UiO : Institutt for informatikk
Det matematisk-naturvitenskapelige fakultet

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Governance challenges of inter-organizational systems and platforms

April 10th 2018

Plan for the lecture

- Governance of inter-organisational systems
  - Example: BankID
  - *Orchestration*, not *control*
- Platforms as an architectural form
  - Within organizations (Enterprise systems)
  - Example: Apple's iOS
- Governance of platforms
  - (Core reading, Tiwana 2013)

Readings

- CORE READING
  - Tiwana (2013): “Platform governance” Chapter 6 in “Platform ecosystems: aligning architecture, governance, and strategy”. 2013.
- ADDITIONAL READINGS
  - Gawer, A. (2014): "Bridging differing perspectives on technological platforms: Toward an integrative framework." Research Policy 43.7 (2014): 1239-1249.
  - Provan, K. G., & Kenis, P. (2008). Modes of network governance: Structure, management, and effectiveness. Journal of Public Administration Research and Theory, 18(2), 229-252.
  - Rolland, K. and Aanestad, M. (2014): Growing platform-based enterprise systems through ‘modular’ and ‘architectural’ acts of customizing: a case study. IRIS 2014, Denmark.
  - Eaton et al. (2015) "Distributed tuning of boundary resources: the case of Apple's iOS service system." Mis Quarterly 39.1, 217-243.
  - Ghazawneh and Henfridsson (2012) "Balancing platform control and external contribution in third-party development: the boundary resources model." *Information Systems Journal* 23.2, 173-192.

From organizational to inter-organizational systems

- Several, independent decision-makers → certain governance challenges:
  - Who will make decisions on:
    - IT principles (strategy), architecture, infrastructure, applications, and investments?
    - Independent decisions within organizations vs. decisions affecting the shared system/platform/infrastructure
  - How to establish governance mechanisms?
    - Decision-making structures
    - Alignment processes
    - Formal communications

Governance of inter-organisational systems

- Provan, K. G., & Kenis, P. (2008). Modes of network governance: Structure, management, and effectiveness. Journal of Public Administration Research and Theory, 18(2), 229-252.

  – Three types of governance structure:

    a) Participant-governed (shared governance, internal, dense collaborative relations)

    b) “Lead organization” or “Hub firm” (based on power, legitimacy etc.)

    c) Network administrative organization: a separate, external entity, not one of the participants (with governance as the purpose)

A Public Key Infrastructure (PKI) used for bank service, ID-porten etc.

A central Infrastructure (NETS) + client versions

Services: electronic identification (eID), authentication and electronic signing

2000 - 2004

Developed through collaboration between the Norwegian banks

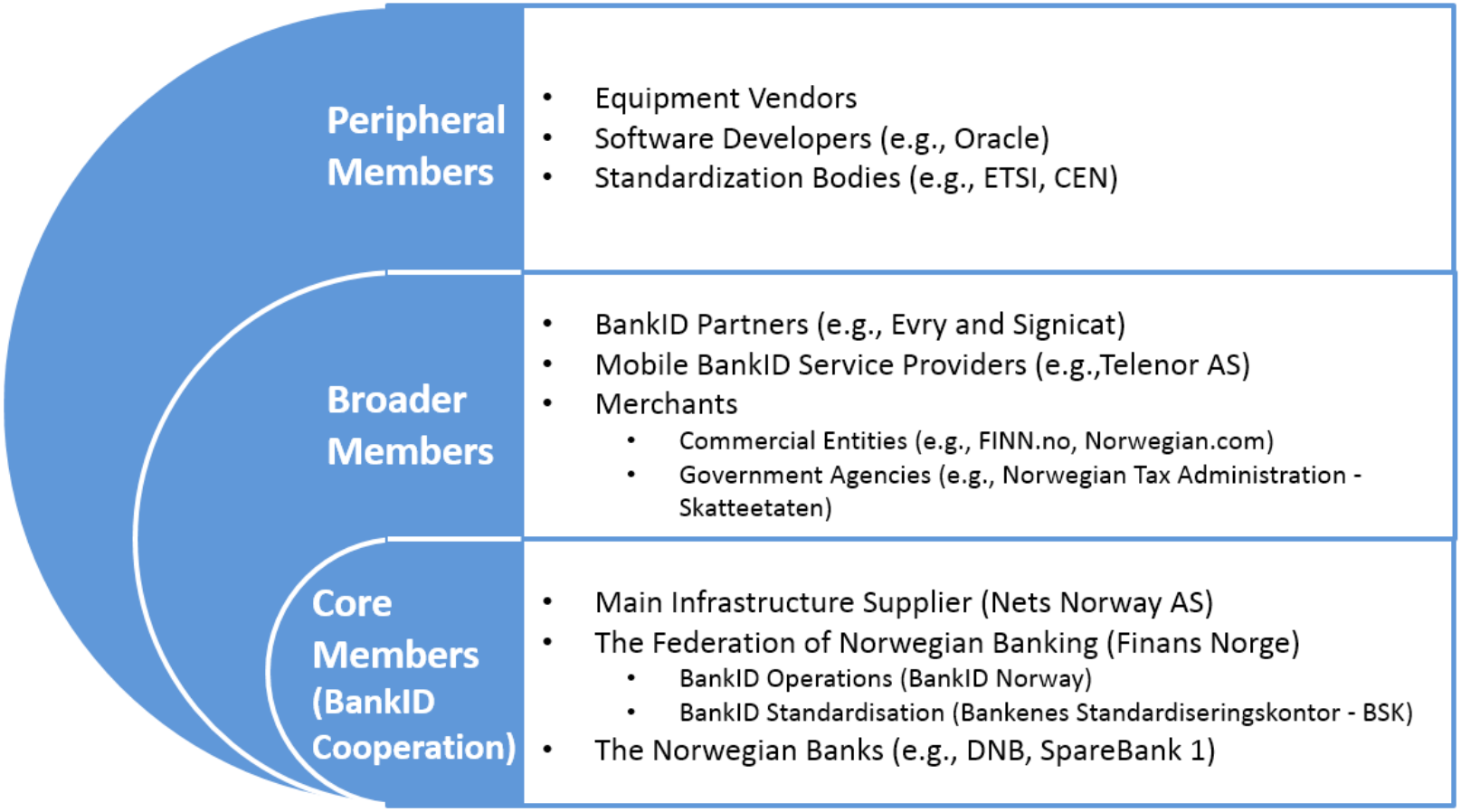
(BBS – Bankenes Betalingssentral)

