



CASE STUDY

Case study, dynamic capabilities and upstream strategy: Supermajor EXP

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ABSTRACT

This case study explicates the dynamic capabilities framework and shows its relevance for the Global Exploration Division of a major IOC, Supermajor EXP. Three characteristics of dynamic capabilities are described: (1) how they differ from ordinary capabilities; (2) how they are identified, built and strengthened through managerial processes; and (3) how they function throughout the strategy development and execution process (sensing, seizing and transforming). Over a one-year period, EXP implemented key organizational and business model innovations to identify and begin to manage 10 dynamic capabilities. The case demonstrates how EXP identified and prioritized their dynamic capabilities through a strategic assessment, built, strengthened and evolved them through dialogical, collaborative and iterative processes that were informed by learning, sustained them by establishing new organizational structures, and reinforced them through cultural initiatives. Three of EXP's dynamic capabilities are described in detail: (1) accuracy in volume and risk predictions in investment proposals (the degree to which the subsurface reality is exposed when the well is drilled); (2) strategic deployment of talent into the ventures and projects with the highest economic value (right people, in the right seats, doing the right thing, with the right people, at the right time), and (3) effective management of the centralized–decentralized polarity.

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1. Introduction

As defined by Teece et al. [1–4], a dynamic capability is a meta-process that orchestrates a number of processes, best practices or competencies to manage comprehensively and systemically, something that is strategically imperative, including the strategy development and execution process itself. “Dynamic capability” is important concept in the strategy literature [3–7], as it describes how leading firms integrate, build and reconfigure internal and external competencies into “learned patterns of collective activity” [6] to gain and maintain competitive

advantage in rapidly changing and highly complex environments.

In Dynamic Capabilities in the Upstream Oil and Gas Sector [4], Shuen, Feiler and Teece argue that dynamic capabilities are particularly important for the upstream oil and gas business environment. Here, operational and general managers with key strategic decision-making responsibilities confront significant challenges that accelerate velocity (particularly in Unconventionals) and increase complexity. These factors include the growing demand for energy resources, new technologies that have opened unconventional plays, increased competition, shrinking global geoscience and engineering talent pools, and the reality and perception of environmental risks. Together these factors create an inflection point,

which requires a new approach to strategy management.

Most treatments of dynamic capabilities in the strategy literature discuss dynamic capabilities in general terms, only a few are specific about the role of dynamic capabilities in oil and gas, and none to our knowledge provide insight into how dynamic capabilities are actually selected and developed by firms. This case study seeks to fill this gap by describing the process by which Supermajor EXP identified and developed the dynamic capabilities it considered essential for strategy execution.¹

¹ Supermajor EXP is in reality the Exploration Discipline within a large, vertically integrated international oil and gas company (IOC). In this case study, the identity of the company is disguised; however, the information provided here was reviewed by the company and permission was granted for its use (January 3, 2014).

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2. Elements of the dynamic capabilities framework

2.1. Dynamic capabilities differ from ordinary capabilities/best practices

As a meta-process, a dynamic capability differs from an ordinary capability. An ordinary capability, best practice or competence usually focuses on the performance of a specific delineated task [3,8,9]. A firm might develop, for example, a best practice in recruiting, to excel at hiring top talent. That ordinary capability alone will not usually create value; its power to contribute to value creation resides in the role it plays among a managed cluster of activities (e.g., recruitment, on-boarding learning, deployment, management, leadership, culture). The effective orchestration of this cluster of activities by managers with strategic and/or operational oversight does create value when it results in getting the best people motivated, putting them into the right seats, and ensuring that they are doing the right things, at the right time. This dynamic capability involves a well-managed cluster of activities – what some call a “people strategy.”

In Oil and Gas Exploration, for another example, accurately predicting volume and risk (the degree to which the subsurface reality is exposed when the well is drilled) in investment proposals could be a dynamic capability built upon effective management that coordinates a cluster of ordinary competences and supportive skills, such as volumetrics and uncertainty analysis, seismic interpretation, sequence stratigraphy, building structural depth models or property models from well correlation data, managing and processing subsurface data, and evaluating data to generate maps. Skills alone do not usually create value; what does is a dynamic capability that involves the effective orchestration of a cluster of activities directed toward achieving something that is strategically imperative.

2.2. Dynamic capabilities are identified, built and strengthened by managers who focus intentionally on strategic routines that create value

Dynamic capabilities do not just emerge and are more than something that firms do well. Zollo and Winter [6] raise and answer the relevant question: “How do dynamic capabilities come into existence and evolve over time?” They argue that “dynamic capabilities have to be developed ‘in-house’ through a set of activities and cognitive processes focused on the organization’s own routines” (p. 11). Building on that idea, this case study demonstrates that for one organization, Supermajor EXP, relevant dynamic

capabilities were identified and prioritized through a strategic assessment, were built through dialogical, collaborative and iterative processes that were informed by learning, were sustained through the establishment of organizational structures and leadership that provided systematic oversight and training, and were reinforced by executive communications and culture.

