



Profiting from Knowledge

Culture of Open Innovation in Industrial R&D and the University-Industry Partnership

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Open Innovation

a new paradigm or a new buzzword?

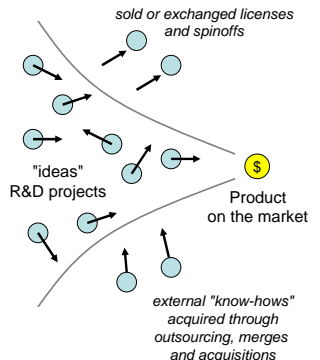
The term was coined by Prof. Henry Chesbrough, the executive director at the Center for Open Innovation at Berkeley.

The business model that determines what external information to bring inside, and what internal information to take outside.

Cross-Border Knowledge Exchange

Bringing Inside - Taking Outside




sold or exchanged licenses and spinoffs

"ideas" R&D projects

Product on the market

external "know-hows" acquired through outsourcing, merges and acquisitions



"Open" vs "Closed"

- A huge body of widely distributed knowledge has been accumulated.
- Internal research is expensive and often inefficient.

↓

- Outsourcing development tasks or buying processes or inventions (i.e. patents) from other companies.
- Internal inventions not being used in a firm's business should not be wasted but taken outside the company (e.g., through licensing, joint ventures, spin-offs).

"Firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology"
Henry Chesbrough

Car-maker are expected to offer a new model each two years.
P&G R&D department is expected to offer a new product each two weeks.

Open New Business Opportunities:

InnoCentive - The Information Broker



welcome

InnoCentive® is an exciting web-based community uniting top scientists to relevant R&D challenges facing leading companies from around the globe. We provide a powerful online forum enabling major companies to reward scientific innovation through financial incentives.

SEEKERS
I have a problem...

SOLVERS
I have a solution...

FEATURED InnoCentive Challenges

INNOCENTIVE BIOPIXA
STRETCHABLE BIO-
FILM FOR MATERIAL
SCIENCE
SEP 30, 2007
\$50,000 USD

INNOCENTIVE ENERGY
REMEDIATE
LIVERMORE OIL
RESERVE
SEP 30, 2007
\$10,000 USD

My InnoCentive

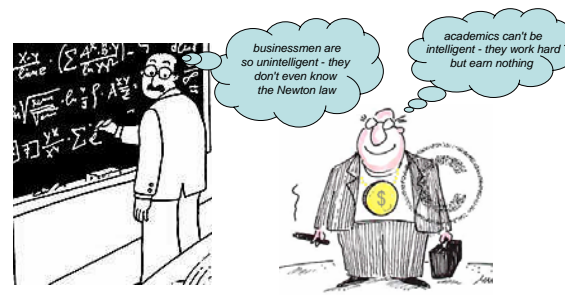
TRACK AND MANAGE YOUR ACCOUNT

Username: Password:

Please Remember My Sign-In Name

Researcher and Entrepreneur

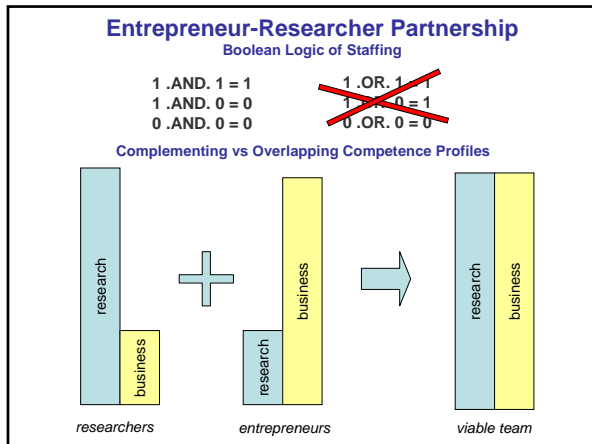
When 1 + 1 = 3



businessmen are so unintelligent - they don't even know the Newton law

academics can't be intelligent - they work hard but earn nothing

A team of specialists always overperform a team of generalists



MIT - The Factory of Entrepreneurship

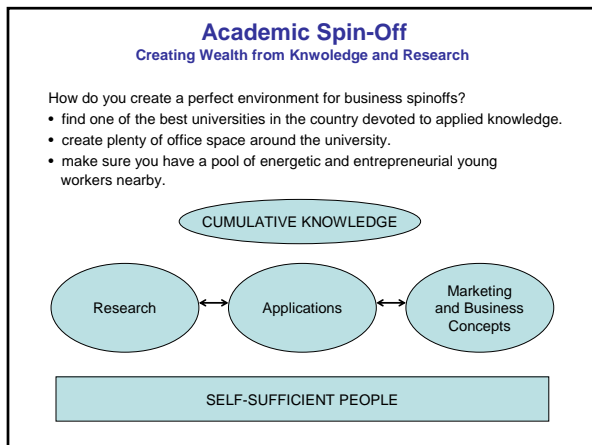
A study prepared by the Bank of Boston in 1989 found 636 firms in Massachusetts founded by MIT alumni employing more than 200,000 with aggregate sales of ca \$40 billion.

