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STRATEGY

How Management and Game Theory Understand Strategy

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CEOs and corporate boards would do well to learn the rudiments of game theory.

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Strategy, as understood by management scholars (henceforth "Management"), is distinct from the way that Game Theory scholars (henceforth "Game Theory") understand it. Management sees strategy as the overarching plan for the company - the set of choices encompassing company goals, scale, scope, and activities. Game Theory understands strategy as “a contingent plan of action.”

The language (terms and concepts), the machinery (models and frameworks), and the output of each discipline are as different as chalk and cheese. The lexicon of Management includes purpose, vision, positioning, value creation and sustainable advantage whereas the lexicon of Game Theory includes decisions, information sets, finite and infinite games and Nash equilibria.

The machinery of Management includes narratives, metaphors, matrices and maps while the machinery of Game Theory includes payoff matrices, game trees, probabilities and mathematical equations. For Management, the output is a formal plan that explicitly spells out what the firm will do (and implicitly what it won’t do). For Game Theory, the output is an equilibrium (or equilibria) characterization.

The differences extend to the way that each discipline is learned and taught. In business schools, strategy is taught using the case method. Students develop the skills to make sense of densely cluttered information and to decipher how events and choices shape outcomes. In the work place, the art of strategy is learned on the job and supplemented by training and mentoring. Game theory teaches strategy by exposing student to canonical models. Examples, rather than thick case studies, are the vehicles by which students develop the skills to engage a variety of problems.

Though each discipline has grown in popularity, each has had a negligible influence on the other. Game theory is absent in Walter Keichel’s survey of the intellectual history of business strategy in his book, The Lords of Strategy. And game theory receives cursory mention in most strategic management texts (see, for instance, Contemporary Strategy Analysis by Robert Grant).

Business strategy (as described above) does not merit more than the odd paragraph or footnote in most game theory text books (see, for instance, Games of Strategy by Avinash Dixit, Susan Skeath and David McAdams). Despite the “East does not meet West” narrative suggested above, I will argue that the two disciplines, different as they are in emphasis and approach, are complementary. CEOs and corporate boards would do well to learn the rudiments of Game Theory. And Management and Game Theory will develop a wider world view if each discipline were to develop a degree of proficiency with the scope and methods of the other.

Here are the 4 dimensions along which the disciplines approach business strategy in distinct ways.

The Agenda

Management and Game Theory start with different agendas. Management's agenda is to provide the CEO (and the management team) with the intellectual and practical frameworks to manage messy, unstructured real-world problems. The aim is to improve the quality of decision-making, sharpen the clarity of the message, and enable a high degree of coordination of activities and initiatives across the company.

Game Theory does not attempt to assist CEOs and leadership teams establish company goals, articulate vision or develop a plan. At least, not directly. Game Theory's illustrations, examples and models identify the considerations that influence the company's strategy. This includes a formal assessment of what the company stands to gain and lose in contests including the recognition that business is not a zero sum game. It encourages companies to develop a deeper understanding of the formal and informal "rules" of games of business. And it makes it possible for companies to identify the opportune circumstances when "interventions" can change the game in a company's favor.

The Landscape

The business landscape is complex, dynamic and uncertain. Companies recognize that their business prospects are shaped by a number of forces including technological change, regulation and deregulation, and globalization and de-globalization. Social media has accelerated the speed with which advantage is won and lost. Information flows thick and fast. And it is unstructured, multidimensional, and ambiguous.

What is one to pay attention to? The here and the now or the future? Actual competitors or potential competitors? Today's buyers or tomorrow's buyers? The behemoths or the upstarts? Research-in-Motion's decline began because it underestimated the outsider, Apple. Motorola's woes began because it was slow to recognize smart phones as the next big thing. And retailers such as Radio Shack and Toys R Us failed because they could not develop the right capabilities.

Management seeks to provide CEOs with the frameworks and tools to make sense of this maze. Millions of managers from across the world are familiar with the ideas expounded in Michael Porter's celebrated book, Competitive Strategy: Techniques for Analyzing Industries and Competitors. Its most significant contribution to management practice was (and is) that it sensitized CEOs, boards of directors, consultants and others to the forces that expand and constrain the potential profits of their industries.

In the forty years since the publication of the book, dozens of frameworks and models have been proposed to assess the changing landscape including industry evolution, disruptive innovation, product diffusion, and technology diffusion models.

Not surprisingly, intelligence gathering and sense-making has become a big business. Management consulting is a $160 billion business and growing fast with many small niche firms jostling for position alongside big players such as McKinsey and Accenture. And business intelligence is one of the fastest growing segments of software today with several large players such as IBM, Microsoft and SAP duking it out with smaller firms such as ThoughtSpot and ClearStory Data. Game Theory helps us understand the landscape in conceptual and practical ways. In their book, Co-Opetition, Adam Brandenburger and Barry Nalebuff identify the players involved in a firm's Value Net. These players cooperate with the company in creating value while competing to extract a share of it. The four players in every company's value net include customers, suppliers, substitutors and complementors. Everyone understands that there is give and take in transactional relationships with customers and suppliers. But it is the norm to view substitutors as the enemy and to ignore complementors altogether. Brandenburger and Nalebuff argue that the game of business is more complex. Everyone is a frenemy.

The Constraints

Every CEO must look inside and outside the company to identify the constraints that inhibit the company from reaching its potential. The constraints that a company faces are numerous: insufficient resources (money and people), inadequate expertise (capabilities), ineffective organizational systems (practices), failing cultures, under-developed ecosystems, and more.

