

**The 5th European Workshop on Software Ecosystems**

# **Analysis of Platform Governance in the Internet of Things**

**Maximilian Schreieck**, Christoph Hakes, Manuel Wiesche,  
Helmut Krcmar

November 30, 2016

# Agenda

- 1 Relevance of platform ecosystems & governance**
- 2 Key concepts of platform governance
- 3 Cross-case analysis of platform governance in IoT
- 4 Main challenges in governing IoT platforms

# Amazon Underground on Android



# Relevance of platform ecosystems in IoT

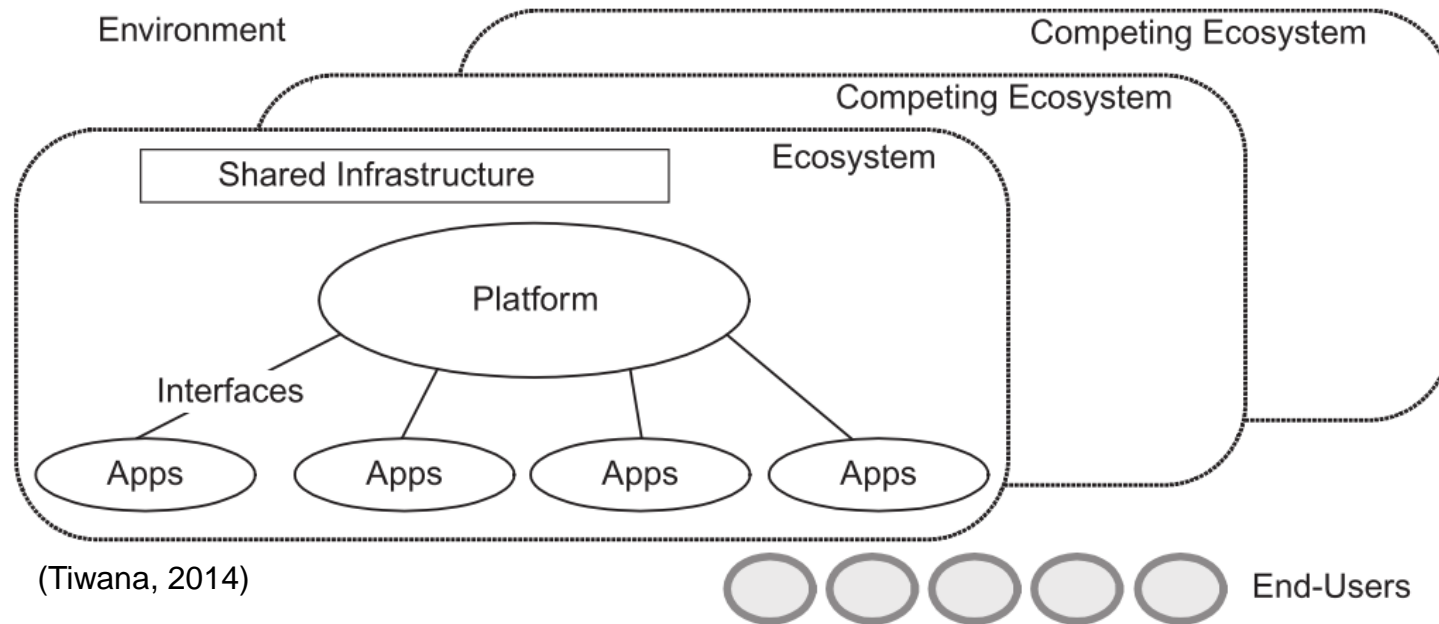


► Complexity makes value co-creation a prerequisite for success  
 → platform ecosystems & governance

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# Platform & platform ecosystem



(Tiwana, 2014)

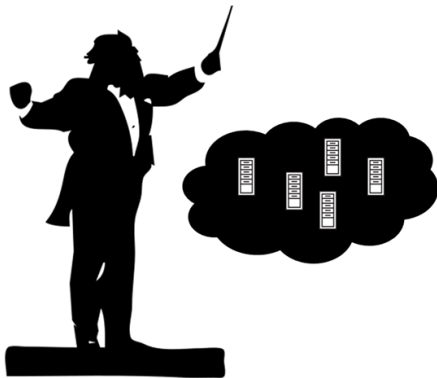
## Platform

Foundational products, services or technologies that enable the development of complementary products, services or technologies (Gawer, 2009)

