UiO : Institutt for informatikk
Det matematisk-naturvitenskapelige fakultet

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Governance challenges of inter-organizational systems and platforms

April 3rd 2017

Plan for the lecture

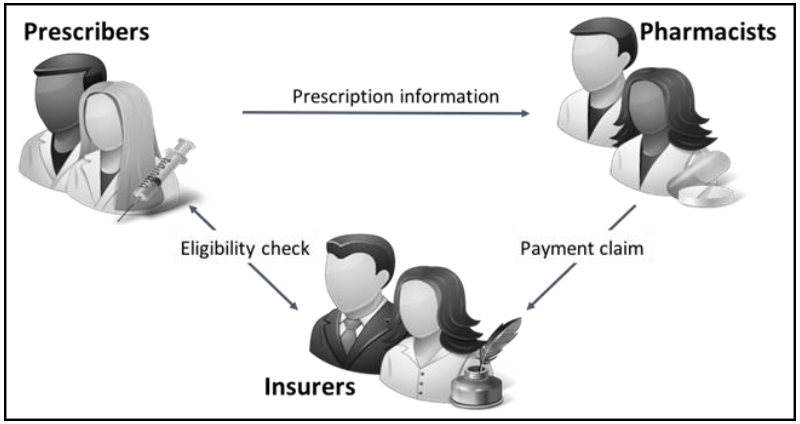
- Governance of inter-organisational systems
  - Example: e-prescription in Norway
- Platforms – as an architectural form
  - What is it? (core + interfaces + modules)
  - Why platforms? (benefits)
  - Types of platforms (internal, supply-chain, industry-wide)
- Governance of platforms
  - Governance challenges and dilemmas (examples)
  - Decision rights, control mechanisms, and pricing

From organizational to inter-organizational systems

- Several, independent decision-makers
- 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

Example: e-prescription

- Infrastructure for digital capture, transmission and dispensing of prescription for medical drugs
- Planned since 2003, rolled out 2012-13 to GPs and pharmacies
- Ongoing developments
  - Hospitals, multidose, online pharmacies, MyPrescriptions
- Organised as joint program w/public and private actors



