

OPEN INNOVATION:



a new environment for R&D,
the future of Innovations

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- 😊 Close innovation
- 😊 Open innovation
- 😊 Open vs close innovation
- 😊 Challenges



INNOVATION

Is the main driver for companies to

- Prosper
- Grow
- Sustain a high profitability



~ Thomke, 2001

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The Business Philosophy

In Business,
IF
You don't
INNOVATE
&
COMMERCIALISE
You will
EVAPORATE



~ Kandiah & Associate

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CLOSE INNOVATION

- ❑ Traditionally large firms relied on their own R&D to create new products
- ❑ Closed innovation - processes that limit the use of internal knowledge within a company & make little or no use of external knowledge
- ❑ In the past close innovation was a successful way to sustain firms in competitive advantage



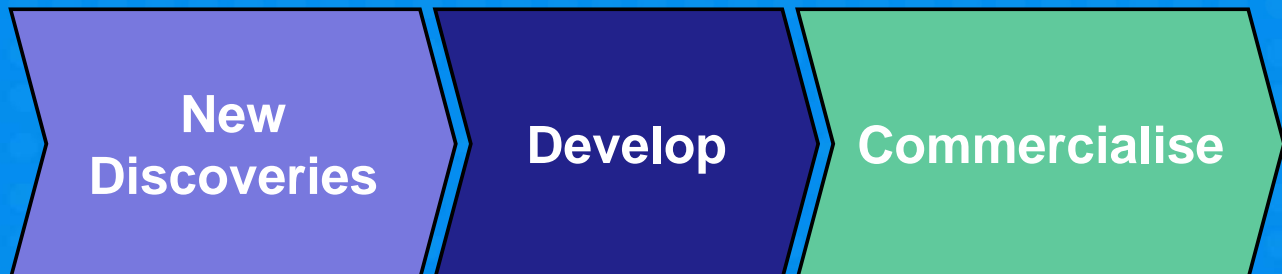
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CLOSE INNOVATION

Large firms R&D output



All R&D done in house



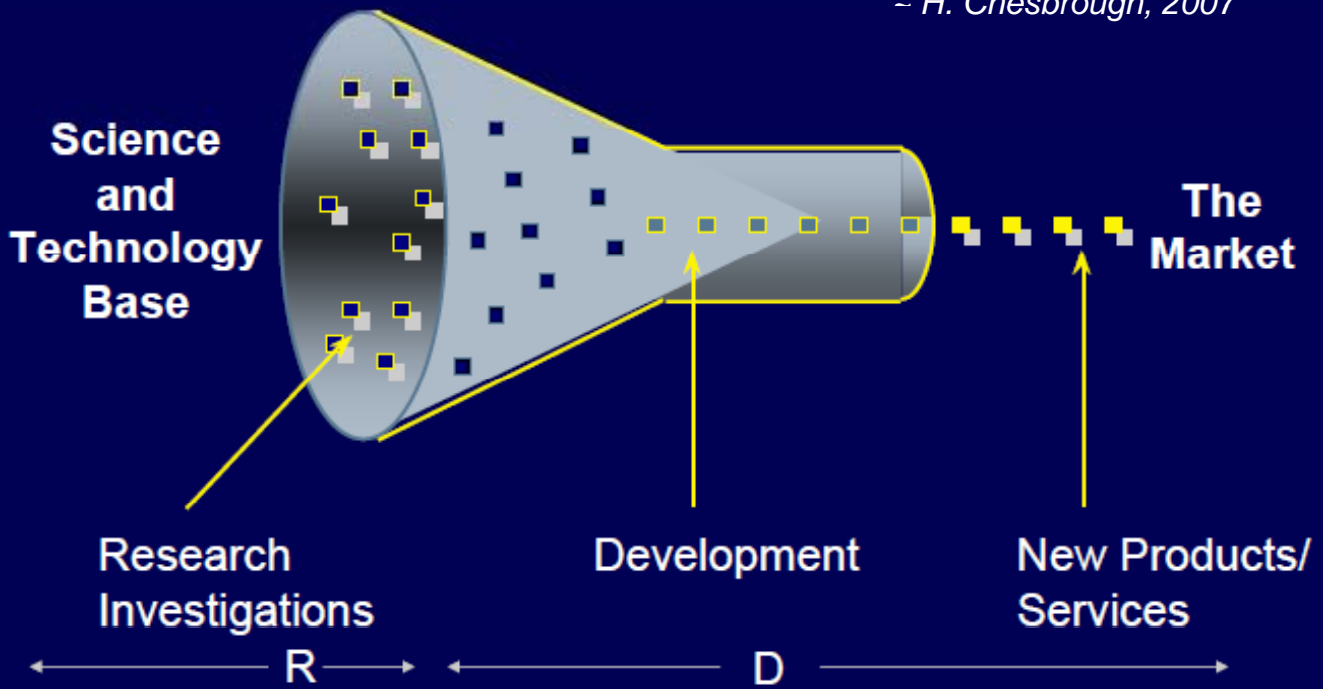
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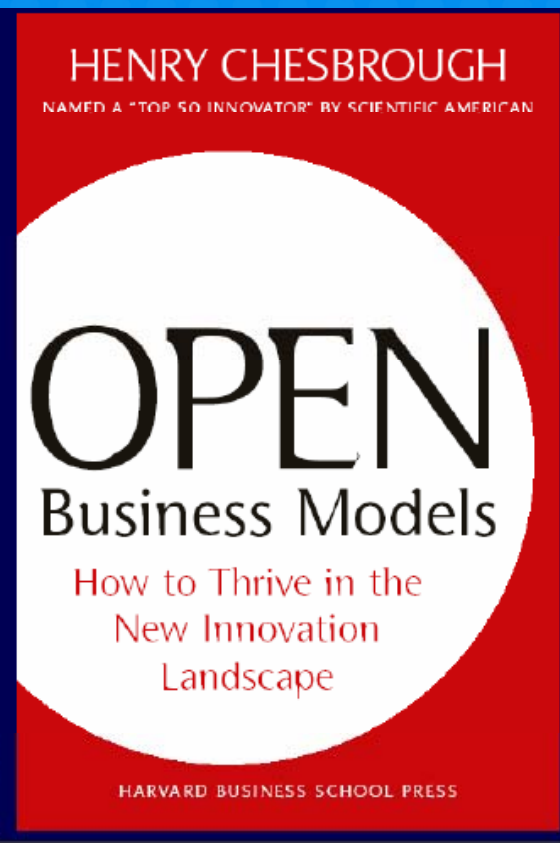
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A CLOSED INNOVATION SYSTEM

