Agile Team Perceptions of Productivity Factors

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Who are we?

NTNU – Trondheim
Norwegian University of Science and Technology

USP
Today’s Agenda

1. **Understand** the **motivation** to explore Productivity in the Agile field

2. **Discuss** software productivity **definitions** and factors

3. **Share our findings** on agile team perceptions of productivity factors
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The Agile Phenomenon

Aim to shorten the development time and deal with the inevitable changes resulting from market dynamics

“have rapidly joined the mainstream of development approaches”  Forrester Research, 2010
Agile productivity claims

2008

- 82% of participants indicated that agile teams have somewhat higher or much higher productivity
  - 3,061 participants in 80 countries

2009 and 2010

- One reason to adopt agile: Increased productivity
  - 2009: 2,570 participants from 88 countries.
  - 2010: 4,770 participants from 91 countries.
There is growing evidence from the research community

(Scott Ambler, “Answering the ‘Where is the Proof That Agile Methods Work’ Question”)
• Recent studies discuss productivity factors in software development:
  – none consider how agile methods can influence team productivity.
  – none consider general factors impacting agile team productivity

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Productivity Factors

- Personnel
- Project
- Product
- Process

Agile Productivity
• Dybå and Dingsøyr reviewed 36 studies and found:
  – 4 studies analyzing productivity using *Lines of Code (LOC)*.

Software development is *knowledge work*, whose nature is far more complex and harder to evaluate than LOC.
The most valuable asset of a 21st century institution will be its knowledge workers and their productivity

Peter Drucker (1909-2005)
Our Questions

1. How do agile teams define productivity?

2. What do agile team members identify as the main factors impacting on productivity?
   – How do these factors impact positively, or negatively on the productivity of agile teams?

3. Which agile practices are perceived to impact on a given team's productivity?
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What is software productivity?

Traditionally defined as

amount of work/amount of time

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Output/Input

- LOC/hour
- Function points/hour
- Story points/iteration (~ team velocity)
Software productivity concepts

Tangen, S. Demystifying productivity and Performance. 2005
Software productivity concepts

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Software productivity concepts

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Volume

Quantity
Software productivity concepts

Return of investment (ROI) – Martin Fowler

Revenue generated per employee – Poppendiecks
Towards a definition of agile productivity

Knowledge worker productivity
(+ learning, + creativity)
Knowledge worker productivity

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Partner companies

• We conducted 2 case studies:
  - 2 Brazilian large (> 250 employees) companies
    - Financial
    - Cloud computing/data center

• Selection criteria:
  - Applying agile methods for, at least, 2 years
  - Projects
    - running for, at least, 6 months
    - > 4 team members
Research steps

• 6 months:
  – Visiting
  – Watching
  – Learning
  – Recording
I. How do agile teams define productivity?

Most team members did not share the same understanding of the concept of productivity.
1. How do agile teams define productivity?

- In most of the interviews, the team member’s definition for productivity was unclear for the researchers.
- 3 mentioned timeliness is a criterion for measuring or perceiving agile team productivity.
- 3 mentioned quantity (~ traditional productivity definition)
- 2 mentioned quality
- 1 mentioned customer satisfaction as a criterion
2. What do agile team members identify as the main factors impacting on productivity?

Team composition and allocation (+)
- Mixed teams
- Small teams
- Full time allocation
2. What do agile team members identify as the main factors impacting on productivity?

- (+) Mixed teams
  - Experienced team members contribute to work adding knowledge, while others contribute being flexible

- (+) Small teams
  - Better communication and alignment among team members
  - Easier conflict management and coordination
  - Sense of commitment and responsibility

- (+) Full time team members
  - Team more focused, without work interruptions
2. What do agile team members identify as the main factors impacting on productivity?

- External dependencies (-)
- (poor) Inter-team coordination policies
- (lack of) Sense of teamwork
2. What do agile team members identify as the main factors impacting on productivity?

- **External Dependencies**
  - (-) Organizational definitions/policies do not consider agile team needs
    - **Coordination** of external dependencies **is not compatible** with the **agile** project **pace**
  - (-) External teams do not consider themselves part of team
    - This **compromises teamwork** and focus on project’s overall goal
2. What do agile team members identify as the main factors impacting on productivity?

Staff turnover (-/+)

- resign
- give notice
- retire 
- (early) retirement
- pensioner
- transfer/promotes
- employ
- recruit
- hire 
- take on
- sack
- fire
- dismiss
- make so redundant
- dismissal
- call in sick
- absenteeism
2. What do agile team members identify as the main factors impacting on productivity?

- **Staff turnover**
  - (-) Loss of critical knowledge, even using job rotation
  - (+) Opportunity to learn new things and make improvements
3. Which agile practices are perceived to impact on a given team's productivity?

Pair programming (+/-)
3. Which agile practices are perceived to impact on a given team's productivity?

- **Pair programming**
  - (+) Enables knowledge dissemination
    - Even when team members work on different schedules.
    - Especially when people have different backgrounds (e.g., domain vs technical).
  - (+) Helps in creating commitment, supportiveness and trust. Increases the level of communication.
  - (-) Full time pair programming
    - Counter-productive and demotivating in easy tasks
    - Controversial issue when resolving complex tasks - it depends on the individual cognitive process of problem solving.
3. Which agile practices are perceived to impact on a given team's productivity?

Collocation (+)
3. Which agile practices are perceived to impact on a given team's productivity?

- **Collocation**
  - (+) Helps in requirements negotiation and planning (re-planning)
  - (+) Improves communication and cooperation.
  - (+) Varies as a function of the workspace layout
    - Even when the team is collocated, team members want to be radically collocated
Questions and answers

Thanks!
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