2007

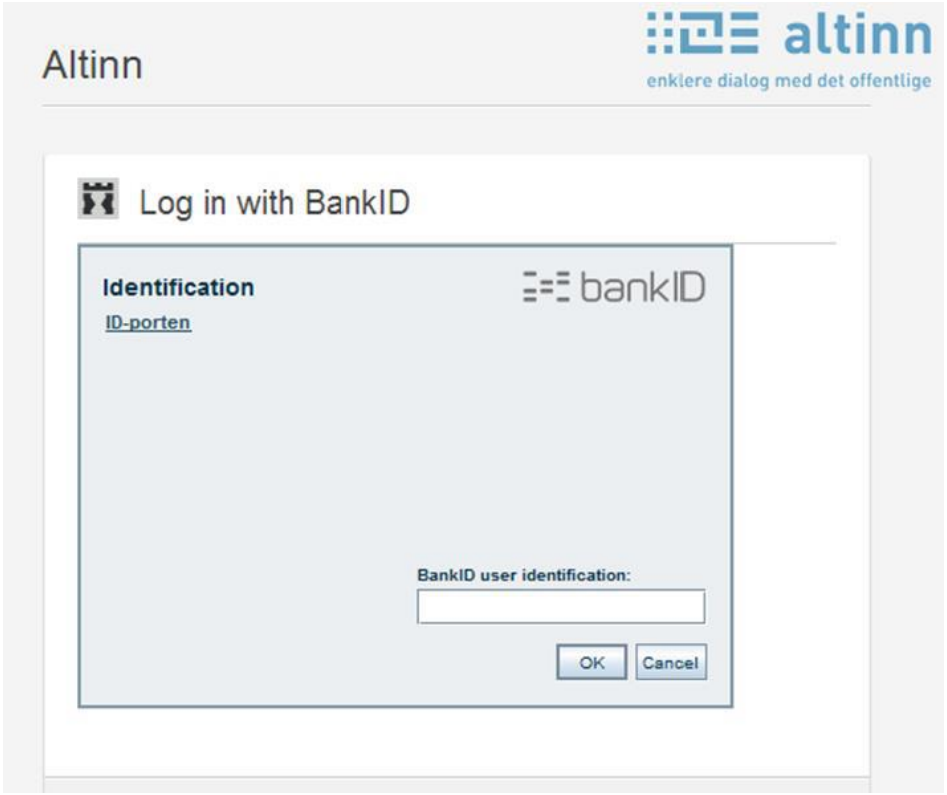
DNB, Nordea
1,7 mill users

2018

3,7 mill Norwegians have BankID (> 1mill BankID mobile)



Fixed set-up fee: 10,000 NOK
Monthly fee: 1,000 NOK
Transaction fee per electronic signature: 7 NOK
Transaction fee per BankID authentication: 3 NOK



Dagens Næringsliv 17.11.2017

Konsernsjef Rune Bjerke i DNB skal være med å slå sammen Vipps, Bankaxept og BankID for å stå sterkere i kampen mot de globale teknologigigantene. Foto: Fredrik Bjerknes

kampen mot de globale teknologigigantene. Foto: Fredrik Bjerknes

Nyheter Finans

Slår sammen Vipps, Bankaxept og BankID

- Vi har sovet litt i timen de siste ti årene, sier DNBs konsernsjef Rune Bjerke.

Jonas Christensen og Jacob Trumpy
Publisert: 17.11.2017 – 08:42 Oppdatert: 17.11.2017 – 10:43

Fredag klokken ti møttes flere av eierne på en pressekonferanse hos Eika Gruppen i Oslo. DNBs konsernsjef Rune Bjerke sa dette om bakgrunnen for samarbeidet:

- Bankene har en infrastruktur vi kan være stolte av, men vi har sovet litt i timen de siste ti årene. Skal jeg være ærlig, så kom dette i stand fordi konkurransen er blitt tøffere og mer global på kort tid, sier Bjerke.

DNB
Siste 150,10 Endring -3,60 % -2,34% Tid 16:25:06
Dag

Målet er å utvikle en ny digital infrastruktur og kjempe mot aktører fra utlandet - også utenlands.

- Vi skal bli så gode at det nye selskapet også kan slå gjennom internasjonalt, sier Bjerke.

Vil stå sterkere mot gigantene

I en pressemelding fra Eika Gruppen fredag morgen skriver Eika at Vipps, Bankaxept og BankID skal slås sammen for å stå sterkere i konkurransen mot de globale teknologigigantene.

Det nye selskapet kommer til å ha 108 ansatte med

2003: DIFI – RFI on secure eID
2004: specifications for national solution
(costly for BankID to comply)

(8 years of indecision:
develop a standalone solution
or adopt a commercial solution?)

Nov 2012: Govt signed contract with BankID (+ two other providers)

How was BankID governed?

a) Participant-governed

b) Lead organization

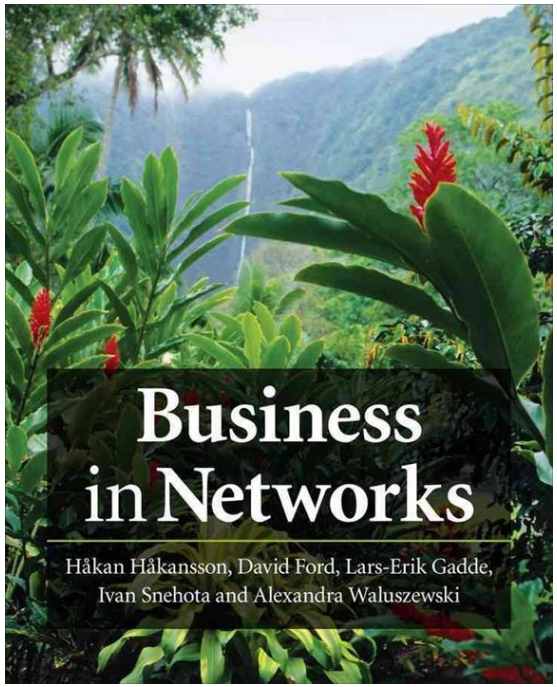
c) Network administrative organization

Discussion

How would you modify the Governance Matrix so that it deals with inter-organizational IT governance?

- (Exam question Spring 2017)

CO-OPETITION = cooperative competition



- Governance of inter-organisational systems
  - Example: BankID
- Platforms as an architectural form
  - What is it? (core + interfaces + modules)
  - Why platforms? (benefits)
  - Types: internal, supply-chain, industry-wide
  - Examples: Enterprise Systems + iOS
- Governance of platforms
  - Governance challenges and dilemmas
  - Decision rights, control mechanisms, and pricing

The platform architecture

- A particular architectual form, which has:
  - A stable base: the platform core, owned by a platform owner (*keystone firm*)
  - Interfaces (standardised, stable) – usually defined by platform owner, e.g.
    - SDK – Software Development Kits
    - API – Application Programming Interface
  - Modules: specific functionality, developed by independent actors

Benefits of a platform architecture

- Different stakeholders
  - Platform owners:
    - Costs and risk of innovation is ‘outsourced’
    - Can concentrate on platform
    - Distributed reach - larger markets
  - Developers:
    - Concentrate on service development, not ‘infrastructure’
    - Easier access to markets/customers
  - Users:
    - Easier access/availability of wide range of products/services,
    - Customization
    - Also niche markets/needs now economically viable