~ H. Chesbrough, 2007



Many in house R&D technologies never make it to the development stage



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OPEN INNOVATION

- ❑ Look for new sources of new technologies globally
- ❑ Firms use both internal & external pathways to exploit technologies
- ❑ Lowering risk & speeding up research & innovation process

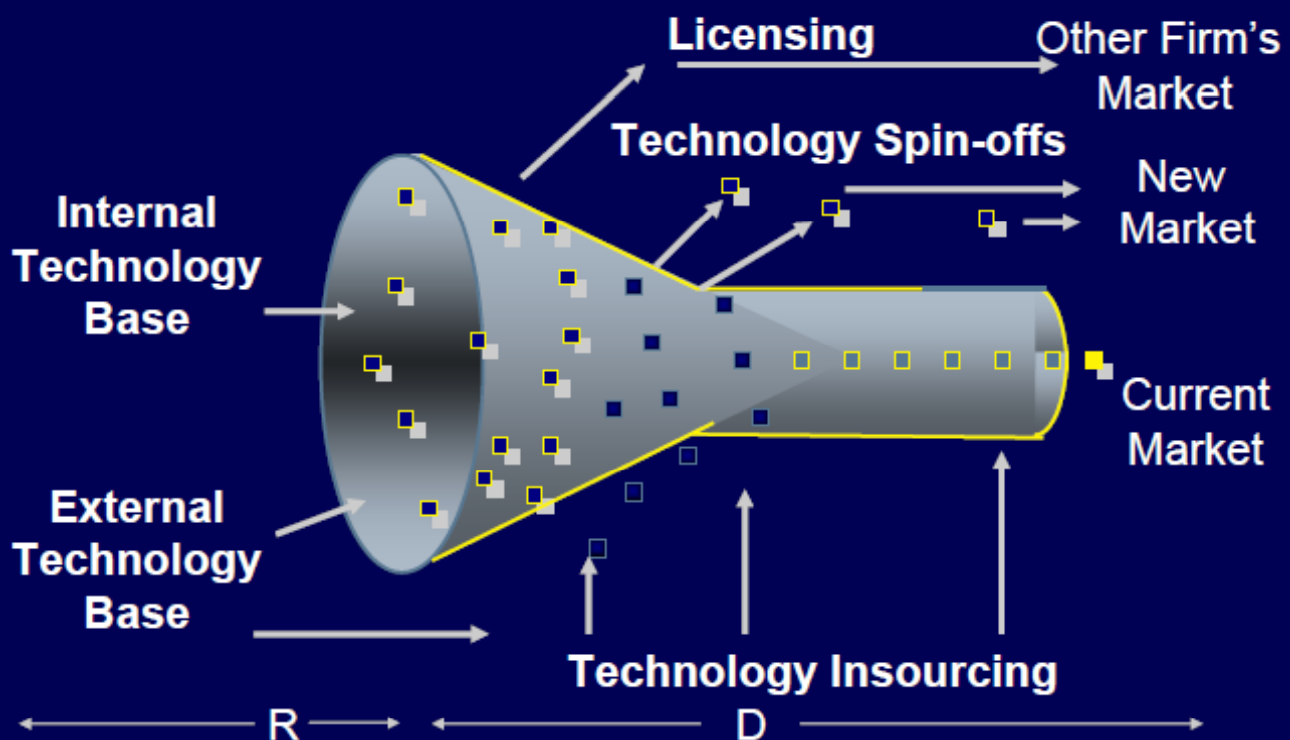
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Open Innovation become increasingly important engines of innovation globally