## Platform ecosystem

A platform and all stakeholders interacting on the platform (Gawer & Cusumano, 2013)

# Governance of platform ecosystems



## Platform governance

the “partitioning of decision-making authority between platform owners and [...] developers, control mechanisms, and pricing and pie-sharing structures” (Tiwana, 2014).



**Value co-creation**

(Tiwana, 2014.)

# Platform governance – dimensions

Dimension	Mechanisms	
<b>Governance Structure</b>	<ul style="list-style-type: none"> <li>• Decision Rights</li> </ul>	<ul style="list-style-type: none"> <li>• Ownership Status</li> </ul>
<b>Resources &amp; Documentation</b>	<ul style="list-style-type: none"> <li>• Transparency</li> </ul>	<ul style="list-style-type: none"> <li>• Boundary Resources</li> </ul>
<b>Openness</b>	<ul style="list-style-type: none"> <li>• Accessibility</li> <li>• Output Control &amp; Monitoring</li> <li>• Input Control</li> <li>• Securing</li> </ul>	<ul style="list-style-type: none"> <li>• Process Control</li> <li>• Regulation of Interaction</li> </ul>
<b>Trust</b>	<ul style="list-style-type: none"> <li>• Strengthen Trust</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce Perceived Risk</li> </ul>
<b>Pricing</b>	<ul style="list-style-type: none"> <li>• Pricing Model &amp; Revenue Sharing</li> </ul>	
<b>Ecosystem Orchestration</b>	<ul style="list-style-type: none"> <li>• External Relationship Management</li> </ul>	<ul style="list-style-type: none"> <li>• Strategic Partnerships vs. Standardized Relationships</li> </ul>

See also Schreieck, Wiesche & Krcmar, 2016; Hein, Schreieck, Wiesche & Krcmar 2016



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# IoT Platforms – overview

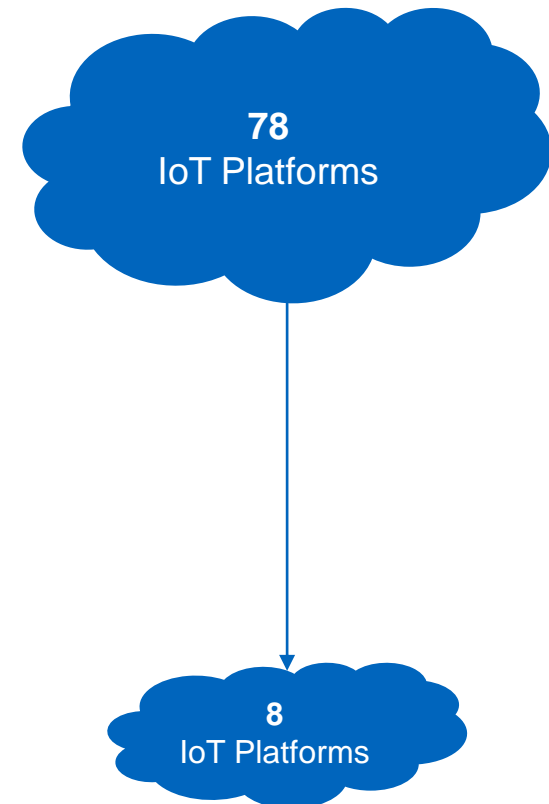


**Application Enablement Platform**

Source: First Analysis, 2016

# IoT platforms – market analysis

1. **Online Market Research**
2. **Screening of the IoT Platforms**
  - Company Maturity
    - Founding Year
    - # of Projects / Customers
    - Market Share
  - Platform Type
  - Segment Focus
  - Available Information & willingness to participate
3. **Further Analysis**






