Update for the VCDWG

Dirk Trossen, Nokia Research

What Happened Since June 2005?

- Case Study continuation
  - RFID continued
  - Music finalized
  - VOIP turned towards system dynamics

- Went into deliverable mode
  - Core-Edge Story released
  - Music case study released
  - Others to come (methodology, taxonomy)

- Modeling
  - Investigation of system dynamics as means to tie coreness into modeling framework

You'll hear more within the next hour

But More Important...

The Core-Edge WG became the

Value Chain Dynamics WG

The Core-Edge Story
An Overview

Dirk Trossen, Nokia Research

Available at http://cfp.mit.edu/groups/core-edge/docs/Core-Edge_story.pdf

Rationale

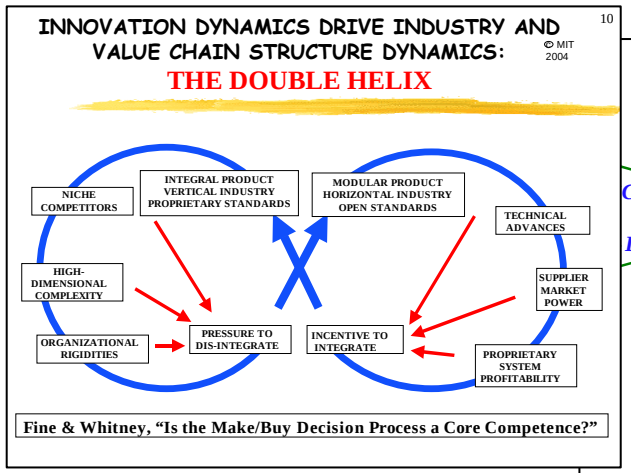
- Present work around a framing story for our WG
  - Attempts to serve as main achievement paper

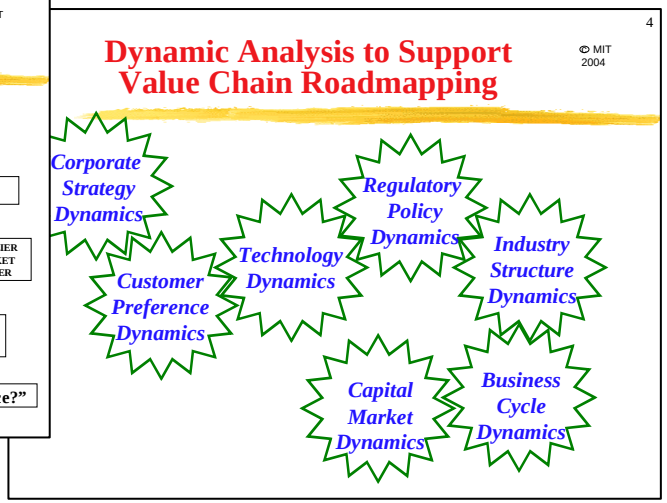
- Concentrate on main messages
  - Attempts to be captivating enough to be disseminated within sponsor companies

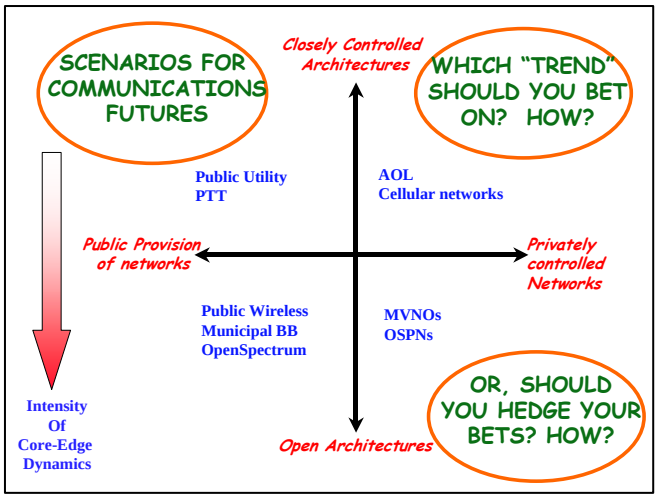
Final Result:

Whitepaper on “Introduction to Value Chain Dynamics”

The Phenomenon: Core-Edge Dynamics



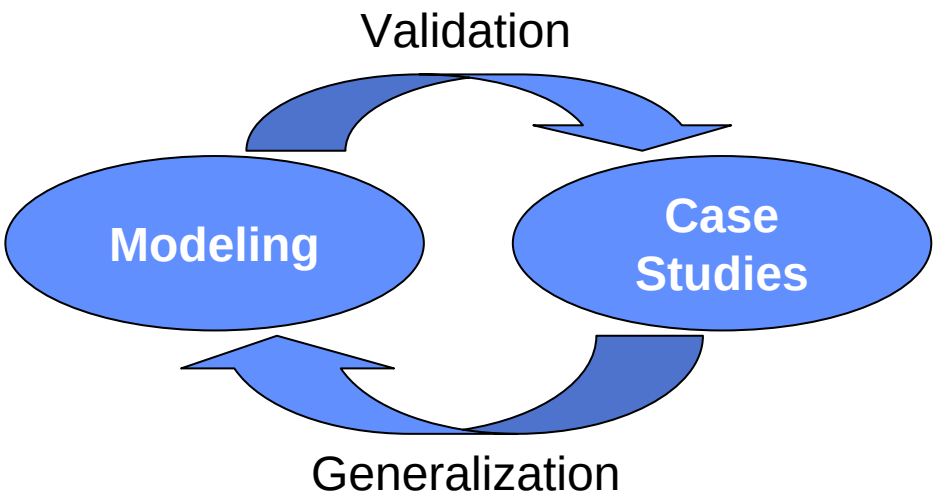




- The communication industry is undergoing major changes in its structure
- A variety of dynamics is causing these changes
- It is crucial to understand these dynamics in order to identify opportunities for future investments

