

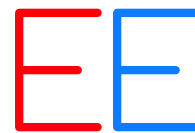
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A Framework to Evaluate Business Process Modelling Methods

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Enterprise Engineering Team



Fonds National de la
Recherche Luxembourg



Radboud University Nijmegen



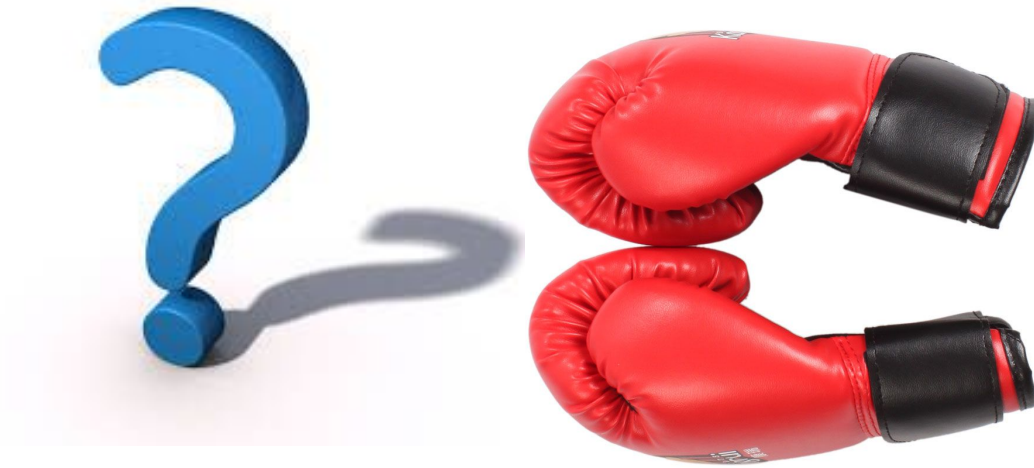
Hogeschool



van Arnhem en Nijmegen
HAN University of Applied Sciences

Agenda

- ☐ Definitions
- ☐ Research motivation + scope
- ☐ Research questions + more scoping
- ☐ Research approach
- ☐ Research design
- ☐ On evaluation criteria
- ☐ Publications and next steps



Preamble

Currently fighting with research questions and
scope

EE

Acronyms

- BP Business Process
- BPMM Business Process Modelling Method
- DS Design Science
- IS Information Systems

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Definitions

■ Process

Set of interrelated or interacting activities which transforms inputs into outputs [ISO 9000]

- We adopted this definition because it is
 - Agreed upon by many practitioners
 - Broad
 - It includes all kinds of “Business Processes” for which people may say “We (want to) model our business processes”
 - Entails intentional specifications, case based specifications, Petri nets like specifications

■ Business Process (BP)

A business process is a process intended to achieve a business outcome

Definitions

- **Process Model**

Formal description of the process

Encompasses graphical and non graphical models

As-is, to be, etc.

Level	Mental representation (think it!)	Model (document it!)	Action (perform it!)
2 Definition	Process	Process model	Process performance
1 Instantiation	Mental representation of a process instance	Process model instance + Process performance trace	Process instance performance

Definitions

- Business Process Modelling Method (BPMM)

= our “evaluand”

Context

- BPMMs are usually referred to in the IS domain or in the context of Enterprise Engineering.

Definition

- Various IS related method definitions exist. For our study:
 - BPMMs are “methods” that are used to model business processes.
 - Affordance oriented definition: we consider something as a BPMM because people say they use it as a BPMM

I model business
processes with this
method



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Research motivation

to evaluate Business Process Modelling Methods
(BPMMS)

Research motivation: two perspectives

- Perspective 1: Stakeholders need to know what can be expected from a BPMM + its scope and limits

“in general”, not bearing in mind a specific problem

E.g. Employees are required to use a BPMM in their organisation (corporate)

E.g. Method promoters want to improve their communication based on more adequate information

Stakeholders: People who are interested by BPMM evaluation results (evaluation beneficiaries). Stakeholders include BPMMs users, who

Model with

Choose

Promote/Sponsor

BPMMs

Stakeholders



What does this BPMM do?

Research motivation: two perspectives

- Perspective 1: Stakeholders need to know what can be expected from a BPMM + its scope and limits

Stakeholders want practical information

Stakeholders



What does this BPMM do?

Research motivation: two perspectives

- Perspective 1: Stakeholders need to know what can be expected from a BPMM + its scope and limits

Stakeholders want practical information

- Understandable without knowing beforehand evaluated BPMM's concepts

Stakeholders



What does this BPMM do?