Platform vs. ecosystem

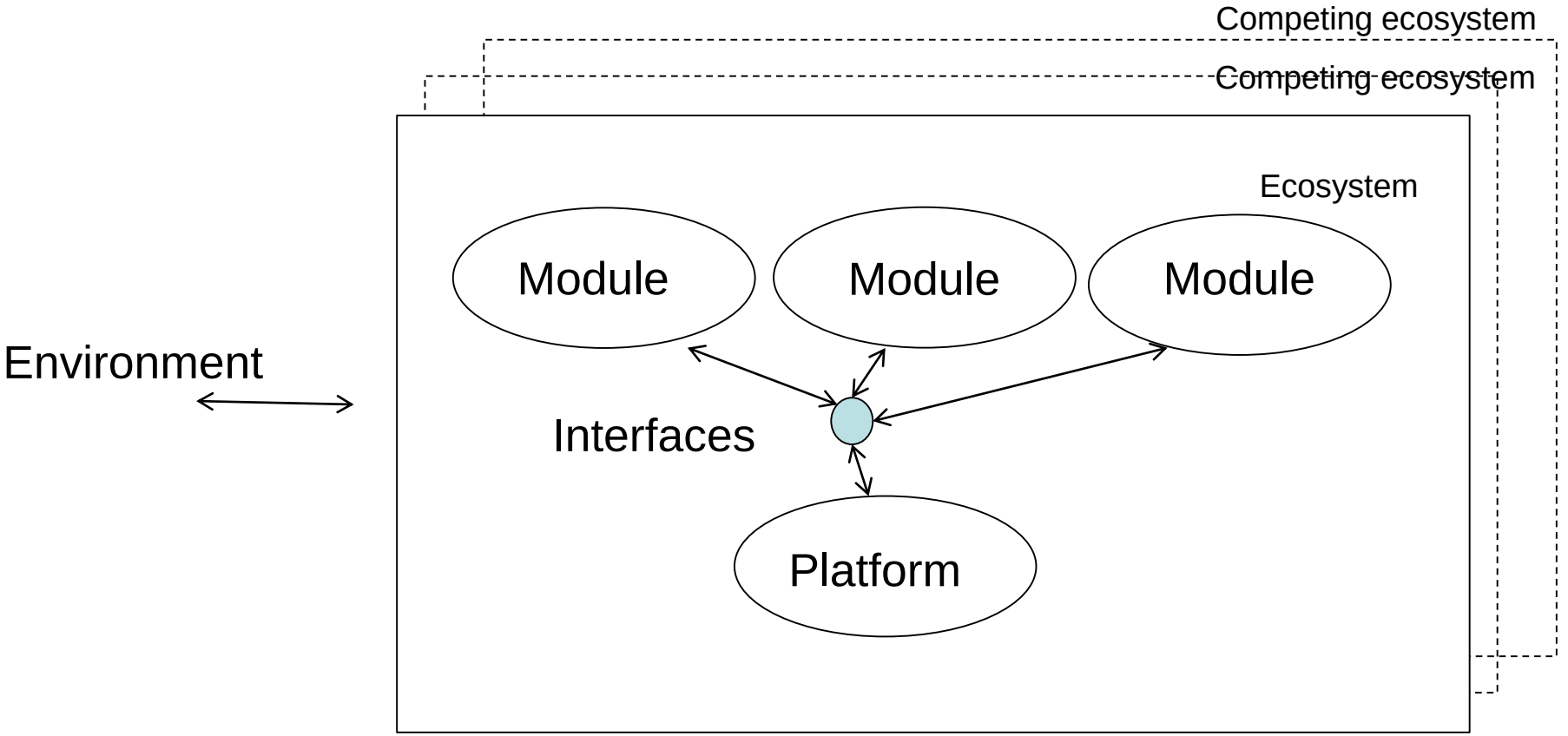
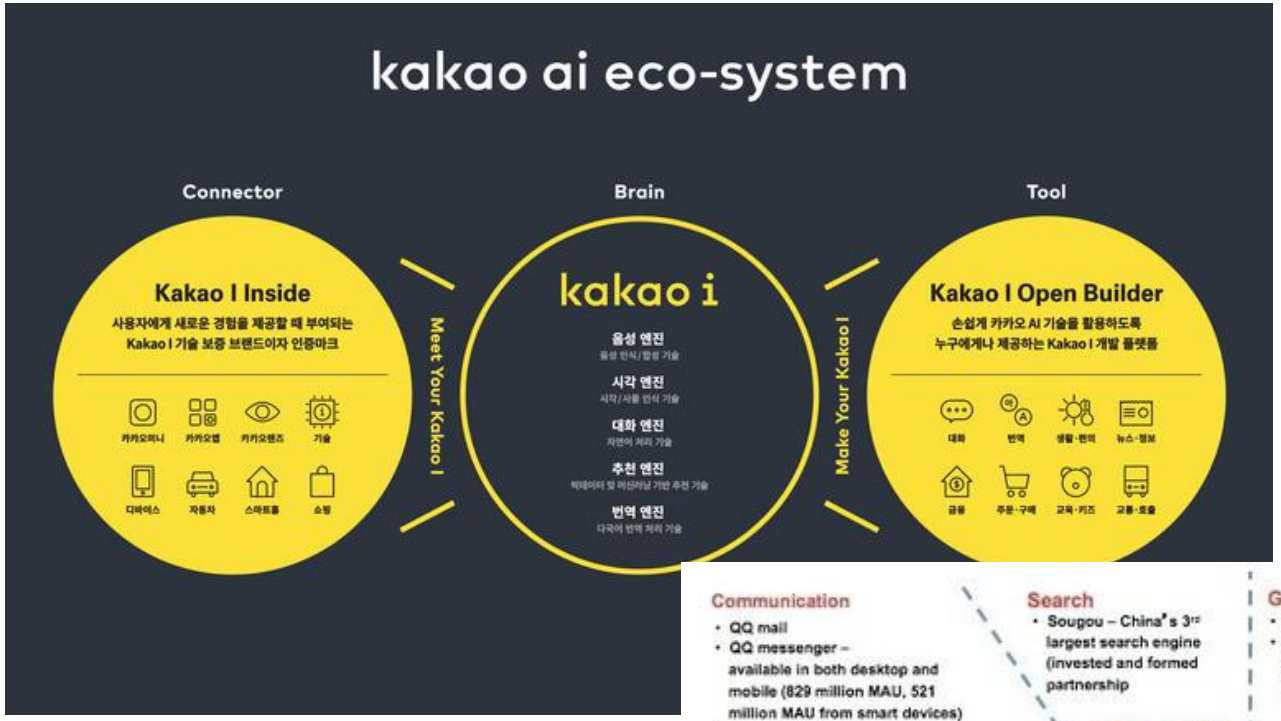
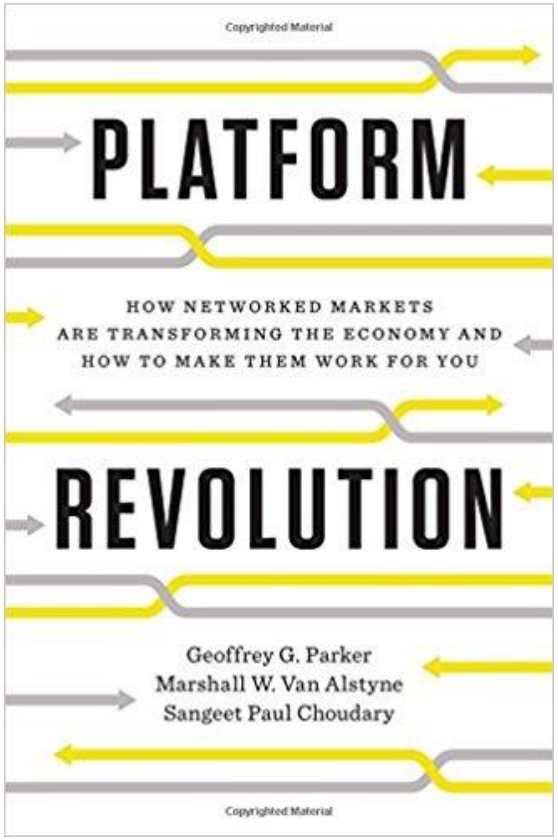


