McCombs
Knowledge To Go

December 13, 2011
Open Innovation and Technology Transfer

Sustaining the Firm of the Future
John Sibley Butler
Purpose

- Discussion of How we view the Economy
- Models of Open Innovation
- Open Innovation and Technology Transfer
The Pony Express

- Management Decisions and Innovation
Schumpeter or Keynes

- Modern Prophets
- Peter Drucker
How can one maintain an economy in balance and stasis?

- Equilibrium Theory
- Ricardo
- John Stuart Mill
- Alfred Marshall
- Keynes
General Equilibrium Theory

MARSHALL WALRUS KEYNES

RATIONALITY

PERFECT MARKETS

PERFECT COMPETITION
KEYNES’S VIEW:
Understanding the Economy

Real Economy of Goods and Services
- Controls

Symbol of Economy: Money and credit
- Real Goods & Services (Depend on it)
- The Veil of Things

Individuals/Businesses vs. the Macro-economy of Nation State
- Macro-economy is everything
- Individuals/businesses have little power to direct the economy.

Production (supply) vs. Consumption (demand) as the Driving Force
- Supply as control
- Demand drives economic phenomena, capital formation, productivity & employment
Joseph A. Schumpeter
The Concept of Creative Destruction

Yesterday’s capital equipment and investments become obsolete in a climate of creative destruction. The more an economy advances, the more capital formation is required.

- Question becomes “is there enough capital? Is there enough capital to stay in business? Is there enough capital to survive creative destruction?”
An Economic Model Which Explains

- Schumpeter’s model of the world is more realistic
- The Keynesian, or classical, treatment of innovation as being outside of the economy can no longer be maintained
The basic question of economic theory, especially in highly developed countries relate to entrepreneurship and innovation.

How can capital formation and productivity be maintained so that rapid technological change as well as employment can be sustained?
Schumpeter’s economic model explains:

- What is the minimum profit needed to defray the costs of the future (to survive destruction)
- What is the minimum profit needed, above all, to maintain jobs and to create new ones?
Definitions of Open Innovation

- Open Innovation: “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 the firms look to advance their technology.”

- Innovation: "an idea, practice, or object that is perceived as new by an individual or other unit of adoption.”

Development of Open Innovation

1st Gen
1950-mid 1960's
Tech Push

2nd Gen
mid 1960's-
early 1970's
Market Pull

3rd Gen
mid 1970's-
mid 1980's
Emergence of Open R&D

4th Gen
early 1980's-mid 1990's
Integrated Business

5th Gen
mid 1990's-
Systems Integration

Roy Rothwell
Evolutionary Models of Innovation

- Technology push: 1\textsuperscript{st} Gen

1. Basic science
2. Design and engineering
3. Manufacturing
4. Marketing
5. Sales
Evolutionary Models of Innovation

- Market Pull

1. Market need
2. Development
3. Manufacturing
4. Sales
Evolutionary Models of Innovation

- Coupling of R&D and marketing (3G)
Evolutionary Models of Innovation

- Integrated business processes (4G)
Evolutionary Models of Innovation

- System integration and networking (5G)
Innovation Research Trends

Increase in Innovation Research

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<th>Decade</th>
<th># Articles</th>
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Business Models of Open Innovation

- The Gold Standard (Connect and Develop)
- Imitators-Alcatel Luscent
- The example of MS Kinect with Open Innovation
- The Innovation Stage Gate Process (Grummond)
Launched Connect and Develop Innovation Program
Specific Innovation Goals

- Bring new innovation to the market in half the time
- Enhance innovation productivity; double the output and be better than BIC competition
- Significantly increase the Net Present Value delivery of the innovation portfolio
- Better brand experience and lower product cost structure than competition
Why Connect and Develop??