2.3. Dynamic capabilities support all phases of strategy development and execution

The Dynamic Capabilities Framework can be used to organize strategic oversight around three clusters of activity: sensing, seizing and transforming [3]. These proceed in a sequential manner and are relevant for corporate strategy (portfolio strategy, M&A strategy, ecosystem combining/partnering strategy), business strategy (whole or single business unit), functional or department strategy, or project strategy.

2.3.1. Sensing

Sensing involves gaining knowledge about the external and internal environment and making decisions about strategic direction. Sensing’s scan is comprehensive – outside and inside the organization [3]. Outside the organization, Sensing is an inherently entrepreneurial set of dynamic capabilities that involves gaining knowledge about competitors, exploring technological opportunities, probing markets, listening to customers or suppliers, distilling new product and service opportunities (“ideation”), along with scanning and exploring other elements of the business ecosystem (partners, joint ventures, government regulators, etc.). It requires management to build models and test scenarios, and in certain markets to ascertain latent demand. Sensing benefits from the application of data analytics and from experimentation. There is also a need for individual insight, as Jack Welch observed, “leaders must develop a sixth sense, an ability to see around corners” [10]. Sensing capabilities involve activities that create a culture of open communication, and knowledge about the organization’s readiness to capture value. This is particularly relevant for oil and gas companies who, when making investment decisions, must assess not only which opportunities create the highest potential value, but which ones are “doable” given the resources at hand or easily procured. In this sense, “gap filling” may not just strengthen ordinary capabilities; the act of doing it can be seen as a dynamic capability.

2.3.2. Seizing

Seizing involves mobilizing and inspiring the organization and its complementors to

develop organizational and ecosystem readiness to capture the opportunity. Seizing deploys a set of capabilities focused on capturing opportunity and mitigating risk. As just mentioned, gap filling (strengthening ordinary capabilities and establishing best practices) can strengthen readiness. Capabilities around eliminating irrelevant processes or selling off non-strategic assets are important. In oil and gas this means getting control over organizational capabilities that are or might become bottlenecks [11]. Core seizing activities include developing the business case, communicating it, aligning stakeholders, raising capital, planning to execute the strategy and the implementation of organizational or business model innovations, which provide structures for action.

2.3.3. Transforming

Transformational capabilities are the routines designed to sustain strategic relevance in changing markets through continuous alignment and realignment of tangible and intangible assets. Teece [3] uses the term “reconfiguration” to refer to adaptation and repurposing capabilities (sometimes achieved through recombining existing resources) as external or organizational realities change. Also essential in the transformation process are the “words and deeds” of leaders that mobilize, motivate and inspire people to change [12].

To summarize, “Dynamic Capabilities” are the orchestrated and managed clusters of activity that empower and help guide decisions about direction (sensing), that prepare, plan and align stakeholders, engendering organizational readiness for change (seizing), and that actually change the organization so that it can capture opportunities and create value through efforts to mitigate risks (transformation). Given this understanding, dynamic capabilities can be understood to empower strategy execution,² helping inform and make precise decisions about what to do (direction and vision) and increasing the organization’s readiness and ability to achieve it.

3. Dynamic capabilities and upstream strategy: supermajor EXP

Though a dialogical and iterative process focused on building routines that create value, EXP managers identified 10 dynamic capabilities, which support both strategy development and execution. In this section we describe EXP’s purpose for focusing on dynamic capabilities, the dialogical and

² Etymologically, the meaning of the word “dynamic” includes both the concepts of change and power.

iterative process they used to identify and develop them, how they organized institutionally to manage and sustain/evolve them, and how leaders established “capability” as an ongoing cultural imperative.

After EXP developed its energy demand scenarios out to 2050, it was quick to realize that to meet its growth objectives, a strategic focus on developing and managing both ordinary and dynamic capabilities was required. EXP was careful about resource allocation: each year regional managers submitted detailed proposals to the Global Exploration Leadership Team (GXLT) with respect to which ventures to fund. Historically, the criteria used by top management to select and prioritize ventures were purely economic: that is, projects with the highest economic value or highest potential economic value were the ones funded.

Recognizing a new upstream reality, and aware of the costs and risks associated with some high-priority ventures (e.g., frontier ventures, Unconventionals), EXP leaders decided to include in the investment decision process an analysis of all current and proposed projects that focused on project “doability,” that is, the strength and availability of capability for venture execution. To deliver venture objectives, leaders required a sufficient number of Geoscientists (capacity), with strong technical skills. These experts needed to be deployed strategically, to be armed with the latest technology and to be managed and led in ways that increase morale and inspire a commitment to technical careers.

In the language of the Dynamic Capabilities Framework, this decision established a sensing capability – a coordinated cluster of activities that led to more complete executive knowledge about project “doability” (capacity to seize). This intelligence was then included in the investment decision process.

