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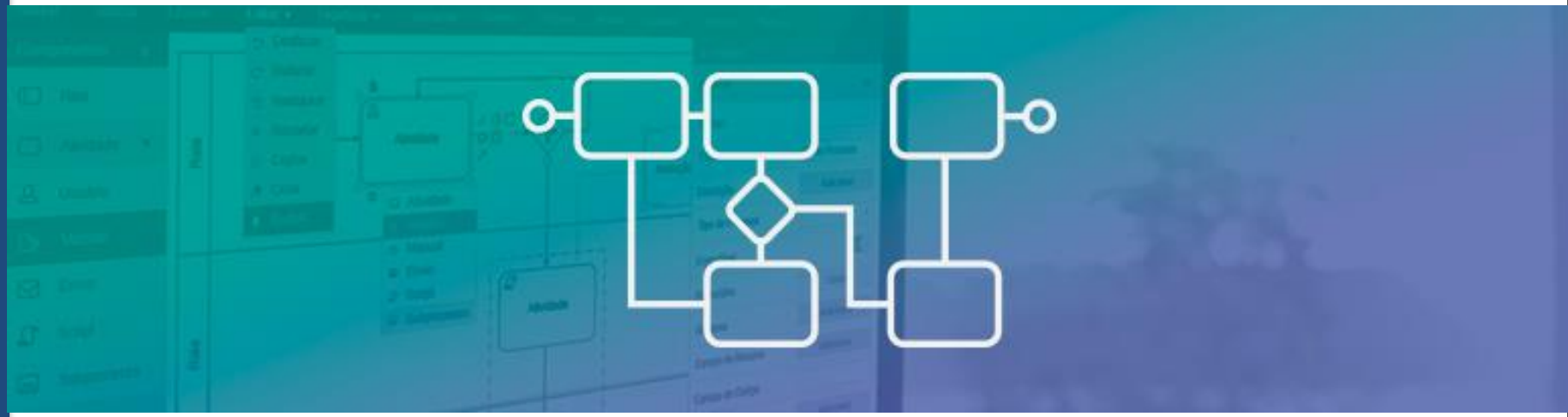


