



SPEED IN SOFTWARE BUSINESS

ICSEA Keynote 18.11.2015 Barcelona

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Outline

- My background
- Speed
- Agile and Speed in Software Engineering
- Need for Speed
- Speed in Software Business
- Focus in Flexibility
- Summary



Pasi Tyrväinen

- University of Jyväskylä 1996-
 - Professor in Information Systems (Digital media)
 - Agora Center, Director 2014-17
- Honeywell Industrial Control 1995-2000
 - R&D Director, Industrial Automation and Control
- Nokia Research Center 1987-1995
 - Knowledge and Software Technology Labs
- PhD (Tech) Helsinki Univ. of Technology 1994
- Digital media
 - Enterprise content management (ECM, DRM)
- Software Business
 - Need for Speed (N4S, 2014-2017)
 - Cloud Software Business (2010-2013)
 - Software Cluster Strategic Study (2002-4)
 - www.icsob.org Int.Conf. on Software Business
 - OSKARI – National SW Industry Survey
 - SIRT – Software Industry Research Team
- <https://agoracenter.jyu.fi/people/pasi.tyrvainen>

Toimialakehitys ohjelmisto-
teollisuuden vauhdittajana
Uutta liiketoimintaa lähialoilla

Pasi Tyrväinen, Juhani Wirtala, Marko Seppänen

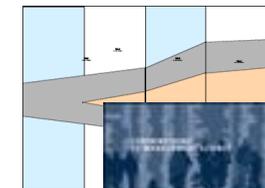
Taloustieteellinen tutkimus 15/00000



Innovatiivisilla toimialaratkaisuilla
kansainvälisille ohjelmistomarkkinoille

Pasi Tyrväinen, Uwe-Lutz Lierberg, Jussi Nikari, Juhani Suominen,
Vilho Seppänen, Juhani Wirtala

Taloustieteellinen tutkimus 17/0005



First International Conference, ICSoB 2010
Jyväskylä, Finland, June 2010
Proceedings

Springer



International Conference on Software Business



The image shows a screenshot of a web browser displaying the homepage for the 6th International Conference on Software Business (ICSOB 2015) in Braga, Portugal. The browser's address bar shows 'sites.google.com' and the page title is 'ICSOB2015'. The main content area features the ICSOB 2015 logo, which consists of the text 'ICSOB' in a bold, black, sans-serif font, followed by '2015' in a smaller font, and a stylized graphic of a green and blue swoosh. To the right of the logo, the text reads '6th International Conference on Software Business Braga, Portugal'. Below this, there is a navigation menu with the following items: HOME, PROCEEDINGS, PHOTOS, PROGRAMME, REGISTRATION, KEYNOTE SPEAKERS, ACCEPTED PAPERS, CALL FOR PAPERS, IMPORTANT DATES, ORGANIZATION, VENUE, and OFFICIAL HOTEL: HOTEL. The main content area contains a 'Welcome' section with the following text: 'The 6th International Conference on Software Business will be held on June 10-12, 2015 at Braga, Portugal. The ICSOB 2015 conference addresses the creation of software-based products, platforms, and services and the business models behind them. In particular, the ICSOB 2015 conference addresses the creation of software-based products and services that provide solutions to the biggest challenges and problems faced by modern cities.' Below this, there is a 'Conference theme: Enterprising cities' section with the following text: 'Advancements in the software industry have had a substantial impact not only on productivity and on GDP growth globally, but also on our daily work and lives.'



Agora Center



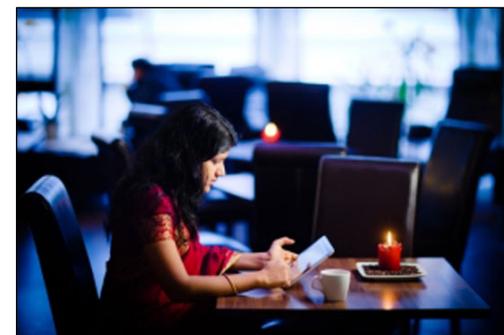
**“Benefiting Society through
Interdisciplinary Co-Creation”**

Agora Center

Agora Center was established in 2002 to provide a platform for interdisciplinary research in human technology.

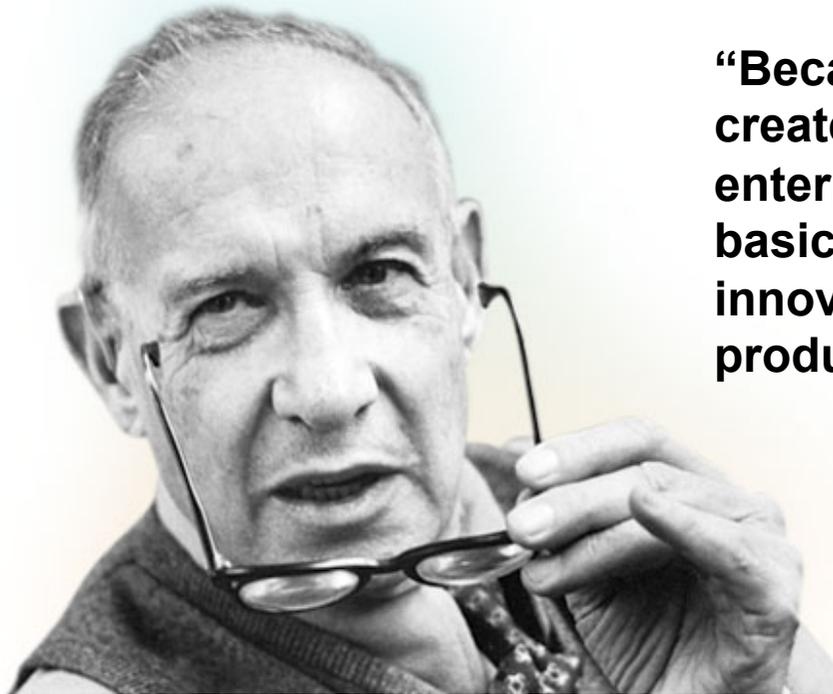
- ▣ Human factors in technology
- ▣ Interdisciplinary approach based on top level research
- ▣ Research + teaching + business
- ▣ Human-centric service innovations
- ▣ **Shortening the innovation chain**

-> Need for Speed ?!



SPEED





“Because the purpose of business is to create a customer, the business enterprise has two – and only two – basic functions: marketing and innovation. Marketing and innovation produce results; all the rest are costs.”

