Modeling to Help Market Adoption of Support Services in IT Industry

Navid Ghaffarzadegan, Ran Xu, Armin Ashouri Rad, and Sarah Mostafavi
Department of Industrial and Systems Engineering, Virginia Tech

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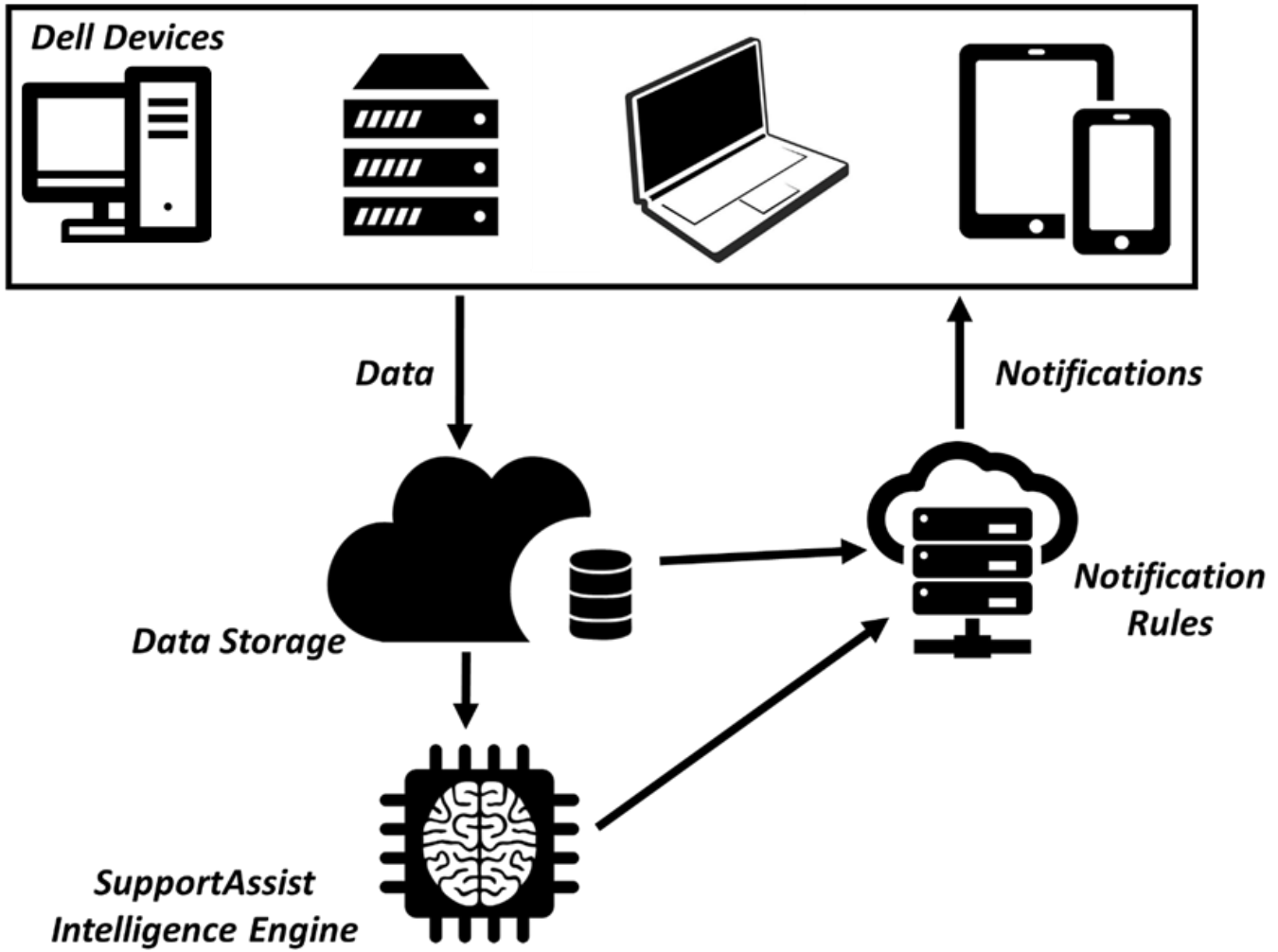
Dell, a multi-national computer technology company

- Dell Inc., one of the largest technology companies in the world with 138,000 employees.
- A new trends in IT:
  - Stress on service; Lower profit margin of production.
- Dell as a leader in after-sales service.
- Paradigm shifts in services (Larson 2016; Davenport & Kudyba 2016).

SupportAssist: Dell's solution for aftersales service

- SupportAssist: a proactive maintenance system utilizing Machine Learning and Big Data.
- For a wide range of Dell devices.
- Continuously stores data from millions of devices
- Predicts failure before they happen.
- Notifies/fixed the problems.



Dilemma

- Not yet achieved the level of adoption anticipated.
- Adoption rate is not increasing in all market segments.

Research question: why is this happening, and what can be done to make the *SupportAssist* program more **successful** in the **market**.

Idea

To develop SupportAssist Adoption Model (SAAM) to use as a decision support system and analyze effects of different marketing/design strategies.

- Building on Bass (1969) Model, and on previous SD applications (Rouwette & Ghaffarzadegan 2013) and models of market adoption (e.g., Milling 1996; Jalali et al. 2016), especially the OnStar case (Barabba et al 2003).

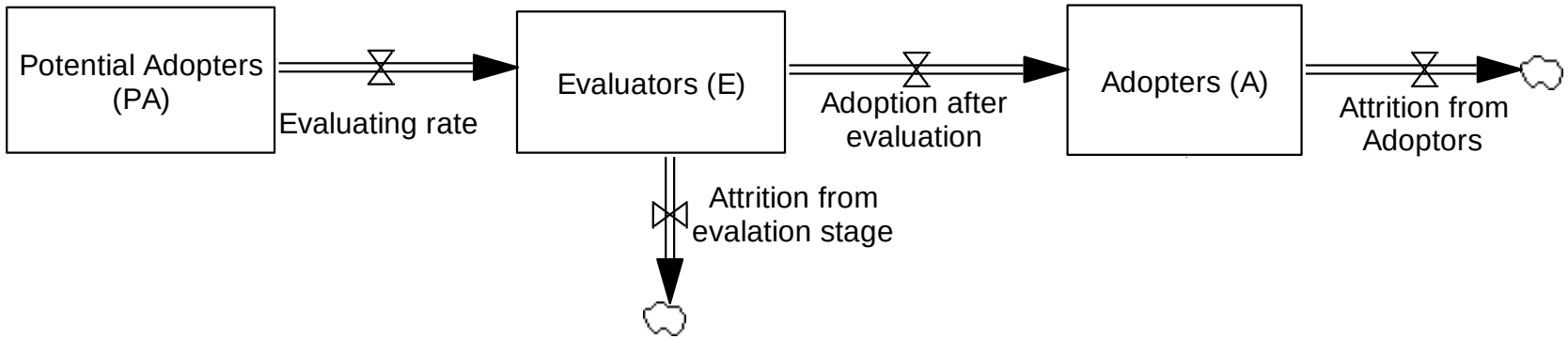
Methodology

- Data:
  - Interview: About 20 interviews with different managers, engineers at Dell.
  - Archival data: Review of 3 years of weekly reports on SupportAssist, and its performance; Review of customer research; Review of data on websites.
  - Detailed quantitative data of market adoption.
- System dynamics method (Sterman 2000)
- Iterative model building: Model building → presentation (bi-weekly) → Model building.
- Market segments (device X customer type X region)
  - First focus: Adoption of SupportAssist in Servers of mid-size companies with 50-300 servers in US region only (example: a university).

