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# Conceptual Modeling of Crowdsourcing Variations

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- The concept "crowdsourcing"
  - Approach to conceptual modeling of crowdsourcing variations – tools and method
  - Sample Models of Crowdsourcing Processes

# The concept “crowdsourcing”

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2006 – Jeff Howe:

"...crowdsourcing represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call."

# The concept “crowdsourcing”

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A wide range of applications, such as:

- graphic design
- data analysis in linguistics
- software product development

By:

- business organizations
- non-profits
- researches

# The concept “crowdsourcing”

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- As a result – trying to describe almost every case in which a network of people is used to produce some result
- Blurring boundaries between crowdsourcing and earlier concepts:
  - open-source development model
  - citizen science
  - virtual community

# The concept “crowdsourcing”

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- Failing of the attempts to fix one universal definition of the concept "crowdsourcing"
- Estellés-Arolas, E., González-Ladrón-de-Guevara, F.: Towards an integrated crowdsourcing definition. J. Inf. Sci. 38, 189–200 (2012)

*"... Based on these existing definitions, an exhaustive and consistent definition for crowdsourcing is presented and contrasted in 11 cases..."*

*... more than 130 words definition*

# The concept “crowdsourcing”

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Suggestion – A slightly different approach to the problem solving:

- Not to search the generalization of the term
  - But to propose methods and tools for **preparation of visual conceptual models** of various crowdsourcing process variations
- The analysis and comparison of the models would present similarities and differences between any two or more variations, or between earlier concepts and a crowdsourcing variation

# Choice of modeling toolset

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- Method of conceptual modeling (of information systems) is part of requirements engineering and describes an industrial practice of **creation of abstract, hardware and system software independent model of some solution of (usually) complex data processing problem.**
- Two of most used standardized toolsets:
  - Unified Modeling Language (UML) - de-facto standard for general software systems modeling
  - Business Process Model and Notation (BPMN) - a toolset aimed at modeling business processes and workflows

(currently both of them are maintained by Object Management Group (OMG))



# Choice of modeling toolset

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- Our choice – BPMN
- Reasons:
  - BPMN is designed to be easily comprehended by wider audience than UML (not only by software engineers and computer science experts)

Field: Research Areas	Record Count	% of 5,599	Bar Chart
COMPUTER SCIENCE	3 002	53.617 %	
ENGINEERING	1 463	26.130 %	
TELECOMMUNICATIONS	618	11.038 %	
BUSINESS ECONOMICS	470	8.394 %	
INFORMATION SCIENCE LIBRARY SCIENCE	228	4.072 %	
REMOTE SENSING	157	2.804 %	
SCIENCE TECHNOLOGY OTHER TOPICS	136	2.429 %	
PSYCHOLOGY	134	2.393 %	
LINGUISTICS	122	2.179 %	
COMMUNICATION	120	2.143 %	

Distribution by research areas of crowdsourcing publications in WoS 2008-10.2018 – 5599 records

