

22b Software Ecosystems

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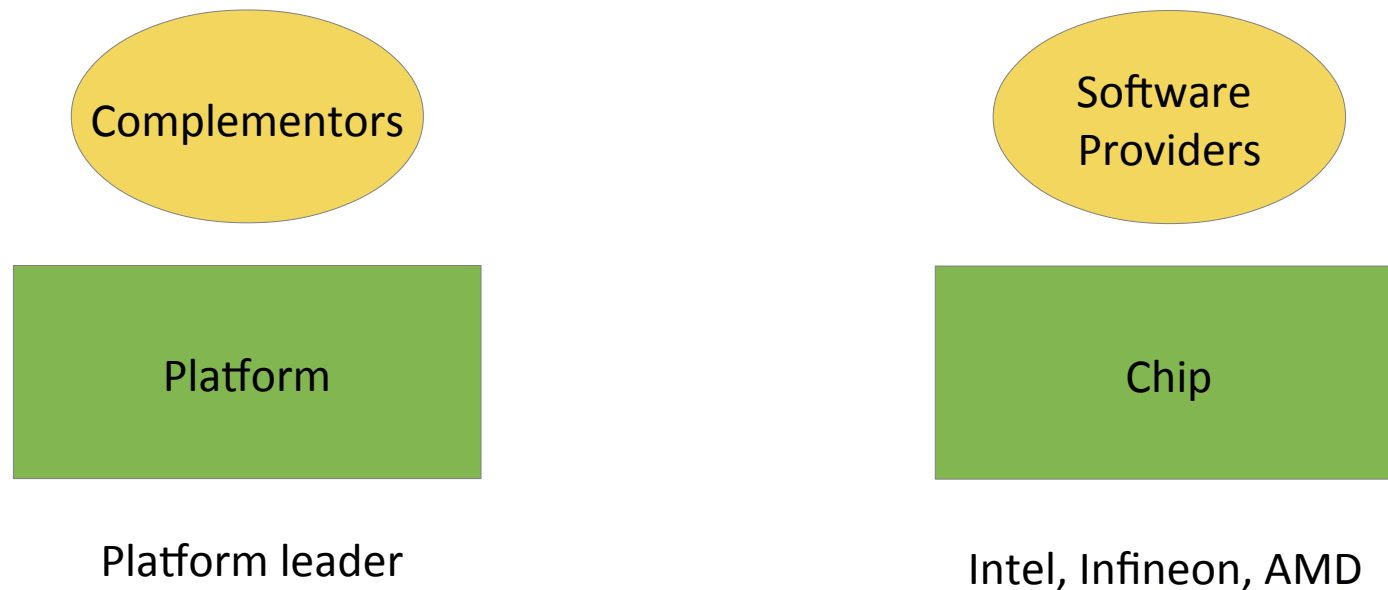


22b.1. Software Platforms and Software Ecosystems

Platforms and Ecosystems

Forschungscampus Teil: Cyber-Physical Software Ecosystems (CYPSE)

- „Platforms, not only products“ (Buch „Staying Power“ Michael Cusumano)
- Marktplätze brauchen Marktplattformen
 - Mit Vendor Lock-In



Plattform Leadership

Forschungscampus Teil: Cyber-Physical Software Ecosystems (CyPSE)

- Platform leadership und „platform wannable“
- Platform can be open or closed
- Platform can be for end users or for developers