Model Structure

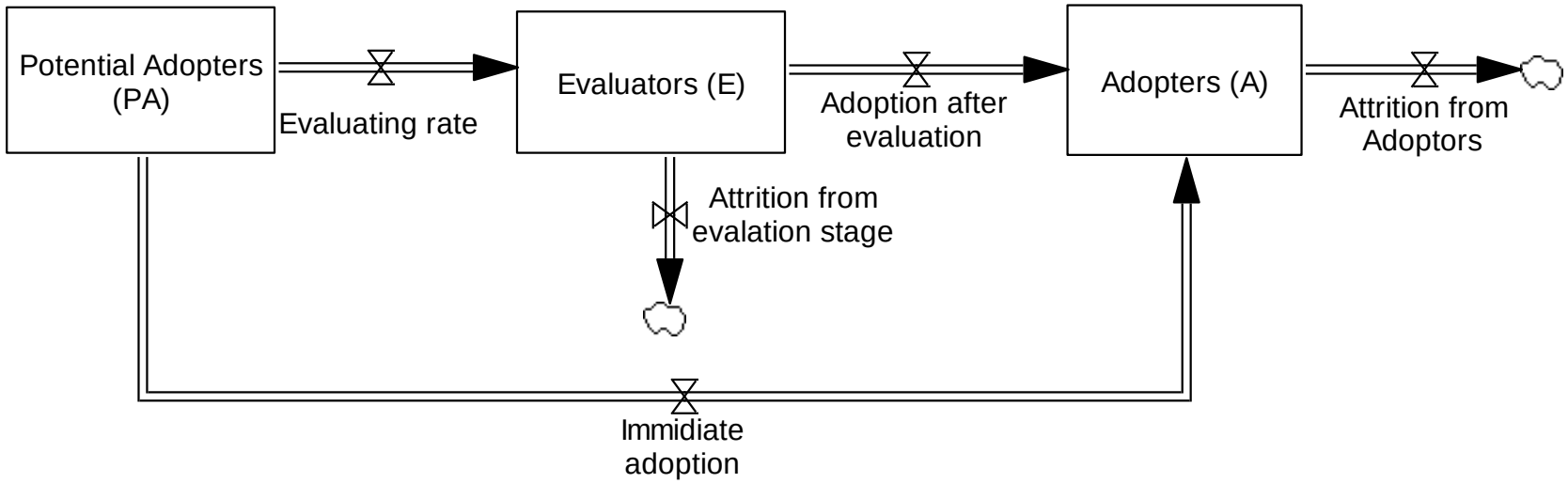
- The main model is very detailed (in terms of number variables, and sectors).
  - The main model is validated using classic validation and verification techniques (Barlas 1996) and calibrated and tested against the historical trends (Homer 2012; Oliva 2003; Hosseinichimeh et al. 2015; 2017).
- Here due to confidentiality we do not report the main model and any sensitive data.
  - We report a simple version, model Alpha (which uses synthetic data due to confidentiality). Learning from simple models is proved to be often more effective than detailed models (Ghaffarzadegan et al. 2011).

Flow of potential customers to adopters



Assumption: no new potential adopters

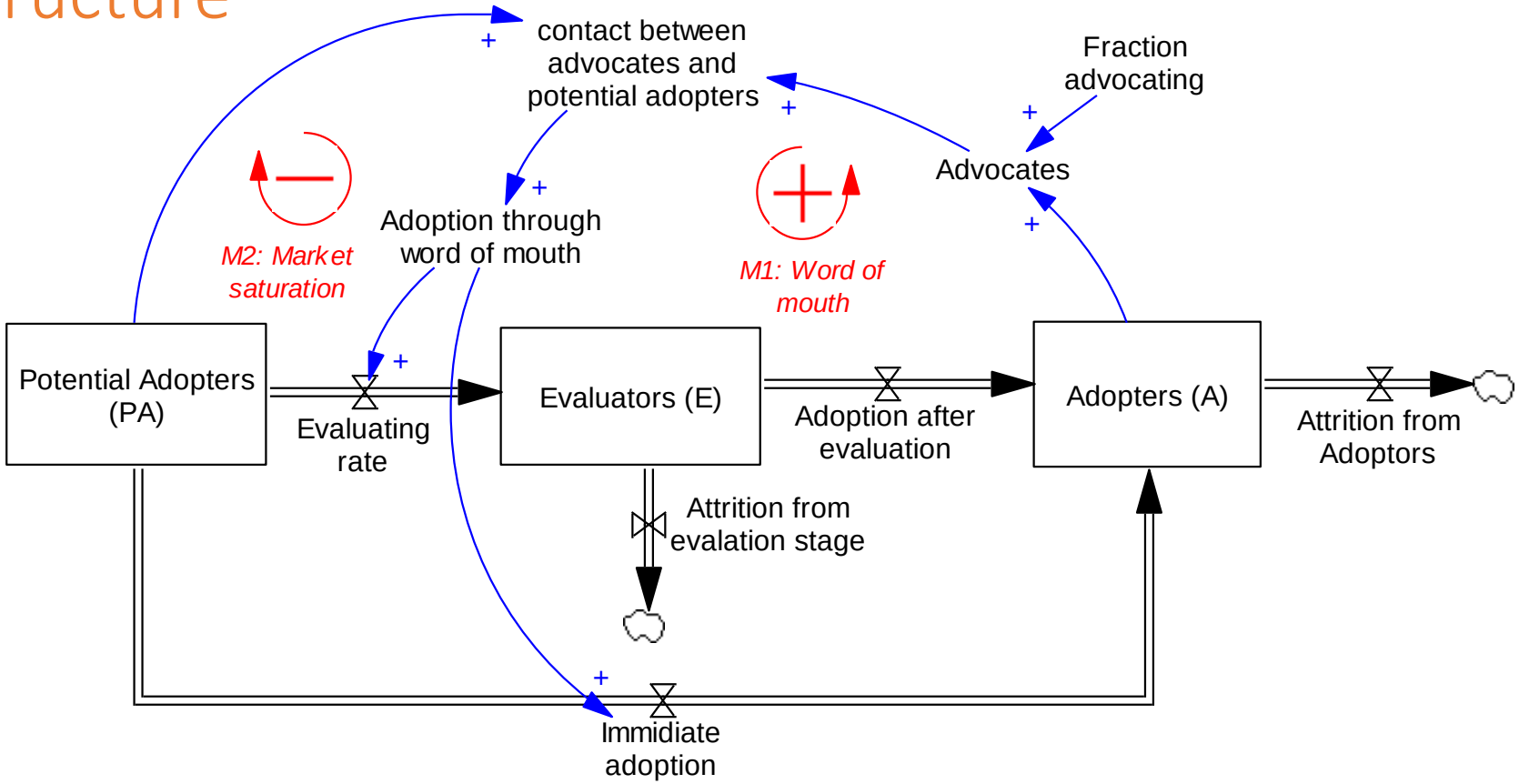
Flow of potential customers to adopters



"…just if we could persuade them [Dell customers] to test SupportAssist."

