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UNIVERSIDAD EAFIT®

Agent based simulation of dynamic pricing policies of academic courses

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Research Practices for Mathematical Engineering

Proposal presentation

Mathematical Sciences Department

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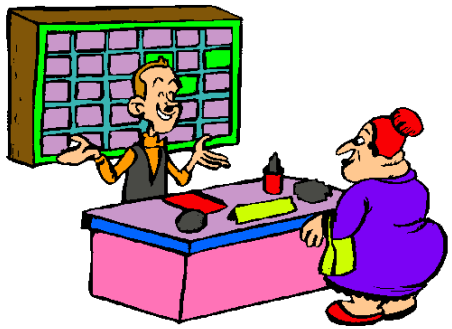
Content

- Problem statement
- Objectives
- Useful previous ABMS uses
- Methodology
- Schedule

What is a dynamic price?

- It is a pricing policy.
- The price is based on the market´s demand and supply dynamics.
- It’s aim is to increase profit.



What is Agent Based Modelling and Simulation (ABMS)?

- A tool for the decision making process.

- It is made out of 3 main things:
  - The agents: Autonomous actors of the process.
  - The behavior rules: describes the process.
  - The context (topology): gives order and determines the agent´s interactions.

What is the problem?

EAFIT´s language center is exploring the possibility of applying dynamic prices.

Centro de Idiomas
Universidad EAFIT

Some questions appeared:

- How is the demand´s behavior?
- What are the product´s characteristics?
- If the policy is applied. What might be the effects on the market?

How it has been addressed?

- Dynamic prices problems had been mainly addressed as optimization problems.

- It seeks an optimal price policy:
  - Optimal market segmentation.
  - Optimal price per segment.

Why to use ABMS?

- Represents individuals' behaviors and interactions.

- There has been used to model dynamic pricing.
  - We haven’t found evidence of its application in academic courses.

- Offers the possibility of evaluating different scenarios.

What is the objective?

To build a conceptual agent based simulation model that:

- Represents the dynamics between a service provider and its clients.
- Captures the product´s characteristics and price dynamics over time.
- Shows a possible client reaction over changes in the product’s price policy.

Some ABMS previous uses

For the agent´s rules

For the product's characteristics.

For adding complexity

Topic	Authors
Online auctions	*Mizuta, H., & Steiglitz, K. (2000)*
Product´s life cycle	*Jinlong et al. (2011)*
Energy auctions	*Ziogos. N. P (2011)*

