Software Center

Delivering Customer Value in the Age of Autonomous, Continuously Evolving Systems

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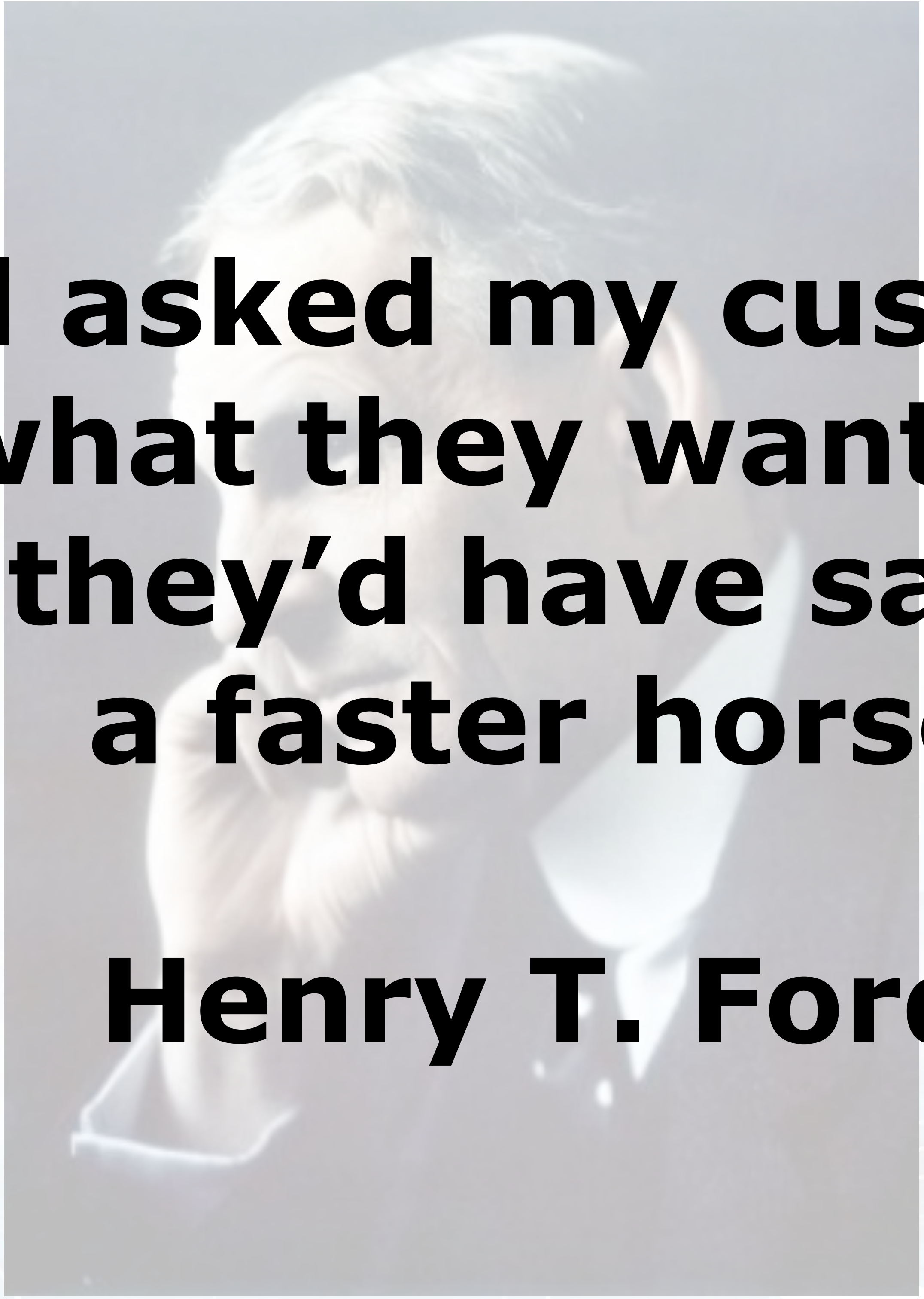


If I’d asked my customers what they wanted, they’d have said a faster horse

Henry T. Ford

Customers don’t know what they want. It’s very hard to envision the solution you want without actually seeing it.

Marty Cagan

The critical failing of user interviews is that you’re asking people to either remember past use or speculate on future use of a system

Jakob Nielsen

[The assumption that a] reasonably well-defined set of requirements exists, if only we take the time to understand them, is wrong

Dean Leffingwell

Customers don’t know what’s possible. Most have no idea about the enabling technologies involved

Marty Cagan

You can't just ask customers
what they want and then
try to give that to them.
By the time you get it built,
they'll want something new.

Steve Jobs

Underlying Insight

- Customer don’t know what they want
- You need to you show “it” to them
- And then measure their behaviour
- Or, if you must, talk to them

Three Key Take-Aways

- Increasing **SPEED** trumps ANY other improvement R&D can provide to the company – the goal is **continuous deployment** of new functionality
- Effective use of **data** from customers and products in the field is the next area to exploit and monetize
- Strategic use of the **ecosystems** around your systems and services is critical as it allows for agility, risk sharing and allows the company to focus on the key differentiators

Overview

- Vem är jag? Wie ben ik? Who am I?
- Trends in Software: Need for Speed
- Stairway to Heaven
  - Speed
  - Data
  - Ecosystems
- Implications for Requirements Engineering
- Conclusion

Academic Research

10X Software Center

Software Center

Consultancy

ERICSSON BOSCH SIEMENS BASF The Chemical Company

GRUNDFOS SONY make.believe JEPPESEN THALES

VARIAN medical systems AirTies wireless networks transmode SEB

Entrepreneur

fidesmo Remente

Industry Innovation

intuit NOKIA

AUQTUS
Automated Quality Testing of User Scenarios

Industry Operations

NOKIA

Software Center

Mission: Improve the software engineering capability of the Nordic Software-Intensive industry with an order of magnitude

Theme: Fast, continuous deployment of customer value

Success: Academic excellence

Success: Industrial impact

Tetra Pak

SAAB TECHNOLOGIES

SIEMENS

verisure ALARMS WITH IQ

AXIS® COMMUNICATIONS

VOLVO

VOLVO

JEPPESEN® A BOEING COMPANY

ERICSSON

GRUNDFOS

AVANCEZ 1829 CHALMERS

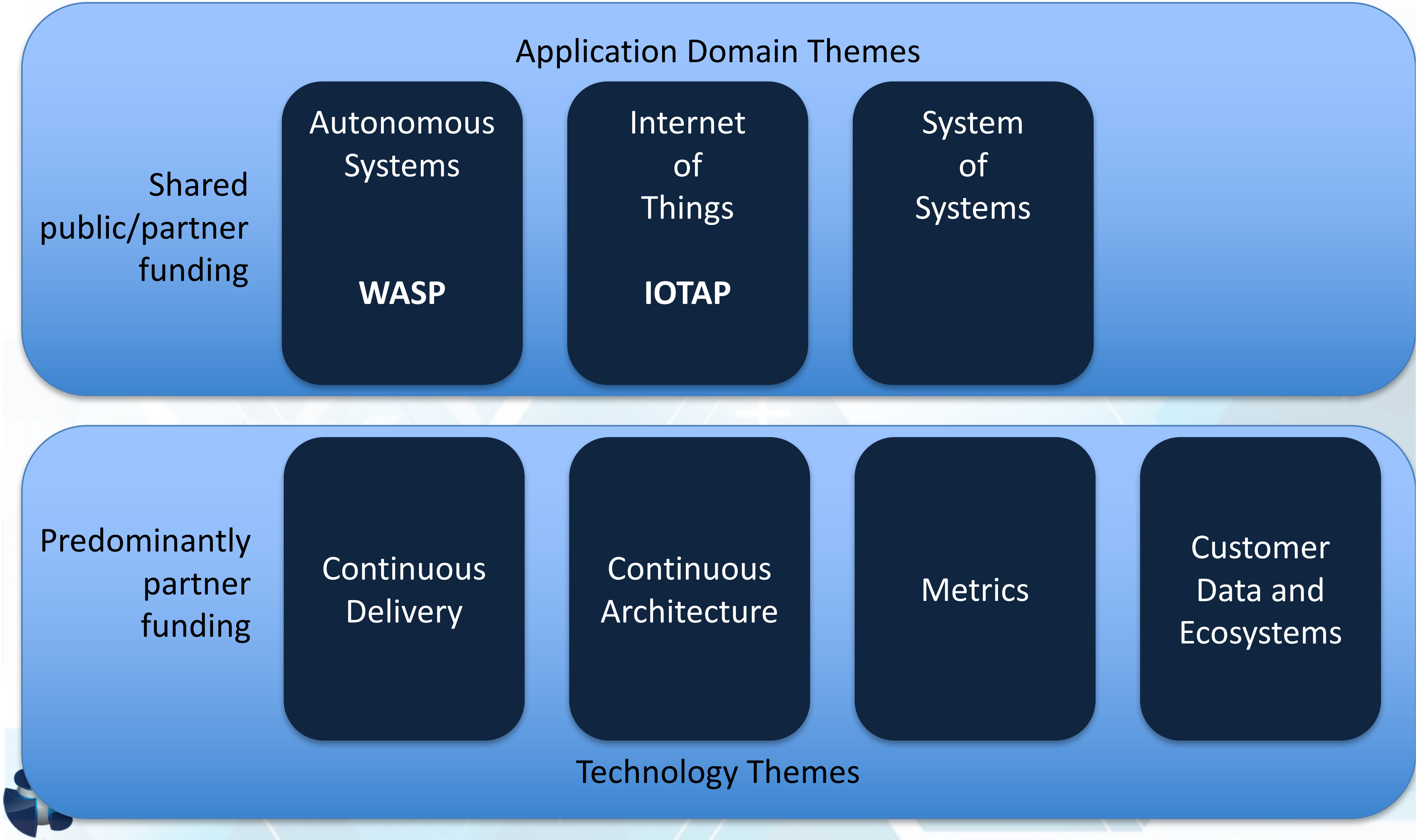
UNIVERSITAS GOTHOBURGENSIS 1891

MALMÖ UNIVERSITY

LINKÖPINGS UNIVERSITET

MÄLARDALEN UNIVERSITY SWEDEN

Theme Structure



Application Domain Themes

Shared public/partner funding

Autonomous Systems

WASP

Internet of Things

IOTAP

System of Systems

Predominantly partner funding

Continuous Delivery

Continuous Architecture

Metrics

Customer Data and Ecosystems

Technology Themes

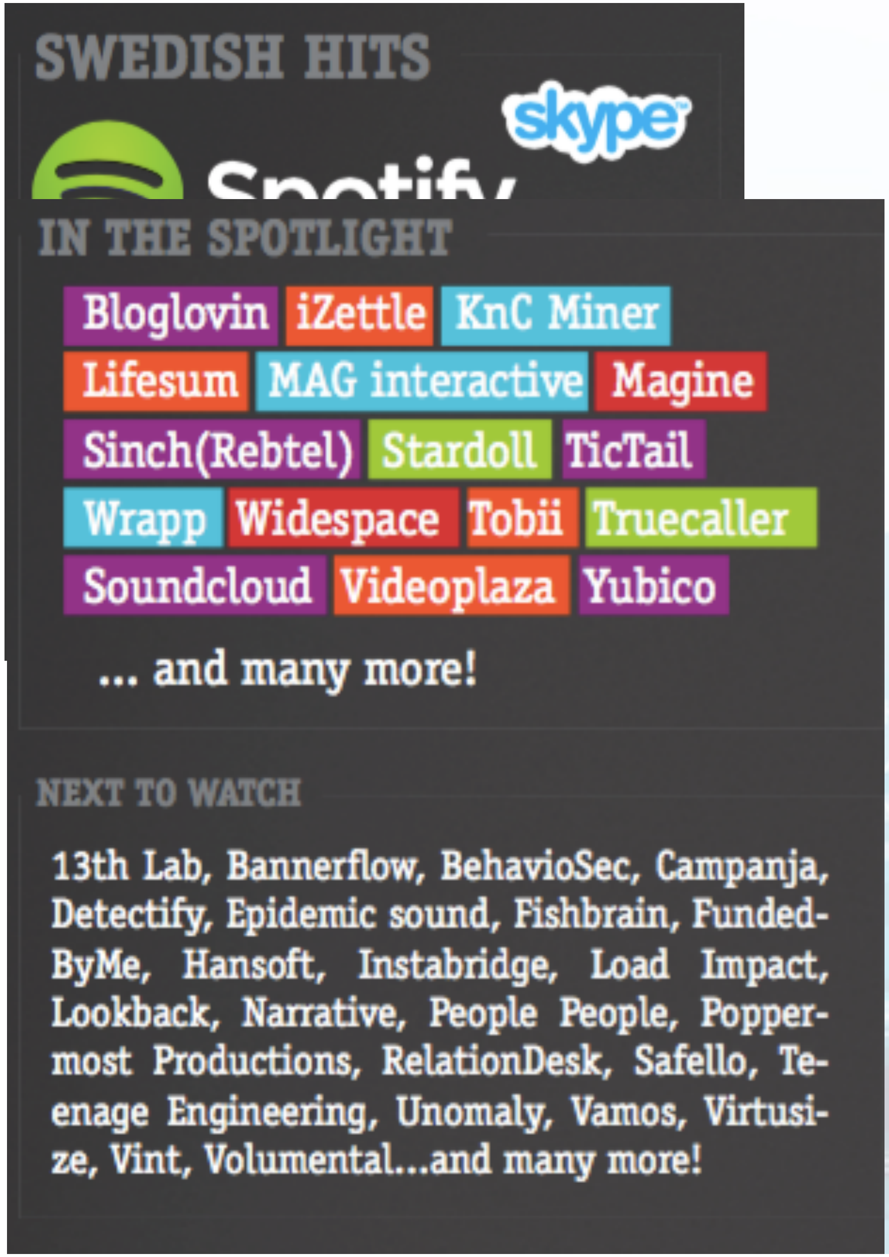
Some Online Companies

BOOKING.COM
online hotel reservations
Spotify®
ROVIO™
Klarna®
Simplifying Buying
King
bing™

About Sweden

- Third largest country in EU (450,295 KM2) (about 4.7% of China)
- ~ 10 Million people (<1% of China)
- Incredibly strong industry base: Volvo, Ericsson, Sony Ericsson Mobile Communications AB, Saab Defense, Electrolux, Volvo Cars, Sandvik, Scania, Atlas Copco, ABB and SKF
- Also: Hennes & Mauritz, IKEA, Nordea, Preem, Securitas and Nordstjernan

About Sweden



SWEDISH HITS

skype

Spotify

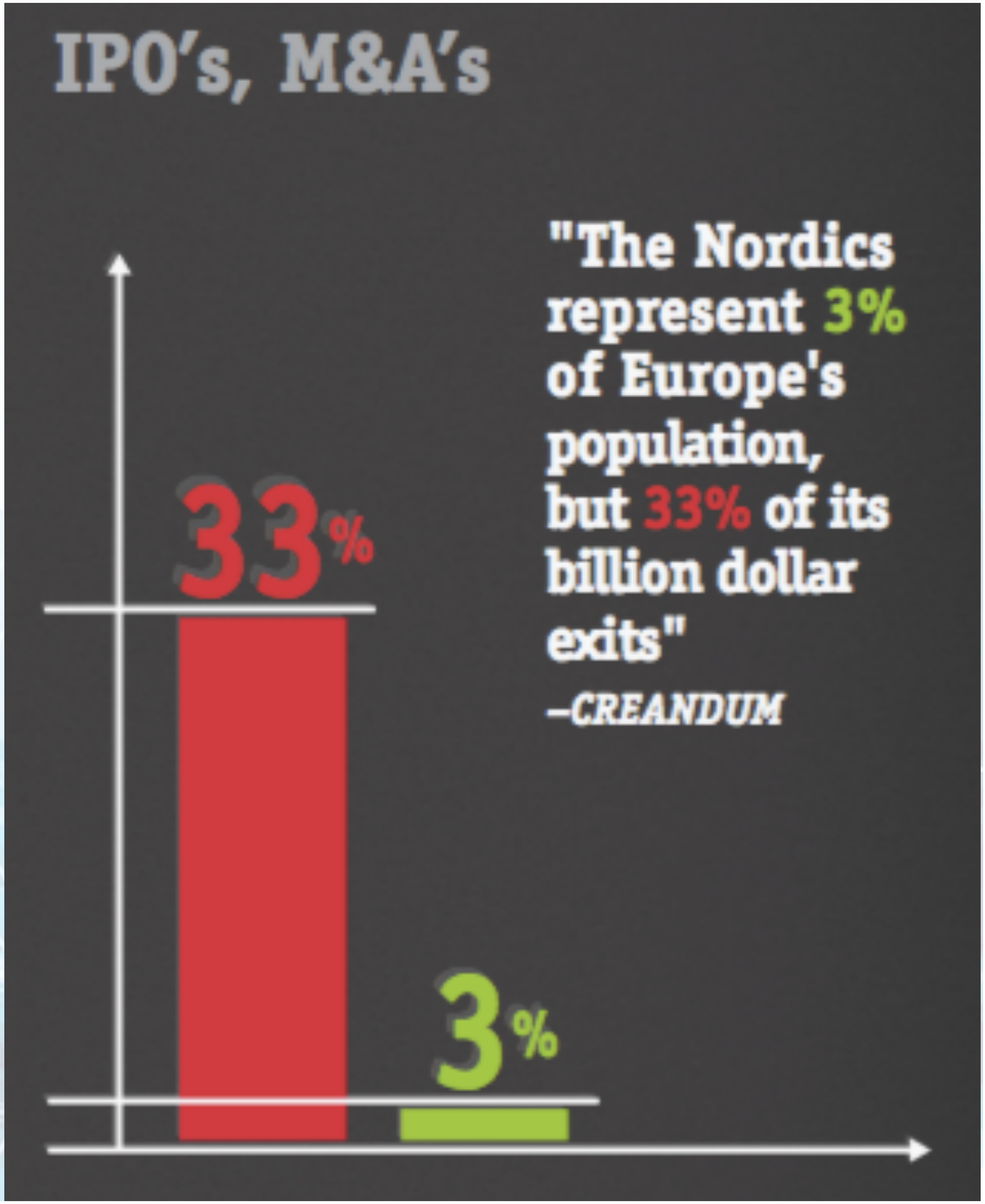
IN THE SPOTLIGHT

Bloglovin iZettle KnC Miner
Lifesum MAG interactive Magine
Sinch(Rebtel) Stardoll TicTail
Wrapp Widespace Tobii Truecaller
Soundcloud Videoplaza Yubico

... and many more!

NEXT TO WATCH

13th Lab, Bannerflow, BehavioSec, Campanja, Detectify, Epidemic sound, Fishbrain, FundedByMe, Hansoft, Instabridge, Load Impact, Lookback, Narrative, People People, Poppermost Productions, RelationDesk, Safello, Teenage Engineering, Unomaly, Vamos, Virtusize, Vint, Volumental...and many more!



IPO's, M&A's

"The Nordics represent 3% of Europe's population, but 33% of its billion dollar exits"

–CREANDUM

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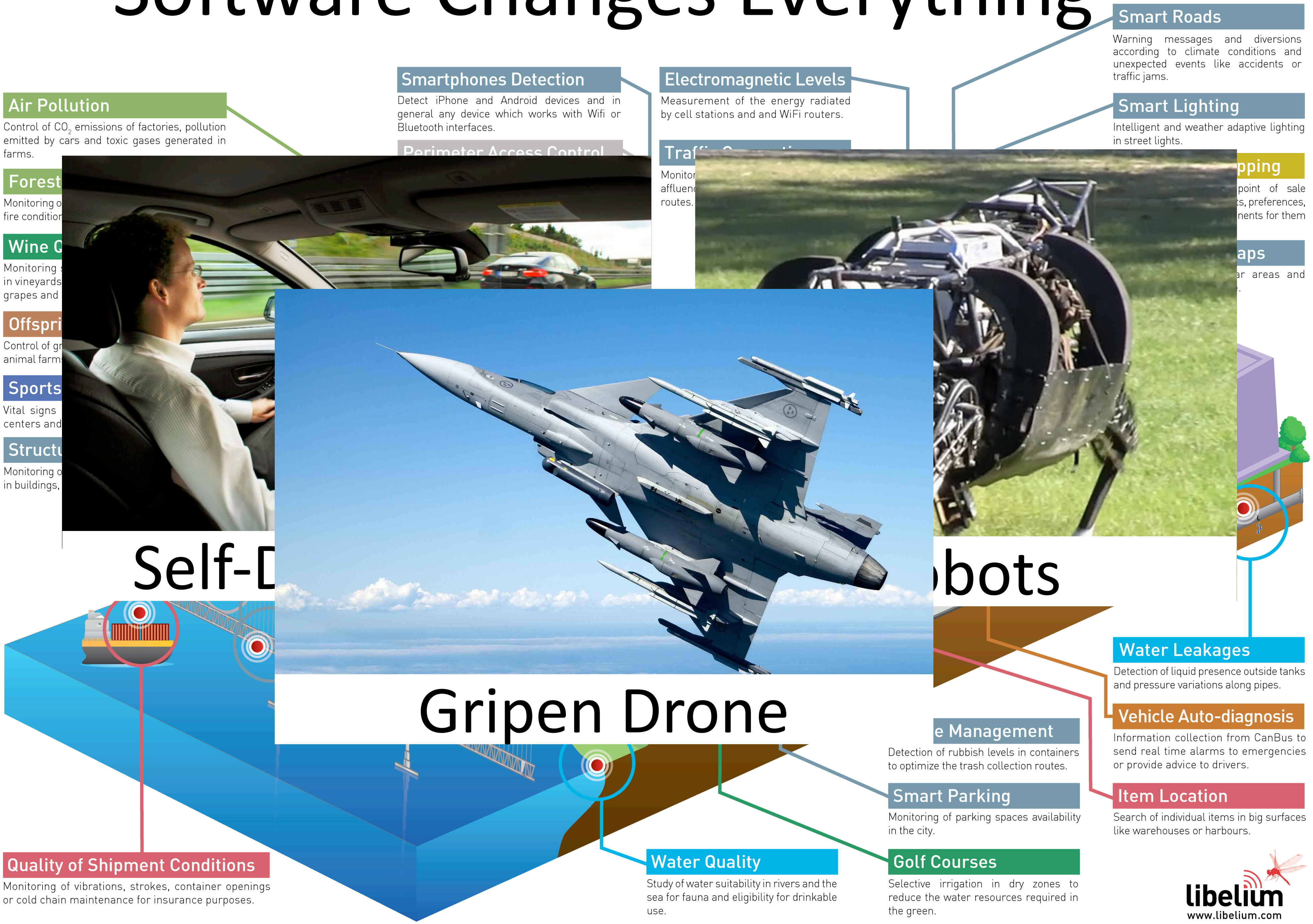
Software Changes Everything



Air Pollution

Control of CO_2 emissions of factories, pollution emitted by cars and toxic gases generated in farms.