Research motivation: two perspectives

- Perspective 1: Stakeholders need to know what can be expected from a BPMM + its scope and limits

Stakeholders want practical information

- Independent from tool vendors

Stakeholders



What does this BPMM do?



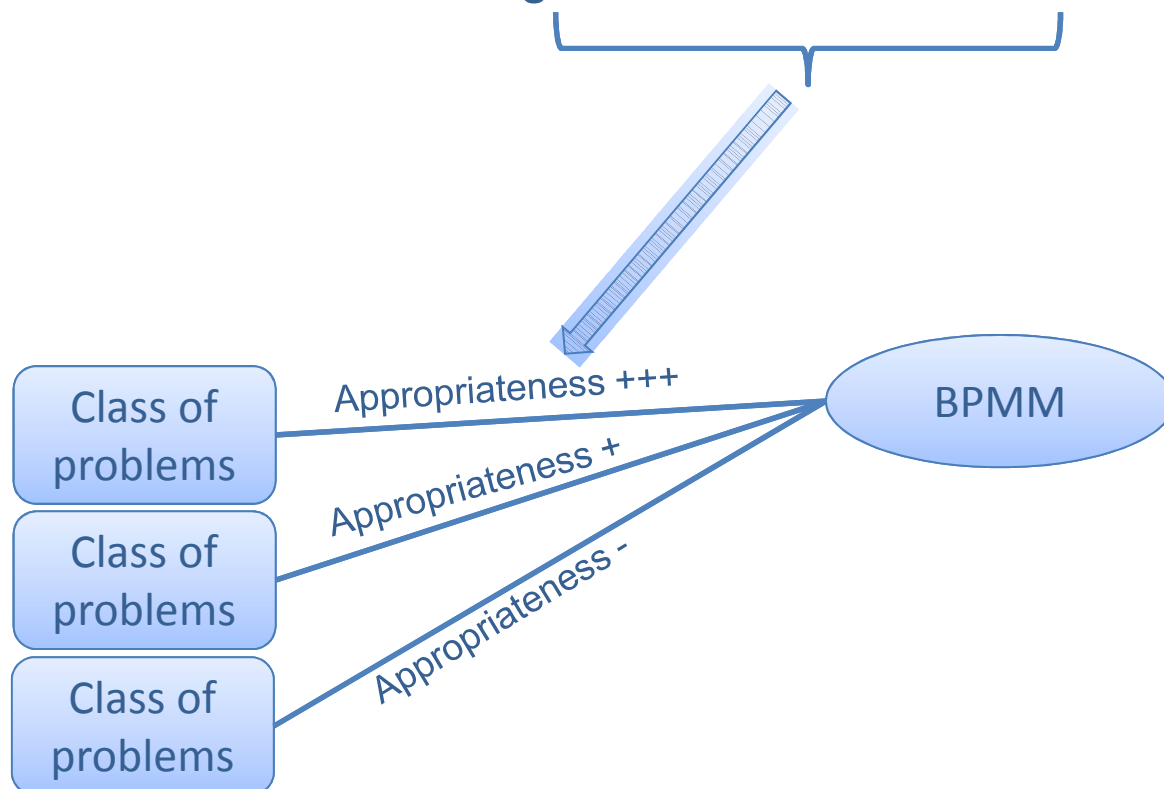
Don't judge
a book by its
cover

Research motivation: two perspectives

- Perspective 1: Stakeholders need to know what can be expected from a BPMM + its scope and limits

Stakeholders want practical information

- Stating BPMM Value in Use



Stakeholders



What does this BPMM do?