Peter Drucker



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

Jack Welch, CEO of GE

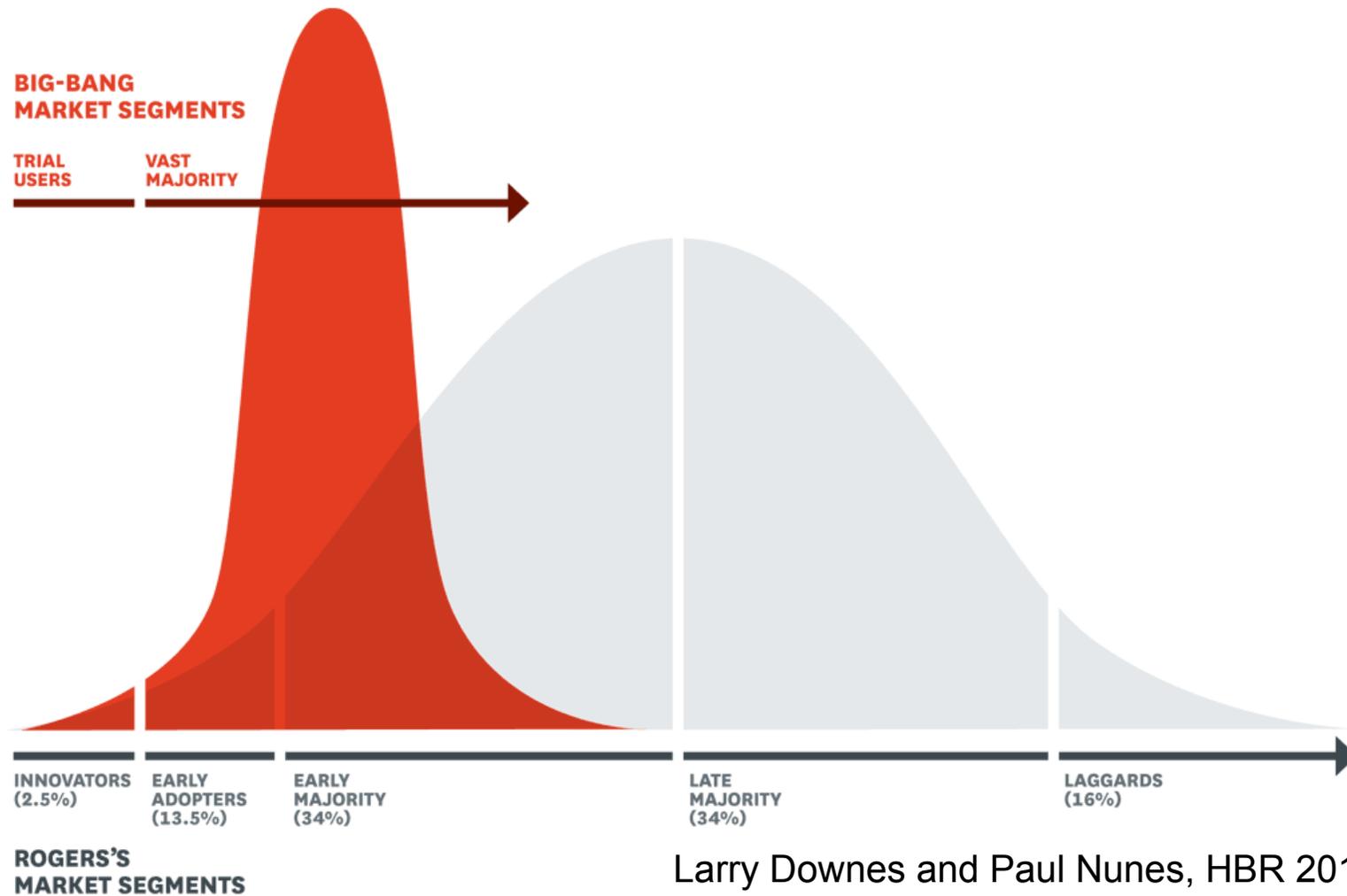


The innovators who create products at “hackathons” aren't even trying to disrupt your business. You're just the collateral damage.

Larry Downes and Paul Nunes, HBR 2013



Big-Bang Disruption



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

AGILE AND SPEED IN SWE



The Agile Manifesto – a statement of values

Individuals and
interactions

over

Process and tools

Working software

over

Comprehensive
documentation

Customer
collaboration

over

Contract negotiation

Responding to
change

over

Following a plan





“That is, while there is value in the items on the right, we value the items on the left more.” (www.agilemanifesto.org)



Principles Behind the Agile Manifesto

- Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
or Value to Customers and the Company?
- Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
- Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
- Business people and developers must work together daily throughout the project.



Would you like to

- Work 2 months for 10'000 € or
- Work 1 month for 10'000 €?

“almost half of software features were never used”

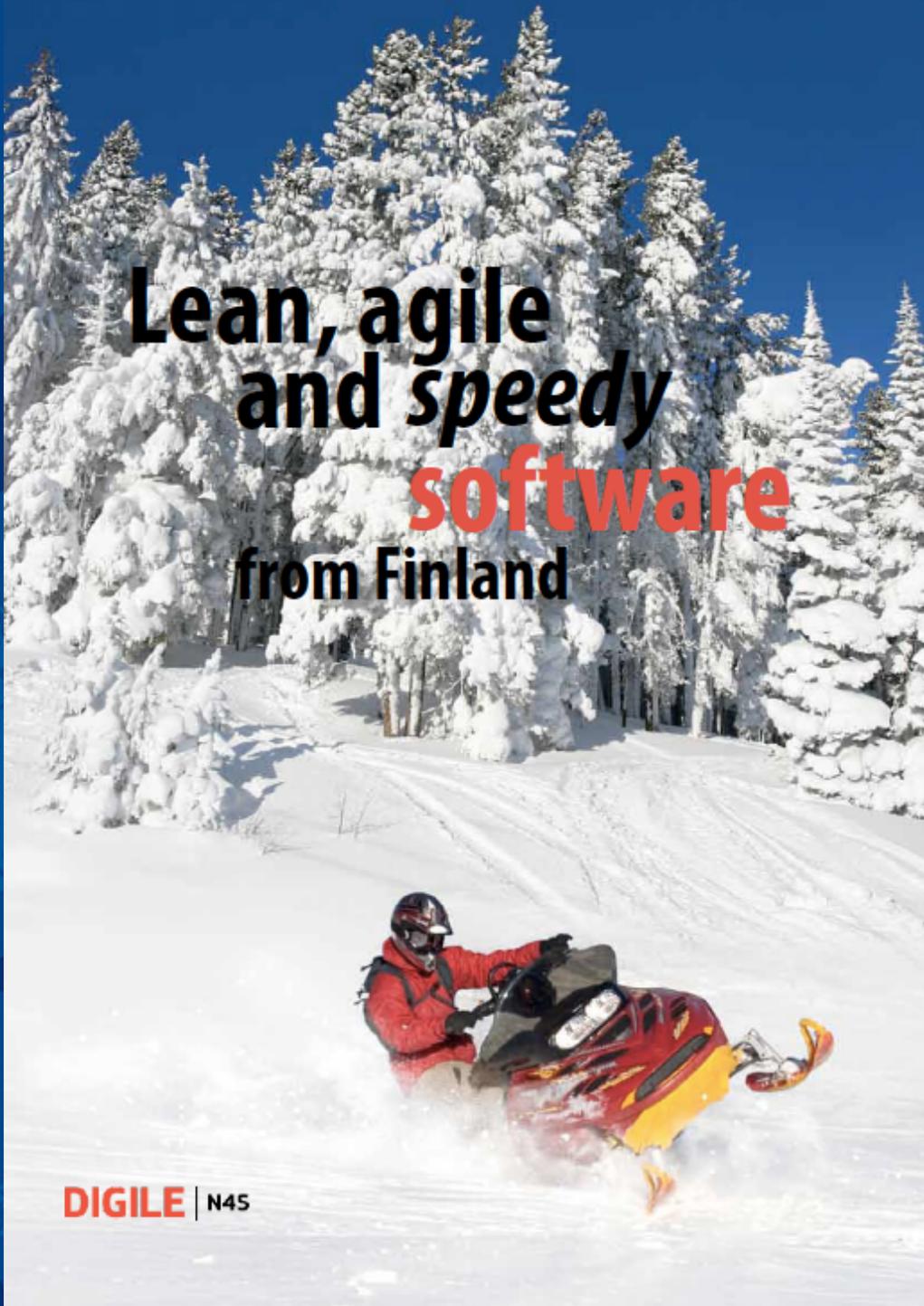
– J. Johanson, Standish Group Study, presentation at XP2002.

- Spend 2 years and 10'000'000 on a project and see that no one will buy the software OR
- Spend 2 weeks and 10'000 on a project and see that no one will buy the software?



NEED FOR SPEED





**Lean, agile
and *speedy*
software
from Finland**

DIGILE | N4S

Need for Speed

- N4S program will create the foundation for the Finnish software intensive businesses in the new digital economy.
 - N4S adopts a real-time experimental approach to business development and,
 - provides capability for instant value delivery based upon deep customer insight.
- The four-year program of Digile (2014-2017) is funded by Tekes and companies (50+ M€).
 - 11 large companies,
 - 15 SMEs and
 - 10 research institutes and universities.

