Beyond Cloud:

Implications for the Industrialization of IT and the 3rd Era of Computing

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Key Takeaways

1. Changes in scale drive changes in architecture
2. Cloud Computing = IT + Ford + Taylor + Lean Production for the digital era.
3. Enables encapsulation, re-composition and global distribution, of economically valuable services
4. Sufficiently abstracted services replace work and tasks of existing employees
5. A 3rd Era of computing is already emerging with profound challenges and implications

Scale & Architecture

1,000s	Mainframe/Mini
1,000,000s	Servers
1,000,000,000s	PC/Mobile
1,000,000,000,000s	IoT
1,000,000,000,000,000s	?

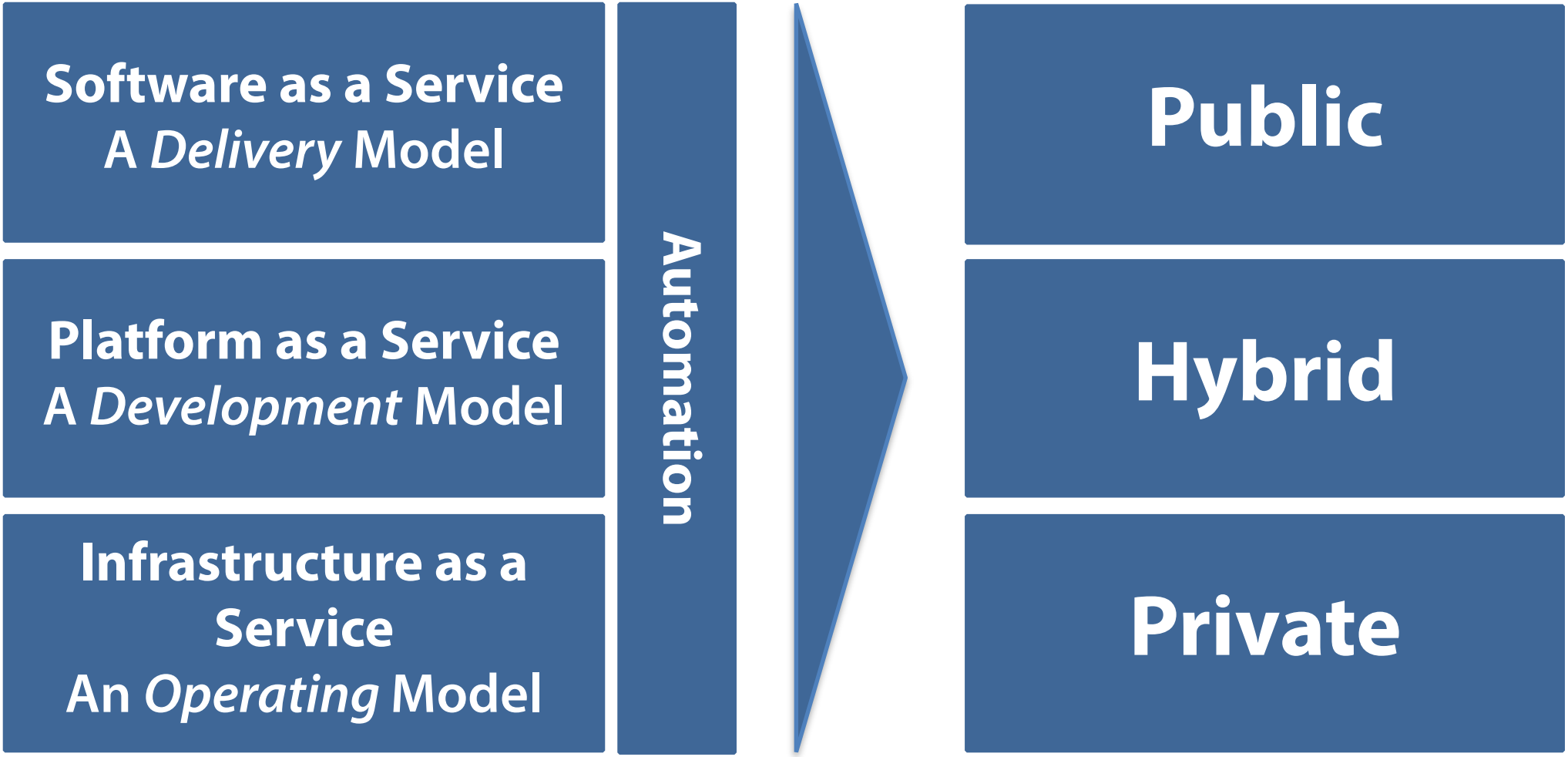
Cloud Scale Computing

Cloud computing delivers elastic computing resources - data storage, computation and networking - to users at the time, to the location and in the quantity they wish to consume, with costs based only on the resources used.

- Scalable, automated, efficient production management capabilities for IT service delivery
- Enabled by 'loosely coupled' computing service architecture, separation of responsibilities and management processes
- Born out of the economic needs of early large scale web service providers: Microsoft, Google, Amazon, Yahoo etc.