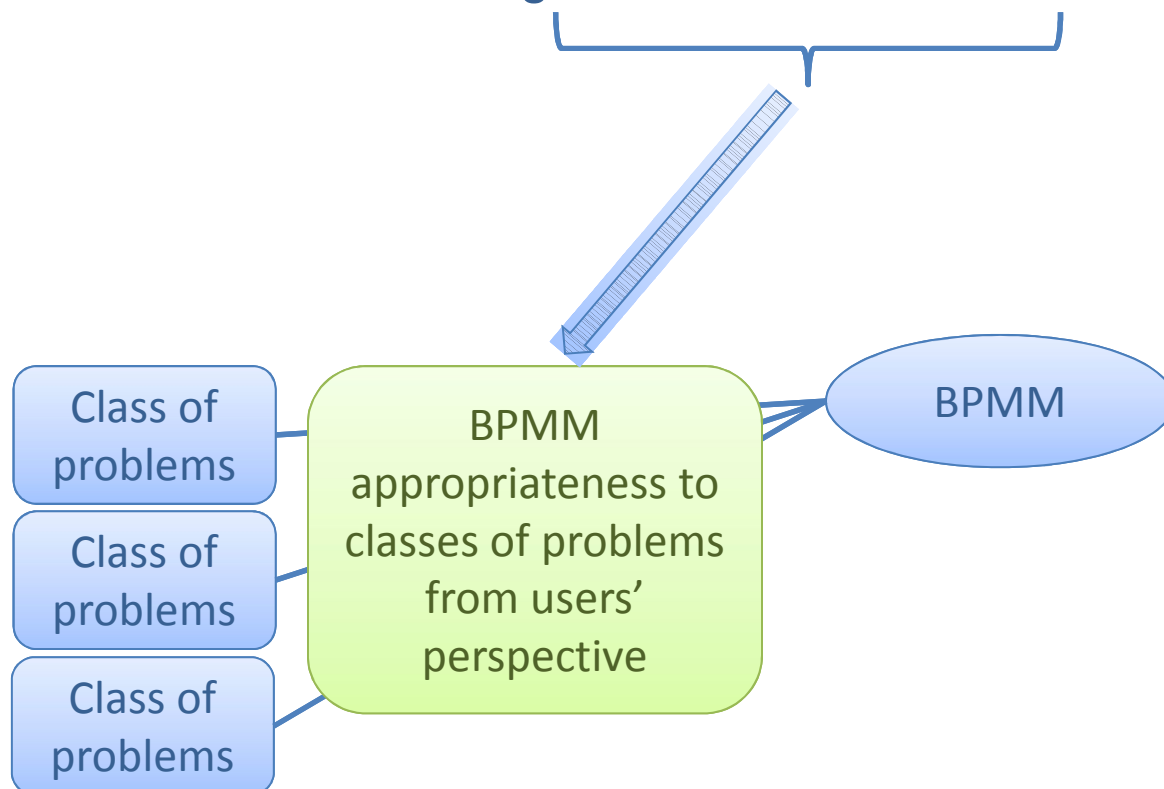
BPMM users

Research motivation: two perspectives

- Perspective 1: Stakeholders need to know what can be expected from a BPMM + its scope and limits

Stakeholders want practical information

- Stating BPMM Value in Use



Stakeholders



What does this BPMM do?



BPMM users

Research motivation: two perspectives

- Perspective 2: Stakeholders need to choose a BPMM for a specific problem

Stakeholders



Which BPMM is most appropriate for my problem?

Single
problem

Research motivation: two perspectives

- Perspective 2: Stakeholders need to choose a BPMM for a specific problem

Stakeholders



Which BPMM is most appropriate for my problem?

Well...

- People often choose amongst BPMMs they know
- People may not be aware of BPMMs differences
- Usually, no appropriateness evaluation is performed when selecting a BPMM

Single
problem

Motivation: two perspectives

- Perspective 2: Stakeholders need to choose a BPMM for a specific problem

Stakeholders may want to compare BPMMs

- Here again they need practical and understandable information

Stakeholders



Which BPMM is most appropriate for my problem?