the Future of Innovations

THE OPEN INNOVATION PARADIGM

H. Chesbrough, 2007





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Business Week : Most innovative companies – 2006

Lesson learned from close innovation

Picture this

80% of your traditional business disappears within 5 years!

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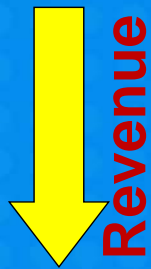
Kodak thinking was defensive

- Mid 90's absolute king of films
- Didn't pay much attention to digital photography – treating it as 2nd priority
- Stock price plummeted



Laid off 25,000 workers (2005)

1997	\$90
2003	\$30
2005	\$24
2009	\$ 4



1990	\$19B/yr
2002	\$13B/yr
2005	\$4.1B
2006	\$1.1B

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Outgoing CEO Dan Carp

- I saw my 1st digital camera 20 years ago.... I knew right then that this company was going to transform itself”
- 10 years too late!



The world is
changing faster
than Kodak can



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Mistakes Made on the Road to Innovation

- For 120 years, Kodak had done everything for itself
- At one time, it even raised its own cattle & used bones for making photographic gelatine
- When it tried to collaborate with others, the results could be messy



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Mistakes Made on the Road to Innovation

Eg., it sought outside expertise from Adobe Systems in 1999 for transferring consumers' photo prints to CD for PCs

