

Using agile approaches to drive Software Process Improvement

Gislaine Nalepa & Rafaela Fontana & **Sheila Reinehr** & Andreia Malucelli



Agenda

Using agile approaches to drive Software Process Improvement

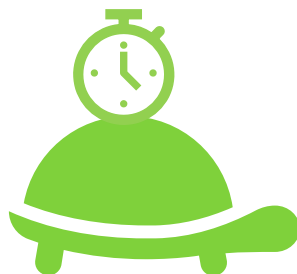
- Introduction
- Related Work
- Research Approach
- Agile SPI Approach
- Conclusions and Recommendations
- References

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What about this?



- 2 different organizations merging
 - Both CMMI Level 3
 - Financial sector (critical)
-
- Demotivated people
 - CMMI improvement guided by the SEPG
-
- Late and slow deliveries

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Related Work

■ Prescriptive SPI approaches

CMMI Product Team (2010)
Zahra et al. (2017)

- Prescriptive is the most used approaches to SPI
- Software processes are compared to a set of best practices defined by reference model, such as CMMI

Unterkalmsteiner (2012)

- Introduce changes in process to generate steadiness
- Divergences represent opportunities for improvements

Related Work

■ Inductive SPI approaches

Basili (1995)

- Changes are guided by the knowledge of the organization
- Learn with each project and reuse knowledge

Petersen (2010)

- SPI through the Lean Measurement
- Avoid problems related to resistance of change

Kuruba (2018)

- SPI approach with Lean methodology

Garcia et al.
(2017)

- Based on application of PDCA and involvement of all employees

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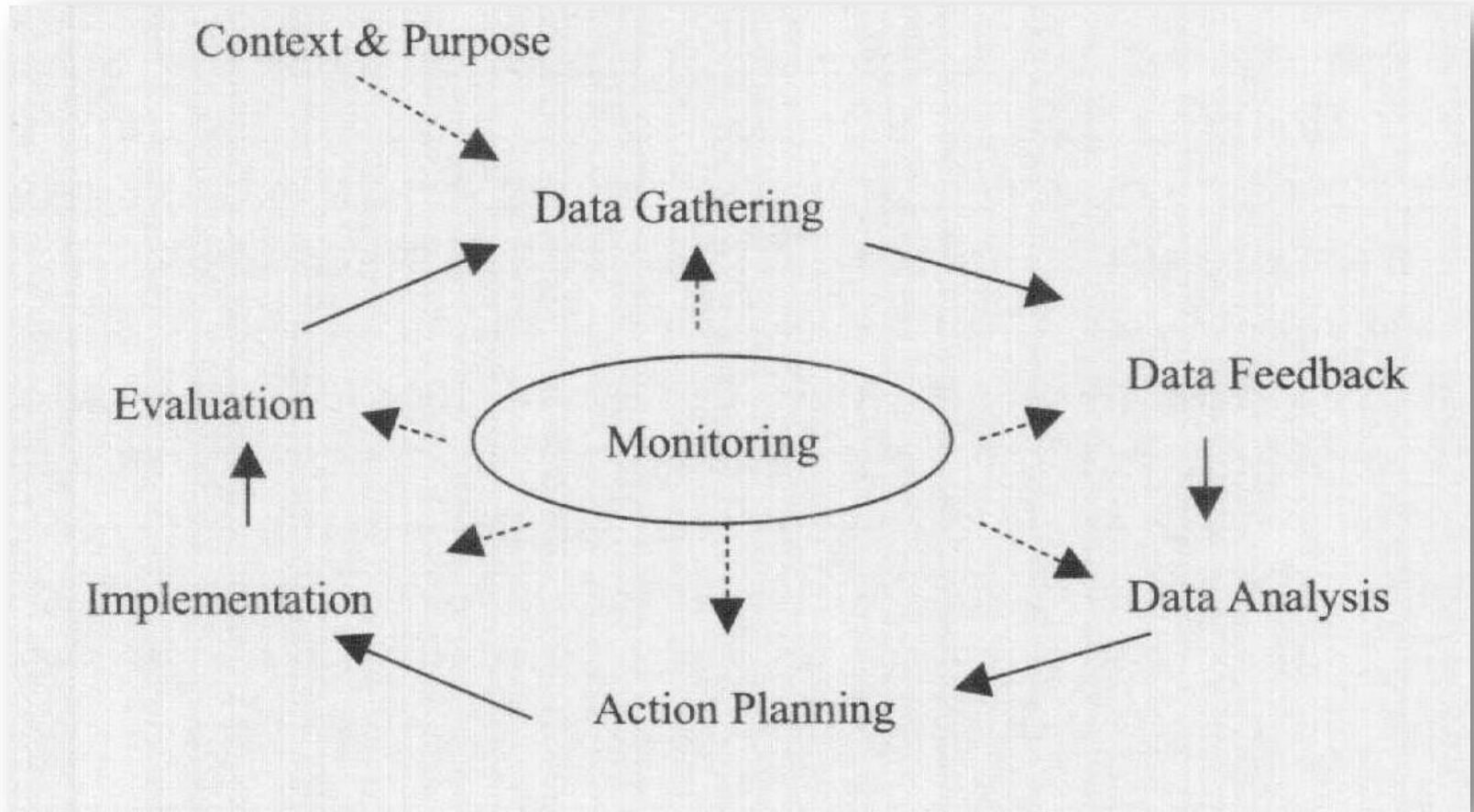
Research Approach

