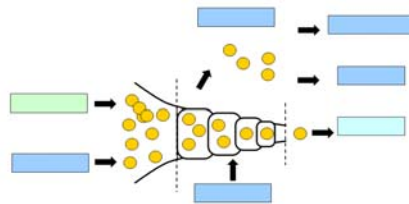


Open Innovation

Module IV



Peter A. Koen, Ph.D.
Associate Professor
Department of Management
Phone: 201-216-5406
E-mail: pkoen@stevens.edu

Agenda

- **Closed Innovation Model**
- **Open Innovation**
 - IBM, Intel, P&G, Apple and Lego
- **Intermediaries**
 - Innocentive, Nine Sigma and YourEncore

Closed Innovation Model

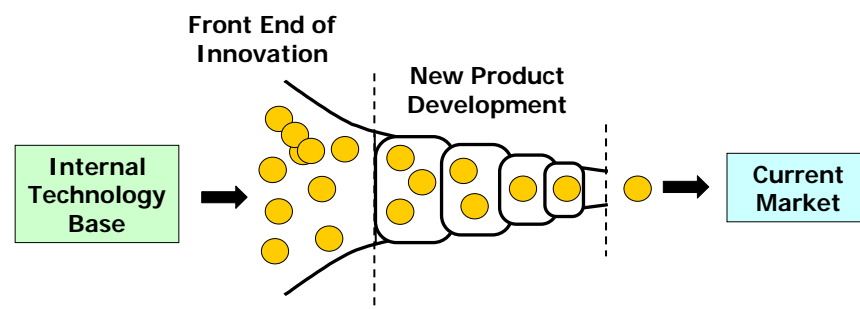
Great Successes

- The Chemicals Industry – Germany and later US
- Edison, GE, and the rise of electrification
- Rockefeller and Standard Oil
- World War II scientific achievements

3

Closed Innovation

Closed Innovation Paradigm



4

Closed Innovation

Hidden Assumptions

- 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
- The best people in this field work for us

"Pick a man of genius, give him money, and leave him alone" – Conant, Harvard

5

Closed Innovation

What changed?

- **Principal Erosion Factors**
 - Mobility of highly experienced and skilled people
 - Focus of science in Academia
 - Enormous increase in Venture Capital

6

Economies of Scale

US Enterprise Size

Size (# of employees)	1981	1989	1999
< 1000	4.4%	9.2%	22.5%
1,000 – 4,999	6.1%	7.6 %	13.6%
5,000 – 9,999	5.8%	5.5%	9.0%
10,000 – 24,999	13.1%	10.0 %	13.6%
25,000+	70.7%	67.7%	41.4%

Source: National Science Foundation, Science Resource Studies, Survey of Industrial Research Development, 1991 and 1999.

7

Technical AND Market Uncertainty

- **Cannot focus R&D if market application is unknown**
 - If everything matters, nothing has priority
- **Cannot solve by more planning – not only unknown, but unknowable**
- **Must experiment, adapt, and iterate**

8

Playing Chess vs. Playing Poker

■ Chess

- Plan several moves ahead
- No new information needed
- You know what you've got, what opponent has

■ Poker

- Pay to play
- Pay for new information
- You discover what you've got, what other players have

9

Adobe

■ Warnock and Geschke at PARC

- Creating fonts for Star Workstation
- Wanted to make into a standard
- Xerox said no: "how can we make money if we give it away?"

■ They leave, and form Adobe

■ Initial plan

- Turn key publishing system, complete with own hardware, software, and fonts

10

Adobe

"We were originally going to supply a turn key systems solution including hardware, printers, software, etc."

"Steve Jobs and Gordon Bell were key ingredients in getting things going..."

Gordon said, "don't do the whole system"

Steve said, "just sell us the software".