# Task relevant upsides and downsides of BPMN

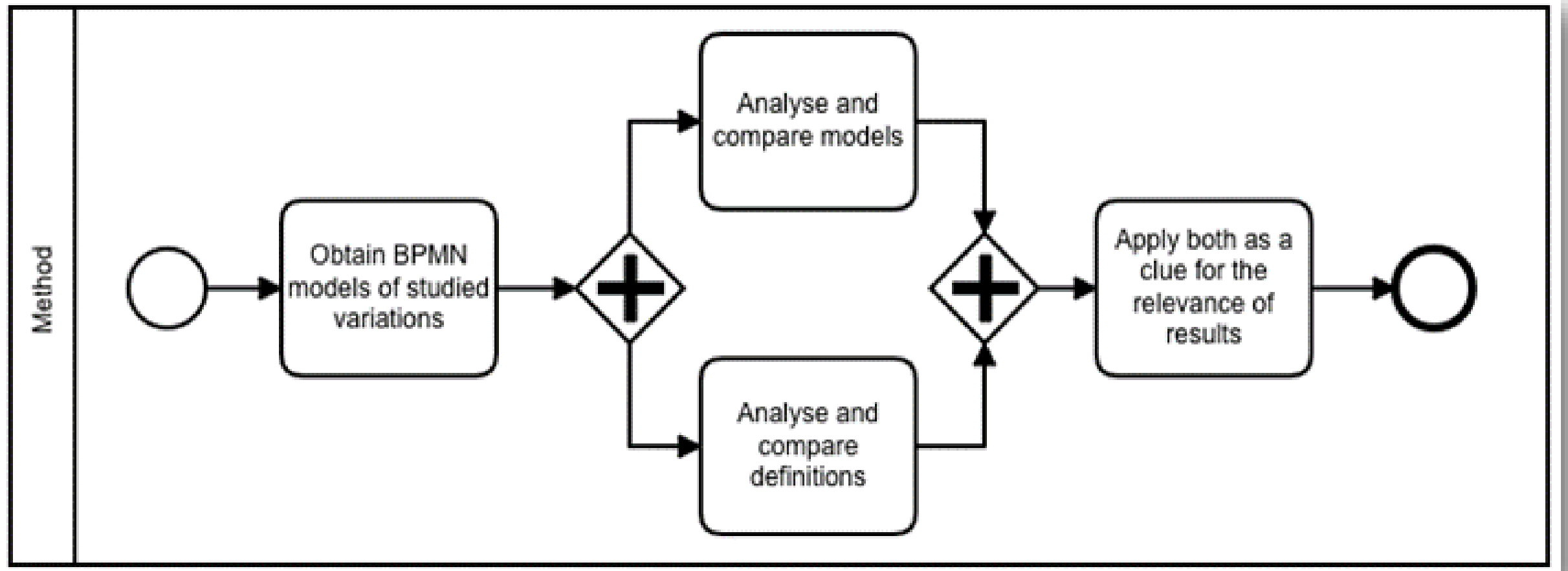
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- + Already mentioned ease of use and comprehension
- + Currently various process engines exist that assimilate the XML file which contains a BPMN diagram
- UML has richer toolset and is generally able to provide more detailed models

*Can be overcome by complementing BPMN with some other modeling tools as:*

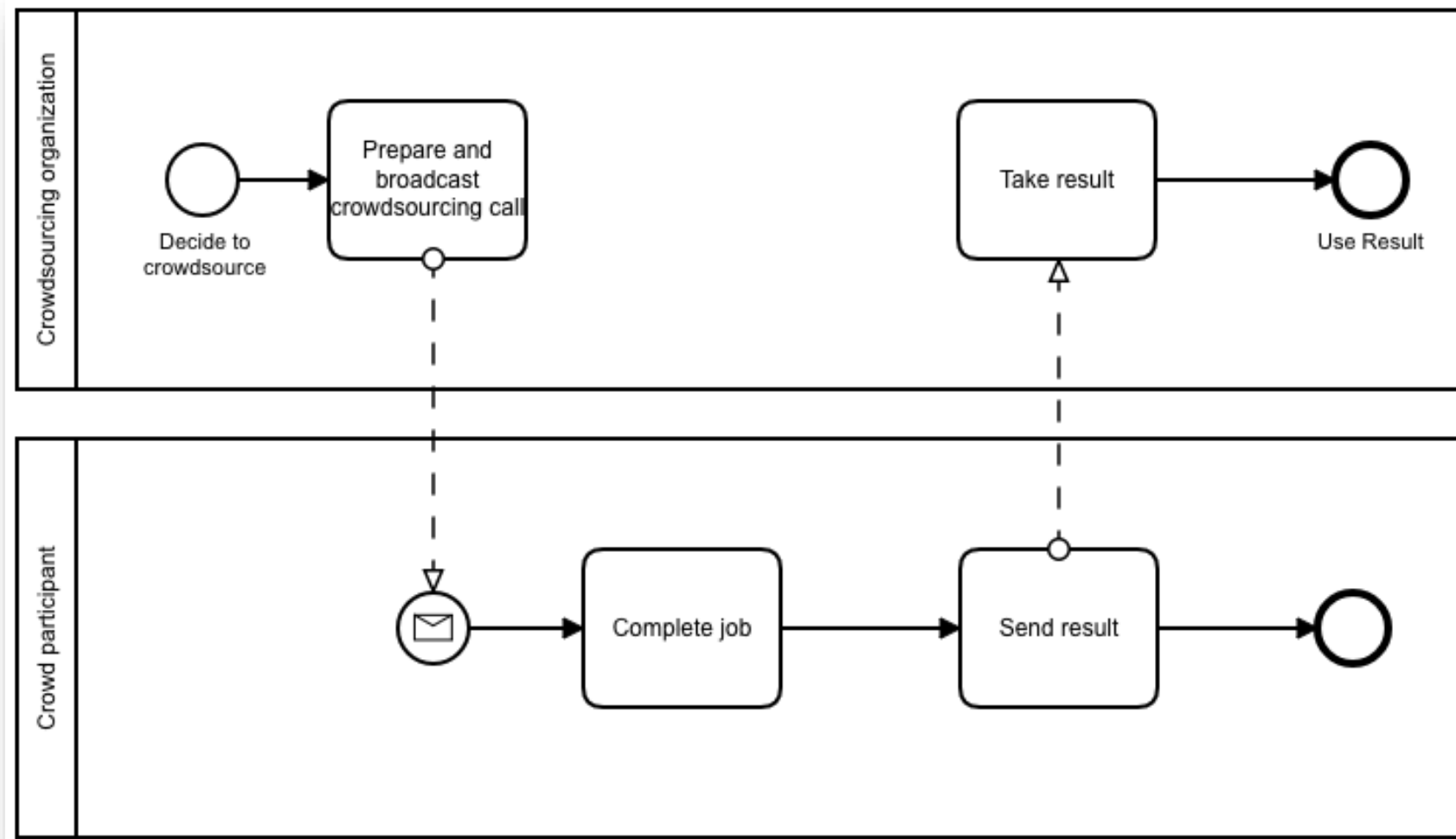
- *Decision Model and Notation (DMN)*
- *Case Management Model and Notation (CMMN)*