- Market life of an innovation to drive preference halved
- Needed to enhance productivity of innovation investment
- Innovation occurring everywhere globally
- Global competition much better
- 1.5 million scientists and engineers available to help
Pillars of Connect and Develop

1. MAKE IT AN EXPLICIT INNOVATION STRATEGY
2. HAVE A “WHERE TO PLAY” STRATEGY
3. HAVE A SEARCH STRATEGY
4. RAPID ASSESSMENT & DEAL MAKING
5. BUILD CORE CAPABILITIES & KNOWLEDGE
The Model
Outcomes

- Annual Organic Sales Growth of 5 to 7%
- Double digit profit growth
- R&D Innovation Productivity increased 100%
- Approximately 60% of all initiatives have important external component
- NPV of Company Innovation increased to 100% delivered vs projected
- Volume and Value Share of all Business Units grew globally
Other Cases In Open Innovation
The Case of MS Kinect

- Is this your image of Microsoft??
Consider the Kinect
What Makes this Open Innovation??

- Kinect Add On Released in November 2010
- Within Weeks Individual hacks that took the Kinect technology and repurposed it in ways that had yet to be imagined began to spring up on YouTube and the world’s top technology & social blogs.
The Microsoft Choice??

Option 1:
- Ignore the hacks on the original purpose of the Kinect Controller and disavow those uses.

Option 2:
- Embrace the hacks as innovative methods of using their product.
The Irony
Lessons From Kinect

- Harness the Power of External Influencers on your technology and organization
- View External Innovation as Opportunity not Competition
- Encourage Staff and Team to Pursue external Opportunities.
Grummond’s Theoretical Stage Gate Innovation Model

Is the NPD project aligned with the current business model?

- Yes
  - Does the NPD project utilize our core capabilities?
    - Yes
      - Should the business model be redefined?
        - No
        - Yes
          - Initiate a process to rethink current core capabilities
    - No
      - Should existing core capabilities be redefined?
        - Yes
          - Initiate a process to rethink current core capabilities
        - No
          - Export
            - Are there any external companies or partners that might be interested in the know-how and technology generated in the NPD project (i.e., can it be commercialized externally)?
            - No
            - Import
              - Consider importing know-how and technology:
                - To complete the product being developed
                - To add value to the product being developed
                - To speed up the innovation process
                - To reduce development cost
              - Always consider Export options
Open Innovation, Regional Advantage, Clustering and the Firm
Where Are the Most Successful U.S. Clusters?

It depends on who you ask.
Technology Clusters
According to Madison Economic Development

Silicon Island
Silicon Rain Forest
Silicon Orchard
Silicon Forest
Silicon Vineyard
Silicon Village
Silicon Gulch
Silicon Valley
 Multimedia Gulch
Silicon Island
Silicon Beach
Digital Coast
Media Del Rey
Silicon Desert
Cyberchella Valley
Silicon Freeway
Biotech Beach
Silicon Glacier
Silicon Mesa
Silicon Snowbank
Automation Alley
Silicon City
Telecom Valley
Silicon Valley
Telecom Corridor
Silicon Bayou
Silicon Swamp
Silicon Beach
Regional Clusters
According to Institute of Portland Metropolitan Studies

- Seattle
  - Software
  - Portland
  - Semiconductors
  - SME/EDA
  - Display
  - Computers
- Silicon Valley
  - Everything!
- San Diego
  - Communications
- Austin
  - Semiconductors
  - Computers
  - SME
- Salt Lake City
  - Software
  - Medical Devices
  - Storage Technology
- Sacramento
  - Computers
- Minneapolis
  - Computers
  - Medical Devices
- Boston
  - Computers
- Research Triangle Park
  - Software
- Denver
  - Telecommunications
  - Satellite
  - Storage
- Atlanta
  - Database
  - Telecommunications
- Phoenix
  - Semiconductors

- **Seattle**
  - Aircraft Equipment and Design
  - Software
  - Coffee Retailers