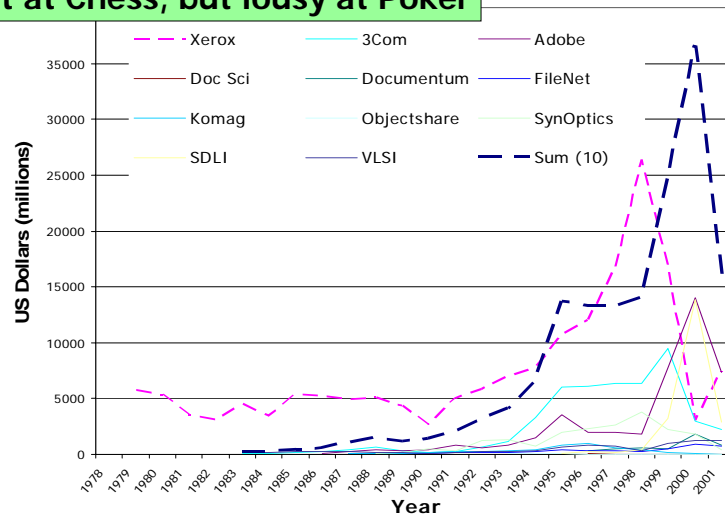
That's how the business plan formed. It wasn't there in the beginning."

Reference: Charles Geschke

11

Xerox

Great at Chess, but lousy at Poker



12

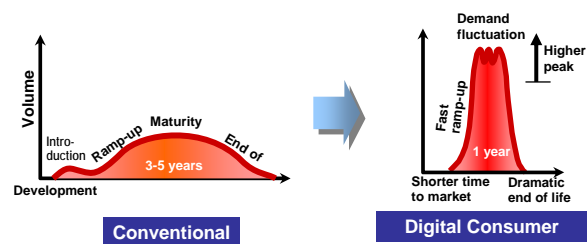
Lessons from Xerox

- Xerox's managers were NOT idiots
- PARC was managed according to the "best practices" of the day
 - 30+ years of funding PARC
 - Tremendous science and technology
 - No process to manage "Playing Poker"
- A new paradigm is required

13

Shorter Product Lifecycles

Faster and efficient R&D processes required



Source: Dr Tsugio Makimoto - Hitachi/Sony

14

Shorter Product Lifecycles

Faster and efficient R& D processes required

Speed-to-Market is Critical Increasing the Need for External Collaboration

- There is an increasing need for external collaboration and efficiency in R&D to accelerate speed-to-market

Non-corporate Research Organization Focus On Long-term Innovation

- Corporate research labs forced to focus on increasingly shorter product cycles
- More opportunity for small companies and individual inventors to generate breakthroughs with long term impact

Greater Need for Corporations to Gain Access to
Innovation Occurring Outside its Boundaries