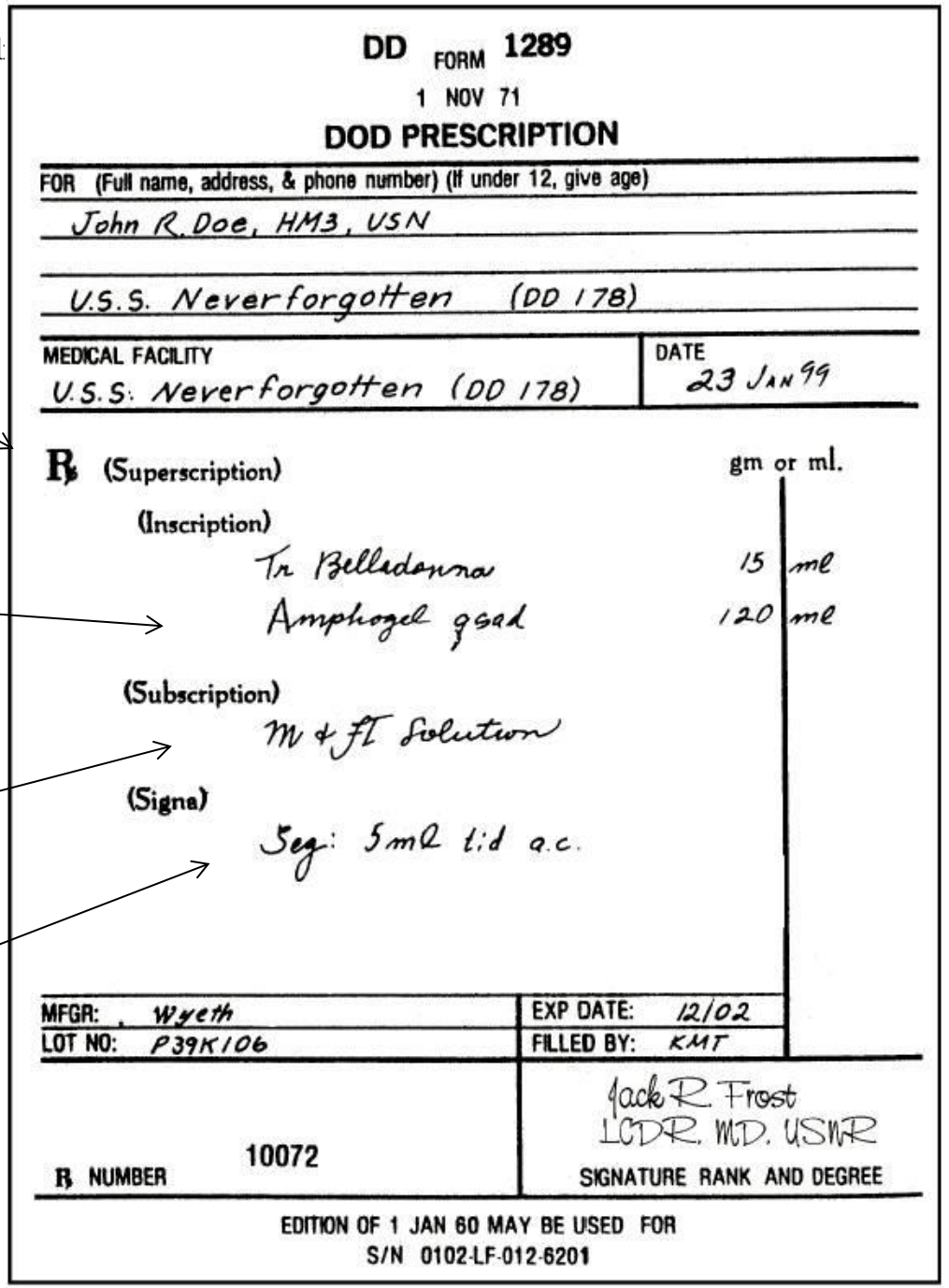

RESIN. GUAJAC.
RESIN. CALAMI
CARMINUM
RADIX GENTIANAE CONC.
TRAGACANTH
AQ. ROSAE EXTEMP.
TINCT. OPII BENZ.
SPIR. PERNIONIS
GUMMI-RESINA AMMONIACUM
LIGNUM QVASSIAE PULV.
ACID. SUCCINIC. SUBFLAV.
SALICYL. MAGNESIC.
FERRUM PULV.

Superscription:
Rx – *lat. recipe*
«take thou»

Inscription:
List of ingredients

Subscription:
Instructions to compunder

Signa («Sig.»):
Instructions to patient