Single
problem

Motivation: two perspectives

- Perspective 2: Stakeholders need to choose a BPMM for a specific problem

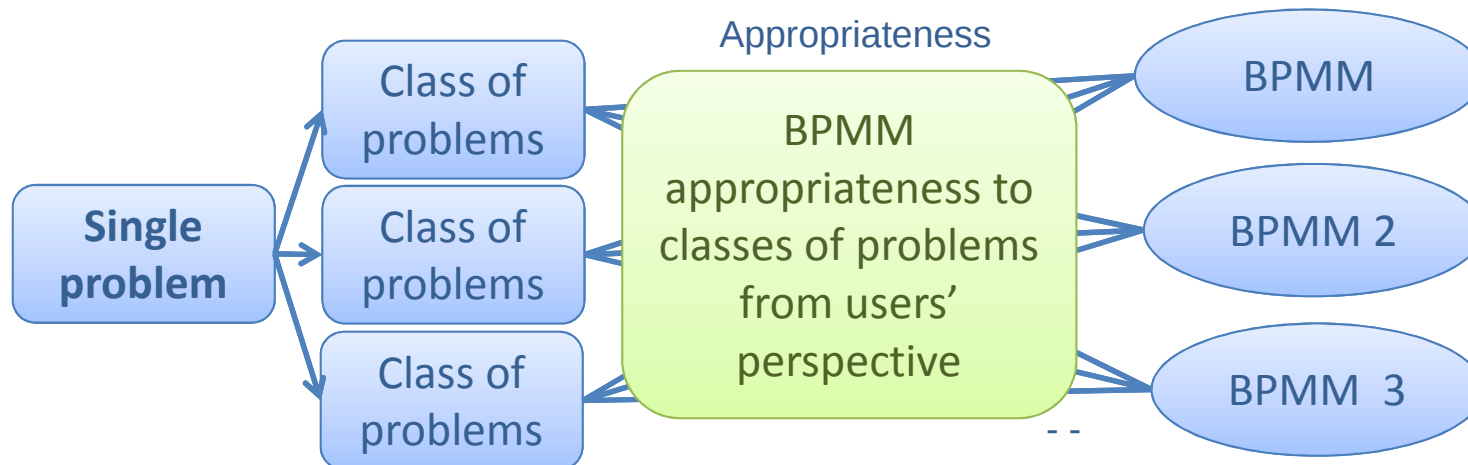
Stakeholders may want to compare BPMMs

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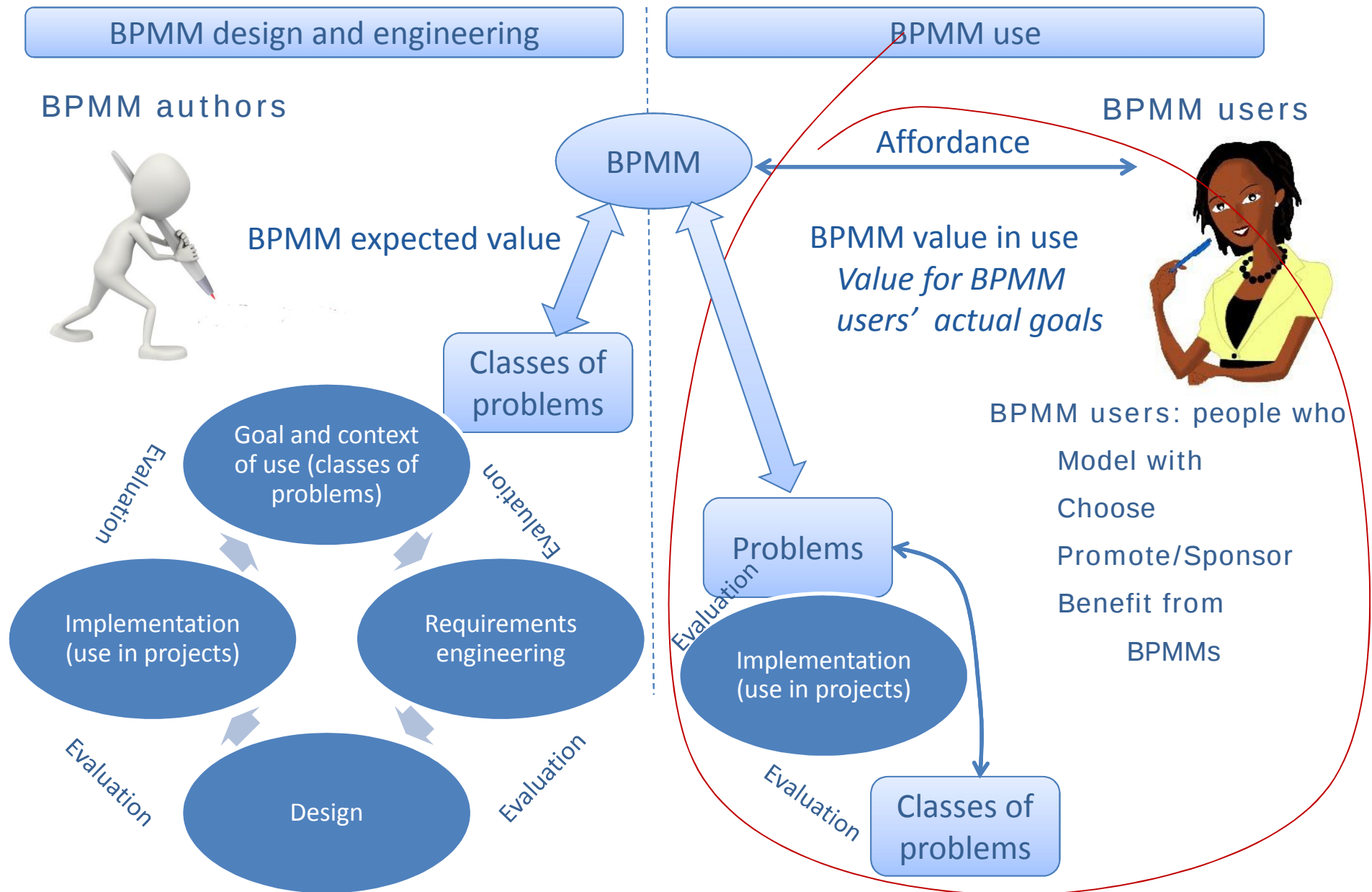
Which BPMM is most appropriate for my problem?