15

Agenda

✓ Closed Innovation Model

■ Open Innovation

- IBM, Intel, P&G, Apple and Lego

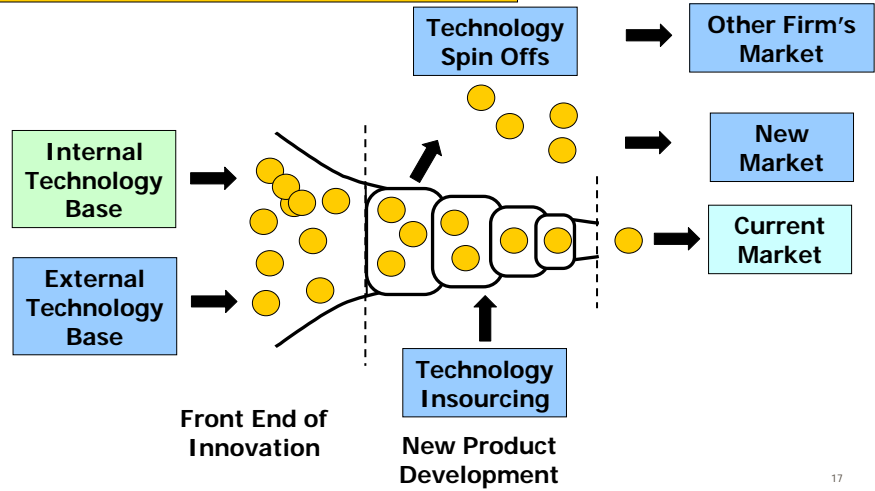
■ Intermediaries

- Innocentive, Nine Sigma and YourEncore

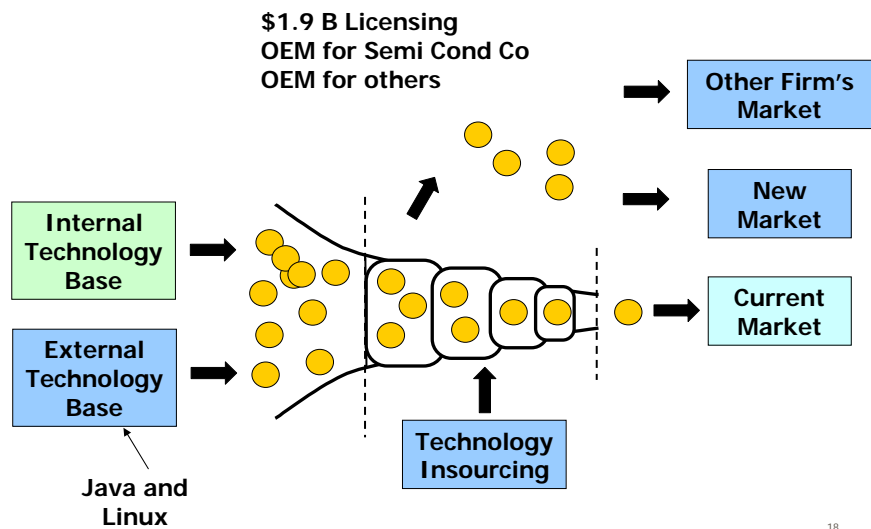
16

Open Innovation

Open Innovation Paradigm

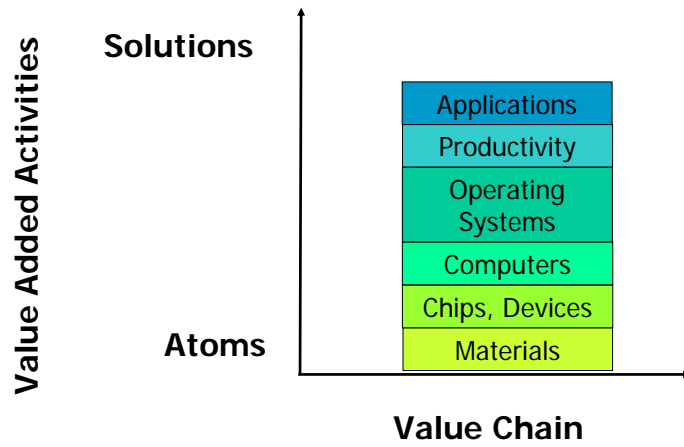


IBM & Open Innovation



IBM

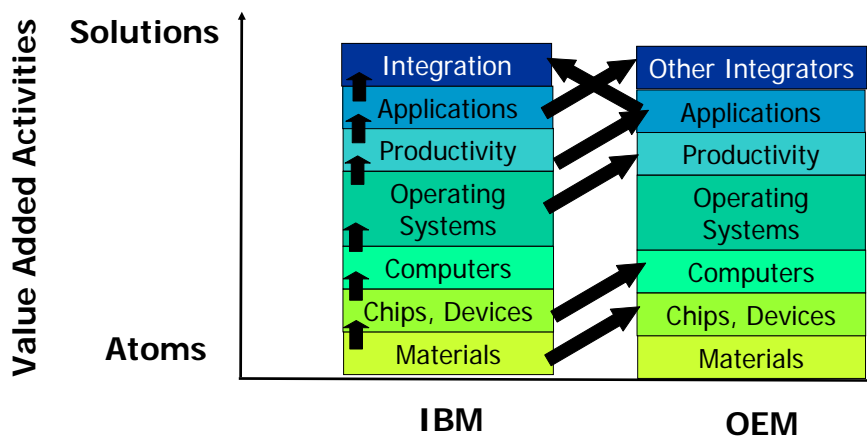
Hidden Assumptions (Closed Value Chain)



