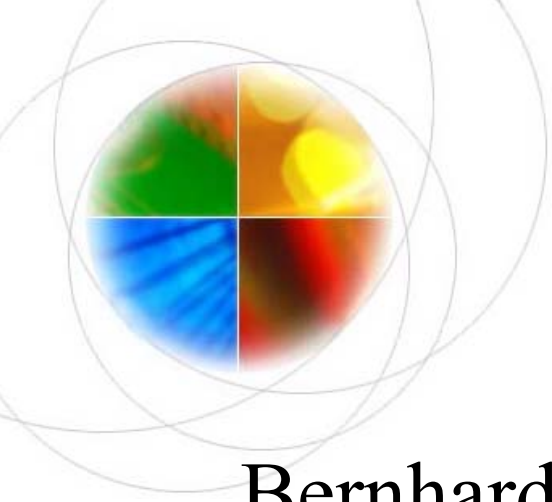


Push



Pull





Technology Transfer

Bernhard Hertel from Garching Innovation:
(Germany)

*“Technology transfer is a long-term process. A TT office should have the basis to survive at least ten years. It is difficult to predict when you will get your big project. **But when it comes you must have the skills to manage it appropriately**”*



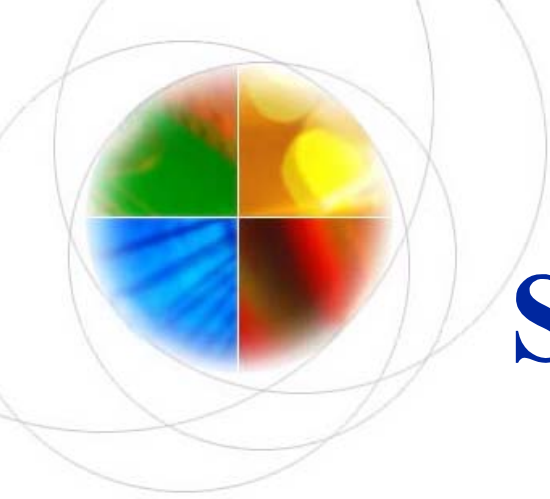
IP Policy and Strategy of the University/Incubator/Park (1)

- Needed: Coherence
- Formal, widely accepted (internally developed)
- Understood: Clear and cogent
- Operational: Rules and procedures
- Enforced: Consistently
- Reviewed: Regularly



IP Policy and Strategy of the University/Incubator/Park (2)

- **IP policy and strategy of Univ./Incubator/Park**
- **Trade Secrets:** “ Potential cannibalization of intellectual property among incubator tenants is a concern with real basis. If not managed properly, the proximity to other startups and the water cooler network can become a danger rather than a positive.”
- **Branding**



Primary Objective of the Science Park or Incubator

Focusing the incubator or park on any purpose other than developing new technology based firms (NTBFs) will compromise its economic development role.



New Technology-Based Firms (NTBFs)

- Established to commercialize an innovative product or service
- Limited tangibles assets
- Rely on innovative business idea
- Human capital and intellectual property are generally the most valuable assets
- IP protection may prove crucial for convincing investors (e.g. venture capitalists).



Cutting-edge technology is critical but not enough...

- Commercializing a new technology is about meeting **market needs**
- Regardless of how good a technology is, **it may not be marketable** (e.g. same needs met by better/simpler/nicer/cheaper/safer product)
- Importance of other IP rights in branding strategy of the company: trademarks, industrial designs, trade secrets, copyright, etc



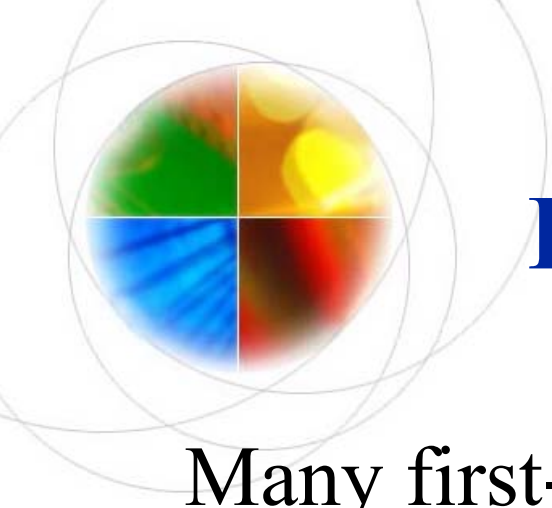
Branding

- **Trademark: Legal concept**
- **Brand: Marketing concept**
- **Registration of a trademark adds value**
- **A brand is a consistent, holistic pledge made by a company, the face a company presents**