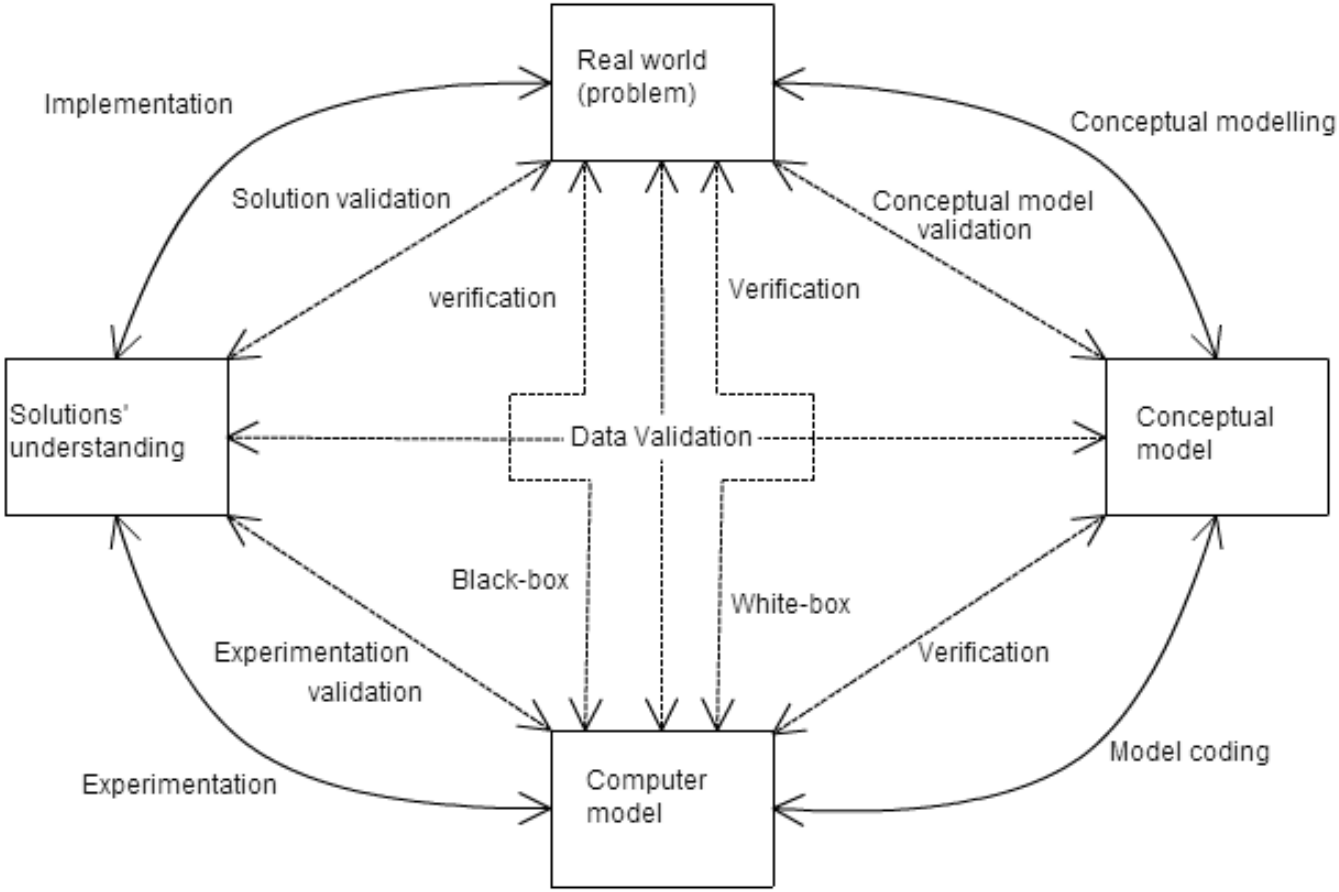
Some ABMS previous uses

For dynamic pricing policy and product´s characteristics

For dynamic pricing policy

Topic	Authors
Dynamic pricing over product chains	*Lin et al. (2011)*
Changing from static to dynamic energy pricing	*Kowalska-Pyzalska et al. (2014)*
Response of consumers to dynamic energy prices	*Valenzuela et al. (2012)*