Getting Results with Process Improvements

Research and Practice

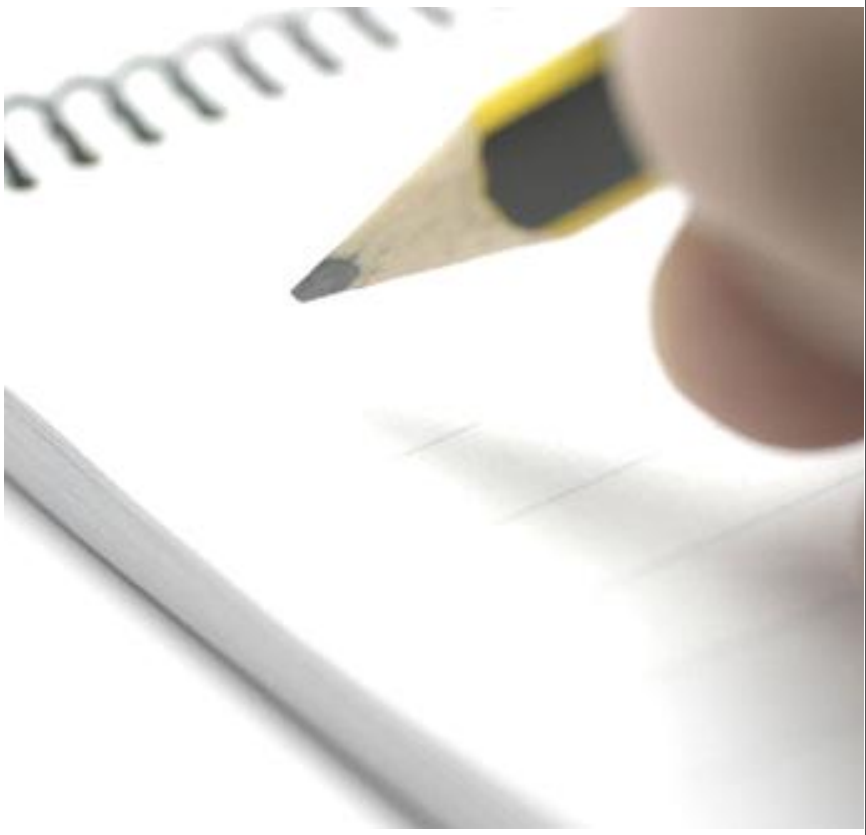
ISEP
1st of April, 2022

about me

- ~20 years of experience in Software Engineering (4 of which as a researcher visiting Software Development companies, Universities and working with the Software Engineering Institute to get her PhD). She is currently moving to an international Consultancy company.
- Isabel Margarido was Senior Project Manager at Sonae, at the Health and Wellness businesses, after working in the Food retail and Fashion Internacionalisation, and being a Business Service Partner of Fashion, Sports and Electronics.
- Previously, working at Critical Software (CSW), as Senior Product Manager, Isabel had a start-up experience, helping found Mindera, establishing partnerships in Europe and USA and managing the products and important accounts such as YUM (KFC, Pizza Hut and Burger King in Canada, China and Europe). Later she became Programme Manager of a transformational Product for the biggest accountancy IT company in the UK, Iris. In her earlier years at CSW, Isabel founded and managed the Testing department, was Project and Quality Manager in key projects, and member of the CMMI Appraisal Team. With her contribution, Critical Software became the first Portuguese company rated at ML 5.
- Isabel holds a Ph.D in Informatics Engineering, in Process and Project Quantitative Management, pursued due to her interest in the implementation of HML of CMMI and her admiration for the work of Watts Humphrey. She conducted her research in collaboration with the SEI. Additionally, Isabel is graduated in Electronics and Computers Engineering. Both her degrees were obtained at the Faculty of Engineering of the University of Porto.

agenda

- **introduction**
- process improvements
- win or fail
- takeaways



what is a process?

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why do they fail?

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how to do it?

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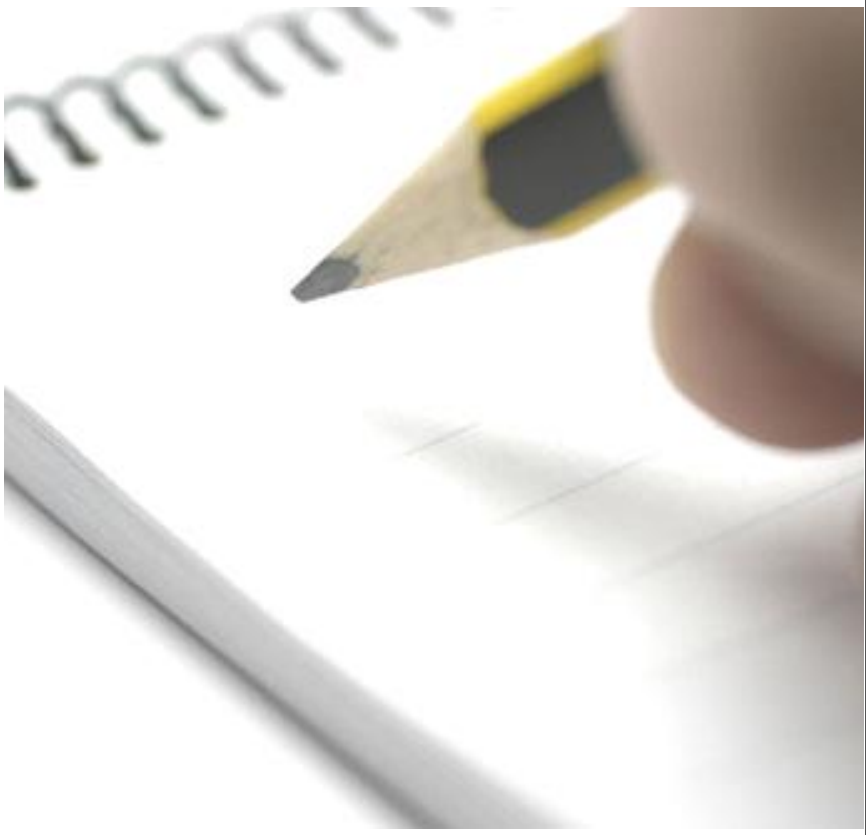

