

Partnering Opportunities

Bruce Lyne, KTH

Options in technology exploitation:

- ✓ Build a business internally or externally
- ✓ Partner (JV, alliance, other)
- ✓ License
- ✓ Discard

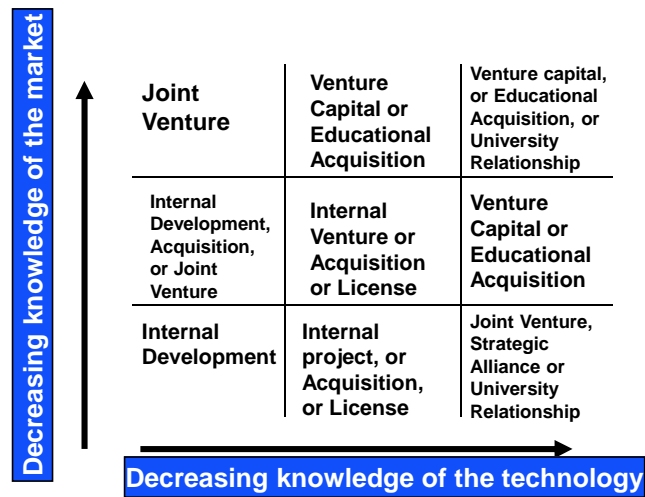
Trends into the 21st century...for many emerging technical companies:

- Cost of technology development and product introduction is growing
- Capital is more difficult to raise, particularly “early stage”
- Market success requires global strategy perspective
- Product development and life cycles are becoming increasingly shorter
- Market credibility is greatly enhanced with endorsement of large corporation alliance
- Larger share of market leads to greater efficiency and better price stability

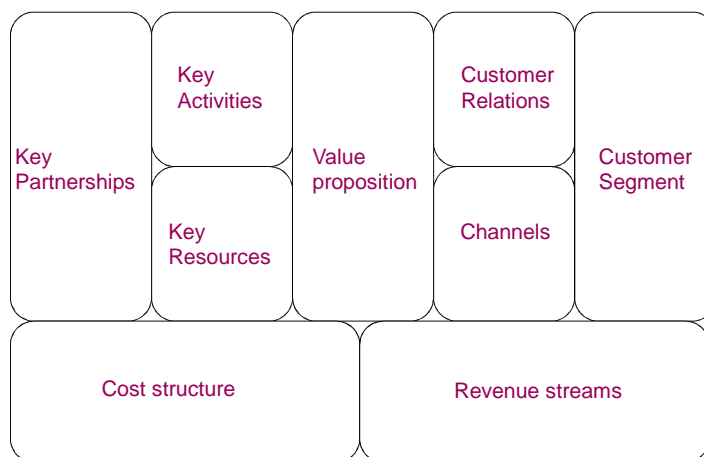
Motivations for partnering

- Access to complementary technology, technology synergy, cross fertilization of fields of technology
- Capturing partner’s tacit knowledge of technology, market experience, thereby leapfrogging competitors
- Minimizing and sharing of costs and uncertainty in R&D
- Reducing time to market to keep up with shorter product life cycles
- Globalization, entry into foreign markets, knowledge of international environment and opportunities

Finding others who know more about the markets or the technology (Berry and Roberts)



Business model Canvas



After Alexander Osterwalder

Ethics and Sources of Information

- Government**
- Patents
 - FDA – applications for clinical trials and approvals
 - SEC filings
 - EPA filings
 - OSHA filings
 - Department of Commerce
 - Federal and state court cases
 - Zoning boards

- Academia**
- Literature publications
 - Academic consultants
 - Professional meetings

- Competitor Sources**
- Competitor publications
 - Product brochures
 - Annual reports
 - Press releases
 - Help wanted ads
 - Current employees



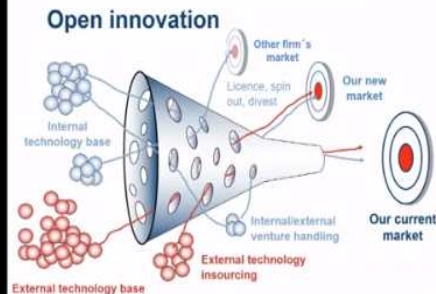
Sources of technology information

- Internal Sources**
- Reverse engineering
 - Marketing
 - Sales
 - Purchasing
 - Planning
 - Engineering



- External Commercial Sources**
- Trade associations
 - Trade shows
 - Consultants
 - Stock analysts
 - Public interest groups
 - Executive recruiters
 - Partners
 - Licensees
 - Consortia
 - Offshore labs
 - Customers
 - Suppliers
 - Directories
 - Databases