DD FORM 1289
1 NOV 71
DOD PRESCRIPTION

FOR (Full name, address, & phone number) (If under 12, give age)
John R. Doe, HM3, USN
U.S.S. Neverforgotten (DD 178)

MEDICAL FACILITY: U.S.S. Neverforgotten (DD 178)
DATE: 23 JAN 99

℞ (Superscription)

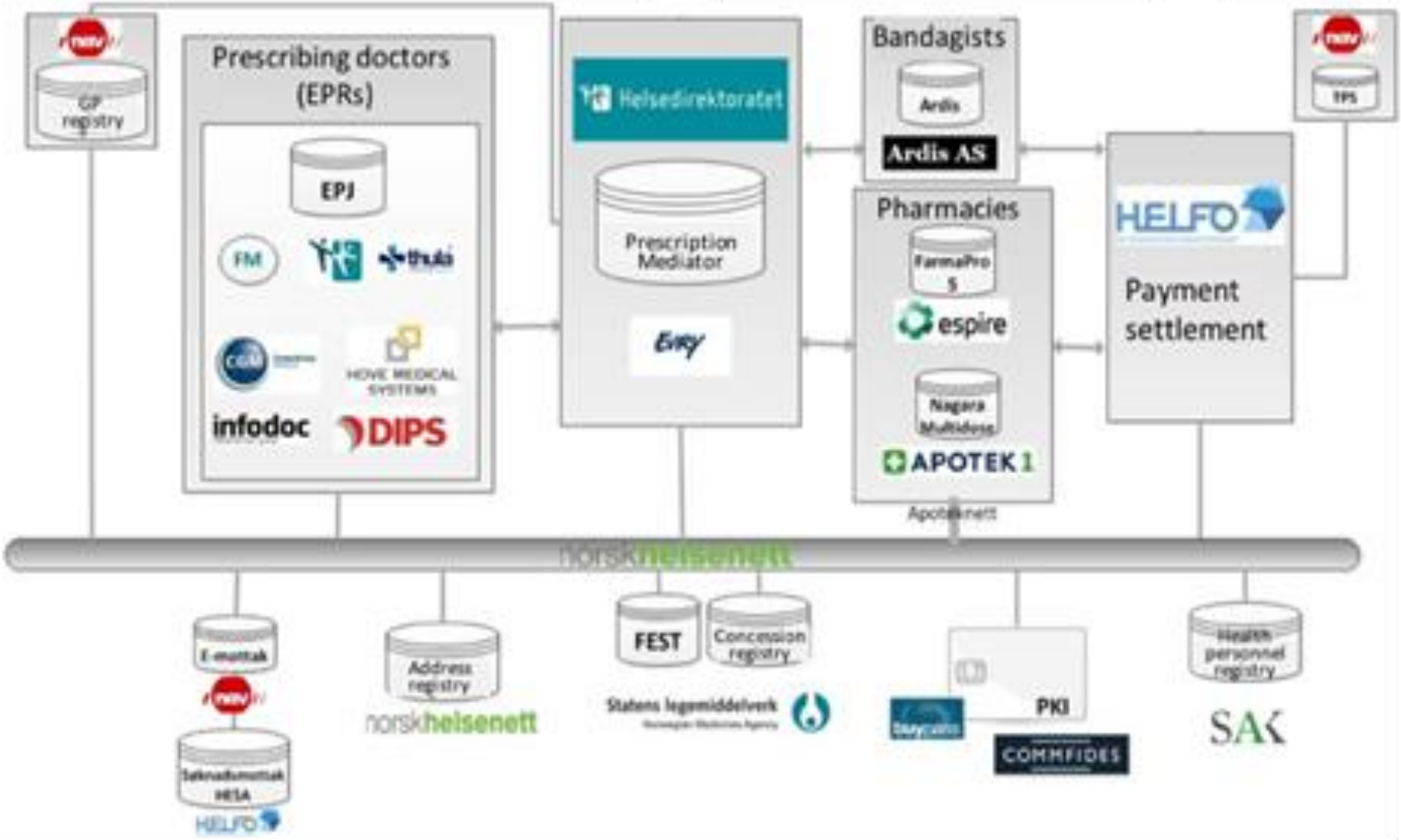
	gm or ml.
(Inscription)	
Tr Belladonna	15 ml
Amphogel qsad	120 ml
(Subscription)	
M & Ft Solution	
(Signa)	
Sig: 5ml t.i.d a.c.	

