

## Opening the Innovation Box

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## Opening the Innovation Box

- What is it all about?
  - The P&G example
  - IBM: today's technological reality
  - What is innovation in the end?
- The "old" innovation paradigm
- The drivers: why it does not work anymore
- Unlocking the innovation box
- Implications, key success factors and caveats
- From open innovation to user innovation
- Putting it all together
- Your take-away's

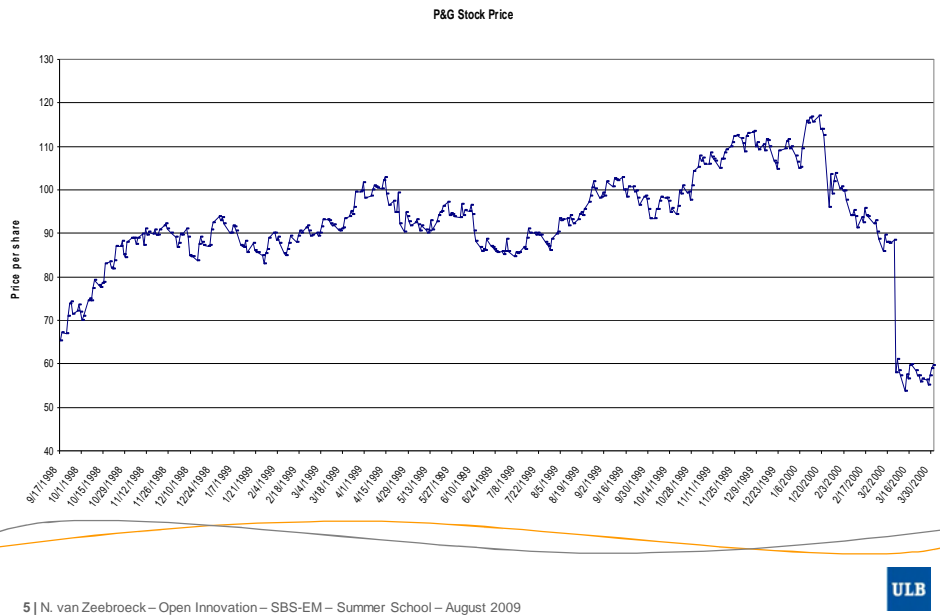
## Opening the Innovation Box

What is it all about?

### The P&G example

- P&G used to be a VERY closed organization
  - “We invented Not Invented Here” – J. Weedman
- P&G financial crisis, in 2000
  - Missed a series of quarterly financial estimates
  - Stock market lost confidence in the company
  - Stock price fell by more than half in 4 months!
  - CEO (Jager) was fired

## The P&G example



## The P&G example

- The challenge
  - Alan Lafley appointed new CEO
  - 4 to 6% annual growth required (roughly +4B\$ in turnover a year)
    - “We fundamentally had a growth problem. Our current brands were performing well. But we weren’t developing many new brands.”  
C. Wynett
  - Products become more sophisticated
    - Cost of R&D increases
    - In contradiction with the search for lower development costs and higher margins
  - R&D staff was about 7500 people, but there are millions of potential innovators around the world outside P&G
    - How to catch ideas those people could generate?

## The P&G example

- Toward a more open innovation
  - Many processes to enable open innovation
    - Technology scouts
    - Legal templates for IP, partnering
    - Investments in Innovation Intermediaries
    - Connect + Develop (SpinBrush, Swiffer, Regenerist)
      - → Collaborates with individuals and companies, laboratories, research institutes, financial institutions, suppliers, academia and e-R&D networks
      - Catch innovation outside and leverage on P&G's R&D and manufacturing machine to transform it into profitable business
  - The Goal Now:
    - Become the open innovation partner of choice
    - Make 50% of new product sales from external ideas

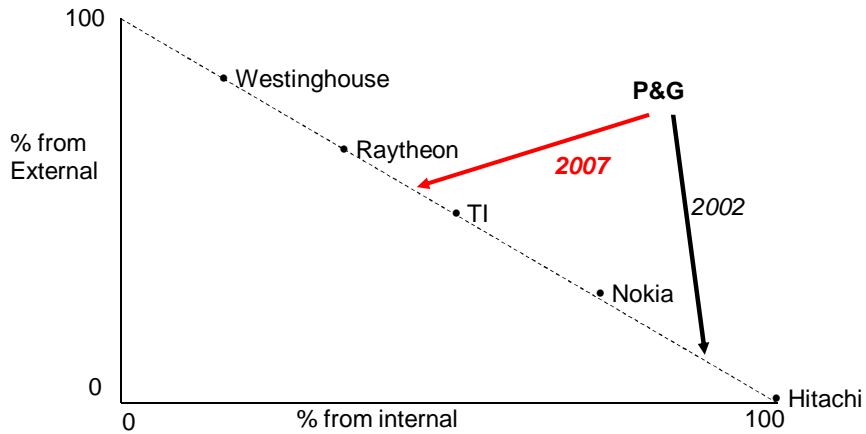
## The P&G example

The screenshot shows the 'connect + develop' website. At the top, there are logos for 'connect + develop', 'P&G', and 'P&G Global Operations'. A navigation bar includes 'Home', 'About Connect + Develop', 'Submit Your Innovation', 'Browse P&G's Needs', and 'Media Center'. The main content area is divided into three sections:

- Log in to your account:** Includes a 'Register here' link, a 'Submit Your Innovation' form with fields for 'Username' and 'Password', and links for 'Log in' and 'Forgot your password?'. Below the form are links for 'User Home', 'Submit Your Innovation', 'Browse P&G Needs', 'Browse P&G Assets', and 'FAQ'.
- Submit Your Innovation:** A text-based section asking if the user has a game-changing product, technology, business model, or method that can improve consumers' lives. It lists criteria for interest and includes a 'Submit Your Innovation Now' button.
- P&G's Innovation Network Includes:** A list of partners including Companies, Individuals, Independent entrepreneurs, Government laboratories, Contract laboratories, Research institutes, Financial institutions, Subject-matter experts, Suppliers, Academia, and Members of e-R&D networks. Specific partners listed are InnoCentive.com, NineSigma.com, Yet2.com, and yourEncore.com. This section also features a circular image of a person in a lab coat.

At the bottom left, there is an 'Also Visit' section with links to 'P&G Bioscience' and 'P&G Future/Works'. A blue banner at the bottom center asks 'Does your innovation meet the above criteria?' and includes a 'Submit Your Innovation Now' button.

## The P&G example



Source: Gassmann, v. Zedtwicz (2002)

## The P&G example

- The new C&D Model
  - Product portfolio analysis and market intelligence
    - growth blockers
    - strengths/opportunities of current technology/IP portfolio
    - new needs in a domain in line with the business objectives
  - Connect: the quest for a solution, inside or outside
    - Needs are formalized and sent over the network (internal+external)
  - Evaluate solutions potential and leverage on P&G capacity to translate idea/products in profitable business
    - If a solution is selected by a Business unit then the process of acquisition/licensing is started
  - Cultural revolution:
    - Move mindset from “Not Invented Here” to “Proudly Found Elsewhere”

## The P&G example

- The results
  - From 2000 to 2004
    - 70% increase in profits (to \$9.8 billion)
    - 30% increase in sales (to \$51 billion)
  - In 2005
    - Purchase of Gillette for \$54 billion
    - Well accepted by investors and analysts

## The P&G example

- I think that the most challenging thing is for a big company to learn how to work with a small or mid-size company. When you are an \$85 billion corporation, nearly every company you work with is a small(er) company. I call these asymmetrical relationships.

*Jeff Weedman*  
*VP External Business Development*

## Today's technological reality

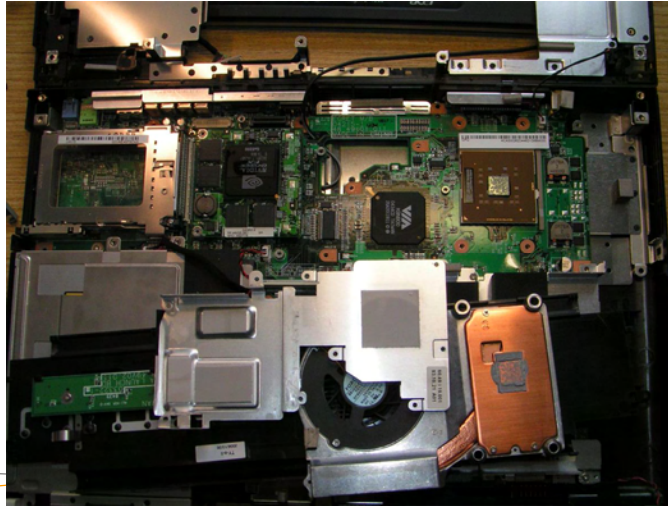
- IBM, Intel, and P&G: what do they have in common?
  - All search externally for useful ideas to leverage their business
    - IBM: invests in Java and Linux
    - Intel: invests significant resources in university research
    - P&G: stretch goal of having 50% of its new project portfolio come from outside
    - All: concede licenses on their ideas to others
      - IBM reported royalty receipts of \$1.9 billion in 2001 (15% of OI)
      - P&G: policy of licensing any patented technology not in use in one of its own businesses within three years

## Today's technological reality

- The old way
  - IP is seen as a negative right, a legal overhead, never as an exploitable asset
  - Traded on a like-for-like basis
- Marshall Phelps' way
  - Joined IBM in the 70's
  - Thought that the company's IP was under-exploited: should be viewed as an asset, IBM should measure its worth and then charge an appropriate price
  - CEO Lou Gerstner was skeptical of the idea
    - Had a bad experience with patents in his previous job at Nabisco
    - Wanted IBM to be aggressive on IP and sue any infringer
  - Phelps opened an IBM computer and marked all components coming from others
    - Phelps told Gerstner: 'See? This is why we cannot be aggressive with our IP'
    - 'In the end, Lou just said, fine, go and do it then. But I bet you can't make a billion by 2000'
    - 'I made twice that and the model for IBM's IP licensing program was born.'

## Today's technological reality

Phelps opened an IBM computer...