Forest

Monitoring o
fire condition

Wine Q

Monitoring
in vineyards
grapes and

Offspri

Control of gr
animal farm

Sports

Vital signs
centers and

Structu

Monitoring o
in buildings,

Smartphones Detection

Detect iPhone and Android devices and in general any device which works with Wifi or Bluetooth interfaces.

Perimeter Access Control

Electromagnetic Levels

Measurement of the energy radiated by cell stations and and WiFi routers.

Traffic C

Monitor
affluenc
routes.

Smart Roads

Warning messages and diversions according to climate conditions and unexpected events like accidents or traffic jams.

Smart Lighting

Intelligent and weather adaptive lighting in street lights.

pping

point of sale
ts, preferences,
nents for them

aps

ar areas and

Self-D

bots

Gripen Drone

Water Leakages

Detection of liquid presence outside tanks and pressure variations along pipes.

Vehicle Auto-diagnosis

Information collection from CanBus to send real time alarms to emergencies or provide advice to drivers.

e Management

Detection of rubbish levels in containers to optimize the trash collection routes.

Item Location

Search of individual items in big surfaces like warehouses or harbours.

Smart Parking

Monitoring of parking spaces availability in the city.

Quality of Shipment Conditions

Monitoring of vibrations, strokes, container openings or cold chain maintenance for insurance purposes.

Water Quality

Study of water suitability in rivers and the sea for fauna and eligibility for drinkable use.

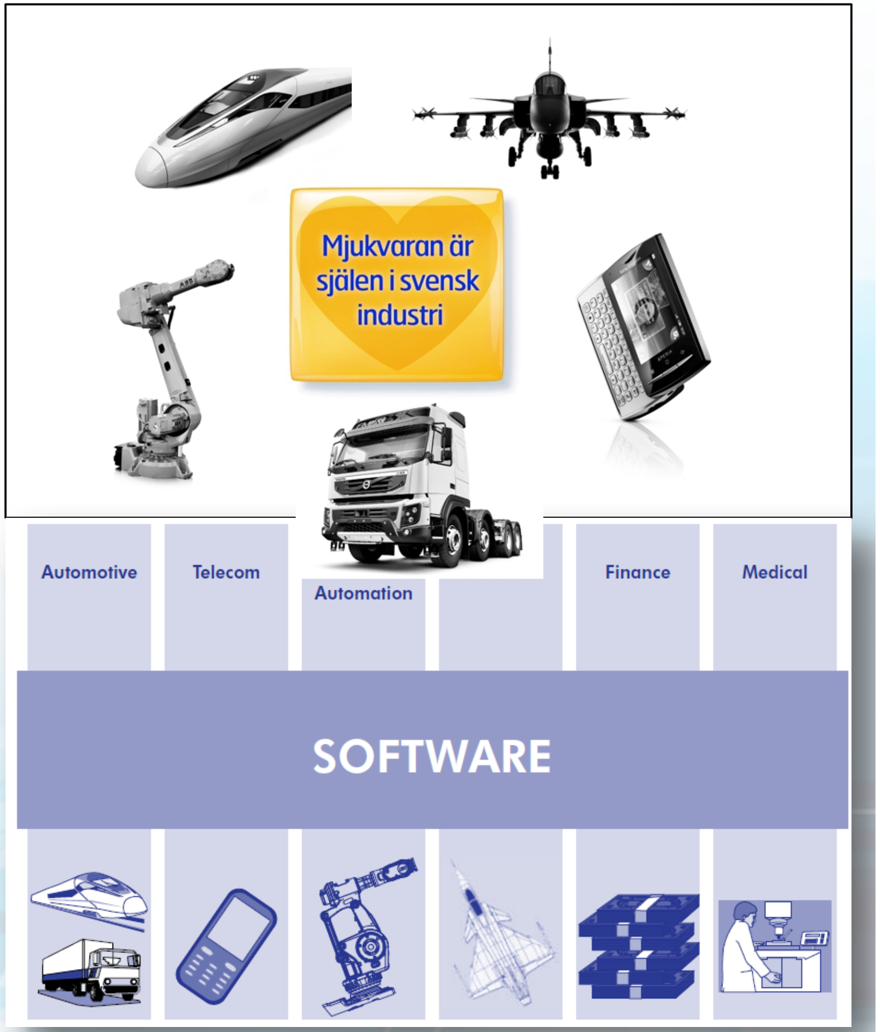
Golf Courses

Selective irrigation in dry zones to reduce the water resources required in the green.

libelium
www.libelium.com

Nature of Product Innovation is Shifting

- More than 90% of R&D is related to software according to Ericsson
  - The world’s 5th largest software company
- 70% of all innovation is related to software according to AB Volvo
- 80-90% of all innovation in a car is related to electronics (HW & SW) according to Volvo Cars

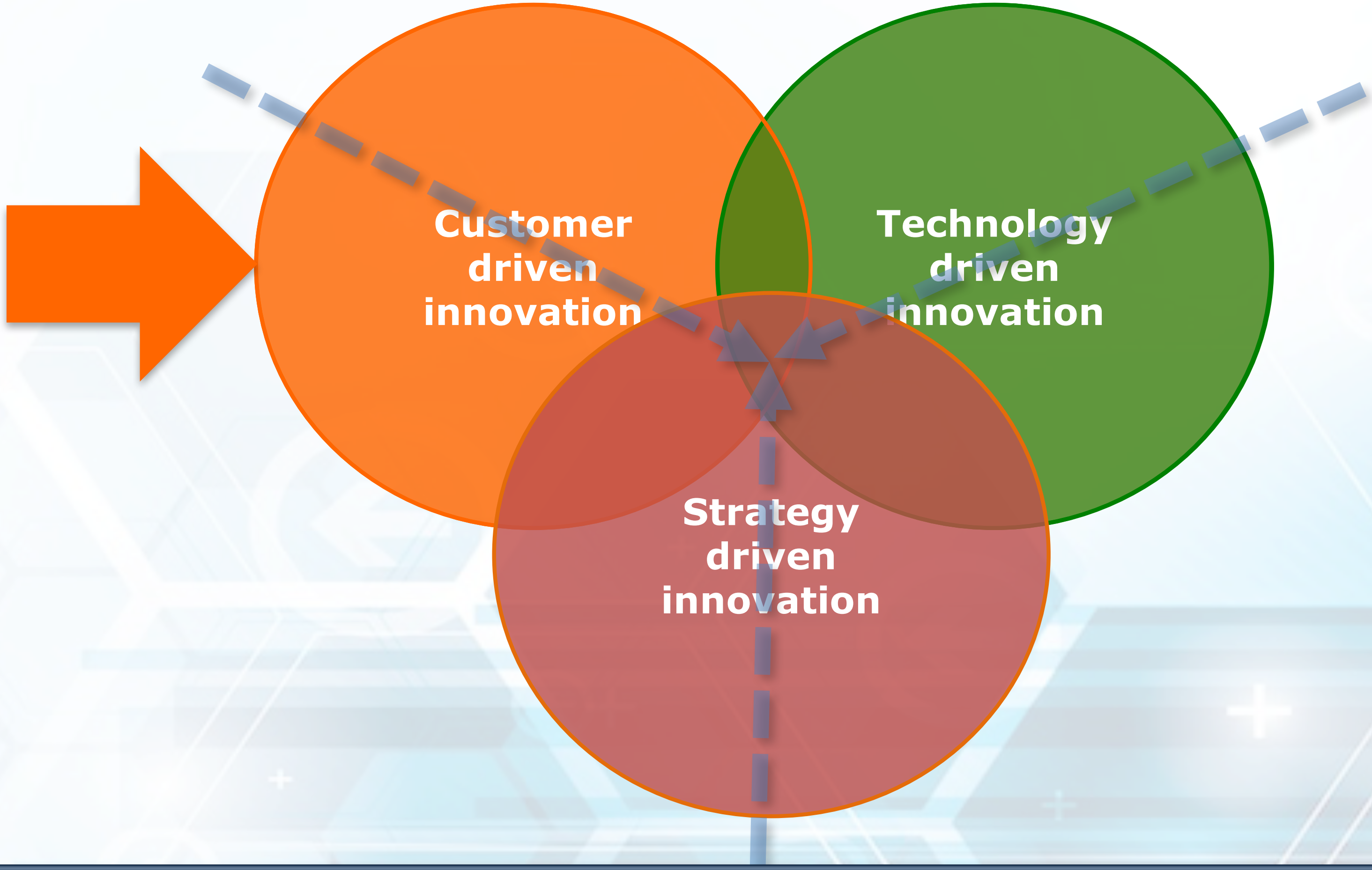


https://hbr.org/2015/06/does-hardware-even-matter-anymore

Towards Product as a Service

This requires continuous deployment throughout the lifetime of the product

Innovation Approaches

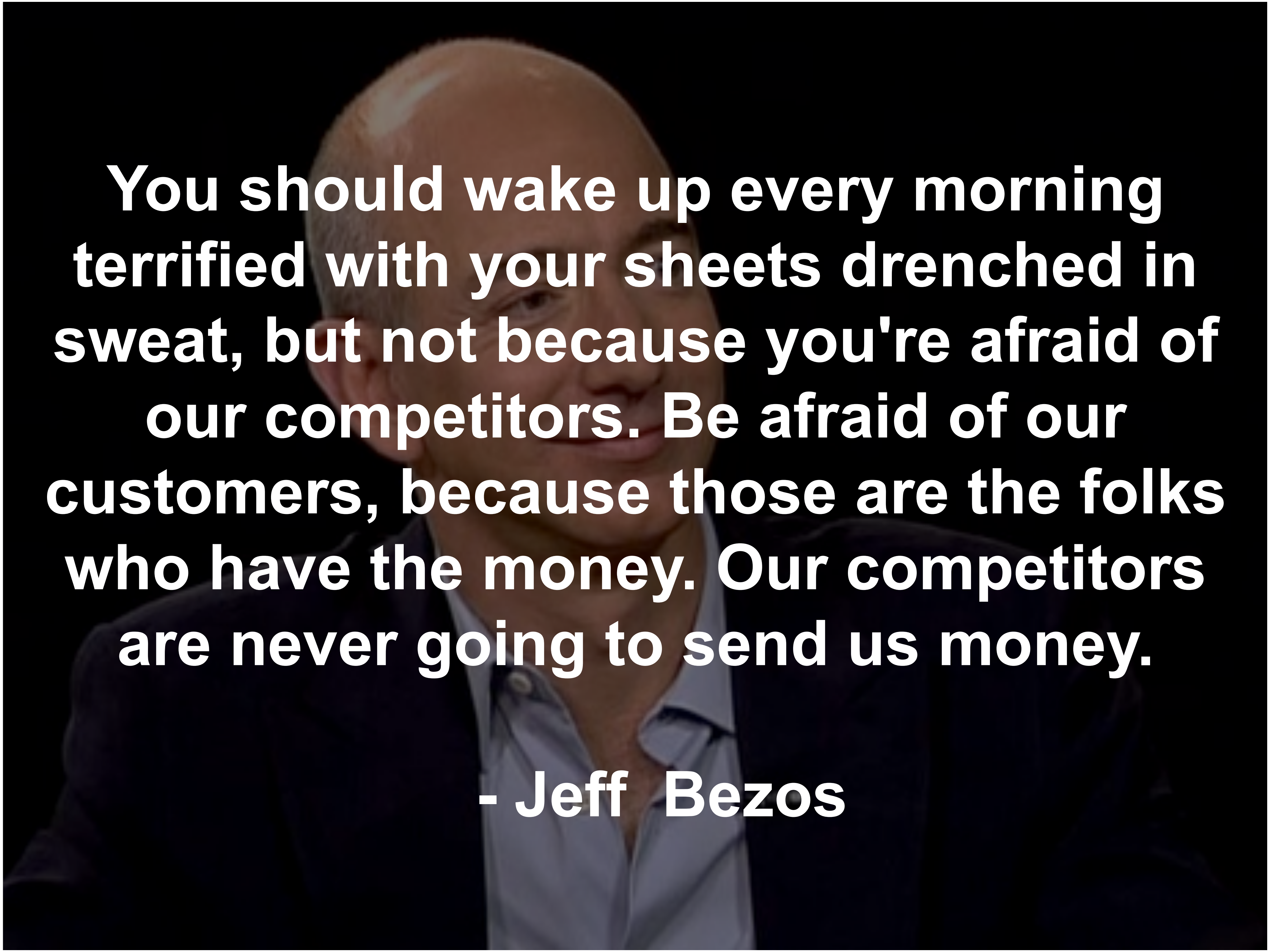


Customer driven innovation

Technology driven innovation

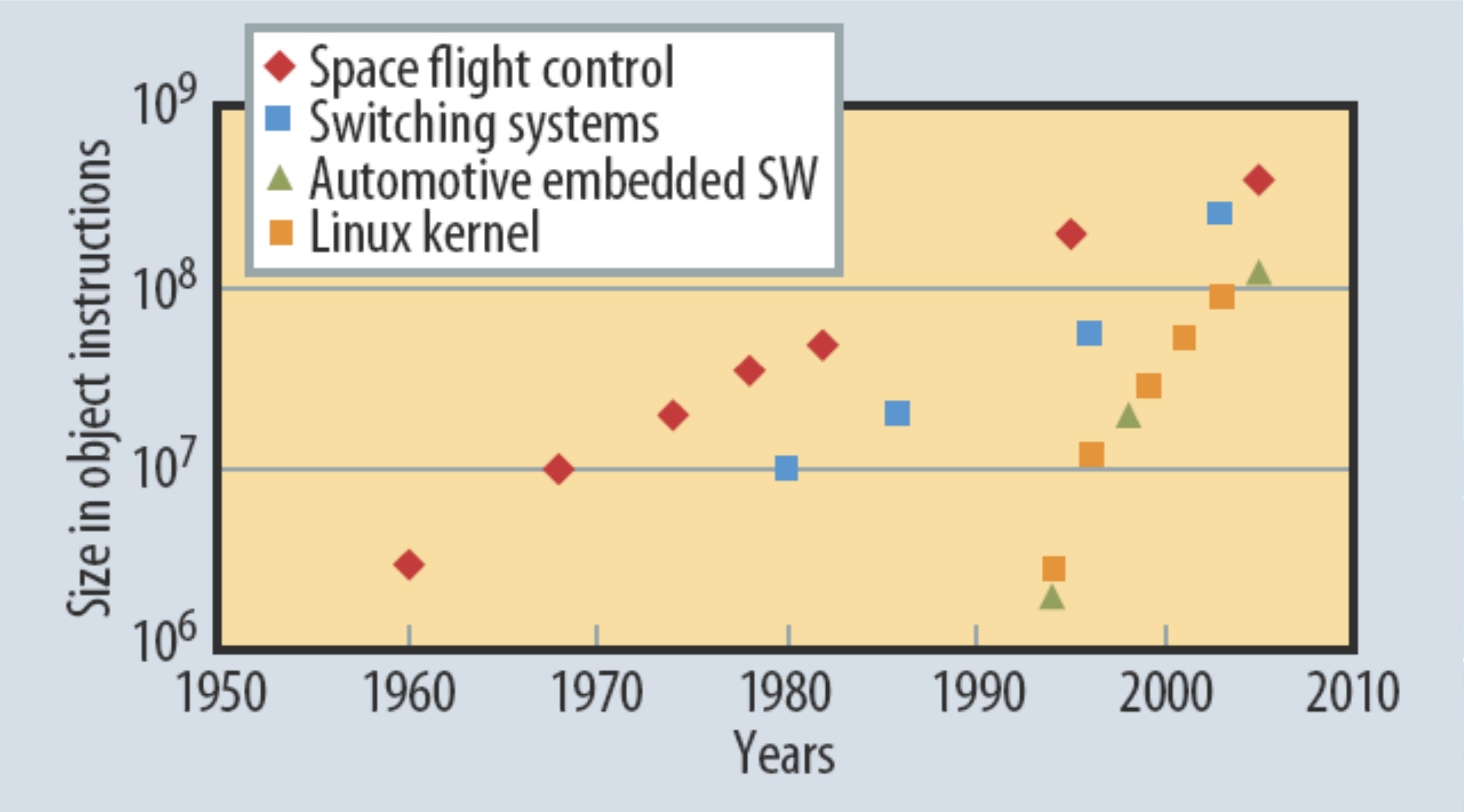
Strategy driven innovation

This requires continuous experimentation with customers



You should wake up every morning terrified with your sheets drenched in sweat, but not because you're afraid of our competitors. Be afraid of our customers, because those are the folks who have the money. Our competitors are never going to send us money.