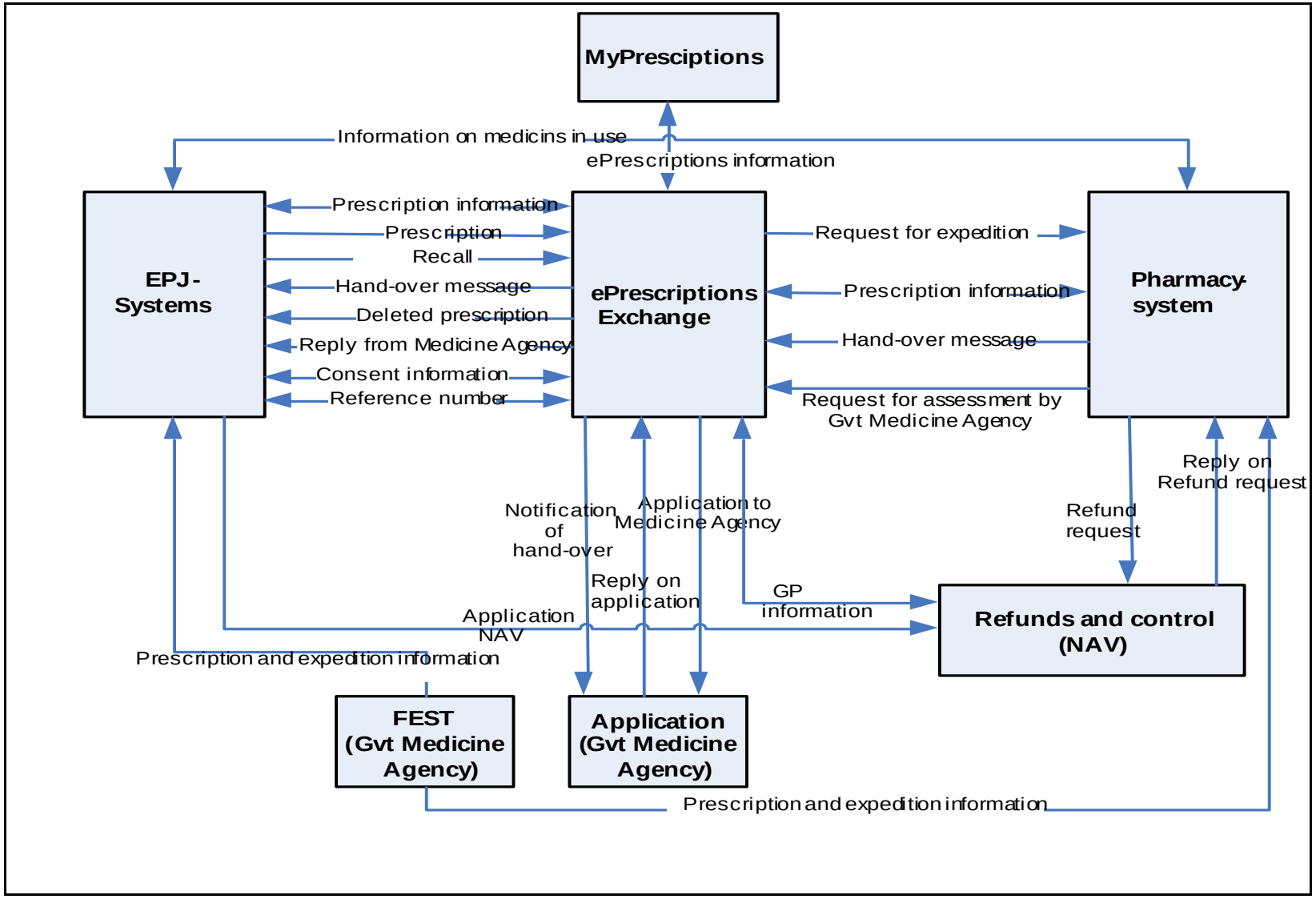
MFGR: Wyeth
LOT NO: P39K106
EXP DATE: 12/02
FILLED BY: KMT