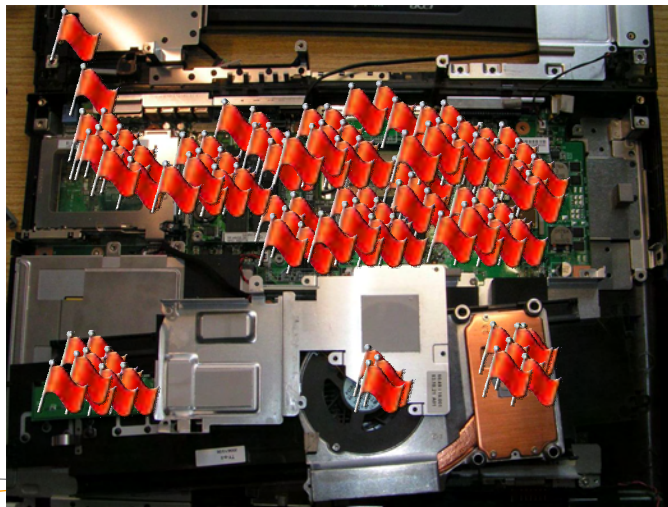


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## Today's technological reality

...and marked all components using technology owned by others



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## Today's technological reality

- Look at a GSM or a computer:
  - Thousands of pieces of IP in a single technological product
    - ➔ virtually impossible to stop someone from working around your technology
  - Allow them to license that technology, however, and you both win

## What is innovation?

- What do you think?

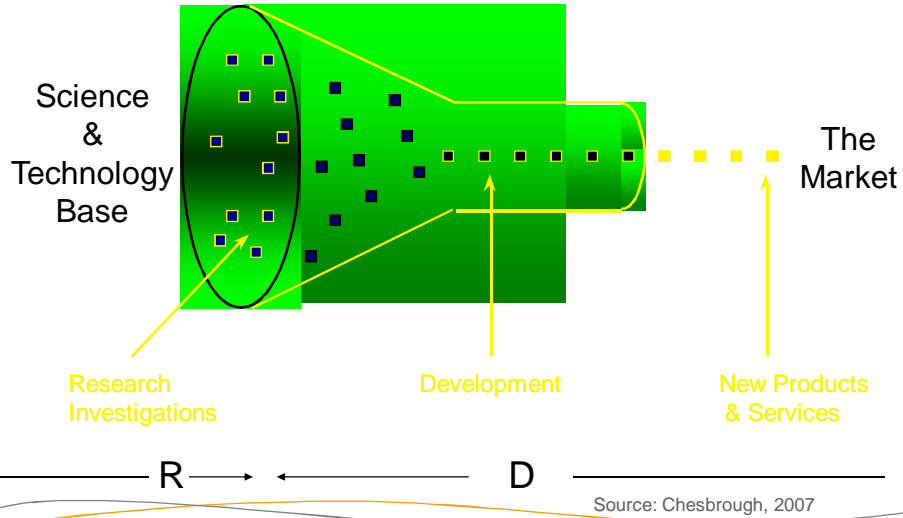
## What is innovation?

- Alternate uses of the term
  - Technological novelty (cf. “invention”)
  - Economic value (i.e., has a biz model)
  - Knowledge production
- Here: all of the above

## Opening the Innovation Box

The “old” innovation paradigm

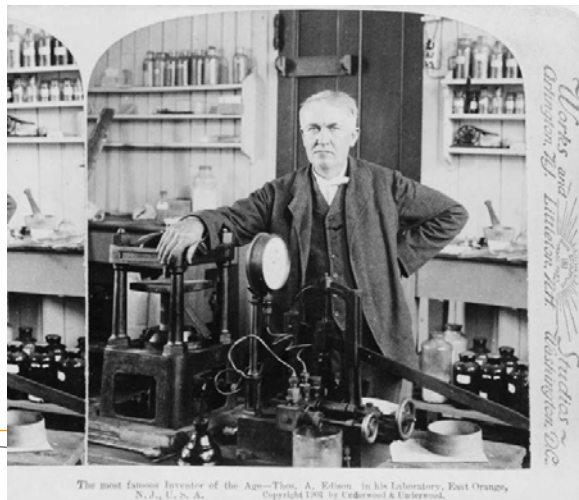
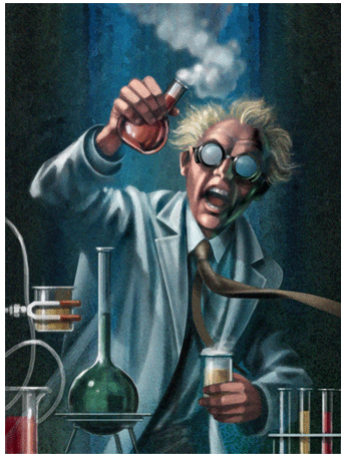
## The 'old' innovation paradigm



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## The 'old' innovation paradigm



The most famous Inventor of the Age—Thomas A. Edison, in his Laboratory, East Orange, N. J., U. S. A. Copyright 1904 by Underwood & Underwood.