Anticipate Needs... Fill Gaps

- Fill the “Gaps” for business creation, higher-paying jobs, and economic development
- Smart space and common infrastructure (including ICTs)
- Economies of scale (common facilities/services)
- Access to Finance (Grants/Venture Capital)
- Entrepreneurship and Marketing: Business Consulting Services



Business Consulting Services (1)

Many first-time entrepreneurs perceive that finding a space with the lowest rent is the goal when choosing a location for their business. In fact, **business consulting services** are the intangible advantages that are the most critical factors for success. These services include **business planning assistance, management building assistance, advisory boards, mentoring, negotiations, and intellectual property protection.**



Business Consulting Services (2)

<http://www.cs.depaul.edu/hyperlink/hypersummer2000/incubator.htm>

“ DePaul Technology Center, provides start-ups with a package of valuable services that take advantage of the university's expertise and connections in business, technology and law,” he says. “Software entrepreneurs receive technology assistance from the computer school, help with developing business plans and raising capital from the business school's entrepreneurship program, and advice on intellectual property protection from the law school.”



Business Consulting Services (3)

http://www.jic.bbsrc.ac.uk/corporate/About_JIC/bioincubator2.html

Businesses have access to a range of experts, specialists and support services in the areas of:

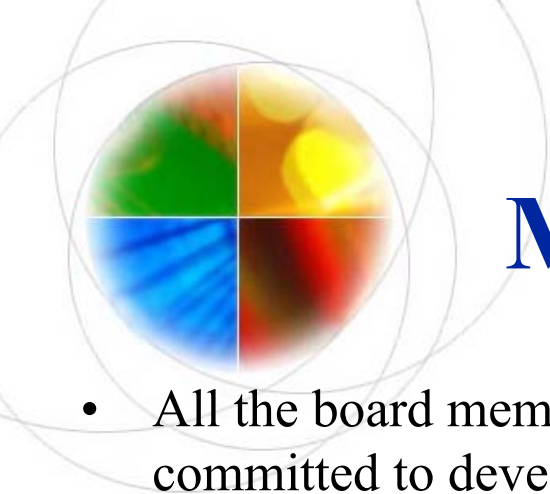
- * Early stage and strategic advice on **intellectual property**
- * Business, marketing and **licensing strategies**
- * Staff and executive recruitment
- * Development of business plans
- * Sourcing and provision of funding
- * Company establishment and administration

Business Consulting Services (4)

http://europa.eu.int/comm/enterprise/entrepreneurship/support_measures/incubators/finland_case_study_2002.pdf

Finland: Links with External Specialist Service Providers

Given the highly specialized nature of the biotechnology sector and the paramount importance of registering complex patent protection at an early stage in the development of an enterprise venture, many of the services required by tenants cannot be provided in-house by incubator management. Incubator management has therefore put in place a formal network of **specialist external service providers** such as those dealing with **industrial property rights, patenting and licensing**, business management, international marketing and finance, in order to meet the needs of its tenants. It has also used its purchasing power to negotiate special deals with legal service providers, buying in a block number of hours at a discount rate, then selling on time to tenants at a reduced rate – enabling SMEs to benefit from economy of scale despite their small size.