MIT alumni stand behind corporate giants such as Amgen, AMP, Campbell Soup, Genentech, Hewlett-Packard, Intel, McDonnell Douglas, National Semiconductor, Rockwell International, Texas Instruments, Tyco International, and 3Com.

The protection we rely on in the business world is patents

MIT's Technology Licensing Office (TLO) today processes an average of two inventions a day, and files three to five patent applications per week.

Center for Innovation and Product Development is a joint venture between MIT's Department of Mechanical Engineering and the MIT Sloan School of Management.



Academia vs Industry

Creativity - Efficiency Dilemma

- > The greatest creativity occurs on the boundary of chaos
- > Organization improves efficiency but hits creativity

Management by rules (ordering) gives its place to management by values (motivating)

Think Small and Focus on the Core

Search Word	Number of Patents in USPTO database (on 22.06.2007)
spade	84
scoop	490
toothbrush	2543
golf club	4653

By selling an appliance worth 1\$ to each Chinese, one gamers \$1 billion in revenue.

"From focus comes growth; by narrowing scope one creates expansion"

Chris Zook, "Profit from the Core", Harvard Business School, 2001

From Development to Commercialization

(HyperCube, Inc.)

I. Knowledge gathering stage (academia):

Many scientists worked on developing the methods of quantum chemistry

..... Market analysis

II. Commercialization stage (industry):

Hypercube, Inc. was founded in 1985 in Waterloo, Ontario, by Dr Neil S. Ostlund

Carbon Nanotubes

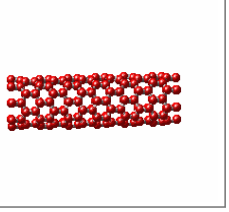
Intellectual Property Rights Protection in Materials Research

graphene sheet **SWNT**

Described by 1991 by Sumio Iijima
(Nature, 354 (1991) 56)

Number of patents in USPTO database on 22.06.2007:
221

What is protected:
1. Production and purification methods;
2. Applications in integrated circuits, surface, anode materials, composites, lubricants, sensors, etc.



KSV Instruments, Ltd

Open Innovation in Small Business

KSV supplies premium quality instruments for surface, interface and particle characterization – "One Stop Shop for Surface Chemistry Instrumentation"

Widest available range of instruments for surface and interface analysis:

- > World leader in Langmuir-Blodgett technology
- > Complete range of innovative devices for measuring surface tension, interfacial tension, and contact angle
- > State-of-the-art instruments for characterizing monolayers and thin layers

KSV Instruments
www.ksvltd.com

Brief History

- ❑ Established in 1981 as a precision mechanics & electronics department of KSV Chemicals Corp.
- ❑ Management buy-out in 1988

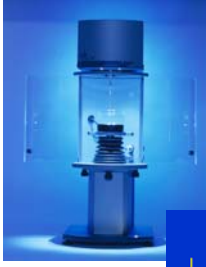
⇒ **KSV Instruments Ltd**

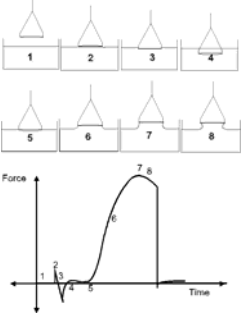
- Started with Langmuir-Blodgett instruments
- Early 90's introduced basic instruments for surface chemistry research (tensiometers, goniometers)
- In 2003 expanded in developing Q.C. and Process Control Applications for Industry and QCM technology
- In 2004-2006 major "face-lift" to enable growth
- More than 2000 KSV Instruments installed all over the world, scientific articles published by KSV's customers are well over 3000
- Jan 2007 KSV was acquired by Biolin AB

KSV Instruments - Product Lines

<p>Solutions for research, QC and process control</p> <ul style="list-style-type: none"> • Wide range of precision instruments • Cutting edge research tools • Customized solutions for industrial applications 	<p>Interface Analysis</p> <p>Easy to use solutions for characterizing solid and liquid interfaces via:</p> <ul style="list-style-type: none"> • Contact Angle • Surface Tension • Interfacial Tension 	<p>Monolayer Preparation</p> <p>Unparalleled range of Langmuir troughs for the control and deposition of monolayers</p>
<p>Dip Coaters</p> <p>Efficient tools for depositing uniform thin layers from liquids</p>	<p>QCM</p> <p>Multifrequency impedance-based OCM for rigid or soft film analysis in liquid or gas</p>	<p>Monolayer Characterization</p> <p>Cutting edge tools delivering new insights on floating and deposited monolayers</p>

