

The Software Industry

Prof. Dr. Dirk Riehle

Friedrich-Alexander University Erlangen-Nürnberg

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Software as a Product (Recap)

- **Product**
 - A man-made artifact sold to customers in a market
- **Software**
 - Has an open-ended life-cycle: Is born, may live forever
 - Typically requires upfront capital investment (development)
 - Is cheap and easy to reproduce perfectly
- **Software as a product**
 - A product sold to either enterprise or retail customers
 - What is sold is typically a usage right plus services

The Software Industry

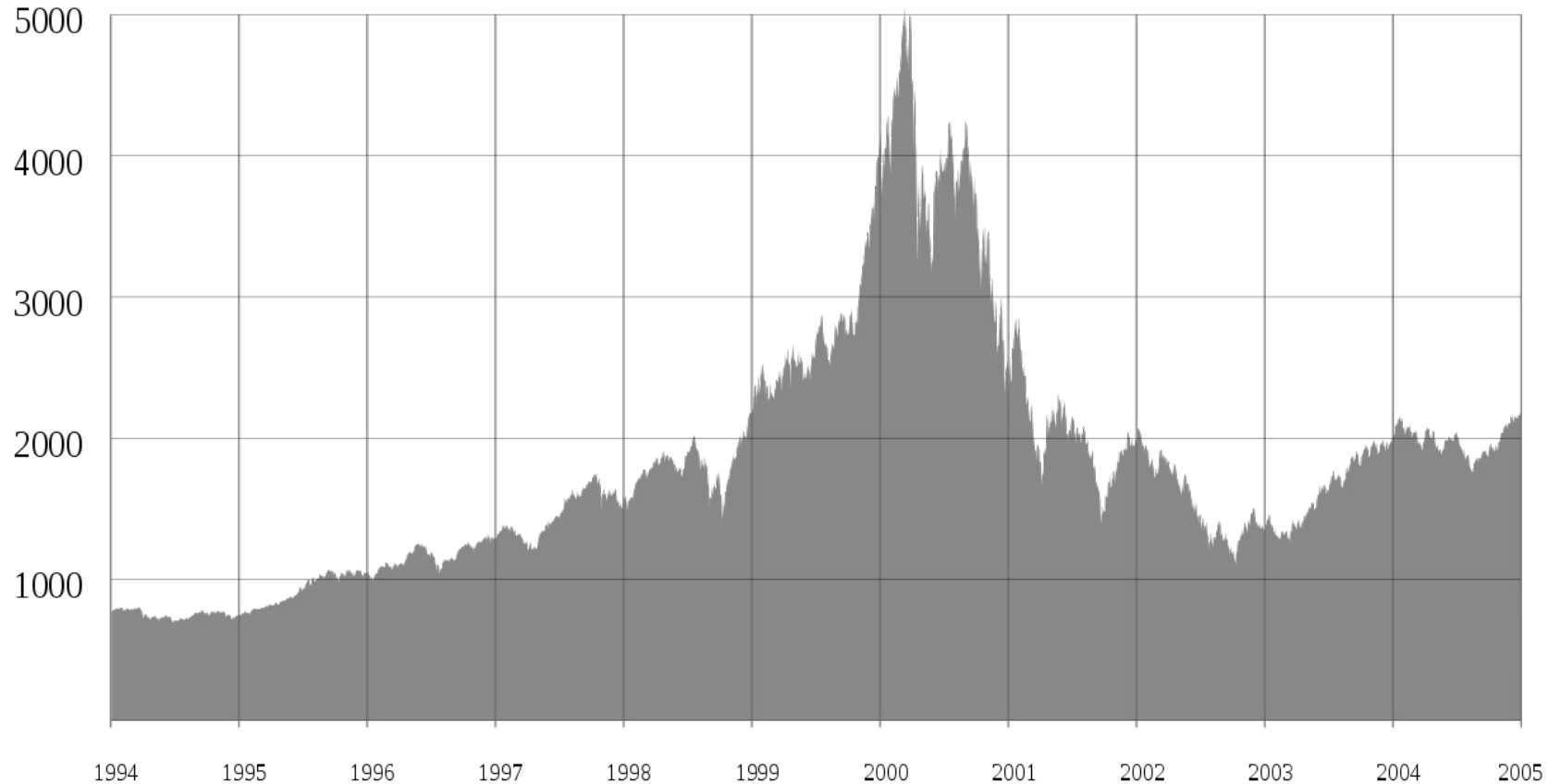
- The software industry
 - Is the set of business that provide
 - Software products and
 - Software services such as
 - Operating services
 - Consulting services
 - Development services
 - Implementation services
 - to other industries as well as itself
- The software industry
 - Is highly concentrated
 - Is highly internationalized
 - Has strong network effects
 - Has a high speed of innovation
 - Is rapidly expanding into new domains

The Software Industry in 2016 [1]

market capitalization	total	\$1.298 trillion
	median	\$744.2 million
	highest	\$415.4 billion (Microsoft)
	lowest	\$177700 (Innovaro Inc.)
earnings per share	median	\$0.20
	highest	\$13.23 per year (IBM)
	lowest	– \$3.40 per year (Wave)
dividend yield	mean	8.913%
	highest	170.3% (Aware)
	lowest	0.07106% (FICO)

[1] <https://www.wolframalpha.com/input/?i=how+big+is+the+software+industry>

The So-called “Dot-Com” Bubble and Burst (1995-2000)



The CEO Interview

“Industrial companies are in the information business whether they want to be or not.”