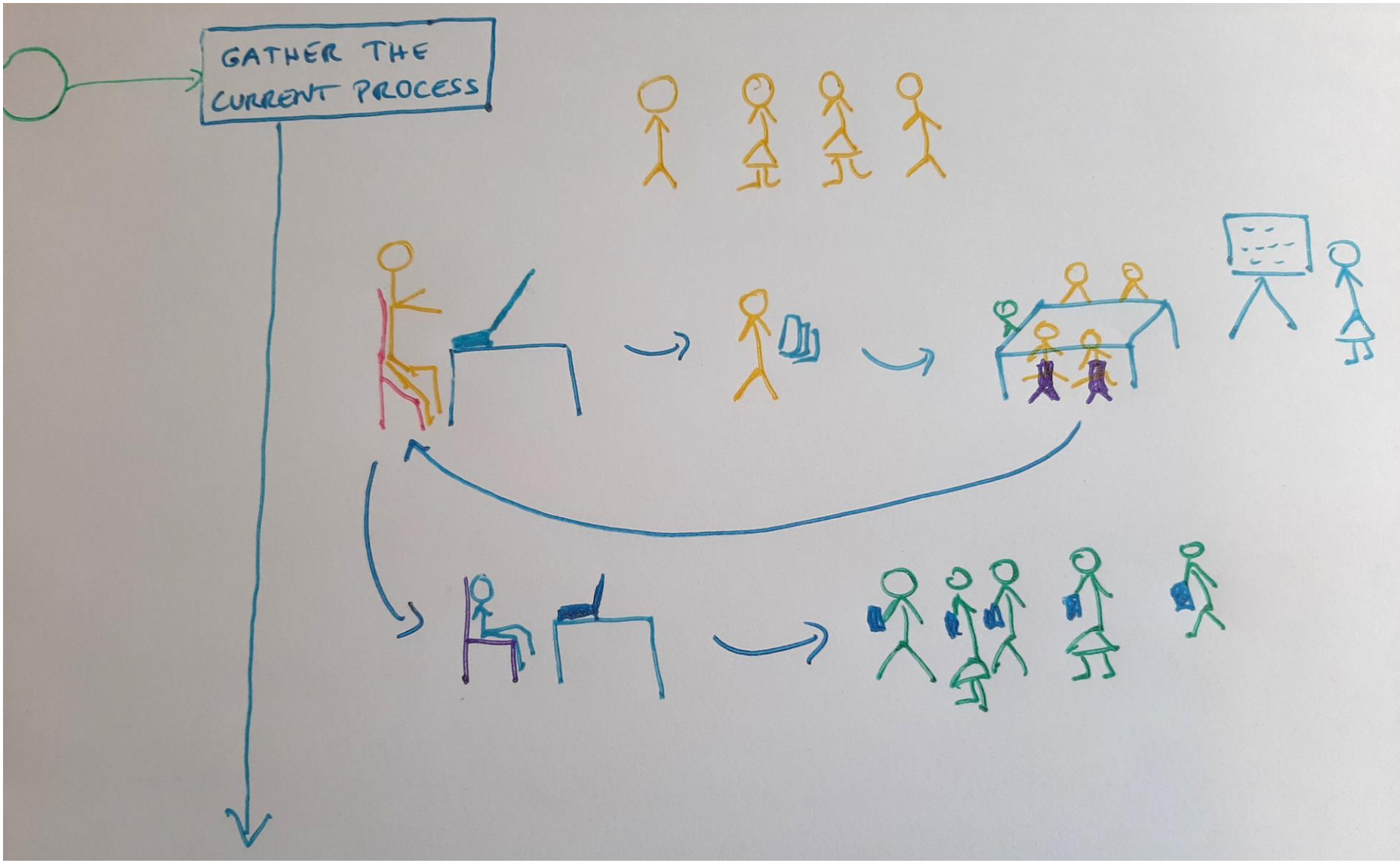

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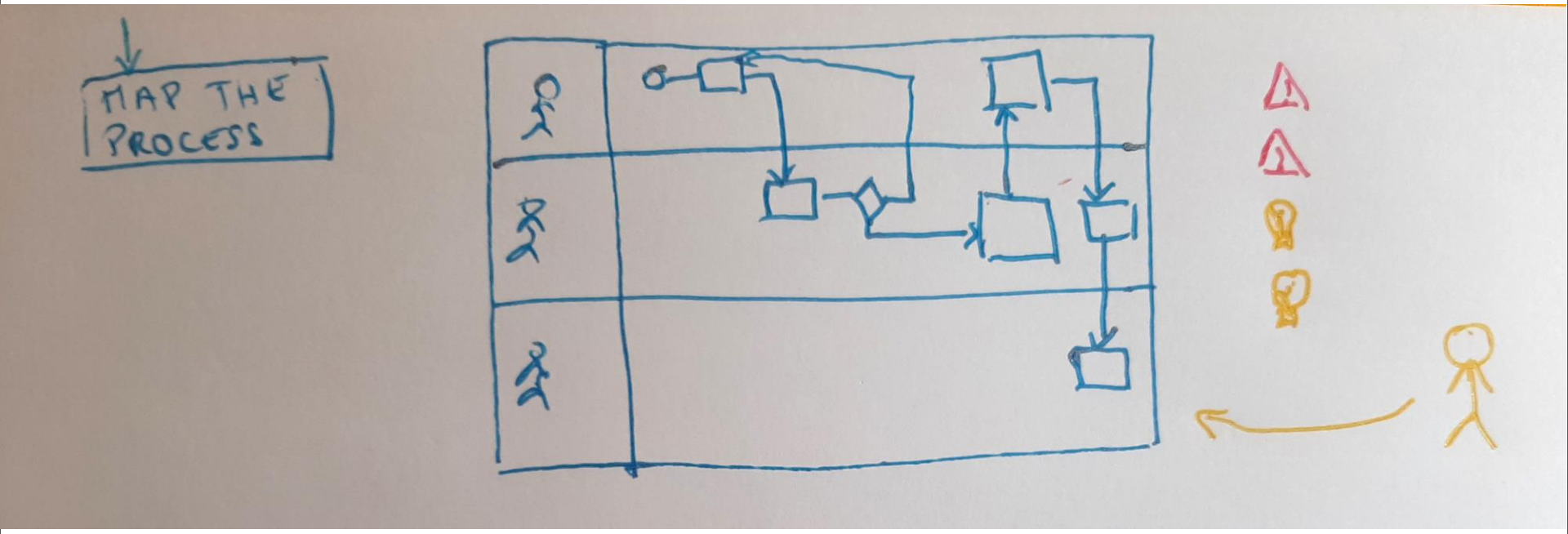
validate the *as is* and *to be* processes