Figure 1 from Tiwana et al., 2010


kakao ai eco-system
Connector
Brain
Tool
Kakao I Inside
사용자에게 새로운 경험을 제공할 때 부여되는
Kakao I 기술 보증 브랜드이자 인증마크
카카오미니
카카오맵
카카오앤즈
기술
디바이스
자동차
스마트홈
쇼핑
Meet Your Kakao I
kakao i
음성 엔진
음성 인식/합성 기술
시각 엔진
시각/사물 인식 기술
대화 엔진
자연어 처리 기술
추천 엔진
빅데이터 및 머신러닝 기반 추천 기술
번역 엔진
다국어 번역 처리 기술
Make Your Kakao I
Kakao I Open Builder
손쉽게 카카오 AI 기술을 활용하도록
누구에게나 제공하는 Kakao I 개발 플랫폼
대화
번역
생활·편의
뉴스·정보
금융
주문·구매
교육·키즈
교통·호출


WALL ST DAILY


Communication
• QQ mail
• QQ messenger – available in both desktop and mobile (829 million MAU, 521 million MAU from smart devices)
• WeChat – instant messenger for smartphones (438 million MAU)
Search
• Sougou – China's 3rd largest search engine (invested and formed partnership
Games
• Tencent Games
• CJ Games – Korean online game publishing company (partnership)
Software & Apps
• QQ doctor – antivirus
• QQ Pinyin – input-method
• QQ Software Manager
• Tencent Traveler – internet browser
• QQPlayer – multi-media player
Tencent 腾讯
Media Platforms
– for university students
– for adults
– for teenagers
– China's Craigslist
E-commerce Platforms
• Paipai
• Yixun (aka 51buy.com)
• JD.com (partnership)
nment Platforms
– digital fashion platform
– leading online interactive
platform in China
– the largest online music
in China
Payment Platforms
• WeChat payment
• Tenpay
Omni-channel / Location-based Services
• Didi Taxi – taxi hailing app
• Dianping – local business search, rating and discounts
Portal Site
• QQ.com – China's largest portal for news, online communities, entertainment products and other services.



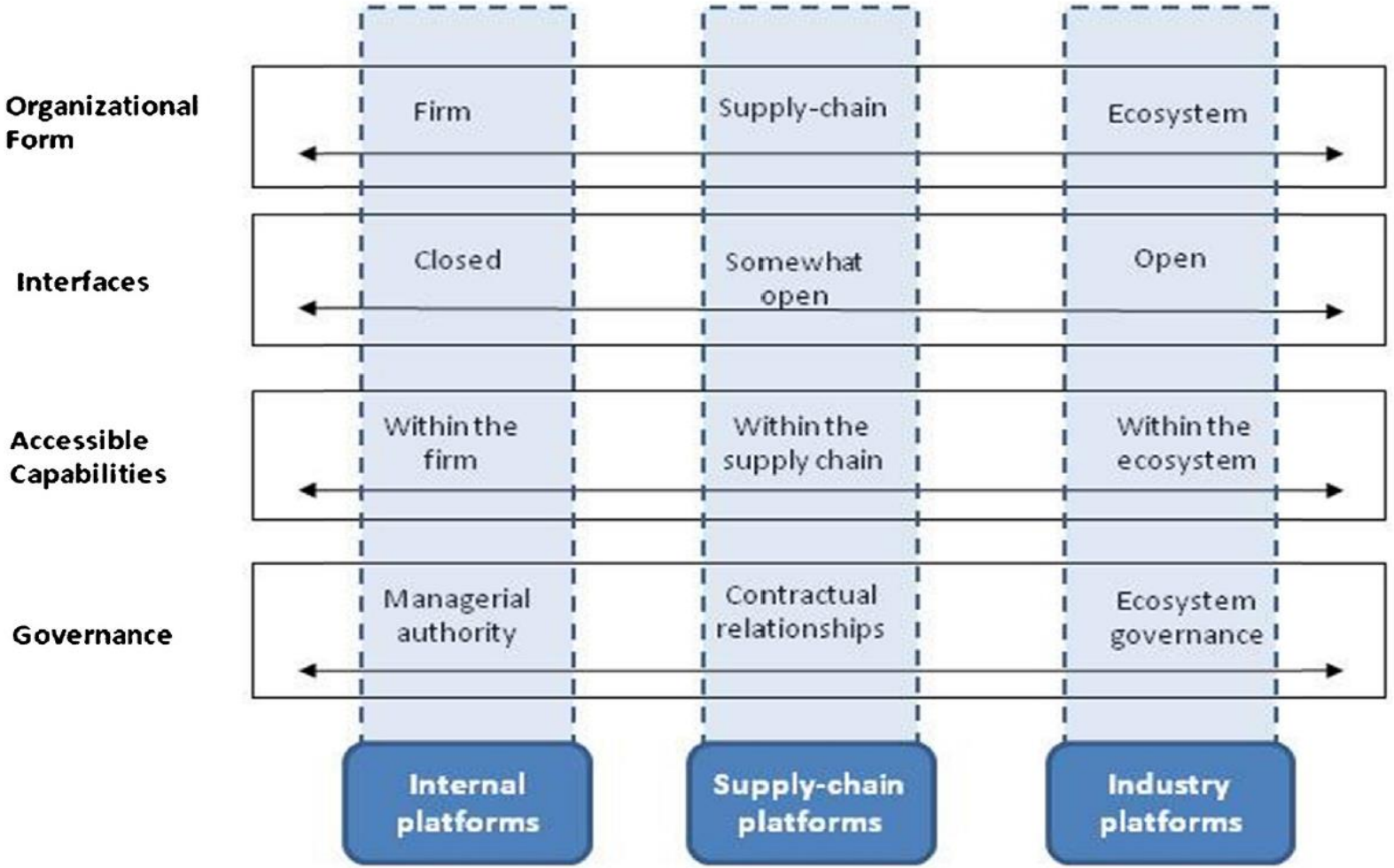
- Moving from a traditional 'pipeline' model to a platform involves three key shifts:

1. The main activity moves from the *control of limited resources* (raw materials, equipments...) to an *orchestration of intellectual property and interactions* of the community of users and partners
2. Efficiency does not come from optimization of internal processes (e.g. production yield) but through the ability to increase (external) network effects via the ecosystem.
3. Value is contained by the whole ecosystem rather than individual products

Reading: Gawer (2014)

- Joins two discourses:
  - platforms as types of markets
  - platforms as technological architectures
- Three categories of platforms
  - Internal
  - Across supply-chains
  - Across industries

Annabelle Gawer



Paper:
ECM as platform
(Rolland and Aanestad, 2014)

Papers:
Apple iOS as platform
(Ghazawneh and Henfridsson 2012)
(Eaton et al., 2015)

Governance of platforms

- Trade-off:
  - Modularization leads to reduction of complexity
  - But introduces new challenges for attempts to control/govern
- Examples:
  - Internal platform: Sharepoint
  - «Ecosystem»: Apple iOS and app developers

Paper: Rolland and Aanestad, 2014

ECM as platform?

- 2009: Implement an ECM (Enterprise Content Management)
  - document management + social collaboration tools
- «Out-of-the-box» strategy (minimal customization)
  - Plus third-party component (e.g. replaced the search module)
- Migrated to 2010 version
  - Used standard search module
  - Left/lost 2 other customized modules
  - Continued customization by in-house developers and super-users (e.g. tracking of operations), in-house/third-party apps
- Migration to 2013 version

Apple iOS ecosystem

- Jan ‘07: only apps in HTML5 and Safari browser
- June ‘07: launch of iPhone
  - incl. DRM module (prevents installation/execution of native code
  - «Jailbreaking» (modifying firmware, Cydia installer + appstore)
  - iOS updates with patches – more hacks – etc
- October 2007: SDK announced (for April 2008)
- Spring 2008: Apple launched AppStore, SDK, App Approval Process, Developer Program License Agreement
- Jailbreaking continues, worries about monopoly, court case decides jailbreaking is not illegal… ongoing tussles…

Eaton et al. (2015), Ghazawneh and Henfridsson (2012)

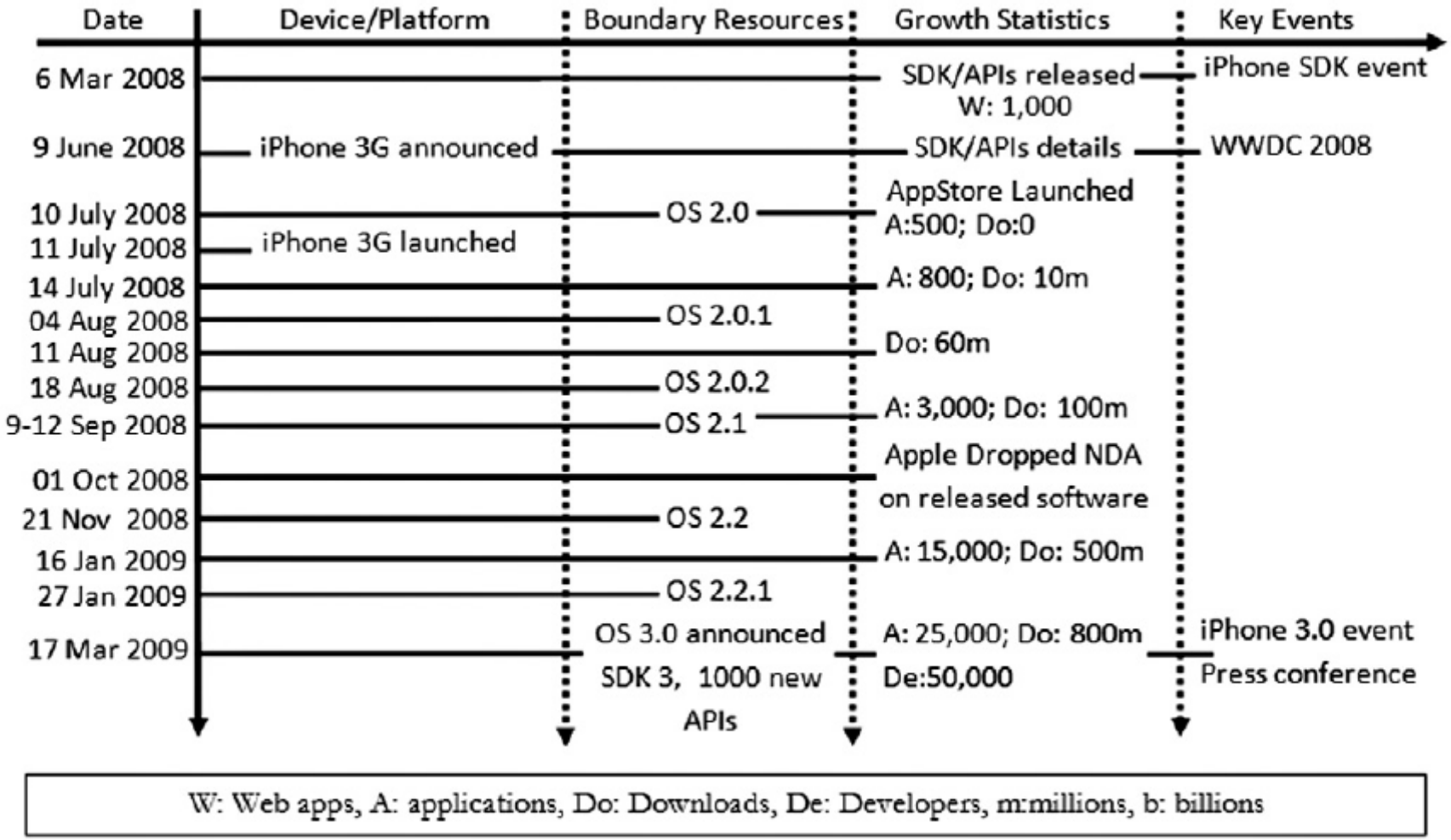


Figure A2. Timeline of episode I.