℞ NUMBER 10072

Jack R. Frost
LCDR. MD. USNR
SIGNATURE RANK AND DEGREE

EDITION OF 1 JAN 60 MAY BE USED FOR
S/N 0102-LF-012-6201


GP registry
Prescribing doctors (EPRs)
EPJ
FM
thuja
infodoc
DIPS
HOVE MEDICAL SYSTEMS
Helsedirektoratet
Prescription Mediator
Evry
Bandagists
Ardis
Ardis AS
Pharmacies
FarmaPro S
espire
Nagara Multidose
APOTEK 1
Apotek-nett
TPS
HELFO
Payment settlement
norskhelsenett
E-resept
Address registry
FEST
Concession registry
Statens legemiddelverk
PKI
COMMFIDES
Health personnel registry
SAK
Sekundærmottak HELSA
HELFO


MyPresciptions
Information on medicins in use
ePrescriptions information
EPJ-Systems
Prescription information
Prescription
Recall
Hand-over message
Deleted prescription
Reply from Medicine Agency
Consent information
Reference number
ePrescriptions Exchange
Request for expedition
Prescription information
Hand-over message
Request for assessment by Gvt Medicine Agency
Pharmacy-system
Reply on Refund request
Refund request
Notification of hand-over
Application to Medicine Agency
Reply on application
GP information
Application NAV
Refunds and control (NAV)
Prescription and expedition information
FEST (Gvt Medicine Agency)
Application (Gvt Medicine Agency)
Prescription and expedition information

Phase	Period	Key Actors	Description
Initiations	2003-2004	National Social Security Administration, Health Ministry, Health Directorate	Social Security Reform Decision to initiate e-Prescription
Planning & Initial Development	2005-2006	Health Ministry, Health Directorate, SLV, Pharmacists Association, Doctors Association, Bandagists, EPR vendors and other software development companies	Starting e-Prescription program Merging NHN on a national level Cooperation-agreement
Unsuccessful Deployment Attempt	2007-2008	Health Ministry, Health Directorate, SLV, Pharmacists Association, Doctors Association, Bandagists, EPR vendors and other software development companies	Tender First Pilot County stops pilot after significant problems emerge
Successful Deployment	2009-2012	Health Ministry, Health Directorate, SLV, Pharmacists Association, Doctors Association, Bandagist, EPR vendors and other software development companies, HELFO	Re-planning Prescription mediator launched Successful pilot and rollout Migration Factory developed for pharmacy systems Prescribing Module developed My Prescription service
Management, Operations & further Upgrades	2013–2016	Health Ministry, Health Directorate, Directorate of e-Health, Pharmacists Association, Doctors Association, Bandagists, EPR vendors and other software development companies, HELFO, PLO (Municipal Care institutions), Norwegian Institute of Public Health	Multidose Dispensing Online-pharmacy Transfer to directorate of e-Health Initiatives for comprehensive overview of patient´s medications and for connecting with the Norwegian Institute of Public Health

Governance of inter-organisational systems

- Provan and Kenis (2008):
  a) Participant-governed
  b) Lead organization
  c) Network administrative organization

- Hoetker and Mellewight (2009)
  – Formal vs. relational governance mechanisms

Platforms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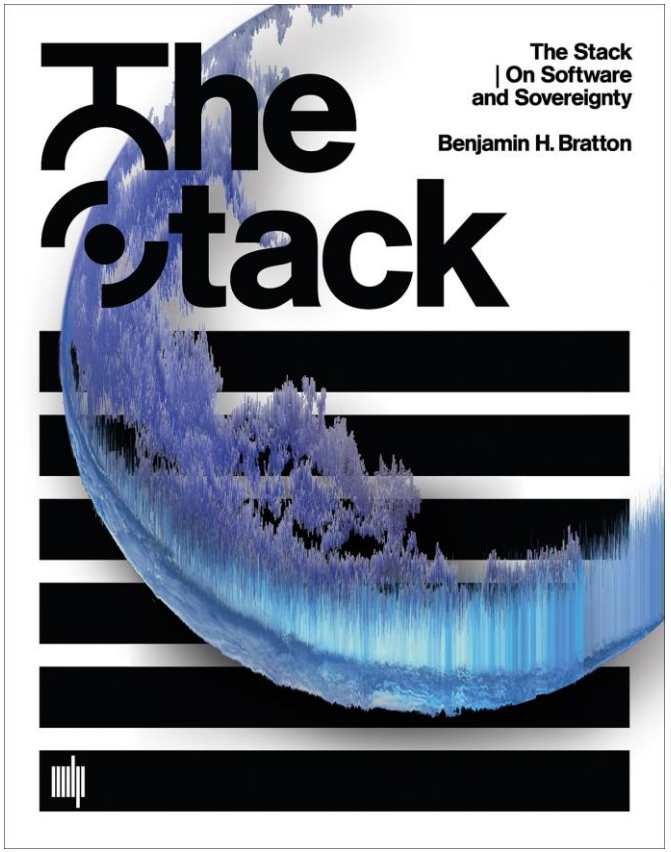