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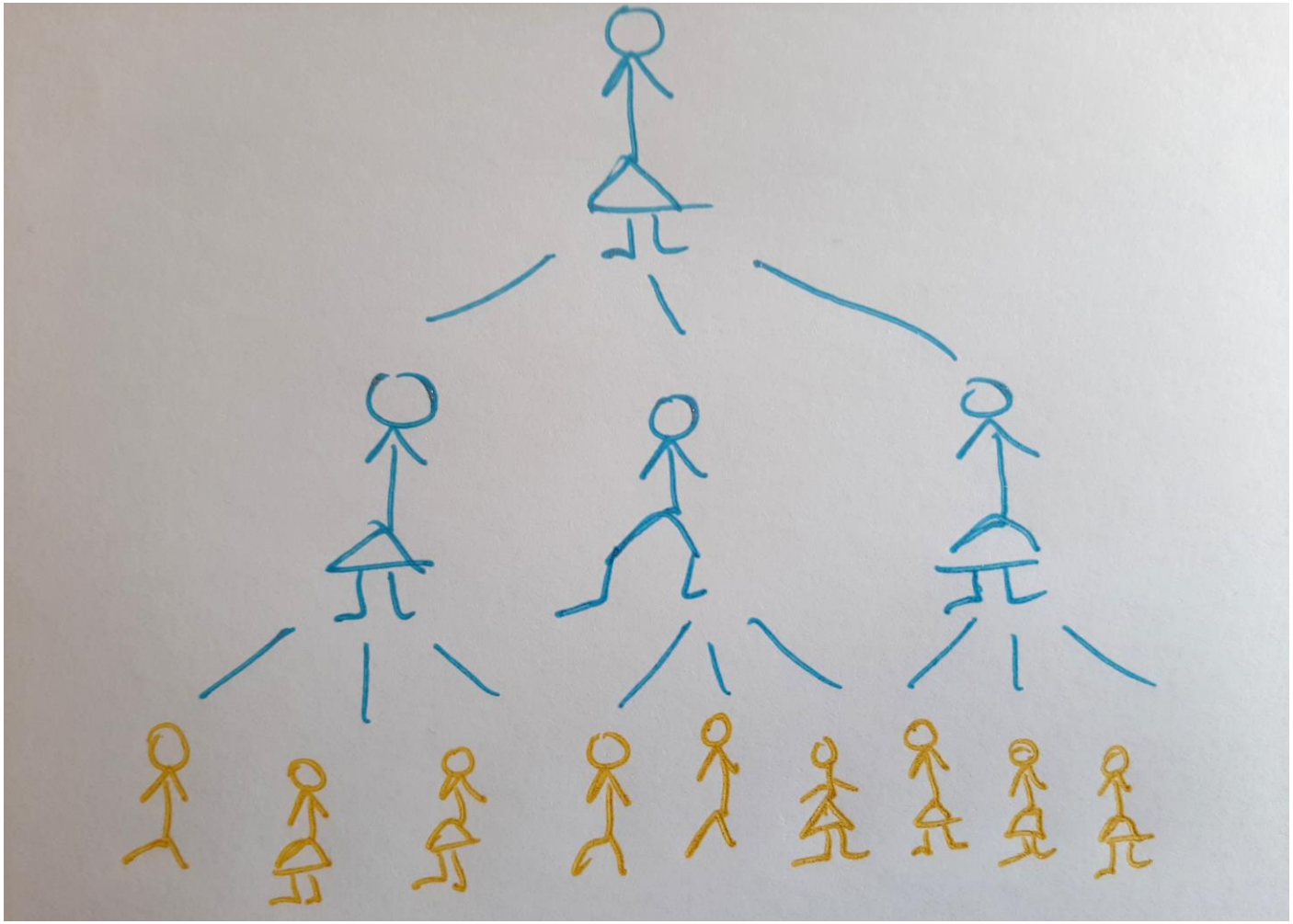
do it organisation wide