*http://www.adamalthus.com/blog/2013/03/01/a-short-guide-for-the-perplexed/

Cloud Computing = Industrial IT Production



*http://www.adamalthus.com/blog/2013/03/01/a-short-guide-for-the-perplexed/

April 22, 2015, 3:57 PM ET

EMC CEO Says IT in Midst of Biggest Secular Shift in History

Superhot startup Docker raises $95 million as it prepares to squeeze out the competition

TECHNOLOGY / GLOBAL

VMware Responds to Container Movement with Lightweight Linux OS and Cloud-Native Tools

3 DAYS AGO, BY SUSAN HALL

Google Brings Containers to its Cloud With Hosted Kubernetes

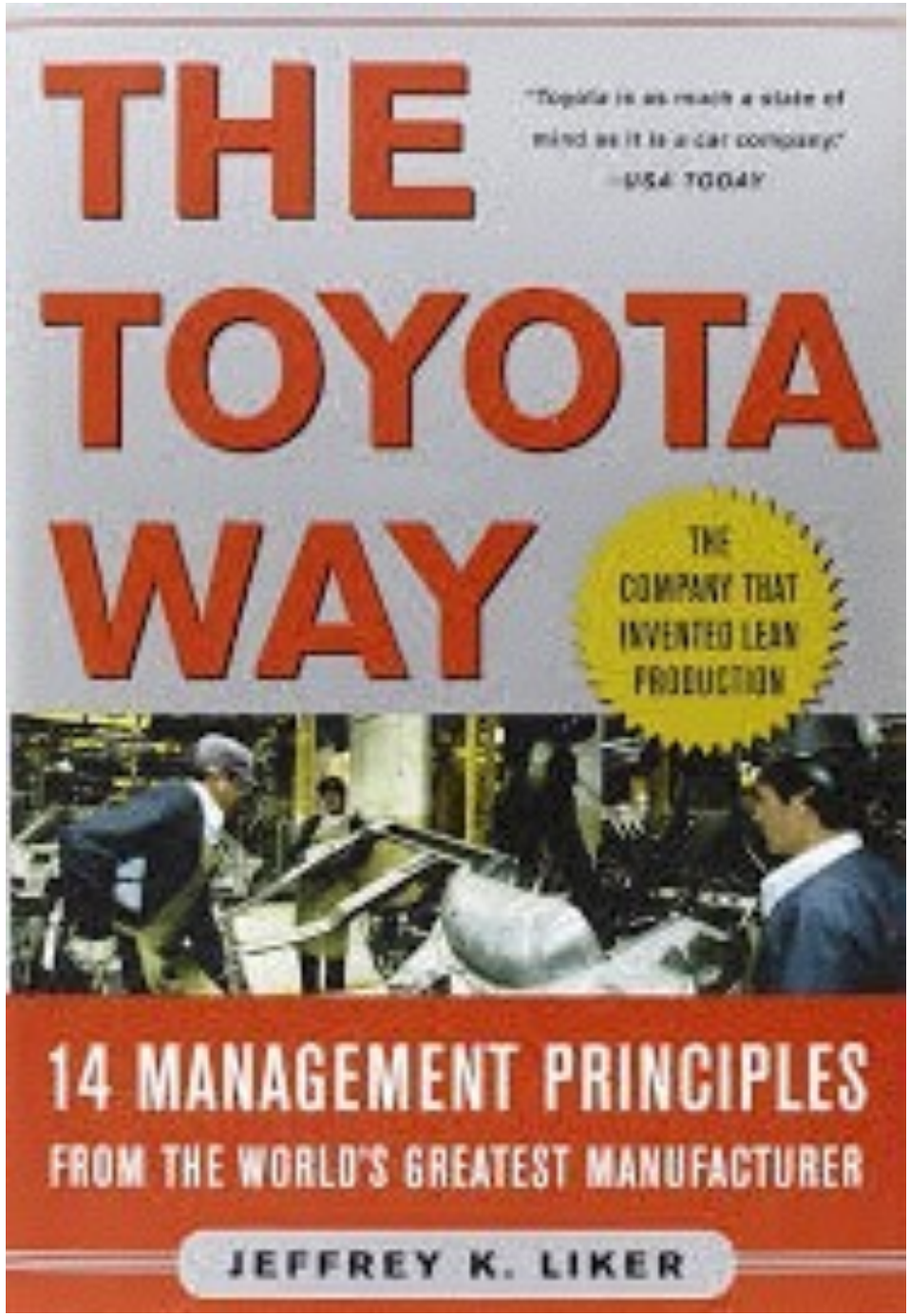
Microsoft reveals Azure Service Fabric, platform behind Cortana and more