Matching a firm's resources and capabilities with promising opportunities is no easy task. Consider, for instance, the predicament of Lawrence Culp Jr. at General Electric (GE). When Culp was appointed as CEO in October 2018, GE was in crisis. Its market capitalization had fallen steeply from its 2007 high of $425 billion to $80 billion. And for the first time in more than a century, it lost a place on the Dow Jones Industrial Average. Culp's bet was (and is) that GE is going to focus on turning around four businesses: power, renewable energy, aviation and healthcare. The question is whether anything that Culp and his management team do with these businesses can propel GE back to the top of Corporate America. As Warren Buffett once astutely noted, "when a management with a reputation for brilliance tackles a business with a reputation for bad economics, it is the reputation of the business that remains intact."

Management's contribution to strategy is to analyze the resources and capability constraints that the firm faces. Resource constraints are primarily financial: cash and access to capital. Capability constraints are the more serious ones. As David Teece has noted, the central differences between the firms that are at the top and those that are not are "dynamic capabilities." Dynamic capabilities include the ability to "sense, seize and transform." It is a capability that is developed over many years. And it is fostered by a combination of leadership, routines and culture. Amazon is reaping the rewards today from developing its dynamic capabilities over 2 decades.

Game Theory identifies the arsenal of tools that a company can use to relax or tighten the constraints that all players in the Value Net face. Brandenburger and Nalebuff use the term, PARTS, to refer to the elements that influence the game: P for players, A for added values, R for rules, T for tactics and S for scope. Companies ought to reimagine the players

(P) that can be included and excluded from the game as a way of relaxing and tightening constraints. They must acknowledge that they cannot hope to capture value if they do not add value (A) and/or if they cannot diminish the added values of other players. While seeking to respect the formal rules (R) that govern business and society, companies ought to examine the potential for changes in informal rules to increase the value they capture. Tactics (T) can be used to alter the way that other players perceive the game as well as alter the range of actions they can take. And companies can expand or contract the boundaries of contests by changing their scope (S).

The Strategic Plan

While long-range planning of the kind that was in vogue in the 1960s and 1970s has been cast aside, the development of a plan that is responsive to changes in economic and market conditions and that best positions the company for growth is still the norm. The formal strategic plan rarely explicitly identify the contingencies that call for refinement or abandonment of Plan A. But CEOs (and management teams) are expected to have thought through the contingencies that require plans B, C and beyond.

Management scholarship on the content of the (and the process of developing and evaluating the) strategic plan are far from monolithic. As Walter Keichel notes in his book, Lords of Strategy, many schools (and sub-schools) of thought on strategy have emerged over the last six decades. Some schools emphasize the importance of ideas while some emphasize the role of people and systems.

There remains the view that the strategic plan is widely misunderstood. In his paper, “What is Strategy?” Michael Porter argued that much of what people describe as strategy is not strategy but operational effectiveness. Strategy, Porter asserts, is about distinctiveness and that, “the essence of strategy is choosing a unique and valuable position rooted in systems of activities that are much more difficult to match.” In his book, Good Strategy, Bad Strategy, Richard Rumelt notes the unfortunate practice of conflating buzzwords, slogans and financial goals for strategy. Here is one example of a strategy statement (from Apple’s 2017 annual report) that passes the distinctiveness, coherence and fit tests advocated by Porter and Rumelt:

> *".... The Company's business strategy leverages its unique ability to design and develop its own operating systems, hardware, application software and services to provide its customers products and solutions with innovative design, superior ease-of-use and seamless integration. As part of its strategy, the Company continues to expand its platform for the discovery and delivery of digital content and applications through its Digital Content and Services, which allows customers to discover and download digital content,iOS, Mac, Apple Watch and Apple TV applications, and books through either a Mac or Windows personal computer or through iPhone, iPad and iPod touch® devices ("iOS devices"), Apple TV and Apple Watch. The Company also supports a community for the development of third-party software and hardware products and digital content that complement the Company's offerings. The Company believes a high-quality buying experience with knowledgeable salespersons who can convey the value of the Company's products and services greatly enhances its ability to attract and retain customers. Therefore, the Company's strategy also includes building and expanding its own retail and online stores and its third-party distribution network to effectively reach more customers and provide them with a high-quality sales and post-sales support experience....."*

Every sentence in this paragraph communicates information of value to company insiders, partners, investors and competitors. The 1st sentence describes the things Apple will do and not do as well as why this approach will win. The 2nd sentence identifies new initiatives. The 3rd sentence discusses the other players in the Apple ecosystem. The 4th sentence identifies the attributes that contribute to Apple's success. And the 5th sentence describes its exploratory actions.

Game Theory's contribution to the development and refinement of the strategic plan is philosophical. It reminds companies that they must not play any (or all) of the games that are given to them. And that though changing the game requires imagination, astuteness, patience and courage, the risk-reward ratio may be favorable. Game Theory teaches companies to see the forest and the trees and to be cognizant of how other players perceive the game. It reinforces the important lesson that games of business can be Pareto improving for all. And finally, it reminds us that games of business and life are best viewed as infinite games in which victories may be ephemeral while losses can be consequential.

Conclusion

Despite differences in language, methodology and emphasis, Game theory and Management have the potential to be strong complementors. Each contributes to the analysis of a company's challenges- making sense of the landscape, assessing the company's constraints, and articulating the plan- in philosophical and practical ways. Game theory's precise language, logical framework and equilibrium thinking enforce intellectual discipline. And Management's comfort with ambiguity and deep uncertainty makes it possible for companies to engage the world on a surer footing.

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