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1. IDENTIFY PROCESS

Based on the needs identify improvement opportunity

2. CARACTERISE *AS IS*, FIELD ANALYSIS

Visit work area, identify the difficulties, map the process

3. MEASURE THE PERFORMANCE

Analyse current performance and identify improvement opportunities

4. DEFINE *TO BE* AND PLAN ACTIONS

Analise and define the solution, identify actions owner and plan

5. MAP NEW PROCESS AND ADJUST

Deploy improvements and adjust as needed

6. CONFIRM BENEFITS

Analyse new process performance

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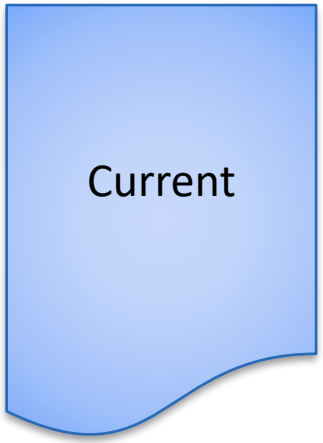
EQualPI - configurations & improvements



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EQualPI - configurations & improvements

(Lopes Margarido *et al.*, CMMI Portugal, 2012)

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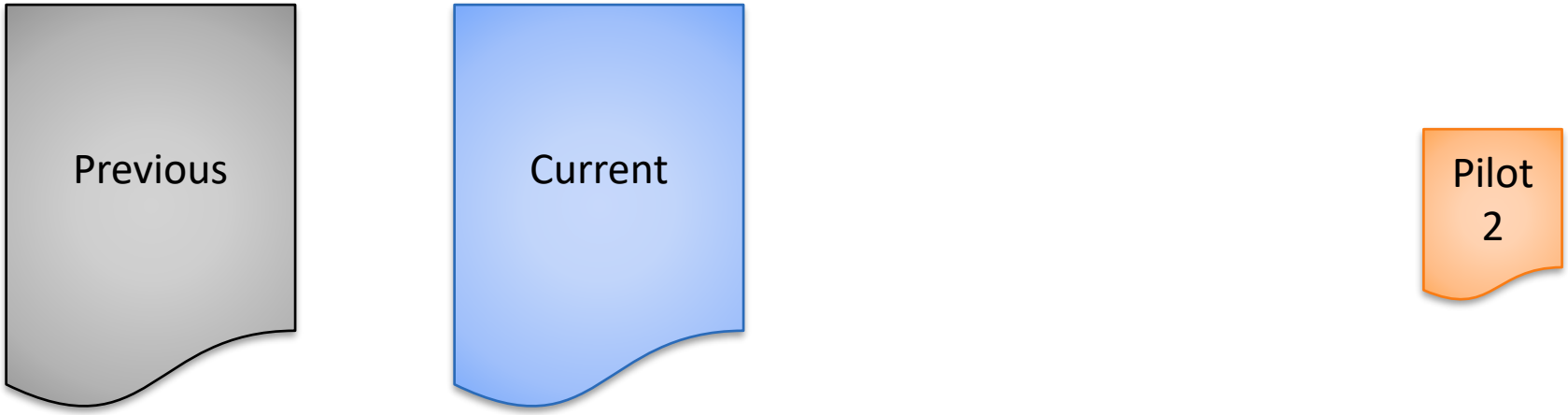

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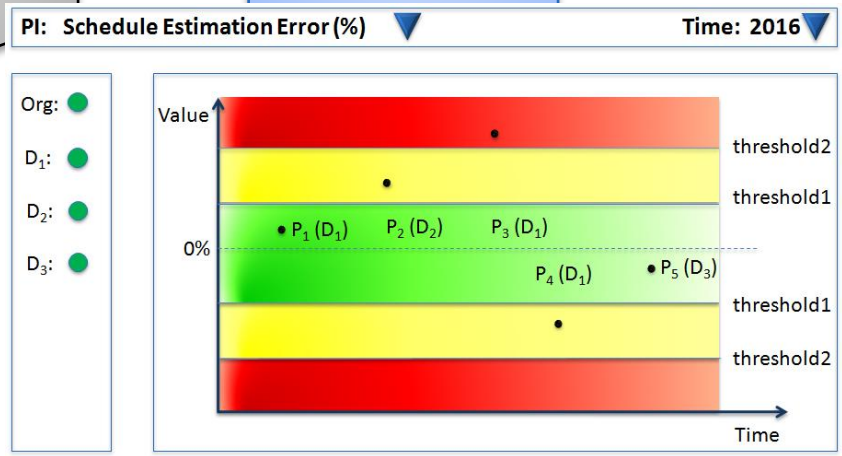
EQualPI - configurations & improvements

(Lopes Margarido *et al.*, CMMI Portugal, 2012)

Previous

Current

Pilot 2



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EQualPI - configurations & improvements