Figure A2 from Ghazawneh and Henfridsson (2012)

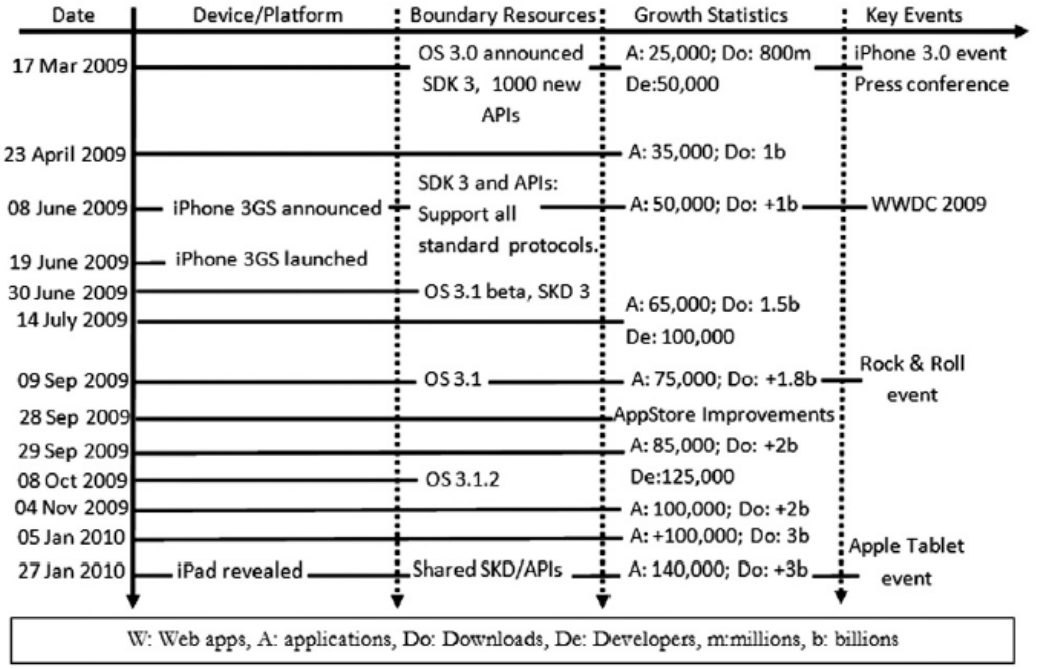
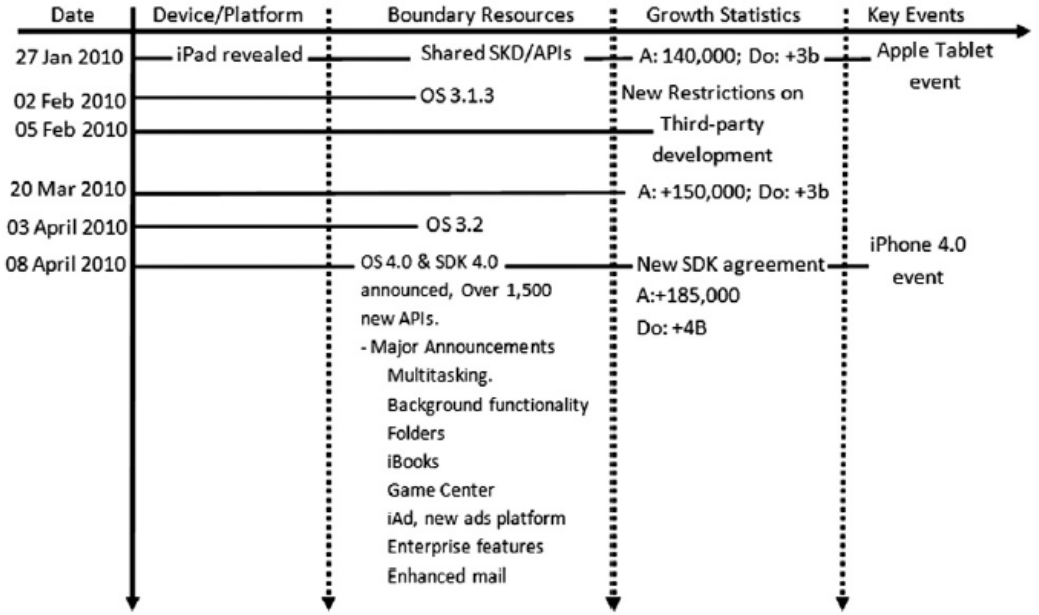


Figure A3. Timeline of episode II.

March – June:
25k to 50k apps
50k to 100k developers

«Diversification» strategy
Expand ecosystem



Jan 2010: The iPad launched, could build on «installed base» of developers and apps

Platforms and Governance

- Gawer (2014) analyses the platform as organization (meta-organization)
  - Organization as *«a system of coordinating activities of two or more persons»*
  - Platforms allow **federation** and **coordination**
  - Allow value creation through economy of scope

Federation: alliance/cooperation where parties retain internal control (e.g. a union of self-governing states)

“While within firms, and to some extent within supply-chains, the commonality of objectives among constitutive agents could perhaps be taken for granted, the federation of innovative and autonomous agents can certainly not be taken for granted within innovative ecosystems. Absent managerial hierarchy or supply-chain authority, an important role for platforms within industry ecosystems is precisely to ensure federation so that coordination amongst agents can happen. Federation cannot be taken for granted, and, without federation and without contracts, there is no basis for coordination. Hence, the importance of ecosystem governance for building and sustaining legitimacy of the platform leader as well as for fostering a collective identity for ecosystem members”.

(Gawer, 2014, p. 1245)

Core reading: Tiwana (2013)

Amrit Tiwana

- Book: «Platform Ecosystems: Aligning Architecture, Governance, and Strategy”
  - Platform strategy: software architecture + business strategy
  - Takes the platform owner’s perspective
  - Commercial platforms
  - Platforms + app development
- Chapter 6: Platform Governance

Governance strategies

"Therefore, platform businesses must be managed differently from product and service businesses, with architecture rather than authority and contracts providing coordination, orchestration foreshadowing conventional notions of management, and platform owners walking the tightrope between granting sufficient autonomy to app developers and ensuring integration of the outputs of diverse ecosystem participants."