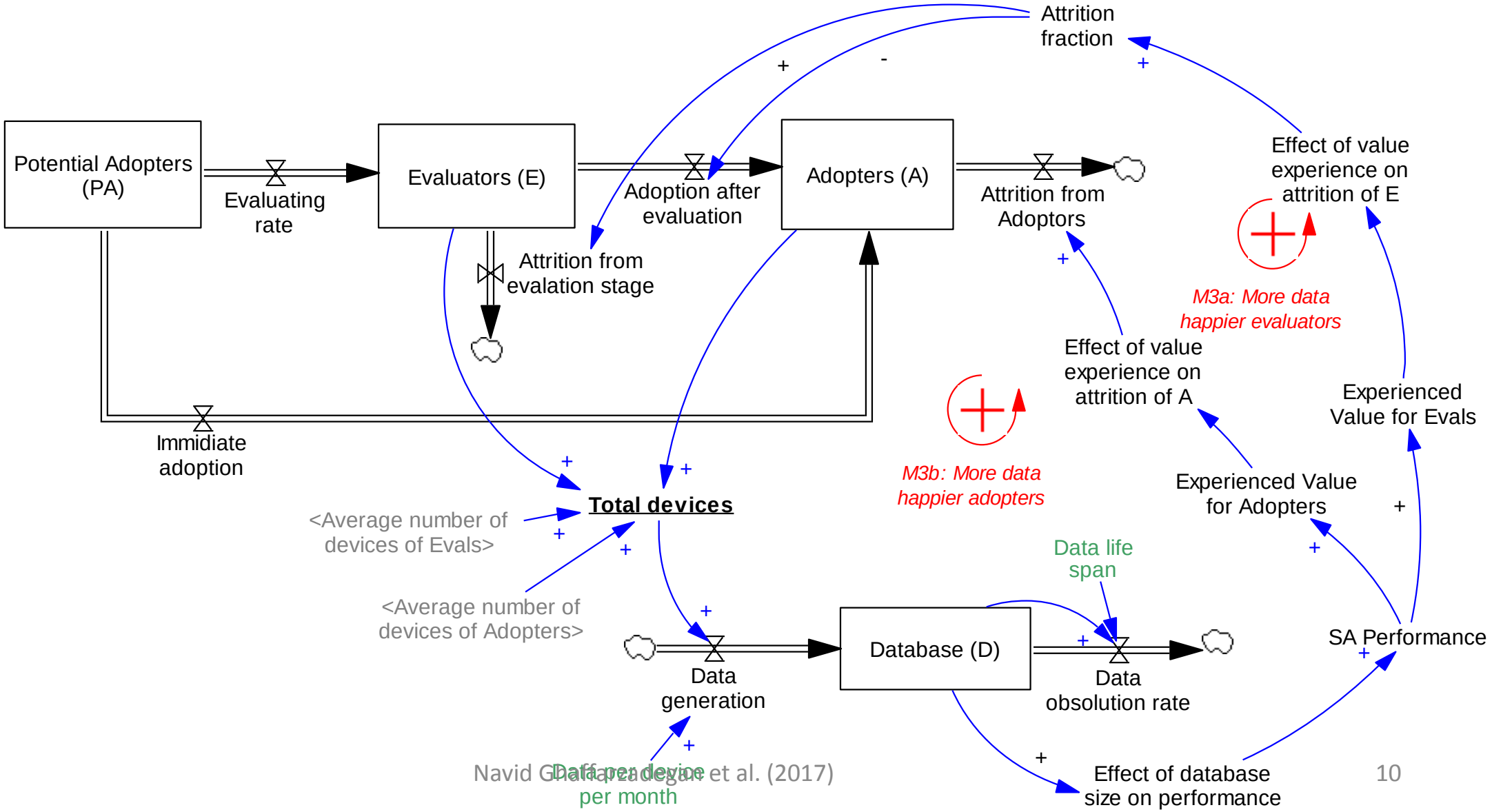
Dell expert in product development

Model structure



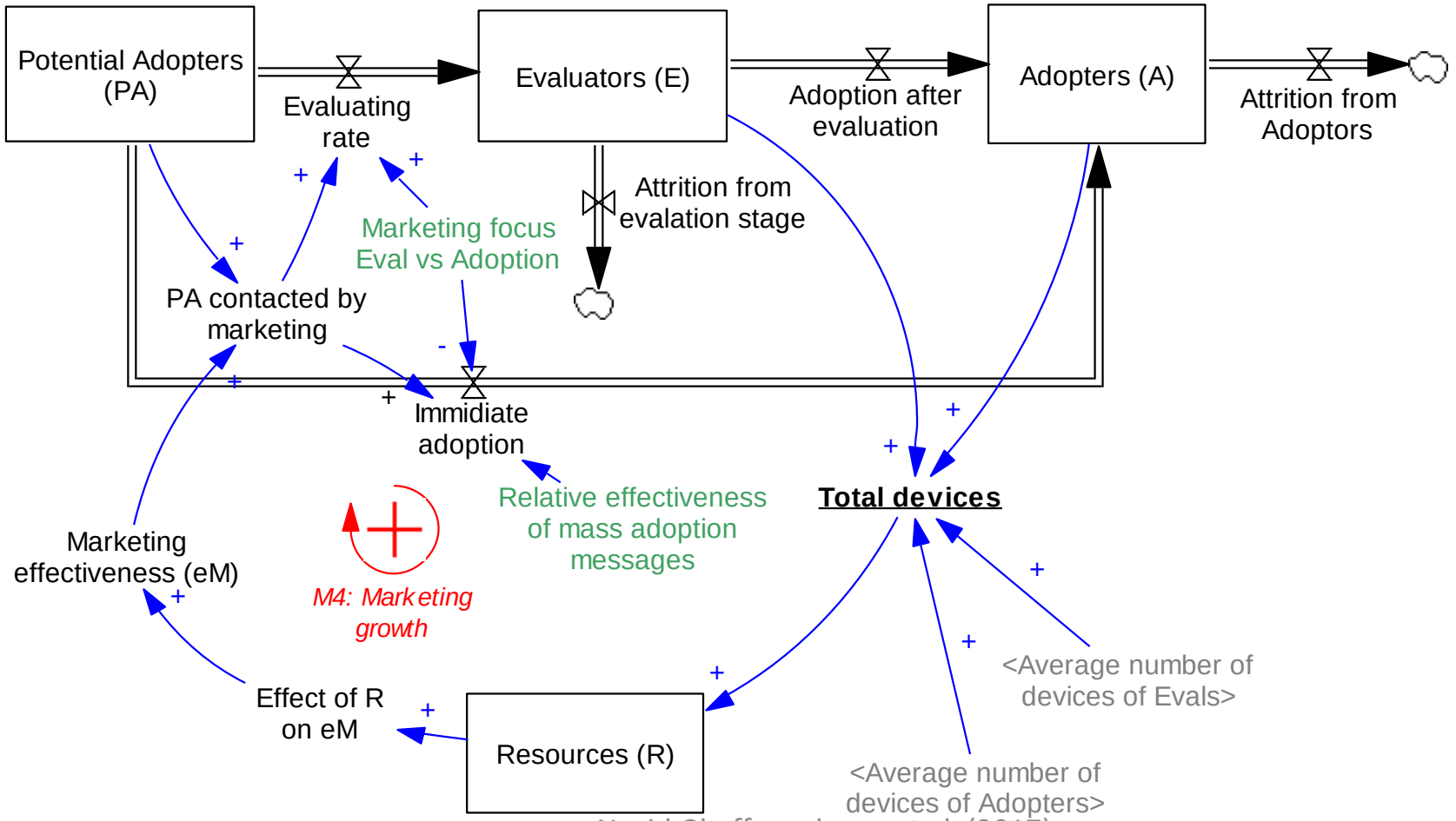
Effect of word of mouth (advocators) on potential customers