Plugin
Providers

App
Providers

Module
Providers

Component
Providers

Eclipse

App Store

AutoSAR

CESAR Reference
Technology Platform

IBM, Itemis, many

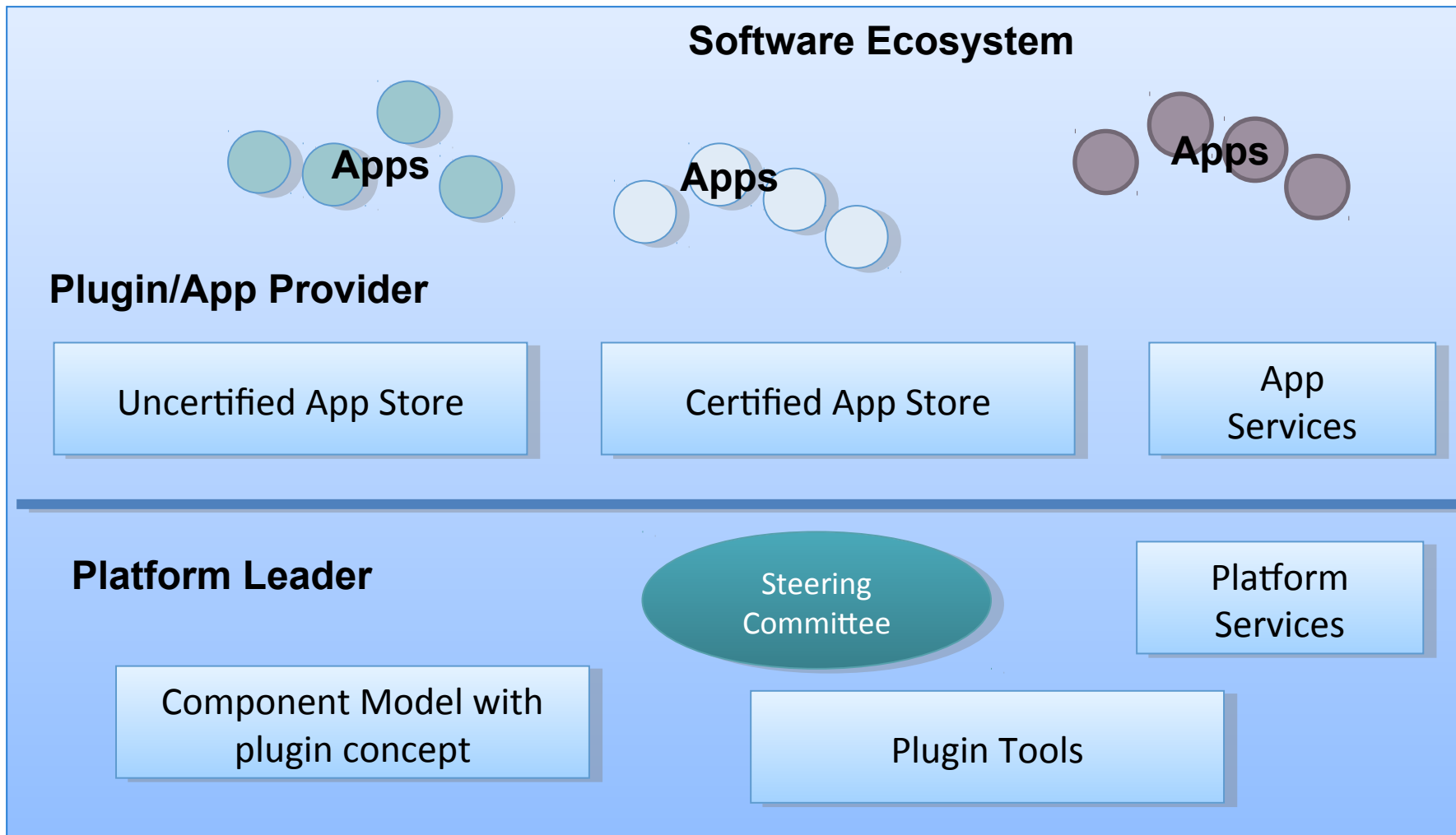
Apple, Intel, Google

BMW, Bosch,...