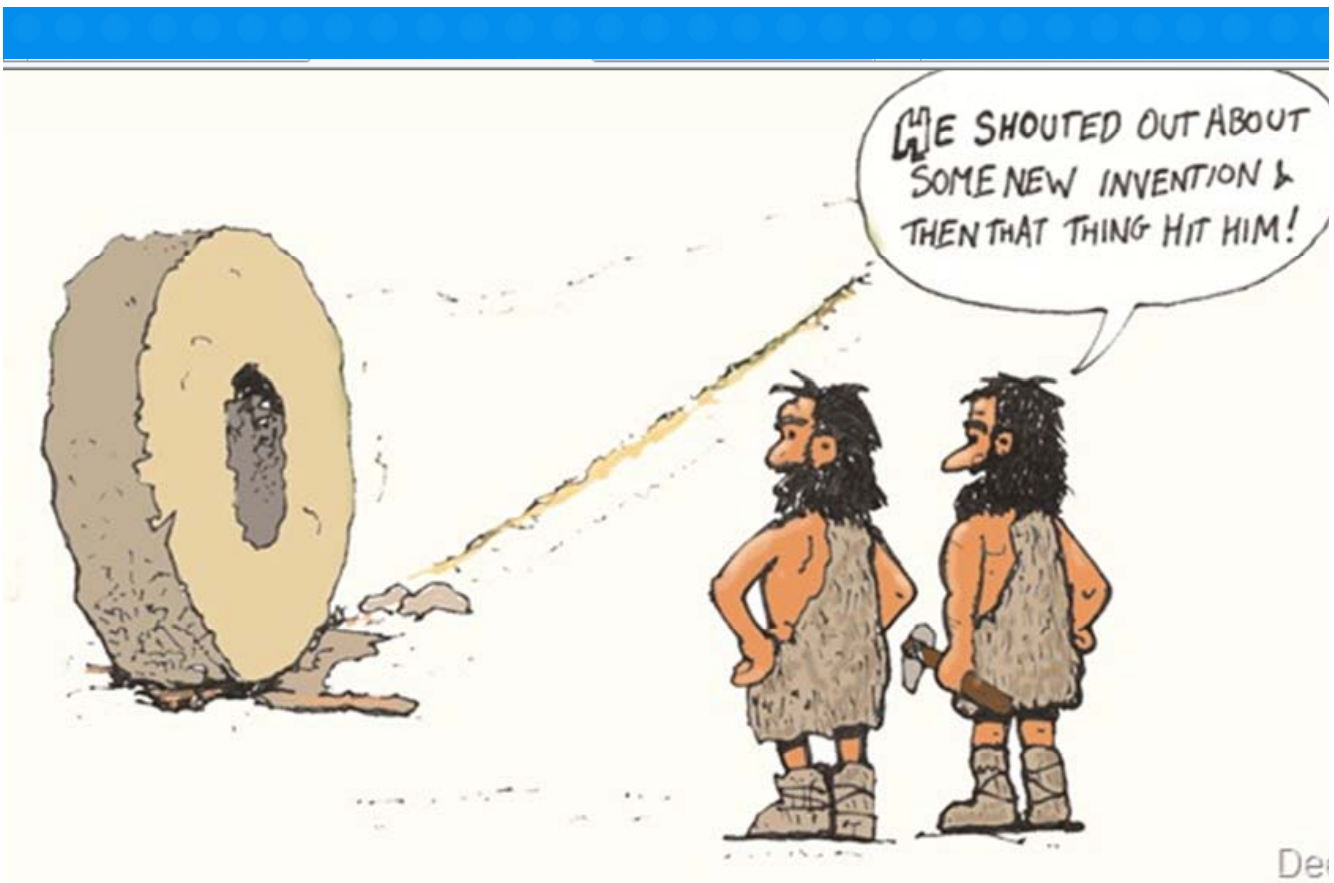
The alliance was fraught with bickering

When Adobe people came up with suggestions, the knee-jerk reaction from Kodakers was "This will never work," recalls Brian Marks, a 19-year Kodak veteran

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De



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Sony Walkman



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Sony vs. Apple



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SONY WALKMAN VS APPLE IPOD

SONY

APPLE

Yrs Manufactured
 10 50 million
 13 100
 16 150

Yrs Manufactured
 4.25 67.5 million
 6 100

Beating Sony by 7 yrs

“Dumb
 hardware”

“The 21st-century
 Walkman.”

Hardware with well
 designed software



http://www.cassettetocdkit.com/take_a_walk.html

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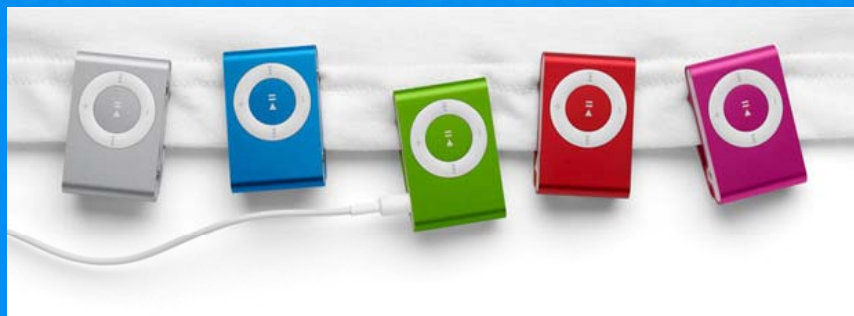


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Touch wheel vs. click wheel

video



Flash Memory rather than hard disk



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Nanopod -2006



2008



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iPod Touch - 2007



Cellular phone - 2007



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Apple Computer Inc.