More customers, better performance



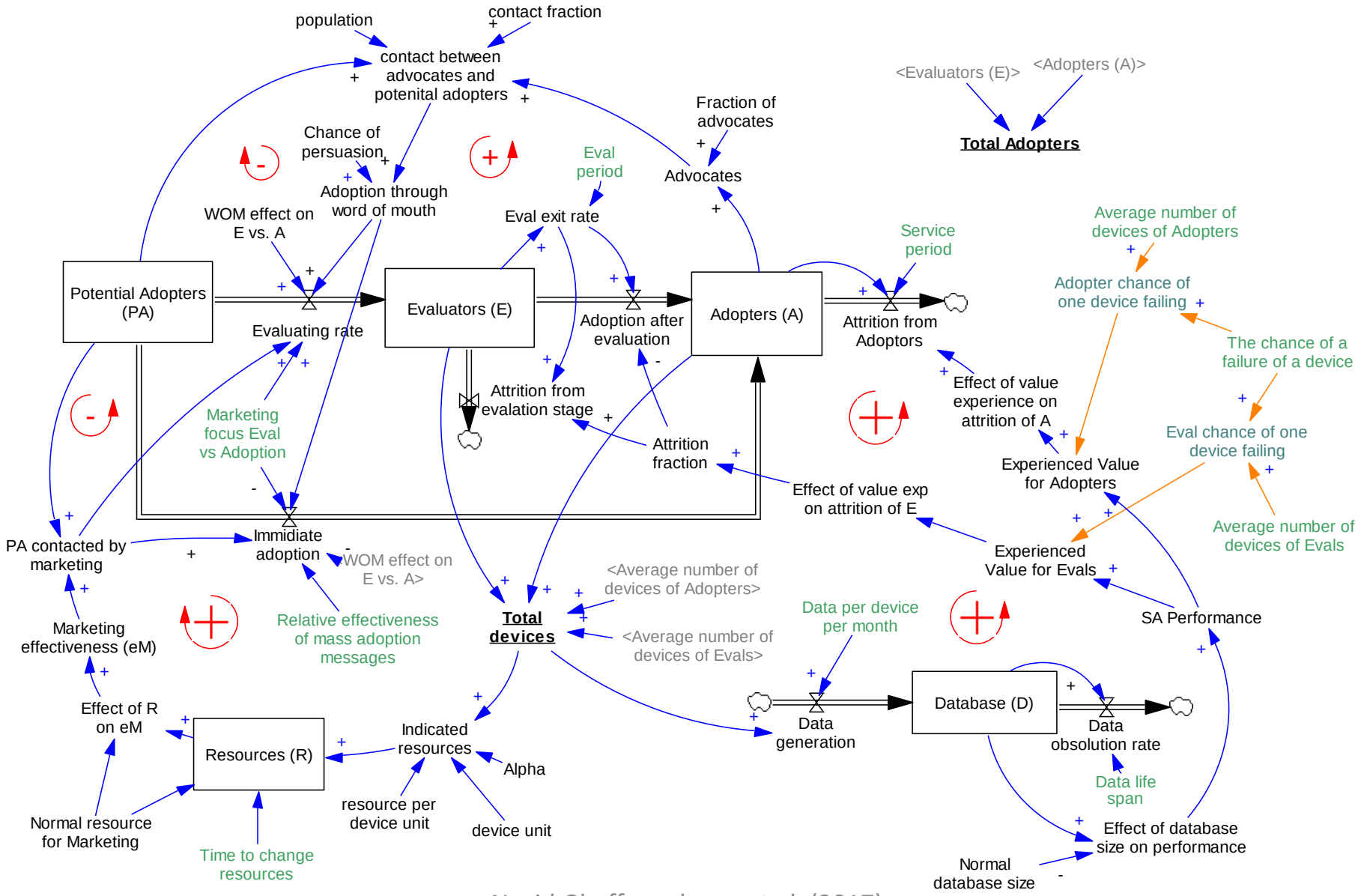
Model structure

Growth in marketing initiatives



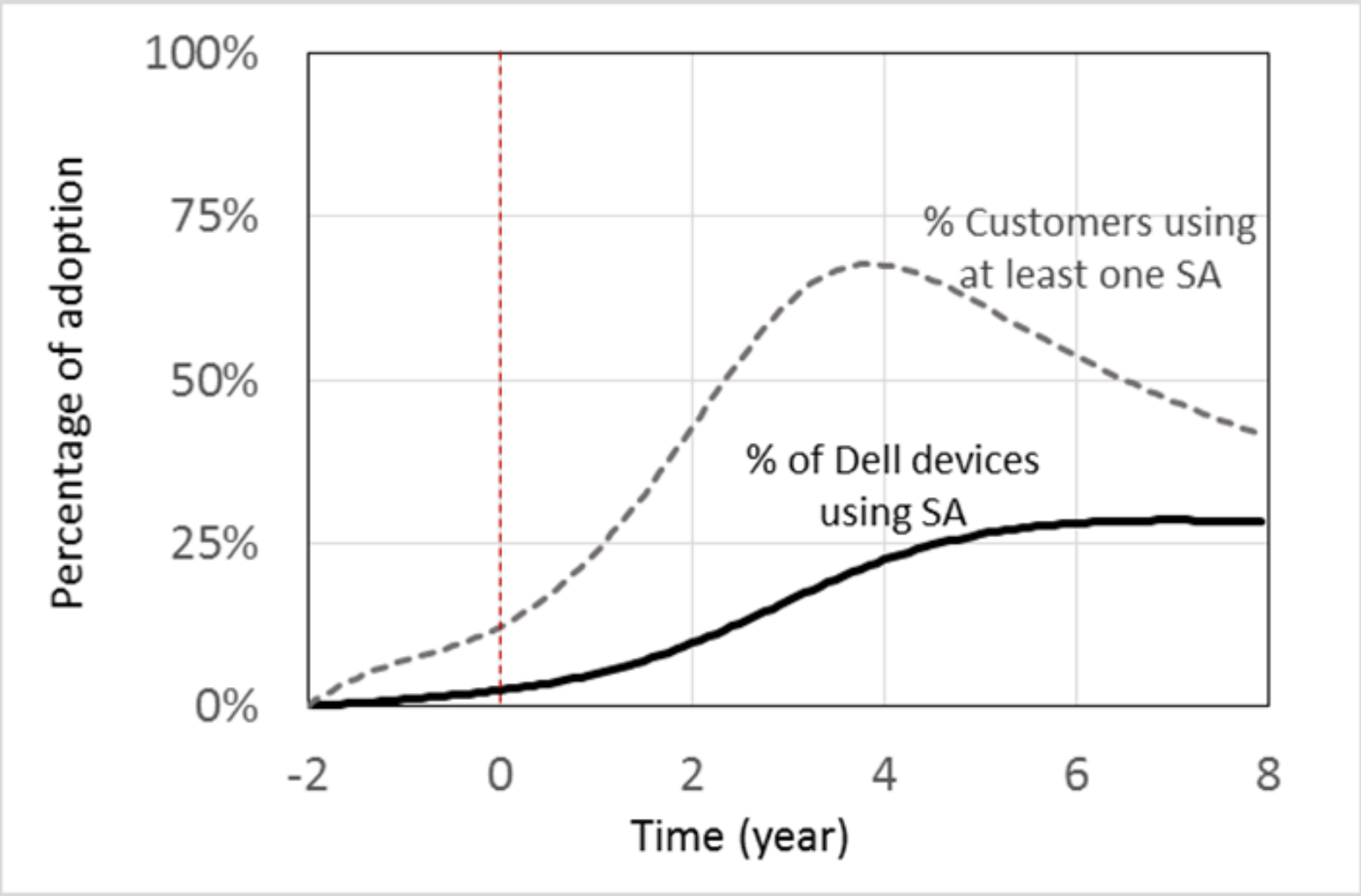
Navid Ghaffarzadegan et al. (2017)

