INFO5992 Understanding IT Innovation

Week 04 Cheatsheet

Open Innovation & Distributed Innovation I

Module Focus: Product Platforms & Web APIs

1. EVOLUTION OF INNOVATION

Traditional (Closed) Innovation Model

- Most R&D; done in-house
- Used throughout 20th century
- One-way flow (left to right)
- All activities inside single company
- Limited spillovers to outside

Trends Leading to Open Innovation (late 20th century)

✓ More worker mobility between companies
✓ More outsourcing
✓ Globalization
✓ Better ICT (email, web)
✓ Venture capital availability
✓ Easier to create tech companies

Joy's Law (Bill Joy, 1990)
"Most of the bright people don't work for you -- no matter who you are. [So] you need a strategy that allows for innovation occurring elsewhere."

2. OPEN INNOVATION

Definition (Chesbrough, 2006)

"The use of purposive inflows and outflows of knowledge to accelerate internal innovation and expand the markets for external use of innovation"

Revised (2014): "A distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model"

Three Types of Open Innovation

Type	Description	Example
Outside-in	Enriching company's knowledge through integration of suppliers, customers, external knowledge	Microsoft acquiring GitHub
Inside-out	Earning profits by bringing ideas to market, selling IP, transferring technology	Qualcomm's Licensing Model
Coupled	Co-creation with partners through alliances, cooperation, joint ventures	BMW, Intel, Mobileye Collaboration

Benefits of Open Innovation

- Larger base of ideas
- Use existing third-party tech (reduced risk/cost)
- Identify new business opportunities
- Share risks and pool resources
- Lower cost than large R&D; departments

Risks of Open Innovation

- Lack of control over external resources
- Higher complexity of managing innovation
- Higher coordination costs
- Possible loss of own capability over time
- Possible loss of competitive advantage

3. DISTRIBUTED INNOVATION

Definition (Eric von Hippel, 1988)

"A system in which innovation emanates not only from the manufacturer of a product but from many sources including users and rivals"

Modularity - Key Enabler

Definition: Degree to which software/web application can be divided into smaller modules

Benefits:

- Standard interfaces enable easy component combination
- Many configurations from given set of components
- Can occur at: User level, Producer level, Industry level

Examples:

- User level: Firefox add-ons, Office plug-ins, Smartphone apps
- Producer level: Software on company platforms
- Industry level: PC components from different companies

Approaches to Distributed Innovation:
A. Product Platforms | B. Web APIs | C. Crowdsourcing/Crowdfunding
D. Open Data | E. Free and Open Source Software
F. User Innovation | G. Platform Ecosystems | H. Accelerators & Investment

4. PRODUCT PLATFORMS

Definition

Foundation of components around which a company builds related products (aka "product family engineering")

Benefits

- Rich product line-up at different price points
- Efficient through re-use of common platform
- Target different customer types
- Faster development time
- Lower effective cost (spread over multiple products)
- Higher adaptability and evolvability

Ways Companies Provide IT Product Platforms

1. Make source code available	e.g., Core Java
2. Provide toolkit (software + docs)	e.g., SAP XML Toolkit
3. Provide plug-in/add-on support	e.g., Chrome Extensions
4. Complete product platform	e.g., Android, iPhone apps
5. Live data/functionality via API	e.g., Facebook API

5. WEB APIs

Definition

Interfaces for web-based services to interact (usually RESTful APIs)

- Enable modularity on the web
- Used for: Maps, Payment, Messaging
- Becoming infrastructure for automation

API Business Models

Category	Description	Example
API as Product	API is main revenue source	Alpha Vantage (freemium stock data)
API Enhancing Product	Enhances existing business	Strava (fitness tracking extensions)
API Promoting Product	Attracts interest/traffic (often free)	Australia Post (shipping integration)

Revenue Examples:
- Salesforce: **50%** revenue through APIs
- Expedia: **90%** revenue through APIs
- eBay: **60%** revenue through APIs

Market Growth

- Global Open API Market: $2.4B (2022) → $14.9B (2030)
- CAGR: 25.1%

Top API Categories (2024)

1. Social (20%) | 2. Data (11%) | 3. Sports (9%)

Real-World API Examples

Alpha Vantage	Free stock APIs (JSON/CSV) 5 req/min, 500/day (free) Premium: unlimited daily
Strava	Open API for developers Millions of activities daily Integration with hardware
Australia Post	Shipping/tracking tools Postage calculator Payment gateway
OpenAI API	Applied to any task Multiple models & price points Image gen (DALL-E), Text (GPT-4)

6. TUTORIAL KEY POINTS

Categorizing API Services

Service	Category	Open Innovation Type
Alpha Vantage	API as Product	Inside-out
Strava	API Enhancing Product	Coupled
Australia Post	API Promoting Product	Inside-out
OpenAI	API as Product + Enhancing	Coupled

7. EXAM/ASSESSMENT TIPS

Be able to:

✓ Define and distinguish closed vs open innovation
✓ Identify types of open innovation (outside-in, inside-out, coupled)
✓ Explain benefits AND risks of open innovation
✓ Define distributed innovation and modularity
✓ Explain product platforms with examples
✓ Describe Web APIs and business models
✓ Analyze real-world examples
✓ Apply concepts to case studies

Key Terms to Know:
Open Innovation • Distributed Innovation • Modularity • Product Platform
Web API / RESTful API • Outside-in / Inside-out / Coupled processes
Freemium model • API as Product/Enhancing/Promoting

Important People & Sources

• **Henry Chesbrough** - Coined "Open Innovation" term
• **Bill Joy** - Joy's Law (Sun Microsystems)
• **Eric von Hippel** - Distributed innovation concept
• **Carliss Baldwin** - Modularity research

Module Coverage: Week 04 - Open Innovation & Distributed Innovation I
Focus: Product Platforms and Web APIs