- **Omaha**
  - Telemarketing
  - Hotel Reservations
  - Credit Card Processing

- **Wisconsin / Iowa / Illinois**
  - Agricultural Equipment

- **Minneapolis**
  - Cardio-vascular Equipment and Services

- **West Michigan**
  - Office and Institutional Furniture

- **Western Massachusetts**
  - Polymers

- **Boston**
  - Mutual Funds
  - Medical Devices
  - Mgmt. Consulting
  - Biotechnology
  - Software and Networking
  - Venture Capital

- **Hartford**
  - Insurance

- **Providence**
  - Jewelry
  - Marine Equipment

- **New York City**
  - Financial Services
  - Advertising
  - Publishing
  - Multimedia

- **Pennsylvania / New Jersey**
  - Pharmaceuticals

- **Pittsburgh**
  - Advanced Materials
  - Energy
  - Household Furniture

- **North Carolina**
  - Synthetic Fibers
  - Hosiery

- **Cleveland / Louisville**
  - Paints & Coatings

- **Detroit**
  - Auto Equipment and Parts

- **Rochester**
  - Imaging Equipment

- **Michigan**
  - Clocks

- **Warsaw, Indiana**
  - Orthopedic Devices

- **Denver**
  - Light Aircraft Farm Equipment

- **Wichita**
  - Farm Equipment

- **Dallas**
  - Real Estate Development

- **San Diego**
  - Golf Equipment
  - Biotech/Pharma

- **Colorado**
  - Computer Integrated Systems / Programming
  - Engineering Services
  - Mining / Oil and Gas Exploration

- **Los Angeles Area**
  - Defense Aerospace
  - Entertainment

- **Northwest Area**
  - Defense

- **Silicon Valley**
  - Microelectronics
  - Biotechnology
  - Venture Capital

- **South Florida**
  - Health Technology
  - Computers

- **Boise**
  - Information Tech
  - Farm Machinery

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  - Information Tech
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  - Coffee Retailers

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  - Biotechnology
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- **South Florida**
  - Health Technology
  - Computers
Clusters and Technology Transfer

Source: Carlos Scheel, 2004

1. Determine the most effective clusters for the region

2. Promote education resources. A strong university inevitably stands at the center of a successful business development clusters

3. Find a way to create knowledge exchange networks (trust) among all participants of the value system

4. Articulate the specific performance/strengths of a region, and build sustainable high potential world-class products.

5. Utilize information technologies, especially Community Learning Centers.
Technology Transfer and Open Innovation

- Strong science base
- Entrepreneurial culture
- Growing company base
- Ability to attract key staff
- Availability of finance
- Infrastructure
- Business support services and large companies in related industries
- Skilled workforce
- Effective networks
- Supportive policy environment
Silicon Valley: Mother of All Clusters