19

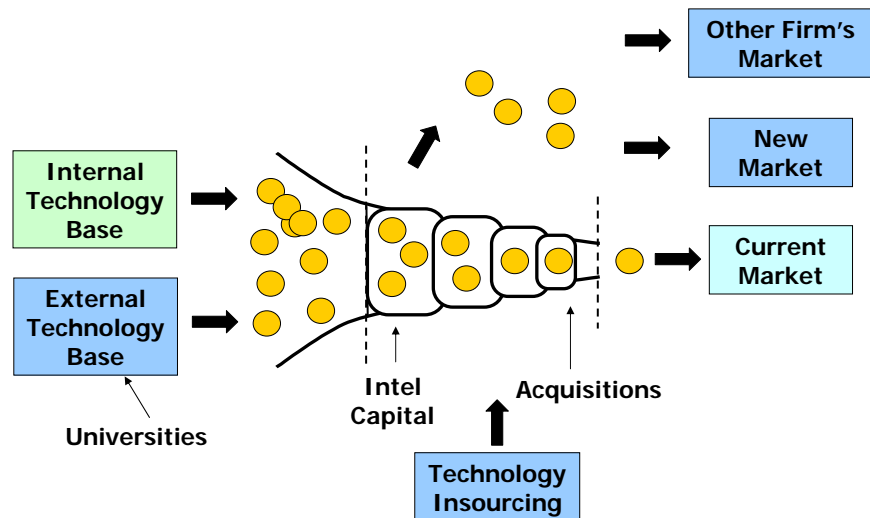
IBM

Unbundling the Value Chain



20

Intel and Open Innovation



21

Intel's University model

- Intel contributes over \$100 million annually to leading US universities (15) and overseas universities (12)
 - This is not philanthropy
- Intel defines promising areas of scientific and engineering research to focus its \$
 - After the NIH and NSF, Intel is one of the biggest funding sources in its chosen areas
- Elicits proposals from university researchers
- Negotiates access to university IP at the university, prior to funding research there

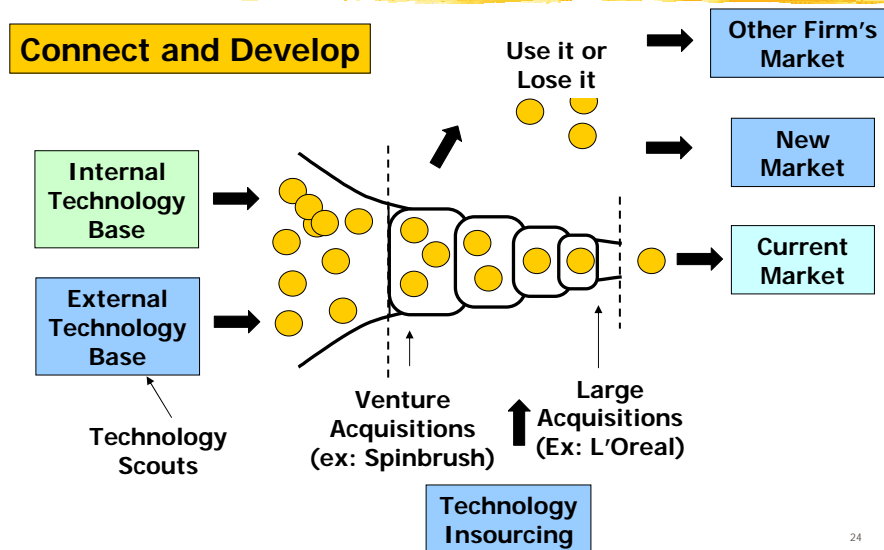
22

Intel's latest move: "Lablets"

- Intel initiated (fall 2002) four smaller research centers, located immediately adjacent to universities at
 - U Washington
 - Berkeley
 - CMU
 - Cambridge
- Each center is led by University academic
- Intention is joint research
- Intel staff measured on joint collaborative research efforts

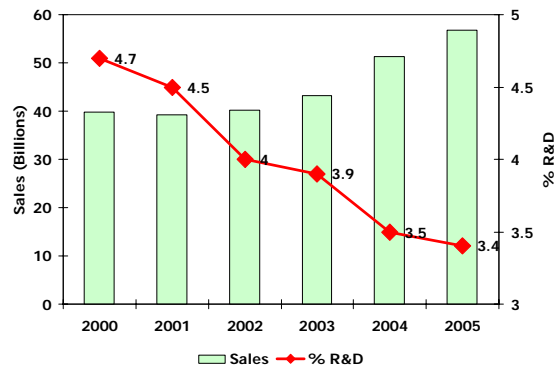
23

P&G & Open Innovation



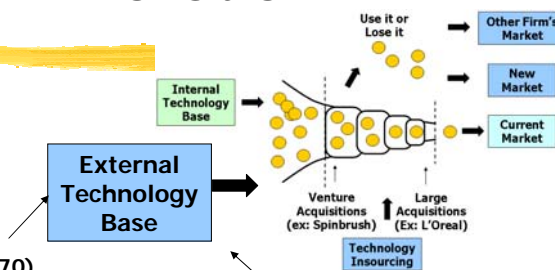
24

P&G Financial Performance



25

P&G & Open Innovation



Technology Entrepreneurs (70)

Discovered 10,000 products, product ideas and promising technologies. For every 100 ideas found from the outside, one ends up in the market