**N4S –
SRA
VISION**

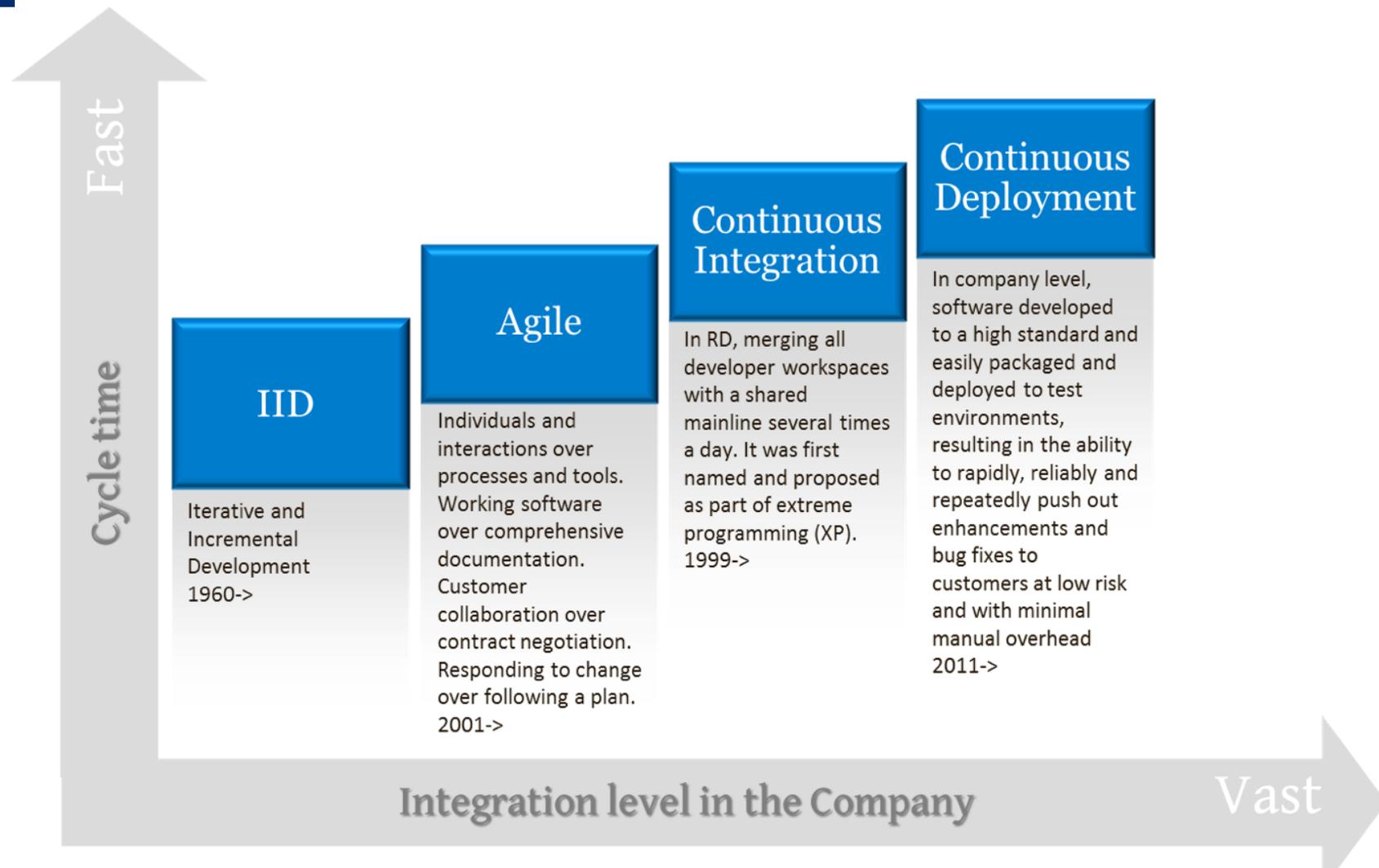


**Systemic Transformations for
Society and Digital Business:**

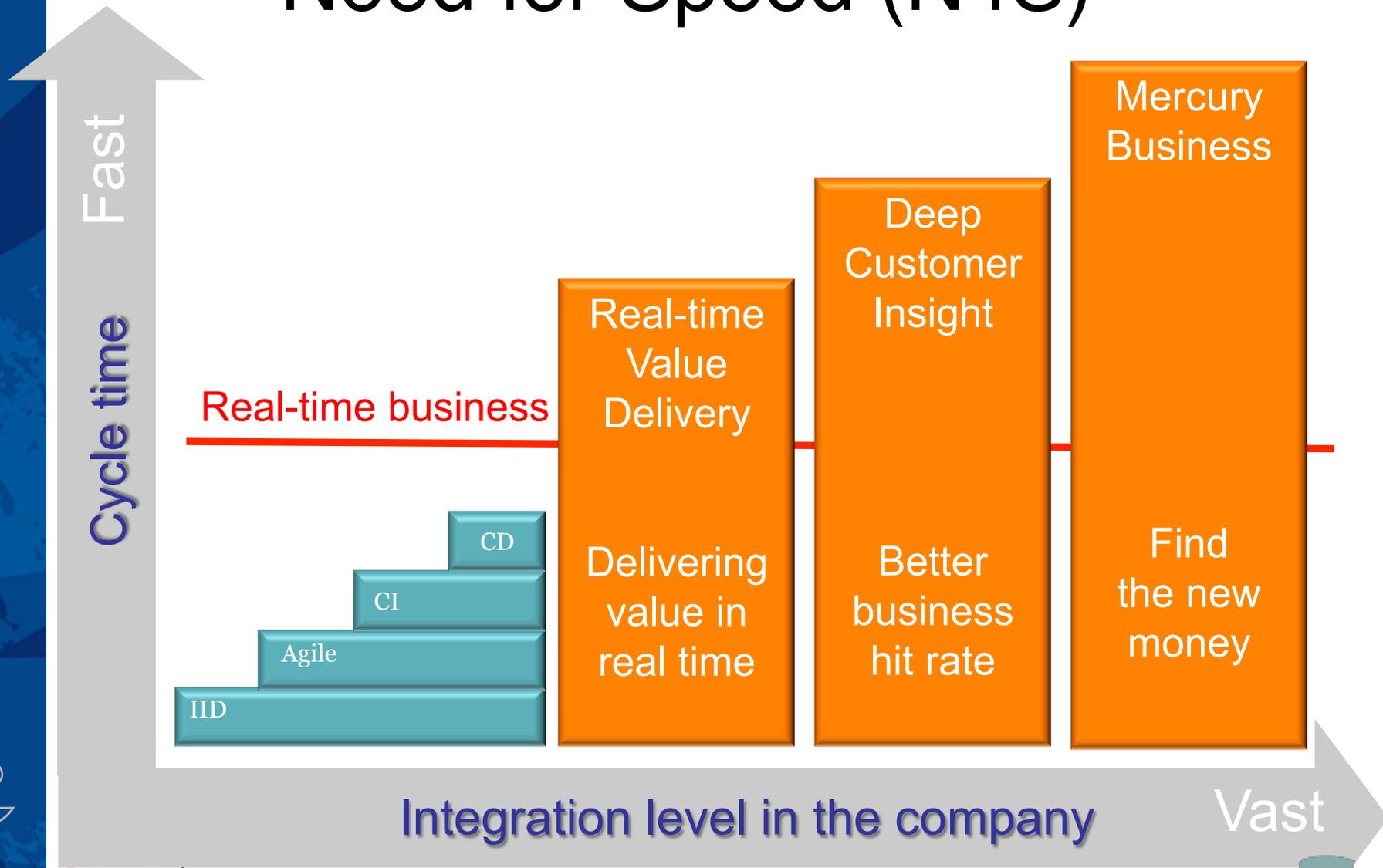
**By 2017 the Finnish
software intensive
industry is the
recognized leader in
business innovation and
fast implementation of
product and services in
the digital economy**

