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Creating an IP Culture in Universities

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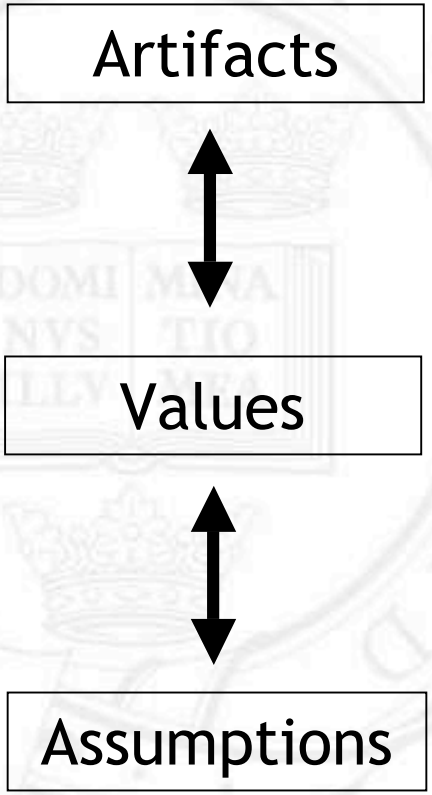
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IP Culture in Universities

- What is an "Organisational Culture"
- How to change an "Organisational Culture"
- What is an "IP Culture"
- How to create an "IP Culture" in a University

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Schein's Three Levels of Culture



Visible - maybe undecipherable

Awareness - whether Tacit or Explicit

Invisible - maybe taken for granted

Adapted from Organizational Culture and Leadership (p.14) by E.H.Schein 1985 Jossey-Bass Inc., Publishers, San Francisco.

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Cultural Artifacts

Physical

- Logos, Buildings, Office Layouts
- Decoration, Art : Pictures / Sculpture

Organisational

- Formal Communication Patterns & Organisational Structure
- Incentives : Formal Rewards / Punishments
- Informal Commmunication Patterns & Organisational Structure
- Traditions

Linguistic

- Formal Language: Words, History, Explanations
- Informal Language: Slang, Jokes, Stories, Metaphors

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Questions about Organisational Culture

- To what extent does Organisational Culture just reflect the external cultural environment within which the organisation is located?

- To what extent can Organisational Cultures :

  Be Changed or manipulated?
  - because culture is characterised by features which are controllable

  NOT be Changed but only observed and analysed
  - because culture simply emerges from uncontrollable processes

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Cultural Change

- Culture *cannot* be totally controlled or easily changed
- Some aspects contributing to Culture *can* be changed
- Culture can be influenced
  - sometimes deliberately by managers
  - often by unforeseen events / causes
- The change process (how) is as important as the cultural change (what) itself
- Cultural Change where it's possible is rarely quick

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Deliberate Cultural Change

Organisational Change

- May involve "unfreezing" "change" and "refreezing" stages (Lewin 1951)

- Will almost certainly encounter some hindrances : (Vandermerwe et al. 1991)
  - Fear & Human resistance
  - Complacency
  - Lack of time
  - Poor Communication
  - Late Technology

Organisational Change Programmes

- may involve cultural changes
- need top down support
- also need bottom up organisational involvement (Beer et al. 1990)
- may need to reconcile differing views

Involvement of third parties in change process

- Change process can benefit but this needs approaching with care

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Two Cases of IPR exploitation - I I

- Penicillin
  - Neither penicillin nor production methods were patented by the discoverers Fleming and Florey for legal and other reasons
  - Production methods were patented by scientists in the USA
    - Andrew J. Moyer - Method for Production of Penicillin
      - US Patent Nos. 2,442,141; 2,443,989; UK Applications 45/13674-6 Etc.
  - Fleming received $100k from US Penicillin Manufacturers in 1945 to fund medical research