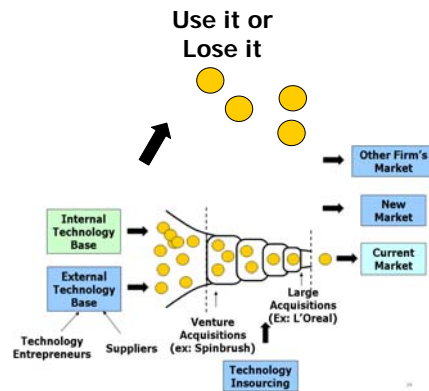
- China (High quality materials and cost innovations)
- India (Solve problems in manufacturing process)
- Japan
- Western Europe
- Latin America
- US

Suppliers

- Share technology briefs with suppliers using a secure IT platform

26

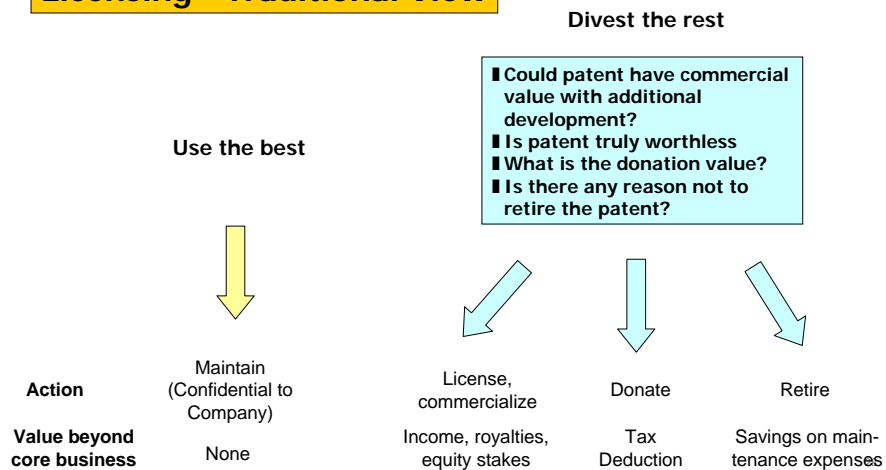
Use it or Lose it



27

Use it or lose it

Licensing - Traditional View



Use it or lose it

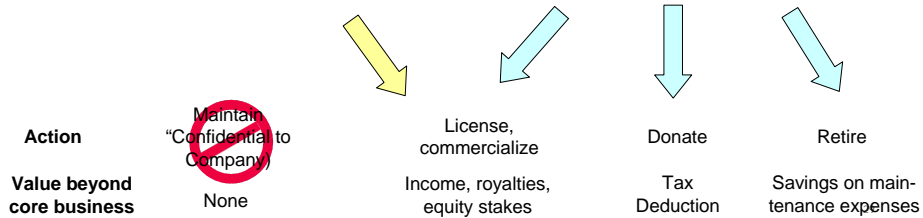
Licensing - The "new" world

Use the best

- What applications exist beyond core industries?
- Who would be interested in the patent?
- What is the rough value of the patent?
- Is value best captured through licensing, commercialization?

Divest the rest

- Could patent have commercial value with additional development?
- Is patent truly worthless?
- What is the donation value?
- Is there any reason not to retire the patent?



Use it or lose it

Licensing - The "new" world

■ IBM

- Generated \$1.8 Billion from royalties and income (16 percent of net income in 2000)

■ Proctor and Gamble

- Generated in 2002 over \$2 billion in sales

Use it or lose it

Licensing at Proctor and Gamble

- **ALL technologies are candidates for licensing**
- **Licensing policy**
 - 3 years after market introduction
 - 5 years after patent is granted
 - Packaging may be immediately licensed
 - P&G retains the right to practice
- **Will license to competitors**
 - P&G quote "We have no competitors, only customers."

Sakkab, N. "Connect and Develop Compliments Research and Development at P&G," Research Technology Management, 38-45; 45(2), Mar/April 2002.