—Jeff Immelt

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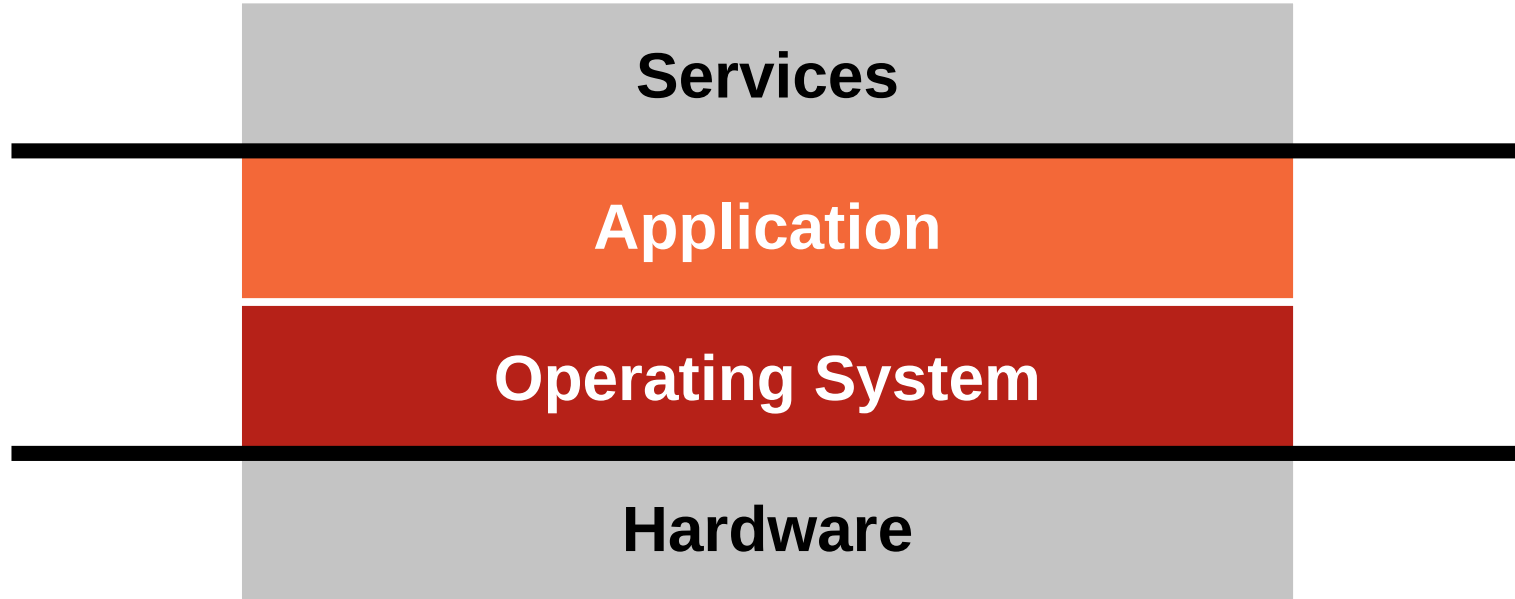
Short History of the Software Industry

- **1959**
 - First mentioning of term “software”
- **1969**
 - US DoJ separates hard- from software
- **1980ties**
 - From vertical to horizontal integration
 - Growth of platforms and ecosystems
- **1990ties**
 - Centralization, dominance of Windows
- **2000ties**
 - Diversification, multiple platforms
 - Growth of open source software
- **2010ties**
 - Back to vertical, cloud computing

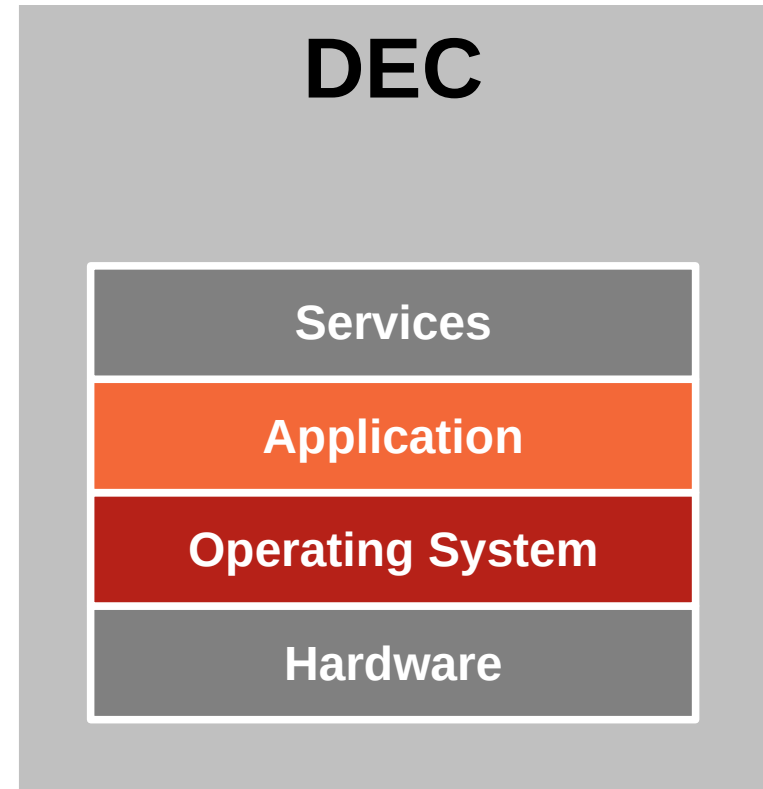
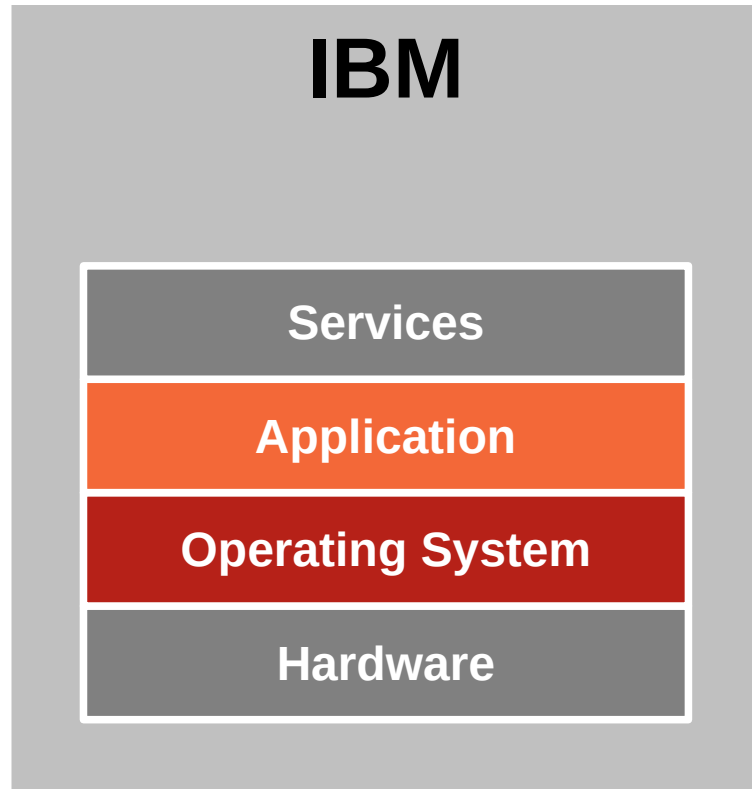
Main Industry Players