Research scope

We partially address users' problems that are stated in the « motivation » section

Research scope: evaluate BPMMs value in use



Motivation to focus on users' perspective

People model BP with BPMMs according to people's goals

People are involved in BP

BP models are read (at least) by people



People are central in BP modelling



We choose to focus on users' perspective

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Still unstable Research questions

From BPMM users' perspective, for which purposes and in which contexts does a given BPMM bring its highest value?

For which classes of problems is a BPMM value highest?

What classes of problems are addressed in practice by a BPMM?

What is a BPMM value for these classes of problems ?

What is a BPMM value in use from users' perspective?

What strategies and criteria can we use to evaluate BPMMs value in use from users' perspective?

Presentation' focus

BPMM evaluation: research scope

- what for

Increase knowledge about BPMMs value in use

...to build a future framework to recommend the use of a BPMM for a specific problem?

- what

~~Evaluate BPMM value in use towards BPMM value as intended by BPMM authors~~

Evaluate BPMMs' value in use towards users' purposes

Criteria: from DS literature (Fit for purpose, Effectiveness, Efficiency, Ease of use)

Context: problem + goal

- when

Ex post evaluation

~~Ex ante evaluation~~

- where

In projects where BP modelling happened

- how

Naturalistic evaluation

- Case studies: evaluated BPMMs are selected so that they are dissimilar according to a BPMM typology (Winter)

~~Experimental evaluation~~

- who

Sources of information : BPMMs users

Evaluators: Researchers

Evaluation beneficiaries: BPMMs stakeholders (including users)

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Research approach: Design Science approach

Design Science approach

Concerns:

Design and Engineering
Evaluation

Evaluation criteria

Evaluation frameworks

Evaluation methods

BPMM

evaluation

A BPMM is a design artefact,
it addresses classes of
problems

Source:

Literature about

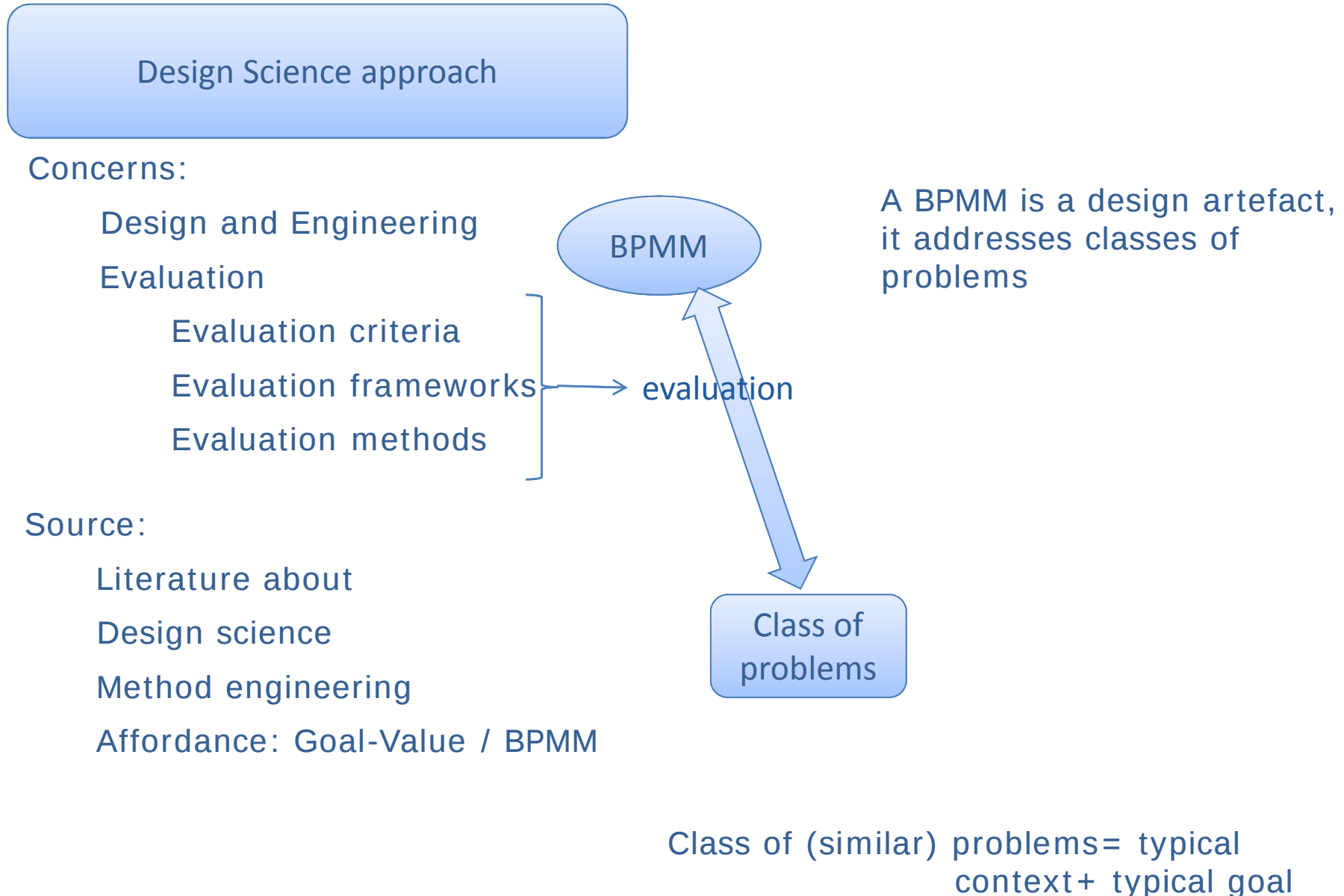
Design science

Method engineering

Affordance: Goal-Value / BPMM

Class of
problems

Class of (similar) problems= typical
context+ typical goal



Research approach: Design Science approach

- Research questions should guide the selection of an appropriate research method
 - DS paradigm fits our research questions
- (Järvinen 2000)

Design Science (DS)	Routine Design (RD)
General solution	Specific solution
Produces new knowledge (novelty)	Uses the current/existing knowledge
Unknowns (not known) things in the planed design	Design is known (replication)
Contributes to the knowledge base (a development of scientific knowledge)	Does not contributes to the knowledge base (An application of scientific knowledge)
Solve unaddressed important problems in a new and effective way	Solve problems using existing knowledge
Technology Invention	Technology Application
Addresses abstract or a class of problems for a class of organizations and stakeholders	Addresses a particular problem for a specific organization and stakeholders
How to resolve a type of problems	Solve one case only

- Comparison between DSR and Routine Design (Alturki et al., 2012)

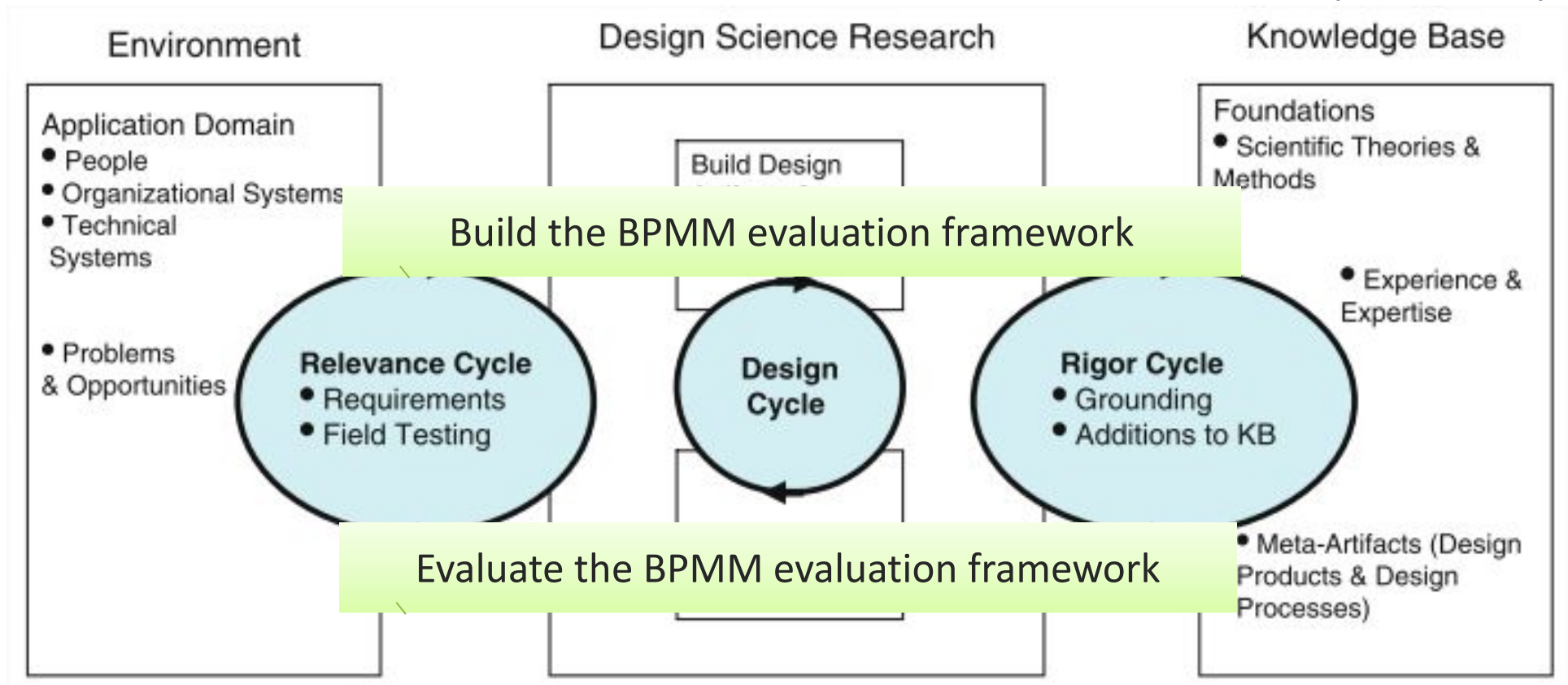
The design science paradigm explores the art of building and evaluating artefacts