Goal of CEWG: Help partners understand these dynamics

Our Approach

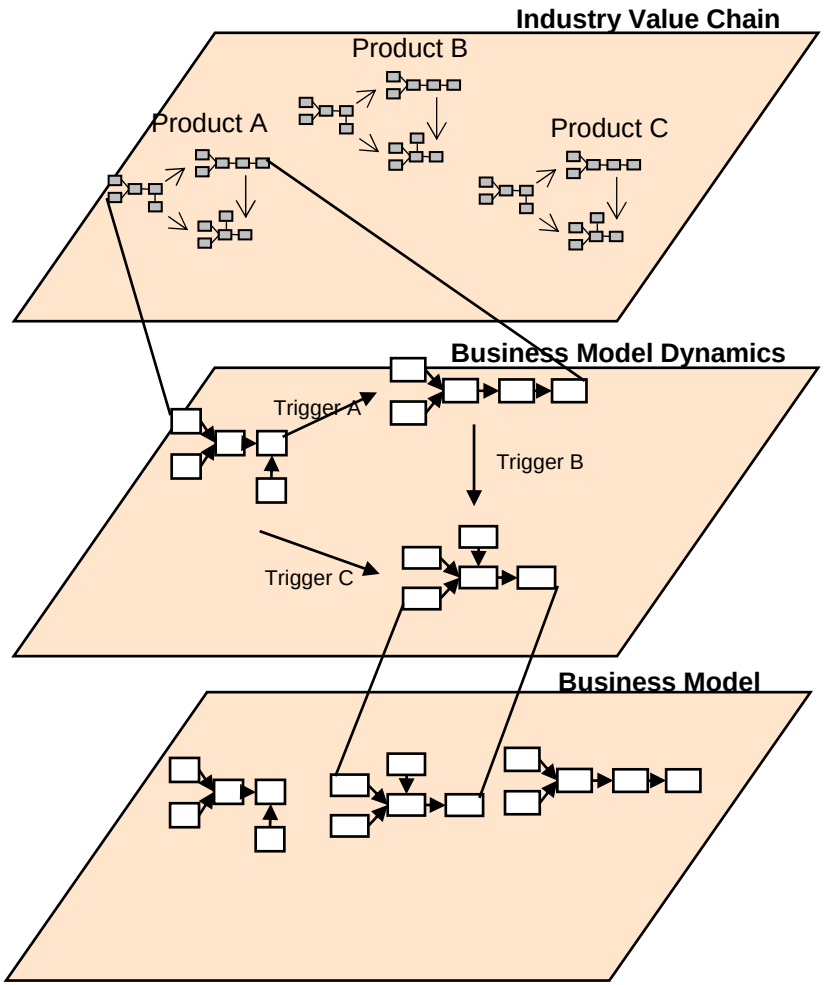


- Create a circle of validation and generalization using case studies

- Main criteria for case studies:
  - Presence of some form of core-edge dynamics
  - Observability of past or current dynamics
  - Predictability of possible dynamics in the future
  - Maturity in technology and market desirable but not necessary

- Examples are services/products (online music, VOIP) or concepts/practices (e.g., open source, regulation policies, such as wireless spectrum policies)

Scope of Research



Value Dimension

How to derive value in the (future) value chain as a whole?

Sustainable success of a particular business model over time

Competitive position of a particular business mode compared to other ones

Value that can be **captured** with a **particular control point**

Strategy Dimension

Devise strategies that **cross entire value chains**, e.g., VOIP subsidizing to capture value in SIP services

Devise **strategies for particular products**, e.g., how to position in presence of particular trigger(s)

Devise **strategies for certain business models** and control points

CFP Dimension

Feed core-edge dynamics into Internet Architecture, Viral Communication, PrivSec & Broadband across all these tiers but also vice versa

Connect to concepts in other CFP WGs, i.e., viral and liquid systems

Use CE methodology within other working groups

Evaluate the Success of Business Models: Critical Issues

Innovation can happen anywhere at anytime by anybody

- Sudden strike type of disruption becomes more apparent in today's industry (Example: Skype)
- Formerly scarce resources become more easily available (Example: servers, call processing functions,…)

Control is key issue

- Technology, business and regulatory action made placement of control points more flexible

Topology relation does not matter much

- Business-critical control points less topology-dependent than in traditional telecomm business

Evaluate the Success of Business Models: Tools Required

- Independent of topology
- Revolve around control and its implementation
- Reflect dynamics of the economic, technological and regulatory environment
- Allow for evolving from the value towards the strategy dimension (see scope of research)

A First Step: Our Taxonomy

- Taxonomy is based on *identification* of
  - service transactions as well as providers & consumers,
  - control structure in the implementation of the service transactions

- Taxonomy is *grounded in infrastructure* aspects for delivery, service provisioning and management
  - Centralized vs. distributed
  - Parties holding control point rooted in these infrastructures

- Taxonomy is used to derive *possible business models* for particular products (control point constellations)

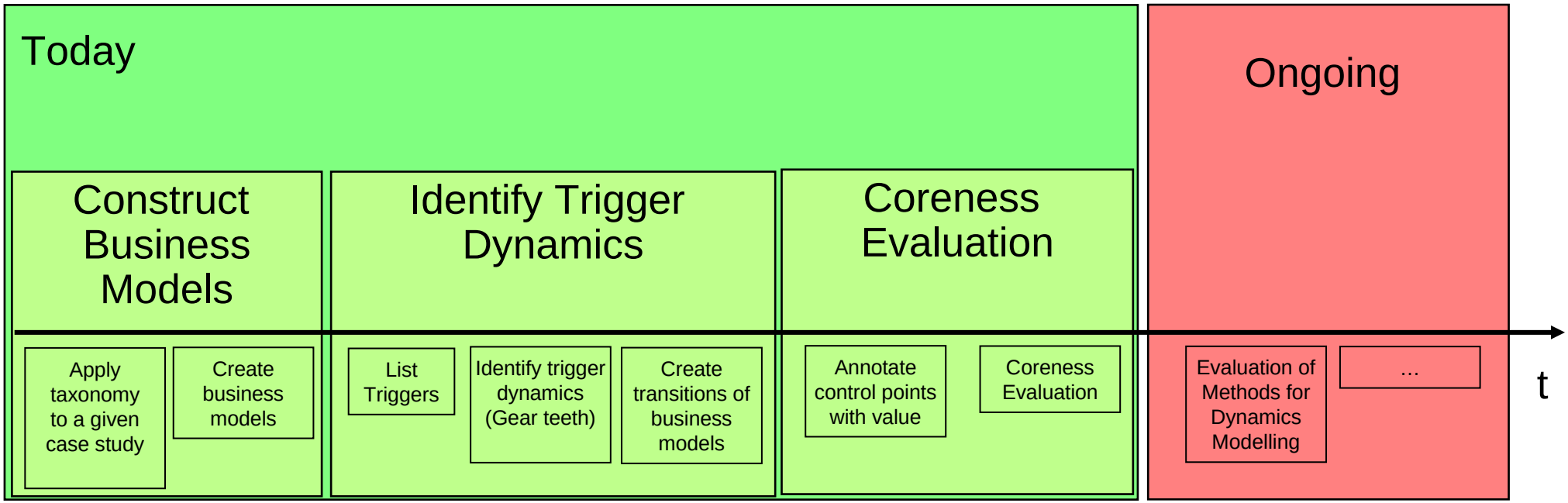
Note: Taxonomy is NOT based on topological constructs for core & edge

The Next Step: The **Coreness** Concept

- Introduced **Coreness** as a measure for the likelihood of a dominant and successful business model
- Based on our methodology
  - **Construct possible business models** -> building control point constellations based on our taxonomy
  - **Identify possible triggers and their dynamics** causing business transformations -> trigger sheet and gear teeth model
  - **Classify control points** (and entire offerings) by scarcity and demand for service transactions -> **coreness**
  - Evaluate evolution over time to devise strategies to position along the value chain -> the **coreness tunnel**