Main structures together



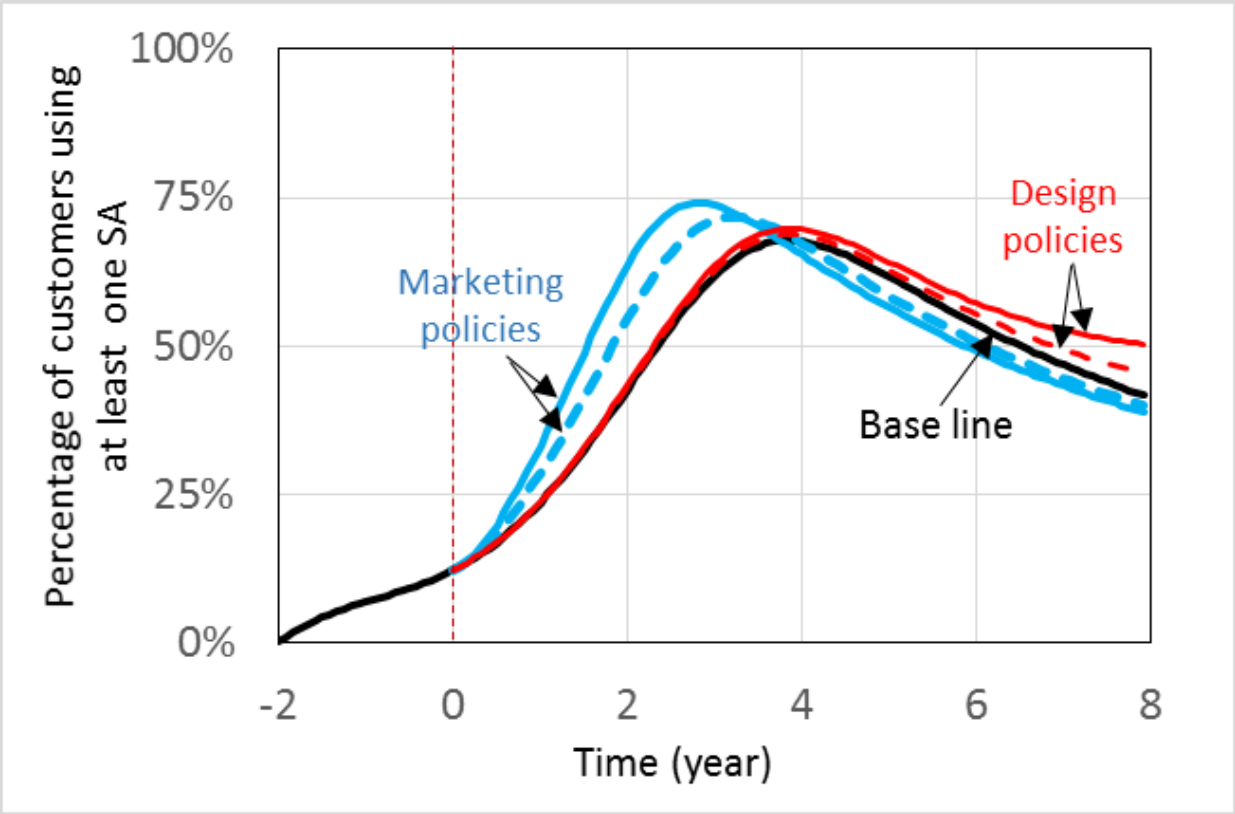
Results

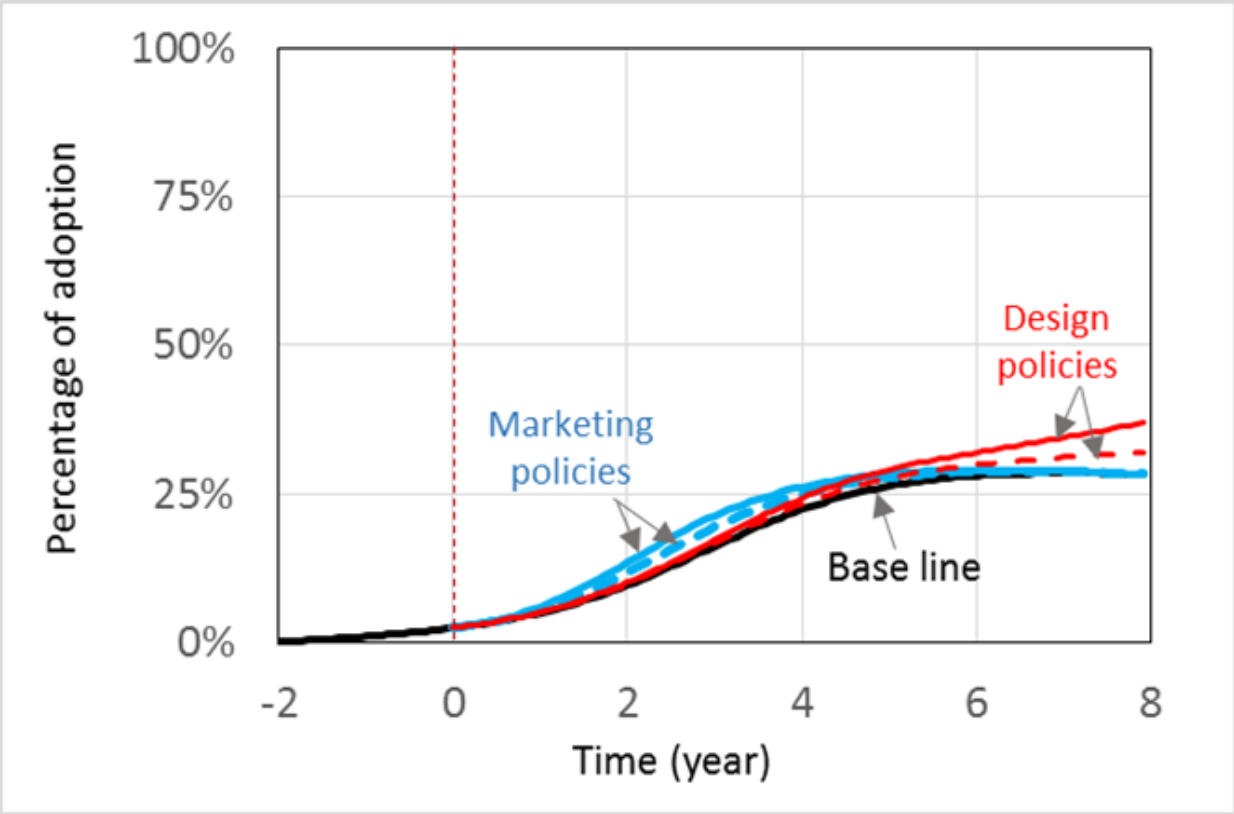
Results: *Business as Usual Predicts a Gradual Market Adoption Growth of SupportAssist*