- **Software vendors**
 - Produce products
 - A.k.a. “standard software” or “commercial off-the-shelf software” (COTS)
- **Operating services firms**
 - Operate any form of software (and hardware)
- **Development services firms**
 - Produce custom software
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 - Adjust software products for use by customers
- **Regulatory bodies**

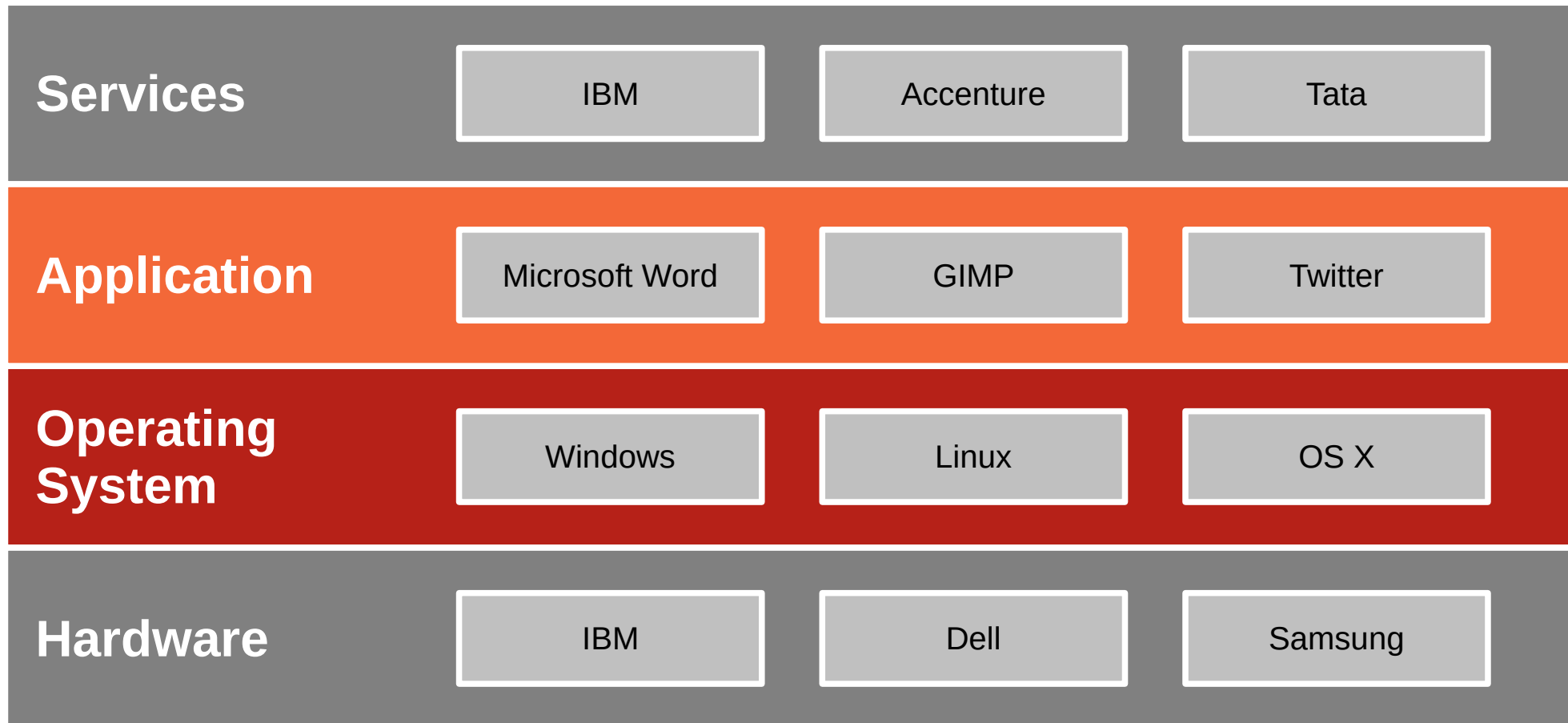
Customers Buy a “Solution”



Vertical Integration (Until 1980ties)

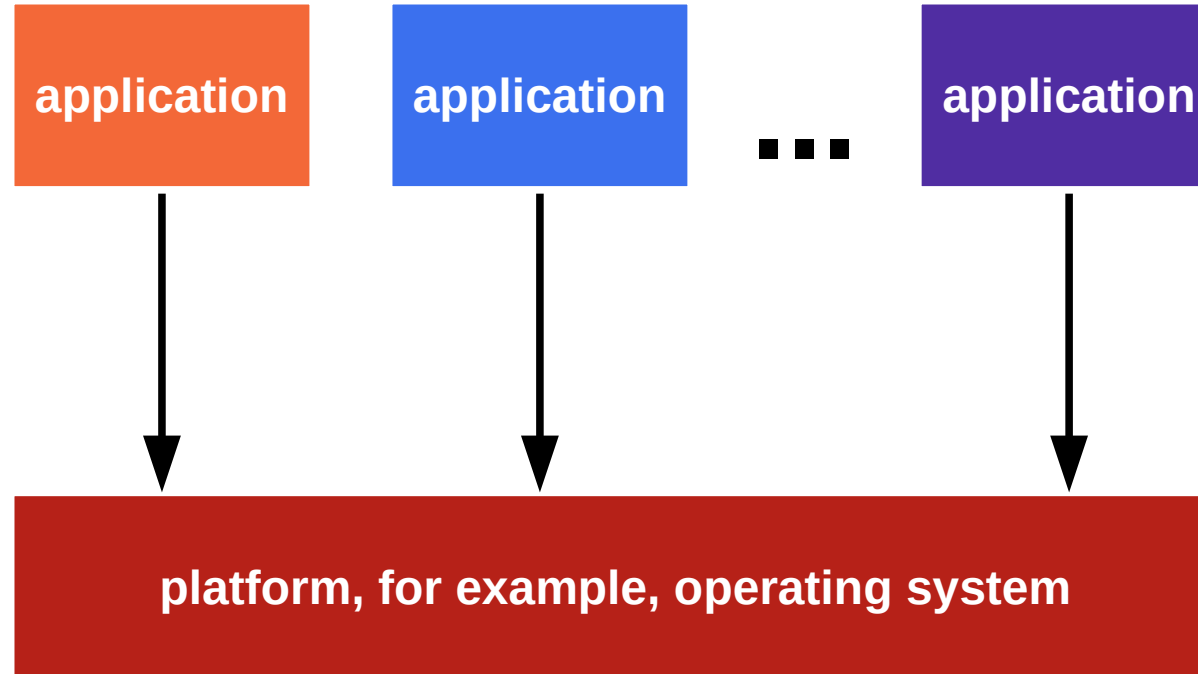


Horizontal Integration (Since 1990ties)