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## The 'old' innovation paradigm

- Old paradigm: 'Closed Innovation'
  - Based on control and self-reliance
    - Firms must generate their own ideas
    - And master the whole value chain:
      - develop, build, market, distribute, service, finance, support
    - Because only way to ensure quality:
      - "If you want something done right, you've got to do it yourself"

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## The 'old' innovation paradigm

- Closed innovation has produced great successes:
  - The Chemicals Industry – Germany and later US
  - Edison, GE, and the rise of electrification
  - Rockefeller and Standard Oil
  - AT&T's Bell Labs
- Internal R&D has been key to the rise of the modern US corporation in the 20<sup>th</sup> century (Chandler)

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## The 'old' innovation paradigm

- Hidden Assumptions in the Internally-Focused Innovation:
  - If I discover it, I will find a market for it
  - If I discover it first, I will own it
  - The important technologies I will need can be anticipated in advance
  - “Misfits” are regrettable, but are a cost of doing business
  - The best people in this field work for us

## Opening the Innovation Box

The drivers: why it does not work anymore?

## The drivers: why it does not work anymore?

### Rising Costs of R&D

#### Then (25 years ago)

- <\$ 30 million for a fab
- <\$ 50 million for a new drug
- < \$ 10 million for a new consumer product

#### Now

- > \$ 3 billion for a fab
- > \$ 800 million for a new drug
- > \$50 million for a new consumer product

## The drivers: why it does not work anymore?

### Shorter product/technology life cycles

- Computers
- Audio/Video Media
- Cell phones
- Generic drugs
- “80% of the senior executives we surveyed indicated that the productive lives of their *strategies* were getting shorter.”

» *Chris Zook, HBR April 2007*

## The drivers: why it does not work anymore?

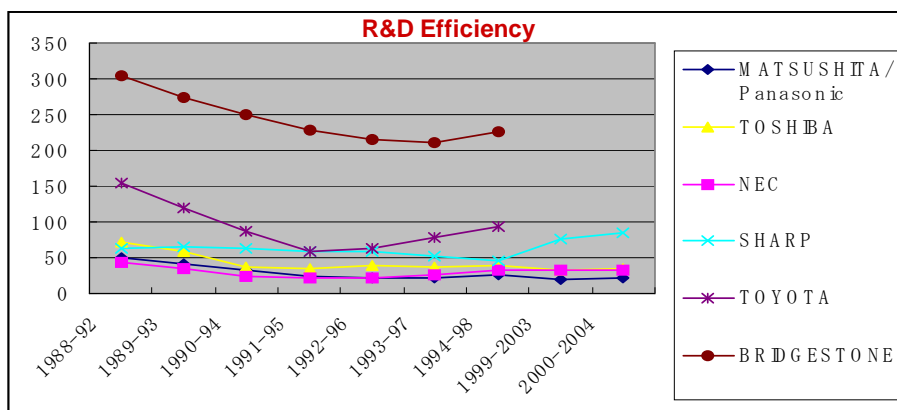
### Diminishing economies of scale to R&D

Company Size	1981	1989	1999	2003
< 1000 employees	4.4 %	9.2%	22.5%	22.5%
1,000 – 4,999	6.1 %	7.6 %	13.6%	14.8%
5,000 – 9,999	5.8 %	5.5%	9.0%	7.5%
10,000 – 24,999	13.1%	10.0%	13.6%	13.4%
25,000 +	<b>70.7%</b>	<b>67.7%</b>	<b>41.3%</b>	<b>40.9%</b>

Sources: National Science Foundation, Science Resource Studies, Survey of Industrial Research Development, 1991, 1999, 2001, 2003

## The drivers: why it does not work anymore?

### Diminishing economies of scale to R&D



## The drivers: why it does not work anymore?

### Increasing R&D performance of SMEs

- **Challenges for SMEs**
  - Less internal R&D capability
  - Less ability to absorb external R&D
  - Less “status” as a partner for others
  - Less market power, weaker ability to capture value
  - Less IP (usually, not always)
  - IP Enforcement often too expensive
- **Advantages of SMEs**
  - **Size**: markets that are too small for large firms can be attractive
  - **Focus**: greater ability to execute for a specific segment or set of customer needs
  - **Specialization**: ability to develop deep knowledge of a specific domain
  - **Entrepreneurial**: external focus on results, much less internal “politics”
  - **Speed**: faster decisions, faster execution, faster results

## The drivers: why it does not work anymore?

- **Five Erosion Factors**
  - Acceleration of technological development
    - An increasing technological complexity
    - With increasingly architectural innovation
    - And shorter life cycles
  - Increasingly mobile trained workers
  - More capable universities
  - Erosion of oligopoly market positions
  - Enormous increase in Venture Capital in the US
- + Impact of ICT?

## Opening the Innovation Box

Unlocking the innovation box

## Unlocking the innovation box

- Open innovation: a new paradigm
  - the internally oriented, centralized approach to R&D is becoming obsolete in many industries
    - Useful knowledge is widely disseminated
    - Ideas must be used with alacrity or will be lost
  - New logic of open innovation:
    - R&D extends far beyond the boundaries of the enterprise
    - Harness outside ideas to advance its own businesses
    - Leverage its internal ideas outside its current operations