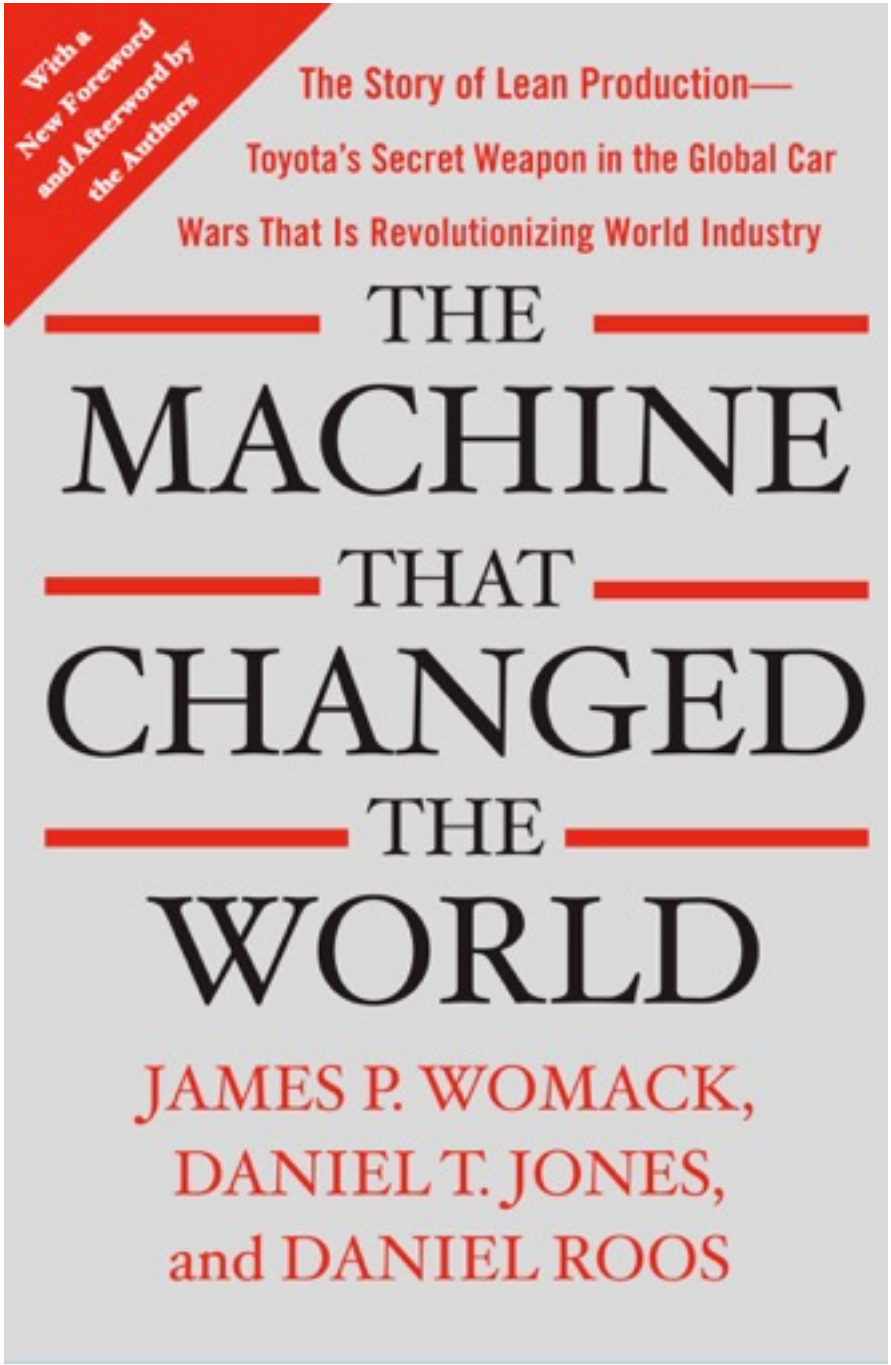
Software already battle-hardened, used to run Cortana, Lync, Azure SQL.