21/11/15

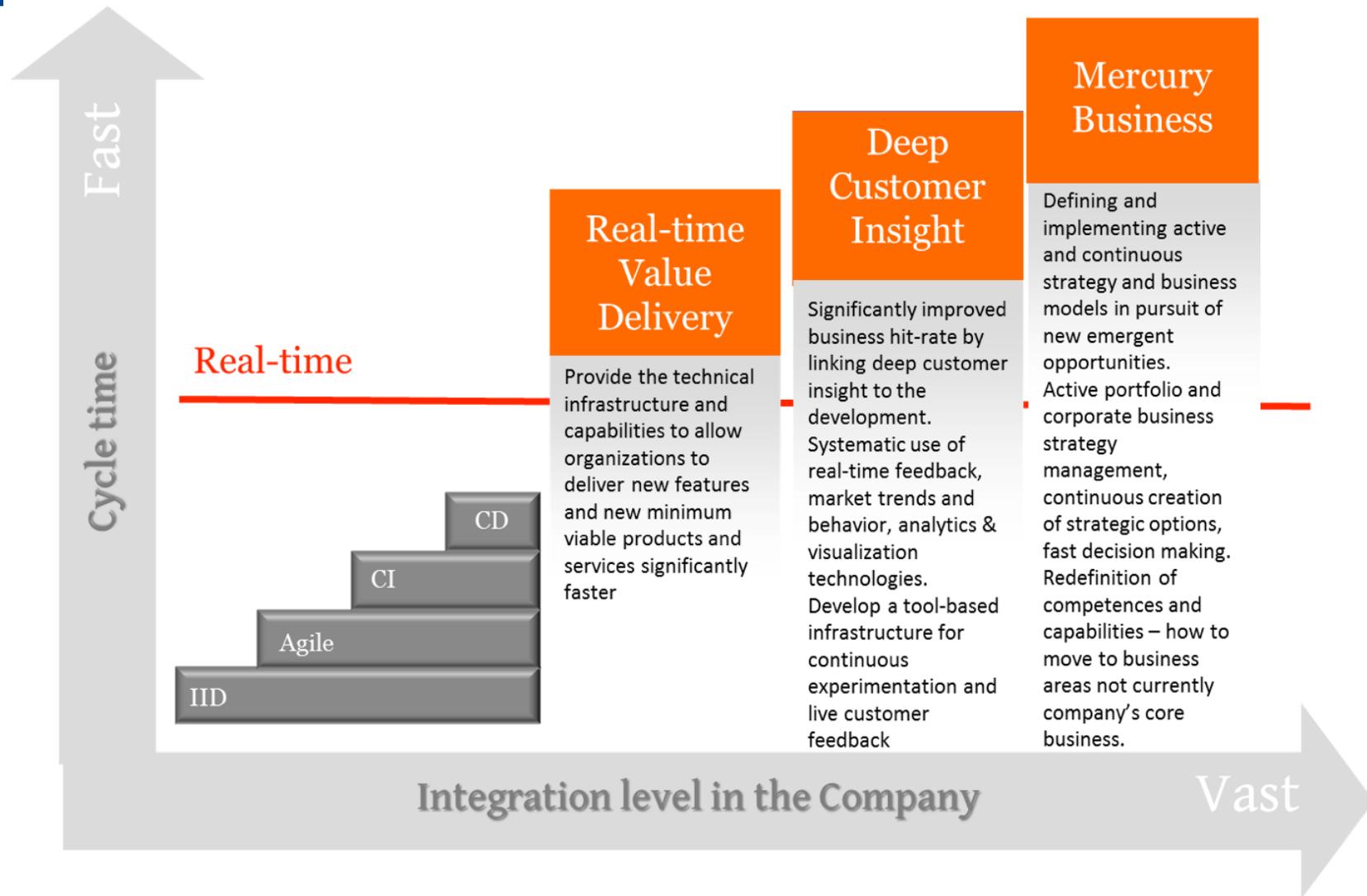
Agile and Lean Software Development



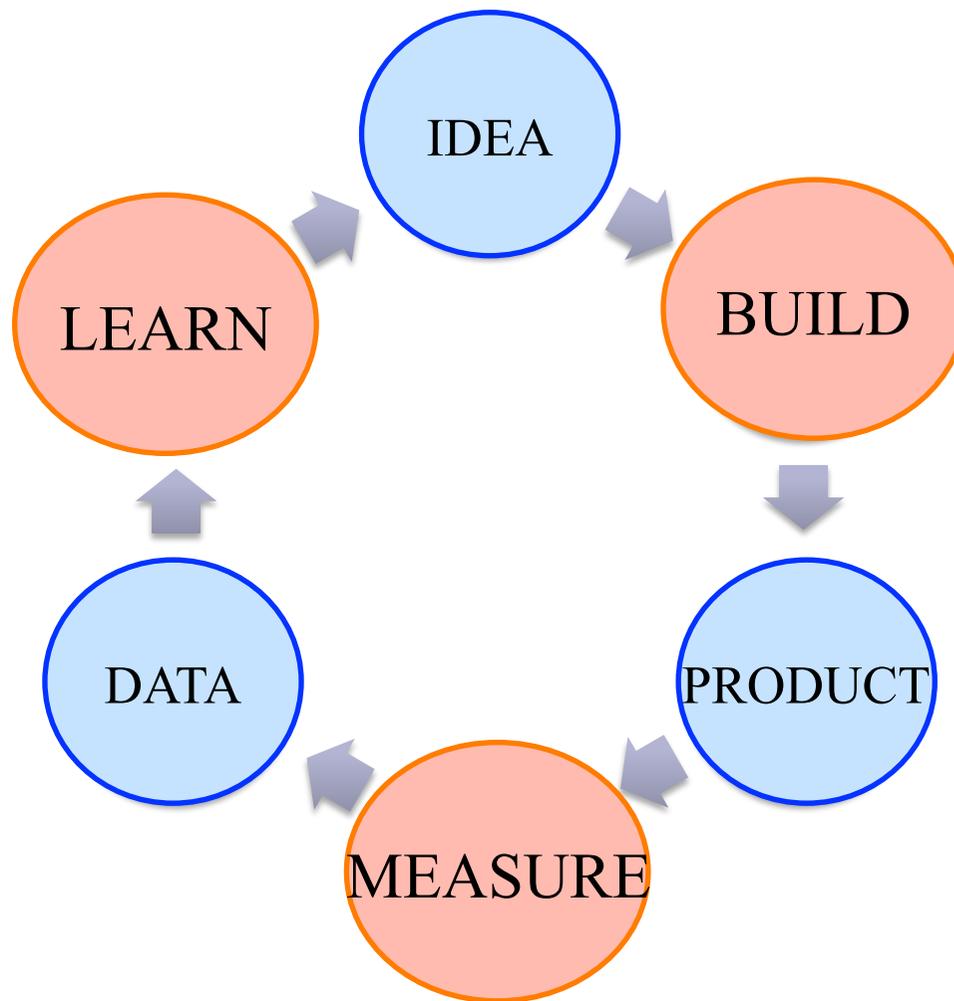
Need for Speed (N4S)



Towards Mercury Business



Lean Startup



Lean Startup provides an approach to

- creating and managing **startups**
- getting a desired product to customers' hands **faster**
- MVP Minimum Viable Product

(Eric Ries 2011)



Lean Startup vs. Mercury Business

Lean startup

No rigid organization; emerging company that is seeking for a form.

Experiment potential products that could be scalable to different markets.

Rapid pivoting where old products can be abandoned for better ones.

Usually only one product at a time is being considered.

No existing infrastructure for supporting experimenting; built as a part of the product and the experiment.

Build-measure-learn.

Mercury business

Already existing organization that seeks new markets and opportunities; internal startups can be used to separate new effort from already existing business.

Experiment scaling of existing products (or product derivatives) to new markets, experiment scaling of features in existing products.

Whole experiment is about experimenting new opportunities; existing products and markets not risked.

Numerous parallel experiments are possible.

Established infrastructure for experimenting must be in place.

Measure-learn-build.



In 25 years 2/3 of companies will not exist in a meaningful way (John Chamblers, SISCO, May 2014)

Growth & Survival of Companies

Today's Fortune 500 Companies



24%
25 Years Ago

87%
Companies Stall



11%
Recover

Today's Major Corporations



1/3
Survive Next 25 Years



SPEED IN SOFTWARE BUSINESS



Speed in Business

Speed in development

- Short development cycle

Speed in Business

- Startup

- Being fastest to innovate and develop new?
- Being fastest to learn what the customers really value!

- Established firm

- Being fastest to find new opportunities?
- Being fast to shift from declining business to new areas prior stagnating or going bankrupt?

- Elasticity! Flexibility!