Chesbrough, 2003

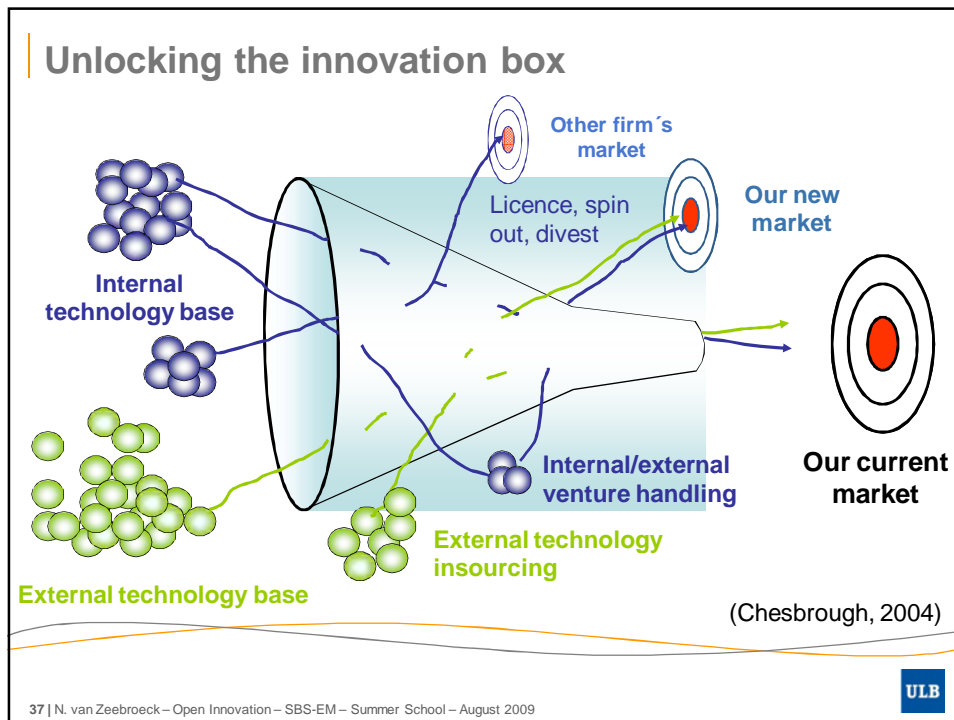
## Unlocking the innovation box

- Open innovation: what does it mean?
  - Open Innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively
  - Open Innovation is a paradigm that assumes that 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

Chesbrough, 2003

## Unlocking the innovation box

- Closed Innovation:
    - “Projects can only enter in one way, at the beginning, and can only exit in one way, by going into the market”
    - “All the smart people work for us”
  - Open Innovation:
    - “There are many ways for ideas to flow into the process, and many ways for it to flow into the market”
- (Chesbrough, 2006)
- “No matter who you are, most of the smartest people work for someone else” (Bill Joy, Sun Microsystems cofounder)



- ### Unlocking the innovation box
- Open Innovation separates innovation into multiple stages
    - From a marathon to a relay race
  - Lab and test equipment are fundamental
    - Customer's ability to verify that spec was met
    - Supplier's confidence that good product was delivered
    - Enables the innovation baton to be passed efficiently and effectively
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- ULB

## Unlocking the innovation box

- The Logic of “Open Innovation”
  - Good ideas are widely distributed today
    - No one has a monopoly on useful knowledge anymore
  - We must manage IP in order to manage research:
    - need to access external IP to fuel our business model
    - need to profit from our own IP in others' business model
  - Not all of the smart people in the world work for us
- Where are the Great Ideas today?
  - Individual Inventors
  - SMEs
  - Universities and Research Institutes
  - Some large companies

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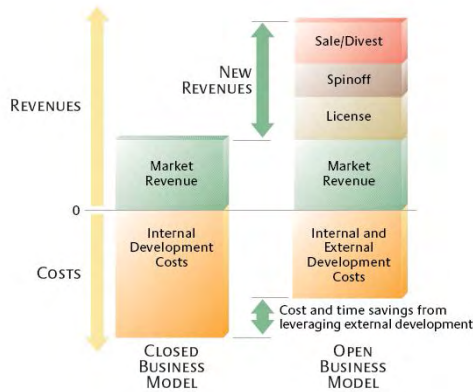
## Unlocking the innovation box

- A few examples:
  - In HP for instance it goes through a complete reorganization of the HP Labs focusing them on research topics in line with company strategy while giving end users the capacity to interact very early with new ideas/product to influence and bring new views in the development.
  - In Cisco, with the Cisco I-Prize, it is clearly a target of giving potential innovators all around the world the means to express and develop their ideas under the Cisco umbrella.
  - Google with Android challenge gave opportunity to any developer to bring new ideas and user experience in the field of mobile phones.

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## Unlocking the innovation box



Valuable ideas can come from inside or outside the company (industry) and can go to market from inside or outside the company (industry) as well

Source: Chesbrough, 2003

## Unlocking the innovation box

	CLOSED INNOVATION	OPEN INNOVATION
CORPORATE ETHOS	Not invented here / "We can do it, we will do it"	Best from anywhere
ROLE OF CUSTOMERS	Passive recipients	Active co-innovators
CORE COMPETENCY	Vertically integrated product and service design	Core competitive differentiation and collaborative partner management
INNOVATION SUCCESS METRICS	Increased margins/revenues, reduced time-to-market, market share within existing market	R&D ROI, breakthrough product or business models
ATTITUDE TOWARDS IP	Own and protect	Buy, sell – the corporation is a knowledge broker using both licensing and commercial development to monetize IPR
ROLE OF R&D AND OPERATIONS	Design, develop and market in-house inventions	Optimize performance of owned assets through both in-house and external development; do enough R&D internally to recognize significant external R&D