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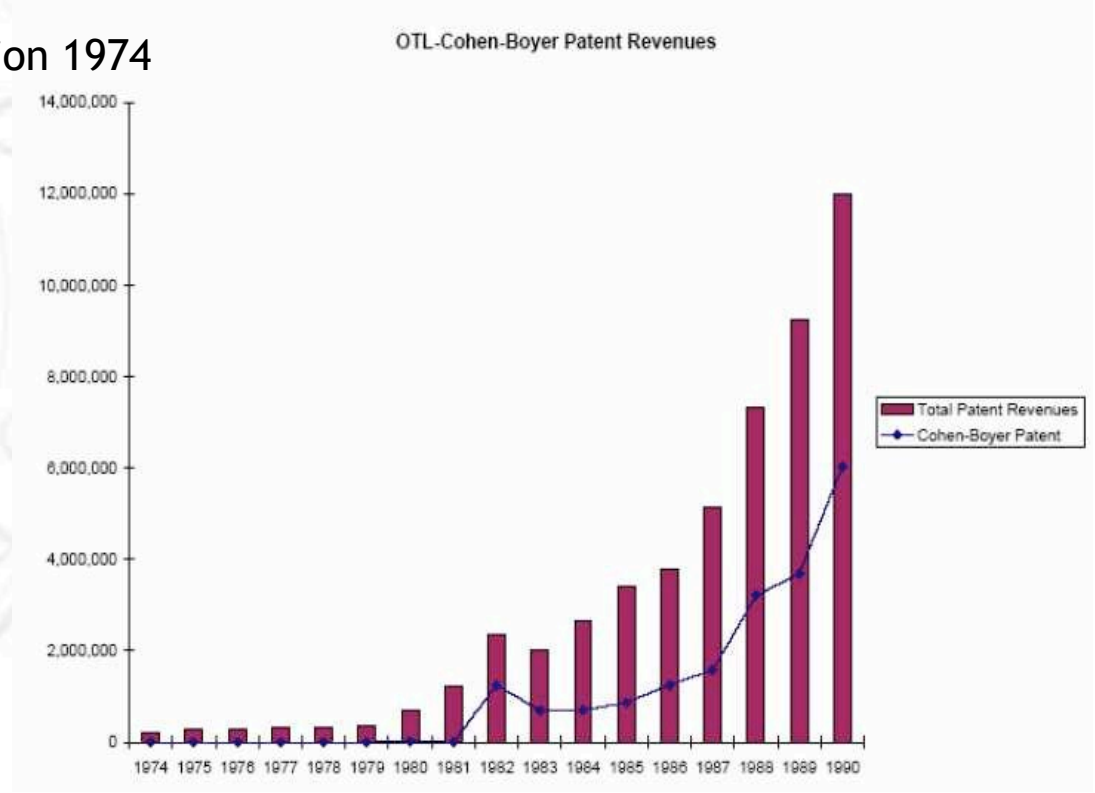
- Cephalosporin-C
  - In 1957, Abraham and Newton isolated cephalosporin-C, the first cephalosporin antibiotic. This was patented.
  - The E P Abraham Research Fund and the Guy Newton Trust, funded by royalties support medical, biological and chemical research in Oxford.
  - Cephalosporin patents generated gross revenues of over £150m

IPRs enable Control of Innovation

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Licensing

- Cohen - Boyer : Key Patent on Recombinant DNA
  "*Process for Producing Biologically Functional Chimeras*" US 4,327,224
- Paper Nov 1973 - US Application 1974
- US Patent Granted 1980
- US Patent Expired 1997
- $35bn Product Sales
- Licensing Revenues $255m from approx 467 licensees for Stanford OTL



(Source: Stanford OTL & M.Feldman, 2005)

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Elements in developing an IP Culture

- Intellectual Property Approval and Engagement
  - Sufficient to attempt to use the system
- Intellectual Property Awareness
  - Sufficient to make effective use of the system
- Intellectual Property System related Resources
  - Organisational Resources supporting use of the system

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Evidence of an University based IP Culture

- TLOs
- Innovation Clusters
- Spin-Out Companies
- IP Administration
- IP education

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University IPRs - Financial Reality