Elastic Enterprise



(Vitalari & Shaugnessy 2012)



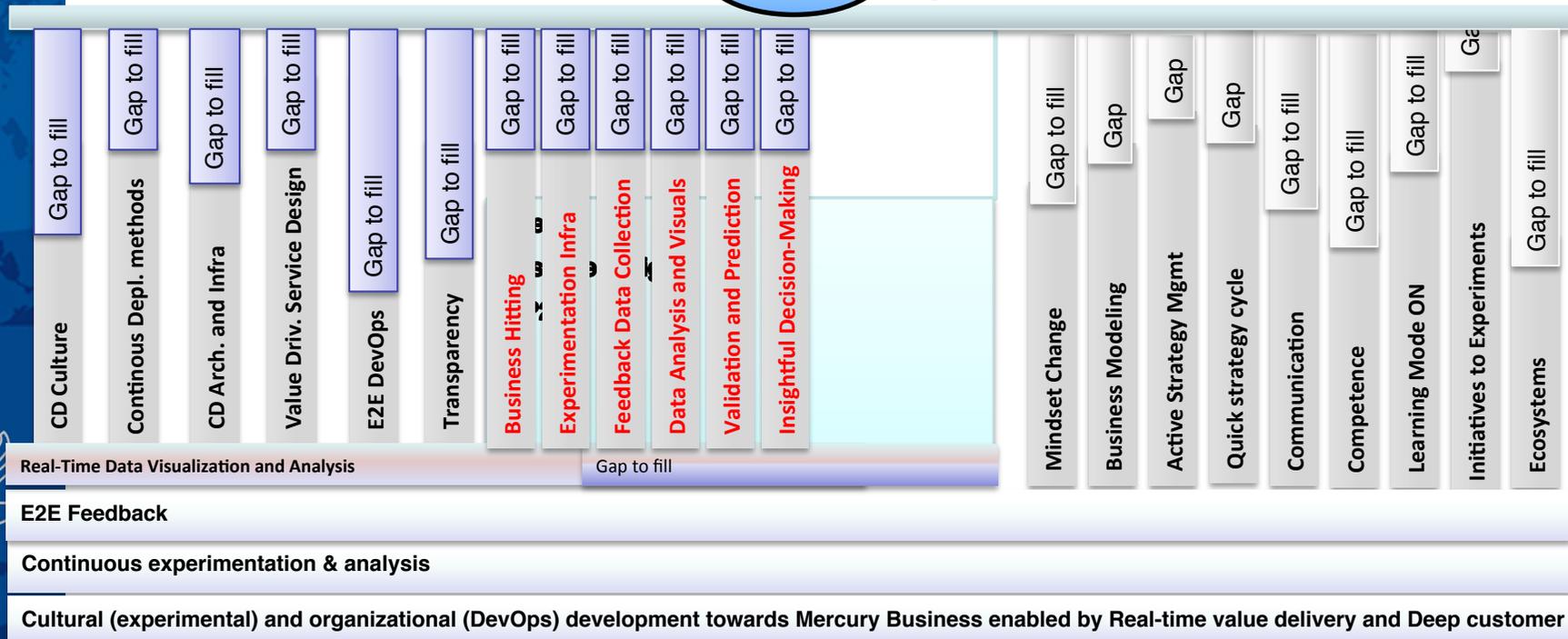
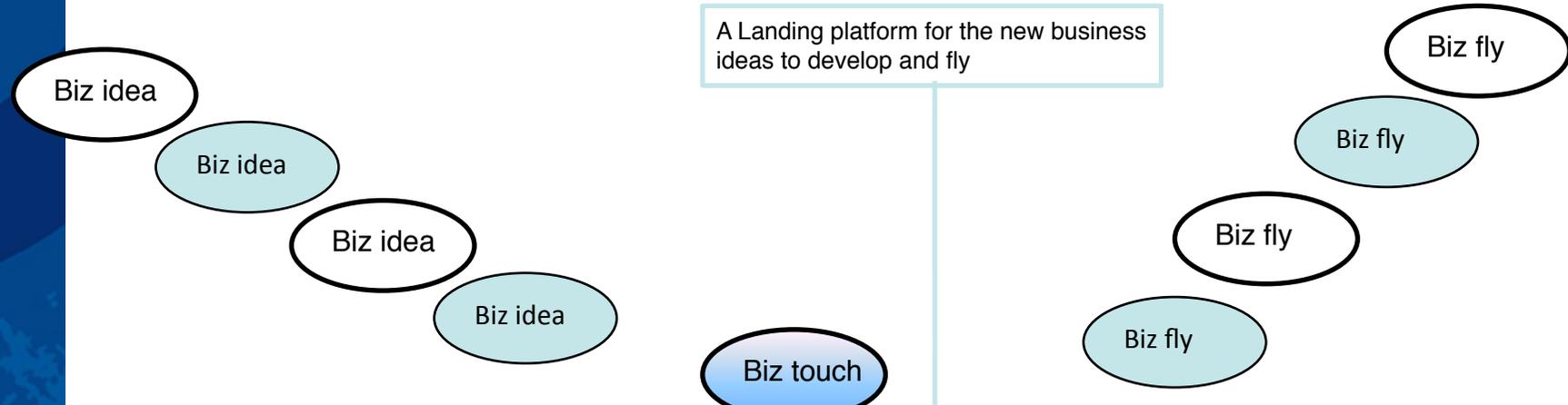
In Search for Key Ingredients of Speed in Business

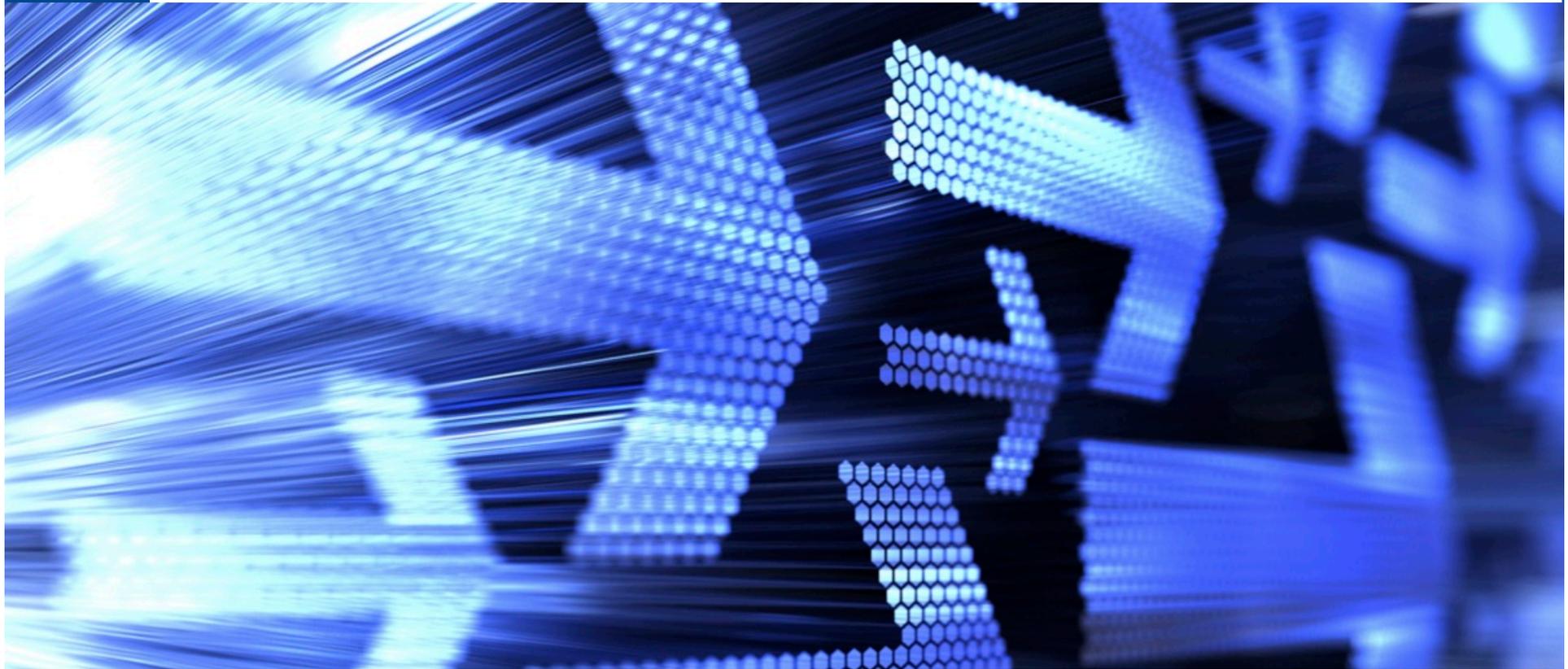
- Real-time value delivery as a base-line
 - Real-time & Continuous everything (CI, CD, ...)
 - Deep customer understanding

 - Externalization
 - Business platforms
 - Transparency
 - Experimenting
 - Cloud
 - ... which are important?
- Adjacencies
 - Strategic options
 - People



N4S REFERENCE MODEL – VISUALIZATION (Janne Järvinen 2014)





Focus on Flexibility

Analysis with Software Industry Survey Data

Eetu Luoma & Pasi Tyrväinen, JYU



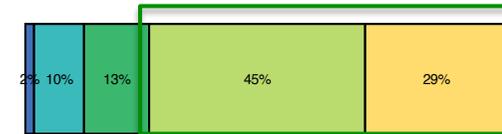
Why Flexibility?