(Lopes Margarido *et al.*, CMMI Portugal, 2012)

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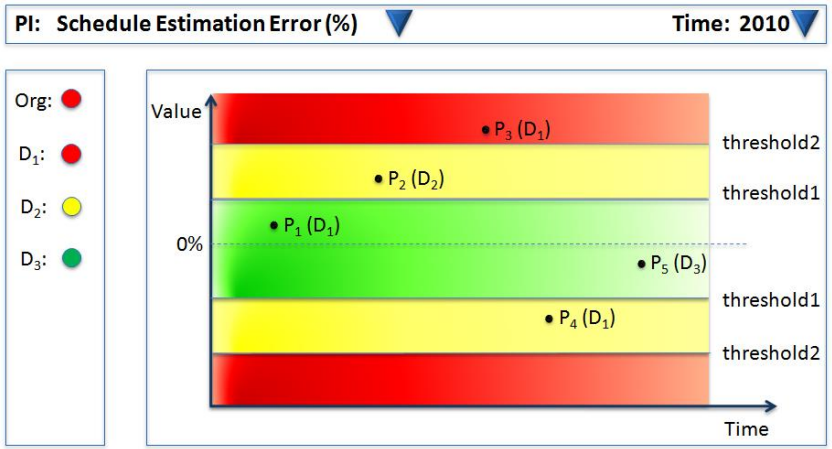

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EQualPI - configurations & improvements

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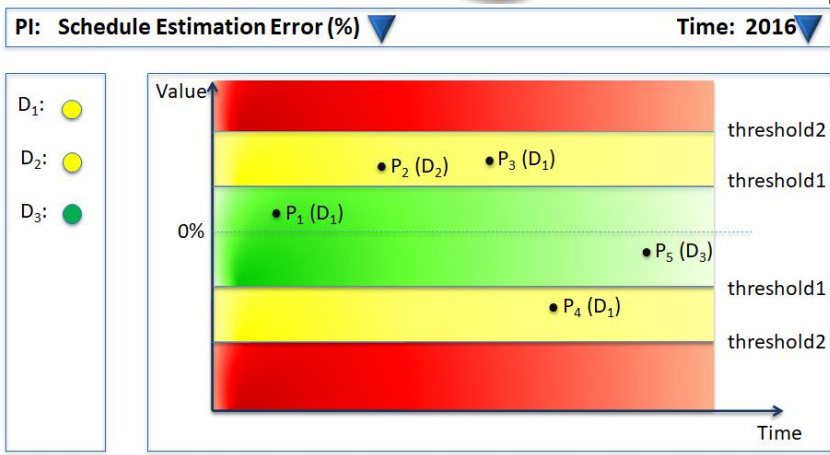

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EQualPI - configurations & improvements

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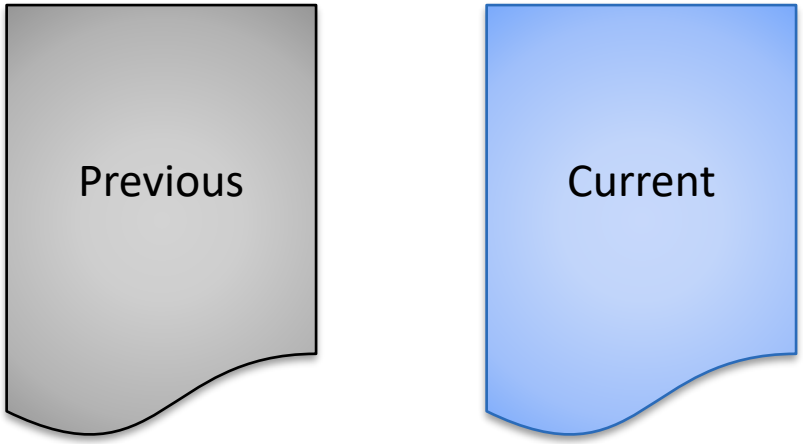

RQ4: how to evaluate quality of implementation of practices ensuring performance and benefits?