- Relation to the notion of **core** (as a topological construct)
  - **Core** in the past guaranteed a certain likelihood for a dominant and successful business model
  - As argued, topological **core** does not warrant business success
    - Instead introduced **coreness** as such measure

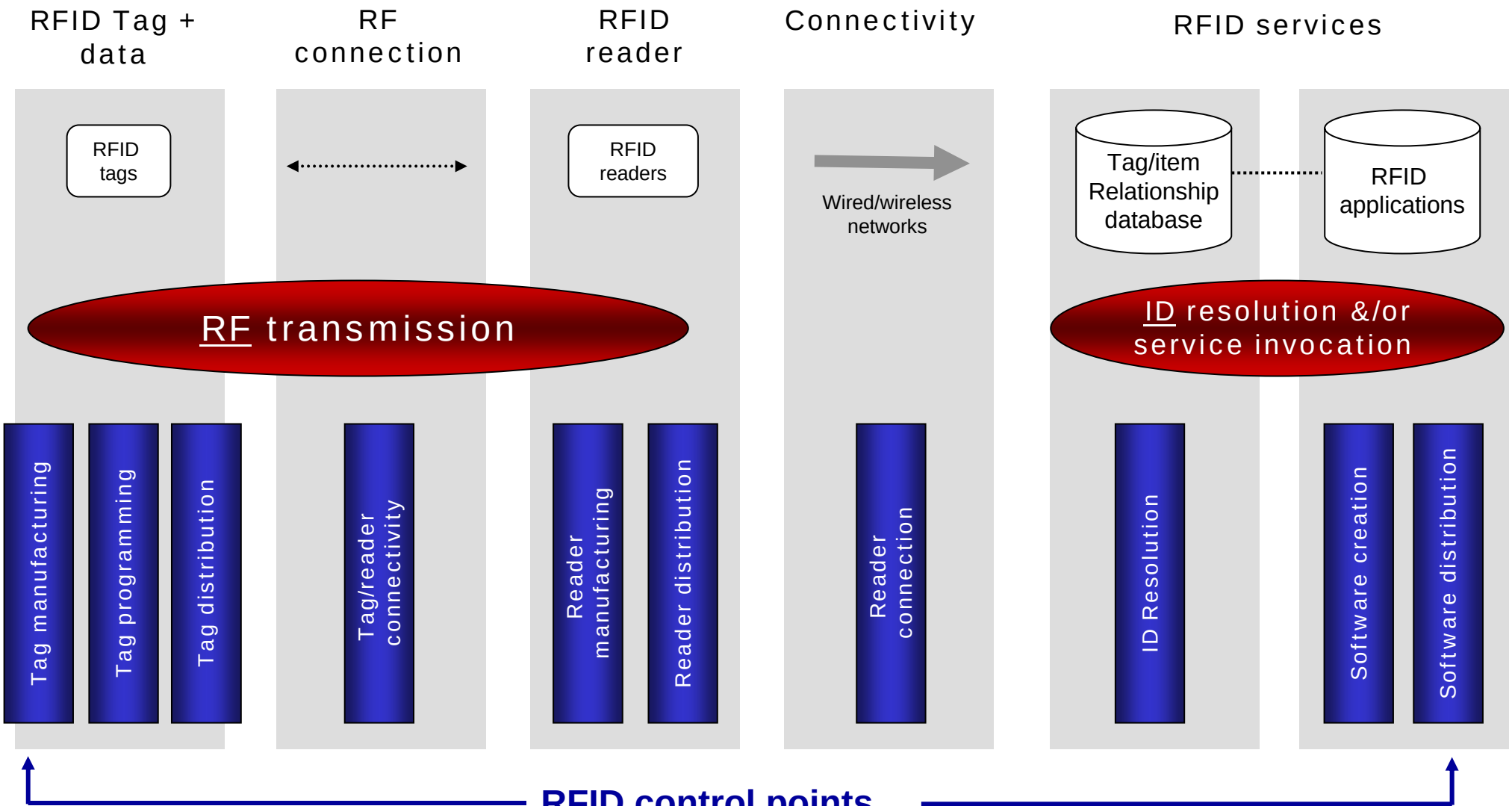
The Core-Edge Methodology



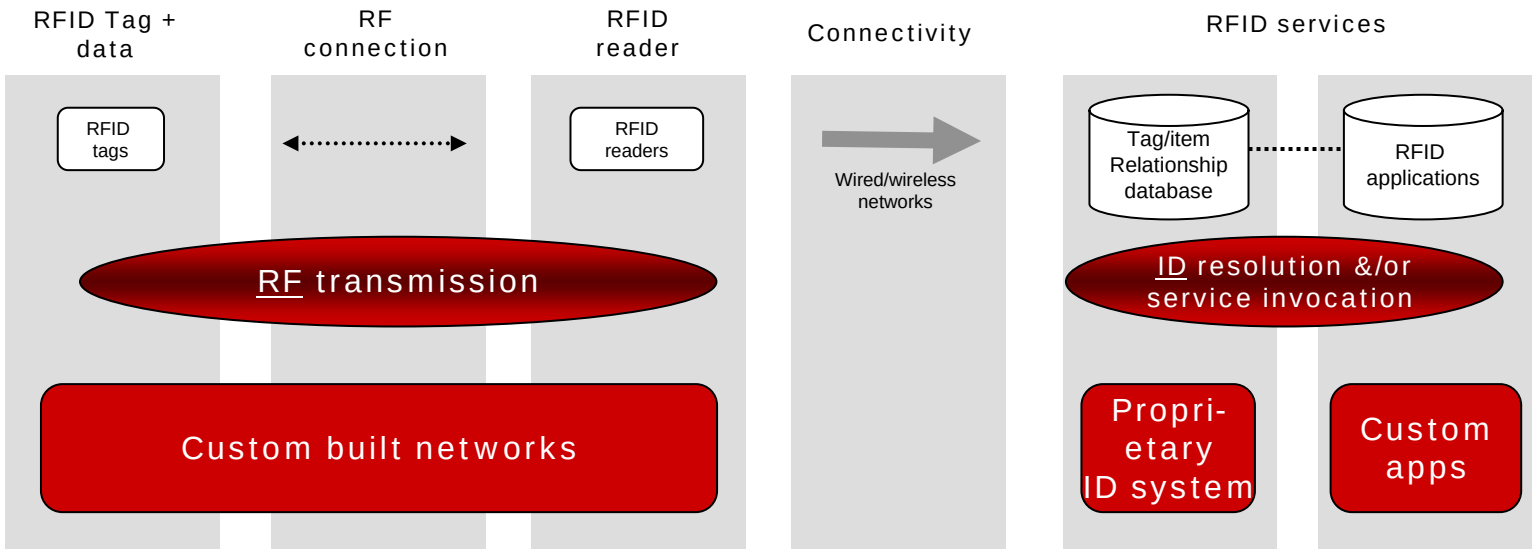
RFID Case Study

Natalie Klym, MIT

RFID key components – control points

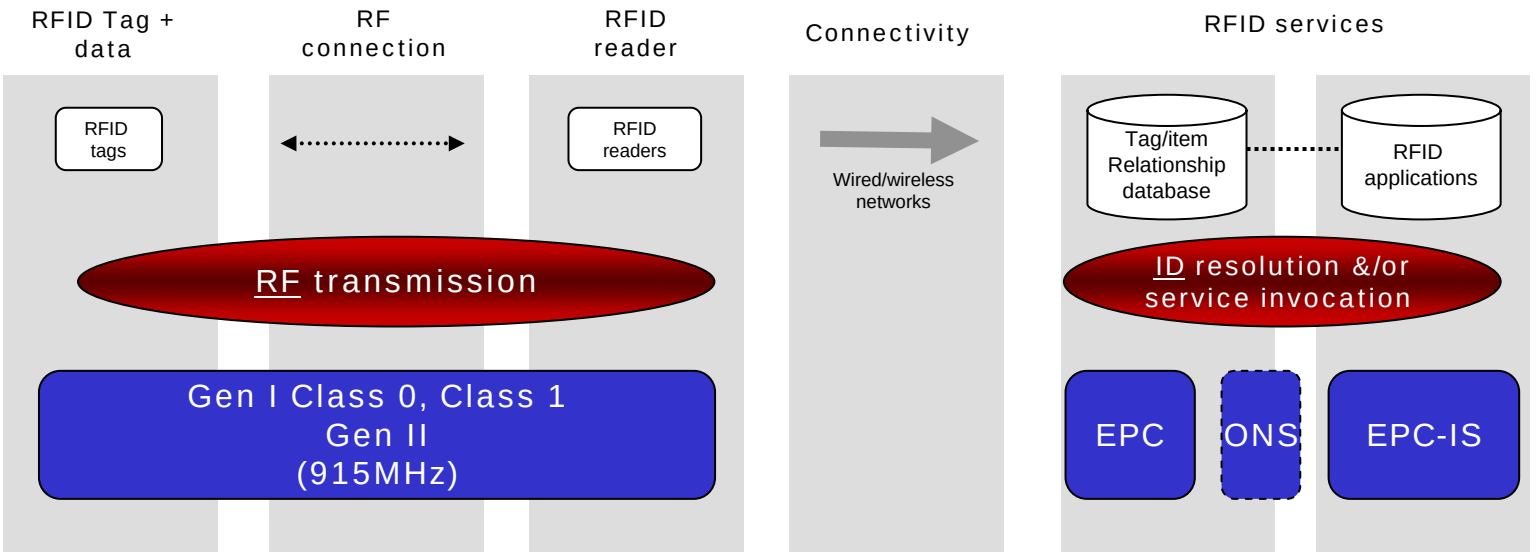


Evolving coreness of control points



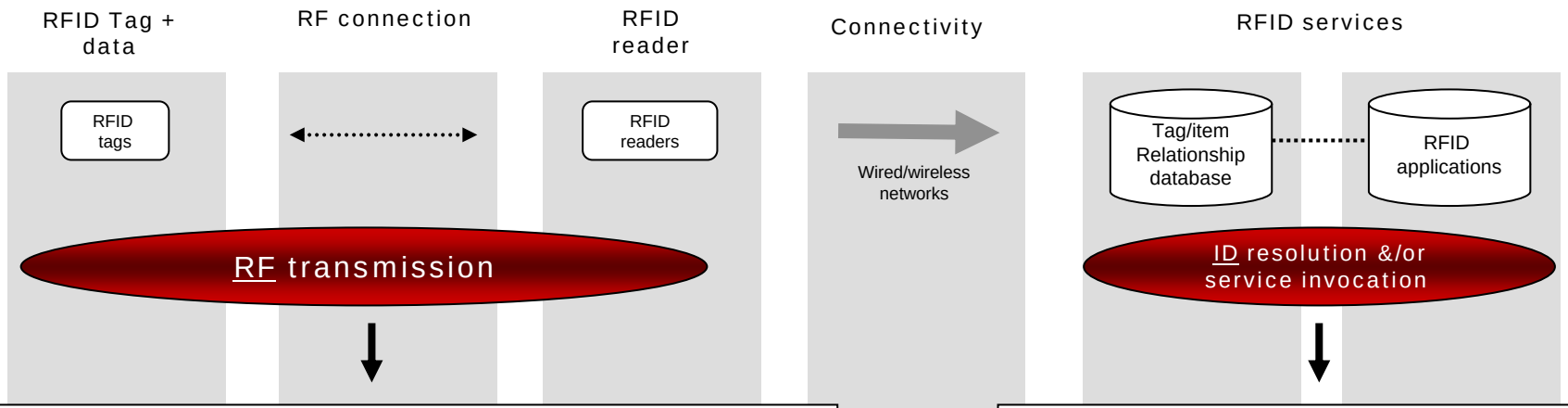
- High scarcity
  - Most of today's RFID implementations are proprietary, closed-loop (internal) systems
  - Hardware & software components are application-specific
  - Control points are vertically integrated & non-interchangeable
- Low demand
  - Demand is growing, but RFID remains immature
  - Supply chain (EPC) apps have generated hype, but most implementations are slap & ship (minimal compliance)
  - Most other (non-EPC) implementations remain experimental
  - Consumer apps on the horizon

EPCglobal Network



- The vision is to standardize all RFID technology components and centralize ID resolution
- Tags are encoded with an EPC number
- Tagged objects pass through standardized networks across the supply chain
- Current implementations subscribe to EPC numbering and tag/reader network standards only
- The future of the EPC platform is uncertain

Other (non-EPC) RFID systems



Non-EPC RF technologies

- Custom RFID networks
  - E.g., 433MHz ISM (industrial, scientific, medical) band
- Pre-existing short-range wireless networks
  - E.g., Kidspotter child tracking app uses active Wi-Fi tags
  - MAC address serves as unique identifier
- NFC (Near Field Communication)
  - Very short range RFID (13.56MHz, 106/202 kbps, 0-20 centimeter range)
  - Contactless smartcards & mobile phones (50% of phones NFC-enabled by 2009)