especially information systems related artefacts

with a strong importance given to the behavioural aspects (Hevner et al., 2004)

Design science research cycles

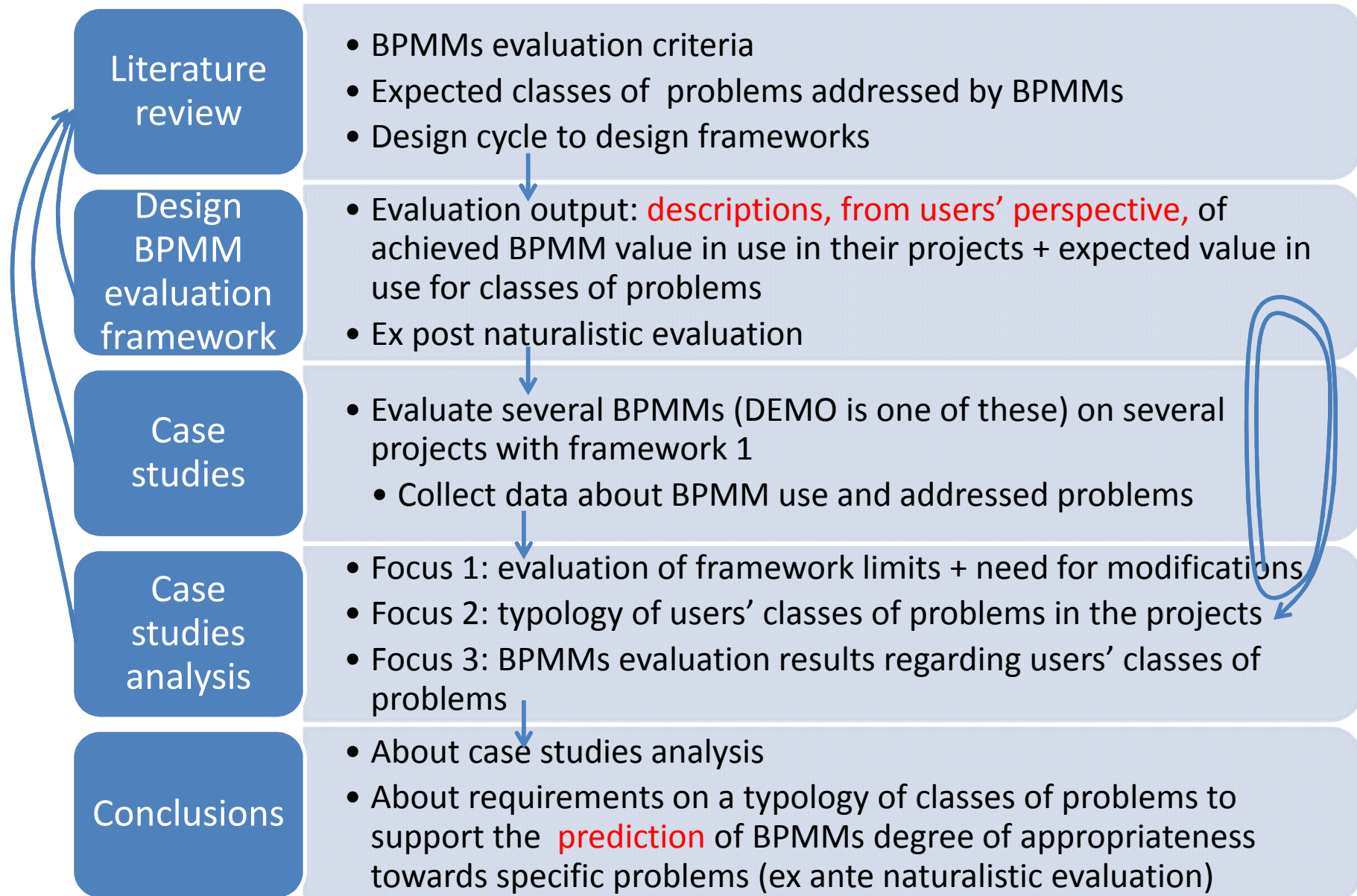
(Hevner 2004)