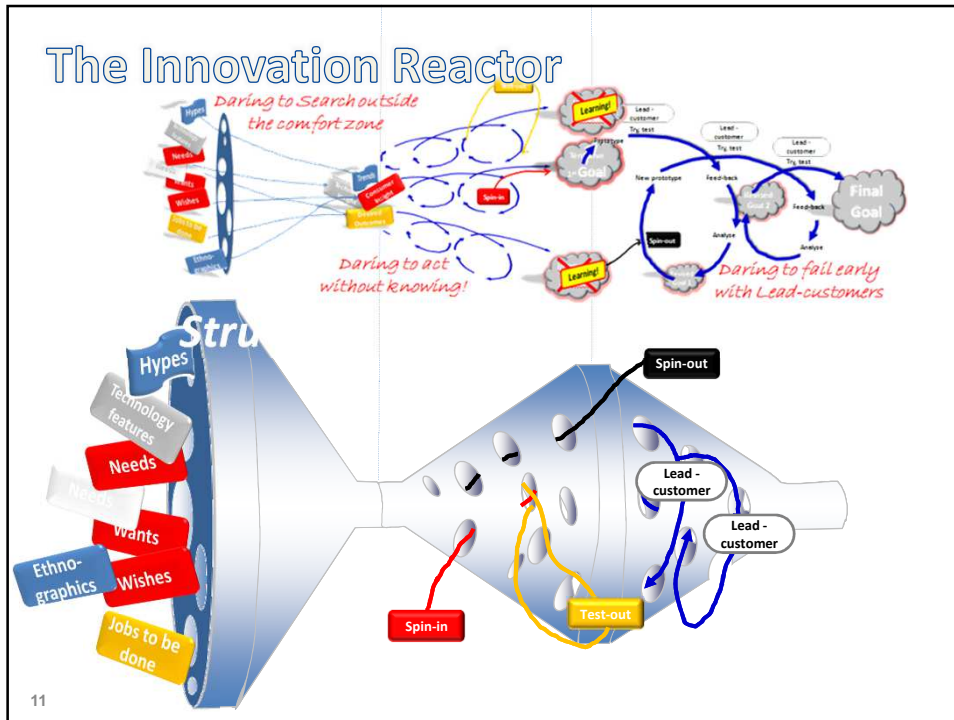
2017 Medalist Address: The Future of Open Innovation



Slides with title from Prof Henry Chesbrough UC Berkeley, Open Innovation: Rethinking Growth from Industrial R&D, 20th Annual Innovation Convergence, Minneapolis Sept 27, 2004



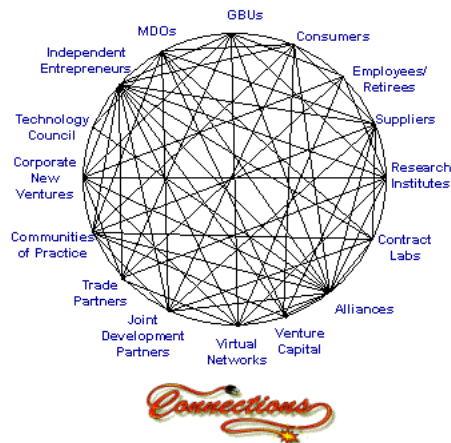
The Innovation Reactor



11

Connect & Develop Vision

“We will source 50% of our technologies and products from outside P&G.” – A.G. Lafley



VISION

P&G has turbo charged its innovation engine by creating capabilities to leverage external assets of all types – suppliers, science communities, entrepreneurs, contract manufacturers, commercial partnerships – to create rapid growth and deliver consistently higher return than our competitors.

16-Aug-2002 P&G/FP K.P.P.

18

How can they Find You?



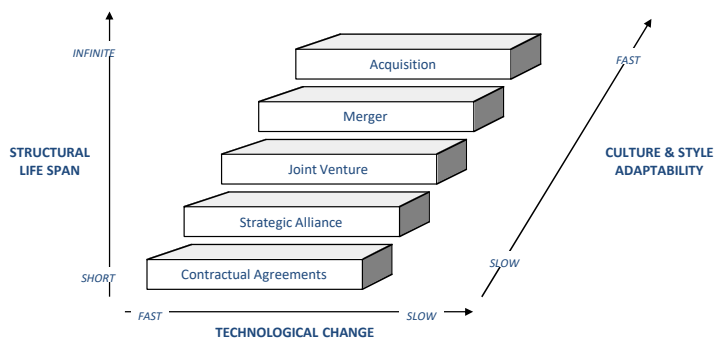
RfP OI Service Suppliers

- NineSigma
- Fellowforce
- IdeaConnection
- TechScout
- Sqore
- Inpama.com
- IXL Center
- Innocentive
- SpecialChem
- Nottingham Spirk
- Harryson Know Who
- Yet2.com
- YourEncore



SP Technical Research Institute of Sweden
Erik Ronne, Head of Open Innovation

Several forms of cooperative linkage can be adopted by a corporation for executing its globalization strategy.