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example

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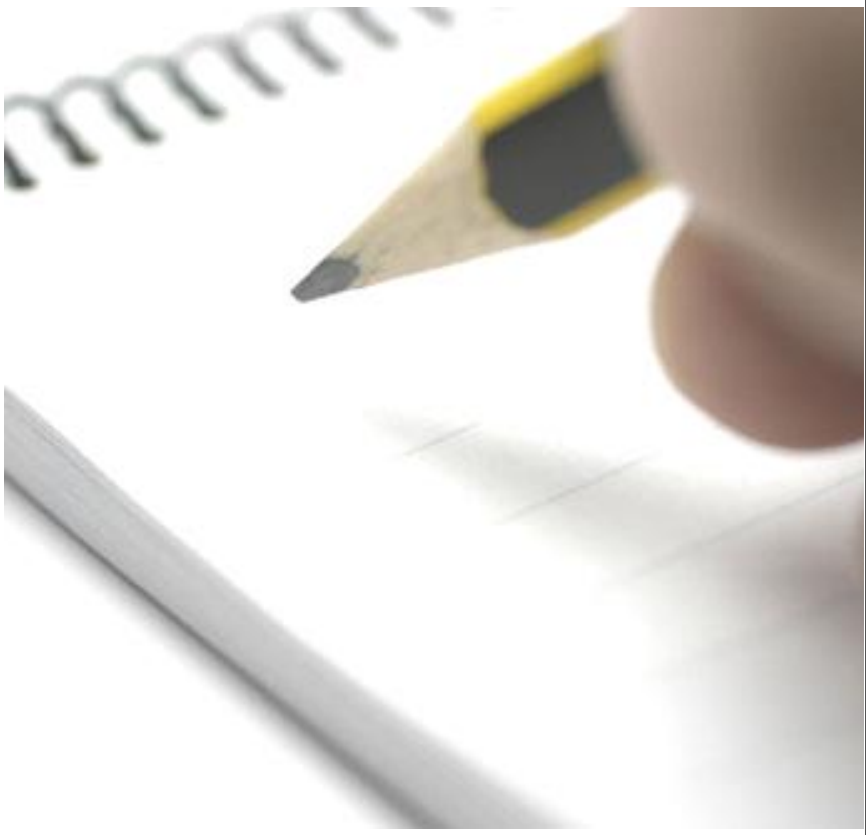

hml survey data analysis

identified additional factors

- useful to implement CMMI
- relevant when appraising

(Lopes Margarido *et al.*, SQP, 2013)

RQ3: what recommendations can we add to avoid problems when implementing CMMI?

RQ4: how to evaluate quality of implementation of practices ensuring performance and benefits?

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case studies

- 47% found in the case studies were also in the literature
- 53% found in the case studies shared with the surveyed organisations
  - 27% also found in literature
- several problems shared between the studied organisations

*"the percentage of problems shared in more than one organisation/source indicates that they can occur when implementing HML, so **organisations should be aware of them.*** (Lopes Margarido *et al.*, SQP, 2013)"

RQ3: what recommendations can we add to avoid problems when implementing CMMI?

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process improvements

field experiment

requirements defects classification

eliminate common defects

PI: agreement

caution (Lopes Margarido *et al.*, CISTI, 2011)

RQ3: what recommendations can we add to avoid problems when implementing CMMI?

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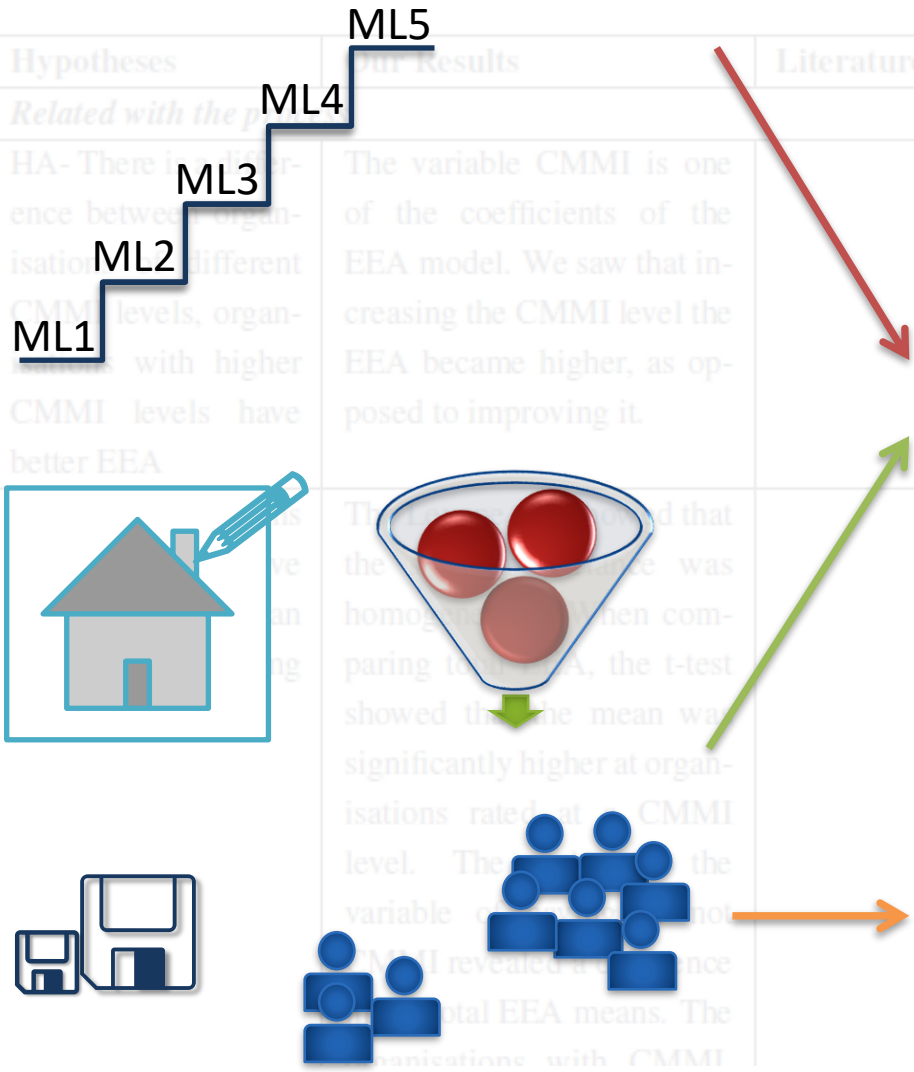
EEA performance indicators