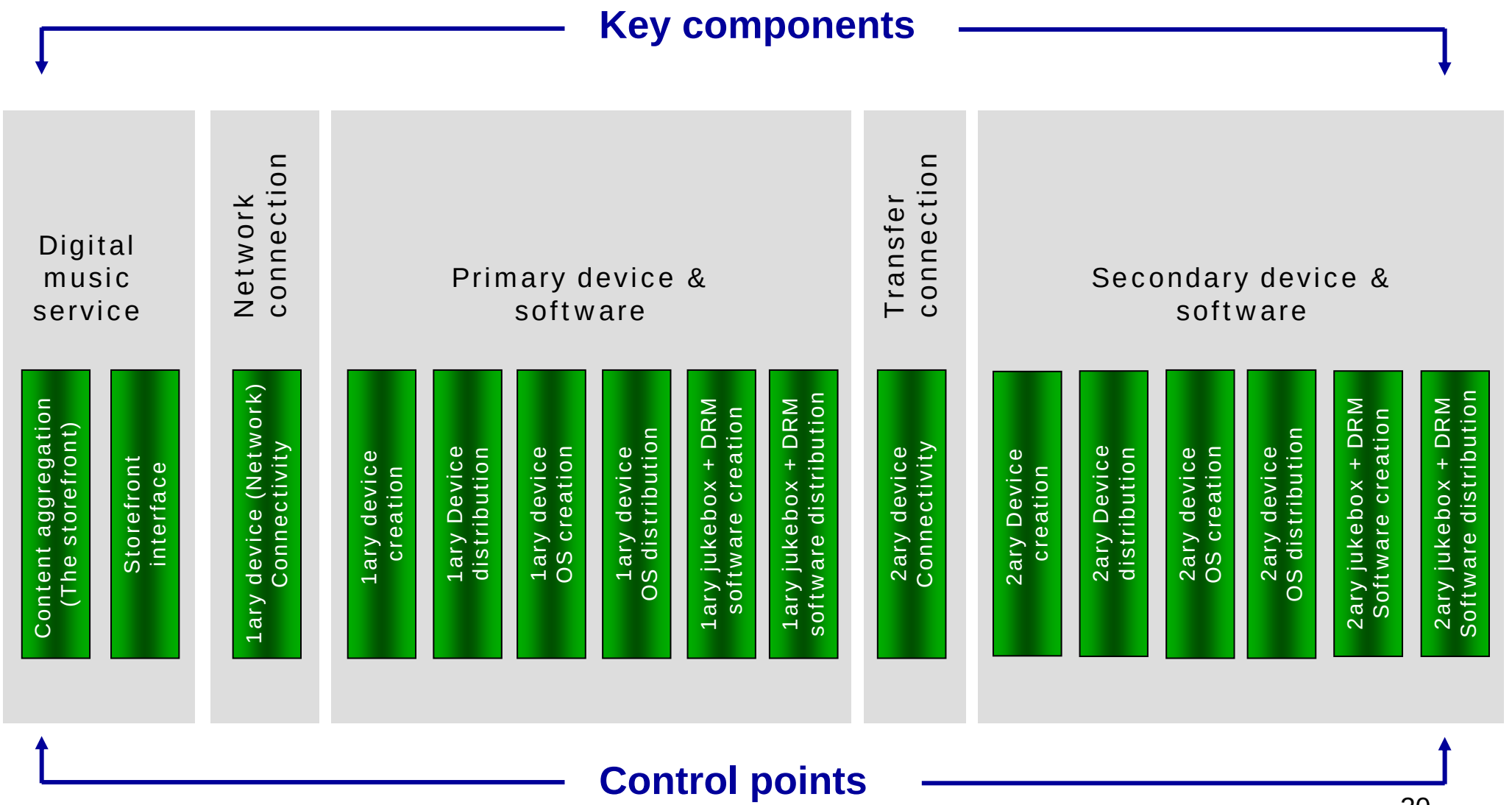
Non-EPC tag data & ID resolution schemes

- Competing supply chain ID
  - e.g., Japan's UCode vs EPC
- EPC Alternatives
  - URL + DNS
  - IP address + DNS
  - XPath expression + DNS/local query
- Proprietary codes
  - e.g., DoD's UID + internal registry
  - Any internal system