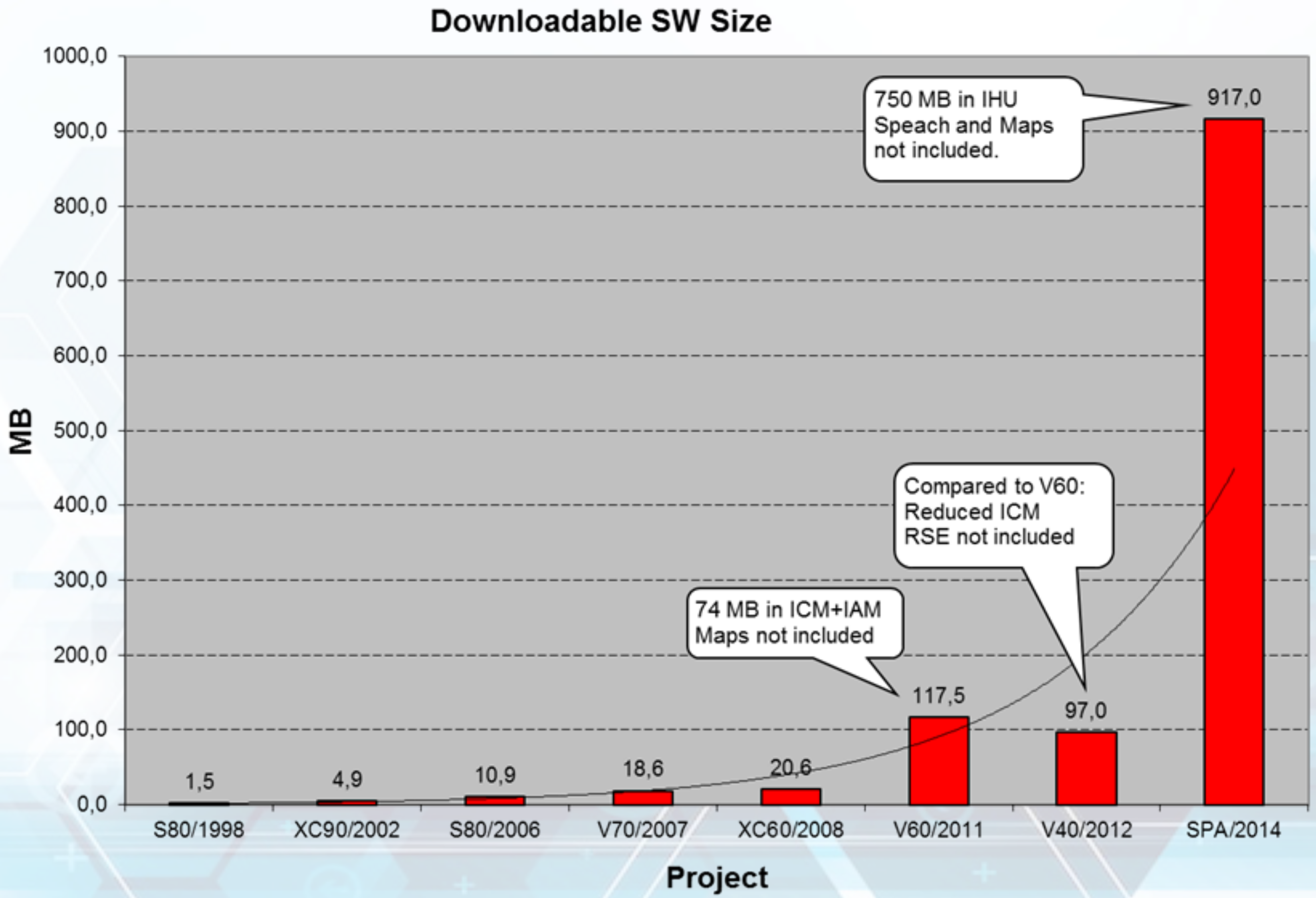
- Jeff Bezos



10x every ~7 years

C. Ebert and C. Jones, Embedded software: Facts, figures, and future, IEEE Computer, 2009

Volvo XC 90

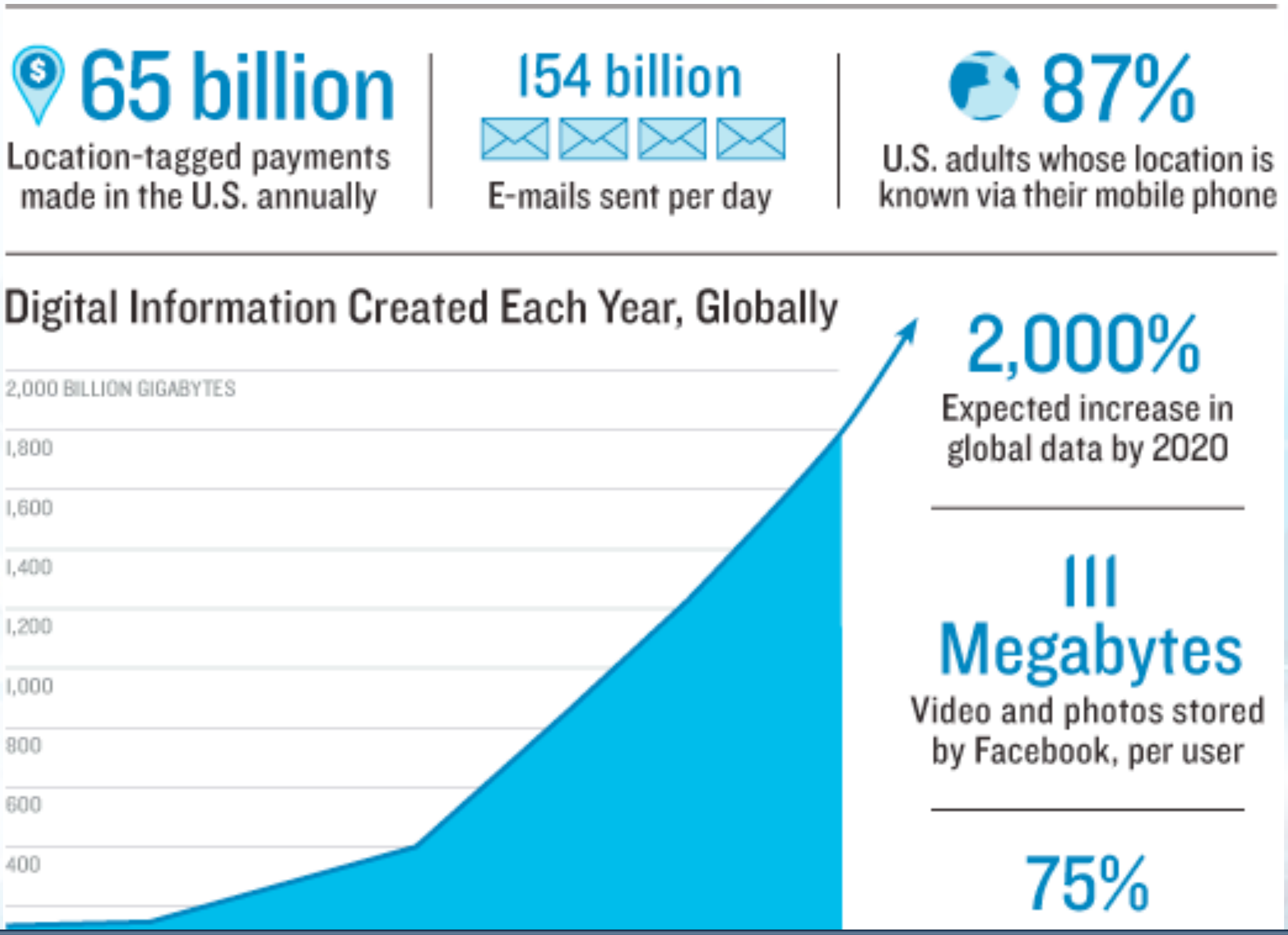


750 MB in IHU
Speach and Maps
not included.

Compared to V60:
Reduced ICM
RSE not included

74 MB in ICM+IAM
Maps not included

Data Generated in the World



65 billion
Location-tagged payments made in the U.S. annually

154 billion
E-mails sent per day

87%
U.S. adults whose location is known via their mobile phone

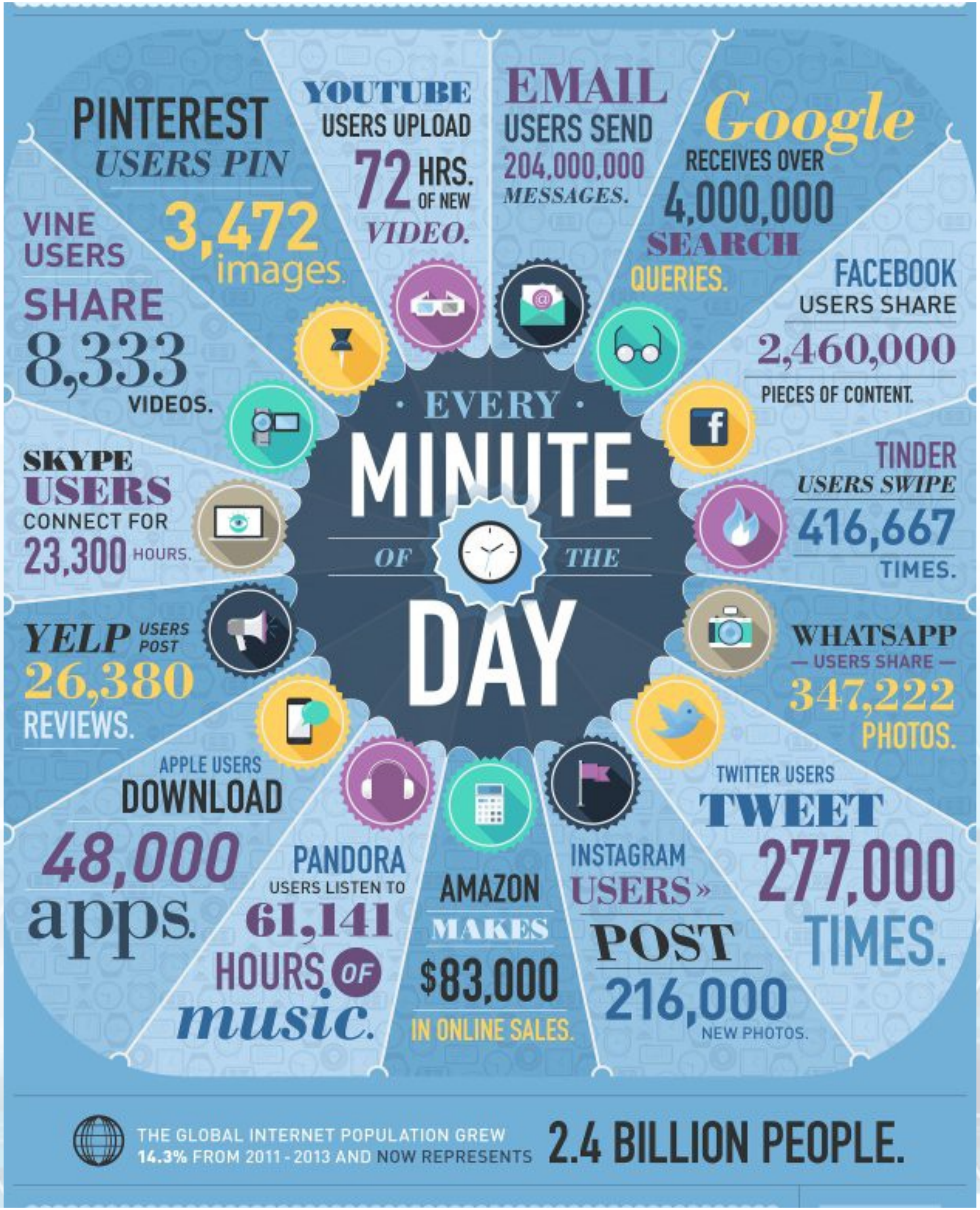
Digital Information Created Each Year, Globally

2,000%
Expected increase in global data by 2020

111 Megabytes
Video and photos stored by Facebook, per user

75%

50 Terabytes of data are created every second



· EVERY · MINUTE OF THE DAY

PINTEREST USERS PIN 3,472 images.

YOUTUBE USERS UPLOAD 72 HRS. OF NEW VIDEO.

EMAIL USERS SEND 204,000,000 MESSAGES.

Google RECEIVES OVER 4,000,000 SEARCH QUERIES.

FACEBOOK USERS SHARE 2,460,000 PIECES OF CONTENT.

TINDER USERS SWIPE 416,667 TIMES.

WHATSAPP — USERS SHARE — 347,222 PHOTOS.

TWITTER USERS TWEET 277,000 TIMES.

INSTAGRAM USERS » POST 216,000 NEW PHOTOS.

AMAZON MAKES $83,000 IN ONLINE SALES.

PANDORA USERS LISTEN TO 61,141 HOURS OF music.

APPLE USERS DOWNLOAD 48,000 apps.

YELP USERS POST 26,380 REVIEWS.

SKYPE USERS CONNECT FOR 23,300 HOURS.

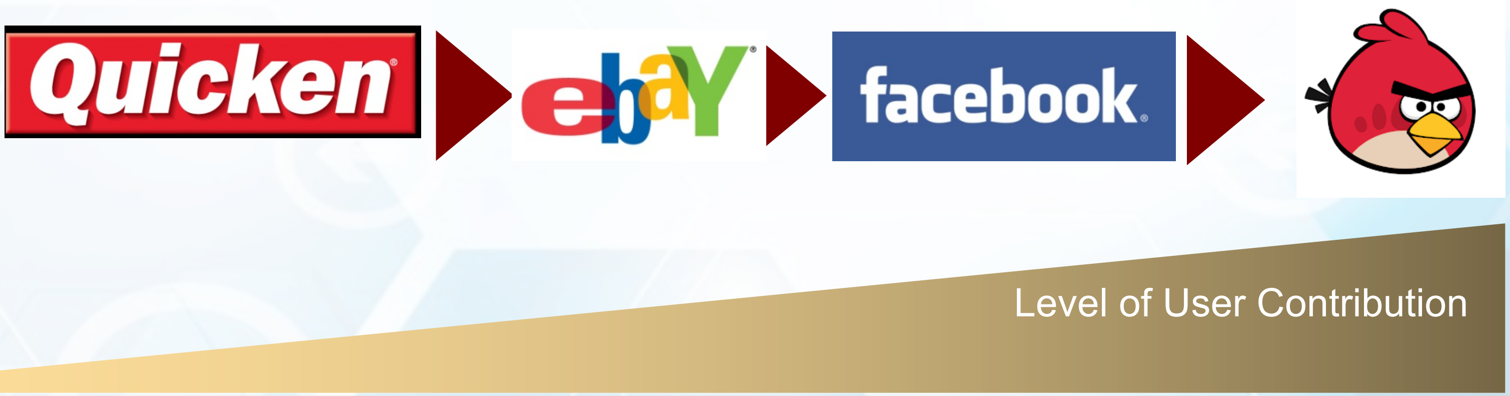
VINE USERS SHARE 8,333 VIDEOS.

THE GLOBAL INTERNET POPULATION GREW 14.3% FROM 2011 - 2013 AND NOW REPRESENTS 2.4 BILLION PEOPLE.

Trend: Need for Speed

Value Creation Shifts

Emerging companies highlight importance
of user contribution and social connectedness



Level of User Contribution

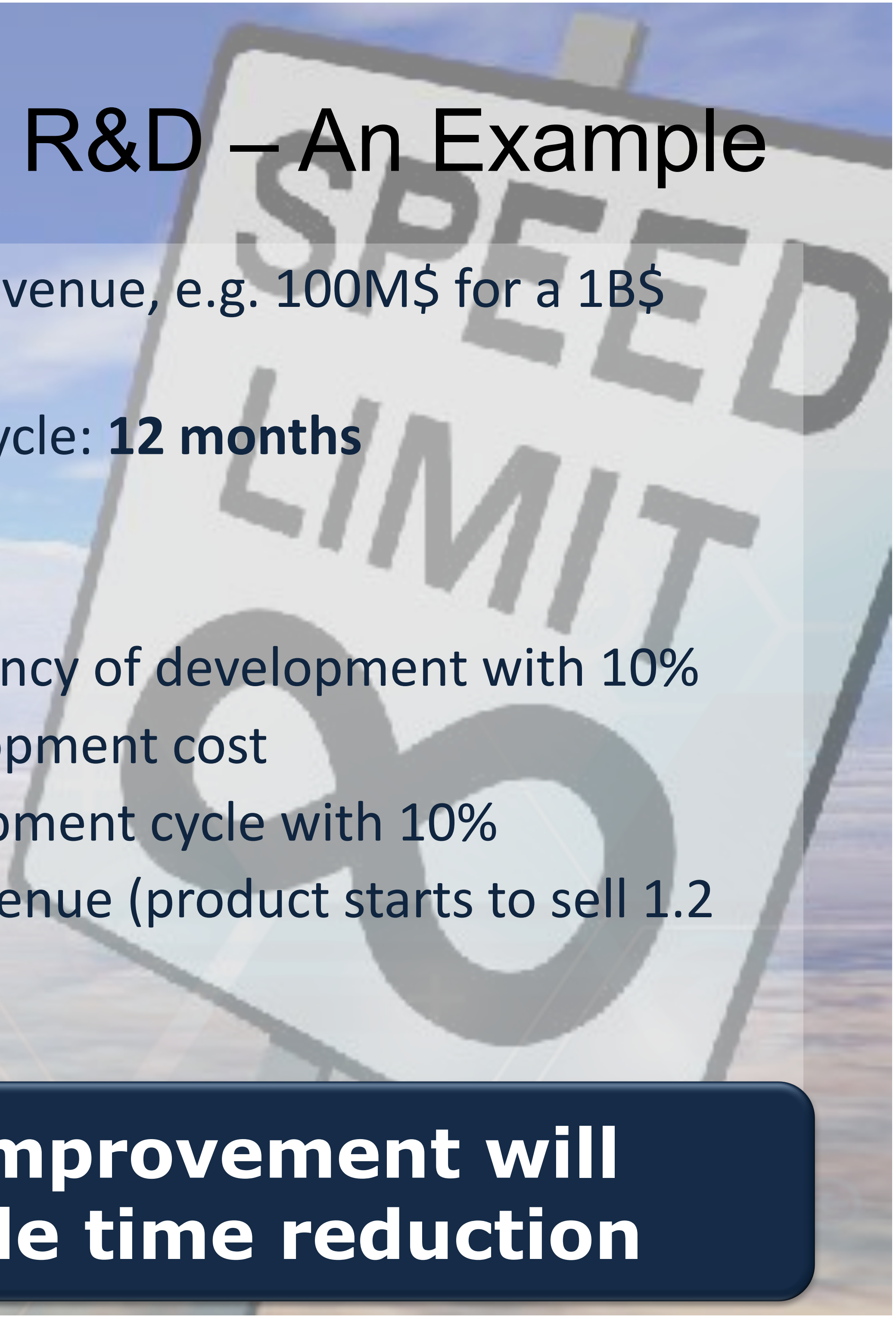
Founded	1984	1995	2004	2009
1M users	~6 years	30 months	10 months	?
50M users	N/A	~80 months	~44 months	~ 1 month

Need for Speed in R&D – An Example

- Company X: R&D is **10%** of revenue, e.g. 100M$ for a 1B$ product
- New product development cycle: **12 months**

- Alternative 1: improve efficiency of development with 10%
  - **10 M$** reduction in development cost
- Alternative 2: reduce development cycle with 10%
  - **100M$** add to top line revenue (product starts to sell 1.2 months earlier)

No efficiency improvement will outperform cycle time reduction



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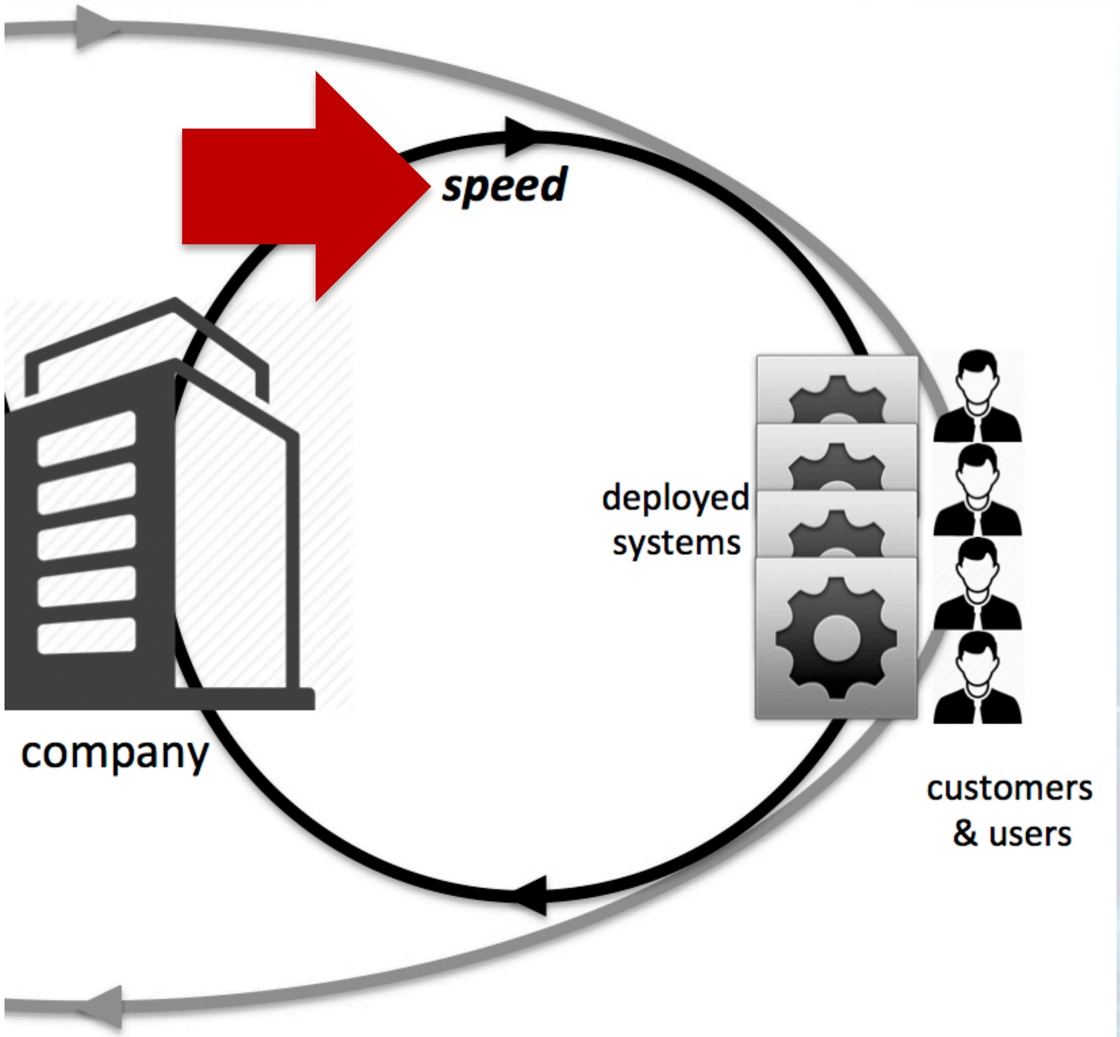
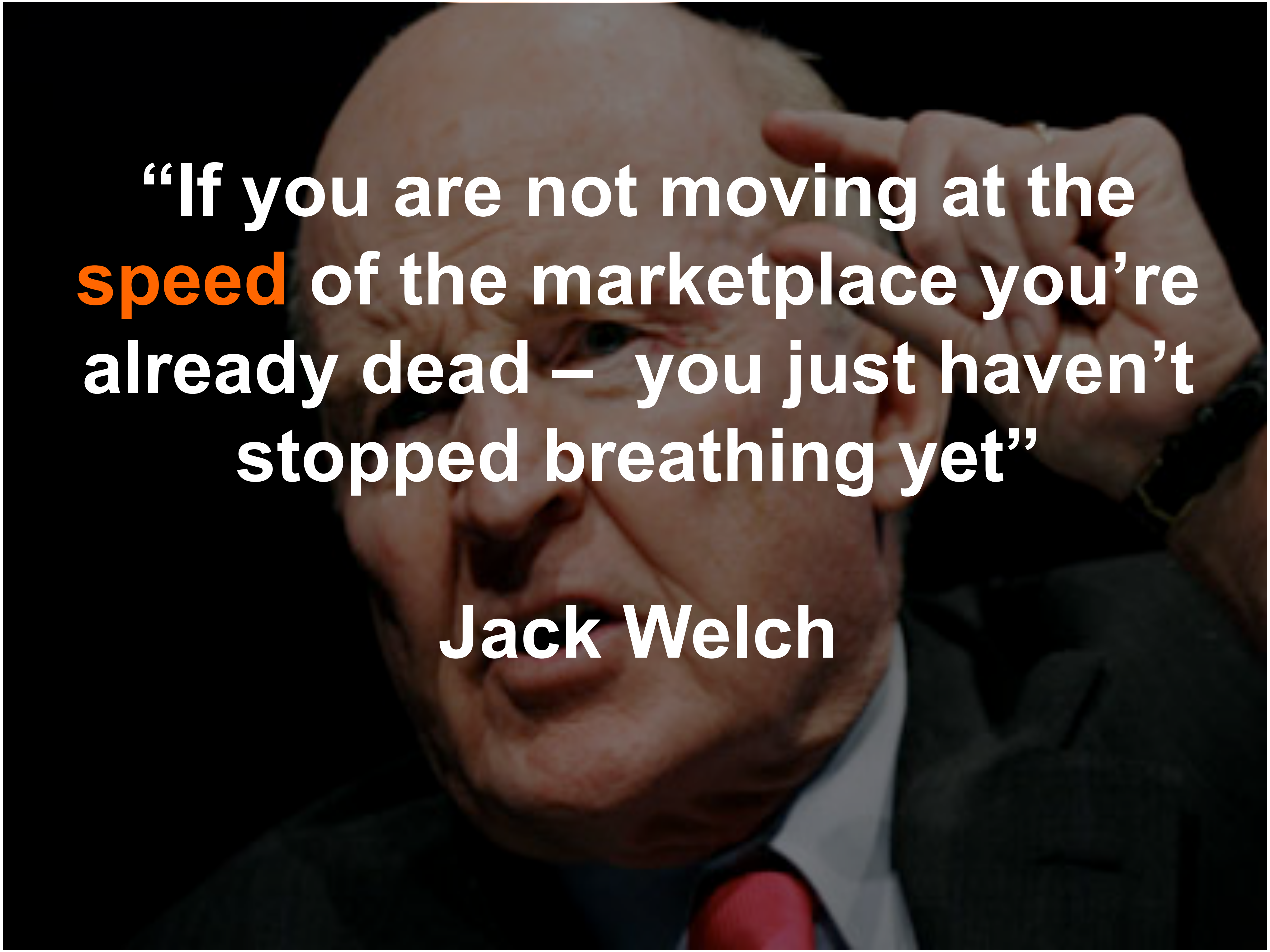
Stairway to Heaven 2.0

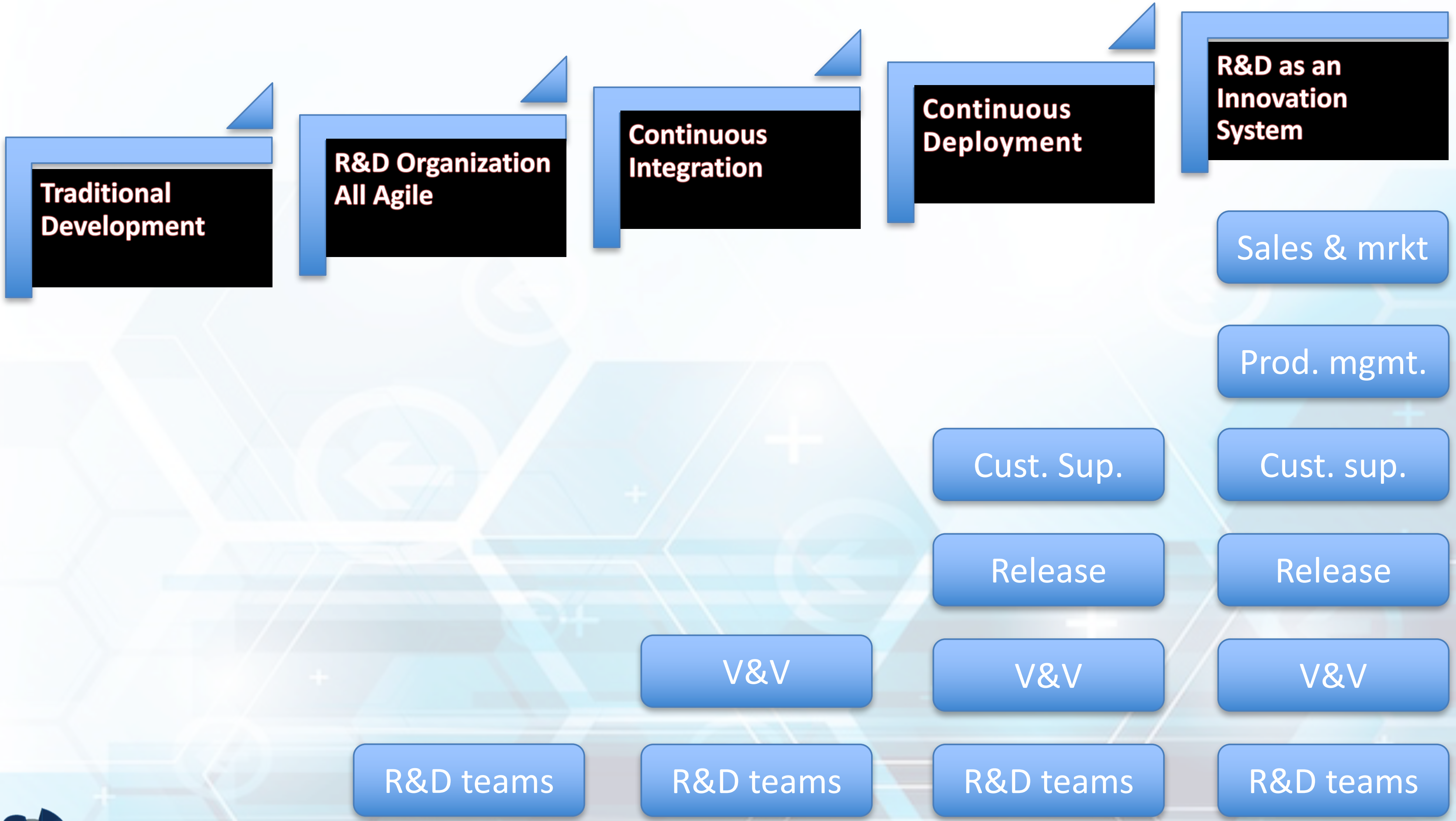




“If you are not moving at the speed of the marketplace you’re already dead – you just haven’t stopped breathing yet”

Jack Welch

Stairway to Heaven: Speed



Traditional Development

R&D Organization All Agile

Continuous Integration

Continuous Deployment

R&D as an Innovation System

Sales & mrkt

Prod. mgmt.