A region of networks - Anna-Lee Saxenian
## Dominance of Silicon Valley in VC

### Investments by Region / Q4 2003

<table>
<thead>
<tr>
<th>Regions Defined</th>
<th>Total $ Invested</th>
<th>Average $ Per Deal</th>
<th>Deals</th>
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<tbody>
<tr>
<td>All</td>
<td>$4,922,919,000</td>
<td>$7,250,248</td>
<td>679</td>
</tr>
<tr>
<td>Silicon Valley</td>
<td>$1619M</td>
<td>32.88%</td>
<td>183</td>
</tr>
<tr>
<td>New England</td>
<td>$660M</td>
<td>13.40%</td>
<td>94</td>
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<tr>
<td>NY Metro</td>
<td>$388M</td>
<td>7.88%</td>
<td>39</td>
</tr>
<tr>
<td>Texas</td>
<td>$369M</td>
<td>7.50%</td>
<td>37</td>
</tr>
<tr>
<td>Southeast</td>
<td>$323M</td>
<td>6.57%</td>
<td>68</td>
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<tr>
<td>Midwest</td>
<td>$277M</td>
<td>5.62%</td>
<td>39</td>
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<tr>
<td>LA/Orange County</td>
<td>$255M</td>
<td>5.18%</td>
<td>34</td>
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<tr>
<td>DC/Metroplex</td>
<td>$209M</td>
<td>4.24%</td>
<td>39</td>
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<tr>
<td>Northwest</td>
<td>$167M</td>
<td>3.39%</td>
<td>32</td>
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<tr>
<td>San Diego</td>
<td>$165M</td>
<td>3.35%</td>
<td>25</td>
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<tr>
<td>Philadelphia Metro</td>
<td>$148M</td>
<td>3.02%</td>
<td>25</td>
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<tr>
<td>Colorado</td>
<td>$108M</td>
<td>2.20%</td>
<td>19</td>
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<tr>
<td>North Central</td>
<td>$64M</td>
<td>1.31%</td>
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<tr>
<td>Sacramento/N.Cal</td>
<td>$51M</td>
<td>1.03%</td>
<td>6</td>
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<tr>
<td>SouthWest</td>
<td>$45M</td>
<td>0.92%</td>
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<tr>
<td>South Central</td>
<td>$41M</td>
<td>0.84%</td>
<td>2</td>
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<tr>
<td>Upstate NY</td>
<td>$25M</td>
<td>0.50%</td>
<td>7</td>
</tr>
<tr>
<td>AK/HI/PR</td>
<td>$8M</td>
<td>0.16%</td>
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Silicon Valley consumes almost 1/3 of total V.C. investments in the U.S.
Types of Industries in Silicon Valley

<table>
<thead>
<tr>
<th>Industry</th>
<th>Amount</th>
<th>% of Total</th>
<th>Deals</th>
</tr>
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<tbody>
<tr>
<td>Software</td>
<td>$359M</td>
<td>22.15%</td>
<td>53</td>
</tr>
<tr>
<td>Networking and Equipment</td>
<td>$273M</td>
<td>16.88%</td>
<td>20</td>
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<tr>
<td>Biotechnology</td>
<td>$242M</td>
<td>14.93%</td>
<td>17</td>
</tr>
<tr>
<td>Medical Devices and Equipment</td>
<td>$221M</td>
<td>13.65%</td>
<td>20</td>
</tr>
<tr>
<td>Semiconductors</td>
<td>$184M</td>
<td>11.36%</td>
<td>15</td>
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<tr>
<td>Telecommunications</td>
<td>$70M</td>
<td>4.33%</td>
<td>10</td>
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<tr>
<td>IT Services</td>
<td>$70M</td>
<td>4.32%</td>
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<tr>
<td>Computers and Peripherals</td>
<td>$42M</td>
<td>2.58%</td>
<td>10</td>
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<tr>
<td>Media and Entertainment</td>
<td>$37M</td>
<td>2.25%</td>
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<tr>
<td>Business Products and Services</td>
<td>$29M</td>
<td>1.78%</td>
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<tr>
<td>Financial Services</td>
<td>$28M</td>
<td>1.72%</td>
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<tr>
<td>Electronics/Instrumentation</td>
<td>$28M</td>
<td>1.71%</td>
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<tr>
<td>Consumer Products and Services</td>
<td>$16M</td>
<td>0.97%</td>
<td>5</td>
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<tr>
<td>Other</td>
<td>$13M</td>
<td>0.79%</td>
<td>3</td>
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<tr>
<td>Retailing/Distribution</td>
<td>$8M</td>
<td>0.46%</td>
<td>1</td>
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<tr>
<td>Industrial/Energy</td>
<td>$2M</td>
<td>0.12%</td>
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IT industries, followed by Bio-Medical are dominants.
Boom and Bust of VC Investment in Silicon Valley

Billions of Dollars

Employment Growth in the Information Industry in Six U.S. Regions

- The six regions follow similar patterns of growth and decline
- The downfall of San Jose, CA (Silicon Valley) is significant
Open Innovation Technology Transfer Case: Key NanoCenters