- Tiwana, chapter 3

«…architecture rather than authority and contracts»

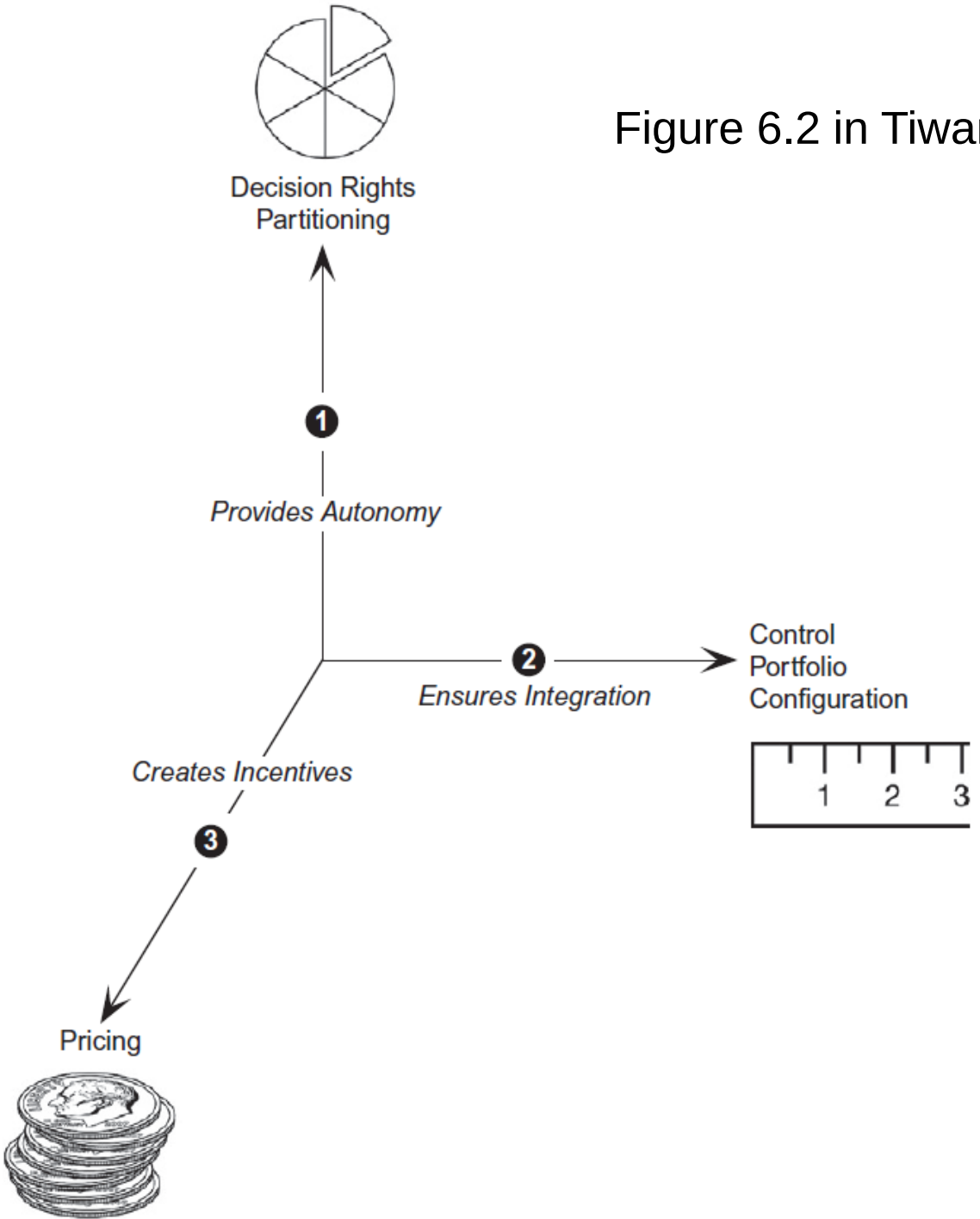
- Chapter 5 discusses platform architecture
  - e.g. the functional partitioning between app and platform (called micro-architectures)
- An app need to have:
  - presentation logic, application logic, data access logic and data storage
- Possible architectural patterns:
  - Stand-alone micro-architecture (all in app)
  - Cloud micro-architecture (all on host)
  - Client-based micro-architecture (data storage (+) on host)
  - Peer-to-peer micro-architecture (servlets, double role)

Chapter 6: platform governance

- Platform governance in terms of decisions rights, control mechanisms and pricing:
  - Decision rights: authority/responsibility for decisions are divvied up among app developers and a platform owner
  - Control mechanisms: mechanisms to ensure goal convergence and coordination
  - Pricing policies

- "… blueprint for ecosystem orchestration"

Figure 6.2 in Tiwana (2013)



Decision rights

- Centralised/decentralized → how shared?
  - Not binary, but a continuum
- Decision rights over what?
  - App decision rights
  - Platform decision rights
- Decision horizon?
  - Strategic (i.e., future-oriented, goals/objectives)
  - Implementation (how to accomplish objectives)
- App developers who target different platforms should expect different decision right structures

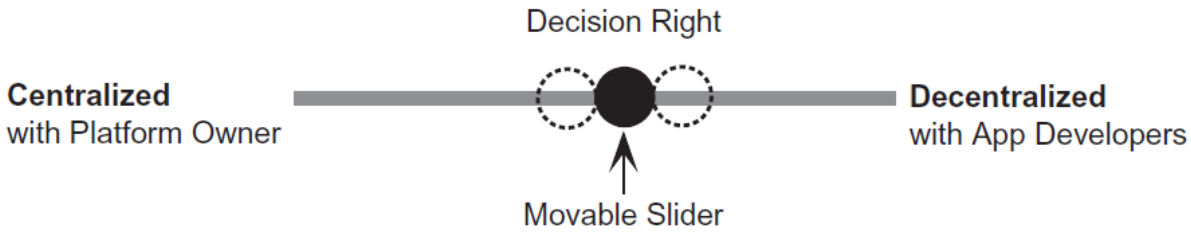


FIGURE 6.3

A decision right can be placed anywhere on the decentralization continuum.

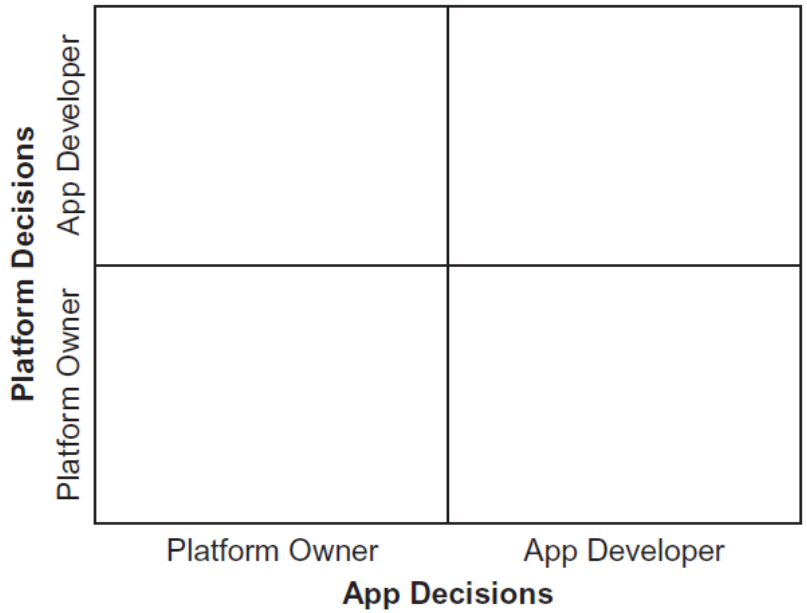


FIGURE 6.4

Platform and app decision rights can be assigned to platform owners or app developers.