Cust. Sup.

Cust. sup.

Release

Release

V&V

V&V

V&V

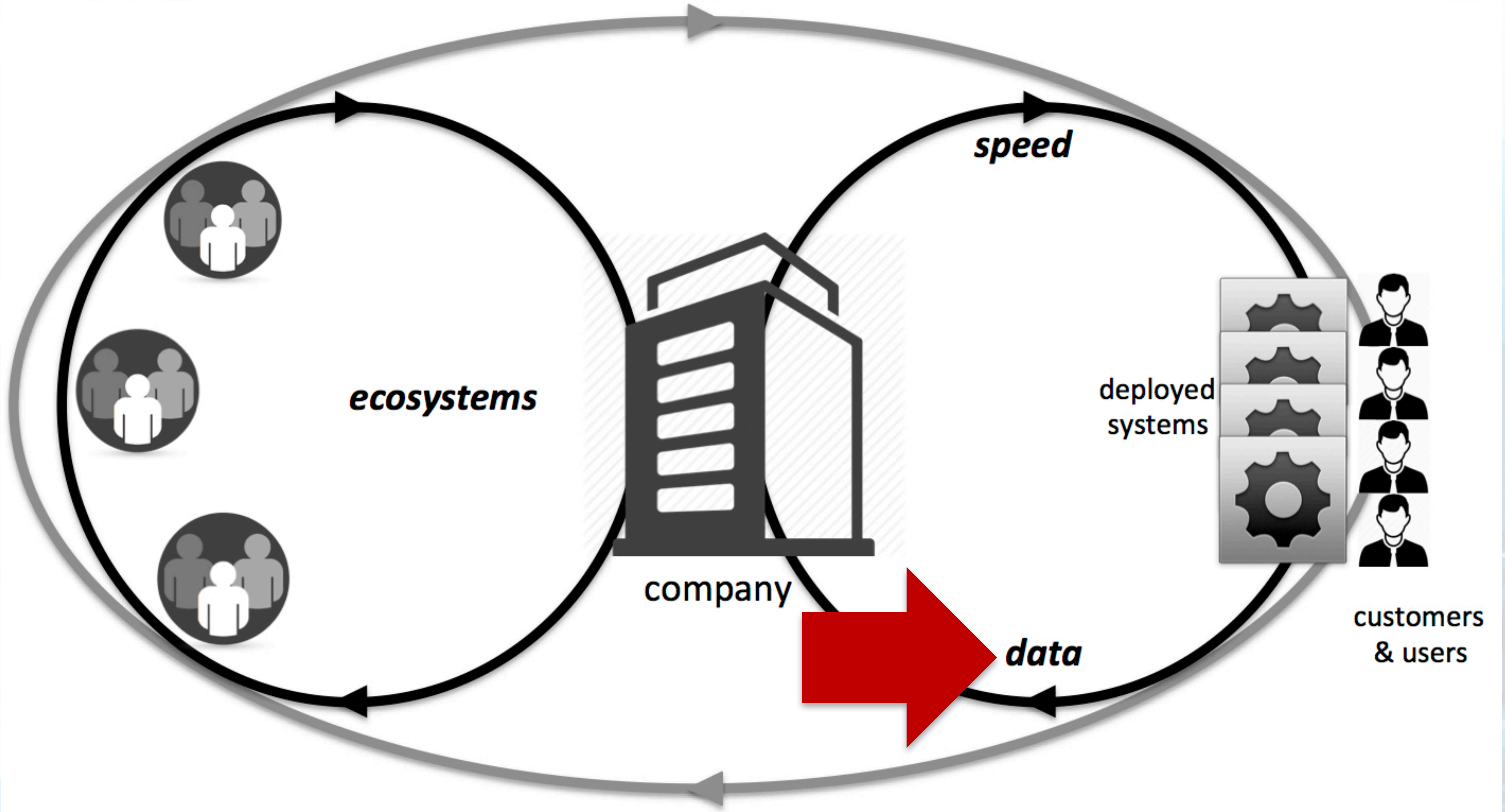
R&D teams

R&D teams

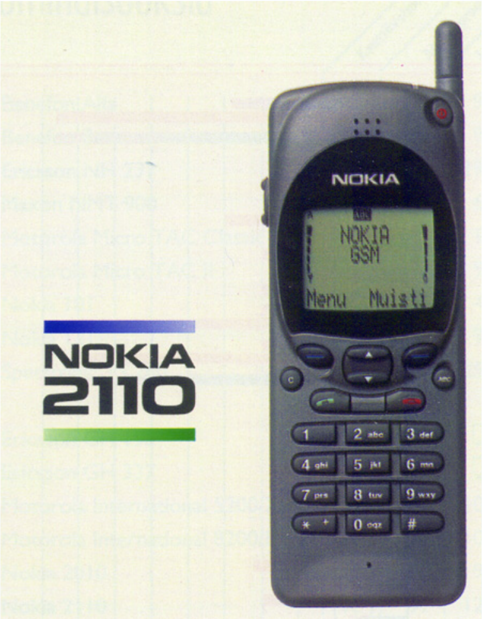
R&D teams

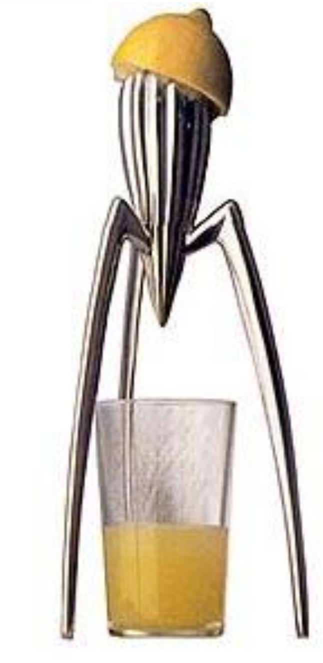
R&D teams

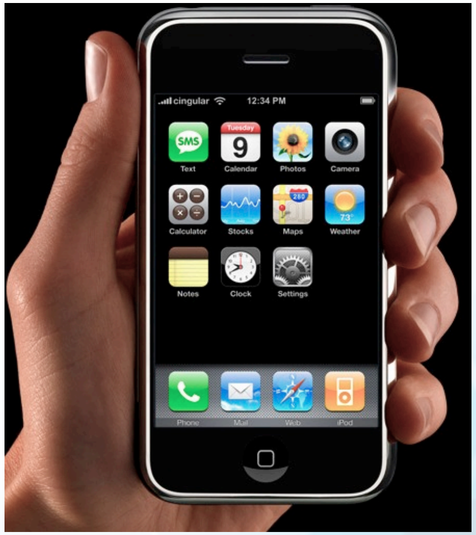
Stairway to Heaven 2.0

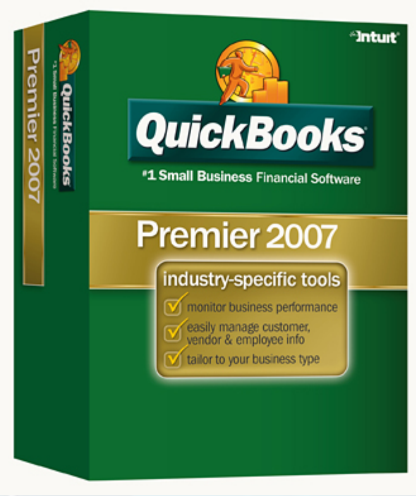


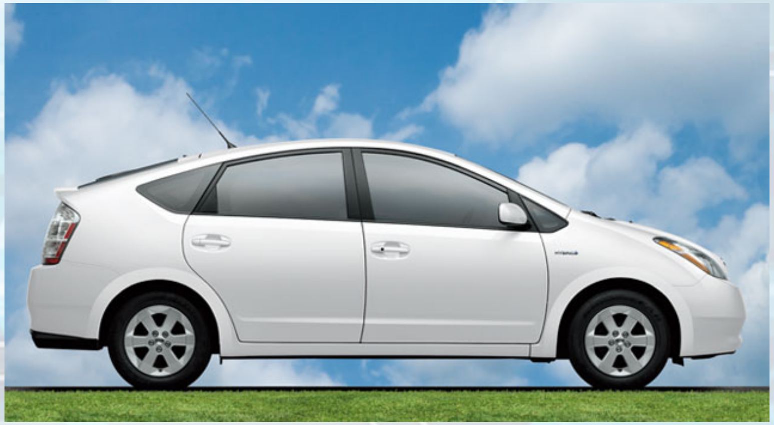
What Do These Product Have in Common?








Intuit
QuickBooks
#1 Small Business Financial Software
Premier 2007
industry-specific tools
monitor business performance
easily manage customer, vendor & employee info
tailor to your business type
Premier 2007
QuickBooks



Example: Apple

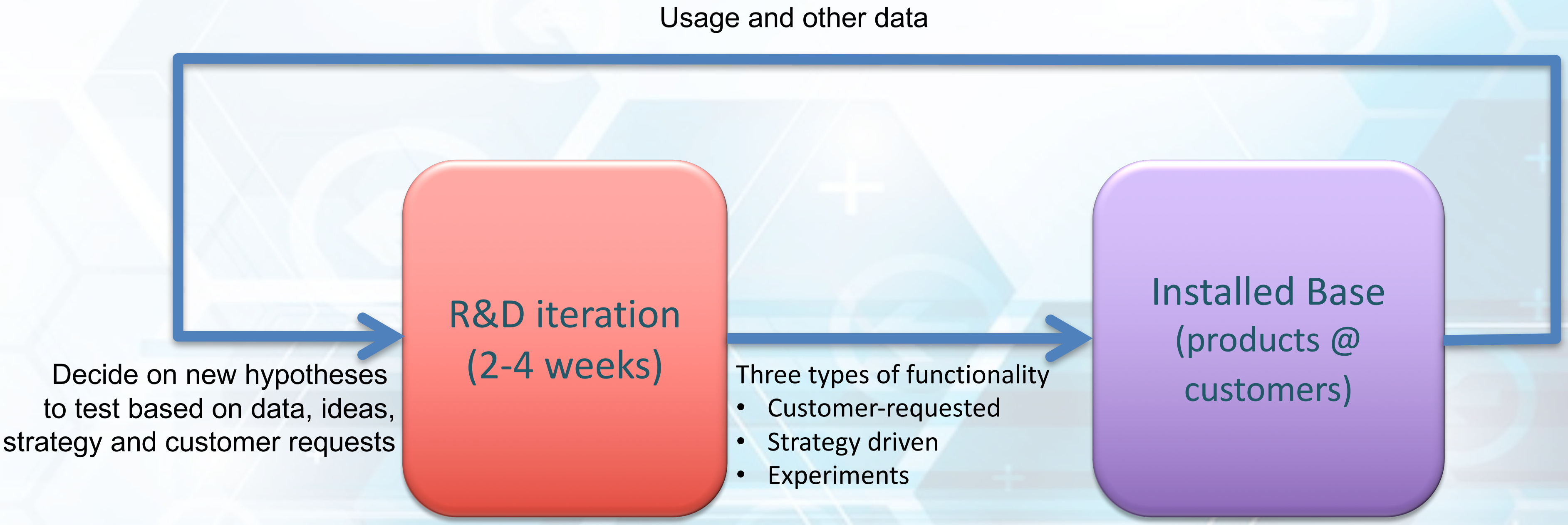
The Myth	The Reality
Inspired innovation	Create and winnow 10 pixel-perfect prototypes
Inspired design	Build a better backstory (intricate layers of business design behind the products)
Brilliantly inspired marketing	Engineer the perfect customer experience to create customer experience and buzz

Reference: http://blogs.hbr.org/cs/2011/08/steve_jobs_and_the_myth_of_eur.html

R&D as an Experiment System

Learning: the company running the most experiments against the lowest cost per experiment wins

Goal: increase the number of experiments (with customers) with an order of magnitude to ultimately accelerate organic growth



Usage and other data

R&D iteration (2-4 weeks)

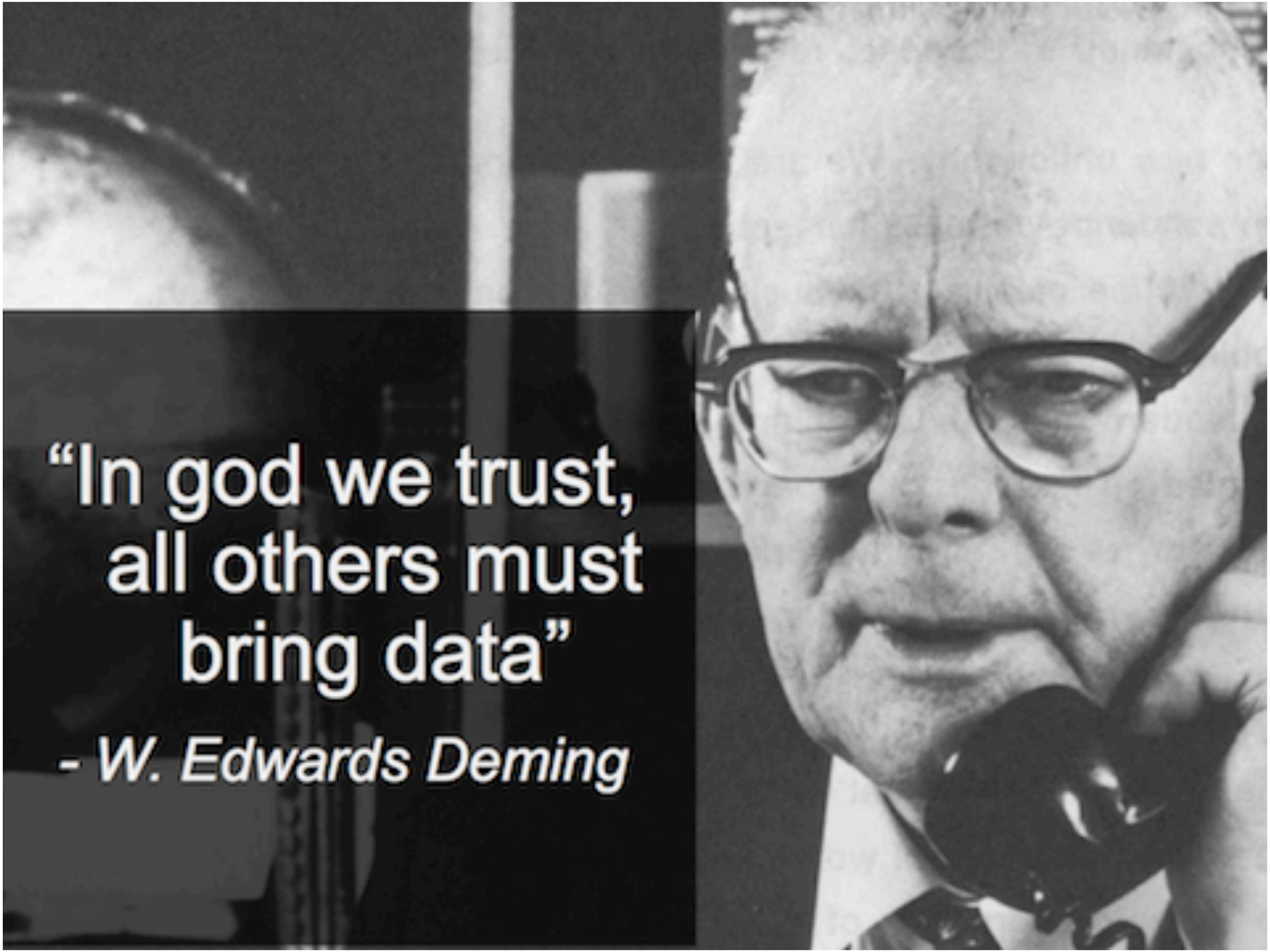
Installed Base (products @ customers)

Decide on new hypotheses to test based on data, ideas, strategy and customer requests

Three types of functionality

- Customer-requested
- Strategy driven
- Experiments

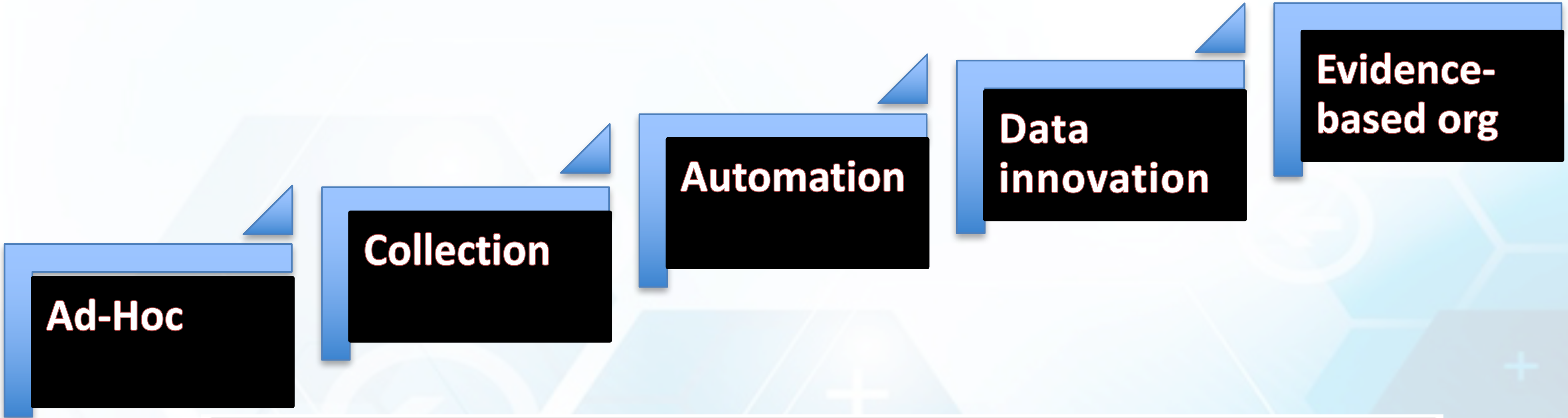
Decisions should be based on DATA, not opinions



“In god we trust, all others must bring data”

- *W. Edwards Deming*

Stairway to Heaven: Data



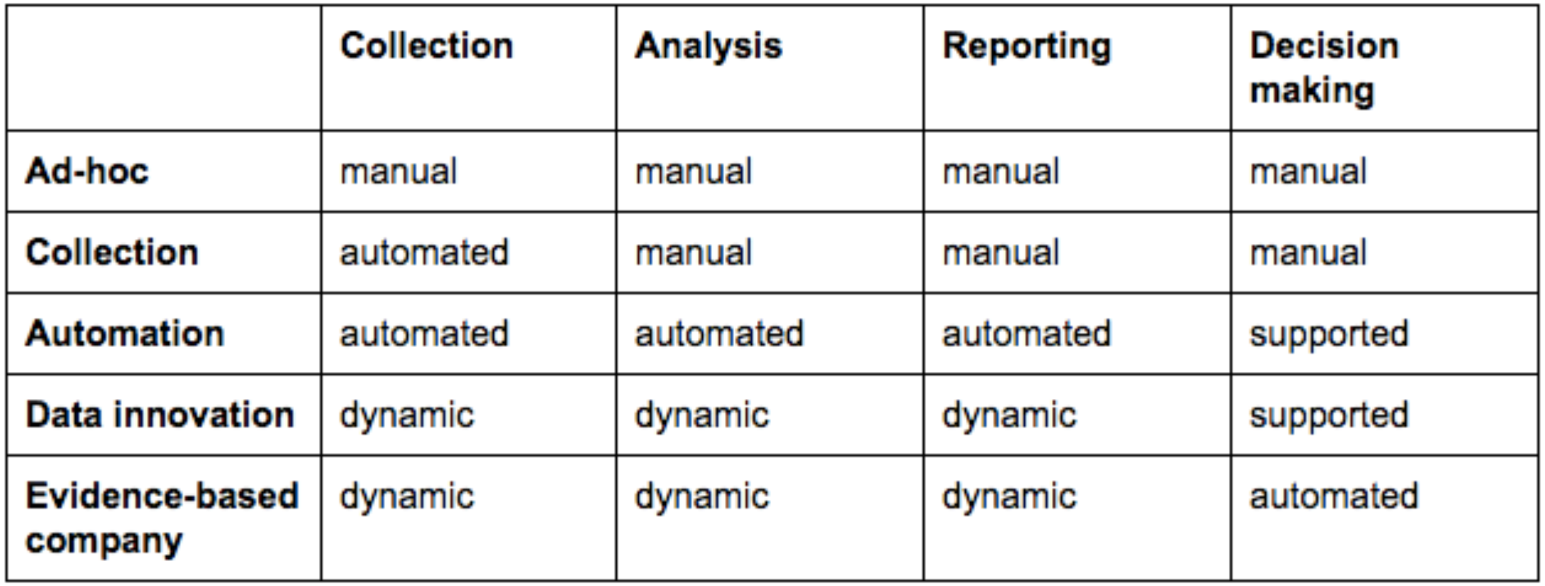
Ad-Hoc

Collection

Automation

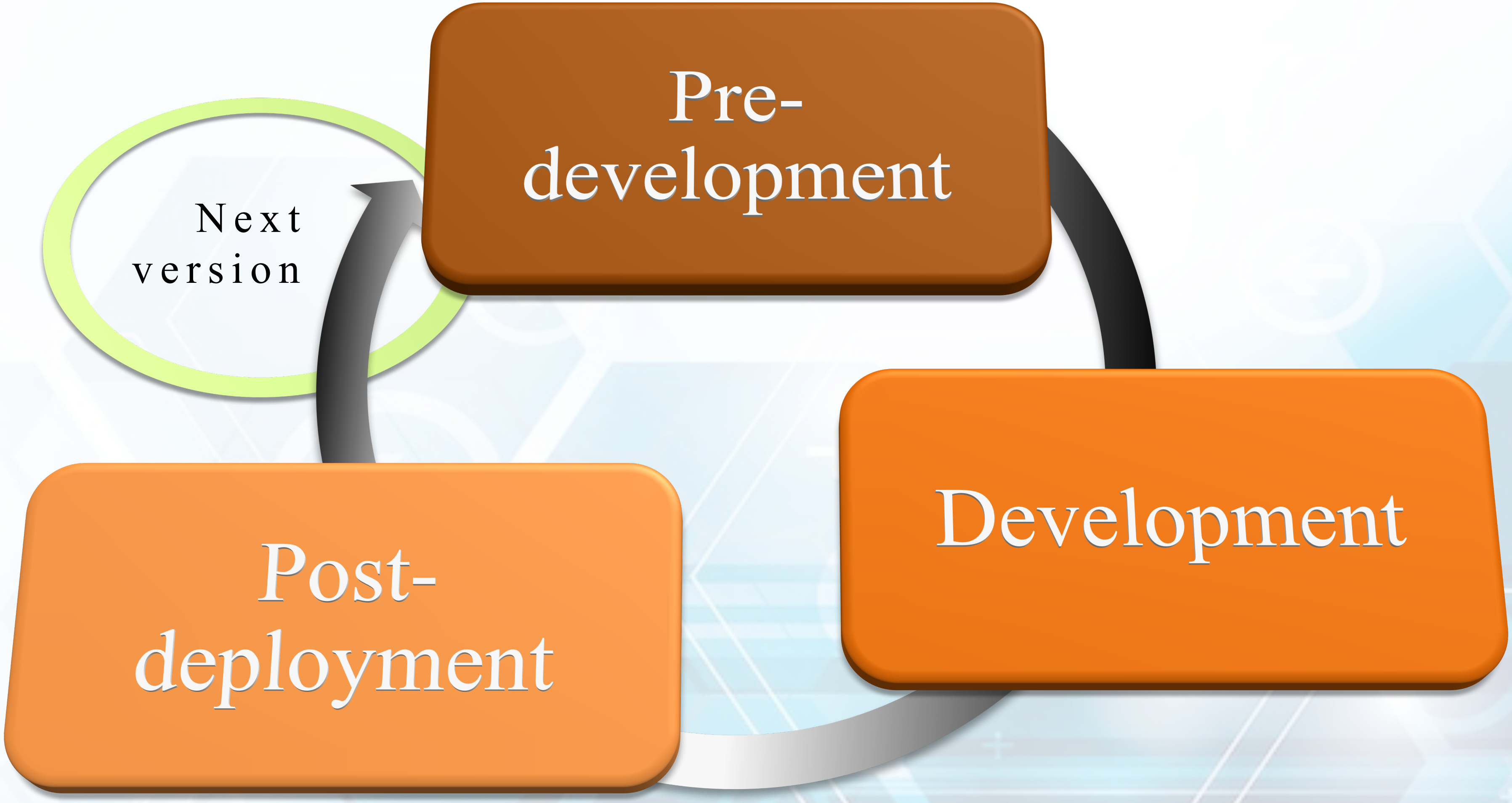
Data innovation

Evidence-based org



	Collection	Analysis	Reporting	Decision making
Ad-hoc	manual	manual	manual	manual
Collection	automated	manual	manual	manual
Automation	automated	automated	automated	supported
Data innovation	dynamic	dynamic	dynamic	supported
Evidence-based company	dynamic	dynamic	dynamic	automated