- Research characteristics:
 - Complex problem from an organization
 - Researcher inside the organization

- Research method characteristics:
 - Research *in action* rather than research *about action*
 - Participative
 - Concurrent with action
 - A sequence of events and an approach to solve problems

Research Method

ACTION RESEARCH

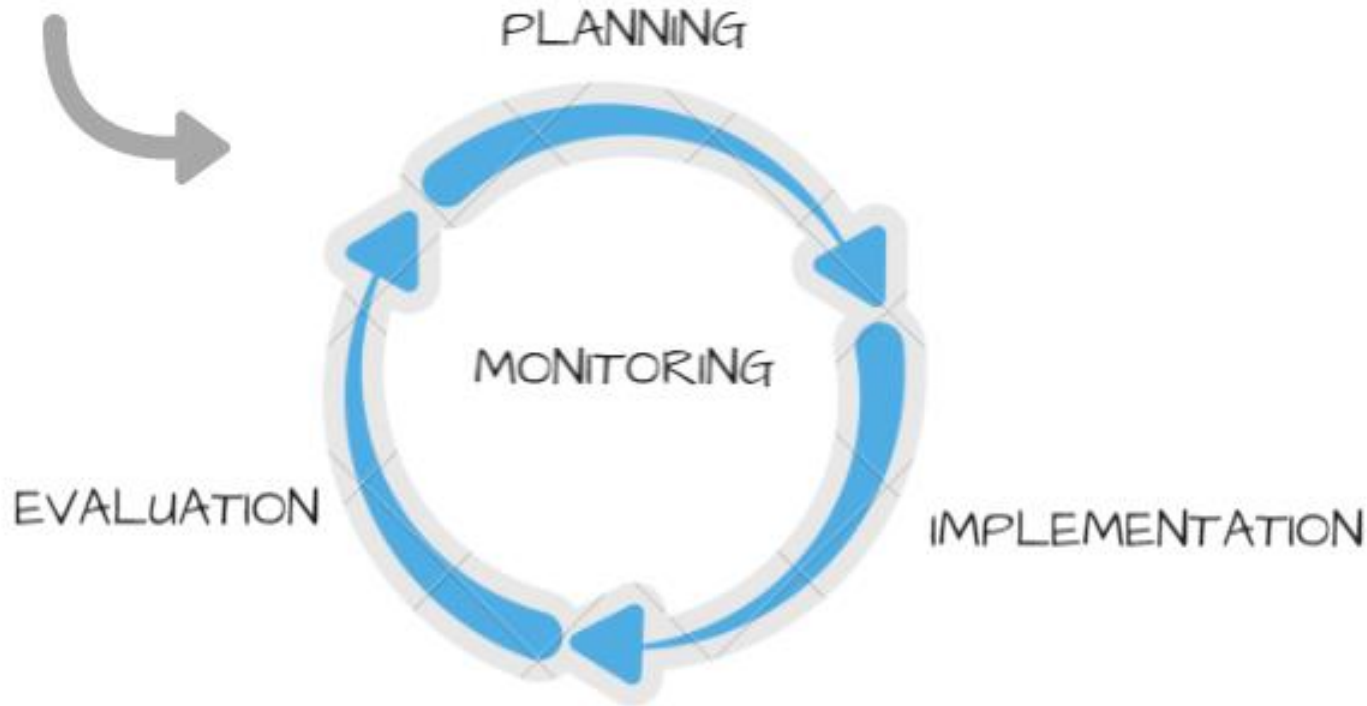


[22] Coughlan and Coughlan (2002)

Research Approach

ACTION RESEARCH OF OUR STUDY

EXPLORATION PHASE



Tailored from [22] Coughlan and Coghlan (2002)