Categories of Software Products

- **Applications**
 - Software that is not built upon
 - Top-layer of the solution stack
- **Platforms**
 - Software that is built upon
 - Everything that is not the top layer
- **Why does everyone want to be a platform?**



- Software platform
 - Is an environment for the development and deployment of applications
 - Implies split between applications on top of the platform
 - Is a full set of application-independent life-cycle functions for applications
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- Customer (user) value of software platforms
 - By definition, a platform in itself is useless
 - Customer value is only created by applications

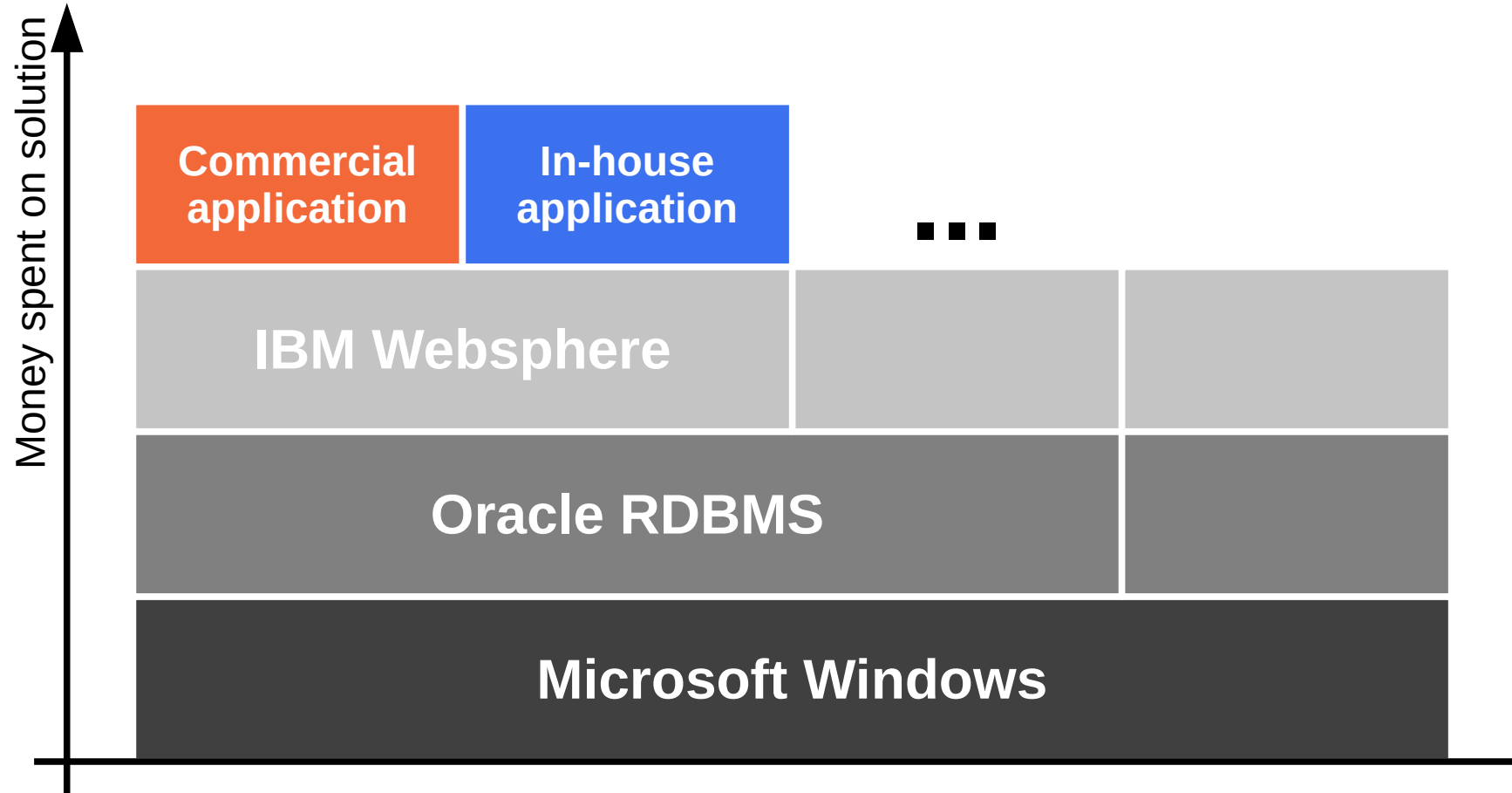
Software Platforms as a Product

- Platforms are valuable
 - Platforms are needed by the applications running on top of it
 - Platforms can simplify IT department operations costs
- An application license sale implies a platform sale