CESAR consortium

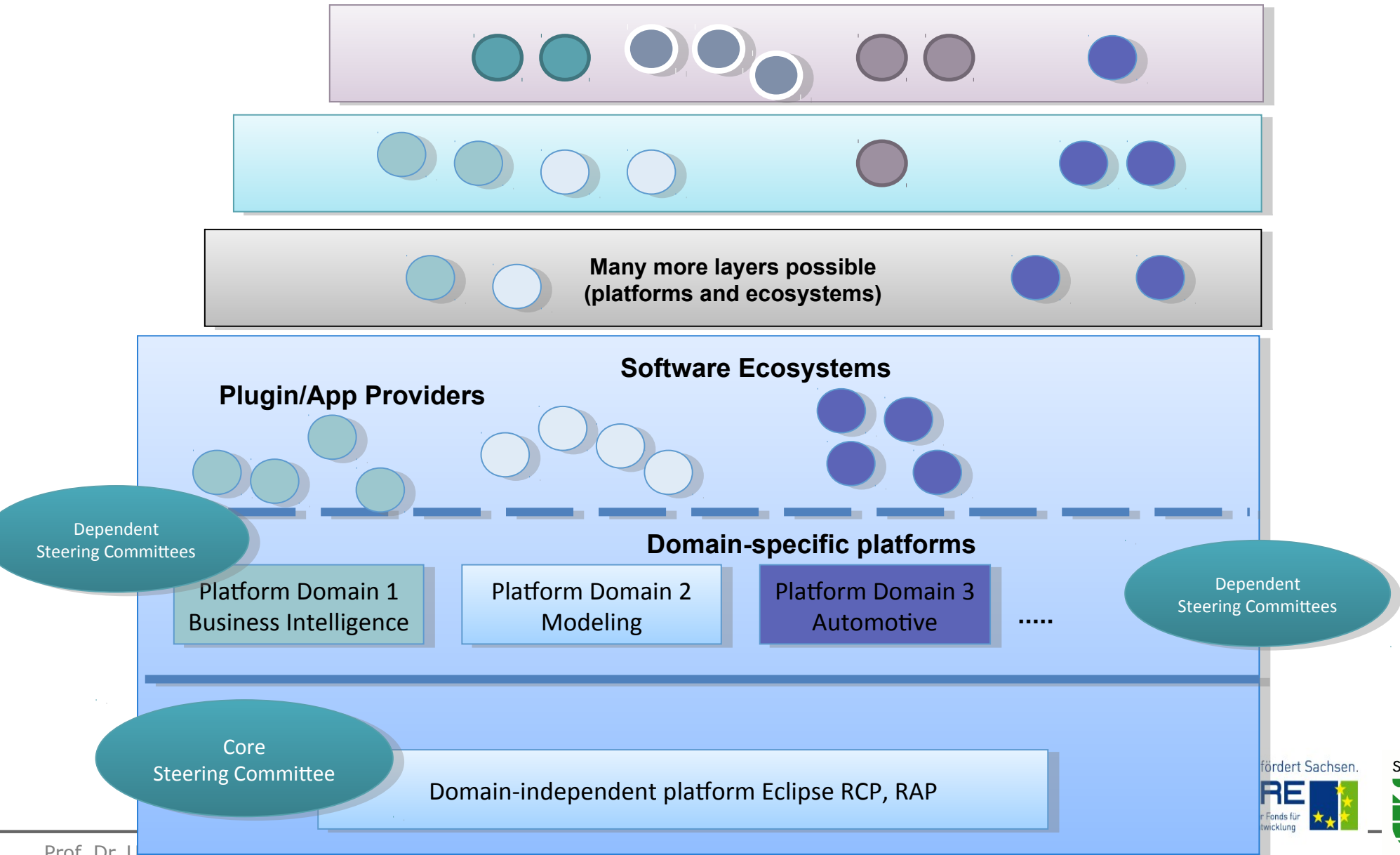
Software Ecosystems a la iPad, AutoSAR, GENIVI

Forschungscampus Teil: Cyber-Physical Software Ecosystems (CyPSE)



Layered Platforms and Layered Ecosystems (Eclipse.org)

Forschungscampus Teil: Cyber-Physical Software Ecosystems (CyPSE)



Pay per Membership of the Foundation

Forschungscampus Teil: Cyber-Physical Software Ecosystems (CyPSE)

- Determined by bylaws of the foundation
- 1 vote costs
 - labor money: e.g. 1 py per vote
 - travel money, rent,..
- Votes can be splitted

„An Eclipse-like software ecosystem relies on a modularity technology and business model“

Modularity Technology:

- Rich component model with plugin concept and non-functional verification

»Business model:

- Steering committees control the platforms and pay fees for their votes

Forschungscampus Teil: Cyber-Physical Software Ecosystems (CyPSE)

- Right to set
 - Standards for the future CPS ecosystems
 - Share a part of the markets
- Right to vote
 - Decision about dependent domain-specific platforms
 - Decision about dependent domain-specific projects
 - Decision about VIP-push projects for third parties
- Right to get transfer projects
 - Tailored, non-exclusive VIP-push projects
 - Tailored, exclusive Cell-pull projects
 - Student cell projects
 - Research rotation projects
 - Industry PhD projects

- Creation of service markets on the platforms („Marktrecht“)
- Certification right (admission of applications)
- Deployment right (Installation right)
- Sales right, Distribution right (see Apple AppStore)
- Licensing for interfaces, tools, infrastructure

22b.2. Software Platforms and Software Ecosystems for CPS



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What are Cyber-Physical Systems (Resubic Systems)?