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Research design



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Evaluation criteria: evaluate BPMMs as generic artefacts with a focus on methods aspects

BPMMs are designed to solve *classes of (similar) problems*

⇒ BPMMs are “generic methods”

Methods are artefacts

(Winter et al., 2009)

⇒ Generic methods are generic artefacts

(Brinkempper, 1996)

⇒ BPMMs are generic artefacts

“A generic artefact consists of
language aspects (construct)

aspects referring to result recommendations (model)

and aspects referring to activity recommendations (method)

as well as instantiations thereof (instantiation).”

- We want to evaluate artefacts that

(Winter et al., 2009)

Are used to solve classes of problems (generic)

Are used to model business processes (goal = BPM)

Are called BPMMs by their users

- Evaluation criteria = generic artefacts evaluation criteria
with a focus on method aspects

Evaluation criteria

Inspired and adapted from

Criteria of Progress of DS IS theories
(Aier and Fischer 2010)

Evaluation criteria

- Ease of use
- Effectiveness
- Efficiency, Return on modelling effort
- Impact on the environment and on BPMMs users
- Operationality
- Fidelity with real world phenomena
- Generality

Evaluation criteria

- Ease of use

 - Learning curve

 - Users profiles

- Effectiveness

 - the degree to which the BPMM meets its goal and achieve its desired benefit in practice (Venable, Pries-Heje, and Baskerville 2012)

Evaluation criteria

- Efficiency, Return on modelling effort

The degree to which the modelling process utilises resources such as time and people (March and Smith 1995)

A quotient of output and input (Aier and Fischer 2010).

“If an artefact resulting from a design theory is used very often, its efficiency might be the best criterion for measuring its utility.” (Aier and Fischer 2010)

Note: Evaluation criteria (or at least their weight) may be context dependent

Evaluation criteria

- Impact on the environment and on BPMM users

A side effect

“Side effects can increase or decrease utility” (Aier and Fischer 2010)

- Operationality

“the ability to perform the intended task or the ability of humans to effectively use the method if it is not algorithmic” (March and Smith 1995; Aier and Fischer 2010)

Evaluation criteria

- Fidelity with real world phenomena (external consistency):

To what extent do the constructs of the BPMM under evaluation reflect business concepts that stakeholders have an interest to model.

- Generality

i.e. “*broad purpose and scope*” (Aier and Fischer 2010)

Possibility to tailor a BPMM to specific business context

List of classes of problems that a BPMM addresses

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Publications

- Exploratory study to gain insights about DEMO: 13 qualitative interviews (2012)
- Two related papers
 - C. Décosse, W. A. Molnar and H.A. Proper. A Qualitative Research Approach to Obtain Insight in Business Process Modelling Methods in Practice. *The 6th IFIP WG 8.1 working conference on the Practice of Enterprise Modeling (PoEM 2013)*. Riga, Latvia, Nov 6-7, 2013
 - C. Décosse, W. A. Molnar and H.A. Proper. What does DEMO do? A qualitative analysis about DEMO in practice: founders, modellers and beneficiaries. *The 4th Enterprise Engineering Working Conference (EEWC 2014)*, LNBIP174, p16, May 5-8 2014, Funchal, Madeira, Portugal.

Next steps

- Refine research questions
- Structure PhD effort
- Structure literature review results
- Design BPMM evaluation framework
- Evaluate BPMM evaluation framework
- Conclude



Thank you very much for your attention

Remarks and questions are welcome