Pricing Power 1 / 2

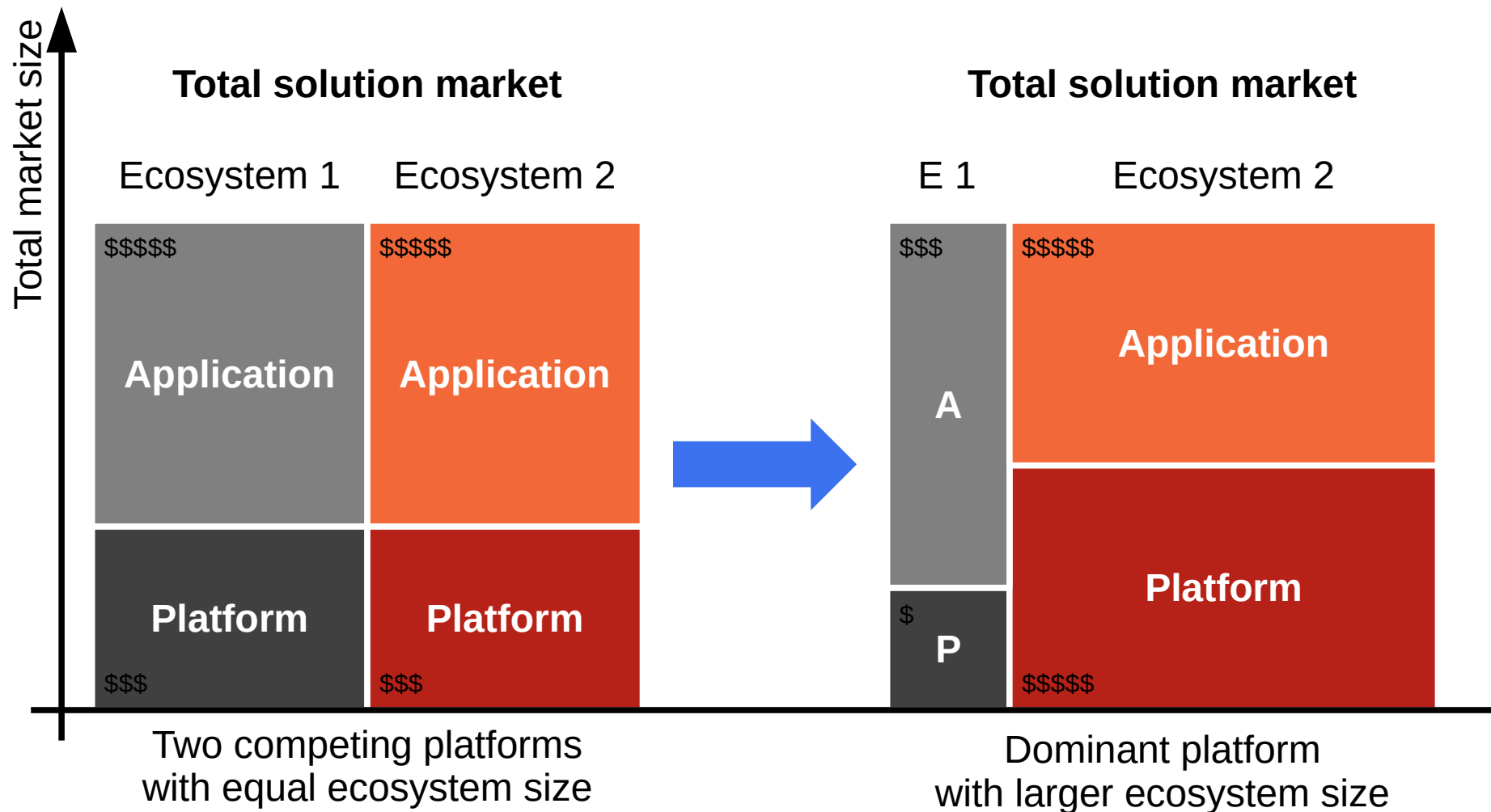


Pricing Power 2 / 2

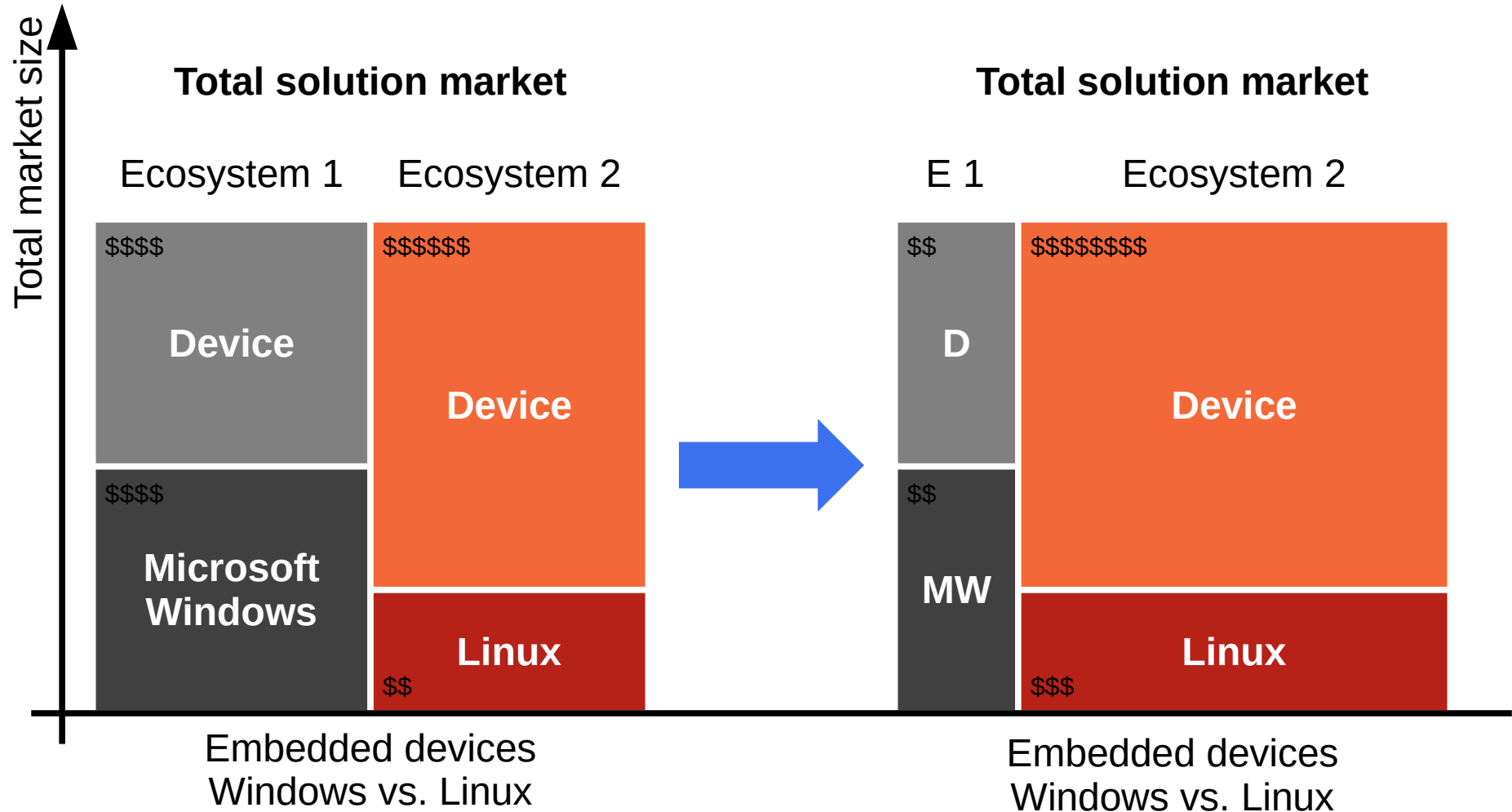


- **Software ecosystem**
 - The totality of actors (businesses and individuals),
 - software applications and components,
 - their relationships and goals
 - for a software platform