The choice will not only depend on evaluating the current situation but on management's view of the future.

**Partnering Opportunities for Commercializing
iPack-Developed Technologies**

Prof. Bruce Lyne
iPack project
TC1.3 Business Innovation in Printed Electronics

Conclusions from Market Report:

- **The probability of successful commercialization increases with the use of existing, well-proven technologies and decreases with the number of new components introduced into the system. Trying to build an entire system from scratch and get it to market is virtually impossible, as each new component introduces uncertainty in manufacturability and performance.**
- **Partnership with companies that have proven track records in RFID and who work closely with customers in designing RFID solutions would also bring easy acceptance...**
- **Several interviewed companies who are in the market with RFID solutions see value-added applications of their RFID technology base in printing sensors for smart packages and tags.**

Partner in printing inks

- **BASF** for the development of polymeric inks for printed electronics by virtue of strong financial commitment to research in this area.
 - dedicated lab in Singapore
 - membership in three important academic/industrial partnerships devoted to printed electronics:
- MaDriX - PolyIC, BASF, Evonik Industries, ELANTAS Beck and Siemens, with matched financing from German Federal Ministry of Education and Research
- Forum Organic Electronics excellence cluster - PolyIC, BASF, SAP, University of Heidelberg, Robert Bosch, Roche Diagnostics, Karlsruher Institut für Technologie, and the University of Stuttgart, Philips, Merck, Max Planck Institute for Polymer and Solid State Research....
- Holst Center -(open-innovation R&D centre that develops generic technologies for Wireless Autonomous Sensor Technologies and for Flexible Electronics, located at the University of Eindhoven)

Partner in chip and sensor technology



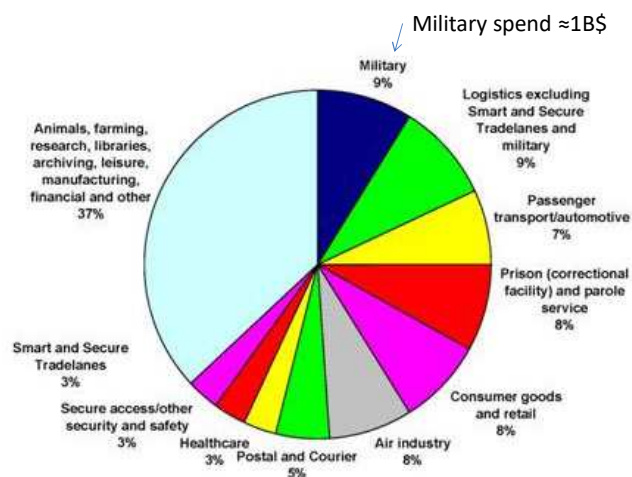
- **Impinj** for the joint development of RFID/sensor chips and circuits.
 - This is the most trusted supplier of UHF Gen 2 RFID solutions with applications across numerous vertical markets, including apparel, inventory management, asset tracking, authentication, and serialization
 - they would like to expand into more complex RFID/sensor systems like those being developed at iPack.

Commercialization of RFID/Sensor Systems



- **Avery Dennison** as the best established and equipped manufacturer of intelligent tags who is interested in extending their reach with sensors for gases, temperature, sugar content in blood, etc.
- offers a wide variety of RFID products covering asset tracking in the HF and UHF RFID spectrum
- Four RFID tag manufacturing plants USA, Europe and Mexico
- AD work with an array of industry leaders in tag converting, printer and reader hardware, software and systems integration
- RFID design center is in Baddow, just East of London (formerly Marconi's RFID center which AD acquired)

Military are biggest single user of RFID




Application of iPack low-energy solutions to RFID communications and positioning

- The US Army Research Laboratory

- Research, Development and Engineering Command (RDECOM) is centrally responsible for developing and integrating technology-enabled solutions for soldiers
- World's biggest user of RFID - inventory is meant to be visible all of the time (including during transport in aircraft) via RFID tags
- pursuing flexible displays to be worn by soldiers and used in mobile outposts
- want to couple their RFID network to sensors to monitor soldiers' physiological vital signs as well as detection of pathogens, explosives, etc
- want to reduce weight and make electronics more robust
- interested in iPack low-energy RFID/sensors, and in food tracking system