31

Use it or lose it

Licensing at Proctor and Gamble

- **Let the numbers guide the decisions**
 - Higher NPV to out license vs. keep internal
 - Will sell, donate, swap, collaborate for capital avoidance
 - Will trade for lower process
 - Will use to minimize litigation costs
- **Separate Business Unit facilitates the process**
 - Business Unit is Staffed with approximately 40 people
 - Approximately 100 a deals a year with about 100 companies/year
- **Deal revenue returns to business unit**
- **Partnered with www.yet2.com to post their technologies available for license**

32

Yet2.com

On line marketplace for intellectual property exchange



Agenda

✓ Closed Innovation Model

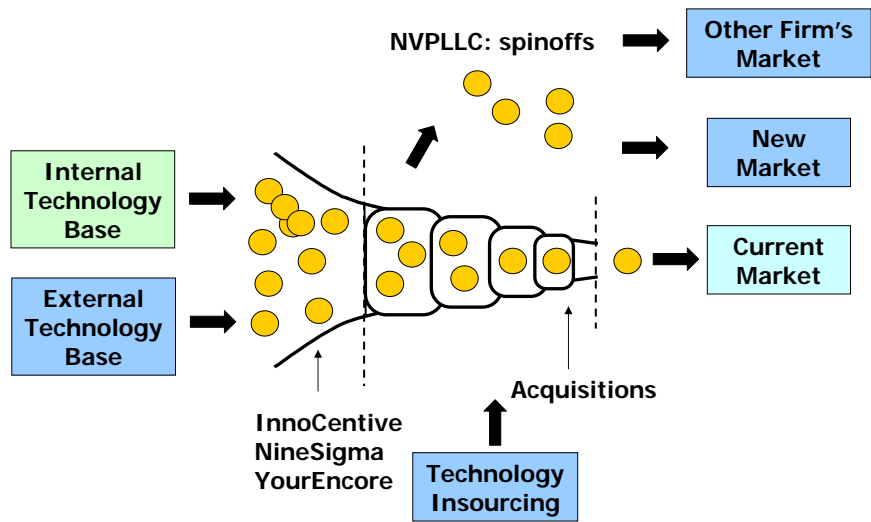
✓ Open Innovation

✓ IBM, Intel, P&G, Apple and Lego

■ Intermediaries

■ Innocentive, Nine Sigma and YourEncore

Intermediaries



35

InnoCentive

InnoCentive brokers solutions to narrowly defined scientific problems

INNOCENTIVE

About Us | InnoCentive Challenges | Using the Website | My InnoCentive | Seeker Companies | News & Press

For Scientists | Management | Careers | Contact | Language

welcome

InnoCentive® is an exciting web-based community matching 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...*
Around the world, uniquely prepared minds are waiting to solve your toughest scientific problems.
[Learn More](#)

SOLVERS *I have a solution...*
World class companies are offering financial awards for solutions to their scientific challenges.
[Learn More](#)

I Found The Answer
InnoCentive matches top scientists to relevant research and development challenges facing leading companies around the globe, for rewards up to \$100,000 USD.
[Find relevant challenges now.](#)

FEATURED InnoCentive Challenges

INNOCENTIVE 2004/04 HIGH TEMPERATURE POLYMERIZATION INITIATOR DEADLINE: OCT 10, 2006 \$20,000 USD

INNOCENTIVE 2004/04 CELLULOSE FROM ANIMAL SOURCES DEADLINE: OCT 09, 2006 \$10,000 USD

View More Challenges:
[History](#) [Settings](#)

My InnoCentive
TRACK AND MANAGE YOUR ACCOUNT

User Name: Password:

Please Remember My Sign-In Name

[Log In](#) [Forgot your password or username?](#)

Entrepreneur of The Year
20 years of awarding entrepreneurs for excellence in business.

Custom Incentives
PROGRAMS For customer loyalty, safety, sales or recognition programs that work.

Award & Recognition
Program for 2006 Companies Incentives & Rewards. View Now!

Perfect Incentive Rewards
Build quality and increase sales. Free Samples! Catalogs start at \$10.

[Help](#) [Feedback](#) [Advertise on Our site](#)

36

Innocentive

Example problem from Innocentive

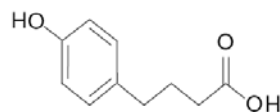
INNOCENTIVE 3109

R4-(4-HYDROXYPHENYL) BUTANOIC ACID

POSTED: June 26, 2001

DEADLINE: Nov 30, 2001

\$25,000USD



Solution Criteria:

Synthesize following chemical:

2 steps or fewer

>80% overall yield

>95% purity

<\$100/Kg

2.0g white to off-white solid

37

Innocentive

Solution

- 221 individuals expressed interest in solving the problem and create project rooms on InnoCentive.com web site
- 10 individuals from 7 countries submit chemicals for analysis
- Retired scientist with wet lab in his backyard wins



38

Innocentive

- Problems posted appear mostly as organic synthesis problems
- P&G reports that 1/3 of problems posted are solved
- Another client* reported and ROI of 2,175% on 12 posted problems
 - Total bounty awarded: \$333,500
 - Internal costs: \$60,000
 - Value generated: \$10,300,000

Raynor, M. and Panetta, J., "A Better Way to R&D," Strategy and Innovation, HBR Newsletter, Reprint S0503E, March – April 2005.