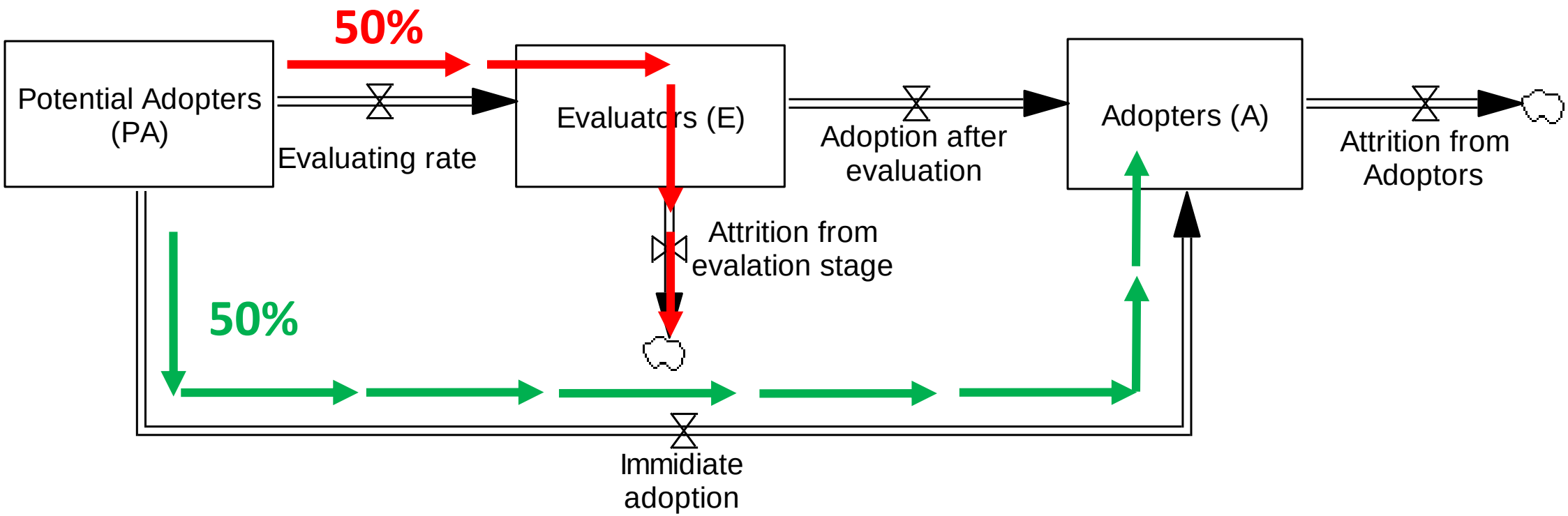
Navid Ghaffarzadegan et al. (2017)

Results: *A Sole Focus on Design or Marketing has Marginal Effects*





Results: *Model Calibration Uncovers Pipeline Leakage*



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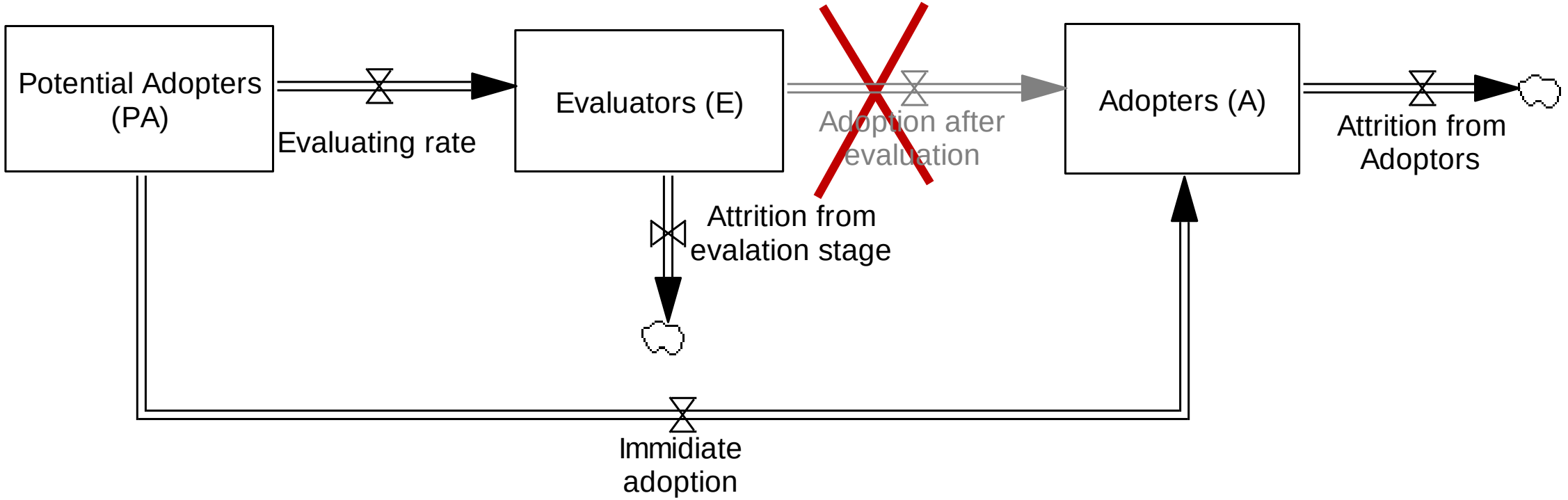

Results: *SupportAssist Experiential Learning for Evaluators is Ineffective*

Table 1: The chance of experiencing the value of a support service depends on the number of devices receiving the support service.