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Exploration Phase



Goals

- Contextualization
- Internal and External environment
- Stakeholders mapping
- Beliefs
- Problems

Tasks

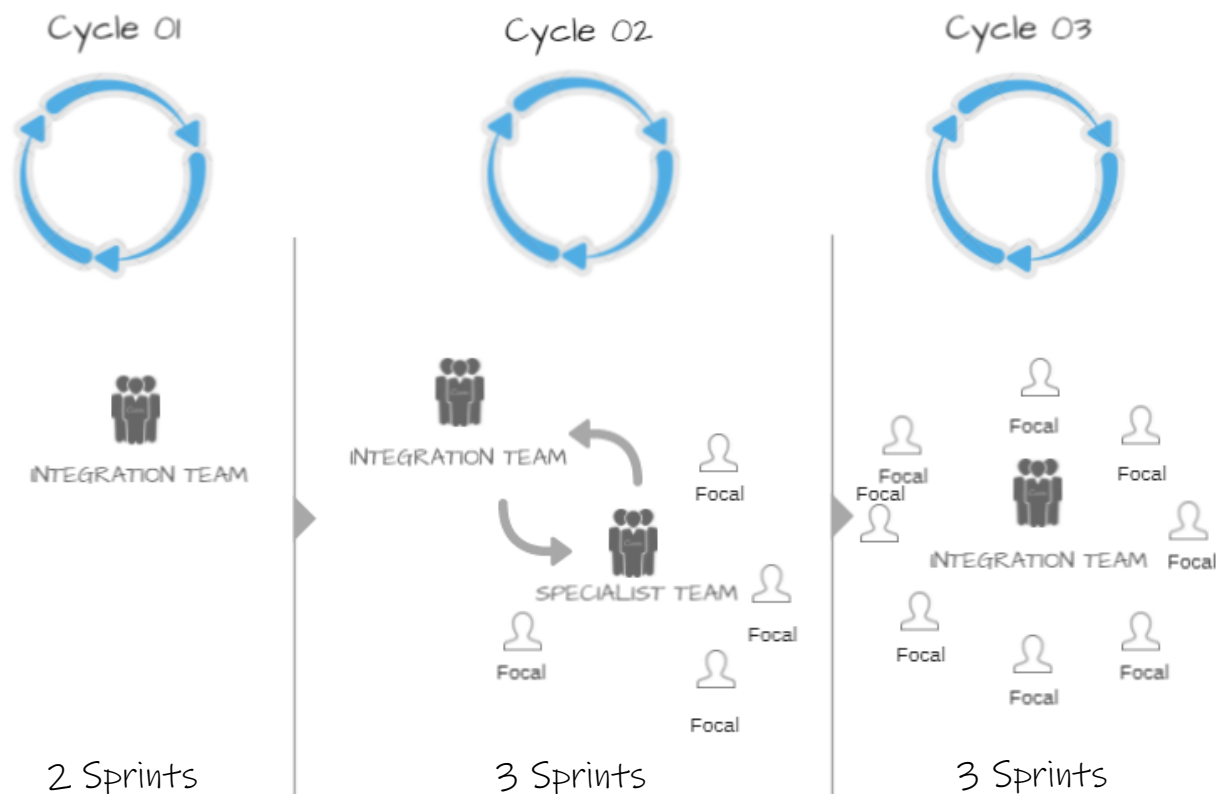
- Interviews with stakeholders
- Existent best practices
- Results of CMMI previous assessment



Findings

- Two different cultures and processes involved
- Lack of flexibility
- People not motivated
- Low quality
- Late deliveries

Agile SPI Approach



SCRUM

USER EXPERIENCE

DESIGN THINKING

Cycle 1 (2 Sprints)

Integration Team

- 04 quality specialists (one from each site)
 - 01 communication specialist
 - 01 infrastructure specialist
- 01 Product Owner (accountable for SPI)
 - 01 SCRUM Master
- All of them working part time (50%), except for SCRUM Master (100%)

Definitions

- Use of SCRUM to manage the SPI project
- Use of User Experience concepts to guide the process definition and deploy
 - 2 Sprints in Cycle 1

Cycle 01



INTEGRATION TEAM

SCRUM

USER EXPERIENCE

Cycle 1 (2 Sprints)



SCRUM

USER EXPERIENCE

Objectives

- Test the use of Scrum
- Validate team composition
- Verify effectiveness of User Experience
- Deliver priority requirements

Deliveries

- Backlog with process problems
- Website
- Processes templates and navigability definition
- Quality Processes

What worked

- Use of Scrum
- Integration Team composition
- User Experience to design the process

What needed improvement

- Maturity on Scrum values (self-organization)
- Consultancy on demand (should be weekly)