The Stack
| On Software and Sovereignty
Benjamin H. Bratton
The Stack

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
  - 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

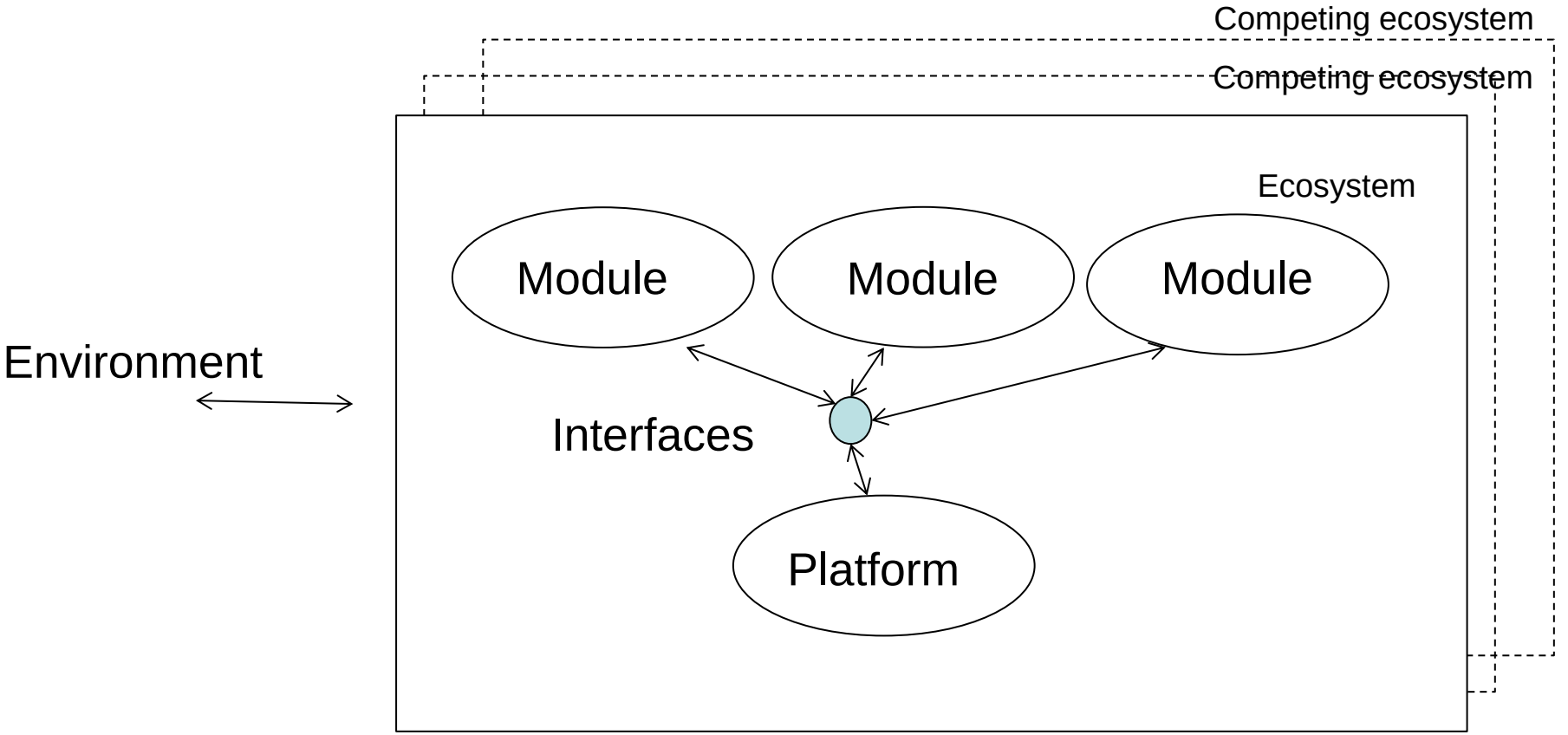
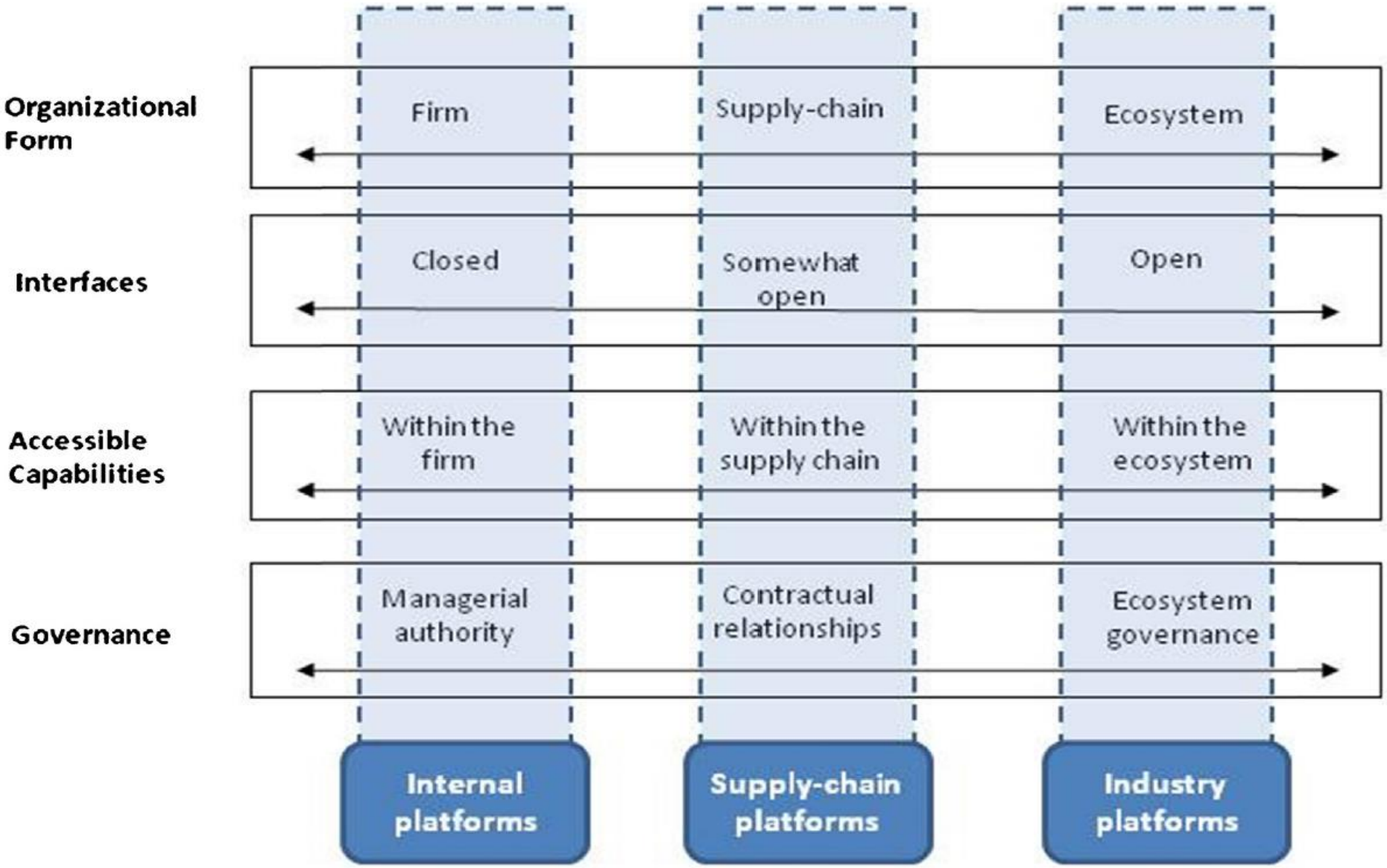