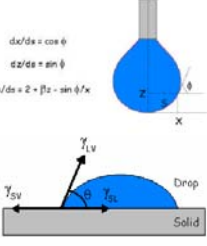
Force Based Contact Angle/Surface and Interfacial Tension Meters






Optical Contact Angle/Surface Tension Meters

$dx/ds = \cos \phi$
 $dz/ds = \sin \phi$
 $\phi/ds = 2 \cdot \gamma_{LV} \cdot \sin \phi / r$






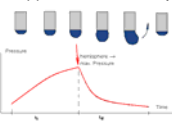
www.ksvltd.com

Instruments for the Dynamic Surface Tension Measurements


BPA




Bubble Pressure Analyzer



AL

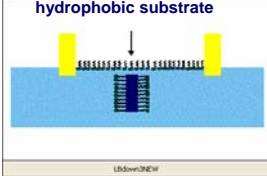


At Line Drop Counter



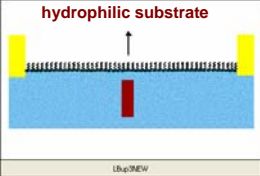
Langmuir-Blodgett Films

hydrophobic substrate



LBdown/NEW

hydrophilic substrate




LBup/NEW

Some facts:

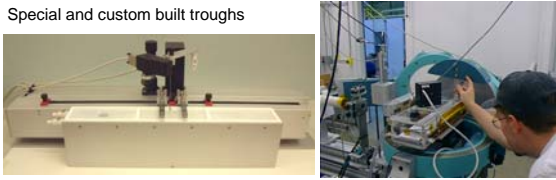
- Process is known from 1930's.
- 6 patents were obtained by Katherine Blodgett herself.
- At present, USPTO database contains over 30 patent covering possible trough designs and applications of Langmuir-Blodgett process.

Complete Range of Langmuir and LB Troughs

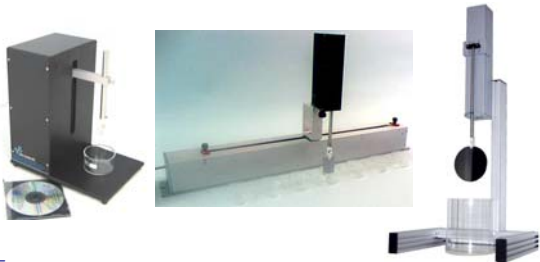
Standard troughs



Special and custom built troughs



Dip Coaters



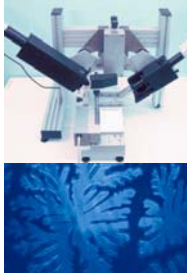
For

- Uniform films
- Sol-gel films
- Self assembled films
- Paints and coatings


- Dipping of different size solid samples in one or several coating liquids
- Vertical or horizontal dipping
- Fully programmable dipping sequences

Advanced Characterization Instruments


Visualization - BAM
(Brewster angle microscope)



Spectroscopy – PM-IRRAS
(polarization modulation IR reflection adsorption)




Rheology - ISR
(interfacial stress rheometer)



www.ksvitd.com

Dissipative QCM Z-500

Measurement



measure

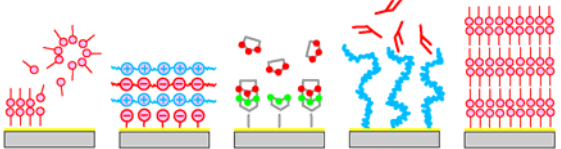
Resistance (Dissipation) change

Frequency change (at 5 overtones)

Analysis

calculate

adsorbed mass
adsorbed thickness
density
surface elastic modulus
surface and bulk viscosity



www.ksvitd.com

Products in Pipeline: Flash Sizer

- Particle size analyzer for dry and wet bulk powders and granules
- Replaces sieve analysis

In conjunction with Helsinki University of Technology

Products in Pipeline: SPR

Surface Plasmon Resonance (SPR) for Surface Chemists and Physicists

In conjunction with BioNavis, Finland

What Distinguishes KSV from Academic Research Centers

1. Profitability (market-driven)
2. Manoeuvrability - 4P (product, price, place, promotion)
3. Customer focus - KSV solves your problem! (custom designs for those who don't get the right answer from standard instruments)

Unavoidable Attitude Change

<p><i>Produce something which</i></p> <ul style="list-style-type: none"> > no-one else has produced > no-one else can use > no-one knows what it can be used for 	→	<p><i>Produce something which</i></p> <ul style="list-style-type: none"> > no-one else produces > everyone can use > addresses demands of a specific group of customers
academic freedom		business rationale