Control mechanisms

- Gatekeeping:
  - The platform owner decides who are allowed into the platform's ecosystem (input control)
- Metrics
  - Reward/penalty based on achieve performance targets (e.g. performance, memory utilization or downloads, sales, ratings etc)
- Process control
  - Reward/penalty based on adherence to prescribed process
- Relational control
  - Shared norms and values, a "clan culture" (ref OSS)

Table 6.1 The Four Control Mechanisms and Their Prerequisites

Control Mechanism	Definition	Prerequisites
Gatekeeping	The degree to which the platform owner uses predefined criteria for what apps are allowed into the platform's ecosystem	• Platform owner must be competent to judge • Platform owner must be fair and speedy • App developers must be willing to accept such gatekeeping
Process	The degree to which a platform owner rewards or penalizes app developers based on the degree to which they follow prescribed development methods and procedures that it believes will lead to desirable outcomes	• Platform owner must have the knowledge to mandate methods to app developers • Platform owner should be able to monitor app developers' behaviors or verify compliance
Metrics	The degree to which the platform owner rewards or penalizes app developers based on the degree to which the outcomes of their work achieve performance targets predefined by the platform owner	• Metrics must be set by the platform owner, predefined, and objectively measurable
Relational	The degree to which the platform owner relies on norms and values that it shares with app developers to shape their behaviors	• Existence of shared norms and values between app developers and platform owner • Low app developer churn

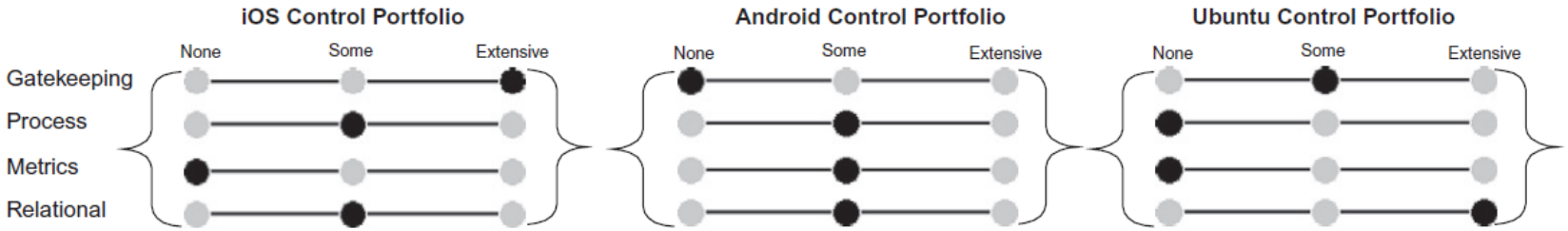


FIGURE 6.8

An illustration of the control portfolios used by three platforms.

Pricing mechanisms

- Aim: create incentives for app developers to invest
- Choices:
  - Symmetric or assymmetric (developers & users)
  - Whom to subsidize, for how long?
  - Pricing for access or for usage?
  - Pie-splitting or a fixed/sliding scale?
  - App licensing decisions
- (Section 6.3: Aligning governance)

Section 6.3 Aligning Governance

Table 6.2 Considerations in Aligning Governance Choices

Governance Dimension	Architecture	Lifecycle	Business Model
Decision rights	●		●
Control	●		
Pricing	●	●	●

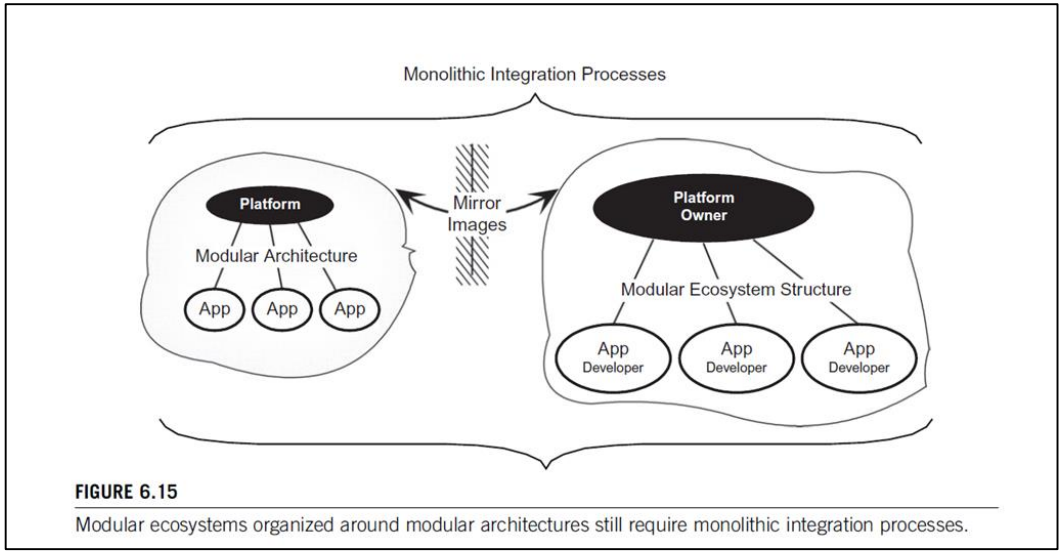
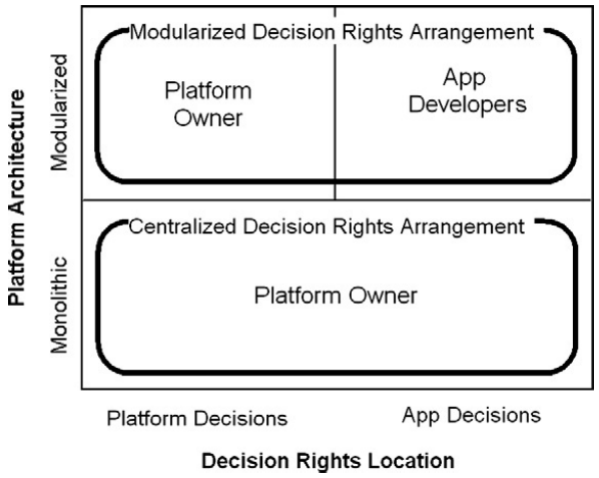


FIGURE 6.15
Modular ecosystems organized around modular architectures still require monolithic integration processes.



Additional readings

- Hoetker, G. and T. Mellewigt (2009): Choice and performance of governance mechanisms: matching alliance governance to asset type. Strategic Management Journal, 30(10): p. 1025-1044.
- Tiwana, Konsynski, and Bush (2010) "Research commentary—Platform evolution: Coevolution of platform architecture, governance, and environmental dynamics." *Information Systems Research* 21.4, 675-687.
- Boudreau (2010): Open Platform Strategies and Innovation: Granting Access vs. Devolving Control. Management Science. 56(10)