Figure 1 from Tiwana et al., 2010


Organizational Form
Firm
Supply-chain
Ecosystem
Interfaces
Closed
Somewhat open
Open
Accessible Capabilities
Within the firm
Within the supply chain
Within the ecosystem
Governance
Managerial authority
Contractual relationships
Ecosystem governance
Internal platforms
Supply-chain platforms
Industry platforms

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

From Eaton et al. (2005)

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…

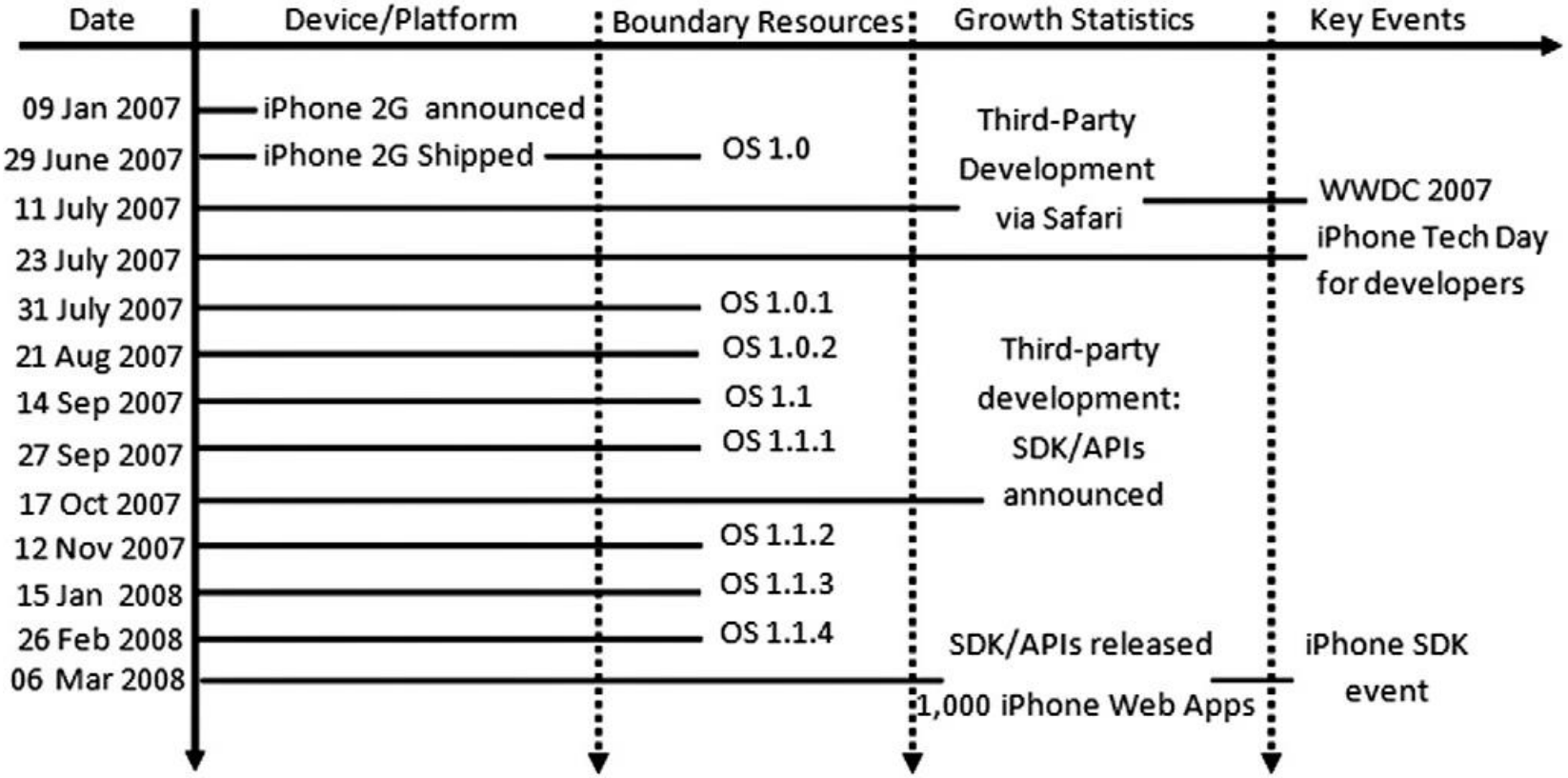
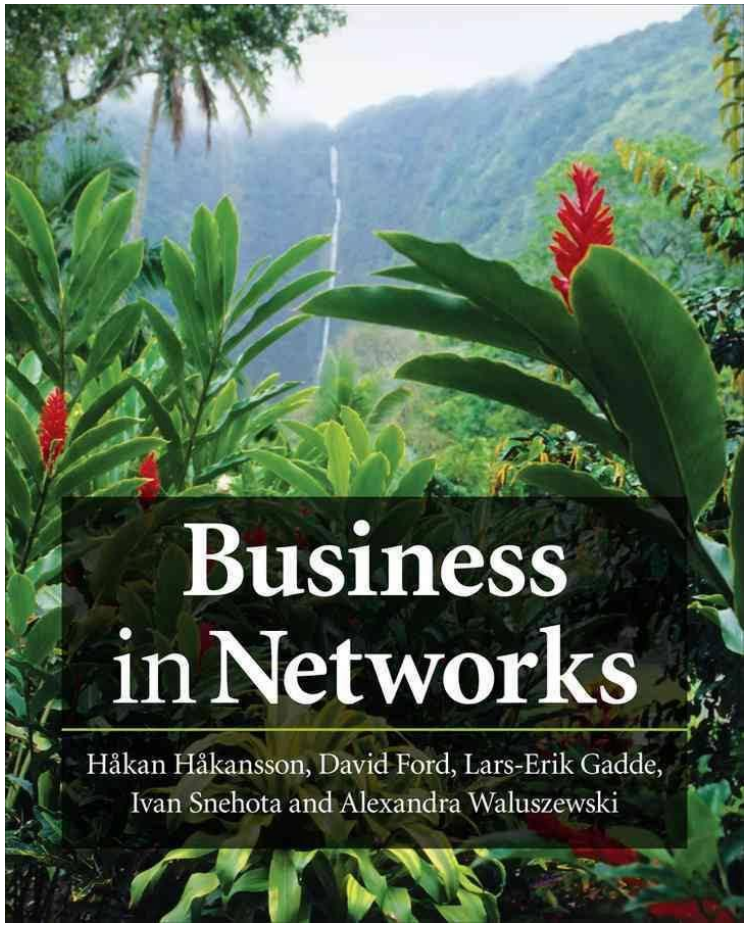


Figure A1 from Ghazawneh and Henfridsson (2012)