Cycle 2 (3 Sprints)

- Integration Team**
- 2 quality specialists (one from each site)
 - 1 communication specialist
 - 1 infrastructure specialist
 - 1 Product Owner (accountable for SPI)
 - 01 SCRUM Master

- Project Management Team**
- 4 Senior Project Managers (2 from each site)
 - 1 Product Owner (aware of PM problems)

- Focal Team**
- 1 representative of each department of the company

- Definitions**
- Use of SCRUM as the SPI management tool
 - Use of User Experience concepts to guide the process definition and deploy
 - 3 Sprints in Cycle 2



SCRUM

USER EXPERIENCE

DESIGN THINKING

Cycle 2 (3 Sprints)



SCRUM

USER EXPERIENCE

DESIGN THINKING

Objectives

- Increase productivity (in delivering processes) and capacity of iterations
- Involve representatives of the whole company
- Test effectiveness of Design Thinking
- Project Management Process

Deliveries

- Project Management process (partial)
- Quality Assurance pilot
- Improvement of deliveries from previous iterations based on feedbacks

What worked

- Maturity of Integration Team

What needed improvement

- Speed of Project Management team
- Involvement of Focal Team

Cycle 3 (3 Sprints)

Integration Team

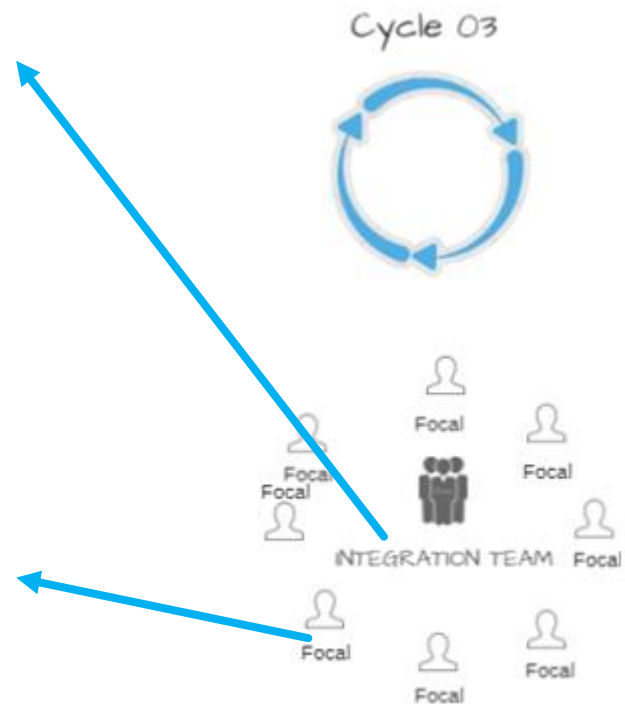
- 2 quality specialists (one from each site)
 - 1 communication specialist
 - 1 infrastructure specialist
- 1 Product Owner (accountable for SPI)
 - 1 PM e=specialist
 - 01 SCRUM Master

Focal Team

- 1 representative of each department
- 4 Project Managers (form the PM Team)

Definitions

- Changes in consultancy frequency
 - Change Management program
- Increase communication to all company



SCRUM

USER EXPERIENCE

DESIGN THINKING

Cycle 3 (3 Sprints)



SCRUM

USER EXPERIENCE

DESIGN THINKING

Objectives

- Make final adjustments in the approach
- Deliver Project Management process

Deliveries

- Project Management process
- Improvement of deliveries from previous iterations based on feedbacks

What was good

- Speed of Integration team
- Reorganization of teams

What needed to improve

- Involvement of focal team

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Conclusions

- The initial context of the implementation was challenging:
 - The fusion of 2 large IT companies (from the financial sector)
 - Each of them with their own culture and their own processes
 - Both appraised at CMMI Level 3
 - Problems with late deliveries
 - Problems related to employee's motivation
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Conclusions

- Research Action approach based on SCRUM, Design Thinking sessions and User Experience practices worked well together to work with the problem
- Retrospective meetings allowed deep analysis to improve the strategy for the next Sprint
- Initial approaches had to be changed in order to gain delivery speed

Recommendations

- Create a strategy able to evolve (action research allowed such evolution)
- Create a SPI strategy based on the context of your organization
- Do not limit SPI to one department of your company



Recommendations

- Allow involved people to perform their best skills, this may be vital for successful results
- SPI approaches making use of iterations and empiricism can generate great results and motivate people to keep involved
- Agile approaches can successfully guide SPI projects

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Sheila Reinehr
sheila.reinehr@pucpr.br

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