Forschungscampus Teil: Cyber-Physical Software Ecosystems (CyPSE)

Mixed-Reality
Interaction

Cloud

Embedded

Ubiquitous

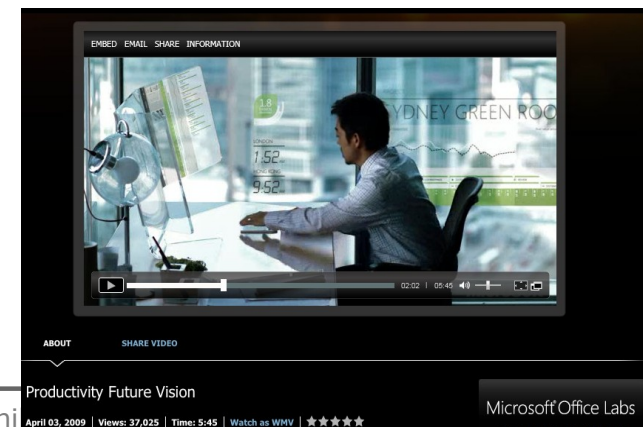


Cyber-physical

Mit Cloud vernetzte
eingebettete Systeme



Resubic
systems
„Human CPS“



CPS-Plattform-Leadership

Forschungscampus Teil: Cyber-Physical Software Ecosystems (CyPSE)