The Software Ecosystem Wars



Open Source in the Ecosystem Wars



- **A business model**
 - Is a summary description (model) of how a business' elements and their relationships interact to help the business achieve its strategic goals
 - Example elements are products, partners, people, positions, etc. and example relationships are the processes that govern their interaction
- Cf. marketing requirements document (MRD) a.k.a. business plan

Key Partners

**Key Re-
sources**

**Key
Activities**

**Value
Proposition**

Channels

**Customer
Relationships**

Customer Segments

Cost Structure

Revenue Streams

	2011 (\$m)	Percentage
Revenues	\$1.657	100%
Subscription and Support	\$1.551	94%
Professional Services etc.	\$106	6%
Cost of Revenues	\$324	20%
Subscription and Support	\$208	13%
Professional Services etc.	\$116	7%
Gross Profit (and Gross Margin)	\$1.333	80%
Operating Expenses		
Research and Development	\$188	11%
Sales and Marketing	\$792	48%
General and Administrative	\$256	15%
Total Operating Costs	\$1.236	74%
Operating Profit (and Operating Margin)	\$97	6%

Source: Michael A. Cusumano. Reflecting on the Facebook IPO. CACM 10, 2012.

Review / Summary of Session

- The software industry
- Software platforms
- Software ecosystems
- Business models

Thank you! Questions?

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It is Friedrich-Alexander University Erlangen-Nürnberg – FAU, in short.
Corporate identity wants us to say “Friedrich-Alexander University”.

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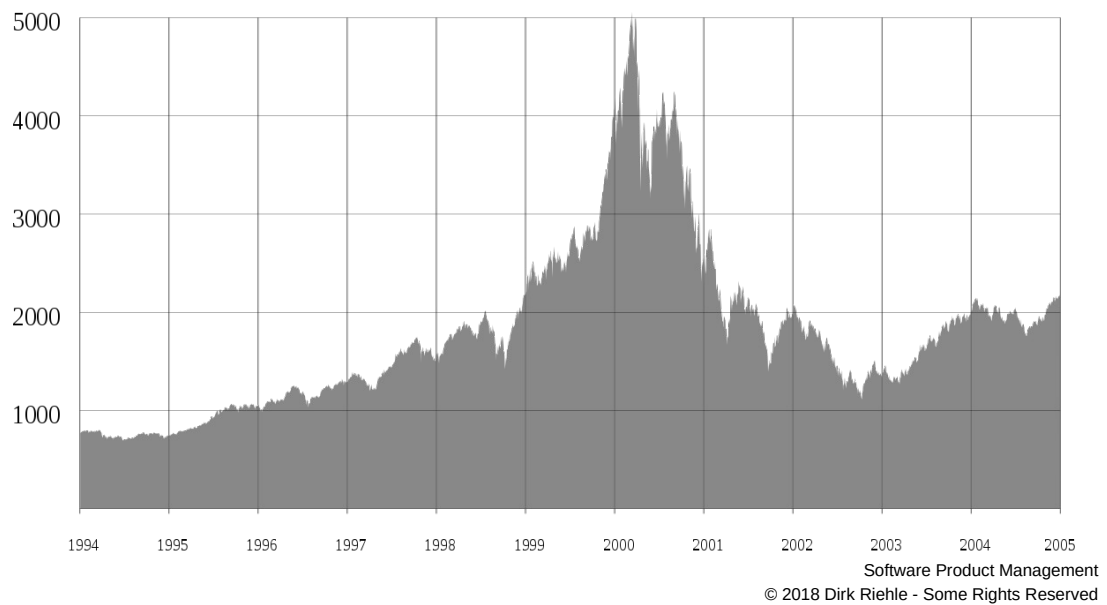
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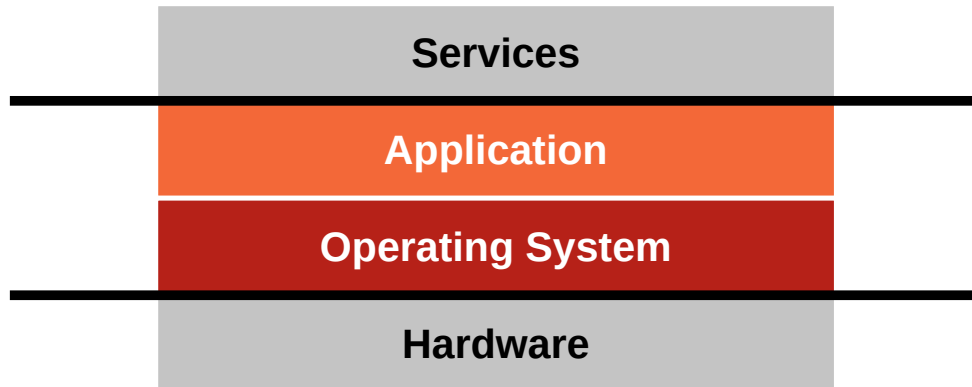
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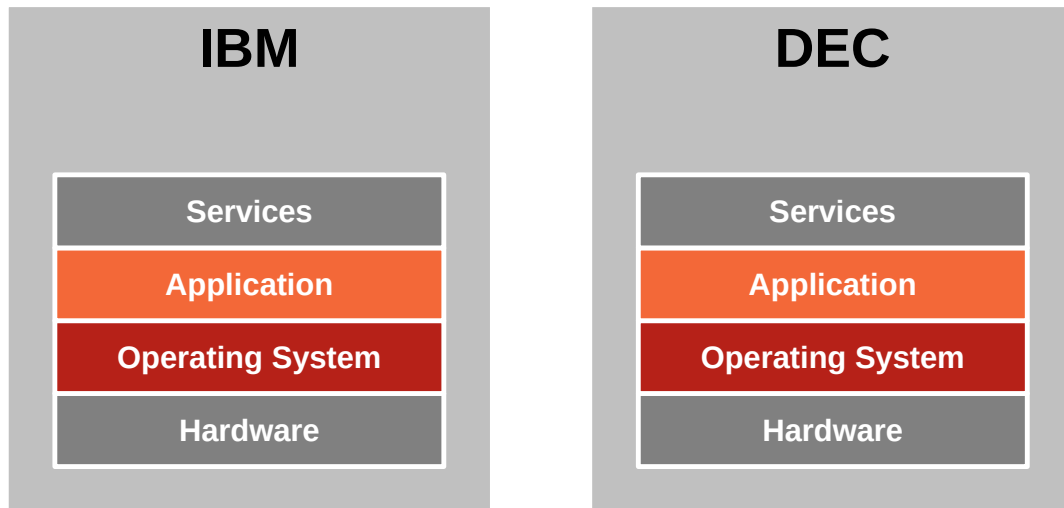
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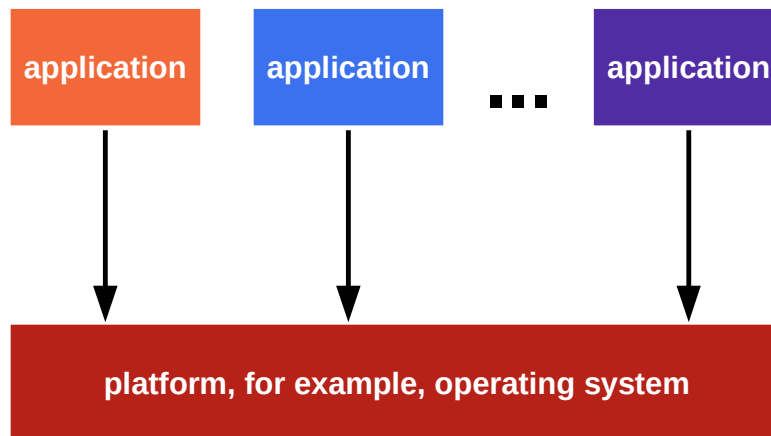
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Services	IBM	Accenture	Tata
Application	Microsoft Word	GIMP	Twitter
Operating System	Windows	Linux	OS X
Hardware	IBM	Dell	Samsung