- Research has demonstrated positive impact of flexibility to company performance under economic cycles.
- Wildly successful firms like Apple and Amazon have been able to enter adjacent market or create new markets. Applying existing resources to new purposes and organizing to new activities requires flexibility.

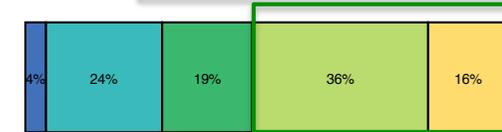


Software companies assess themselves as flexible in resources and adaptability

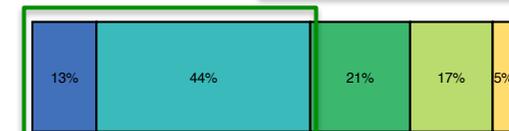
Our products/services are easily modifiable to new markets.



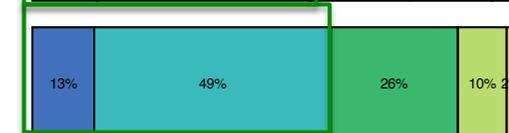
We are very fast in creating new products/services to new segments.



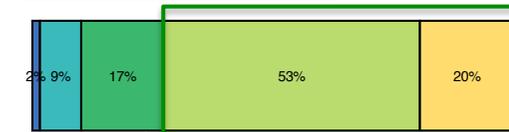
Modifying our products/services to new markets creates significant costs.



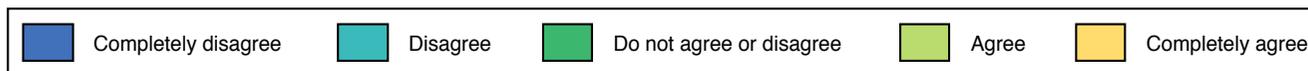
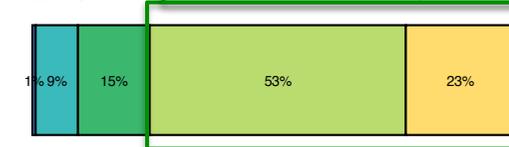
We are unable to utilize the resources of our company fast enough to respond to



We are able to organize into new activities quickly.



We can organize into new activities with our partners quickly.



N=253



Data and Measures

- Software Industry Survey 2014, Collected in June/Sept. 2014, N=500
- Flexibility factors: Three indicators per factor based on Sanchez (1995, 2004). Alphas .680 and .669.
- Other main factors: Min. three indicator per factor based on Kohli and Jarowski (1990, 1993), Hart (1992), Chandler et al. (2011) and the Agile Manifesto. Alphas between .637 and .831.
- Cloud usage and platform provisioning as dichotomous variables. Age and revenue growth from the Finnish trade register. Int. revenue from the survey (self-reporting).



Key Results for Speed in Software Business

- ★ Identified three types of flexibility for ICT firms:
 1. Entering New Markets Quickly
 2. Organizing into New Activities Fast
 3. Reacting Fast to Changes in Customer Demand

- ★ Flexibility is associated with **experimental approach to business development** and with **use of customer data**.

- ★ Flexibility is partially but not clearly associated with revenue growth and international revenues.