RDECOM Emerging Flexible Electronics **AR**



Medical Imaging and Diagnostics

- **Emerging Flexible Electronics: *Displays, Electronics, Sensors, Energy***
- **Enabling Large-Area, Rugged Applications**
- **New concepts for Security and Defense**
- **Expanding US-Based Manufacturing and Jobs**

The CAMM's Unique Capabilities have an opportunity to solve critical manufacturing and packaging challenges for the emerging Flexible Electronics Industry



Cautions in Partnering

- Studies show 50% of all strategic alliances fail within three years
- Mismatched expectations are the principal cause of failures
- There are no “merger of equals”
- Successful alliances MUST make good business sense
- Successful alliances MUST meet individual needs
- Weak + weak = weaker !

Note: An Industrial Research Institute survey of 2010 reports that 47% of companies expect increases in alliances and joint ventures tied to R&D.

Partnering is a people process: Implementation

- Carefully organize teams
- Prepare for trauma
- Define success
- Move swiftly & decisively

–Maintain morale

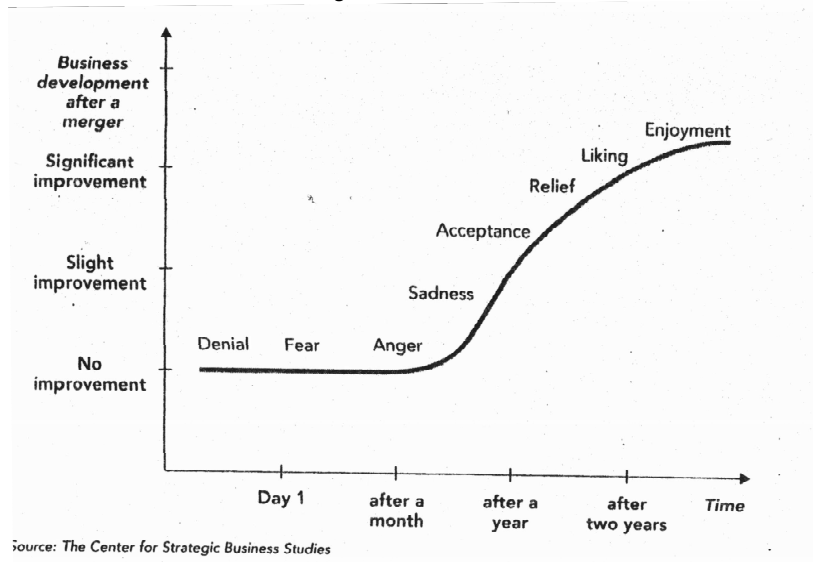
–Minimize rumors

–Minimize loss of key personnel

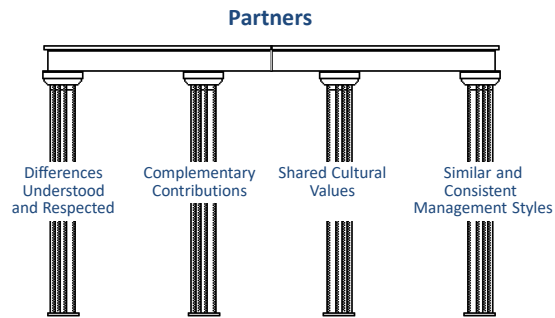
–Eliminate uncertainty

Strategic Alliances - Partnering is a people process

The individual's reaction in a change situation



Successful joint ventures and strategic alliances exhibit similar characteristics.



Partners understand differences:



Transferring Rights: Intellectual Capital Components

- Human Capital
 - Know-how
 - Creativity
 - Skills
- Intellectual Property
 - Patents
 - Copyrights
 - Trademarks
 - Trade secrets
- Intellectual Assets
 - Programs
 - Inventions
 - Documents
 - Processes
 - Drawings
 - Designs

Intellectual Capital Risks in Strategic Alliances

- Shared Facility:
 - Exposed Trade Secrets and Sensitive Technologies
 - Access to Confidential Information
 - Unintended Transfer of Technologies
 - Inconsistent Judicial Decisions or Enforcement Favoring a Country
- Conflict of Interest for Personnel
 - Question of Employee Loyalty (e.g. to JV or partner)
 - Potential Future Competitor
 - Information Shared with JV, Partnerships, or Suppliers
 - Individual risk Issues
 - Mobility of personnel

