



## ANALYSIS

# Strategic partnering in oil and gas: A capabilities perspective



Rodrigo Garcia <sup>a</sup>, Donald Lessard <sup>b,\*</sup>, Aditya Singh <sup>c</sup>

<sup>a</sup> Technology and Public Policy Program, MIT, USA

<sup>b</sup> MIT Sloan School of Management, 100 Main Street, Cambridge, MA 02142, USA

<sup>c</sup> New Ventures and Asset Management, Total Exploration & Production, France

## ARTICLE INFO

## Article history:

Received 3 March 2014

Received in revised form

2 July 2014

Accepted 3 July 2014

Available online 24 July 2014

## Keywords:

Strategy

Capabilities

Dynamic capabilities

Integrative capabilities

Integrative dynamic capabilities

Strategic groups

Partnering

Oil and gas industry

## ABSTRACT

A firm's strategy typically is defined in terms of its position in the industry or landscape that operates in and the competitive advantage of the firm on that landscape. This competitive advantage, in turn, derives from a combination of assets (what the firm owns) and capabilities (how the firm does what it does). While the image of the oil and gas industry is that it is all about assets, competitive advantage generally results from a combination of tangible assets, capabilities, and intangible assets such as reputation and intellectual property (IP). The types of capabilities that are most likely to set one firm apart from others in a highly competitive field like oil and gas are complex bundles of complementary capabilities that are required to solve key challenges and that are hard to develop and emulate, particularly when the challenges are new and require new bundles of capabilities. Thus, the differentiating capabilities may be integrative, dynamic, or both. This paper identifies a set of integrative dynamic capabilities that are emerging as differentiators in the oil and gas industry and discusses what these imply for partnering at the company and asset levels.

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## 1. Introduction

The petroleum industry faces challenges of intensifying demands for delivery of both shareholder value and increased output to meet global demand for hydrocarbons, while at the same time ameliorating its environmental and social impact. While the image of the oil and gas industry is that competitive advantage results from tangible assets, in fact it generally results from a combination of tangible assets, capabilities, and intangible assets such as reputation and intellectual property (IP). As chronicled by Zuckerman in *The Frackers* [1], the latest chapter of extraction from shale formations with horizontal drilling and hydraulic fracturing is the result of a combination of assets - land acreage, which in some cases was inherited from earlier business models but in many was the result of a capability of amassing acreage without drawing undue attention - and dynamic drilling and completion capabilities.

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bundles of complementary capabilities that are required to solve key challenges and that are hard to develop and emulate, particularly when the challenges are new and require new bundles of capabilities.

Even without the specter of climate change, the oil and gas industry is highly dynamic given the inexorable requirement to replace reserves, particularly as the most accessible reserves are exploited first and new opportunities typically involve greater technical challenges, institutional challenges, or both. With increased environmental scrutiny, these challenges become even more complex and dynamic, as resources must be extracted with an eye to both economic efficiency and an environmental footprint that may include local contamination, local social and economic displacement, water use, and greenhouse gas emissions.

Taking the long view, most firms defined solely by extraction will eventually become extinct, as exploitation of carbon producing fuels must ramp down.<sup>1</sup> Even before then, extractive firms may have to

\* Corresponding author.

E-mail address: [dlessard@mit.edu](mailto:dlessard@mit.edu) (D. Lessard).

<sup>1</sup> IEA's World Energy Outlook [45] estimates that in order to have a 50% chance of limiting the rise in global temperatures to 2 °C, only a third of current fossil fuel reserves can be burned before 2050. The balance could be regarded as "unburnable".

position themselves as clean(er) energy service firms in order to maintain their public legitimacy and sustainable competitiveness, even as they also continue to seek to effectively identify and develop new reserves.

Even those firms whose central focus remains finding and extracting fossil fuels are seeing old sets of capabilities – such as advanced exploration techniques, complex drilling and completion, or processes for assuring safety in operations and the health and safety of employees and adjoining communities – becoming “qualifiers” and no longer differentiating, while new capabilities – such as industrializing the production of hydrocarbons from distributed sources while significantly reducing surface and environmental footprints, rapidly and safely prototyping and proving new technologies at scale, diversifying into new sources of energy, or creating inclusive supply and distribution infrastructures in new regions that engage local talents and entrepreneurship beyond the usual “local content” model – are becoming the new differentiators.

Recognizing that the future is not predetermined, the purpose of this essay is not to provide a crystal ball regarding exactly which suite of capabilities-based strategies will be viable going forward, as this will result from a complex and unpredictable interaction of technological progress, innovation and collaboration in the oil and gas business, public policy, markets, social opinion, the physical realities of climate change. Rather, it is to define the types of capabilities required to meet the various technical and institutional challenges (Section 2), to explore various bundles of capabilities that are emerging and/or that may be called for and the resulting scope and type of organization of firms that possess them (Section 3), and the way that this will play out in partnerships at the asset level (Section 4).