Enters new markets quickly

Uses Cloud Platform

Is reactive in software development

Operates autonomously in business network

Provides standardized products/services

Provides Platform

Collects customer data

★ Has experimental approach to business development

Is a young firm

★ Most important factors

█ Marks relatedness

..... Not related



Organizes into new activities fast

Uses Cloud Platform

★ Is reactive in software development

Operates autonomously in business network

★ Provides standardized products/services

Provides Platform

★ Collects customer data

Has experimental approach to business development

★ Is a young firm

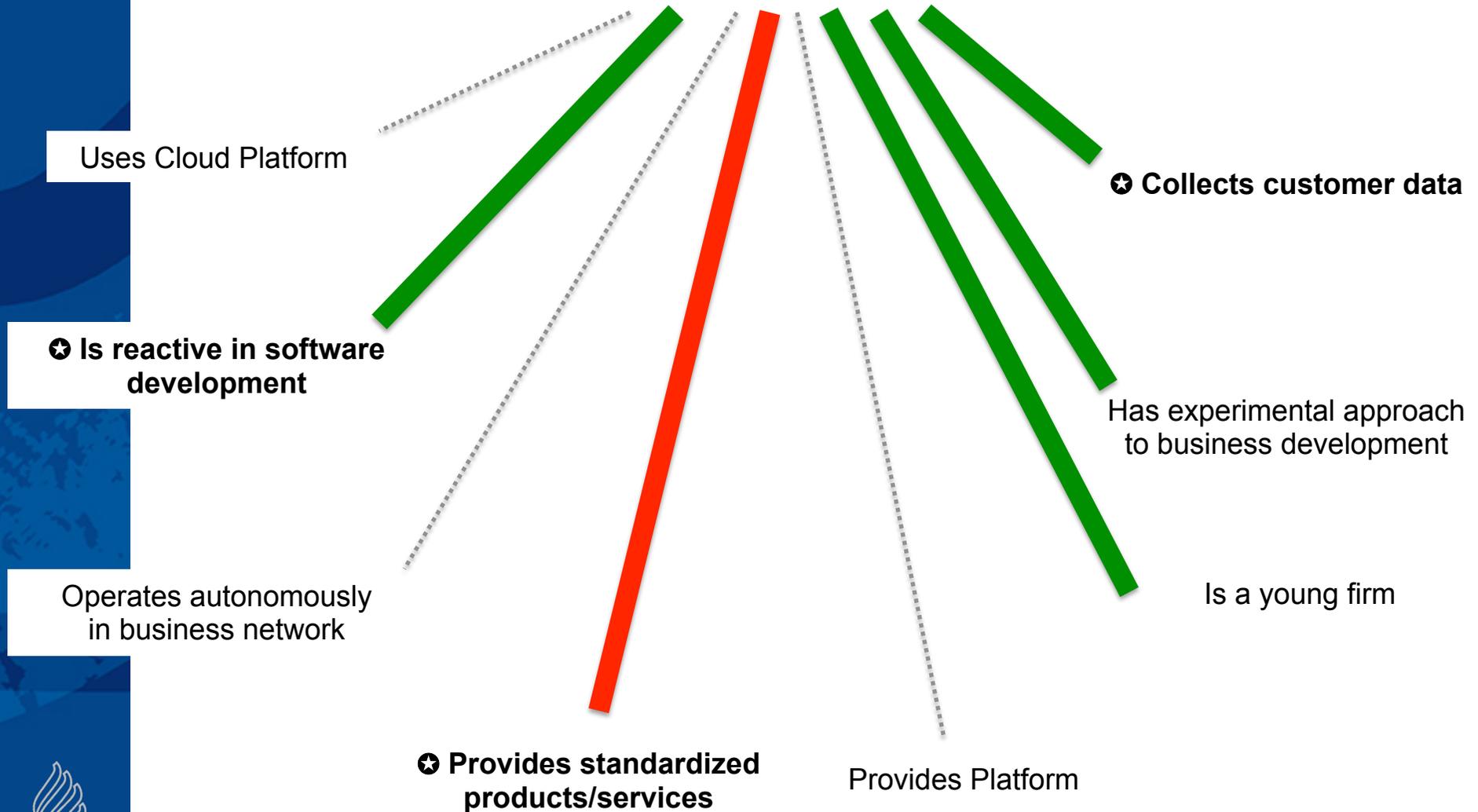
★ Most important factors

█ Marks relatedness

⋯ Not related



Reacts fast to changes in customer demand



⊛ Most important factors **█** Marks relatedness Not related



Uses Cloud Platform

Is responsive in software development

Operates autonomously in business network

Collects customer data

Has experimental approach to business development

Is a young firm

Provides standardized products/services

Provides Platform

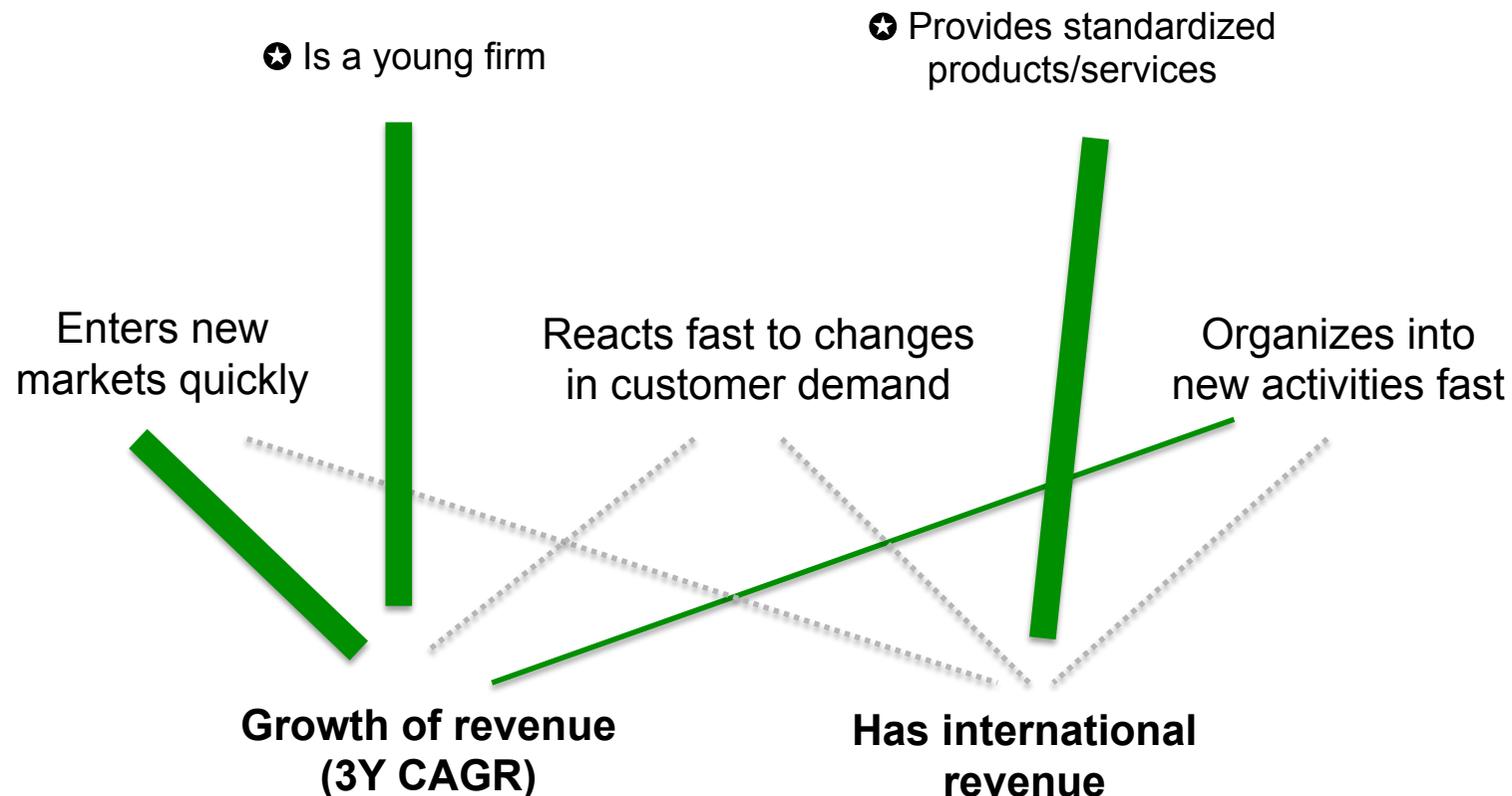
★ Most important factors

█ Marks relatedness

⋯ Not related



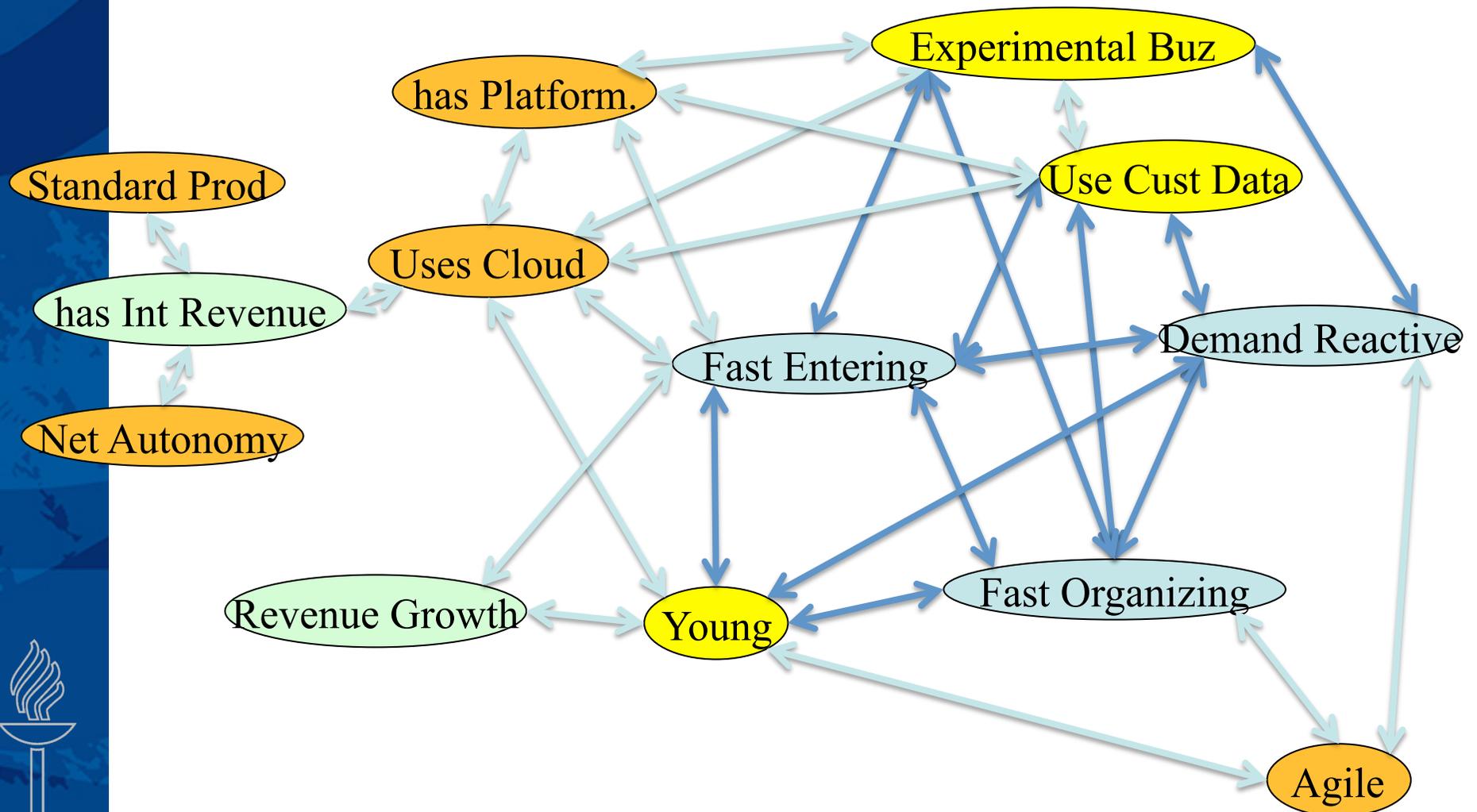
Flexibility is partially but not clearly associated with growth and internationalization



✦ Most important factors **█** Marks relatedness Not related



Factors Strongly (**) Related



Key contributions

- ★ Identified three types of flexibility for ICT firms.
“Firms should use these as metrics for improvements.”
- ★ Flexibility is associated with experimental approach to business development and with use of customer data.
“Age was also a important factor, younger firms are more flexible. Combining the three, firms should investigate internal ventures and external startups”.
- ★ Flexibility is partially but not clearly associated with revenue growth and international revenues.
“Capabilities to enter adjacent markets are worth investigating.”