# Method of application



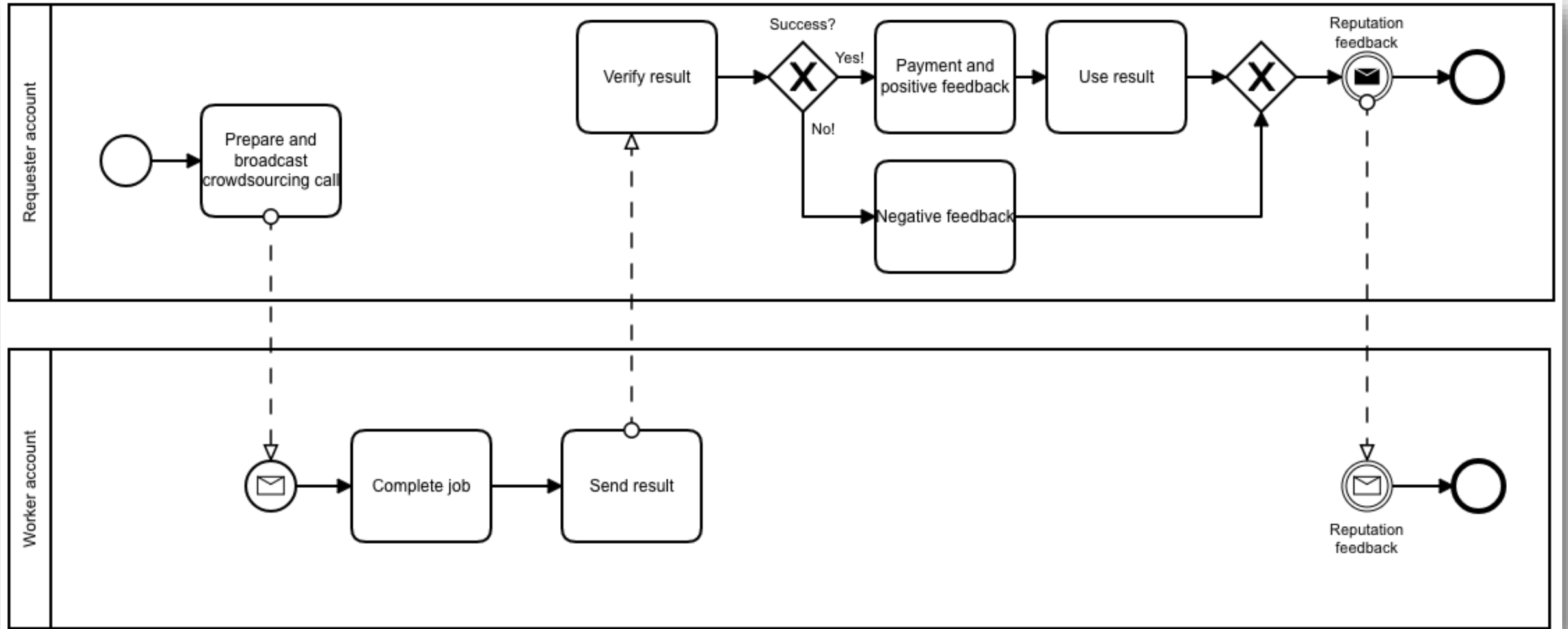
# Sample Models of Crowdsourcing Processes