- In einer längeren Wertschöpfungskette kann jede Ebene eine *Plattform* sein

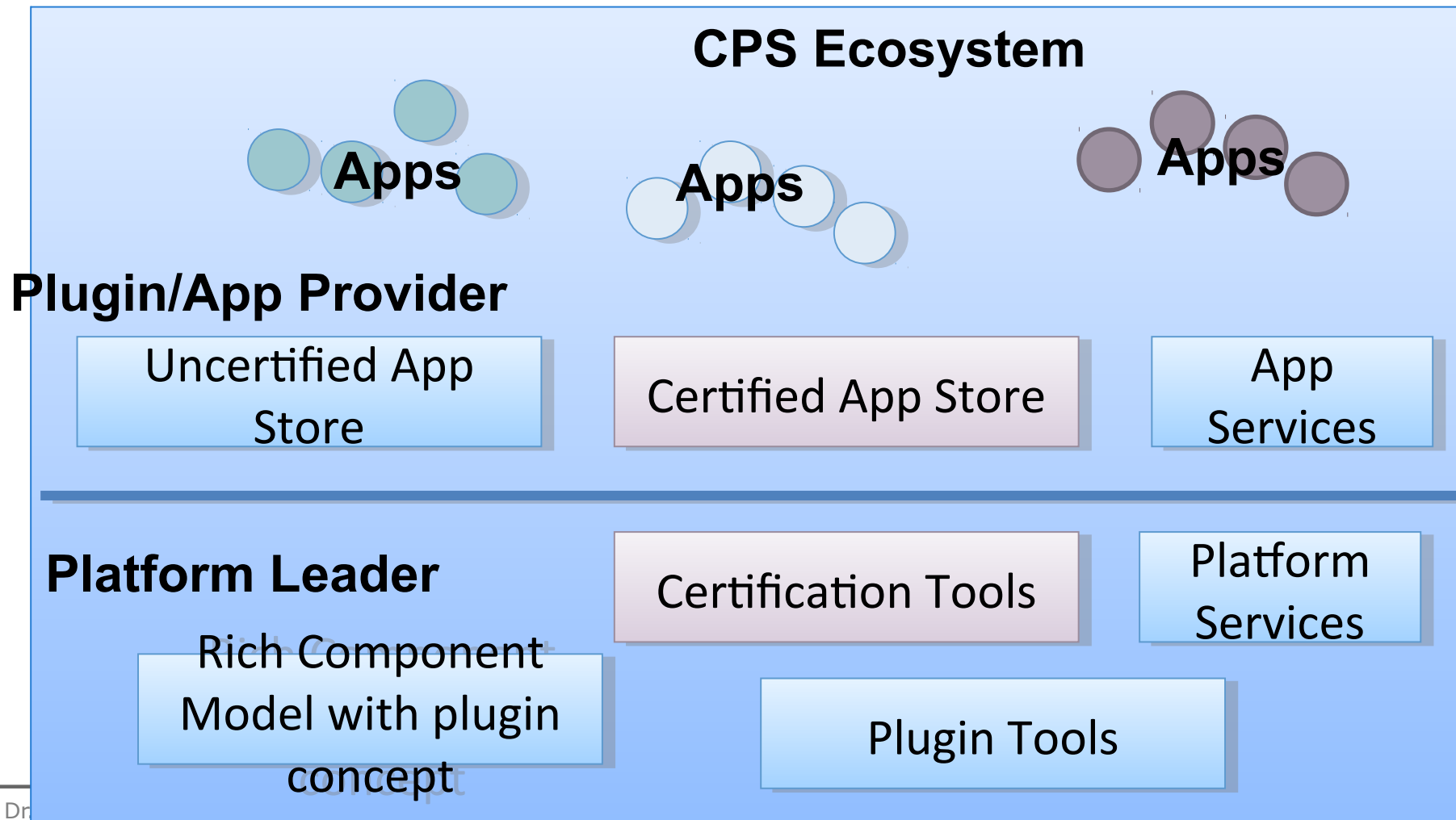


Wer hat die CPS-Plattformen in der Hand?

Basic CPS Software Ecosystems

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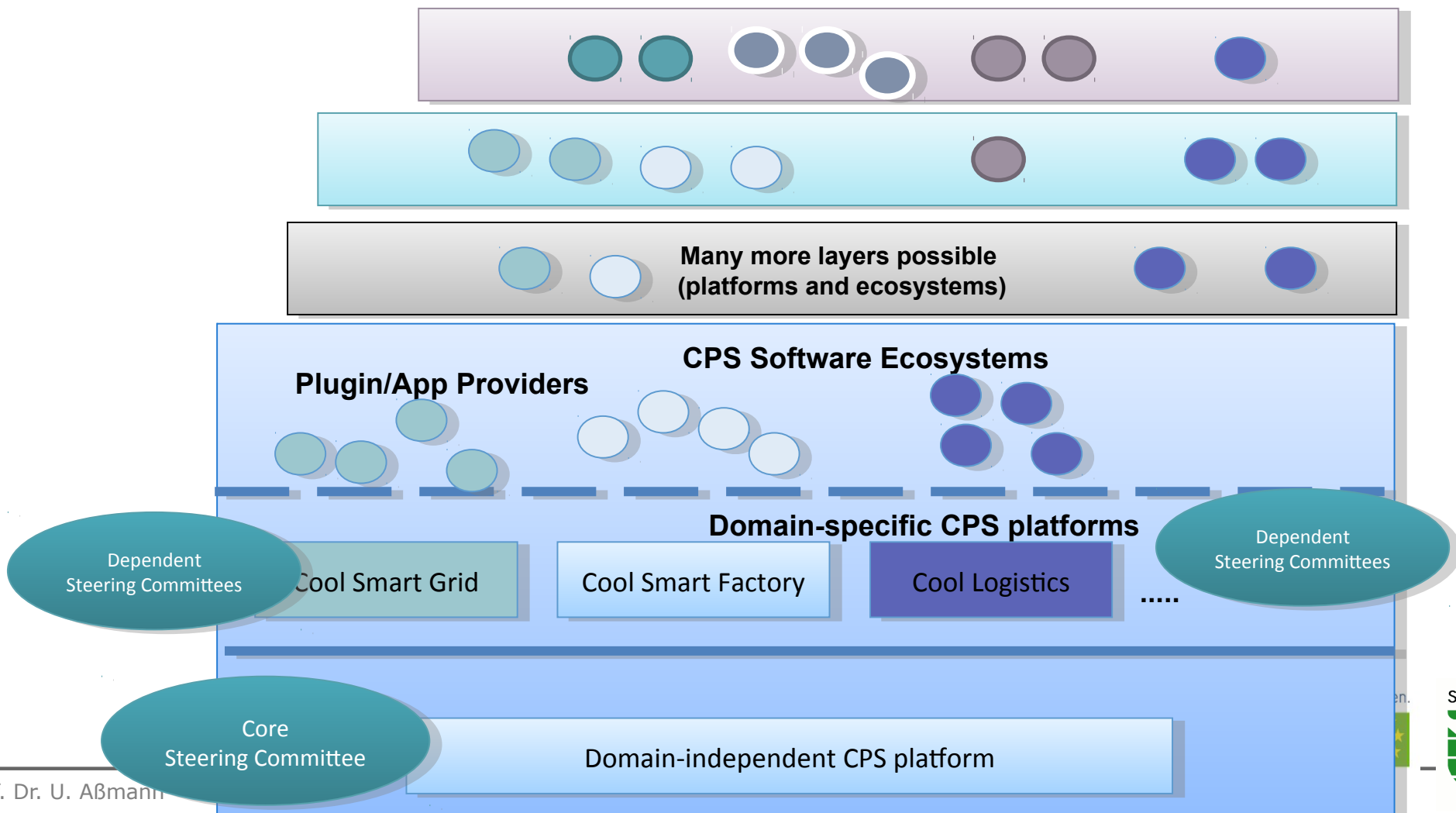
- Divided by platform leader and App provider
- Apps are safety-critical and must be certified