	The chance of experiencing SupportAssist value for different customers			
Scenario: The chance of failure of 1 device	Customer with 1 device on SupportAssist (Evaluator)	Customer with 2 devices on SupportAssist (Evaluator)	Customer with 50 devices on SupportAssist (Mass adopter)	Customer with 100 devices on SupportAssist (Mass adopter)
0.01	0.01	0.02	0.39	0.63
0.02	0.02	0.04	0.64	0.87
0.05	0.05	0.10	0.92	0.99
0.1	0.10	0.19	0.99	1.00

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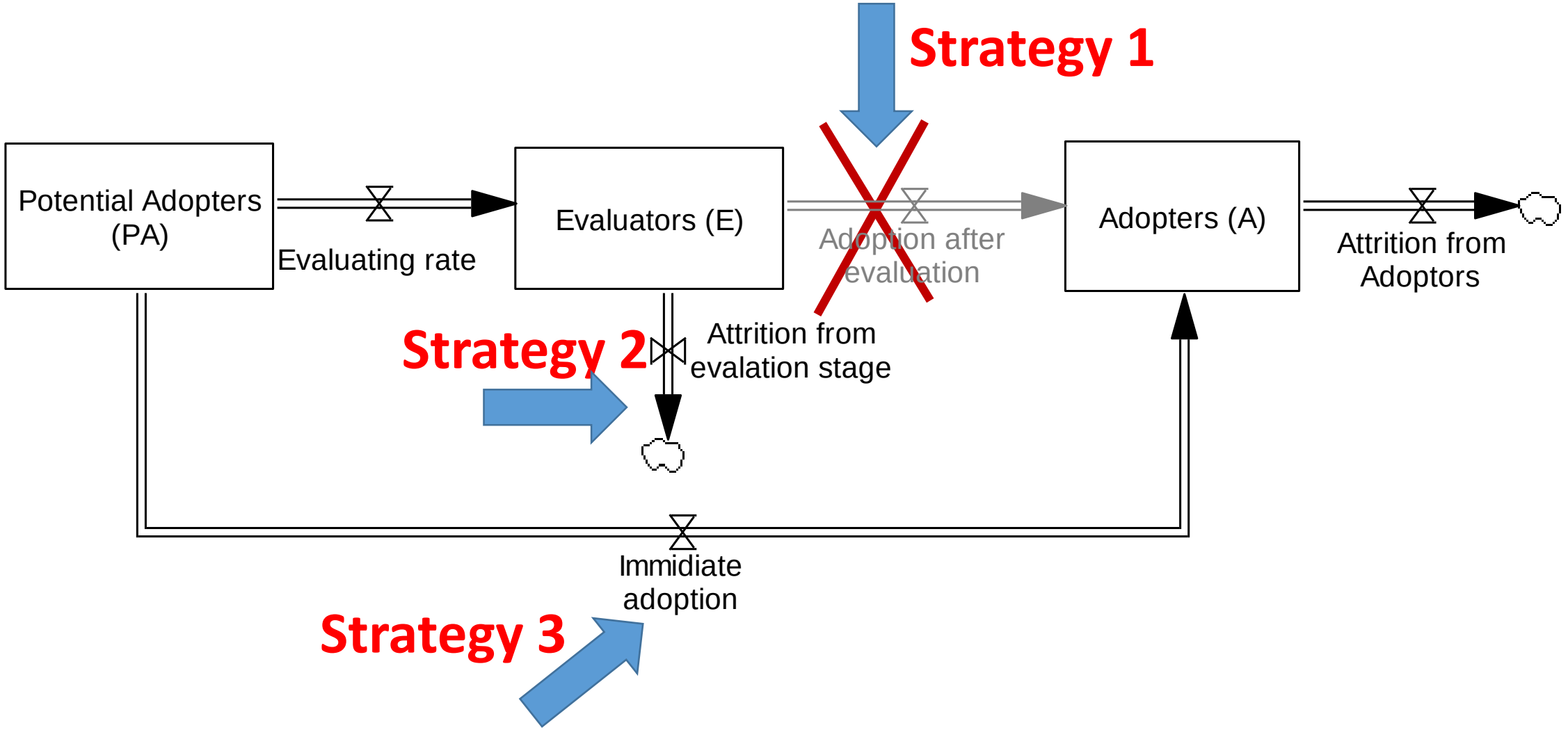
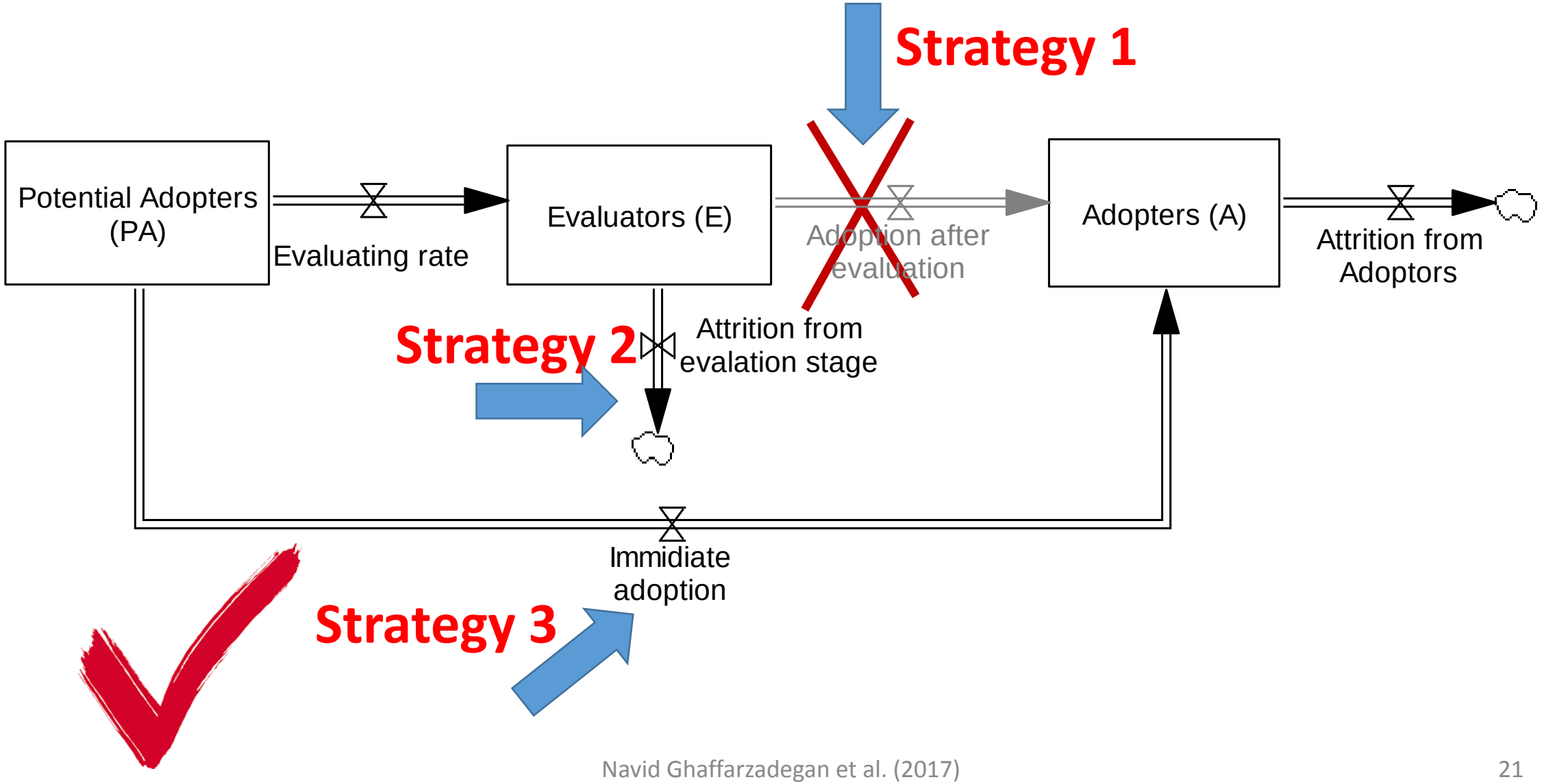
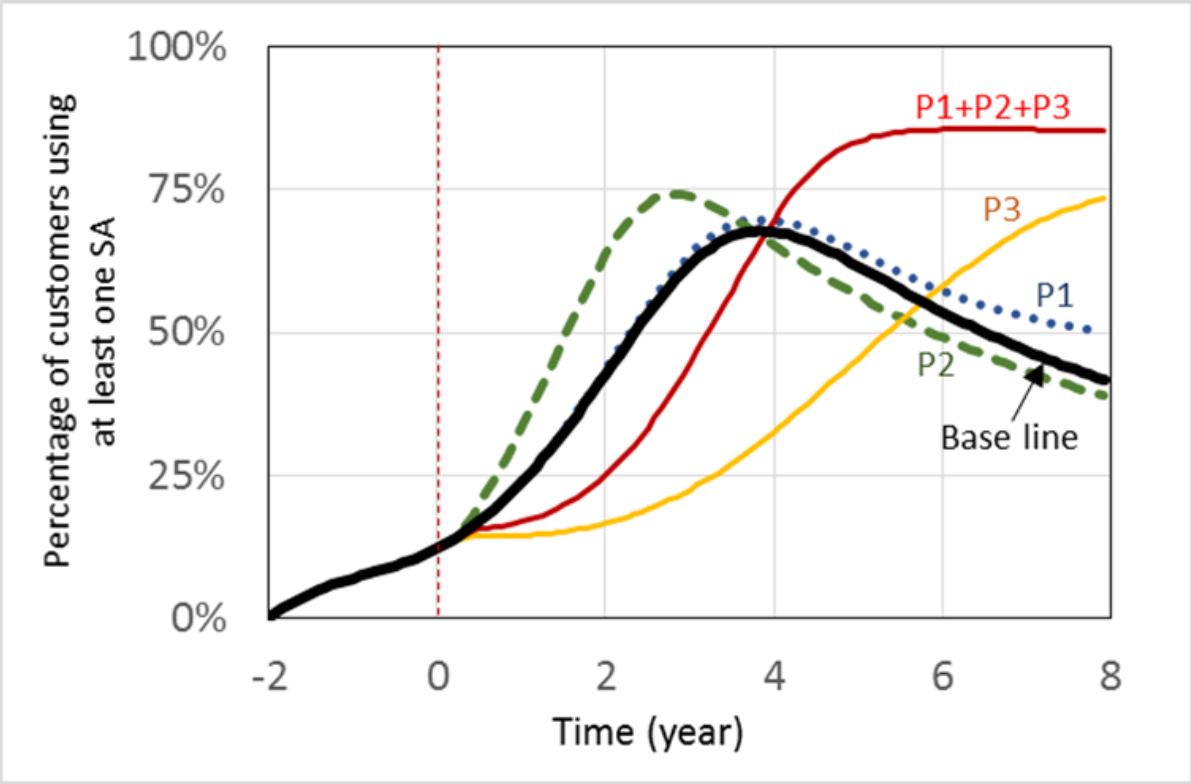
Model-based strategic planning