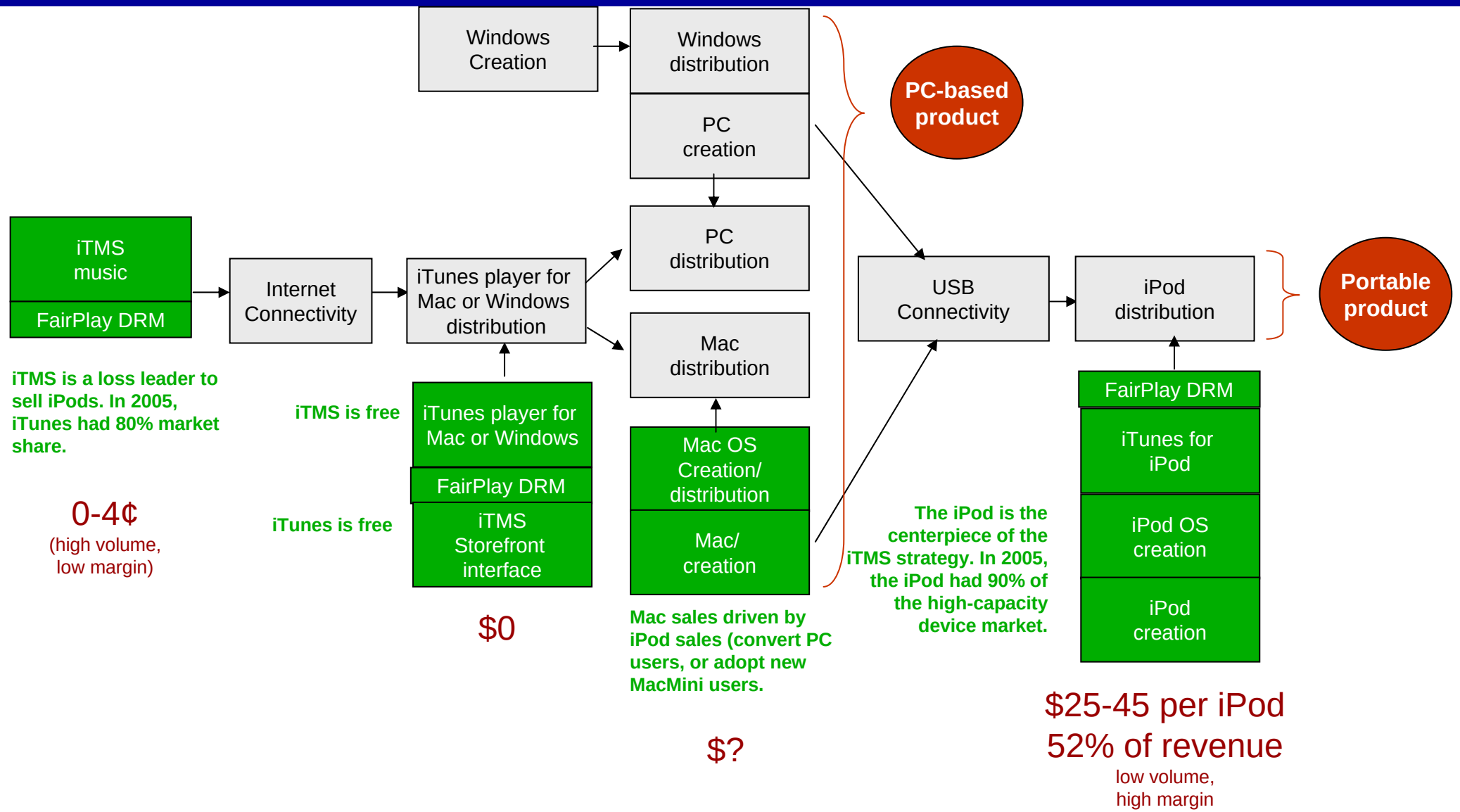
Digital Music Services Case Study

Natalie Klym, MIT

Key components and control points

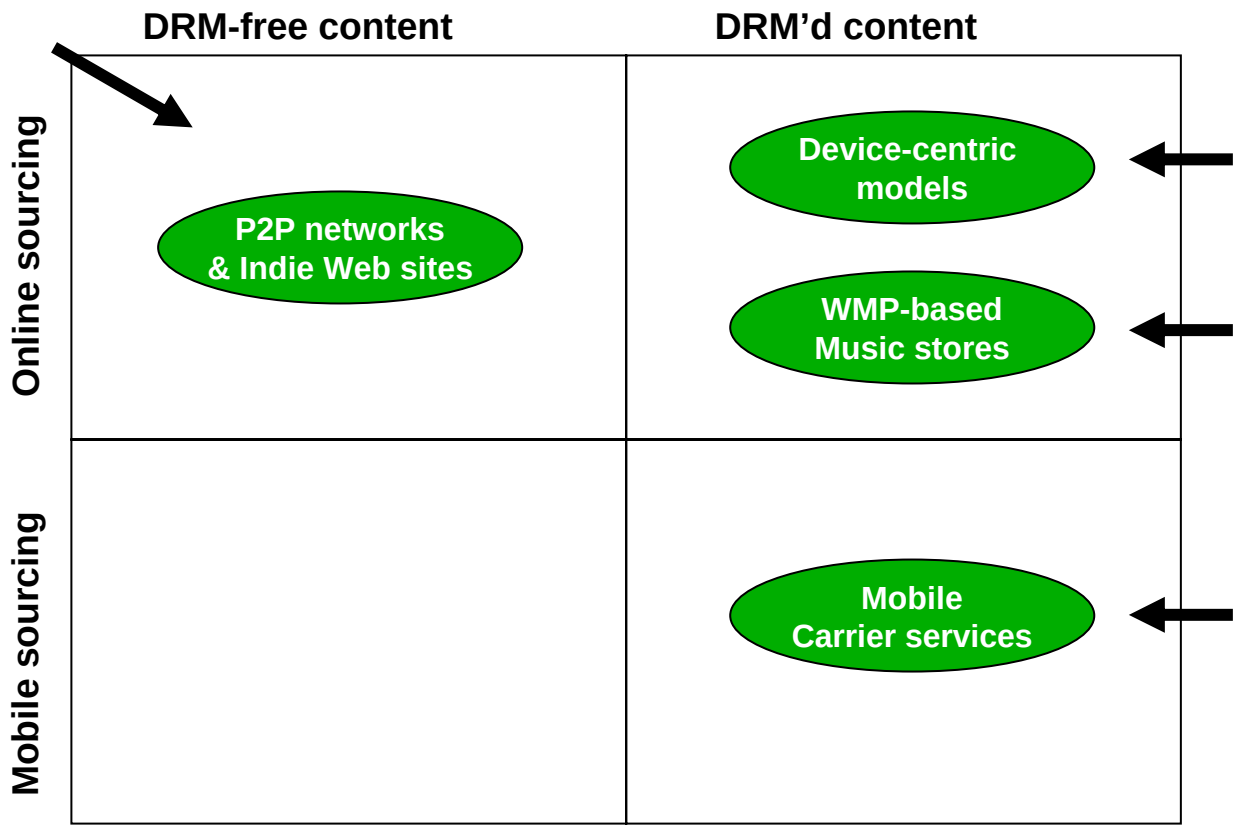


iTunes Music Store Control Point Constellation



Control Point Constellation Key Categories

User-controlled networks and independent artists/ labels support “free” and/or untethered music models

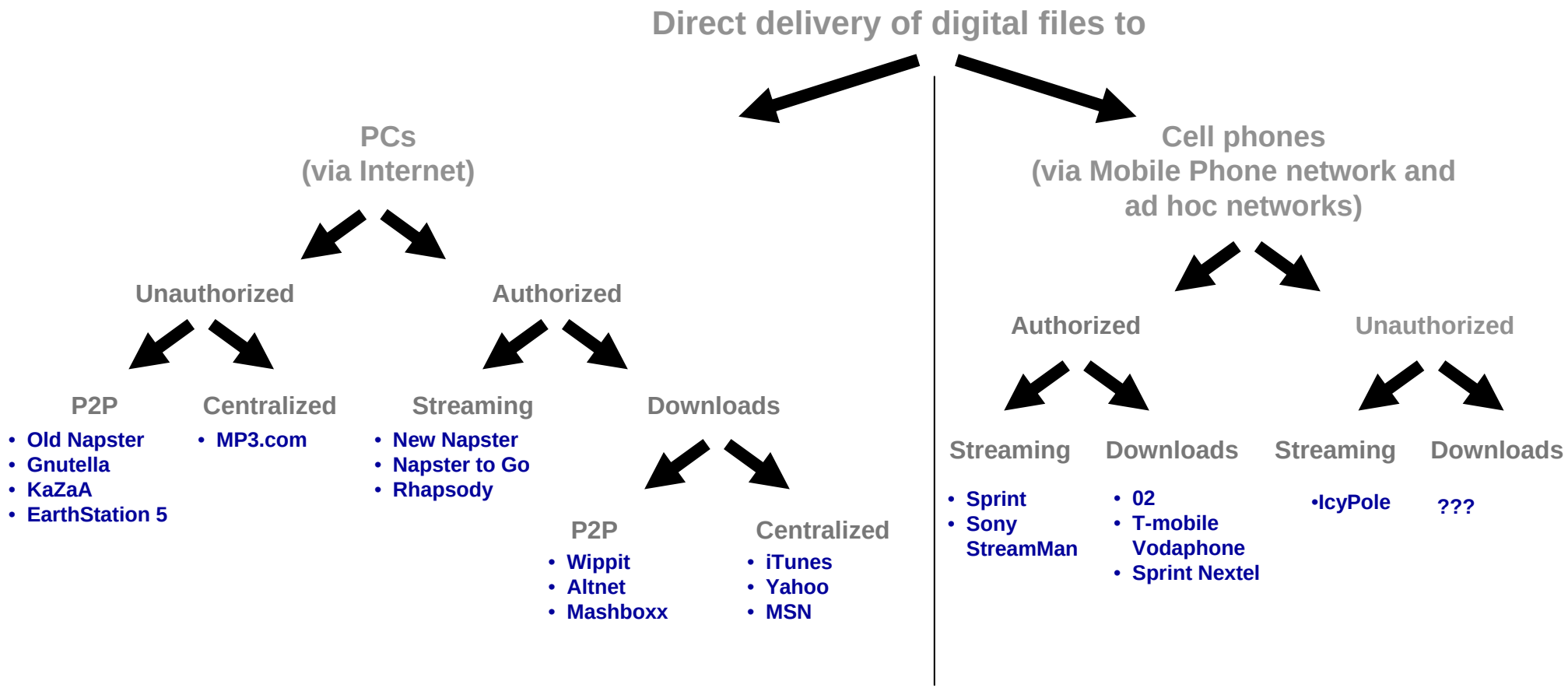


- Services provided by device manufactures like Apple (iTMS) and Sony (Connect)
- Dominated by iTunes
- Proprietary DRM (FairPlay) ties music to iPods