**Chicago, Illinois**
- Northwestern Univ
- Chicago Nano
- Venture Capital
- 2 National Labs

**Silicon Valley, California**
- > 50 Small Tech companies
- Technology-focused Infrastructure
- Academic Agenda
- Talent Pool
- Venture Capital
- Culture of Innovation

**Southern California, Los Angeles, Orange County, San Diego**
- 30 Small tech companies
- National Research Facilities
- 4 major academic centers
- Lower costs of business

**Austin/Dallas.Houston, Texas**
- Texas Nanotech Initiative
- UT-Dallas
- Rice Univ
- Zyvez
- Richard Smalley
- Center for Nanospace Technologies
- Start-up Cluster

**Toronto**

**Michigan**

**Upstate New York**

**Boston, Massachusetts**
- Harvard University
- Mass Institute of Technology
- Start-up Cluster

**Metropolitan New York and New Jersey**
- Columbia Univ Nanotech Initiative
- New York University
- Highly educated workforce
- Industry-Academic Partnerships
- Financial Community
- Nanobusiness Alliance

**Washington State**

**North Carolina**

**Ohio**

**New Mexico**

**Small Times Magazine “Hot Spot”**
- = Small Times Magazine “Hot Spot”

**Small Times Magazine “Places to Watch”**
- = Small Times Magazine “Places to Watch”
Regional Clusters: Beyond Technology Dominated Paradigms

- The study of Regional Clusters and Regional Development has over emphasized the central role of technology & Venture Capital
- Also of central importance are the same concepts key to Technopolis
  - Quality Hard and Smart Infrastructure
  - Supportive Business Environment
  - Education and Training
  - Attracting and Retaining Talent
  - Entrepreneurship: Business, Civic, and Social
  - Regional Quality of Life
  - Regional Networking and Collaboration – Leveraging assets to overcome challenges
Entrepreneurship/Innovation needs to happen in a range of organizations and communities at the regional level

Academic/Business/Government
Market/Customer
Manufacturing
Creativity & Learning
Organizational
Immigrant Entrepreneurship
Civic Entrepreneurship
Social Entrepreneurship
Technological Entrepreneurship
Technopolis/Cluster: Critical Components

- Build on Regional Strengths & Assets
- University/Centers of Excellence
- Industry: small, medium & large
- Finance: Government, VC, Angel, Self-Funded
- Effective Knowledge/Technology Transfer
- Science Park (s)? Incubator (s)?
- Quality of Life & Diverse/Tolerant Culture
- Hard & Smart infrastructure
- Talent” Grow, Retain, Recruit “Creative Class”
- Entrepreneurship: Business, Civic, Social
- Global Partnerships
Thank You

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Percentage of Alumni Giving

- Dartmouth (Tuck)
- Virginia (Darden)
- Rice (Jones)
- Notre Dame (Mendoza)
- Harvard Business School
- Northwestern (Kellogg)*
- UCLA (Anderson)
- Duke (Fuqua)
- USC (Marshall)
- MIT (Sloan)*
- Chicago (Booth)*
- Emory (Goizueta)
- Berkeley (Haas)
- UNC (Kenan-Flagler)
- Texas A&M (Mays)
- Michigan (Ross)
- Indiana (Kelley)
- SMU (Cox)
- NYU (Stern)
- Texas-Austin (McCombs)

Percentage of Alumni Who Give to Business School (FY2010)
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Talent: Mentor another alumni or speak at a future webinar
Treasure: Make a donation to McCombs

www.mccombs.utexas.edu/alumni
Suggested fund: MBA or BBA Alumni Excellence Funds
Please use response code KTG

Online survey link: https://mccombs.qualtrics.com/SE/?SID=SV_bQ039ThtfL9SuBC
Send me your feedback -- jimbock@gmail.com

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February 23-24, 2012