Top most innovative companies — Businessweek 24 April 2006

Used no fewer than 7 types of innovation

- Networking (a novel agreement among music companies to sell their songs online)
- Business model (songs sold for a buck each online)

➤ **Simplicity of the iTunes software platform that made it a great success**

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Case iPod: 6 Months to Create from Scratch

A Technology Entrepreneur and a Start-up Partner – a Benchmark of Openness and Speed

An entrepreneur with an idea comes to Apple

- Independent contractor Tony Fadell develops complete iPod/iTunes product solution in 8 weeks after he proposes it to Apple



Apple hires partners & team

- Apple hires Tony to create and lead 35 person team from Philips, IDEO, General Magic, Apple, Connectix and WebTV to develop the iPod
- Apple developed the user interface and design leaving PortalPlayer in charge of the technical design

PortalPlayer manages technical design and earns annuity revenue stream



portalplayer

- PortalPlayer, provides the platform and produces the reference design in collaboration with Apple based on list of desired features; selects other design chain members and manages the design process
- PortalPlayer makes \$15 / iPod sold



TOSHIBA



6 months

Sources: Electronics Design Chain Magazine, August 17, 2004; Wired Magazine, July 21, 2004; Forbes Magazine, February 16, 2004; interview with Tony Fadell

iPod

iPod critical success factors:

- Business system innovation
- Openness of development process
- Fast decision making
- Iterative collaborative relationship with PortalPlayer and other partners

SONY

- ❑ Had expertise for hardware, software, contents, services – all working in Silo within Sony
- ❑ Getting divisions to work together was very difficult
- ❑ **Behind the doors of its tightly guarded R&D Labs**, dubbed Sony's Creative Center, engineers are thinking up ways to "touch the hearts of consumers."



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SONY

In 2006 Walkman launched with hard drive – however iPod had 75% of market & 7 years late



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Apple Computer Inc. Most Innovative Company

- Ability to create demand by understanding customers' needs & anticipating new ones
- Reintroduces new products at the right time & effectively markets them
- Has built a culture that encourages innovation & accepts risks entailed

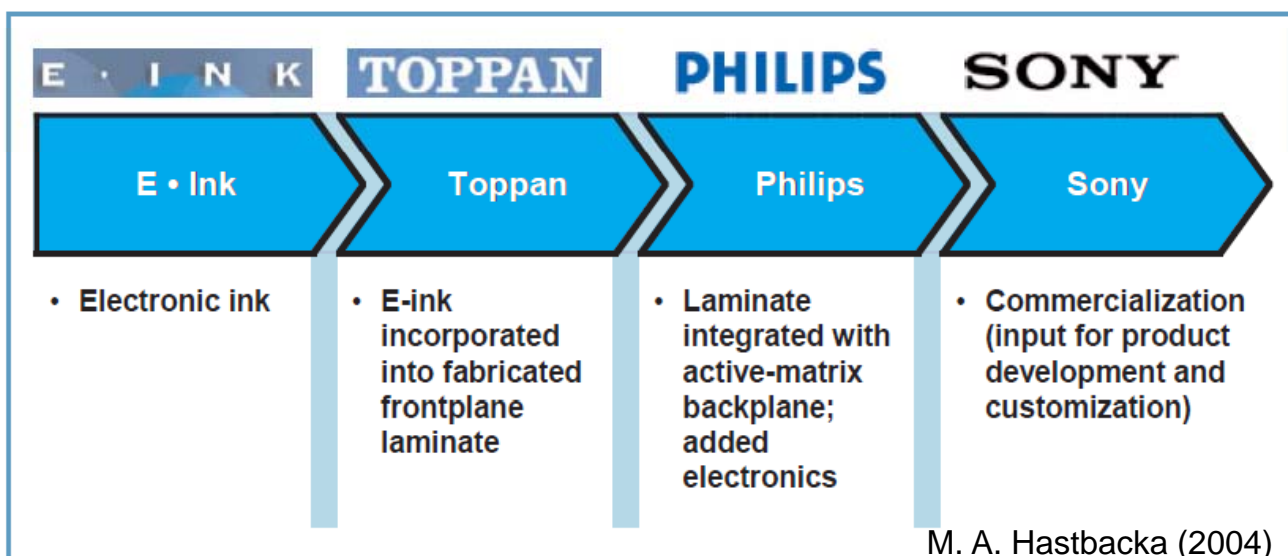


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Open Innovation results in accelerated realisation of revenues & profits from highly valued products & services