SUMMARY

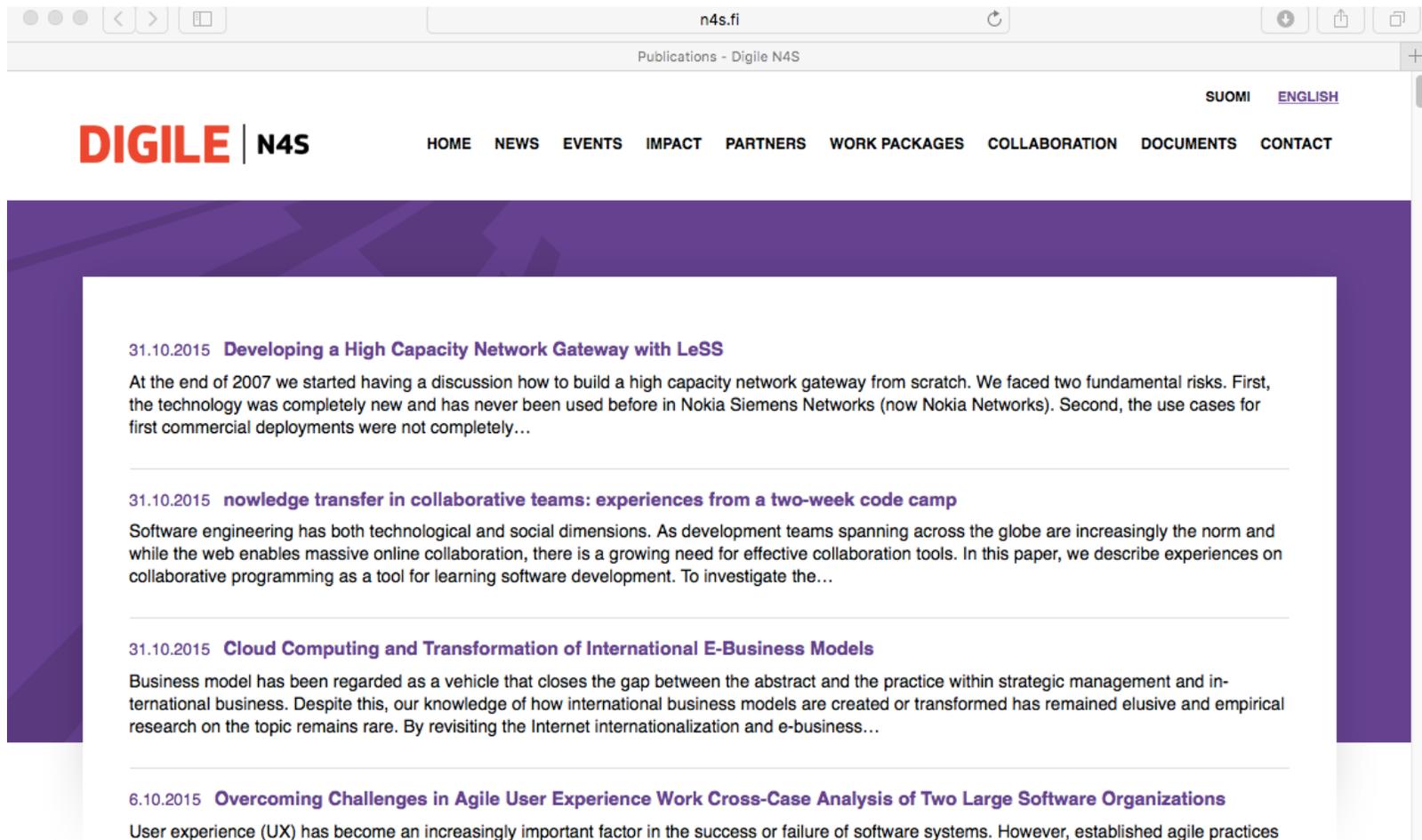


Speed and Flexibility in Software Business

- Flexibility is related to multiple factors
 - Customer understanding = speed to identify customer value
 - Experimental business = speed to identify/learn new business
 - partially: Using/providing cloud platforms
 - partially: Agile development approach
- Other factors assumed, but not studied here
 - Transparency
 - Externalization
 - Other ecosystem connections and connections (to cloud)
 - Strategic options
 - Capability and competence development
 - Leadership model...



>140 N4S Publications at n4s.fi



The screenshot shows a web browser window with the URL n4s.fi. The page title is "Publications - Digile N4S". The navigation menu includes "SUOMI" and "ENGLISH" language options, and a main menu with "HOME", "NEWS", "EVENTS", "IMPACT", "PARTNERS", "WORK PACKAGES", "COLLABORATION", "DOCUMENTS", and "CONTACT". The main content area features a purple header and a list of publications:

- 31.10.2015 Developing a High Capacity Network Gateway with LeSS**
At the end of 2007 we started having a discussion how to build a high capacity network gateway from scratch. We faced two fundamental risks. First, the technology was completely new and has never been used before in Nokia Siemens Networks (now Nokia Networks). Second, the use cases for first commercial deployments were not completely...
- 31.10.2015 knowledge transfer in collaborative teams: experiences from a two-week code camp**
Software engineering has both technological and social dimensions. As development teams spanning across the globe are increasingly the norm and while the web enables massive online collaboration, there is a growing need for effective collaboration tools. In this paper, we describe experiences on collaborative programming as a tool for learning software development. To investigate the...
- 31.10.2015 Cloud Computing and Transformation of International E-Business Models**
Business model has been regarded as a vehicle that closes the gap between the abstract and the practice within strategic management and international business. Despite this, our knowledge of how international business models are created or transformed has remained elusive and empirical research on the topic remains rare. By revisiting the Internet internationalization and e-business...
- 6.10.2015 Overcoming Challenges in Agile User Experience Work Cross-Case Analysis of Two Large Software Organizations**
User experience (UX) has become an increasingly important factor in the success or failure of software systems. However, established agile practices





THANK YOU FOR YOUR
ATTENTION

[https://agoracenter.jyu.fi/people/
pasi.tyrvainen](https://agoracenter.jyu.fi/people/pasi.tyrvainen)

References

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- Bosch, J., & Olsson, H.H., “Climbing the Stairway to Heaven, Towards Data- and Ecosystem-Driven Development”, Keynote in N4S Review, Dec. 2014.
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- Luoma E, “Software Industry Survey – Focus on Flexibility: Three Types of Flexibility” 10/01/2014 <http://www.softwareindustrysurvey.fi/node/80.html>
- Tyrväinen, P., Saarikallio, M., Aho, T., Lehtonen, T., & Paukkeri, R. “Metrics Framework for Cycle-Time Reduction in Software Value Creation, Adapting Lean Startup for Established SaaS Feature Developers”, The 10th International Conference on Software Engineering Advances, IARIA. ISBN: 978-1-61208-438-1, 2015. pp. 220-227.



info. GraphoGame .com

- Value proposition:
Learn to read in 6 hours
- Mission:
Eliminate illiteracy from the Globe
- Lead time:
20 y of research





Care &
Wellbeing



(Learning)
Environments



Digital Games

AC FOCUS AREAS



Innovation
Management



Traffic &
Transport



Security, Risk &
Crisis



Smart City &
Services



Solving Wicked Problems

addressing megatrends from Agora