39

NineSigma

NineSigma connects companies with technology problems with 700,000 potential solvers

Products & Services
Managed Exchange (Mx™)
Request for Proposals (RFP)
Request for Information (RFI)
Innovation Management Services
Representative Projects

My NineSigma
Start Receiving RFPs
Innovation Alliance Program
NineSigma e-Library

News & Events
Press Releases
Recent Articles
Events

About Us
Overview
Clients
Case Studies
Management
Directors
Career Opportunities

Contact Us
Request a Quotation
Address, Phone, Fax
Terms and Conditions of Use

Type email here
REGISTER to Receive RFPs

Sourcing Innovation Worldwide™

NineSigma enables organizations like yours to amplify internal resources and capabilities by tapping a global network of innovators for new solutions, technologies, products, services and opportunities. Our global innovation sourcing solutions help you accelerate top-line growth, reduce risk and lower cost by expanding the reach and capabilities of your innovation management organization and by improving your innovation management processes.

NineSigma expands your innovation network so you can do more, faster.

Innovation Managers
Find new solutions, technologies, products and services

Solution Providers
Place your technologies, products and capabilities in new applications/markets
Find new funding opportunities to advance your innovation
Stay aware of commercial opportunities and communities of practice

Become a Client to expand your innovation network
Request information about the Innovation Alliance Program

Become a Solution Provider to receive opportunities
Request information about the Innovation Alliance Program

40

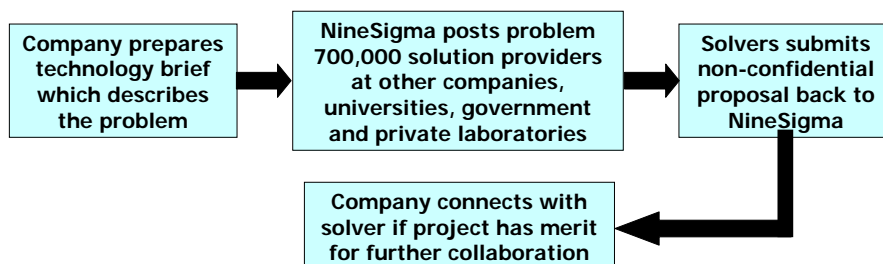
YourEncore

YourEncore allows company to contract short term assignments with 800 high performing retired scientists and engineers from over 150 companies at preretirement salary adjusted for inflation



41

NineSigma



- P&G helped create NineSigma
- P&G has distributed 100 technology briefs to over 700,000 people
 - Completed 100 projects with 45% of them leading to agreement for further collaboration

42

Open Innovation

What it is NOT	What it is
■ Free access to corp. technologies	→ ■ Strategic IP management
■ Outsourced R&D	→ ■ Strategic R&D
■ Technology only	→ ■ Technology + business model
■ Commercial innovation	→ ■ Technical invention
■ Appropriating value	→ ■ Win-win partnership
■ New ventures	→ ■ Core R&D processes
■ Partnerships	→ ■ Innovation ecosystem building
■ Cutting research costs	→ ■ improving R&D ROI

43

Why is Open Innovation Critical?

Growth and Renewal

- **A more agile R & D process**
 - Increased ability to “turn on a dime” and adjust to unpredictable market shifts
- **A higher new product hit rate**
 - Increases the number of truly innovative products and commercial successes
- **A greater effectiveness of R & D**
 - Higher new product success rate through iterative researcher & customers contact
 - Faster time-to-market and lower development spend
- **Decreased Risk of Missing Market Opportunities**
 - Fewer “false negatives” given early exposure to market and alternative development paths; also less risk of being “blind-sided” by competitive product, technology, service introductions

44

Logic of "Open Innovation"



- **Good ideas are widely distributed today. No one has a monopoly on useful knowledge anymore.**
- **Industrial innovation processes must play poker, as well as chess**
- **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.**