M. A. Hastbacka (2004)

Sony's new e-bookreader had "effective linkages of activities in each organisation's value chain"



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Changing innovation landscape

- ❖ Good ideas are widely distributed
- ❖ No firm has the monopoly
- ❖ Venture capital abundant to accelerate product life cycle
- ❖ Product life cycle getting shorter – IP is an increasing perishable asset



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P&G



PROCTER & GAMBLE

P&G Report Card

Progress Against P&G's Long Term Goals & Strategies, 2001-2005

~~Growth Goals~~

	Goals	Results
Sales Growth	4-6%	7%
Earnings per Share Growth	10%	11%
Free Cash Flow		
Productivity	90%	19%

Growth Strategies

Build Existing core business into stronger Global leaders

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- Reduced R&D cost
- Increased the value of Innovation pipeline & led the industry in Innovation by leveraging a global network of external Innovation partners



~ 2008 Annual Report

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Multiply Innovative capacity with a global network of innovation partners - That give an access to literally 1000s of ideas & technologies each year (annual report 2005)



P&G was ranked as the No. 1 innovative in 2005 (US industry survey) “Employs "Connect & Develop" model to leverage external resources to drive innovation”

P&G is Designed to Innovate... and to grow

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❖ Involve external innovation to turbo-charge internal innovation capability

❖ In 2002 – only 15% outside innovation

❖ 2008 – > half of all innovation includes an external partner

❖ Past year evaluated >5,000 innovation opportunities from

- Small entrepreneurs
- Universities
- RIs
- Large companies



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P&G Networks of Innovators

Networks include;

- NineSigma - which links up companies with scientists at university, government, & private labs;
- YourEncore Inc., which connects retired scientists & engineers with businesses;
- yet2.com Inc., an online marketplace for intellectual property



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Nokia: Every 2 weeks – a new model

Nokia open innovation network with academic partners



- i) Foster Innovation
- ii) Unlock global business opportunities in collaborating with world's best experts



~ <http://research.nokia.com/openinnovation>

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Nokia Research Centre

Actively engage in Open Innovation through selective & deep research collaborations with world-leading institutions

By

- Sharing resources
- Leveraging ideas
- Tapping each other's expertise



~ <http://research.nokia.com/openinnovation>

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Nokia Research Centre

- Able to create vibrant innovation ecosystems
- Multiply efforts
- Enhance innovation speed & efficiency
- Derive more value for organizations
- Ultimately benefit for end-customers



~ <http://research.nokia.com/openinnovation>

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ETHZ

(Eidgenössische Technische Hochschule Zürich)



Is among the top universities in the world with an outstanding research record in the fields of chemistry, mathematics & physics

More than 20 Nobel laureates connected to ETHZ.

Nokia collaborates with Depts of;

- Computer Science & Information Technology
- Electrical Engineering.



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Massachusetts Institute of Technology

- Research in spoken language
- Location sensing
- Interfaces that provide users better access to information

- One of the top engineering schools in the world
- Former members of community have won Nobel Prize
- Nokia is working with:
- Computer Science & Artificial Intelligence Laboratory
- Media Lab

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Stanford University

One of the world's leading research & teaching institutions

Located in the heart of Silicon Valley –

Its alumni founded Co. such as:

- Hewlett-Packard
- Sun Microsystems
- Nvidia
- Yahoo
- Cisco Systems
- Silicon Graphics



- ❑ Mobile Augmented Reality
- ❑ Open platform for imaging & Computational photography



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Tampere University of Technology (TUT)

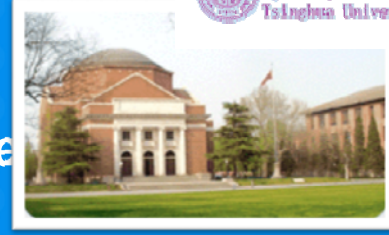
- ❖ Finland's second largest university in engineering sciences
- ❖ Leading-edge fields of research are;
 - signal processing based technologies
 - Nanophotonics
 - Biotechnology
 - intelligent mobile machines
 - hydraulic systems



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Tsinghua



- ❖ One of China's most renowned universities
- ❖ Collaborate with Nokia researchers on a wide range of topics; some global, others focused specifically on Asia
- ❖ Departments collaborating - EE, CS, IE, Dept Sociology, Industrial Design, Dept Precision Instruments & Mechanology.