Container wars: Microsoft debuts its Windows-based answer to Kubernetes


CraftIT


Industrial
IT


THE TOYOTA WAY
"Toyota is as much a state of mind as it is a car company"
—USA TODAY
THE COMPANY THAT INVENTED LEAN PRODUCTION
14 MANAGEMENT PRINCIPLES
FROM THE WORLD'S GREATEST MANUFACTURER
JEFFREY K. LIKER


With a New Foreword and Afterword by the Authors
The Story of Lean Production—
Toyota's Secret Weapon in the Global Car Wars That Is Revolutionizing World Industry
THE MACHINE THAT CHANGED THE WORLD
JAMES P. WOMACK, DANIEL T. JONES, and DANIEL ROOS

Why Industrialized IT?

- Firm and sector level productivity has greatly improved as a result of investments in IT, but…
  - Growth in IT investment has lead to an exponential growth in IT system complexity
  - Increasing complexity reduces the efficiency of physical IT and human capital
  - IT function productivity has not improved
  - Explosion in business demands on IT function

Benefits of Industrialized IT

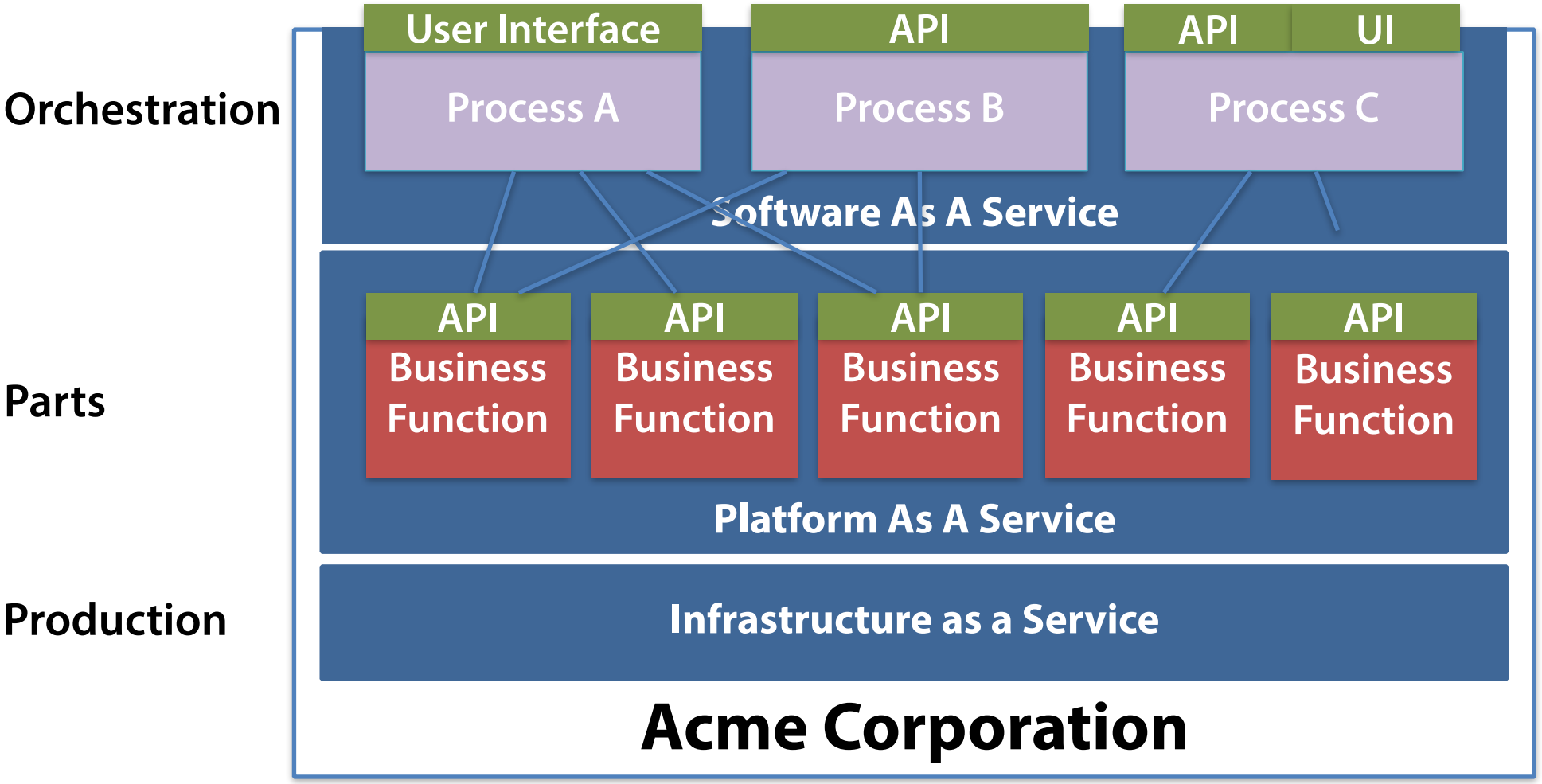
- Efficient utilization of physical IT and human capital
- Accelerated Time-to-Value
- From discreet to continuous production processes
- Decomposition of IT/Service value chains
- Abstraction and encapsulation of services
- High velocity, low cost experimentation
- Rapid innovation and efficiency improvement cycles