“Basic Crowdsourcing” - the process that is described by Howe’s definition



# Sample Models of Crowdsourcing Processes

## Model of Basic Crowdsourcing Process in a platform



Model sample - Amazon's Mechanical Turk (MTurk)

# Sample Models of Crowdsourcing Processes

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One of the questions which arise with the basic Howe's model

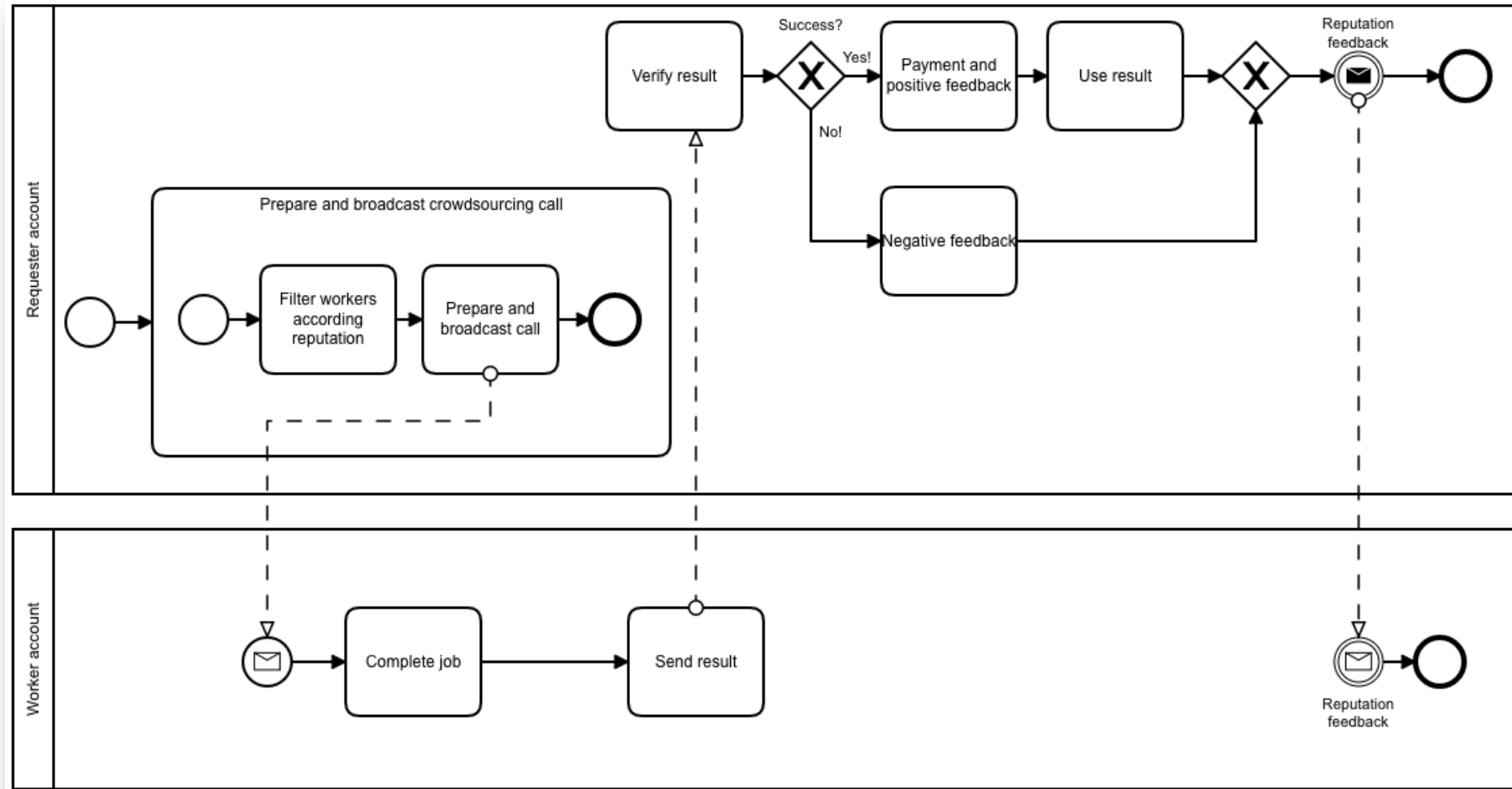
*"what are the mechanisms to make a crowd member to want to take a job by a crowdsourcing organization?"*