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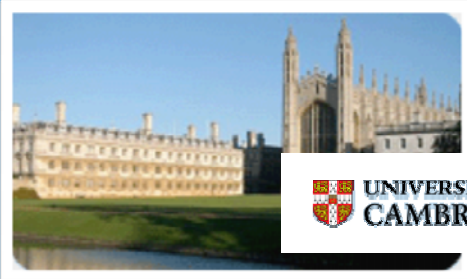
University of California

- ❑ The world's premier public research university
- ❑ 21 Nobel laureates to date
- ❑ Has a rich history of innovation
- ❑ Nokia worked with UC Berkeley and the California and U.S. Departments of Transportation (Caltrans and U.S. DoT) on;
- ❑ Mobile Millennium Project - an unprecedented traffic monitoring system capable of fusing GPS data from mobile phones with data from existing traffic sensors



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University of Cambridge

Highest No. of Noble Prizes in the world > 80

Large & vibrant high-tech entrepreneurship clusters & one of Europe's main Open Innovation hubs, with hundreds of start-ups & several large corporate research labs located in & around town of Cambridge

- Nokia collaborating with Nanoscience Centre
- Cavendish Laboratory
- Centre for Advance Photonics & Electronics

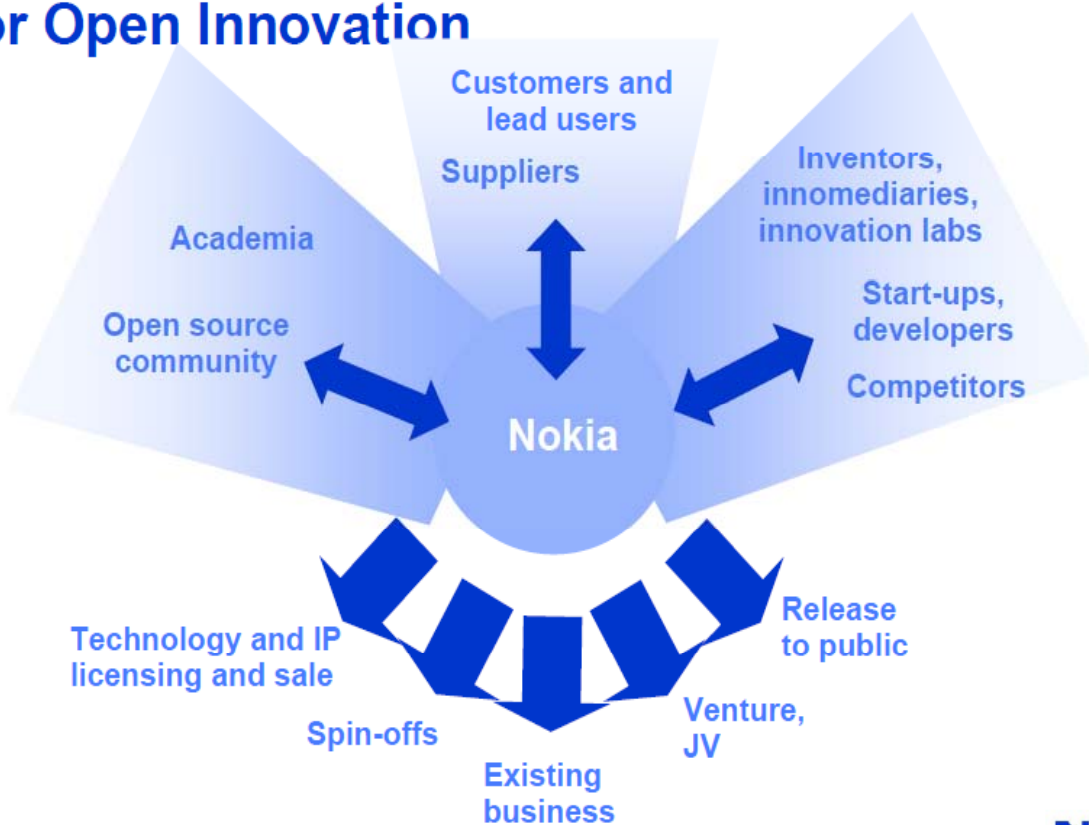


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A Wide Variety Of “Sources And Sinks “Exists For Open Innovation