Layered CPS Software Ecosystems

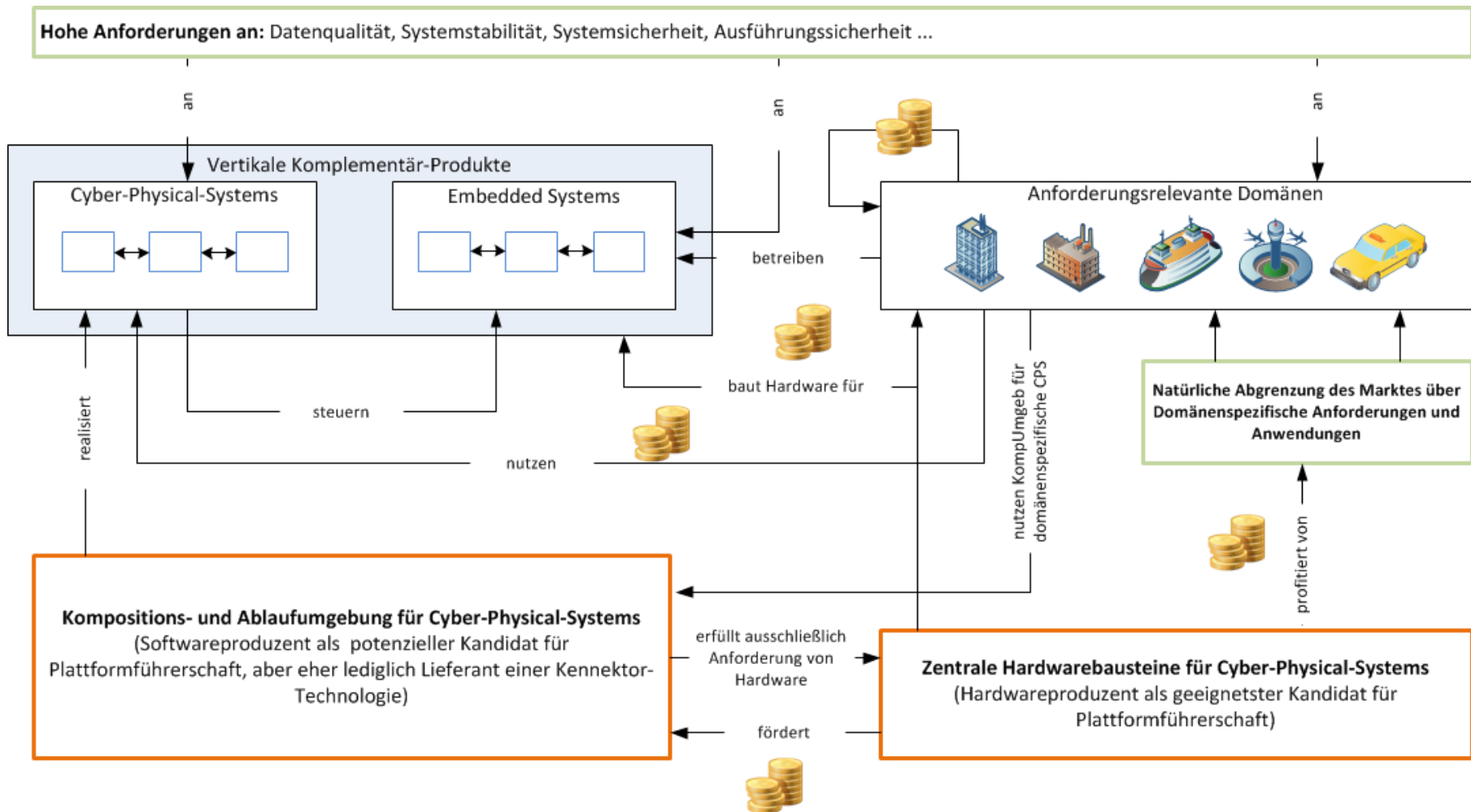
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- CPS ecosystems will be structured like the Eclipse ecosystem:
 - Layered platforms, hierarchic ecosystems
 - Steering committee admitting projects