Composable

kəm-ˈpōz-ə-bəl\

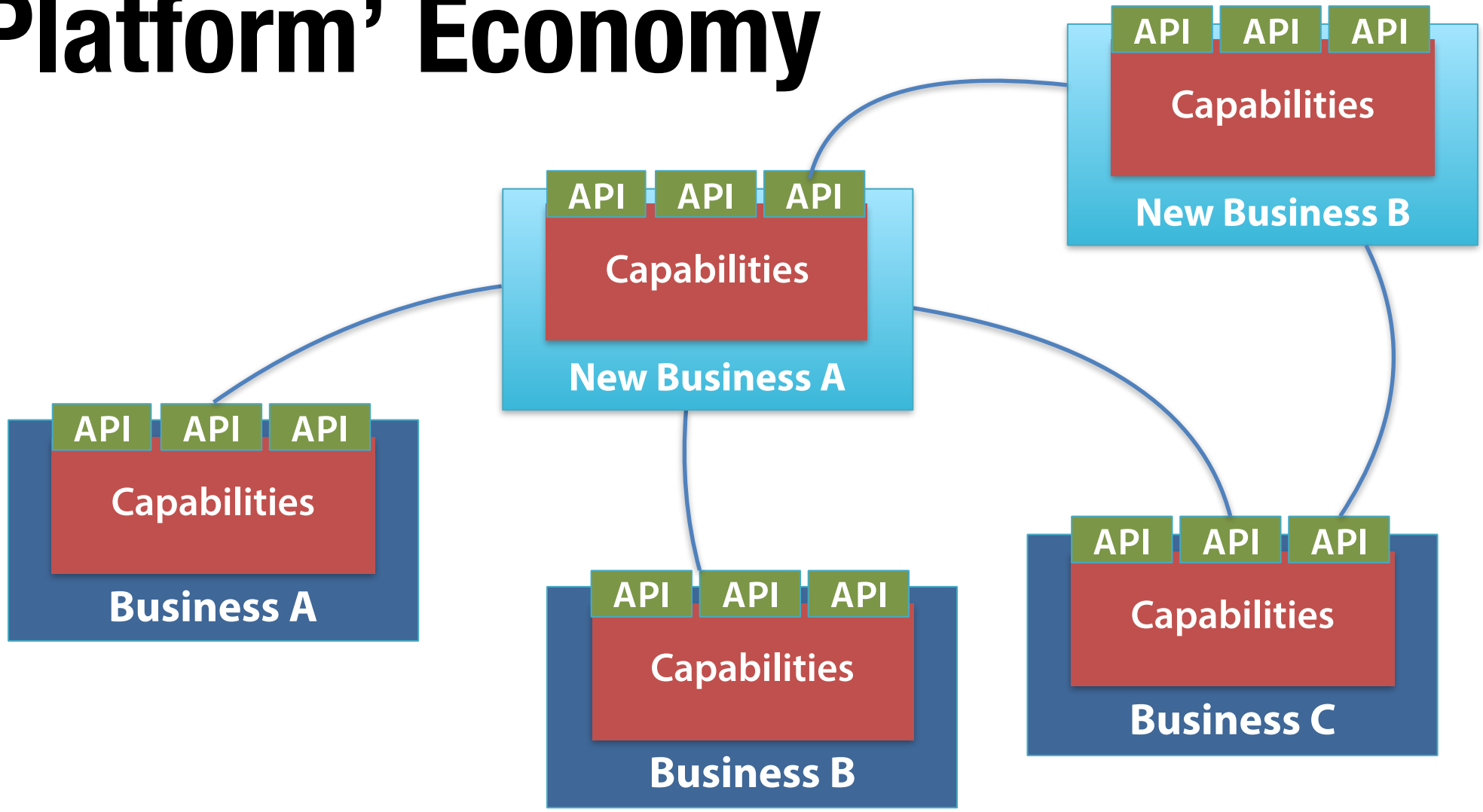
Of being constructed from parts

The Composable Enterprise*

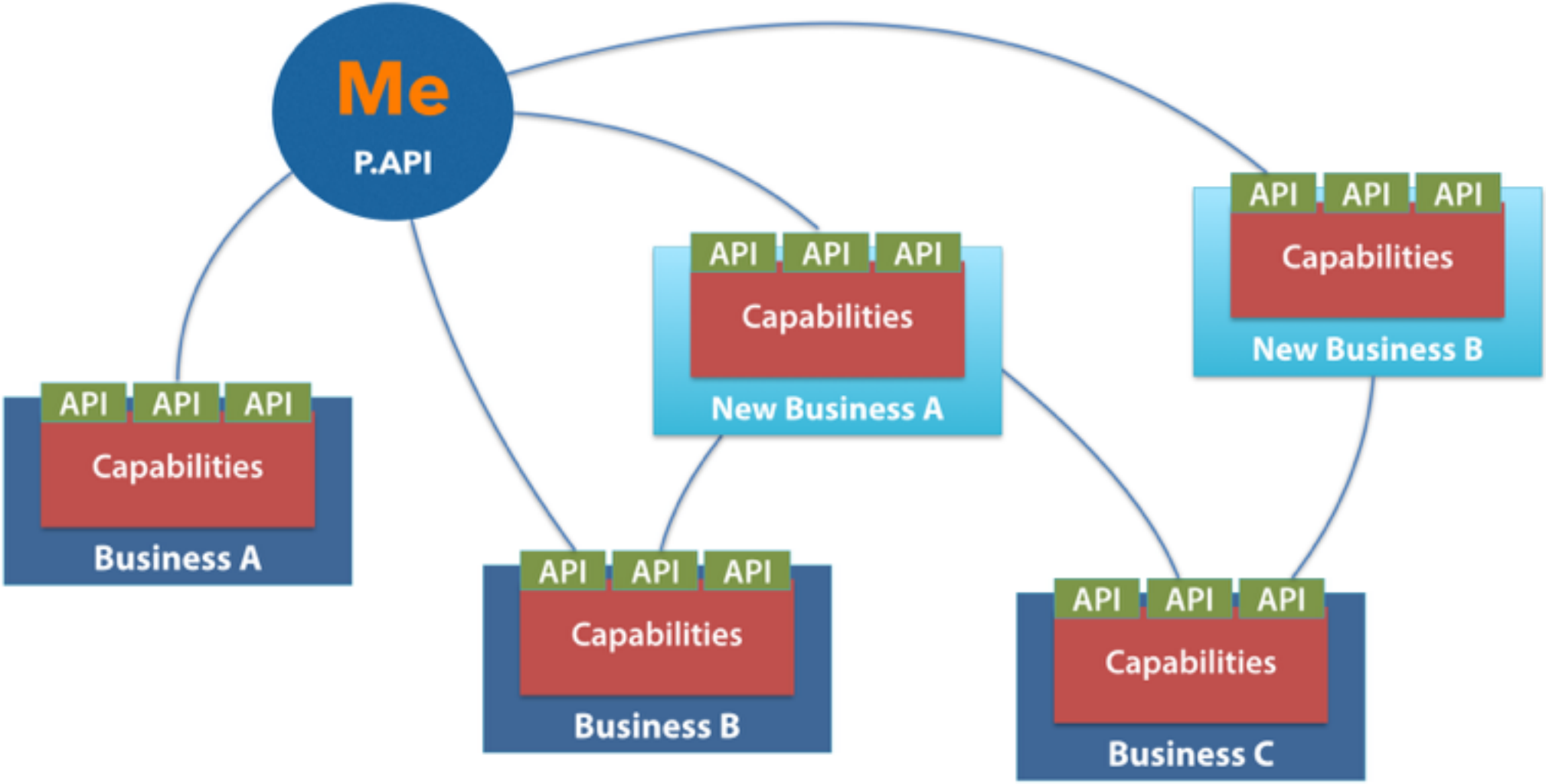


*http://www.adamalthus.com/blog/2013/04/04/the-composable-enterprise/

Enabling The Composable ‘Platform’ Economy



Integrating a Composable Me



The Next Computing Era

1st Era	Tightly coupled
2nd Era	Loosely Coupled
3rd Era	Uncoupled

Metaform*

\ˈmā-tä-ˈfȯrm\

A platform of platforms

* *http://www.adamalthus.com/blog/2015/01/08/the-metaform-the-platform-of-everything/*

3rd Era Requirements

- Uncoupled execution everywhere
- Smart contracts
- Trusted Transactions
- Friction-free payments
- Private data
- Efficient data processing for IoT volumes

3rd Era Enabling Technologies

- **OpenStack & Azure Fabric Services** - Infrastructure for Industrial IT
- **Docker + Kubernetes/Mesos** - Reducing skills required and time to deliver applications and services at scale
- **AWS Lambda & Code Deploy** - Data/Event driven code execution everywhere
- **Apache Storm, Spark, Mahout** - Industrial strength OSS real-time BigData processing and machine learning
- **Blockchain & Ethereum Project** - Fabric for secure, trusted and anonymous distributed service execution

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