CLOSE INNOVATION VS. OPEN INNOVATION VIEWPOINT

"Closed" Innovation	"Open" Innovation
Nobody knows what the Co. is innovating	Nobody knows the confidential ideas that Co. is working on
Spending more on internal R&D will improve the market position & help Co. grow	"Smart" innovators engage with global innovation community & reap highest returns
First-to-patent = highest profit	First-to-market = highest profit
Co. needs more R&D staff to close knowledge gaps	Need Co. R&D staff to focus on Co. core competencies, allowing outside solution providers to provide the rest

[AboutOpenInnovation.aspx](#)

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Benefits of open innovation

Upgradation: Adopting global technologies - wider source of innovation

- Acquire patent without in house expertise
- Leverage R&D developed on someone budget

Diverse knowledge: Even new Co. can offer the best deals, with diverse range of technologies

Instant solutions: Found & adopted immediately

Constant reinvention: Constant renewing of technology which may be difficult to achieve with in house R&D

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Benefits of open innovation

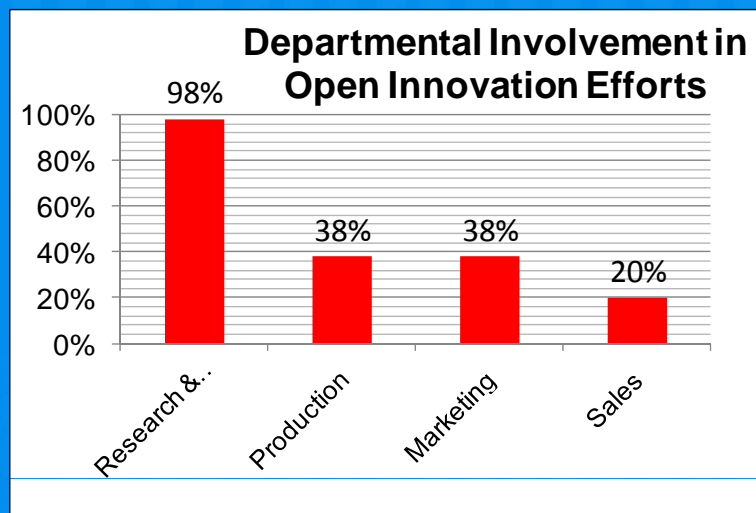
- **Improved payback** on internal R&D through sale or license of otherwise unused IP
- **A greater sense of urgency** for internal groups to act on ideas or technology (use it or lose it)
- Strategic experiments at **lower risk & resources**, with the opportunity to extend core business & create new sources of growth
- **Create innovative culture**, from the 'outside in' through continued exposure & relationships with external innovators



Source: M. Dechert
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Open innovation now at the early stages of product & technology development. More functions to become involved in open innovation to support the entire product lifecycle.

More companies that integrate open innovation into multiple functions will have the most demonstrable successes.

Open Innovation— Criteria for Selection of a Partner

- Global reach to research & innovation community
- Real-time identification of potential solution providers
- Strong internal staff with appropriate background (Ph.D., R&D experience)
- Safeguards in place around IP
- Simple & straightforward process
- Experience



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OBJECTIVES OF OPEN INNOVATION

Identify , Exploit & Leverage Points

- Fuse multiple technologies to create value & differentiation
- Understand true needs, strengths, weakness & overall technology position

Reserved

It is not just about

- Buying technology
- Outsourcing R&D
- Strategic supplier management
- Customer data collection
- Buying Cos. to fuel growth



Instead it's about

- Building a portfolio of deep relationships & networking to provide access to technology, meeting technology needs & capture related opportunities

Challenges

- Co. need to think differently about how opening labs to outsiders can create technology exchange that lead to revenue
- Perspective for internal R&D must change – R&D must become comfortable with handling a greater breath of technologies & must develop skill to integrate those technologies in value-added ways
- R&D budget will also change, to reflect not just spending on internal budget but also accessing & implementing 3rd party technologies



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KEY QUESTIONS/CHALLENGES

- What is the appropriate balance of internal/external technology?
- What competencies should we invest in & control externally? How should others be acquired?
- How do we make quantum leaps in innovation?
- How do we integrate board room deal-making with other types of advance technology collaboration?



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Traditional working models

- *joint development efforts, Alliances, Consortia*
- Many Co. work with Univ. or PRIs to bringing ideas & technology into the firm
- Firms are not reaching the entire global research & innovation community
- Depriving themselves of potential partners & solutions



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