- indicators influence EEA
- organisations can control them

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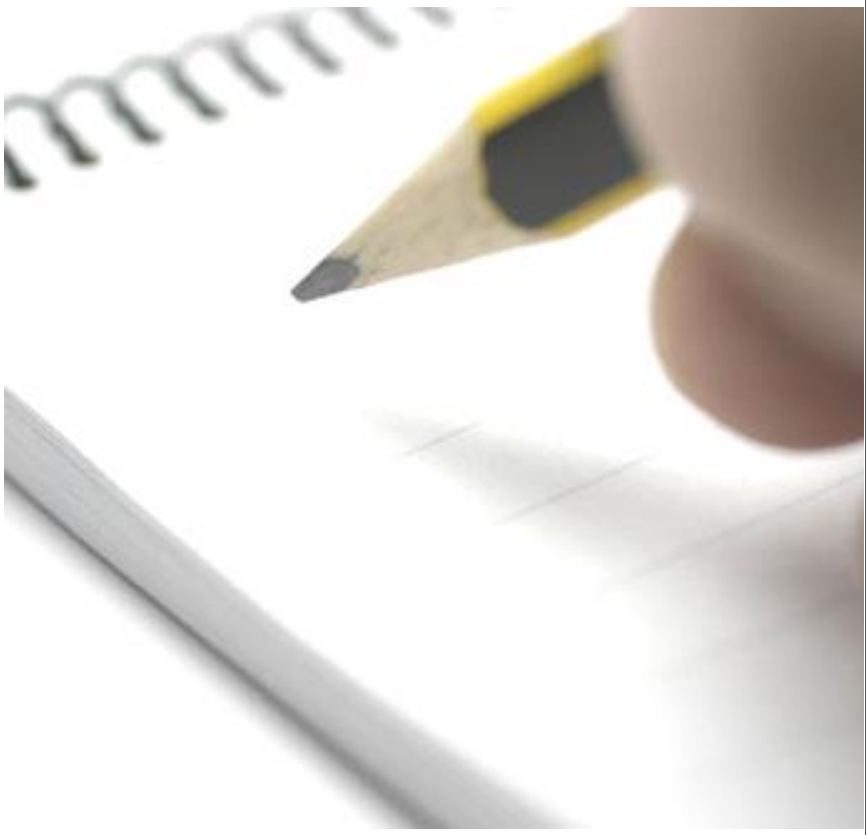

remember

- ❑ establish attainable quantitative improvement objectives
- ❑ map the *as is* process in collaboration with the people who are actually doing the work
- ❑ define, gather metrics and establish the baseline with eveyone
- ❑ establish meaningful process indicators at the diferente levels and roles in the organisation in a way that allows to define specific goals at the diferente levels of the organisation
- ❑ define the metrics and performance indicators, their governance model and include the aggregation rules
- ❑ identify improvement needs and opportunities
- ❑ start with pilots
- ❑ measure results to allow validation and to identify new improvement opportunities
- ❑ progressively rollout
- ❑ continue to measure and evaluate to identify other improvement opportunities

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CMMI evolution

- V1.3 was intended to **overcome issues** in undertanding **high maturity**…
  - however, lacked ability to do benchmarking and objectively evaluate **performance**
- V2.0 changed the model definition and implemented the evaluation with **benchmarking**
  - simplified the vocabulary to allow a better understanding of the good practices

still, all process improvements rely on the intent of the organisation of really wanting to get better results, meet time to market and have happy people, as they are better at their job

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questions

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acronyms

CMMI – Capability Maturity Model Integration
EEA – Effort Estimation Accuracy
ML – Maturity Level
PI – Performance Indicator
PSP – Personal Software Process
TSP – Team Software Process
RQ – Research Question
SEI – Software Engineering Institute
SQP – Software Quality Professional

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