Membership of Advisory Board

- All the board members, regardless of which stakeholder group they represent, must be committed to developing the incubator's companies, **managing the incubator as a business** and developing a comprehensive array of services and programs that can be targeted to companies depending on their needs and assets. In light of the above, the optimal board composition should include a) leaders/champions, b) networkers, c) real estate and business operations professionals, d) business assistance providers, e) investment professionals, f) entrepreneurs, g) **product/service assessment professionals**.
- Product/service assessment professionals: especially important for technology incubators these professionals can assist the president to assess the products/services of the tenant businesses. Board members that are apt for this task include **intellectual property attorneys, or directors of university/corporate research and development laboratories**.
- http://www.aucc.ca/_pdf/english/programs/cepra/Russian%20Bus%20Incub-%202nd%20Report-%20Text.pdf



Tenant Selection Policy (1)

<http://www.kazoosmic.com/documents/Tenant%20Selection%20Policy.pdf>

- High-quality management (or willingness to enhance)
- Strong science/technology (enabling, **uniqueness, patentability, freedom to operate**)
- Viable business model
- Industry uniqueness
- Operates in a **legal and ethical manner**, including the establishment of necessary legal actions including company formation and **protection of intellectual property via patents, trade secrets, copyrights, trademarks, or otherwise.**
- **Company must have legal rights to its technology (i.e. a patent, potential to patent or other instruments to protect its technology)**



Tenant Selection Policy (2)

<http://www.kazoosmic.com/documents/Tenant%20Selection%20Policy.pdf>

Required Materials to submit for Consideration

For step 1, the following items are required:

Completed SMIC application form

Business Plan with Executive Summary

For Step 2, the following items will be required:

Issued patents for technology of the business

Patents for technology licensed by the company



Strength of Intellectual Property (1)

<http://esahosting.esrin.esa.int/ESI/page.php?name=checklist>

Strength of Intellectual Property

A patented or otherwise protected core technology will give the entrepreneur significant competitive advantage, whereas unprotected technology runs the risk of competitors copying the product and taking market share.



Strength of Intellectual Property (2)

<http://esahosting.esrin.esa.int/ESI/page.php?name=checklist>

Where patents exist, technologies patented in key market areas (e.g. US, Europe, Japan) and with significant ‘time to run’ score higher than weaker patents. Significant know-how, particularly where protected as a trade secret, has value, however, invariably strongly protected technologies are most valuable.



Strength of Intellectual Property (3)

<http://esahosting.esrin.esa.int/ESI/page.php?name=checklist>

Example Questions

What intellectual property is associated with this development?

- Know how
- Trade Secret
- Copyright
- Design rights
- Patent



Strength of Intellectual Property (4)

<http://esahosting.esrin.esa.int/ESI/page.php?name=checklist>

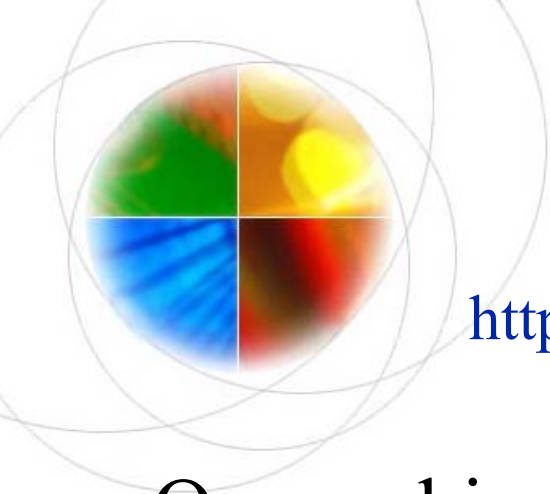
If Patent, is this patent application or granted patent?

What is the coverage of the patent(s) applications or granted Patent? Single country, Europe, US, Japan, China, others

How many years are left on the patent?

Is there any other intellectual property in the pipeline?

Has there been any public disclosure yet, - research papers, conferences



Third Party Issues (1)

<http://esahosting.esrin.esa.int/ESI/page.php?name=checklist>

Ownership of the core technology needs to be determined. Clearly defined preferably single-point ownership is obviously advantageous.

Widely spread (i.e. amongst several universities) or disputed ownership can lead to delay and disagreement over commercialization actions and/or a dilution of revenue share that makes the project unviable.



Third Party Issues (2)

<http://esahosting.esrin.esa.int/ESI/page.php?name=checklist>

Example Questions

- How many parties were involved with the applicant's development?
- Is there shared ownership of the technology – who owns the intellectual property rights (IPR)?
- Are agreements in place with all third parties for exploration of the development/technology?
- Could a partner develop and sell the technology for his own benefit?