Source: Forrester – Innovation Networks, June 17, 2004

## Unlocking the innovation box

### The logic of Open Innovation

- Good ideas are widely distributed today; no one has monopoly
- First to discover is neither sufficient nor necessary for commercial success
- A better business model beats a better technology
- IP is a perishable asset: customer or markets don't wait

#### Open Innovation is not about...

open access to own technologies

outsourced R&D

technology only

technical invention

appropriating value

new ventures

partnerships only

cutting research costs

#### ...but about

strategic IPR management

strategic R&D

both technology and business model

commercial innovation

win-win partnership

core product development process

innovation ecosystem building

improving R&D ROI

Source: Chesbrough, 2008

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## Opening the Innovation Box

Implications, key success factors, and caveats

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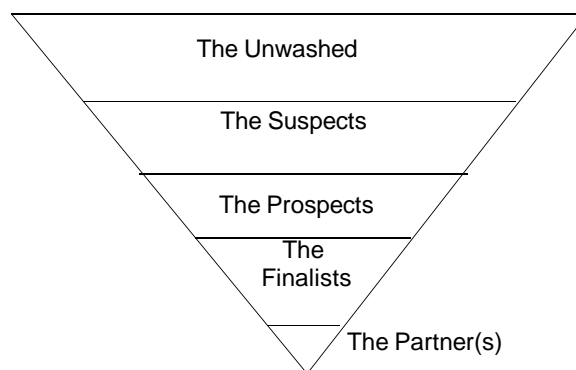


## Implications, key success factors, and caveats

- 2 main issues
  - Where and how to find partners or sources of ideas?
  - How to manage the property of the knowledge (ideas)?

## Implications, key success factors, and caveats

- Finding Partners: A Massive Filtering Problem



Source: Chesbrough, 2008

## Implications, key success factors, and caveats

- To facilitate the search for ideas/partners: Ideas brokers
  - Scouting technologies (utilizing public domain information)
  - Innovative Intermediaries:
    - Nine Sigma and Yet2.com
      - Outbound email “RFPs”/ Contacts and Competencies
      - Requires (public) Problem Statement from Client
    - InnoCentive
      - Start with public domain Problem Statement
      - Solver Agreement (Solver owns solution being proposed)
      - Private “rooms” on site for Solver to propose solution
      - InnoCentive staff validates potential of idea prior to sharing idea with Client
      - Client pays only for valid solution
    - Other:
      - Inbound: Innovation Exchange, SSIPEX, YourEncore.com
      - Outbound: IpValue, ThinkFire (patents), Utek, Flintbox (university technology)

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## Implications, key success factors, and caveats

- Once partners/ideas are found, how to appropriate them?
  - Growing collaborations between
    - Firms and universities
    - Incumbent firms and start-ups
    - Firms and their competitors
    - Suppliers and customers
  - Shared developments lead to shared ideas
    - Knowledge economy: firms trade more and more knowledge, less and less products
  - Key issue: Intellectual Property

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## Implications, key success factors, and caveats

- Key issue: Intellectual Property
  - Patents (and other IPR) delineate the ownership of each partner
  - Licensing and cross-licensing become increasingly growing practice
  - Cf: RIM v. NTP, SONY and SAMSUNG, etc.
- The success of open innovation is a key driver of the patent explosion

## Implications, key success factors, and caveats

- Other caveats:
  - What are the incentives for firms to open innovation?
  - When do knowledge brokers obstruct innovation?
  - How do firms know which network ties will help?
  - Are benefits from strategic alliances always equitable?

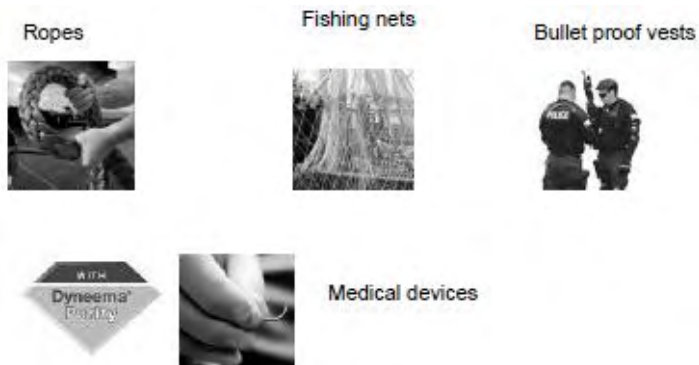
## Implications, key success factors, and caveats

- An illustration: DSM's DYNEEMA
  - DYNEEMA: DSM's strong fiber (20 times stronger than steel)
    - Invented under the 'old' (or closed) innovation model
    - Value creation: Technology has no value in itself
    - Customers are not interested in technical characteristics of the product
  - How to create value?
    - Translate product characteristics into sales arguments
    - = show value of the product in the customer's value chain (e.g. Dyneema in fishing nets: stronger, smaller twines, less resistance, less fuel costs, OR higher speed, higher fishing productivity)
    - Make sure you can convince the whole value system and the final customer

Source: Vanhaverbeke, 2008

## Implications, key success factors, and caveats

- An illustration: DSM's DYNEEMA: Potential Applications



Source: Vanhaverbeke, 2008

## Implications, key success factors, and caveats

- An illustration: DSM's DYNEEMA
  - Starting a screening process to find partners to develop applications
    - Can it be done?
      - Is Dyneema the right fiber for you?
      - Is what you want technically feasible?
    - Is it a winning solution?
      - The application should be a leading one. We'll help you identify all the benefits of your Dyneema application.
    - Is there a market for your application?
      - Is there really an end market for your application in the interest of both your business and DSM?
    - Is it worth it?
      - Consider the implications in terms of R&D investment and marketing, and whether your market is big enough to justify all this.