In Practice: Slow Feedback Loops



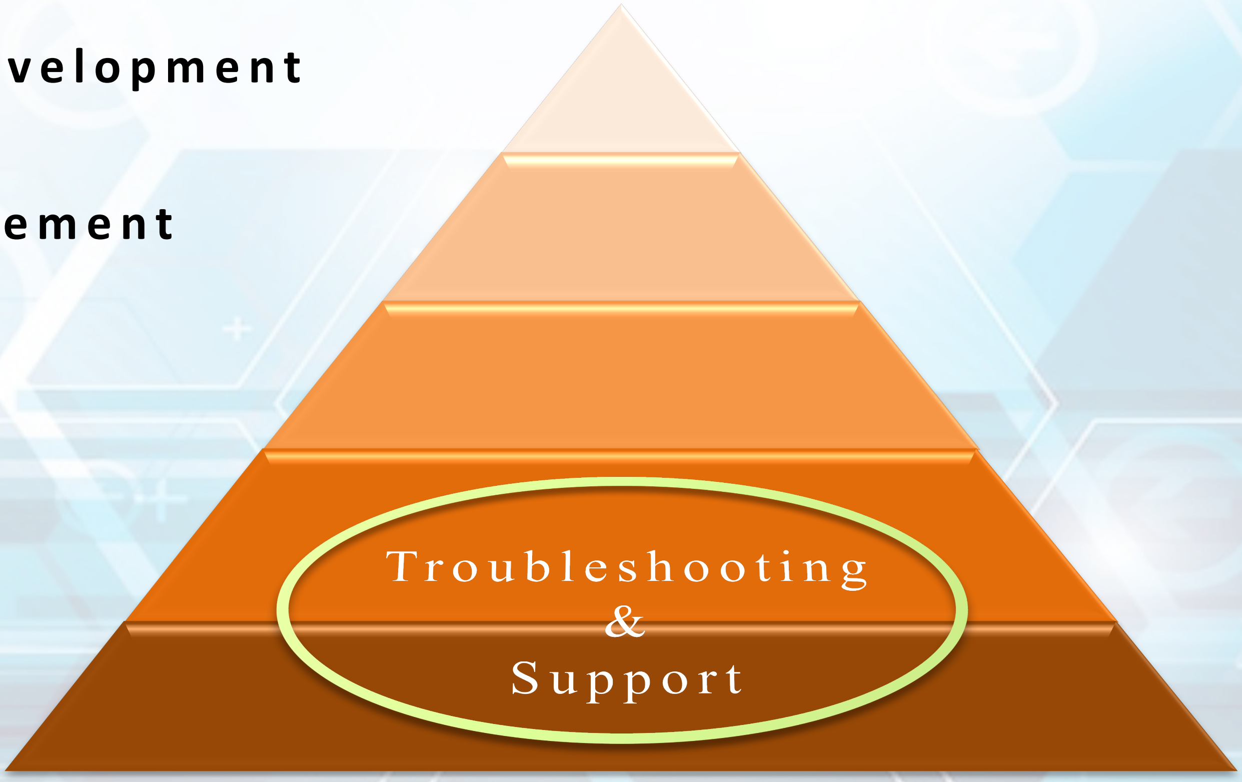
Pre-development

Development

Post-deployment

Next version

In Practice: Limited Use of Data



New feature development

Feature improvement

Feature usage

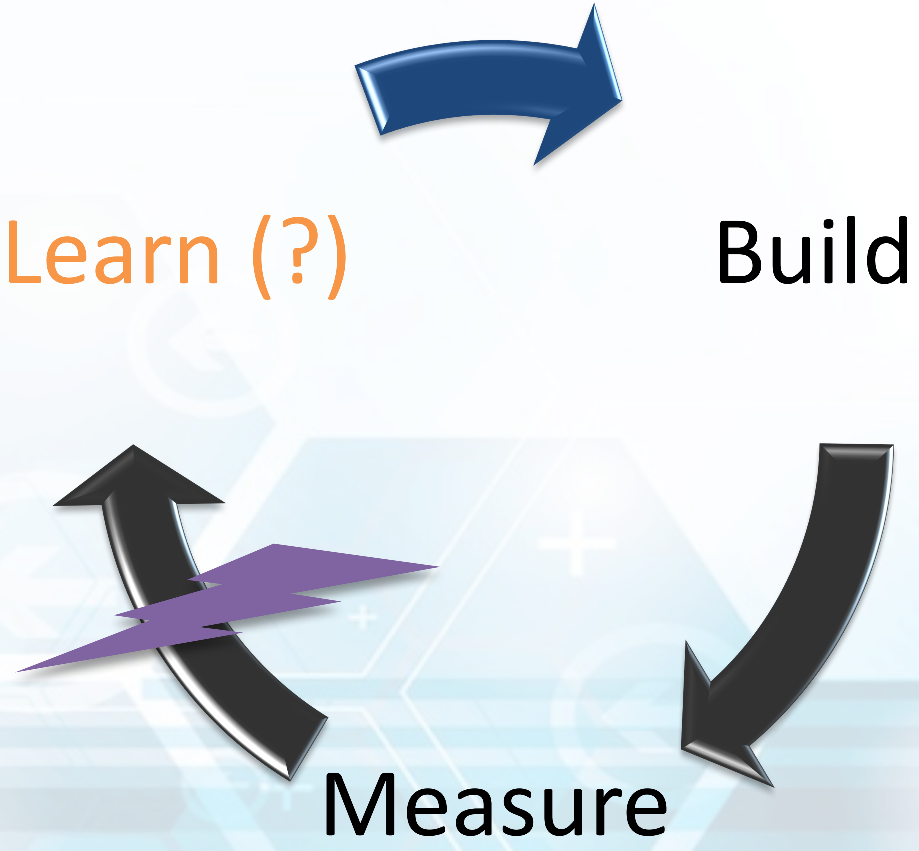
Diagnostics

Operation

In Practice: The ’Open Loop’ Problem

Weak link to PM decision-making and feature prioritisation.

- Are the prioritised features used by customers?
- Are the prioritised features generating revenue?



Technology-driven feature development.

- Difficulties in building smaller increments.
- Difficulties deploying early to customers.

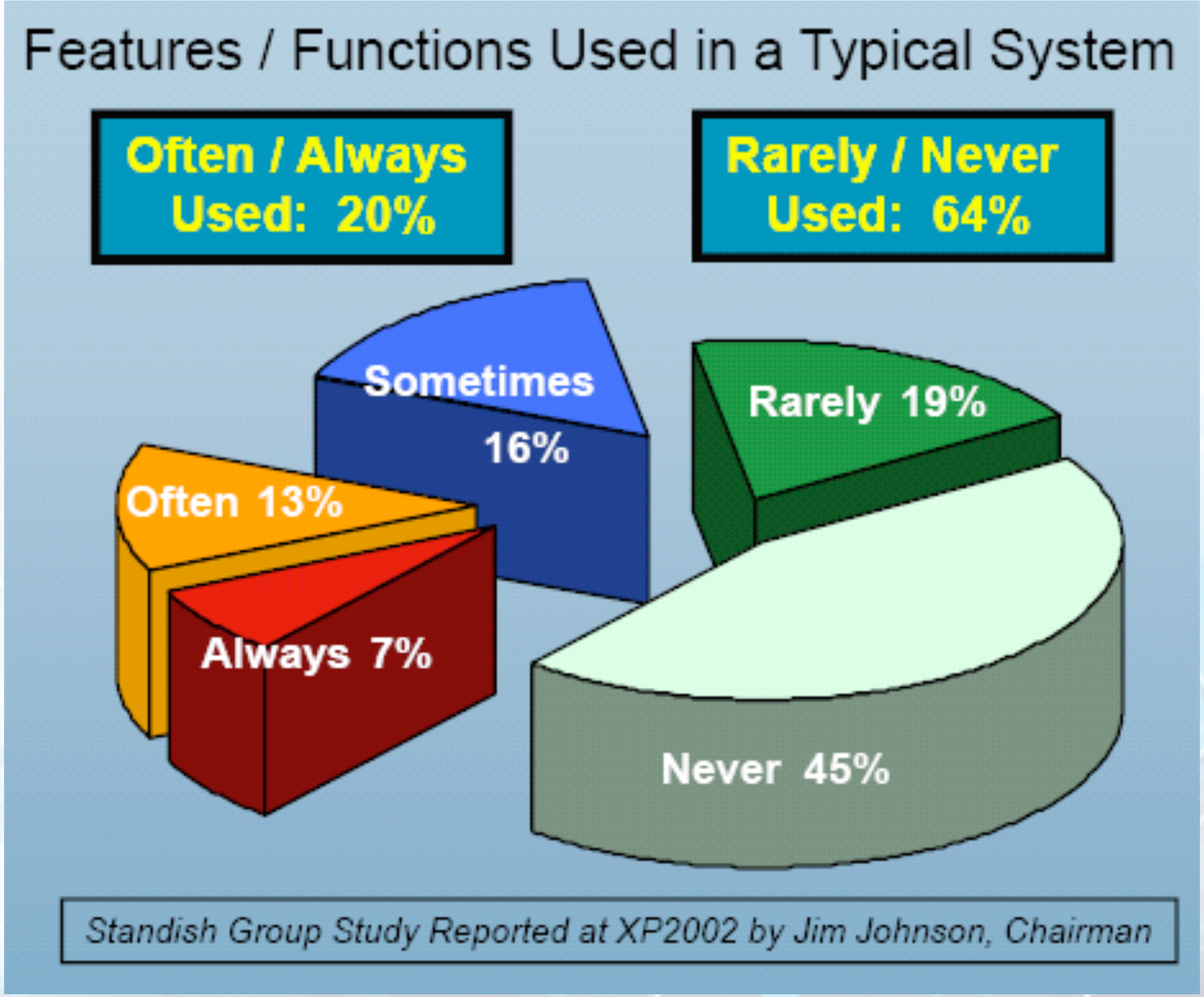
High-level system measurements.

- Limited metrics on feature level.
- Inability to track feature use.

Interview Quotes

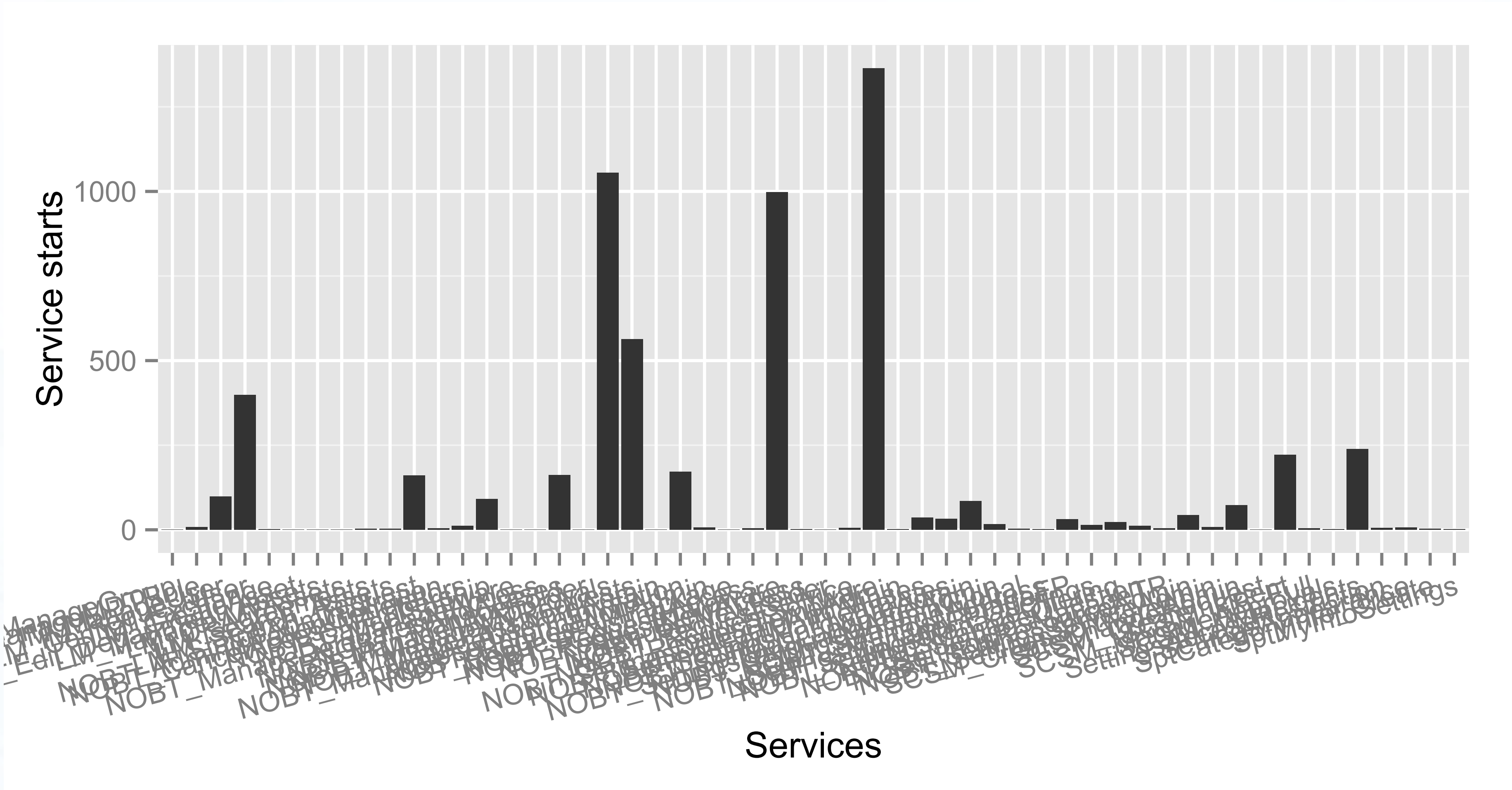
- ”We DON’T know what features our customers use”.
- ”We have an idea on what functionality that is used…based on sales…but we DON’T really know…”.
- ”We can see some of the functionality that is used, but we CAN’T see how it is used”.
- ”Our development is affected in that we DON’T know what customers want”.
- ”We get feedback only on things that DON’T work…things that are problemtic. This is not necessarily an indication of what is used the most…”.
- ”Does silence mean that things are OK? We DON’T know…”.

"Featuritis"



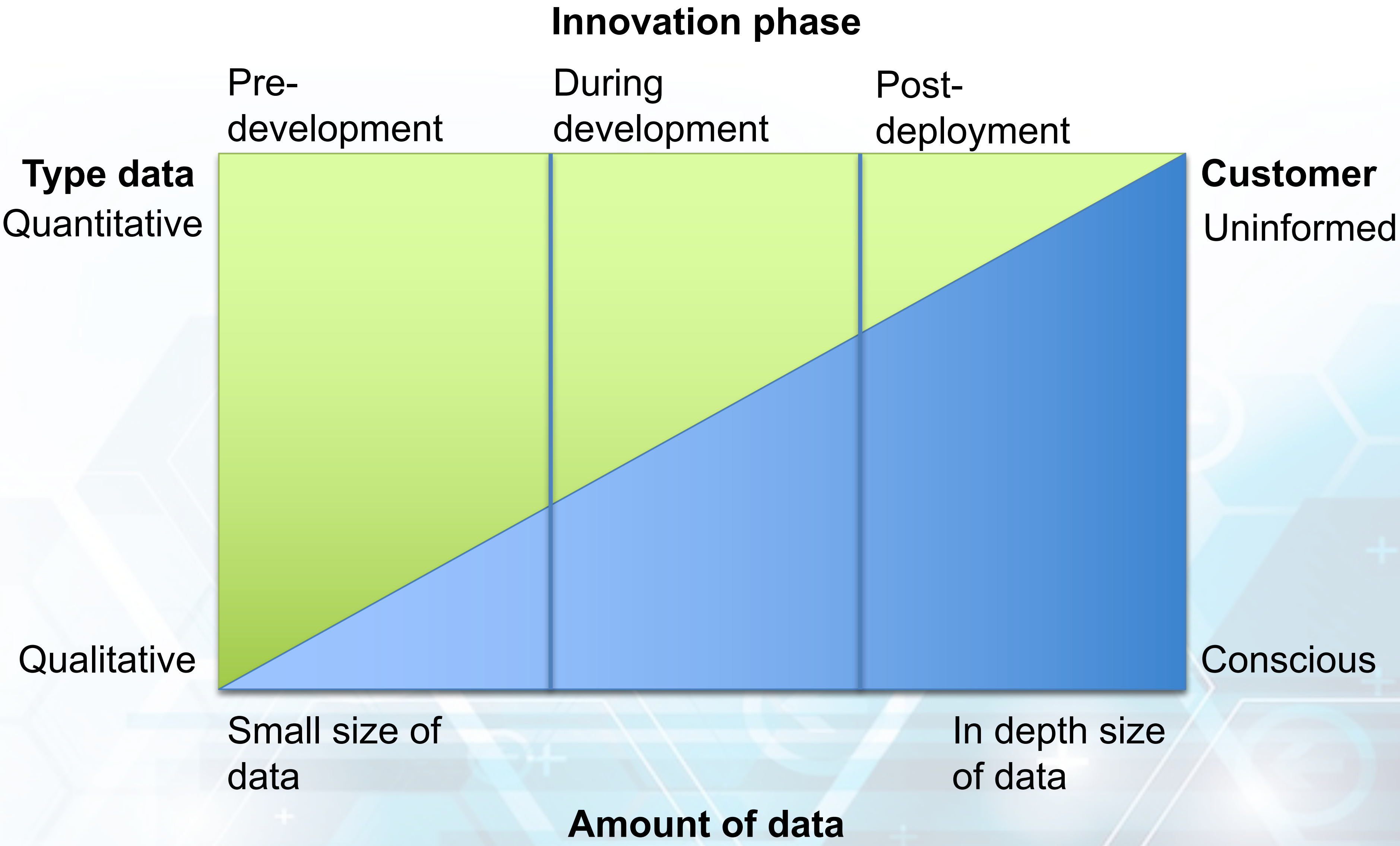
Standish Group Study Reported at XP2002 by Jim Johnson, Chairman

Our Research …



Stages and Techniques

	Pre-Development	During development	Post deployment
Optimization	Ethnographic studies	Independently deployed extensions	Random selection of versions (A/B testing)
New features	Solution jams	Feature alpha In-product surveys	Instrumentation/ collecting metrics
New Products	Advertising Mock-ups BASES testing	Product alpha Labs website In-product advertising	Surveys Performance metrics