- WMP-based stores supported by the Windows Media Player
- DRM ties music to WMP, which is tied to the Windows platform

- Wireless carriers build their own music stores

Scenarios for Digital Music Services



A Systems Dynamics Model for VoIP (Work in progress)

Chintan Vaishnav, MIT

System Dynamics Modeling: The Goal

We are developing an SD model to…

1. understand what triggers a change in the demand and supply of VoIP offers over time,
2. understand which triggers are strong and which are not,
3. abstract the learning from VoIP to a macro gear-teeth model and
4. validate the core-edge taxonomy we have developed and used in the past for characterizing different technologies and services.

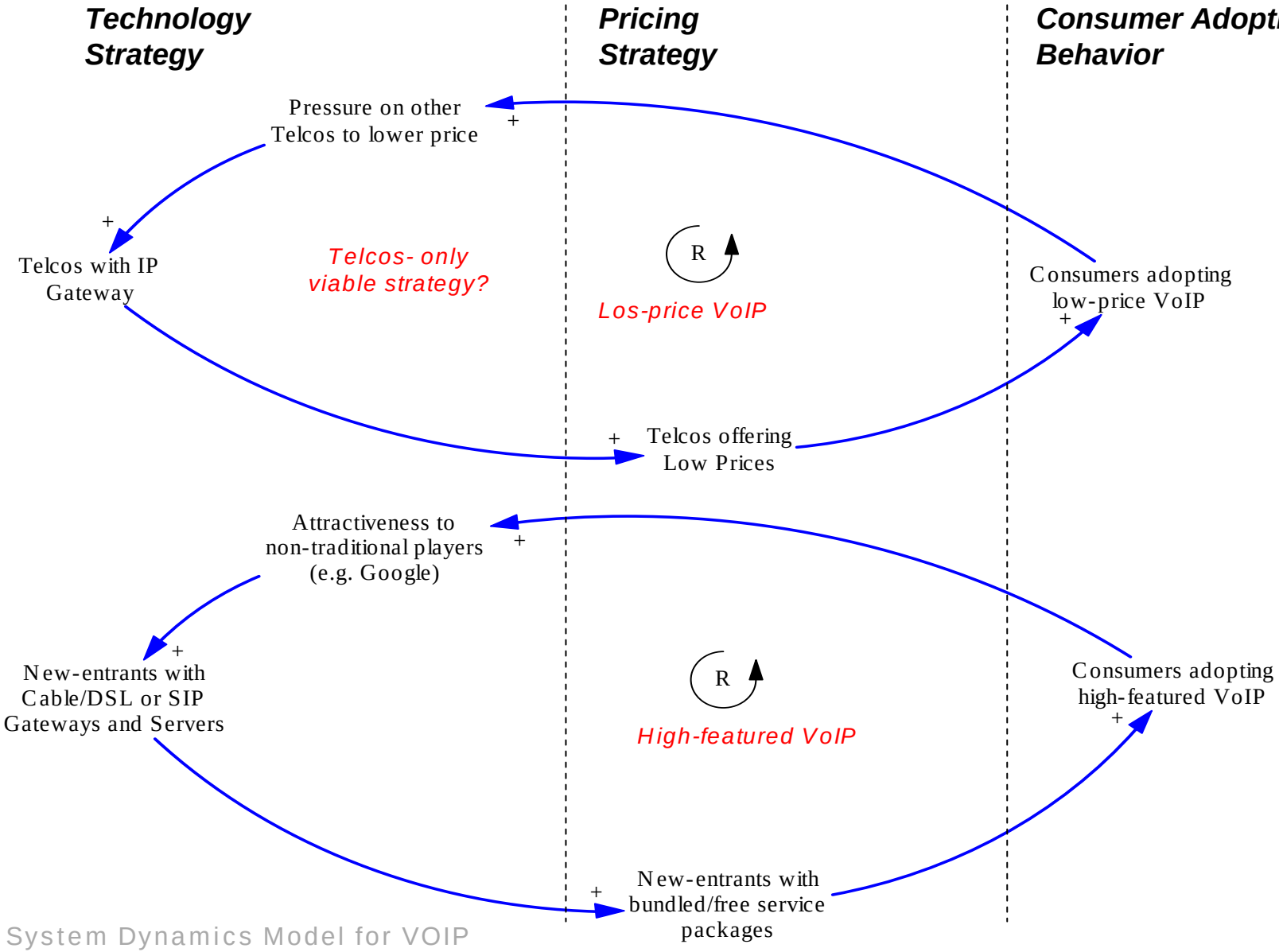
The VoIP Model

Important Variables for Modeling Demand

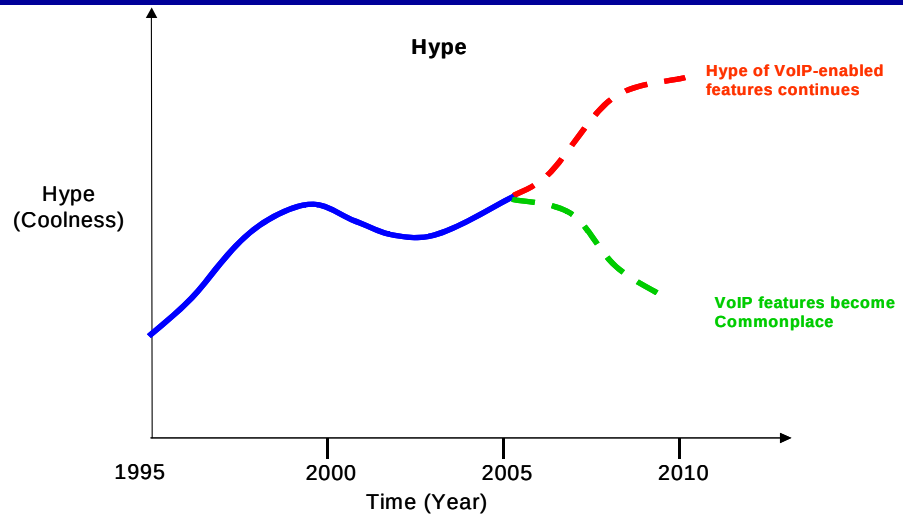
- Price
- Hype
- Voice quality
- Ease of Use
- New VoIP-enabled features