# Multiple case studies – overview

Analyzed



## Legend

-  Online Research
-  Mail Interview
-  Telephone Interview



# Case study – Example (1/2)

Dimension	Mechanisms	Sample IoT Platform
<b>Governance Structure</b>	<ul style="list-style-type: none"> <li>• Decision Rights</li> <li>• Ownership Status</li> </ul>	<ul style="list-style-type: none"> <li>• Public Edition (Cloud-based)</li> <li>• Dedicated Edition (White-labeling of platform)</li> <li>• Private Edition (Hosting in customers' data center)</li> </ul>
<b>Resources &amp; Documentation</b>	<ul style="list-style-type: none"> <li>• Transparency</li> <li>• Boundary Resources</li> </ul>	<ul style="list-style-type: none"> <li>• Extensive, open online documentation &amp; guides</li> <li>• Help Center + Forum (stackoverflow.com)</li> <li>• Developer Workshops</li> </ul>
<b>Openness</b>	<ul style="list-style-type: none"> <li>• Accessibility</li> <li>• Regulation of Interaction</li> <li>• Process Control</li> <li>• Output Control &amp; Monitoring</li> <li>• Input Control</li> <li>• Openness</li> </ul>	<ul style="list-style-type: none"> <li>• Self-Registration for customers</li> <li>• No marketplace for add-ons</li> <li>• No interaction between developers</li> <li>• No control of the third-party applications</li> <li>• APIs for all data on the platform</li> <li>• SaaS Integration via Zapier</li> </ul>

...

Interview with company representative by C. Hakes.