Source: Vanhaverbeke, 2008

## Implications, key success factors, and caveats

- An illustration: DSM's DYNEEMA
  - Value capturing / appropriation
    - Lead user interaction is necessary to detect how value can be created: you have to know his value chain activities
    - Knowing the value chain of the lead user implies you know his cost-structure
    - Maximize your profits using "value based pricing"

Source: Vanhaverbeke, 2008

## Implications, key success factors, and caveats

- **OI and consequences for lead user interaction**
  - Exclusive focus on a successful product introduction is no longer working
  - IP-licensing, spin outs, are other potential outcomes: profound impact on the return of the cooperation for the lead user
  - Lead user may also be acquired
  - LU will have to negotiate up front about the different possible outcomes/scenarios

## Opening the Innovation Box

From open innovation to user innovation

## From open innovation to user innovation

- User innovation: the next paradigm?
  - What if the source of new ideas becomes the user himself?
  - Innovation is democratizing:
    - Users are increasingly able to innovate for themselves
  - In the old 'manufacturer-centered' view:
    - Manufacturers are the developers of new products
    - They protect their innovations as intellectual property
  - In the new 'user-centered' view (von Hippel):
    - Users are the actual developers of many / most new products – both physical and information products
    - Users generally freely reveal their innovations
    - User innovation is a "good thing" that increases social welfare
    - User innovation is steadily increasing as enabling computing and communication technologies improve

## From open innovation to user innovation

- The "functional" source of innovation depends upon the functional relationship between innovator and innovation:
  - An innovation is a USER innovation when the developer expects to benefit by USING it
  - An innovation is a MANUFACTURER innovation when the developer expects to benefit by SELLING it

*Von Hippel, 2008*

## From open innovation to user innovation

- Can freely-revealed user innovation be plausible and important?
  - See Open source software projects
- Though, as Lerner and Tirole (2002) put it:
  - “Why should thousands of top-notch programmers contribute freely to the provision of a public good?”

## From open innovation to user innovation

- As a matter of fact, evidence suggests many users innovate

<b>Industrial products</b>	<b>n</b>	<b>% Innovating</b>
<b>Printed Circuit CAD</b> Urban and vH	136	<b>24.3%</b>
<b>Pipe Hanger Hardware</b> Herstatt and vH	74	<b>36%</b>
<b>Library IT Systems</b> Morrison, Roberts, vH	102	<b>26%</b>
<b>Software security features</b> Franke and vH	131	<b>19.1%</b>
<b>Surgical Equipment</b> Luthje	262	<b>22%</b>
<b>Consumer products</b>	<b>n</b>	<b>% innovating</b>
<b>Outdoor Products</b> Luthje	153	<b>9.8%</b>
<b>“Extreme” sports equipment</b> Franke & Shah	197	<b>37.8%</b>
<b>Mountain biking equipment</b> Luthje, Herstatt, vH	291	<b>19.2%</b>

## From open innovation to user innovation

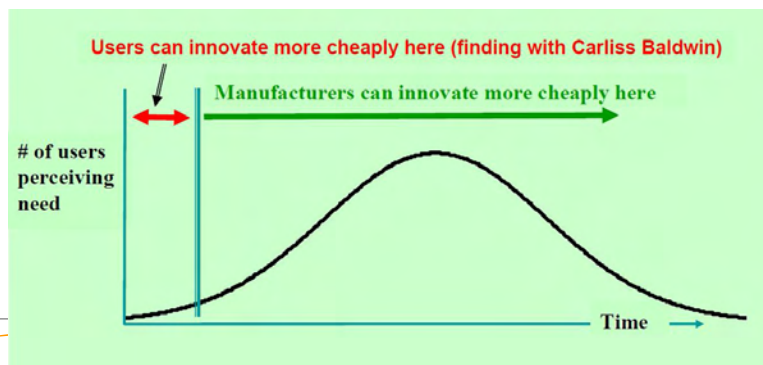
- Why do so many users innovate?
  - Because they need custom products / features
- Why do so many users want custom products?
  - Because they have “custom” needs
    - 2 Meta analyses of market segmentation studies show heterogeneity of need is generally high (Franke and Reisinger, 2003; Franke and von Hippel, 2003)

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## From open innovation to user innovation

- Why would user innovation be valuable?
  - Users tend to innovate at the leading edge of markets where demand is small and uncertain.
  - So lead user innovations offer a product feedstock for manufacturers



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## From open innovation to user innovation

- Example of a user innovation that became a major commercial product: The World Wide Web
  - Berners Berners-Lee did not set out to invent a contemporary cultural phenomenon; rather, he says, “it was something I needed in my work.” He wanted to simply to solve a problem that was hindering his efforts as a consulting software engineer at CERN.
  - Berners Berners-Lee’s innovation was to apply hypertext to the growing reality of networked computers. He expanded the idea he had developed at CERN and made it available on the Internet in the summer of 1991.