Metaphors: eco-systems, platforms …



Reading 1: Gawer (2014)


Annabelle Gawer

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

"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)

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

Reading 2: 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»

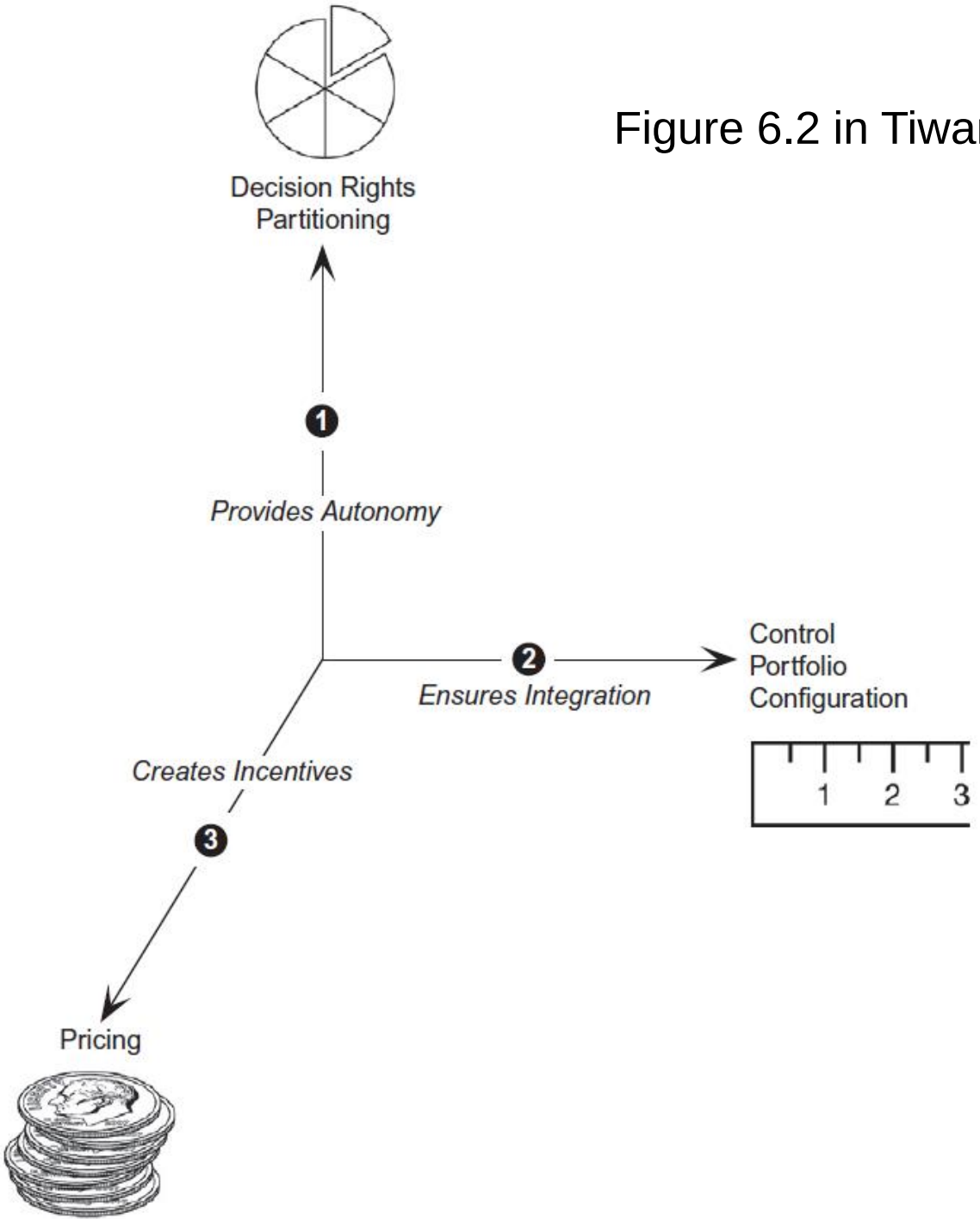
- Chapter 5 discusses platform architecture
  - e.g. the functional partitioning between app and platform (called micro-architectures)
- An app need to have:
  - presentation logic, application logic, data access logic and data storage
- Possible architectural patterns:
  - Stand-alone micro-architecture (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

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)

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)

Additional readings

- Provan, K.G. and P. Kenis (2008): Modes of Network Governance: Structure, Management, and Effectiveness. Journal of Public Administration Research & Theory, 18(2): p. 229-252.
- 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.
- Rolland, K. and Aanestad, M. (2014): Growing platform-based enterprise systems through ‘modular’ and ‘architectural’ acts of customizing: a case study. IRIS 2014, Denmark.
- 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.
- Eaton et al. (2015) "Distributed tuning of boundary resources: the case of Apple's iOS service system." *Mis Quarterly* 39.1, 217-243.
- Boudreau (2010): Open Platform Strategies and Innovation: Granting Access vs. Devolving Control. Management Science. 56(10)