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FROM EFFECTUATION TO MARKET DRIVEN: THE MATURATION OF SOLAR TECHNOLOGIES

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Introduction:

We aim to study process of new product development in the dynamic solar energy industry. Marketing theory traditionally assumes that firms apply linear logic and action towards new product development and commercialization. However, empirical findings suggest that entrepreneurs confronting internal and environmental turbulence employ non-linear processes that grossly diverge from the aforementioned descriptive accounts (Moorman & Miner, 1998). Sarasvathy (2001) describes this alternate approach to new product development as effectuation, which is graphically illustrated below.

Context:

We suspect that predominance of effectual processes accompany (and may in some ways explain) the “historic nascency” of the solar industry. We use this term “historic nascency” to describe decades (or arguably centuries) of attempts at solar energy commercialization by dynamic set of distributed actors in the absence of consistent market demand (Gahrud and Karnoe, 2003). Given the solar energy industry’s historic nascency, this perspective suggests that companies developing solar technologies have, to-date, focused on creating effects through iterative recombinations of means rather than through the manipulation of means to produce a predetermined effect.

Hypothesis:

Recent increases in both social and government support for solar energy may be changing the market dynamic, effectively creating a ‘problem’ to which the solution of solar energy technologies is now adapted to solve. If the solar industry is transitioning from effectual to causal processes we would expect to find support for the following hypotheses:

- H1:** Decision making will become driven by expected gains rather than affordable losses. Greater focus in both products and markets.
- H2:** Competitive tactics will become more common than strategic alliances.
- H3:** Individuals and organizations will emphasize the exploitation of existing knowledge rather than exploiting contingencies.
- H4:** Individuals and organizations will try to predict the future rather than attempting to shape the future.

Data Sources:

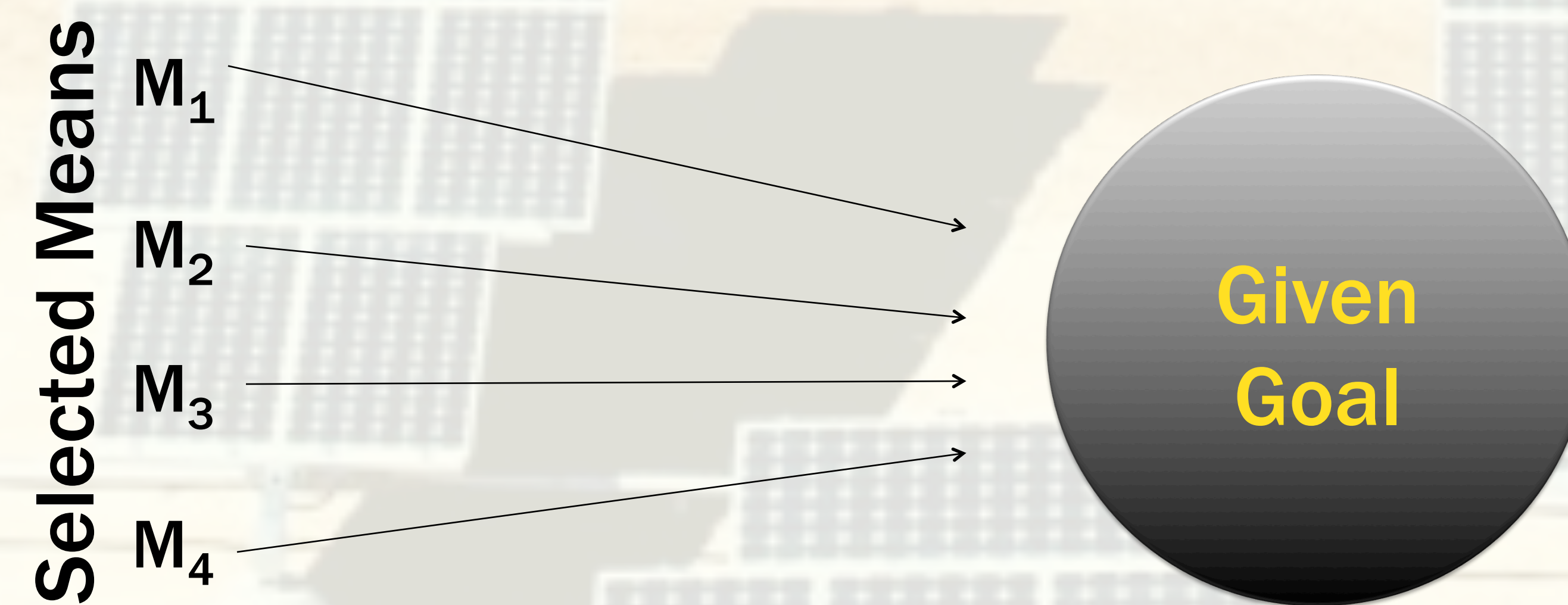
Partnerships/Alliances among firms, Diversity of funding, Licensing fees, Quantity/Specificity of patent filings, Lobbying efforts, Consumer education efforts, Breadth of products and customers

Entrepreneurial Thinking [Effectual] Distinguishing Characteristics:

Imagining a possible new end using a given set of means

Managerial Thinking [Causal] Distinguishing Characteristics:

Selecting between given means to achieve a pre-determined goal



Implications:

The solar industry’s historic nascency makes it an interesting context in which to position ourselves to observe a transition from effectual to causal logics among firms. We hope that this study elucidates field level drivers underlying the emergence of a stable market for solar technologies. In addition, we hope to unpack the role that institutional entrepreneurs play in changing and maintaining the institutions around other emerging sustainable technologies.

We also expect our research will have important implications for practitioners. It is important to note that neither effectual nor casual logics are inherently correct. We suspect that our findings will assist practitioners in determining the effective use and routinization of casual vs. effectual processes specific to their industry.

Figure adapted from effectuation.org

References:

Gahrud, R. & Karnoe, P. (2003). Embrace vs. Breakthrough: Distributed and embedded agency in technology entrepreneurship. *Research Policy*, 32, 277-300

Moorman, C. & Miner, A.S. (1998). The Divergence of Planning and Execution: Improvisation in New Product Development. *Journal of Marketing*, 62, 1-20

Sarasvathy, S. B. (2001). Causation and Effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *The Academy of Management Review*, 26, 243-261