## 2. Capabilities as the bedrock of strategy in the oil and gas industry

The first layer of capabilities that help the firm drive its operations are usually referred to as operational capabilities that underpin the firm’s potential to perform an activity “on an on-going basis using more or less the same techniques on the same scale to support existing products for the same customer population” [2].<sup>2</sup> Operational capabilities are best practices that start in one or two companies and then spread to the entire industry [3]. It is important to emphasize that operational capabilities can entail a dimension of values that hinder innovation and limit the firm’s chances of moving beyond its common practice [4].

The types of capabilities that are most likely to set one firm apart from others in a highly competitive field like oil and gas are complex bundles of capabilities that are required to solve key challenges and that are hard to develop and emulate. Further, the ability to create such bundles is itself a capability. Kogut and Zander [5] define “combinative capabilities” as the ability of firms to generate new applications from existing knowledge. These higher order capabilities have become known as dynamic capabilities [6–11]. Dynamic capabilities are defined as what makes a firm distinct from others by sustaining competitive advantage based on a unique combination of resources [9,12,13]. However, dynamic capabilities have to be more than just what the firm happens to do well. To be considered as capabilities they must be intentional and repeatable [14].

Dynamic capabilities are grounded in the resource-based view (RBV) framework, which claims that competitive advantage is obtained through distinctive bundles of resources. Nevertheless, the RBV does not take into account that the major strategic challenge of the firm is to sustain competitive advantage over time by continuously realigning its

capabilities. Dynamic capabilities enhances the RBV of the firm through a repetitive process of integrating resources as a response to the rapidly changing environments [11], which helps the firm continuously learn and reinvent its value chain.

Parallel to the concept of dynamic capabilities, Henderson and Clark have developed the concept of architectural competences that enable the firm to integrate and deploy component competences in new and flexible ways (without necessarily changing the core components). These architectural competencies are difficult to build, may depend on the way the core competences are structured, are difficult to adapt, and as a result can have important consequences for competitive advantage [15–17].<sup>3</sup> From our perspective and considering the oil and gas industry, it is important to merge Henderson and Clark’s architectural perspective with the concept of dynamic capabilities in order to emphasize the importance of integrating and recombining core concepts and components at a system level.

Integration takes many forms. In oil and gas it often takes place within the project, in the early stages of opportunity assessment and concept selection, during the FEED stages, during execution, and then during the handoff to operations. It also must work across projects in technology and multiple field development programs. Stage gates are major points of integration, but so are other periodic integration activities focused on value and/or safety. Frontier projects typically are lumpy. So expertise must be integrated across the firm and deployed when opportunities arise. Further, projects are embedded in particular regions with their own supply, commercial, regulatory, and community dynamics, but must draw on common expertise, and experience. Integration also takes place at the level of the supply chain both for technology and quality, and finally at the full ecosystem level including setting standards and integrating the co-creators. In some instances, such as those described by Am and Heiberg [18], this dynamic integration is catalyzed by government initiative, while in others it is led by individual firms but almost always requires some scaffolding of trust and facilitating legislation to thrive.

Both operational and dynamic capabilities can be integrative, as explained by Helfat and Winter, who state that “integrative capability may be dynamic or operational, depending on the nature of the capability and its intended use.” [19] Therefore, even though dynamic capabilities as defined by Teece, Pisano, and Shuen [17] are integrative, we maintain the distinction between the two dimensions.

We therefore propose that capabilities can be considered to be integrative dynamic capabilities (IDCs) when they involve system-level orchestration of different elements in order to sustain competitive advantage. Our concept of IDCs is a synthesis of the resource-based view (RBV)<sup>4</sup> – combining “complex bundles” of resources and assets [7]; the dynamic capabilities perspective (DC) – “complementary sets of dynamic capabilities” [9] and architectural capabilities [15].

Drawing on these concepts, we classify capabilities on two dimensions, the degree of integration and the degree of change they entail. Table 1 illustrates these concepts for the oil and gas industry. The degree of integration refers to the extent of the system that knowledge is drawn from and/or whose behavior is influenced by bringing the different parts together, whereas the degree of change corresponds to the need for adaptation that the capability addresses.

Examples of operational capabilities (the upper left cell) in the oil and gas industry include drilling and completion or seismic acquisition and reservoir modeling, Examples of integrative but relatively static

<sup>3</sup> Henderson and Clark initially introduced the notion of architectural competencies with respect to a multi-component product. They later generalized it to the broader organizational system.

<sup>4</sup> The RBV proposes that firms can be organized as bundles of resources, and that these can reach a sustainable competitive advantage once these combination of resources becomes valuable, rare, inimitable and non-substitutable [11].

<sup>2</sup> Capabilities that underpin a variety of products or businesses within the firm are often referred to as core competencies [46].

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