- The aim is not to turn Universities into Venture Capitalists but to avoid giving away Universities' share of research revenues

- Successful Inventions are Rare :
  e.g. Yale University 1982-1996
  - 850 Invention Disclosures $20million Revenue
  - 70% of Revenue comes from 10 disclosures
  - 90% of Revenue comes from 33 disclosures
  - Only 12% of disclosures (102) generated more than $10,000

- The probability of success is small but the potential returns high

Comprehensive but also Selective IP portfolio management is needed

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University Industrial Liaison Offices - Key Factors

- Funding Future Research
  - Providing for distribution of Research revenues
- Managing an IPR Portfolio
- Exploiting Past Research
  - Licensing
  - Venture Capital

A. Who owns the IPRs?

B. How are IPR revenues distributed?

C. What resources and skills are needed :
  - to manage an IP portfolio?
  - to exploit an IP portfolio?

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A. Who owns the IPRs?

- Joint Ownership can be complicated and is best avoided
- Concentrating initial ownership of the IP with the party developing it will provide greater incentives for commercialisation
- Subsequently, if other corporate parties have better resources available for commercialisation some sharing of the benefits and responsibilities of ownership can occur
- Where initial funding is from Industry, IPR management functions can be delegated to the company concerned.

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B. How are IPR revenues distributed?

- There are at least three potential beneficiaries :
  - The Funding Source (Government/Research Fund/Company)
  - The Researcher
  - The Researcher's University and University Department

- Patent law and the contracts involved are critical
  - Some countries have laws on employee remuneration

- Most Universities divide the benefits between :
  - The Researcher % of Net Revenue
  - The Researcher's University Department % of Net Revenue
  - The University as a whole % of Net Revenue
  - The University Industrial Liaison Office Costs +% of Gross

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ISIS Innovation / Oxford University

(4) Net revenue received by the University shall be distributed as follows, unless otherwise specified in arrangements for commissioned works:

Total net revenue	*Researcher(s)*	*General Revenue Account*	*Departments*
Up to £50K	87.2%*	12.8%	0%
Band from £50K and up to £500K	45%	30%	25%
Over £500K	22.5%	40%	37.5%

(after 30% deducted to cover ISIS innovation overheads)

http://www.admin.ox.ac.uk/statutes/regulations/182-052.shtml

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C. Resources and Skills to Manage IPR - In Universities

- Industry Liaison Office
  - Entrepreneurial Staff with experience of IP contract management
- Funding to support initial IPR costs
  - Patent Applications, Etc.
- Combined Technical and Commercial Assessment Skills
- Wide-ranging commercial and legal contacts
- Top-level University Support
- Pro-active ability to sell IP advisory services to University Researchers
- Speed - Ability to act quickly to protect IP assets
  - Ability to act quickly so as not to hinder academic publication

Industry Liaison Offices must be seen as helping not hindering research
a) they must be seen to add value - but b) they need investment

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Who else is involved in Commercialisation?

- **INNOVATION CLUSTERS** can lead to more efficient commercialisation
  - Silicon Valley
  - Route 128
  - "The Cambridge Phenomenon"
  - 'The Oxford to Cambridge Arc' (www.oxford2cambridge.net)

- Benefits arise from Concentrating and Combining:
  - R&D staff & Universities
  - Professional Advisors
  - Investor Networks
  - New Venture Infrastructure (Businesss Parks / Incubators)

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Enterprising Oxford - Networks

University Based Networks
- Said Business School
- Isis Business Angels Network
- Oxford Innovation Society
- Oxford Business Alumni
- Oxford Private Equity Network

Investment Networks
- Oxford Investment Opportunity Network (OION)
- Thames valley Investment Network

Other Networks
- Oxford Bioscience Network
- Oxford Innovation
- & many others

Enterprising Oxford: the Oxfordshire Model,(2007), Lawton-Smith, H., Glasson, J., Chadwick, A. OEO, http://oeo.geog.ox.ac.uk/research/output.php