Plattform-Bildung

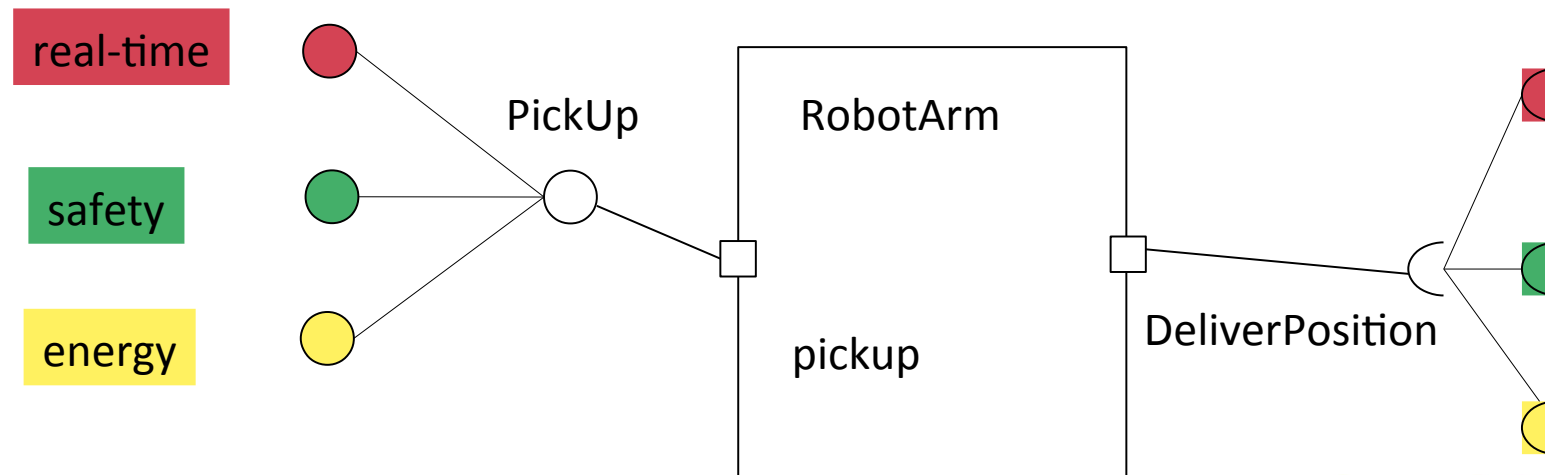
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Voraussetzungen für eine CPS Plattform

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- Komponentenmodell, das die Verifikation von sicherheitskritischen Anwendungen unterstützt
 - Lösung: Qualitätssichten auf Schnittstellen
 - Hier: HyperQCS
- Software-Framework, das erweiternde Plugins erlaubt
- Erweiterung muss zertifiziert und durch das Komponentenmodell verifiziert werden



ResUbic Lab Dresden

Software Aspects

Forschungscampus Teil: Cyber-Physical Software Ecosystems (CypSE)

- Exploring cyber-physical systems (res ubiqu)
- ESF Nachwuchsforschergruppen
 - ZESSY: safety-critical cyber-physical systems
 - EDYRA: seamless interaction, personal info services
 - FLEXCLOUD: cloud management
- 4,5 Mio € 2011-13, 19 Forscher, ESF, SMWK
- Focus „Smart Office“

