Strategic Decision Making in the 3D Printing Industry - A Robust Decision Making (RDM) analysis

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Why 3D Printing

Supporting **Strategic Business Decisions** with DMDU methods

- DMDU provides guidance for decision making in many contexts, but...
- There is scant guidance on how to apply it for business decisions;
- Strategic Decision making Literature still ignores its contribuitions;

Why 3D Printing

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Key Features of 3D printing

■ 3D printing may

Why 3D Printing

Why 3D Printing?

Why 3D Printing

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3D Printing is an emergint technology, but decision makers face uncertainty.

Positive Evidence: - 3D printing Industry has seen two digits growth consistently in the last few years; - 3D printing is already reshaping supply chains across industries (e.g.: prothesis, aerospace, etc.);

Negative Evidence: - Major players have been observing declining profitability (e.g.: Stratasys, 3D Systems); - Estimates of 3D printing growth diverge;



Where to start in DMDU?

Shaping events in the 3D Printing Industry

- Patent Dynamics & Patent Expiration (e.g. FDM Patent);
- Fierce Competition;
- After the 3D printing Bubble, major players refocused their operations on industrial-grade printers;

Why 3D Printing

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Model

Model

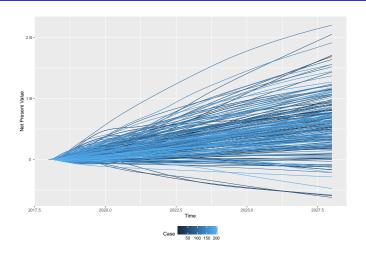
Case Generation

Design of Experiments

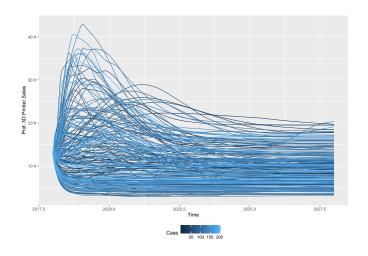
■ Full factorial design of these variables, resulting in 54 strategies:

Variable	Meaning	Levels
<i>S</i> ₁	Market & Pricing Strategy. Defines wether the player	Agressive (1); Conservative (2)
	pursue an agressive marketing strategy to gain market share	
	(by cutting prices and accepting excess capacity), or pursue a	
	conservative strategy,	
S_1^{max} or	Desired Market Share. For a	20%; 30%; 40%
S_1^{min}	Conservative Strategy, the player adopts the S_1^{max} , and for	

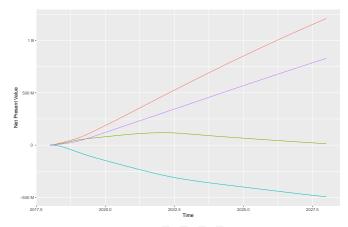
Candidate Strategy NPV across scenarios



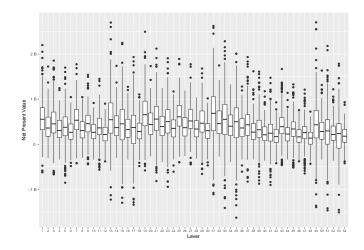
Global Demand across scenarios



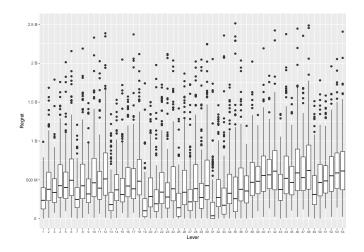
4 Players Net Present Value in a given scenario



Net Present Value across strategies and Scenarios



Regret across strategies and Scenarios



Ranking Strategies by Regret

Scenario Discovery

Tradeoffs

Second Iteration

Final Thoughts

Slide with Plot

Slide with Plot