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Spin Outs

Advantages

- separation of Business from core Organisation
- better value extraction compared to Licensing (the main alternative)
- opportunities to raise capital to gain resources for exploitation
- retention of some control

Disadvantages

- more complex : inventors, university/organisation + investors
- critical reliance on people
- need to sell the business idea to investors
- need for many advisors : lawyers, banks, brokers, etc.
- need for initial seed capital to get the process going

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OXFORD CATALYSTS
FUELLING A CLEANER WORLD

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OVERVIEW



Oxford Catalysts produces specialty catalysts for the generation of clean fuels, from both conventional fossil fuels and renewable sources such as biomass.

INNOVATING ENERGY

Our patented intellectual property and technology is the result of almost 19 years of research at the University of Oxford's prestigious Wolfson Catalysis Centre, headed by company co-founder Professor Malcolm Green, one of the world's most respected inorganic chemists.

Each of our catalysts boasts several of the following key benefits:

- Greater cost effectiveness
- Higher productivity
- Better selectivity (leading to higher quality output)
- Increased resistance to contaminants
- Longer operational life

Core products include catalysts for the following markets:

- **Petro/chemicals**: removing sulphur from gasoline/diesel and converting natural gas or coal into ultra-clean liquid fuels
- **Fuel Cells**: generating hydrogen-on-demand from methanol starting at room temperature or from conventional hydrocarbon fuels by reforming at higher temperatures
- **Biogas Conversion**: transforming waste methane into the chemical building blocks of liquid fuels
- **Portable Steam**: creating superheated steam instantaneously from methanol and hydrogen peroxide

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http://www.oxfordcatalysts.com

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Oxford Catalysts

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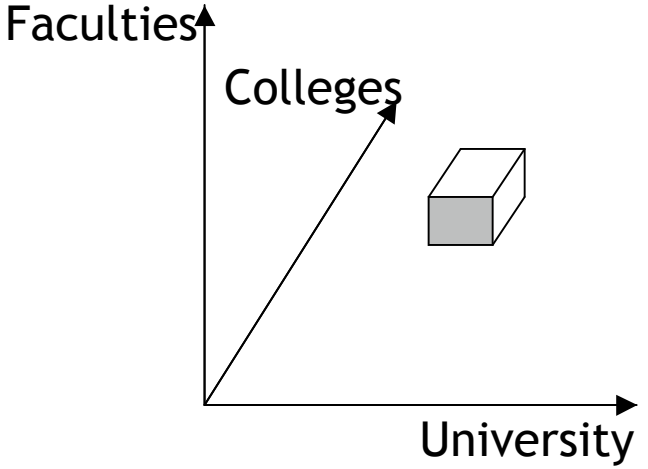
- **August 2001**: £124,500 received from the **University College Seed Fund**
- **October 2004**: Oxford Catalysts was incorporated.
- **December 2004**: £23,500 from **University of Oxford's proof-of-concept fund** to demonstrate process of producing hydrogen from methanol.
- **March 2005**: $420,000 from Saudi Aramco for Wolfson Catalysis Centre to research sulphur removal from diesel.
- **April 2005**: University of Oxford wins Carbon Trust Innovation Award for conversion of waste methane (biogas) into liquid fuels.
- **December 2005**: Oxford Catalysts raised £500,000 from a **group of investors led by IP Group plc**, the university IP commercialisation specialists.
- **April 2006**: Oxford Catalysts raised £15 million through its successful **IPO on the AIM market of the London Stock Exchange** to further fund the commercialisation of its technology.
  Both the academic founders and the University of Oxford retain significant shareholdings in Oxford Catalysts.

  IP2IPO holds a 40.3% equity stake in Oxford Catalysts.