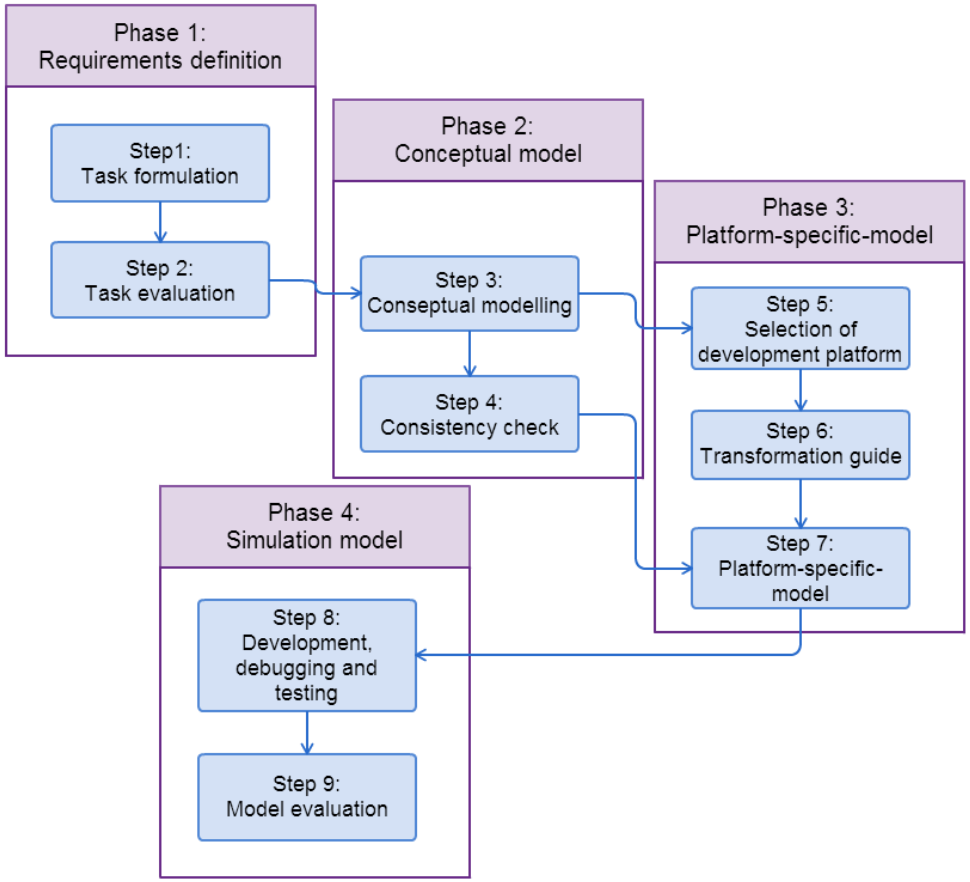
Methodology



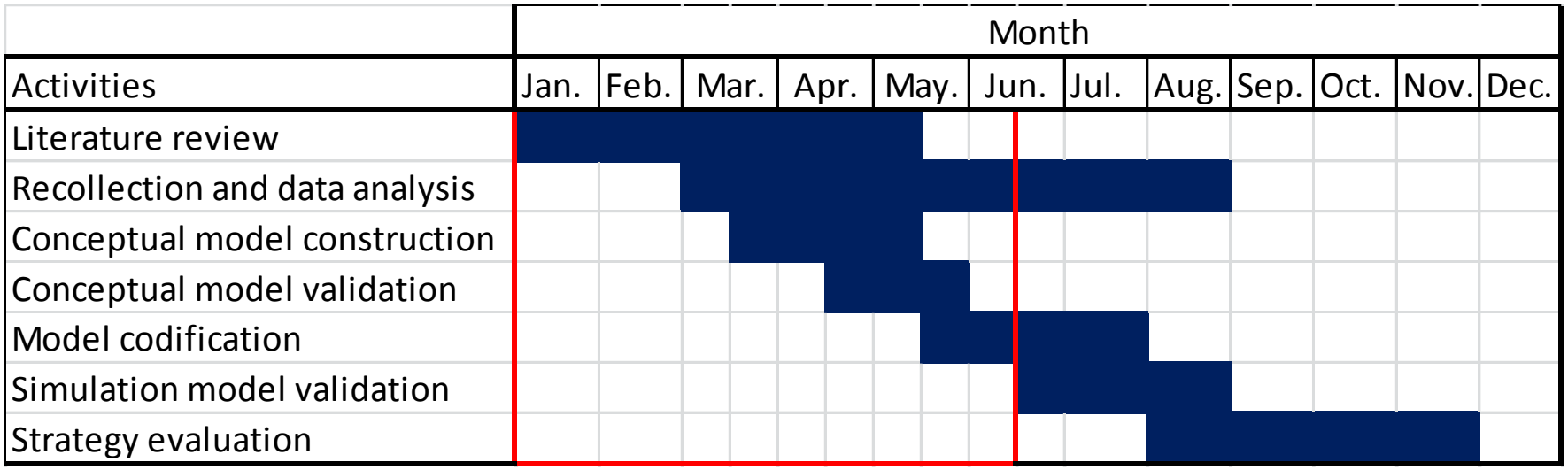
Tako, A. A., & Robinson, S. (2010)

Methodology

The specific methodology for ABMS proposed by Salamon, T. (2011):



Schedule


Month
Activities
Jan.
Feb.
Mar.
Apr.
May.
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
Literature review
Recollection and data analysis
Conceptual model construction
Conceptual model validation
Model codification
Simulation model validation
Strategy evaluation

Thank you

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