Innovation phase

Pre-development

During development

Post-deployment

Type data

Quantitative

Qualitative

Customer

Uninformed

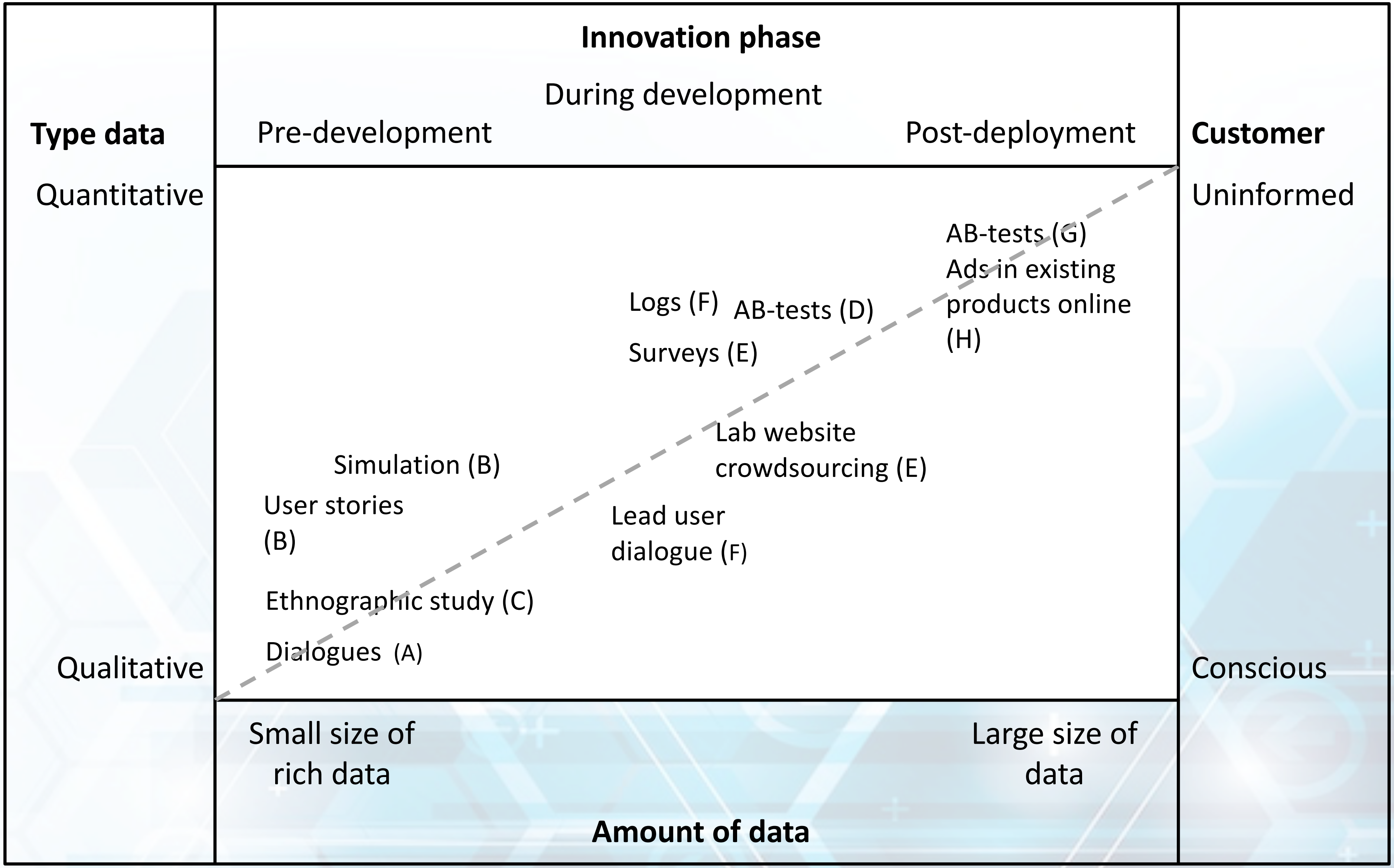
Conscious

Small size of data

In depth size of data

Amount of data

Source: Bosch-Sijtsema & Bosch, 2015



Innovation phase

Pre-development

During development

Post-deployment

Type data

Quantitative

Qualitative

Customer

Uninformed

Conscious

AB-tests (G)

Ads in existing products online (H)

Logs (F)

AB-tests (D)

Surveys (E)

Lab website crowdsourcing (E)

Simulation (B)

User stories (B)

Lead user dialogue (F)

Ethnographic study (C)

Dialogues (A)

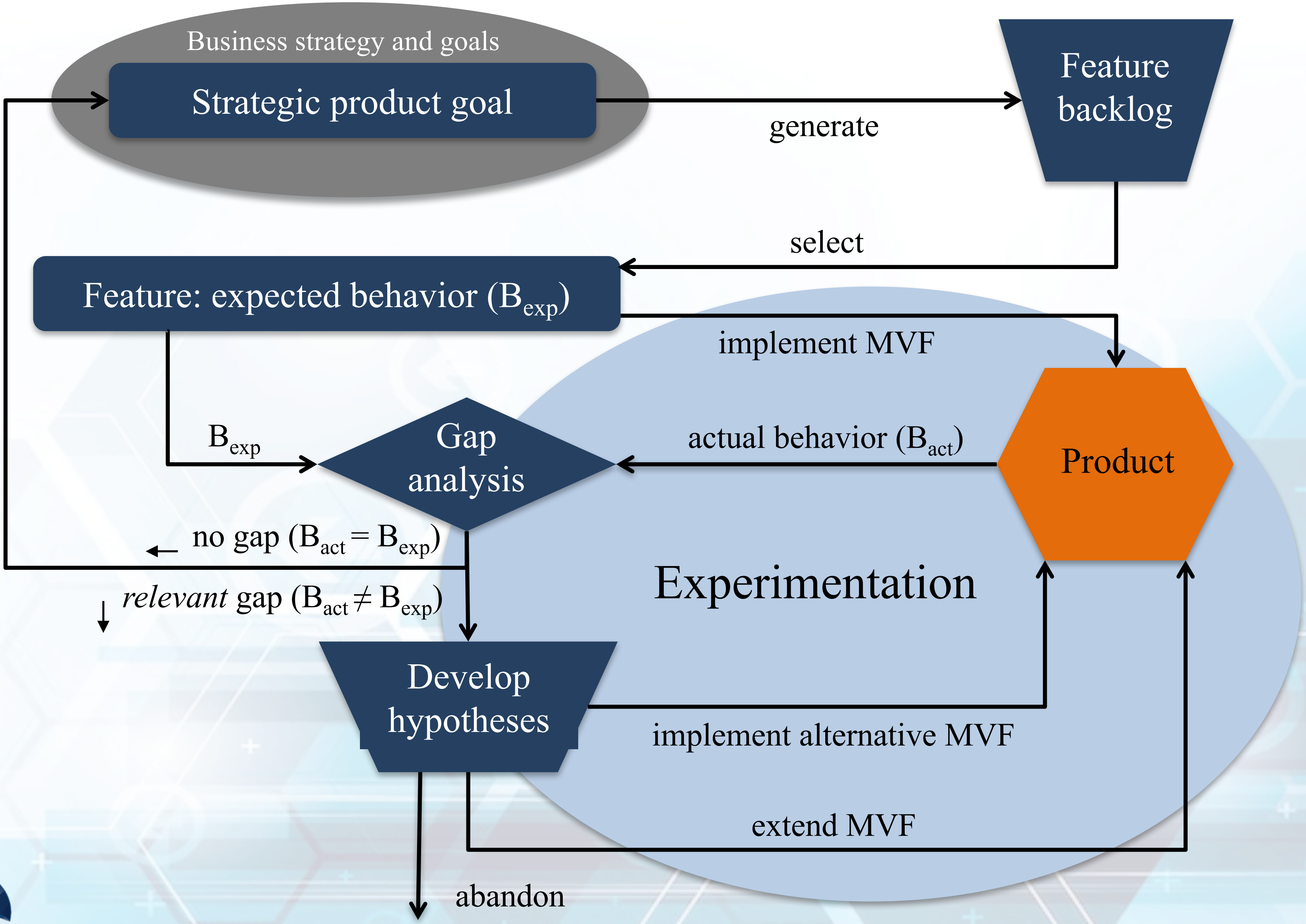
Small size of rich data

Large size of data

Amount of data

Source: Bosch-Sijtsema & Bosch, 2015

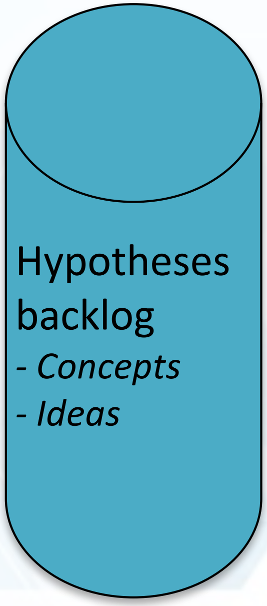
The HYPEX Model


Business strategy and goals
Strategic product goal
generate
Feature backlog
select
Feature: expected behavior (B_{exp})
implement MVF
B_{exp}
Gap analysis
actual behavior (B_{act})
Product
no gap ($B_{act} = B_{exp}$)
relevant gap ($B_{act} \neq B_{exp}$)
Experimentation
Develop hypotheses
implement alternative MVF
extend MVF
abandon

The QCD model: Qualitative/quantitative Customer-driven Development

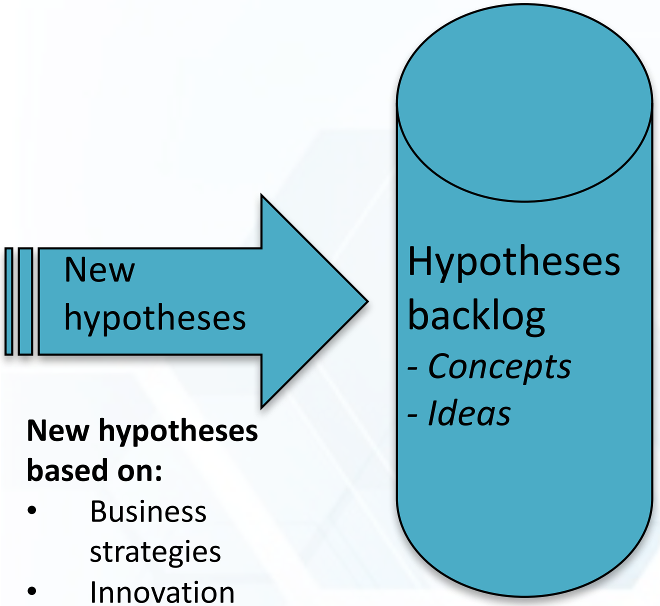
- Emphasizes the need for combining qualitative feedback with quantitative customer observation.
- Requirements are treated as hypotheses that are continuoulsly validated with customers.
- The validation data is used to decide whether to run another validation cycle, whether to have the hypothesis put back into the backlog, or whether to abandon the hypothesis.
- Allows for continuous re-prioritization of feature content.
- Could be used to better understand the content of large amounts ofquantitative data, and/or to validate qualitative data with a large customer base.

Not Requirements; Hypotheses



Hypotheses backlog

- *Concepts*
- *Ideas*



New hypotheses

Hypotheses backlog

- *Concepts*
- *Ideas*

New hypotheses based on:

- Business strategies
- Innovation initiatives
- Qualitative customer feedback
- Quantitative customer feedback
- Results from QCD cycles

Product R&D organisation

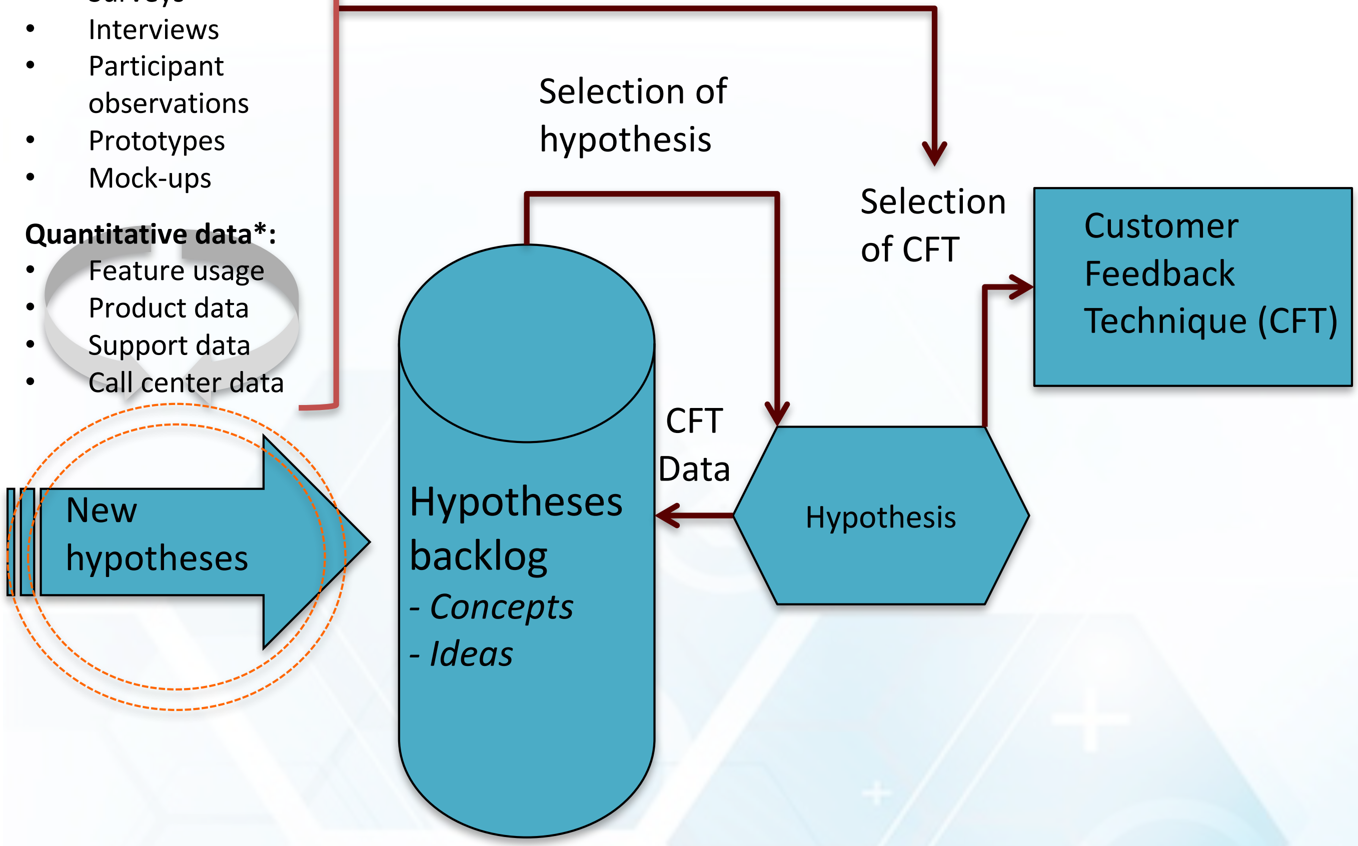
Customer Feedback Techniques (CFT):

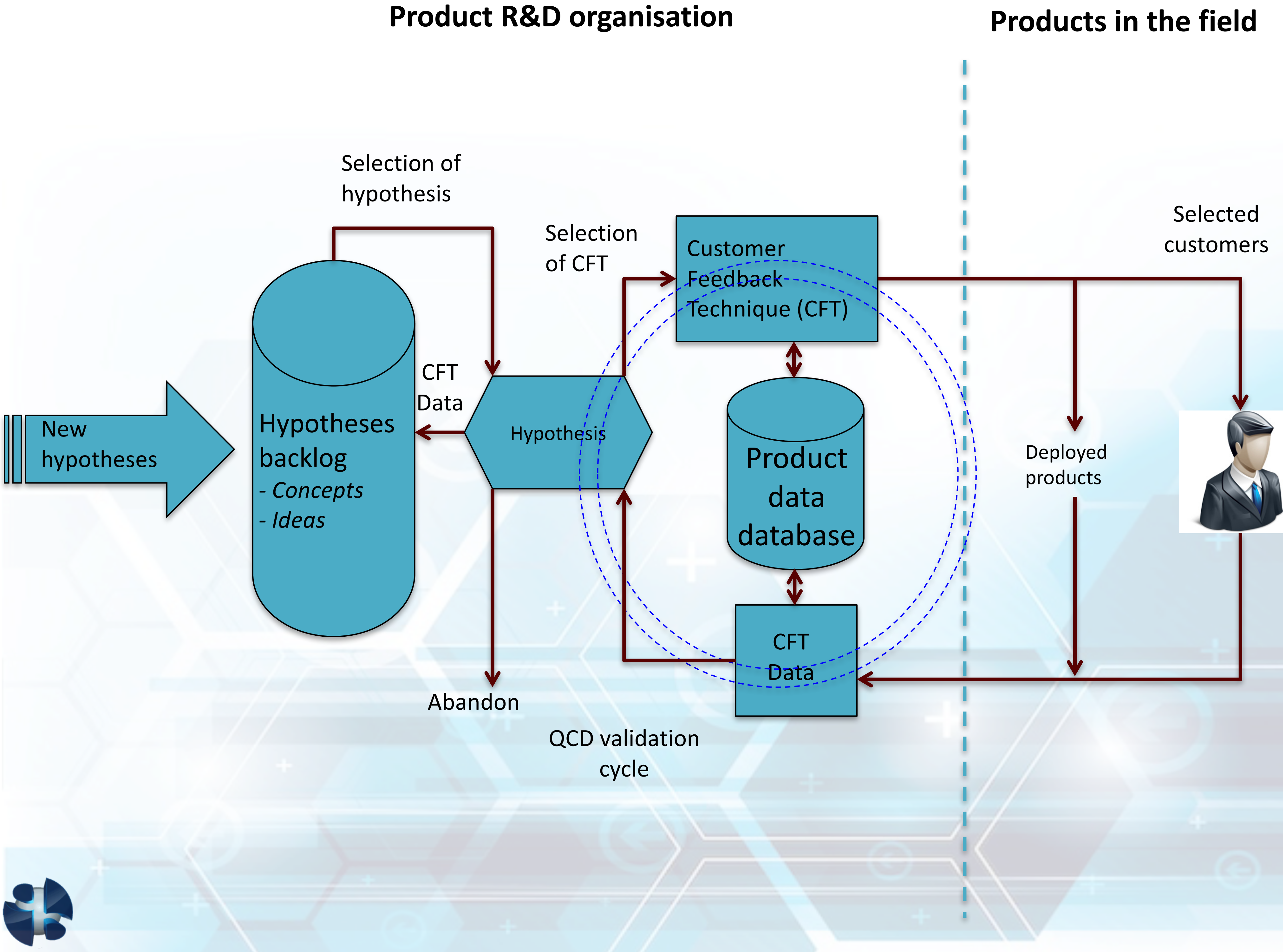
Qualitative data:

- Surveys
- Interviews
- Participant observations
- Prototypes
- Mock-ups

Quantitative data*:

- Feature usage
- Product data
- Support data
- Call center data





Product R&D organisation
Products in the field
Selection of hypothesis
Selection of CFT
Customer Feedback Technique (CFT)
Selected customers
New hypotheses
Hypotheses backlog
- Concepts
- Ideas
CFT Data
Hypothesis
Product data database
Deployed products
Abandon
CFT Data
QCD validation cycle

Product R&D organisation

Products in the field

Customer Feedback Techniques (CFT):

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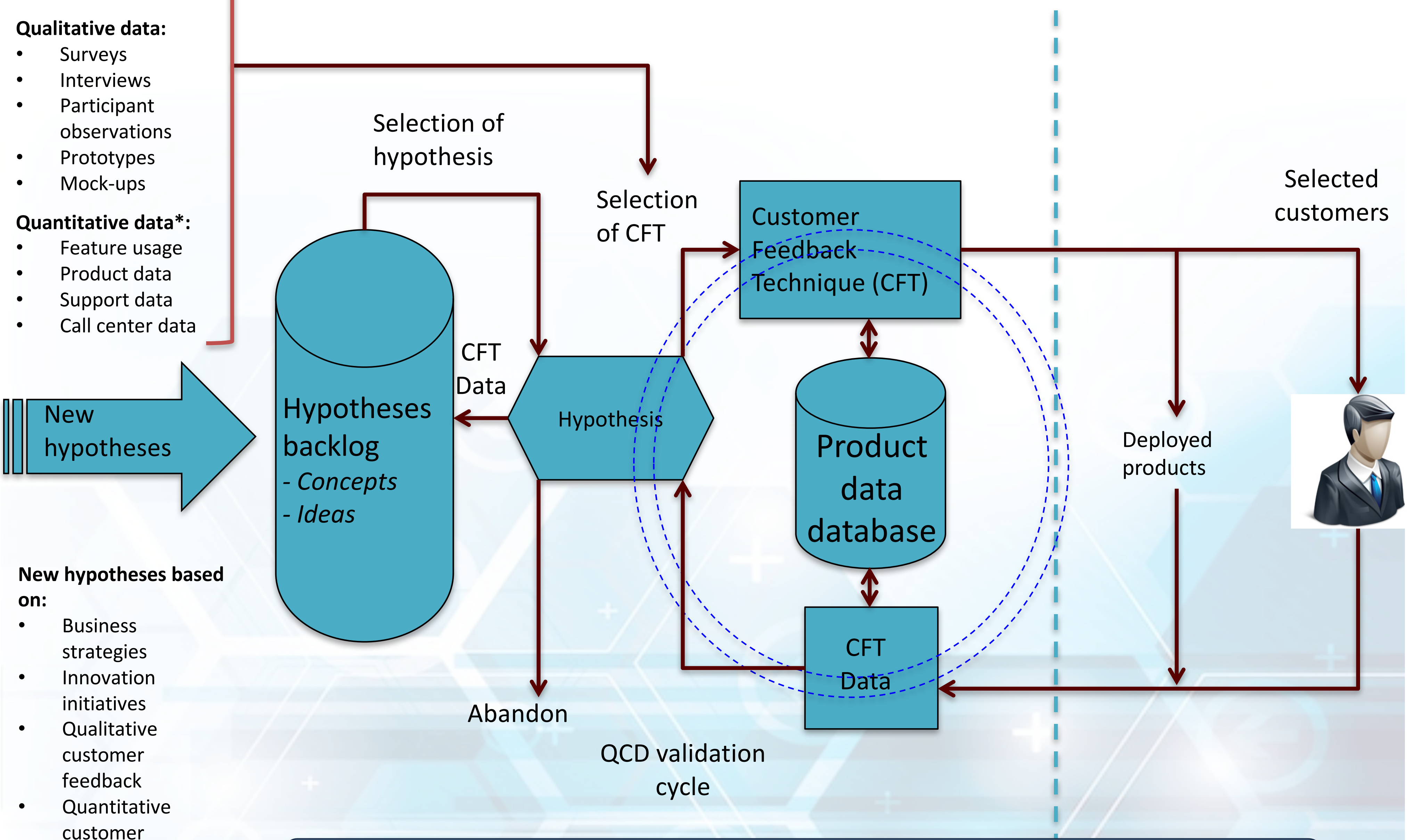


New hypotheses

Hypotheses backlog

- Concepts

- Ideas

Selection of hypothesis

Selection of CFT

CFT Data

Hypothesis

Customer Feedback Technique (CFT)

Product data database

CFT Data

Abandon

QCD validation cycle

Selected customers

Deployed products

New hypotheses based on:

- Business strategies
- Innovation initiatives
- Qualitative customer feedback
- Quantitative customer feedback
- Results from QCD cycles

Continuous prioritization of hypotheses!

Loop in which decisions are taken on whether to do more qualitative customer feedback collection.

