SPEED IN SOFTWARE BUSINESS

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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
Welcome

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.

Conference theme: Enterprising cities

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 ?!
“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

Larry Downes and Paul Nunes, HBR 2013
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

(Jan Bosch 2012)
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.
- 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”

- 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
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.
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

**IID**
Iterative and Incremental Development 1960->

**Agile**
- Individuals and interactions over processes and tools.
- Working software over comprehensive documentation.
- Customer collaboration over contract negotiation.
- Responding to change over following a plan. 2001->

**Continuous Integration**
In RD, merging all developer workspaces with a shared mainline several times a day. It was first named and proposed as part of extreme programming (XP). 1999->

**Continuous Deployment**
In company level, software developed to a high standard and easily packaged and deployed to test environments, resulting in the ability to rapidly, reliably and repeatedly push out enhancements and bug fixes to customers at low risk and with minimal manual overhead 2011->
Need for Speed (N4S)

- Real-time business
- Delivering value in real time
- Deep Customer Insight
- Better business hit rate
- Find the new money

Cycle time

Integration level in the company
Towards Mercury Business

Real-time Value Delivery
- Provide the technical infrastructure and capabilities to allow organizations to deliver new features and new minimum viable products and services significantly faster.

Deep Customer Insight
- Significantly improved business hit-rate by linking deep customer insight to the development.
- Systematic use of real-time feedback, market trends and behavior, analytics & visualization technologies.
- Develop a tool-based infrastructure for continuous experimentation and live customer feedback.

Mercury Business
- Defining and implementing active and continuous strategy and business models in pursuit of new emergent opportunities.
- Active portfolio and corporate business strategy management, continuous creation of strategic options, fast decision making. Redefinition of competences and capabilities – how to move to business areas not currently company’s core 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

<table>
<thead>
<tr>
<th>Lean startup</th>
<th>Mercury business</th>
</tr>
</thead>
<tbody>
<tr>
<td>No rigid organization; emerging company that is seeking for a form.</td>
<td>Already existing organization that seeks new markets and opportunities; internal startups can be used to separate new effort from already existing business.</td>
</tr>
<tr>
<td>Experiment potential products that could be scalable to different markets.</td>
<td>Experiment scaling of existing products (or product derivatives) to new markets, experiment scaling of features in existing products.</td>
</tr>
<tr>
<td>Rapid pivoting where old products can be abandoned for better ones.</td>
<td>Whole experiment is about experimenting new opportunities; existing products and markets not risked.</td>
</tr>
<tr>
<td>Usually only one product at a time is being considered.</td>
<td>Numerous parallel experiments are possible.</td>
</tr>
<tr>
<td>No existing infrastructure for supporting experimenting; built as a part of the product and the experiment.</td>
<td>Established infrastructure for experimenting must be in place.</td>
</tr>
<tr>
<td>Build-measure-learn.</td>
<td>Measure-learn-build.</td>
</tr>
</tbody>
</table>
In 25 years 2/3 of companies will not exist in a meaningful way (John Chamblers, SISCO, May 2014)
SPEED IN SOFTWARE BUSINESS

21/11/15
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!

21/11/15
Elastic Enterprise

Operating model:
- Platform
- Cloud
- Connectors
- Ecosystem

Business concepts:
- Externalization
- Radical adjacency
- Mass differentiation
- Strategic options

Leadership:
- Reframing
- Meta strategy
- Active strategy
- De-risking

Business model:
- Seeking utility value

(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
A Landing platform for the new business ideas to develop and fly

Continuous experimentation & analysis

Cultural (experimental) and organizational (DevOps) development towards Mercury Business enabled by Real-time value delivery and Deep customer insight
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


- 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

Mark relatedness

Not related
Organizes into new activities fast

- Uses Cloud Platform
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Most important factors

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Most important factors
- Marks relatedness
- Not related
Flexibility is partially but not clearly associated with growth and internationalization

- Enters new markets quickly
- Reacts fast to changes in customer demand
- Organizes into new activities fast
- Has international revenue
- Growth of revenue (3Y CAGR)
- Provides standardized products/services
- Is a young firm

Most important factors
Marks relatedness
Not related
Factors Strongly (**) Related

- Standard Prod
- Net Autonomy
- Revenue Growth
- Experimental Buz
- Use Cust Data
- Demand Reactive
- Fast Entering
- Fast Organizing
- Agile

[Diagram showing relationships between factors]
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.”
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

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...

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
References

info. GraphoGame .com

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

Care & Wellbeing
(Learning) Environments
Digital Games
Innovation Management
Traffic & Transport
Security, Risk & Crisis
Smart City & Services
Solving Wicked Problems
addressing megatrends from Agora