# Case study – Example(2/2)

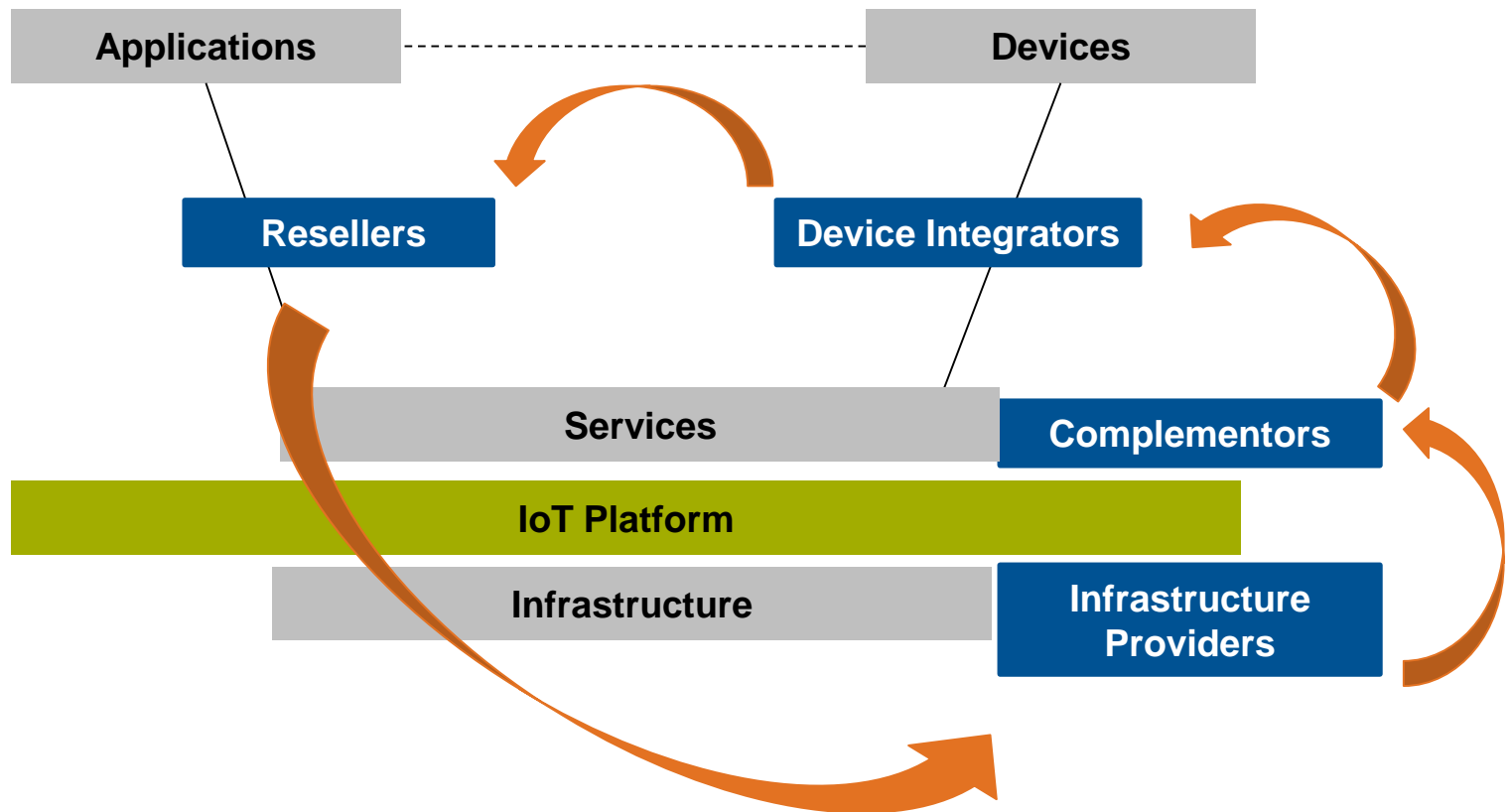
Dimension	Mechanisms	Sample IoT Platform
<b>Trust</b>	<ul style="list-style-type: none"> <li>• Strengthen Trust</li> <li>• Reduce Perceived Risk</li> </ul>	<ul style="list-style-type: none"> <li>• Free trial (30 days)</li> <li>• Reference Cases &amp; Case Studies available</li> <li>• „Industrie 4.0-Kit“ in cooperation with Deutsche Telekom</li> <li>• Complies with Nokia Networks' "Design for Security" policy and Deutsche Telekom's "Privacy and Security Assessment" (PSA)</li> </ul>
<b>Pricing</b>	<ul style="list-style-type: none"> <li>• Pricing Model</li> </ul>	<ul style="list-style-type: none"> <li>• Flexible deployment model</li> <li>• Pay per device</li> <li>• Additional „Professional Services“ for customers</li> </ul>
<b>Ecosystem Orchestration</b>	<ul style="list-style-type: none"> <li>• External Relationship Management</li> <li>• Number of Complementors</li> </ul>	<ul style="list-style-type: none"> <li>• Extensive Partnering (47 named)</li> <li>• Value Added Resellers, System Integrators, Device Partners</li> <li>• Part of OASIS Alliance</li> <li>• Further evolution of the platform by own development</li> </ul>

Interview with company representative by C. Hakes.