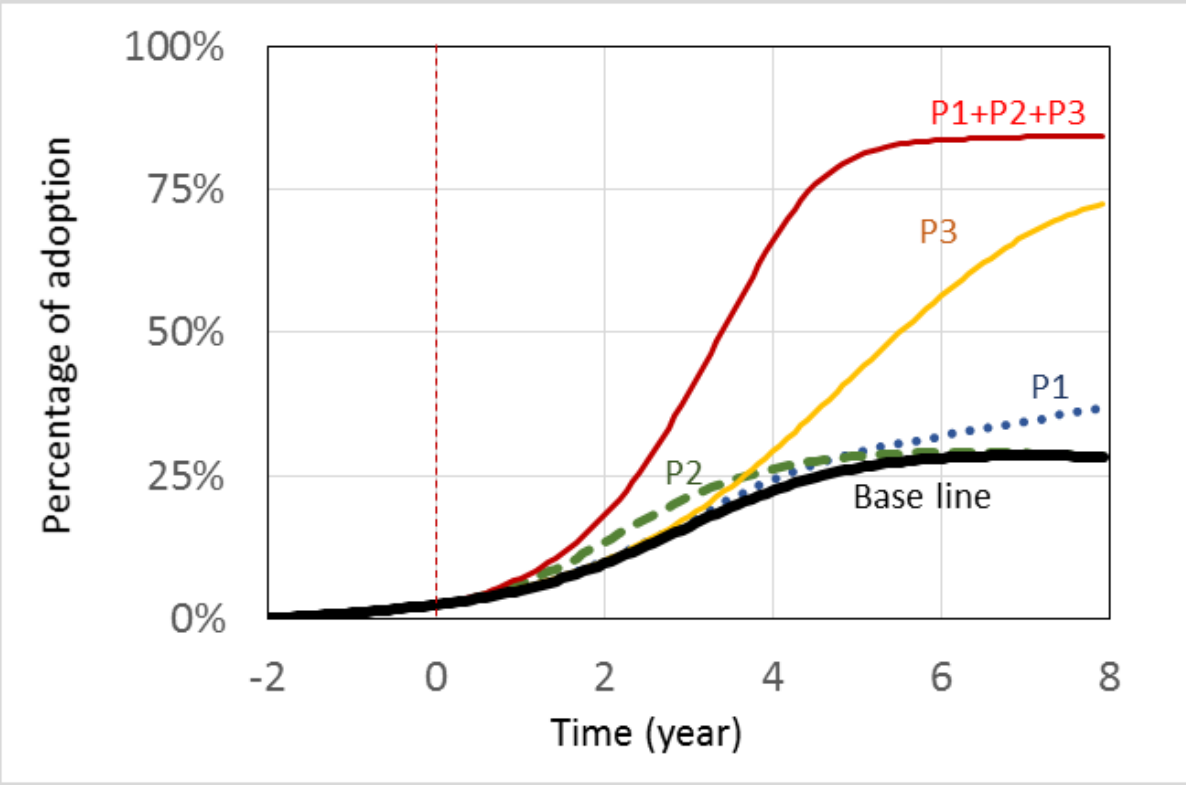


Results: *Model-based strategic planning*



Results: *Change in Marketing Focus*





P1 [100% improvement in design],
P2 [100% improvement in marketing])
P3: Shift in marketing focus

Conclusion

- *Product: A Decision Support System for SupportAssist*
- *Outcome level 1:*
  - *Better "design" and more "marketing" are effective, but the effects are marginal*
  - *Effective policies are combinations of different strategies.*
- *Outcome level 2: Challenging mental models:*
  - *Model Calibration Uncovers Pipeline Leakage*
    - *Evaluation has significant attrition.*
  - *SupportAssist's Experiential Learning for Evaluators is Ineffective.*
- *Outcome level 3: Model-based strategic planning*
  - *Change in Marketing Focus – Focus on mass adoption.*
- *Outcome level 4: Modeling process as a continuous insight generation process includes data gathering, molding, presentation, questioning mental models, (and again) data gathering, …..*

Thank you!

Email: navidg@vt.edu

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