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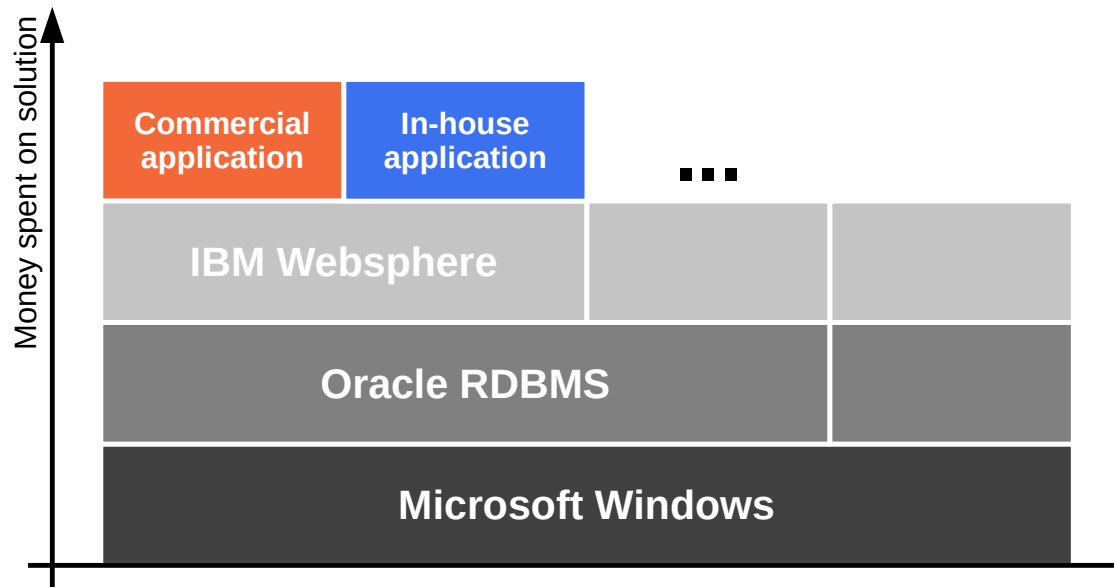
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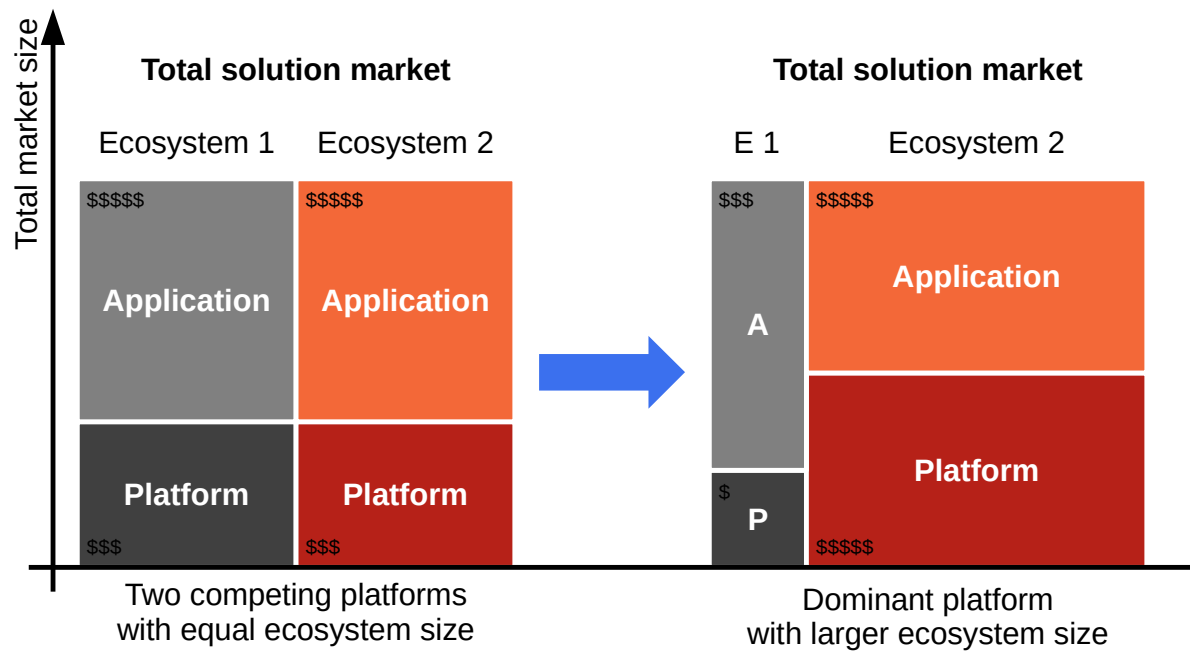
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