<p>Some of the top reasons TO partner:</p> <ul style="list-style-type: none"> • Hands: Extra R&D capacity – hands • Brains: Expertise • Access to key technology/market • Localized products for local markets • Lets you focus on your competencies • Speed to market • Reduce costs 	<p>Some of the top reasons NOT TO partner:</p> <ul style="list-style-type: none"> • Loss of strategic control of your business • Loss of in-house expertise • Confidentiality of Intellectual Property • Loss of project control • Stability of partner
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Three Phases of Open Innovation						
	Exploration		Joint (Co-)development			Commercial
			Incubation	Development		
	Initial Contact		OPTIONAL STEPS*			Commercial
Contracts	Initial Contact Non-confidential Letter	Detailed Discussion Mutual, One-way or Two-way Confidentiality Agreements	Develop Relationship Material Transfer Agreement	Exploratory Co-Development Exploratory Research Agreement	Co-Development Detailed JDA or Alliance Agreement	Commercial License, Buy or Commercial Supply Agreement
Activity	Identification of Interest Areas, Business and Cultural Fit	Clear Understanding of What Each Party Brings, Technology Expertise & Areas of Interest	Initial Testing to Develop Joint Technical Statement of Work	Successful Laboratory Test & Proof of Concept	Successful Field Test & Valuation Model	Market Success for Both Firms
Deliverable	Open Discussion	Agreement on Vision For Success	Joint Technical Plan	Understand Value Chain	Understand Valuation Thoroughly	Equitable Division of Profits

Better Practices for Managing Intellectual Assets in Collaborations
Research and Technology Management, Feb 2010

*Depending on complexity & technology development stage

Trends into the 21st century...for the larger companies

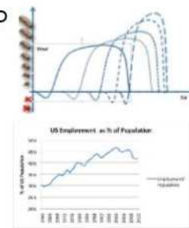
- Lack flexibility to respond rapidly to technological and market changes
- Need to look outside for innovation
- Rapid market shifts and fragmentation motivate selection of small companies
- Partnering allows large company to respond to emerging technology risks



Some numbers on startups...



- 1958 the average life span of the companies in S&P 500 was 61 years. 2012 it was only 18 years. (70 % less)
- Between 2009-2014 70% of all new employments in the US were created in startups.
- Startups are 16 times more productive than large companies regarding number of patents per employee
- The patents from startups are cited 2,5 times more often than the ones of the large companies, indicating a higher degree of originality and inventiveness





Asymmetric Collaboration – What can we get?



- Credibility
- Branding & PR
- Distribution & Market access
- Supplier Network
- Funding



- Speed of innovation
- Innovative image
- Innovations
- Culture

Insead & #500Corporations, How do the worlds biggest companies deal with the startup revolution, 2016

Combining the DNA of dinosaurs and fruit flies

- Fruit flies are tech start-up companies that react at lightning speed to changes in the technology or business environment
- Dinosaurs are the large well-established companies that are bureaucratic, risk-averse, rife with internecine politics, hobbled by government regulations and stockholders' concerns
- Dinosaurs are very robust and have been around for a long time, but lack the agility to adapt to major shifts in climate like that associated with a comet impact
- The fruit flies create Internets, killer-app software, and breakthroughs in fields like biotech, semiconductors, and nanoscience
- While dinosaurs can easily squish fruit flies, they need to somehow combine their DNA in order to be responsive and adaptable
- The result is that companies like Intel and Pfizer are forever monitoring small companies as potential fast-paced suppliers or as acquisition targets so they can remain competitive



Inspired by *Clockspeed : Winning Industry Control in the Age of Temporary Advantage* by Charles H. Fine

Why great companies fail

1. Corporate arrogance and hubris
2. Leadership fails to anticipate a reality different than what they are prepared to see
3. Insufficient attention to weak signals
4. Biases of internal decision-making processes
5. Lack of vision and risk taking
6. Wrong incentives: short-term & risk adverse
7. Trapped in yesterday's business models
8. No large-scale technology company does partnering especially well. (Business Week)

Triple helix model can drive transitions

umicore

The triple helix

- consists of **3 components**:
 1. industry
 2. academia
 3. government
- stimulates **innovation in innovation** through institutions taking non-traditional roles
- requires a **prominent role for university** in innovation



EIRMA, Open Innovation, 4 October 2016 | 10

Results of academia – industry – government partnerships