MTurk model:

- **Payment**
- **Peputation**

# Sample Models of Crowdsourcing Processes

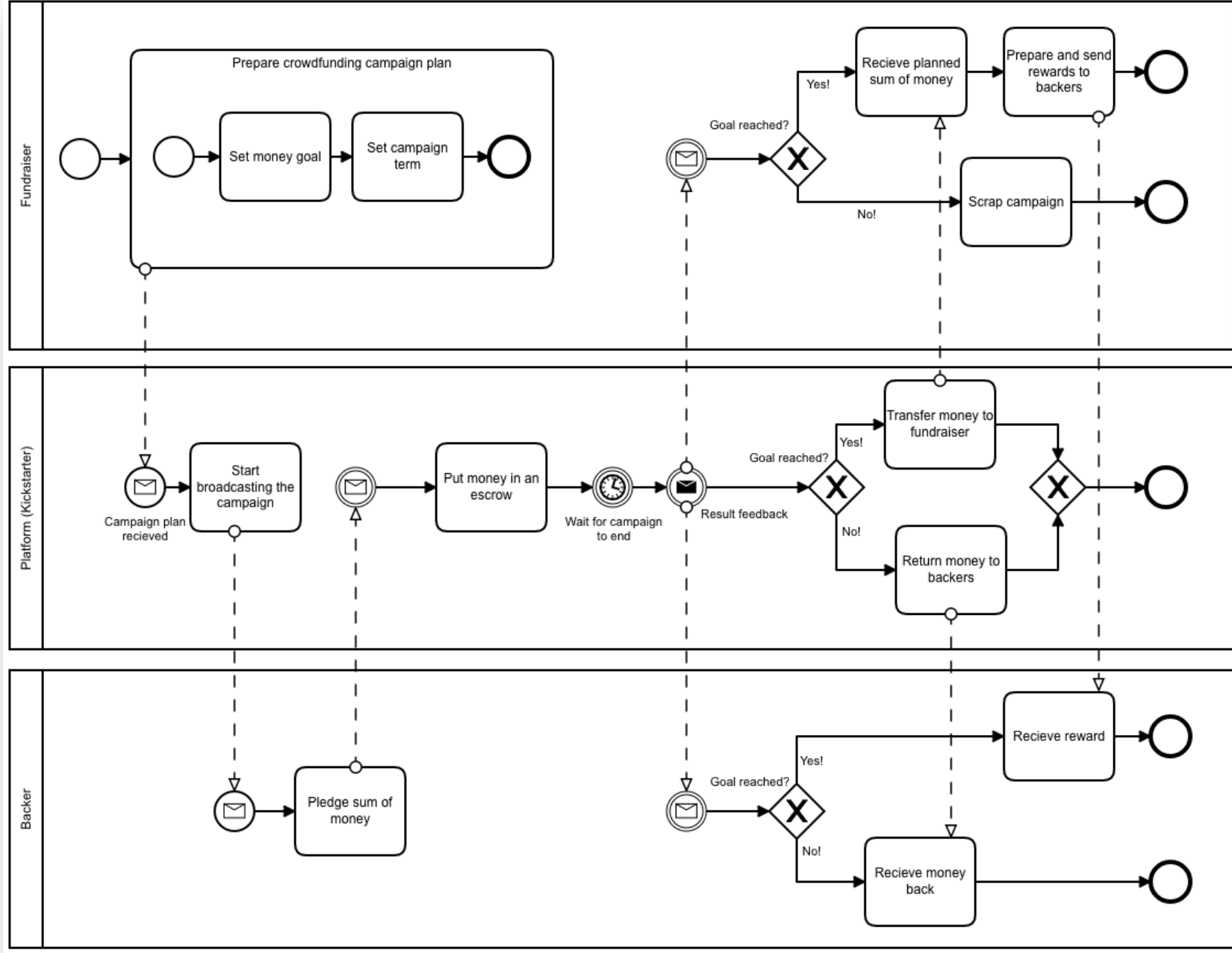
## Research domain specific model



*Very convenient for sociology, psychology, management science...*



# Model of Crowdfunding implemented in Kickstarter



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The final result will be preparing a common library of conceptual models and BPMN diagrams, that can be used in each particular case.

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