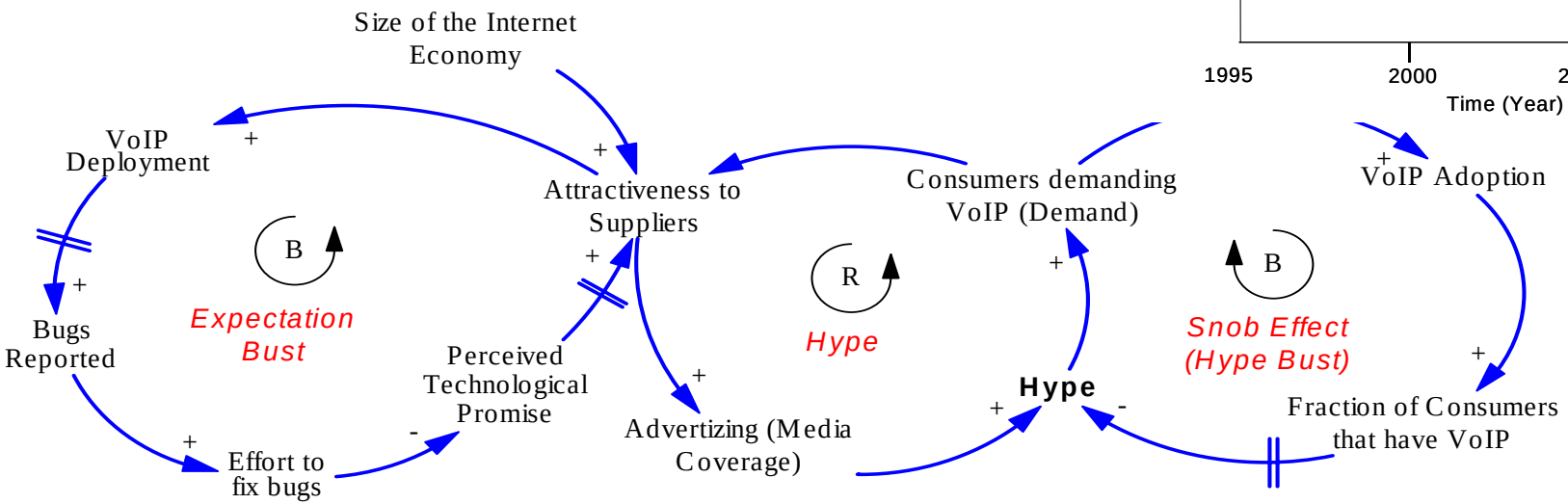
Most of the learning occurs during the process of modeling

The VoIP Model: Price

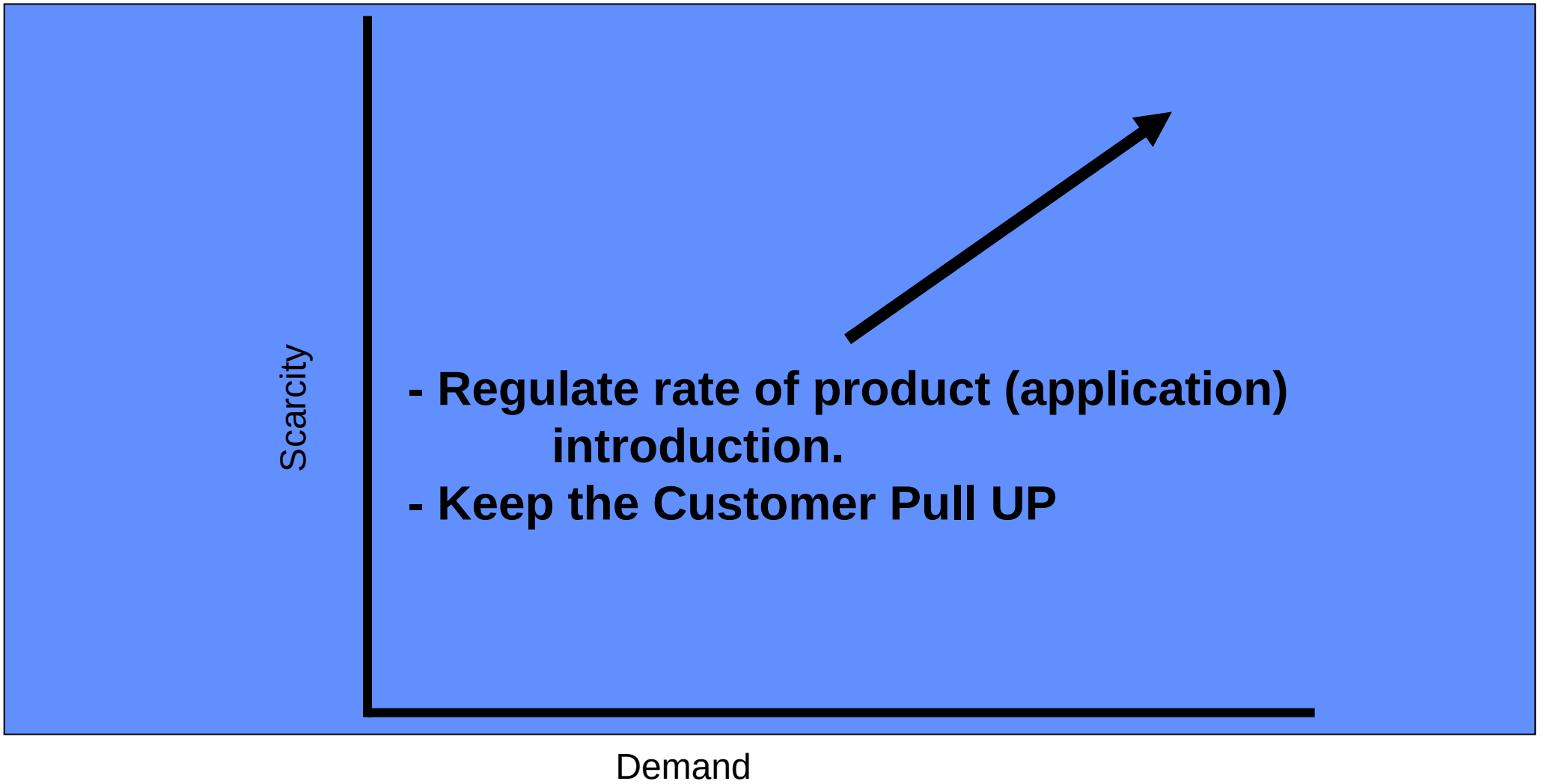


The VoIP Model: Hype





The VoIP Model: Hype – Is There an Insight?



The VoIP Model: Next Steps

1. Complete causal loops for the demand side
2. Pick important variables for the scarcity side and create a causal loops.
3. Combine causal loops in 1 and 2 with variables that affect both.
4. Build stock and flow model.
5. Calibrate the model.
6. Carry out desired analysis…

Some Words on Case Studies

Plan for Spring

- Focus on SD modeling in VOIP
- Continue with RFID
- Establish new case study around…