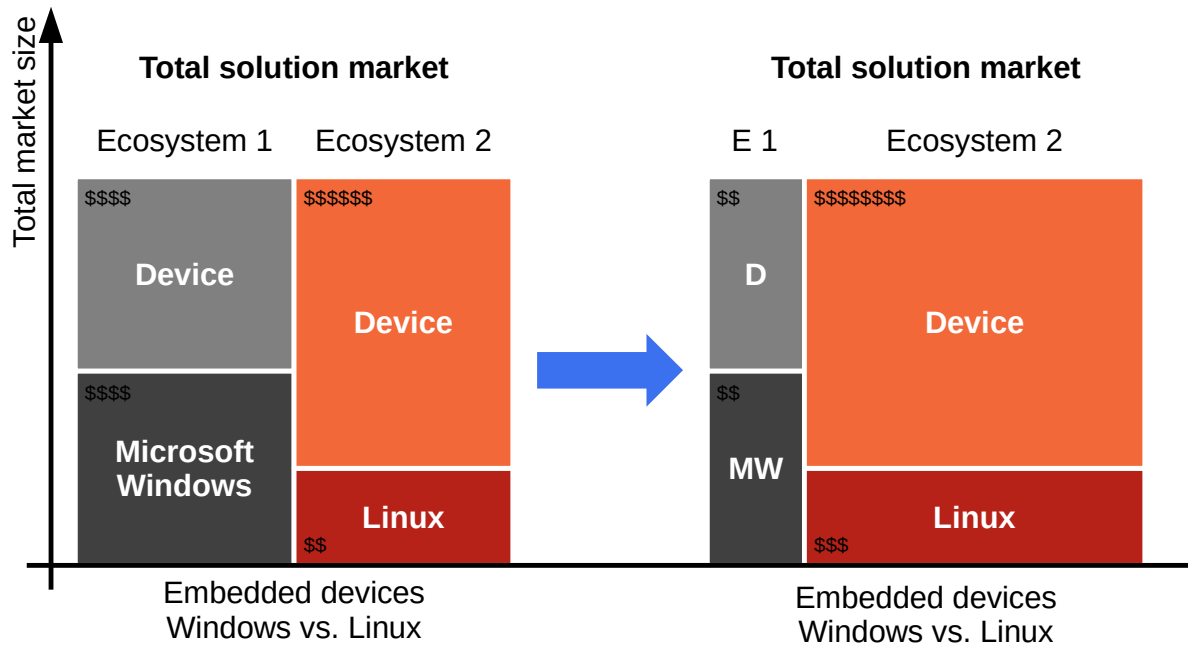
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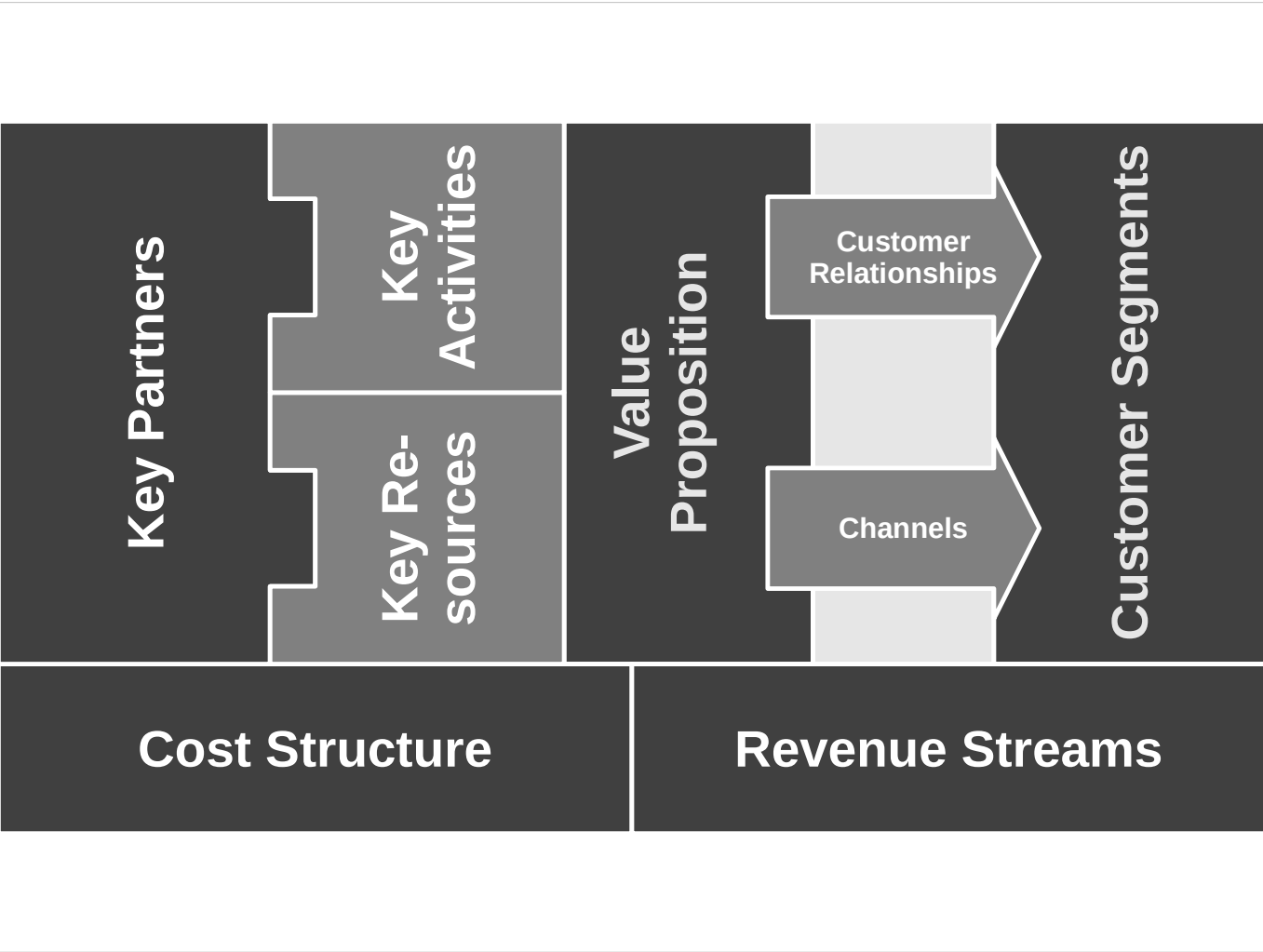


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DR

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