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Intellectual Property Education

Faculties
- Law
- Management (Said Business School)
- Natural Sciences



The University
- **Intellectual Property Advisory Group**
- **Research Services Office**
- **Isis Innovation** (www.isis-innovation.com)

Centres (Multi-disciplinary)
- Science Enterprise Centre (in Said Business School)
- Oxford IP Research Centre (in St. Peter's College)

The University's structure may have disadavantages
but it *helps promote interdisciplinary cooperation*

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University Administration

Intellectual Property Advisory Group

- Membership includes:
  - Professorial Heads of Science Departments,
  - Representatives and Members drawn from :
    - Legal Services, Resarch Services Office & ISIS Innovation (the University TLO),
    - Law Faculty (Professor of IP Law),
    - Said Business School
- Remit includes:
  - Advice to University governing body on IP matters and University IP Policy
  - Oversight of ethical and emerging issues connected with IP and technology transfer
  - Arbitration of (very rare) disputes between Researchers and the Isis Innovation

Research Services Office

- Advises University researchers on research contracts with outside oganisations
  - c2500 research contracts / year - c2000 reseasrch grant applications
- Provides IP rights management advice / service in conjunction with ISIS Innovation

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Intellectual Property Related Courses

Law

- BA/MA — Undergraduate Course
- BCL/MJur — Taught Graduate Courses
- DPhil(PhD) et al. — Research based degrees

Management

- MBA — Elements within Semi-Core courses / Specialist Electives
- MSc — Occasional Option in MSc in Management Research

Oxford IP Research Centre

- IP Summer School

Science Enterprise Centre

- "Building a Business" Course - IP Lecture
- Specialist IP Courses for Natural Scientists

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Oxford Science Enterprise Centre
OxSEC

- Runs 40-50 events a year
  - Relating to innovation, entrepreneurship, and the science/business interface
- Supports the 3000+ member 'Oxford Entrepreneurs' student society
- Organises the Oxford University Business Plan Competition
- Founded the Oxford University "Building a Business" course

http://www.science-enterprise.ox.ac.uk

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OxSEC IP Training Courses

- Building a Business Course Intellectual Property Lecture (I of 8)

- Tailored In-depth Intellectual Property courses
  - Following on from the Building a Business course.
  - Tailored to specific science divisions
    - e.g. Maths & Physical Sciences / Medical Sciences /
  - Includes speakers from :
    - Isis Innovation (Technology Transfer Office)
    - Research Services Office (Research Contracts Advice office)
    - Patent Attorneys / IP lawyers
    - Said Business School

- Online Intellectual Property Course (currently under development)
  - Under development in conjunction with Continuing Education Department
  - aimed at all university members
  - funded by the University's Graduate Skills Committee

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Creating a University IP Culture

Creating an IP culture in a University requires :

Top down organisational support and investment from central administration

- Investment in TLOs and successful/justifiable commercialisation
- Provision of wise IP Policy formation and IP advice

Attention to academic interests and academic concerns

- Understanding is needed of the pressures on and motivation of :
  - university researchers
  - industry and investors
  - law faculty members
- Attention to potential conflicts of interest (COI) and creation of a good COI policy

Bottom up motivation and involvement of Researchers

- University TLO and RSO activity must be such that it is in the researchers interest to seek their advice and help rather than ignore IP or seek help elsewhere

IP awareness promotion activity

- opportunities for researchers to learn more about essential IP awareness

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Creating a University IP Culture

Creating an IP culture in a University can also benefit from *external* help :

- Running/sponsoring IP based business plan competitions
- Providing Judges for mooting competitions for law students
- Selling the need to manage IP to Senior University managers.
- Information sources eg web pages designed for and accessible by trainees
- Speakers on courses /seminars
- Introductions to speakers - attorneys, entrepreneurs
- Not just money - contacts, introductions, information, time…
- Etc. ….

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CONCLUSIONS

- An "IP Culture"
  - is like any other culture, difficult to control and slow to change
  - can be influenced if factors influencing the culture are controllable

- Change to an "IP Culture" - like any organisational change - requires both top-down support & investment and bottom-up involvement

- Before an "IP Culture" can exist "IP Awareness" is needed

- Once IP Awareness has been achieved a vital task is showing that a positive "IP culture" based on the exercise of control is consistent with academic ideals and in the interests of all.

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