# Agenda

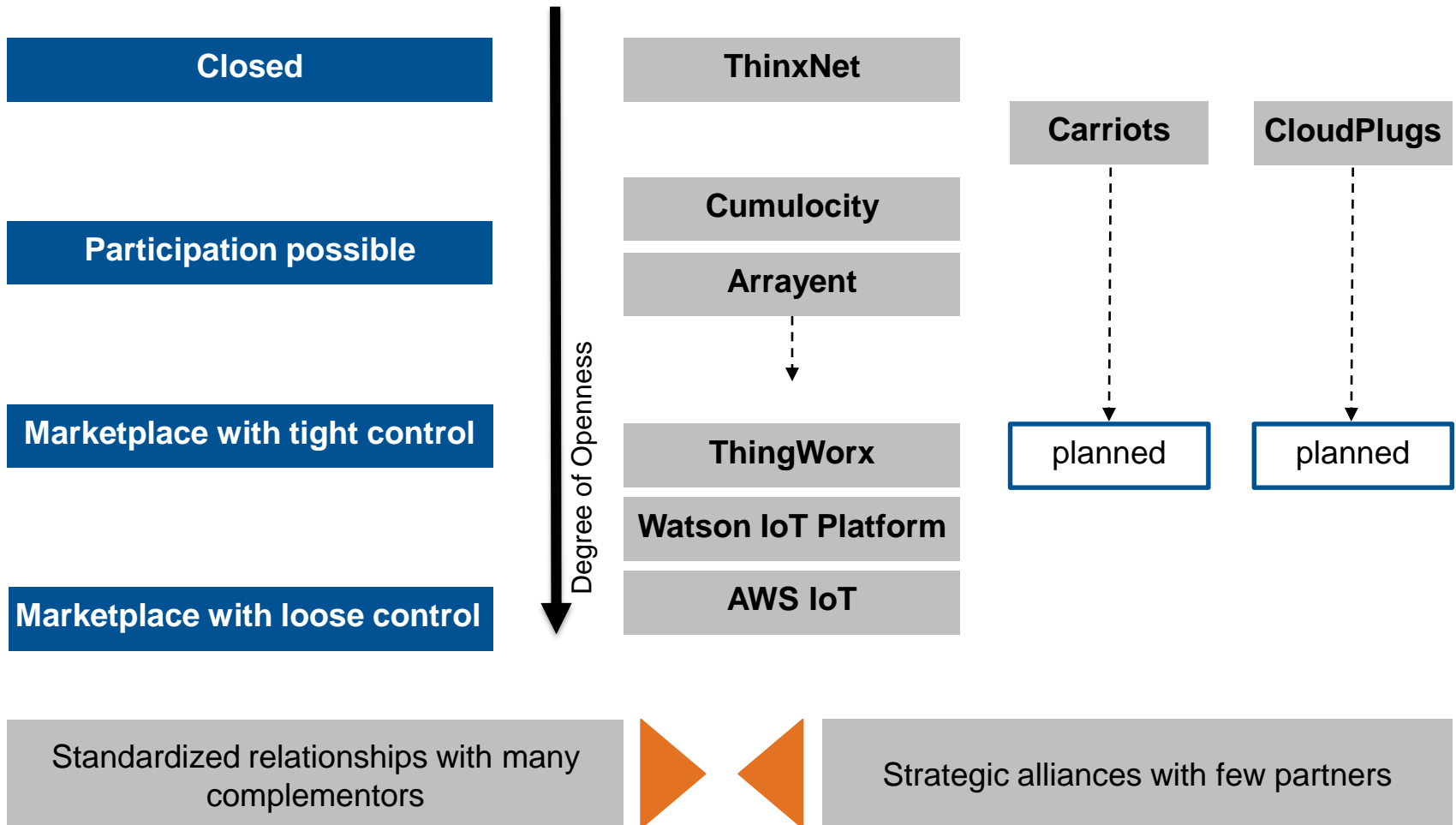
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# Four groups of IoT platform partners





# Degree of platform openness



# Standardization

Strategy	Advantages	Disadvantages
<b>Integration</b>	<ul style="list-style-type: none"> <li>• Satisfaction of all competitors</li> <li>• Competitive advantage</li> </ul>	<ul style="list-style-type: none"> <li>• Almost impossible</li> <li>• Very high costs</li> <li>• Low cost-benefit ratio</li> </ul>
<b>Specialization</b>	<ul style="list-style-type: none"> <li>• Specialist for some potential customers</li> </ul>	<ul style="list-style-type: none"> <li>• Discouraging for all other potential customers</li> <li>• High costs</li> </ul>
<b>Alliances</b>	<ul style="list-style-type: none"> <li>• More power to enforce the global adoption of standards</li> </ul>	<ul style="list-style-type: none"> <li>• Possible knowledge transfer with competitors</li> <li>• Strategic problems</li> </ul>
<b>Acquisition</b>	<ul style="list-style-type: none"> <li>• Acquire specialized knowledge in short time</li> </ul>	<ul style="list-style-type: none"> <li>• High risk</li> <li>• High costs</li> <li>• Might lead to specialization</li> </ul>
<b>Marketplace</b>	<ul style="list-style-type: none"> <li>• Outsourcing of the problem</li> <li>• Integration of the free market to fill the gaps</li> </ul>	<ul style="list-style-type: none"> <li>• Initial high costs</li> <li>• Absorption</li> </ul>

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# - Appendix -

# Market approach