*Technology Review Review, July 1996, p.34*

## From open innovation to user innovation

- User and Manufacturer Innovations Differ
  - Users tend to develop Functionally Novel innovations:
    - The first sports-nutrition bar
    - The first scientific instrument of a new type
  - Manufacturers tend to develop Dimension of Merit Improvements:
    - A better better-tasting sports sports-nutrition bar
    - Improvements to an existing type of scientific instrument

## From open innovation to user innovation

- Lead users (von Hippel, 2005)
  - Only “Lead User” innovations form the basis for new products and services of value to manufacturers
  - “Lead Users” are users that:
    - Have needs that foreshadow general demand in the marketplace
    - Expect to obtain high benefit from a solution to their needs (Such users are more likely to innovate “Necessity is the mother of invention!”)

## From open innovation to user innovation

- Lead users (von Hippel, 2005)
  - Empirical studies find innovating users often freely reveal their innovations to other users and/or to suppliers
    - Improvements to Open Source software
    - Improvements to iron furnaces (Allen)
    - Improvements to mine pumping engines
    - Improvements to Technicon clinical chemistry analyzers
    - IBM copper interconnect technology
    - Improvements to library information systems (OPACs)

## From open innovation to user innovation

- Policy Implications

- User-centered innovation is increasing as computing and communication costs drop
- User-centered innovation increases social welfare
- Should be supported – or at least not discriminated against – by policy
  - IP is being used in ways that favor major holders (e.g., patent thickets)
    - Since user-innovation is distributed, each innovator will have little IP – is at a disadvantage.
  - Digital Millennium Copyright Act is aimed at illegal copying
    - But also causes collateral damage to user innovation: Affects users' ability to modify and improve what they buy

## Opening the Innovation Box

Putting it all together

## Putting it all together

- Sources of innovation and paradigms

	Focal Firm	Suppliers	Customers	Rivals
Vertical integration	X			
User innovation	X	†	X	
Cumulative innovation	X			X
Open innovation	X	X	X	X

X = Sources of Innovation; † limited emphasis

Source: West, 2008

## Putting it all together

- Vertical Integration
  - Firms integrate to supply inputs & control outputs
    - R&D is an essential part of integration
    - Technology-based industries require large R&D labs
  - Large producers of early 20th cent.
  - Basis of postwar MNC and TNC
  - Captured by Chandler (1977, 1990)

## Putting it all together

- User Innovation
  - From von Hippel (1988, 2005)
  - Users know their needs best
  - Goal: engage users in innovation
    - Use empowerment, other motivations
    - Direct (toolkits) & indirect (feedback)
    - Requires processes, tools, design
  - Found in ever-wider domains

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## Putting it all together

- Cumulative Innovation
  - Promoted by Scotchmer (1991, 2004)
    - Also Nuvolari (2004), Murray & O'Mahony (2007)
  - Initial innovation is rarely complete
    - Thus, enable later technological progress
  - Competitors build on each other
    - Need rights to each others' work
    - Some IP regimes hinder C.I.
  - Research differs on motives

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## Putting it all together

- Open Innovation
  - Chesbrough (2003, 2006, 2007)
  - Key points:
    - Find alternate sources of innovation
    - Either markets or spillovers
    - Find alternate markets for innovation
    - Central role of the business model
  - Cognitive managerial paradigm
  - Framework consonant with UI, CI

## Putting it all together

- Related Innovation Models
  - Cooperative innovation without monetization:
    - Open Science
      - Cumulative knowledge production
    - Free Software
      - Shared production of shared good
      - Cf. "creative commons": explicitly cumulative innovation

## Putting it all together

- Sources of innovation and paradigms

Model	Norms	Motivations	Vs. Other Innovators
User innovation	Cooperation	Utility	Cooperate
Cumulative innovation	Competition	(various)	Compete
Open innovation	Market exchange	Pecuniary	Exchange
Free software	Community	Intrinsic?	Share
Open science	Professional	Reputational	Build

Source: West, 2008

## Putting it all together

- Sources of innovation and paradigms
  - Open innovation is a general trend and a general framework
  - Main benefits from O.I.
    - Agility in R&D (researchers have to look outside)
    - Networking effect: more innovative products and more often
    - Increases the opportunity to assemble different technologies to create new products
    - Reduction in time to market: thanks to early involvement of customer
    - Improves R&D ROI as it focuses R&D effort on activities which really generate value

## Putting it all together

- Conclusions
  - A single company can no longer manage by itself all the innovation process
  - It must now rely on others and make sure it put in place the adequate structure
    - to foster internal innovation
    - to catch external innovation
    - and make its financial performance sustainable
  - A few years ago: move from Web1.0 to Web2.0:
    - content consumers become content producers
  - Nowadays: move from innovation model 1.0 to 2.0
    - passive customers become innovators for somebody else