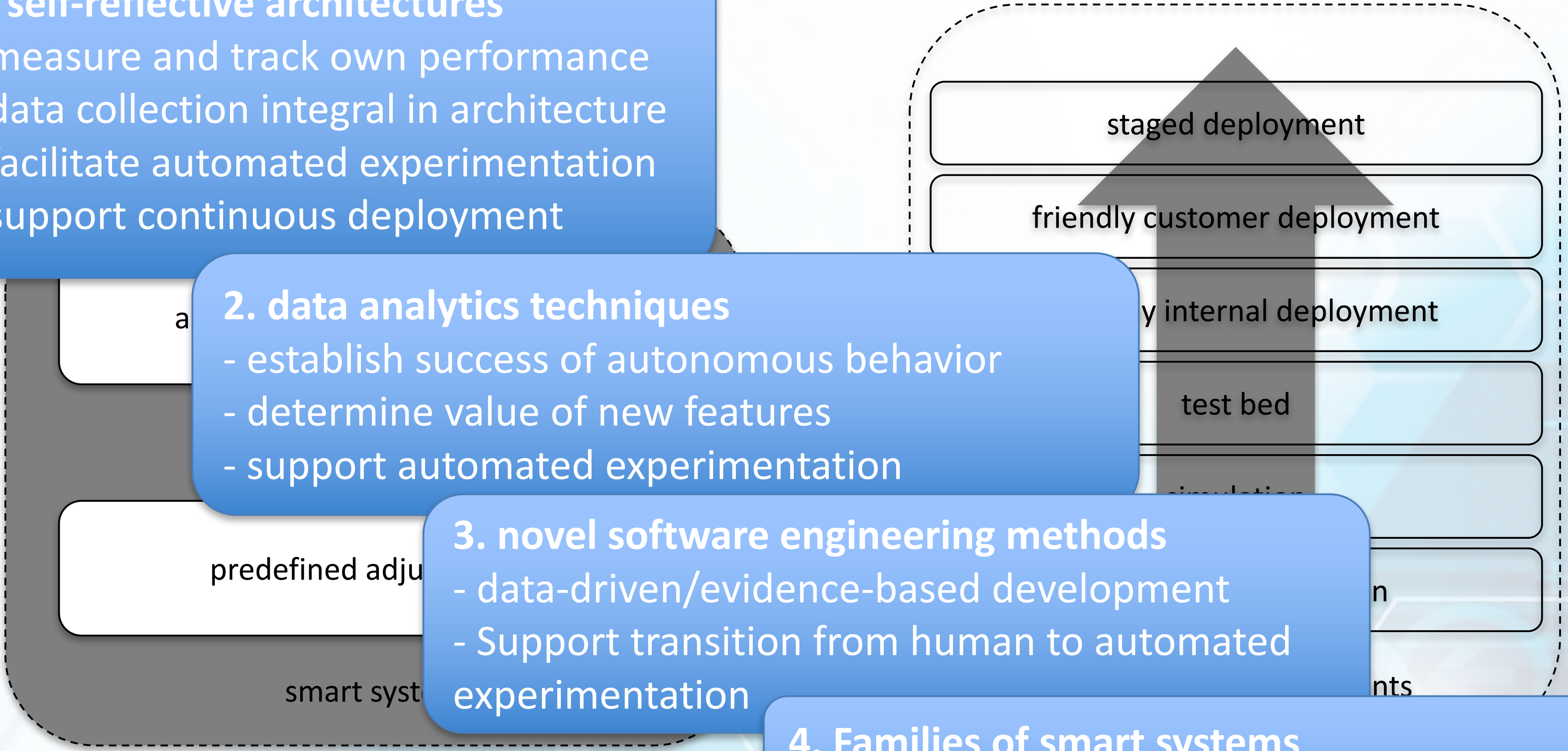
Towards Automated Experimentation

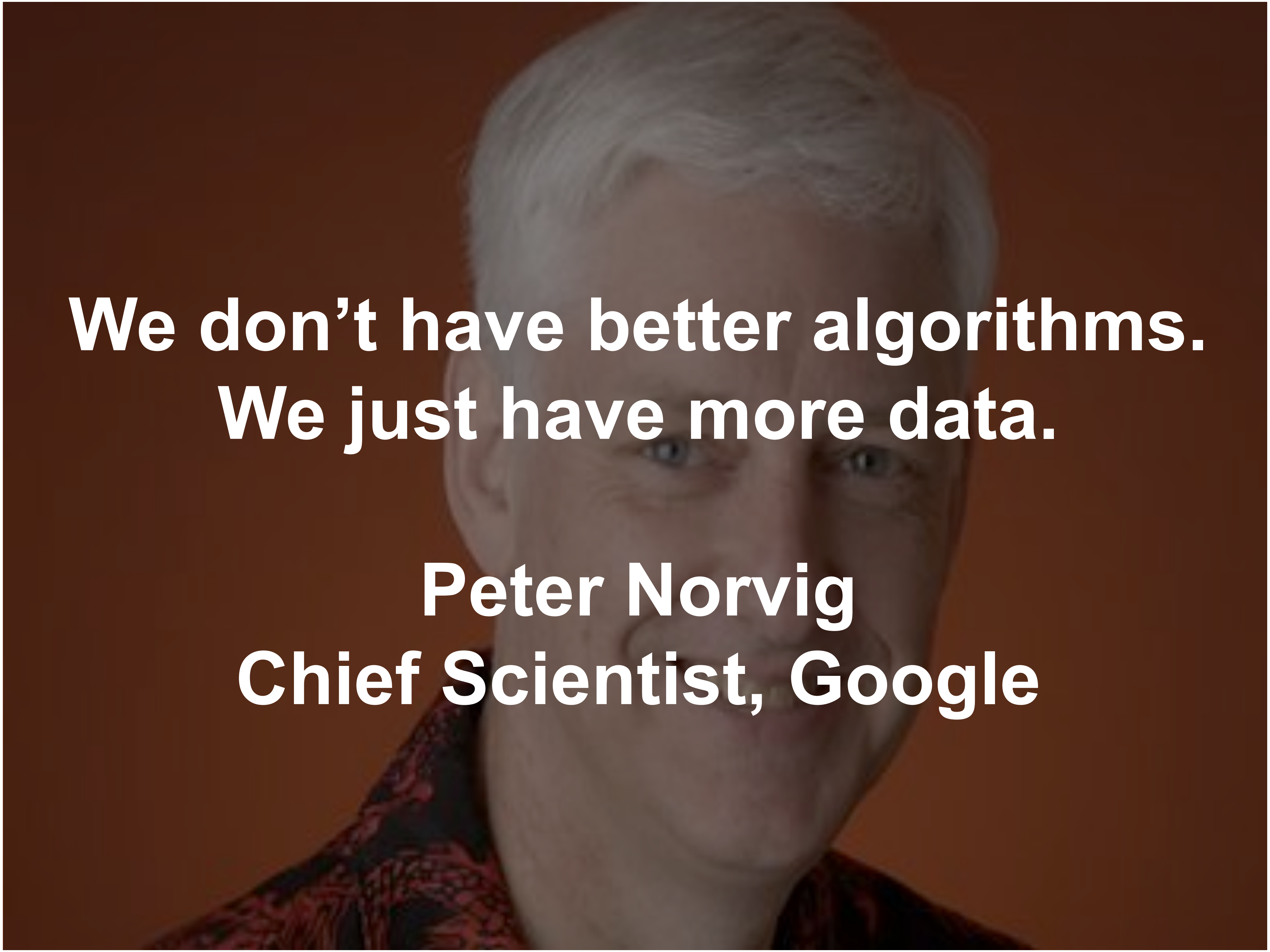
1. self-reflective architectures
- measure and track own performance
- data collection integral in architecture
- facilitate automated experimentation
- support continuous deployment

2. data analytics techniques
- establish success of autonomous behavior
- determine value of new features
- support automated experimentation

3. novel software engineering methods
- data-driven/evidence-based development
- Support transition from human to automated experimentation

4. Families of smart systems
- Facilitating learning from each other

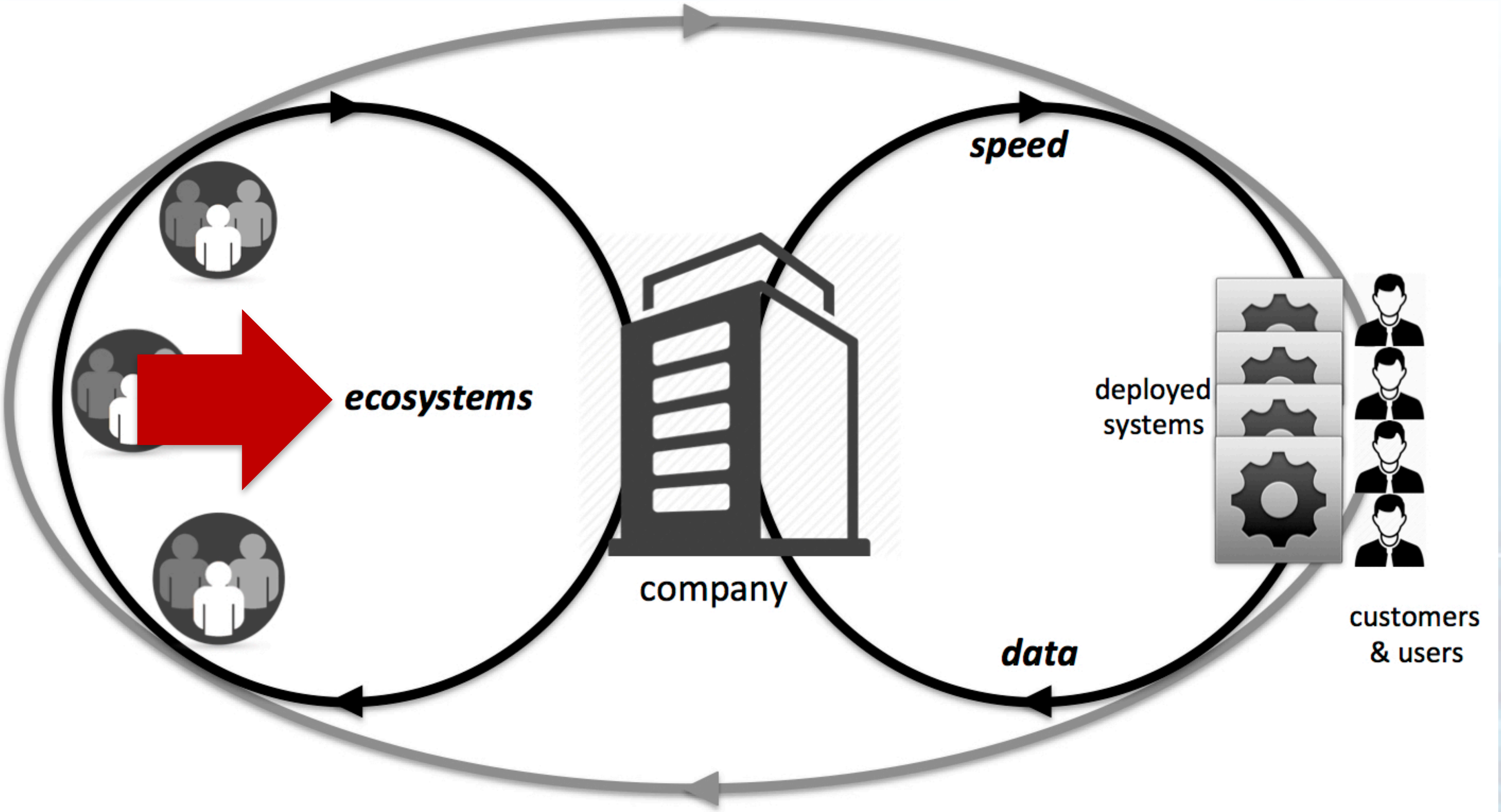




We don’t have better algorithms.
We just have more data.

Peter Norvig
Chief Scientist, Google

Stairway to Heaven 2.0



Business Ecosystem

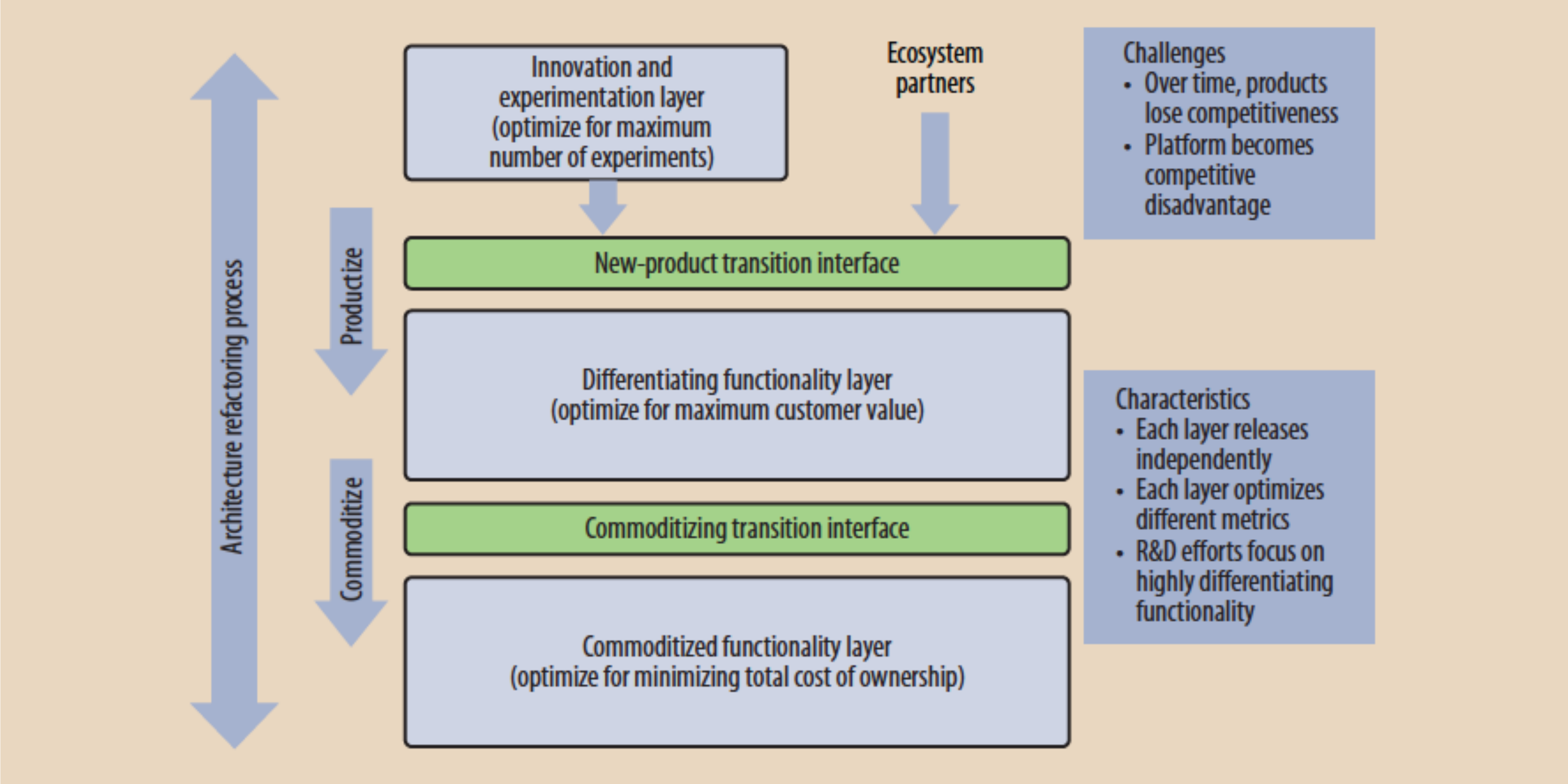
Economic community supported by a foundation of interacting organizations and individuals, which can also be perceived as organisms of the business world (Moore, 1993).

1. Symbiotic relationship
2. Co-evolution
3. Platform: tools, services and technology used in ecosystem to enhance performance

Software Ecosystems

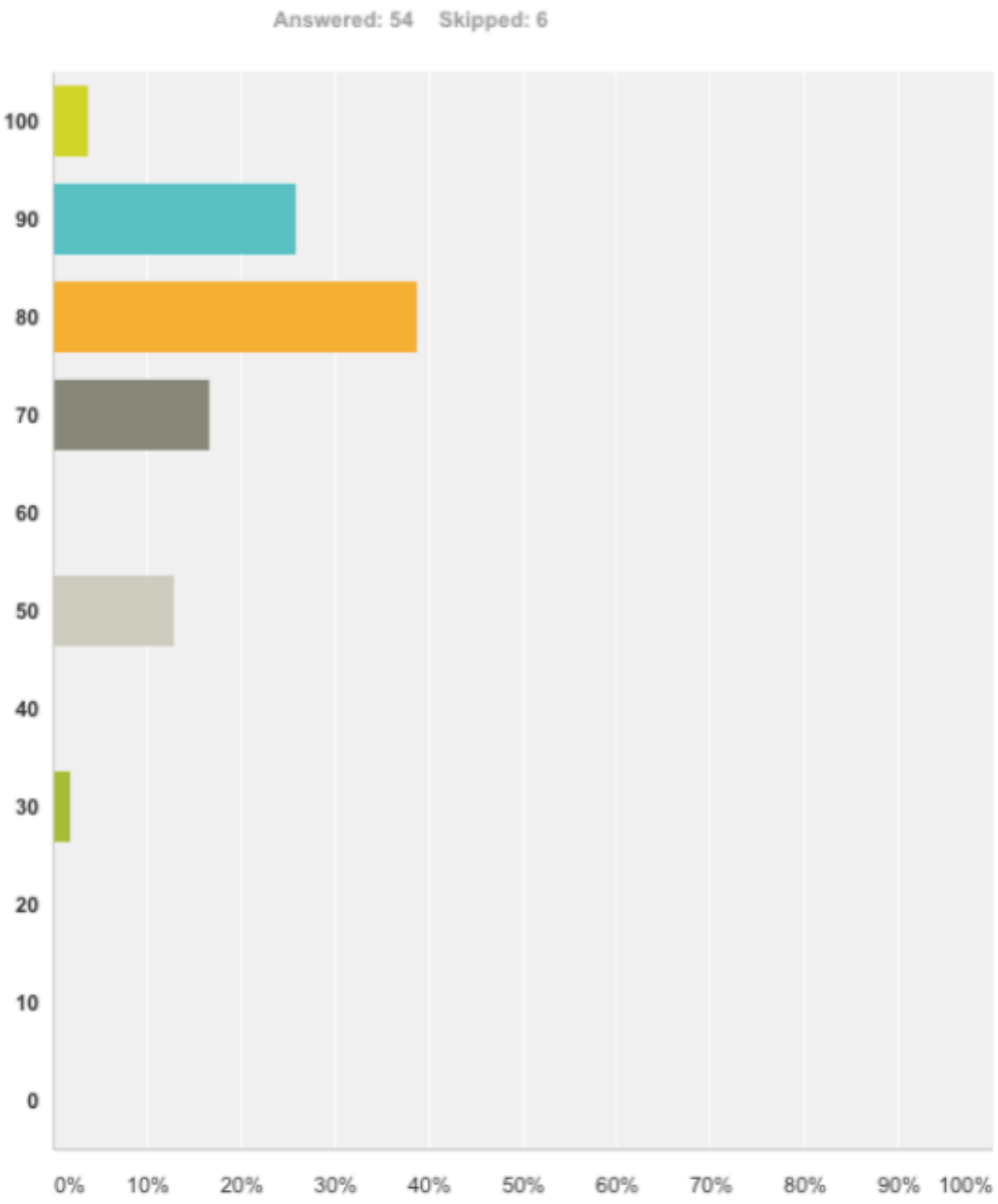
- Here's a try: A business ecosystem consisting of a platform, a set of internal and external developers and a community of domain experts in service to a community of users that compose relevant solution elements to satisfy their needs.
- Some more detail:
  - **platform**: A hierarchical set of shared components providing functionality that is required and common for the developers constructing solutions on top of the platform.
  - **Evolution**: Over time, the functionality in the ecosystem commoditizes and flows from unique solutions to the platform.
  - **Developers**: Although internal and external developers use the platform differently, the platform often allows developers to build on top of each other's results.
  - **Composition**: Users are able to compose their own solutions by selecting various elements into a configuration that suits their needs optimally.

3LPM: Three Layer Product Model

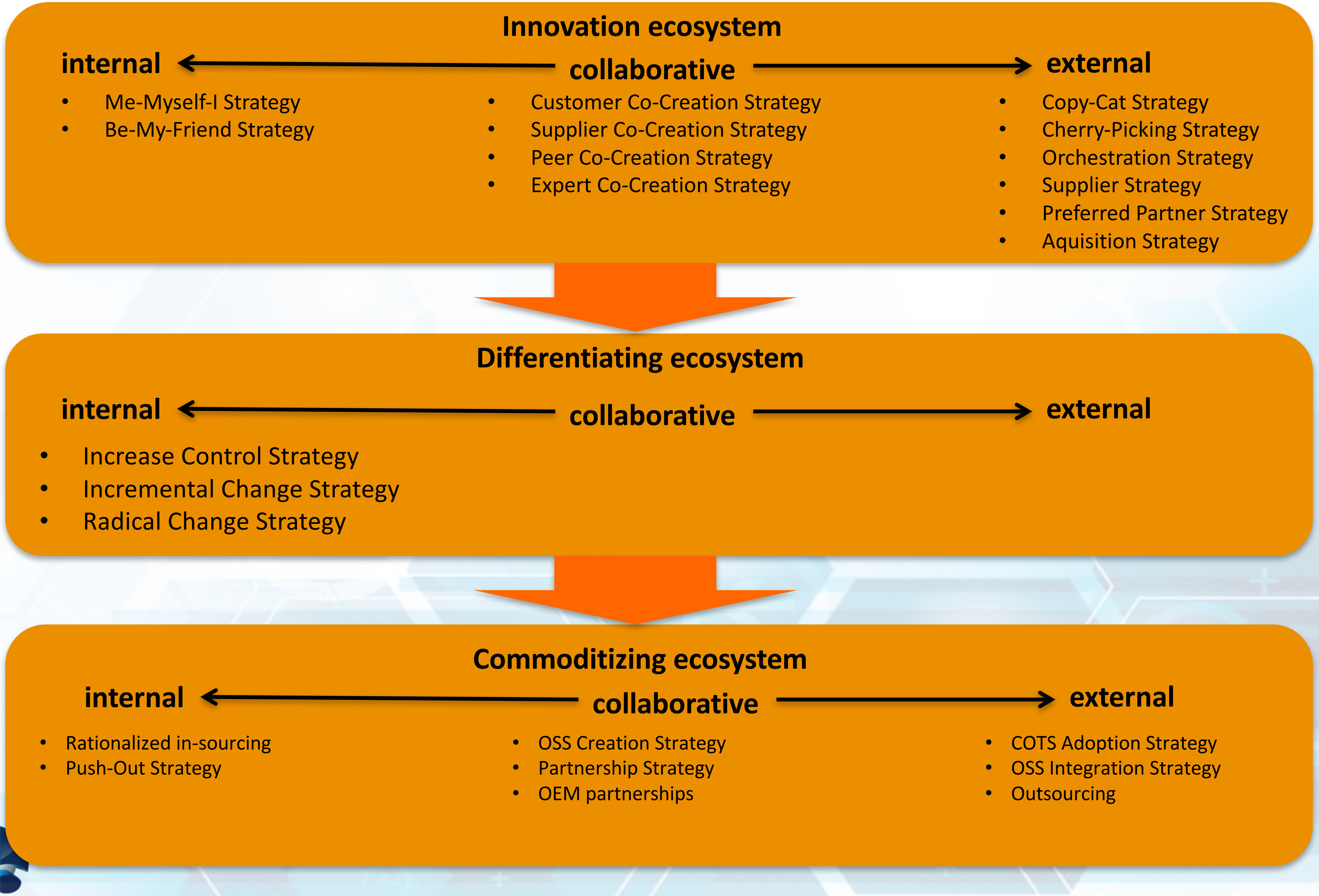

Innovation and experimentation layer (optimize for maximum number of experiments)
Ecosystem partners
Challenges
• Over time, products lose competitiveness
• Platform becomes competitive disadvantage
New-product transition interface
Productize
Architecture refactoring process
Differentiating functionality layer (optimize for maximum customer value)
Characteristics
• Each layer releases independently
• Each layer optimizes different metrics
• R&D efforts focus on highly differentiating functionality
Commoditize
Commoditizing transition interface
Commoditized functionality layer (optimize for minimizing total cost of ownership)

Bosch, J. (2013). Achieving Simplicity with the Three-Layer Product Model, *IEEE Computer*, Vol. 46 (11), pp. 34-39.

What % of R&D for Commodity?



TeLESM: Three Layer Ecosystem Strategy Model



Innovation ecosystem

internal ← collaborative → external

internal:
- Me-Myself-I Strategy
- Be-My-Friend Strategy

collaborative:
- Customer Co-Creation Strategy
- Supplier Co-Creation Strategy
- Peer Co-Creation Strategy
- Expert Co-Creation Strategy

external:
- Copy-Cat Strategy
- Cherry-Picking Strategy
- Orchestration Strategy
- Supplier Strategy
- Preferred Partner Strategy
- Aquisition Strategy

Differentiating ecosystem

internal ← collaborative → external

- Increase Control Strategy
- Incremental Change Strategy
- Radical Change Strategy

Commoditizing ecosystem

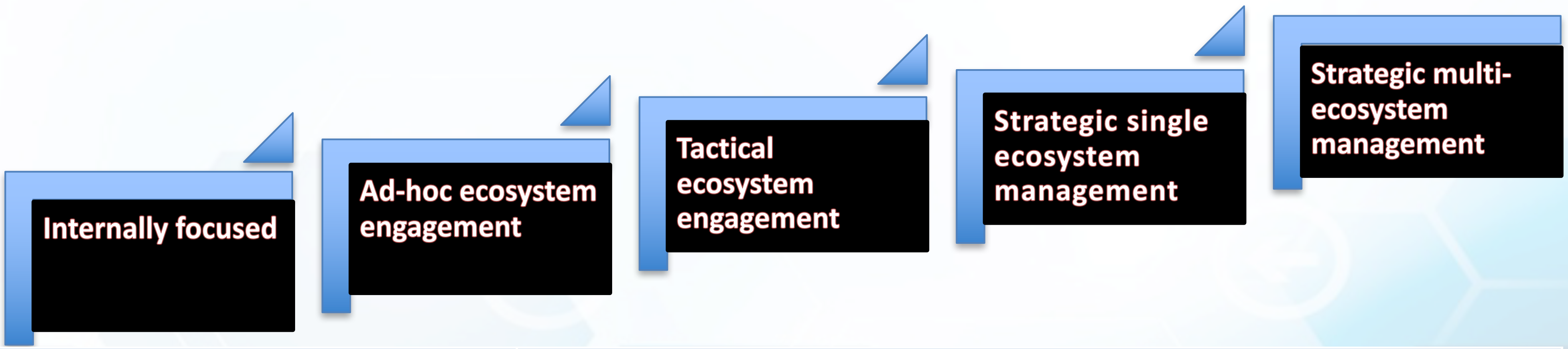
internal ← collaborative → external

internal:
- Rationalized in-sourcing
- Push-Out Strategy

collaborative:
- OSS Creation Strategy
- Partnership Strategy
- OEM partnerships

external:
- COTS Adoption Strategy
- OSS Integration Strategy
- Outsourcing

Stairway to Heaven: Ecosystems



Internally focused

Ad-hoc ecosystem engagement

Tactical ecosystem engagement

Strategic single ecosystem management

Strategic multi-ecosystem management

Levels	
Internally focused	do everything in-house unless it is really impossible
Ad-hoc ecosystem engagement	individuals take ad-hoc decisions to engage with ecosystem partners, but local optimization
Tactical ecosystem engagement	ecosystem engagement is centralized, but driven by tactical (rather than strategic) considerations
Strategic single ecosystem management	one of the ecosystem types is managed strategically
Strategic multi-ecosystem management	all three types (I, D, C) are managed strategically

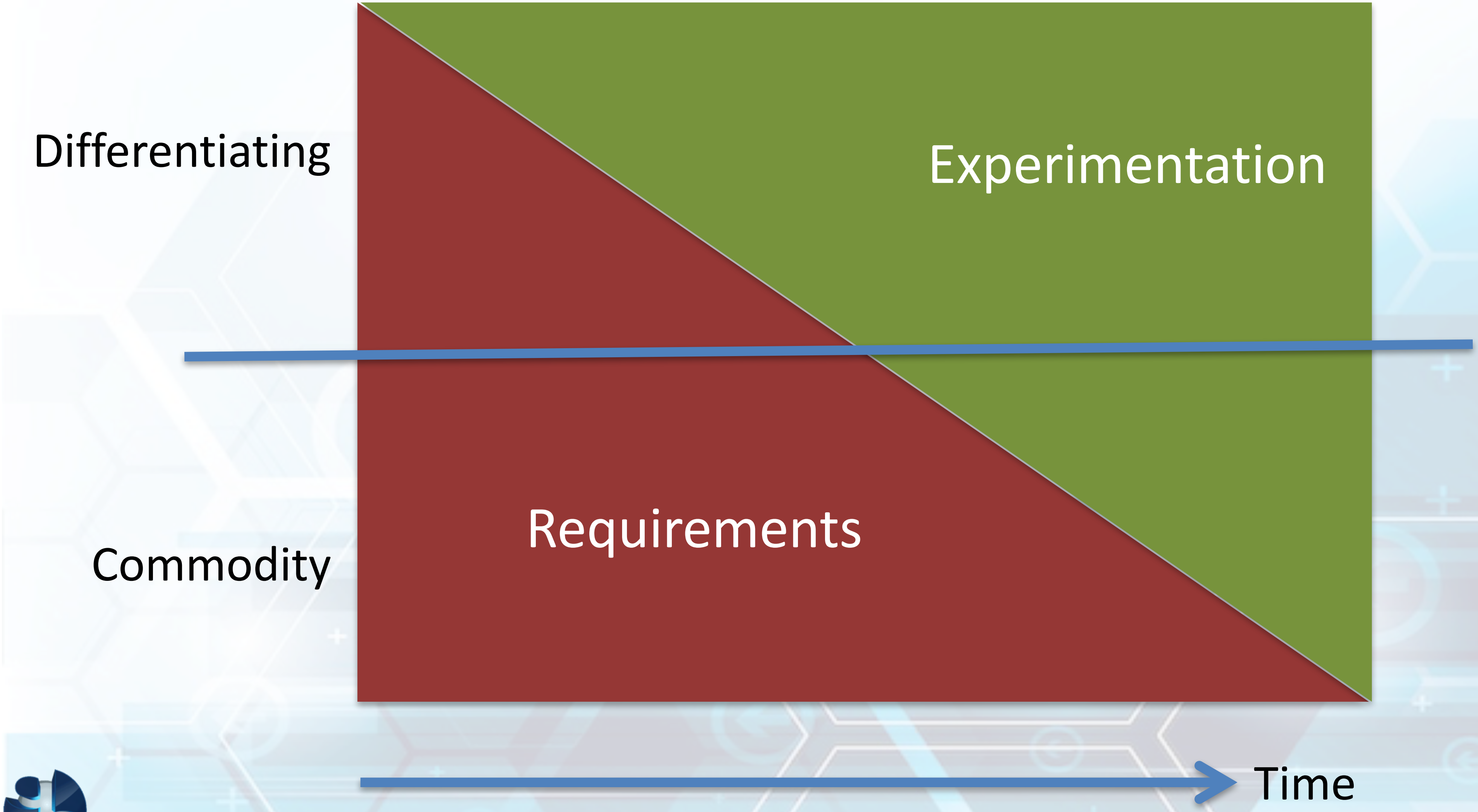
Overview

- Vem är jag? Wie ben ik? Who am I?
- Trends in Software: Need for Speed
- Stairway to Heaven
  - Speed
  - Data
  - Ecosystems
- Implications for Requirements Engineering
- Conclusion

From Requirements to ***Proven*** Value

- All systems will employ continuous deployment (at least once per agile sprint)
- R&D teams will employ A/B testing for all feature development and "MVP" approach for new products (***instead of requirements!***)
- Systems will use streaming analytics in various forms and exhibit data-driven behavior
- Systems will autonomously experiment with their behavior to improve the delivered value
- Families of similar systems will learn from each other automatically

Requirements versus Experimentation



Implications

1. Elicit as **few requirements** as you can before building the MVP
2. Instrument, collect and analyze data to **constantly validate** your prioritizations
3. Model the **expected value** rather than express the requirement
4. Focus on **minimizing the R&D investment** between data driven proofpoints

Implications

From	**To**
• Pre-development requirements	• Value modeling and constant validation
• Opinions-based decision making (experience)	• Data-driven decision making
• Satisfying the requirements	• Constant experimentation and innovation
• Deeply integrated architectures	• Modularized architectures
• Hierarchical organizational model	• Ecosystem of partners
• Static certification	• Dynamic, continuous certification

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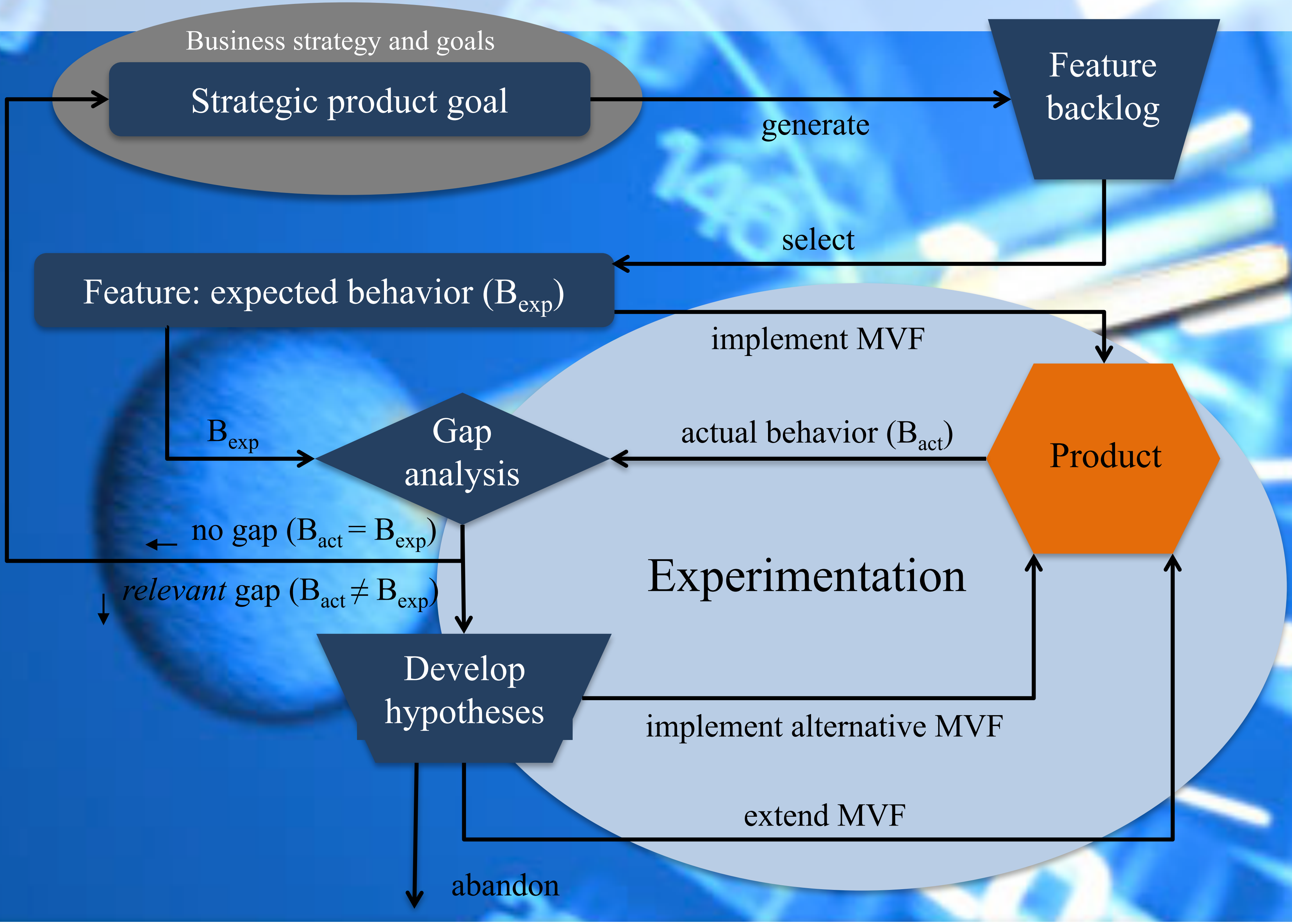
Speed

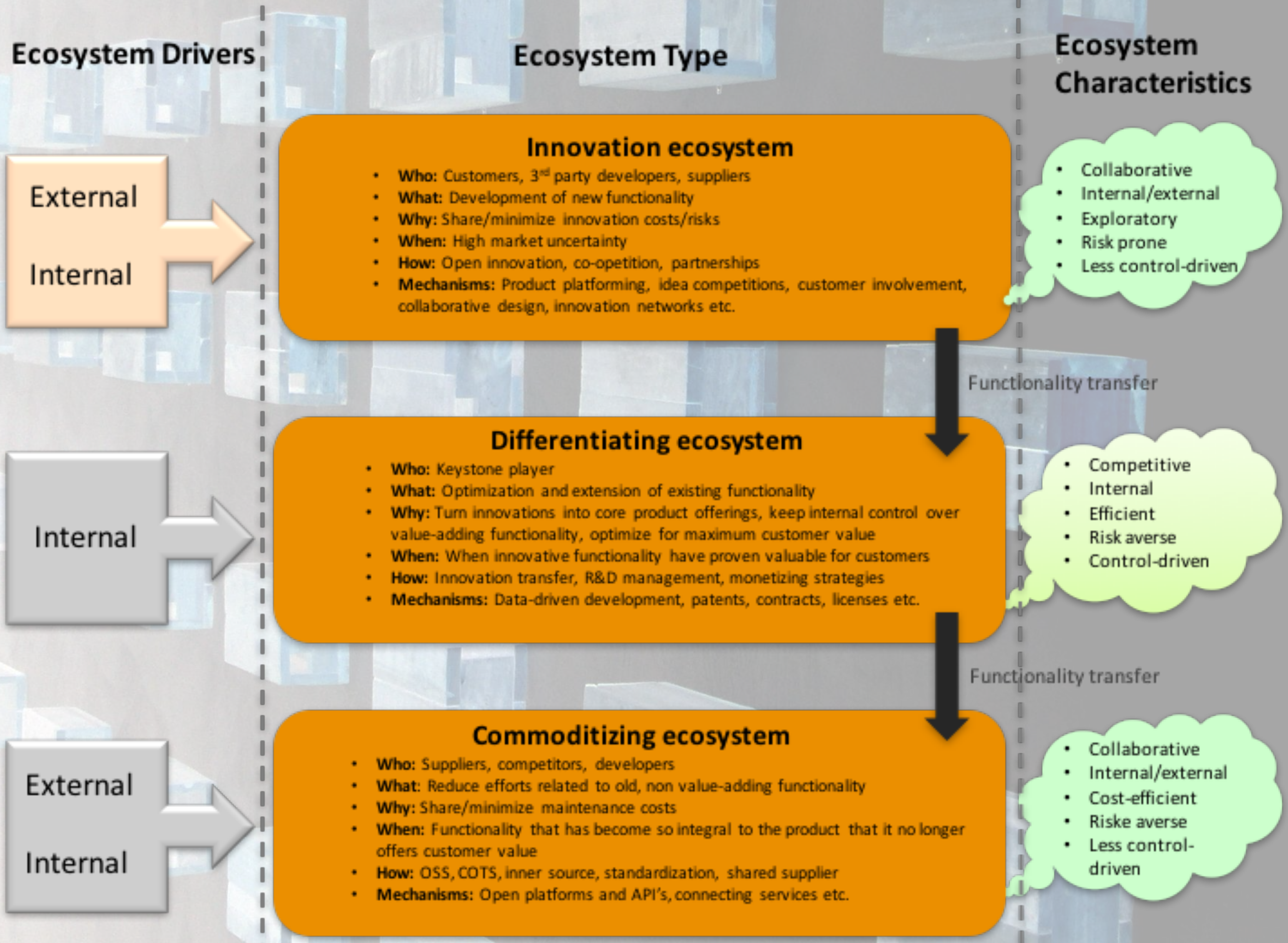
- Increasing **SPEED** trumps ANY other improvement R&D can provide to the company – the goal is **continuous deployment** of new functionality

- If you’re not a front-line engineer, there is only ONE measure that justifies your existence: how have you helped teams move faster?
- Don’t optimize efficiency, optimize speed

Data-Driven Development


Business strategy and goals
Strategic product goal
generate
Feature backlog
select
Feature: expected behavior (B_{exp})
implement MVF
B_{exp}
Gap analysis
actual behavior (B_{act})
Product
no gap ($B_{act} = B_{exp}$)
relevant gap ($B_{act} \neq B_{exp}$)
Experimentation
Develop hypotheses
implement alternative MVF
extend MVF
abandon

Software Ecosystems



Ecosystem Drivers

Ecosystem Type

Ecosystem Characteristics

External

Internal

Innovation ecosystem

- **Who:** Customers, 3rd party developers, suppliers
- **What:** Development of new functionality
- **Why:** Share/minimize innovation costs/risks
- **When:** High market uncertainty
- **How:** Open innovation, co-opetition, partnerships
- **Mechanisms:** Product platforming, idea competitions, customer involvement, collaborative design, innovation networks etc.

- Collaborative
- Internal/external
- Exploratory
- Risk prone
- Less control-driven

Functionality transfer

Internal

Differentiating ecosystem

- **Who:** Keystone player
- **What:** Optimization and extension of existing functionality
- **Why:** Turn innovations into core product offerings, keep internal control over value-adding functionality, optimize for maximum customer value
- **When:** When innovative functionality have proven valuable for customers
- **How:** Innovation transfer, R&D management, monetizing strategies
- **Mechanisms:** Data-driven development, patents, contracts, licenses etc.

- Competitive
- Internal
- Efficient
- Risk averse
- Control-driven

Functionality transfer

External

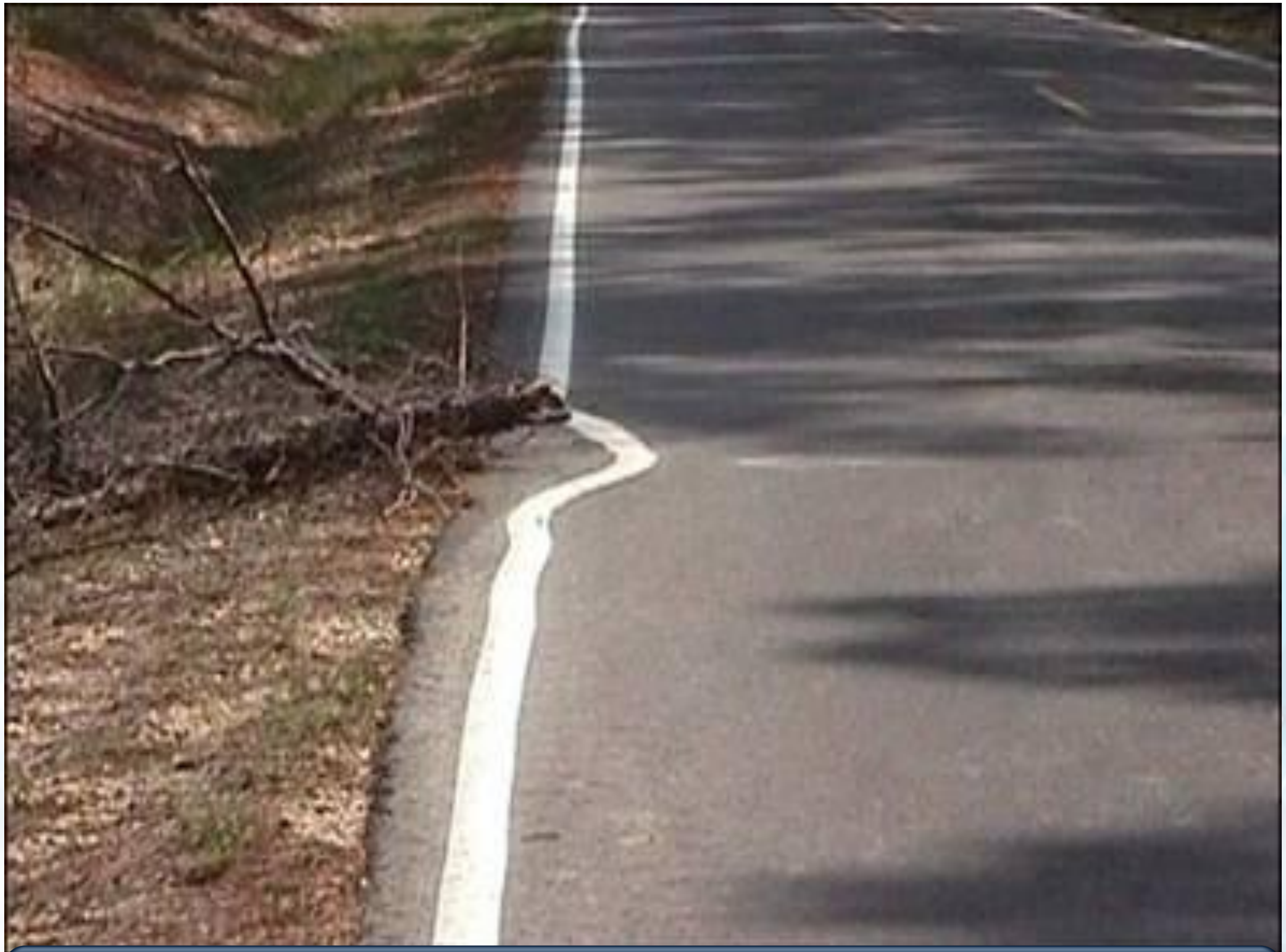
Internal

Commoditizing ecosystem

- **Who:** Suppliers, competitors, developers
- **What:** Reduce efforts related to old, non value-adding functionality
- **Why:** Share/minimize maintenance costs
- **When:** Functionality that has become so integral to the product that it no longer offers customer value
- **How:** OSS, COTS, inner source, standardization, shared supplier
- **Mechanisms:** Open platforms and API's, connecting services etc.

- Collaborative
- Internal/external
- Cost-efficient
- Riske averse
- Less control-driven

Not My Job?!



Strong LEADERSHIP needed from YOU

“One accurate measurement is worth more than a thousand expert opinions.”

- Admiral Grace Hopper

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