The process used to identify and develop EXP’s dynamic capabilities began with a strategic assessment. Led by the Chief Global Geoscientist, a global capability assessment (The Global Capability Health Check) was conducted in over 55 global ventures (the Gulf of Mexico is one venture). The capability analysis evaluated 8 core technical capabilities (which joined over 50 ordinary competences or skills), capacity (key positions filled), deployment related to the priority of projects, leadership and managerial effectiveness, HSSE, the provision and management of resources from the ecosystem, rapid technology deployment, knowledge networks and learning, partnerships (internal and external) and other capabilities related to the specific geology of the projects.

After the “paper” assessment was completed and analyzed, individual interviews with the leaders of 10 global regions,

select area managers and team leaders were conducted to deepen the analysis, to begin to identify strengths and remedial actions to close ordinary capability gaps relevant for dynamic capabilities, and to begin to identify the clusters of activities that needed to be coordinated to improve performance and create value.

To develop and sustain their dynamic capabilities, EXP executives established a permanent Global Capability Team led by the Chief Global Geoscientist. The team included the leaders of nine global regions, the VP of Global Exploration Strategy, the Global Manager of Technological Innovation, the leaders of functions that provide Capability (HR, Learning and Development, Recruitment, Managed Open Resources), technical subject matter experts, and ecosystem partners.

This organizational innovation ensures that an annual cycle of capability identification and strengthening is conducted and that strategic routines are reinforced. The cycle includes four face-to-face workshops per year where the global team meets to assess the current state of capability and discuss and define optimal ways to orchestrate or evolve capabilities. Both ordinary and dynamic capabilities are discussed, as gaps in ordinary capabilities undermine the effectiveness of dynamic capabilities. In addition, each year the Capability Team authors the annual Global Capability Improvement Strategic Plan and develops action plans and teams to better manage dynamic capabilities, to close gaps and to focus management attention on major dynamic capabilities that require ongoing oversight. Teams responsible for executing action plans that support global and regional capability improvement meet on a bi-weekly basis to review progress. Representatives of the regions (Regional Chiefs) also write capability improvement plans that focus regional and area managers on capability oversight. The Chiefs also participate in their own weekly conference call, led by the Chief Global Geoscientist, to share best practices and collaborate on resolving capability issues.

The establishment of the Capability Team and its sub-groups represents a seizing capability, establishing an organizational entity, roles and responsibilities to manage capability on an ongoing basis. The team make-up, inclusive of members at the center of the organization and in the regions, also establishes an organizational entity able to better manage the centralized–decentralized polarity.

On a quarterly basis, the Chief Global Geoscientist develops and presents to the EVP of Global Exploration a capability scorecard consisting of 10 key capability measures. Then at the summer meeting of the Global Exploration Leadership Team, when investment proposals are evaluated and portfolio

decisions are made, the Chief Global Geoscientist presents the Capability Report that represents the joint conclusions of the Capability Team about the “doability” of the proposals.

Over the course of a year, through a structured series of workshops and ongoing leadership dialogue described above, the following 10 dynamic capabilities evolved and were prioritized by the Global Capability team; action plans were written and carried out to strengthen these capabilities.

1. The provision of relevant and timely information about the current state of organizational capability to leaders as they make strategic portfolio decisions.
2. Accurate volume and risk predictions (the degree to which the subsurface reality is exposed when the well is drilled) in investment proposals.
3. Strategic orchestration of human resources: to recruit, train and deploy talent in a timely and efficient manner, into the ventures and projects with the highest economic value (right people, in the right seats, doing the right thing, with the right people, at the right time).
4. Effective management of non-technical risks across the business ecosystem: including the safe deployment of resources into energy-rich geographies that are that politically unstable or environmentally fragile.
5. Rapid deployment of technical and process innovations into ventures with high economic value.
6. Effective management of the centralized–decentralized polarity; to entrust managers in the ventures with managerial and operational decisions related to the specificities of the venture, while also protecting the need at the center of the organization for communication, cross-venture collaboration, HSSE, quality, efficiency and effectiveness.
7. Restructuring of Global Exploration, which created a separate division focused on Unconventional ventures, including new leadership and management structures, with dedicated financial, human and technological resources and synergistic linkages back to Global Exploration.
8. Timely learning throughout the organization, but particularly in Unconventionals; the development of cross-border, cross-organizational and cross-generational knowledge networks.
9. The orchestration of external and internal partnerships required to complete the work and create value.
10. The establishment of Capability as a strategic and cultural imperative throughout Exploration.

Several factors sustained this effort (transformation): the commitment of leaders who supported the capability initiative through regular communications and attendance at capability meetings and events; managers who reinforced with staff the importance of developing capability and personally worked to improve the capability of younger staff through cross-generational mentoring; an internal marketing campaign that featured capability as one of the pillars of EXP's strategy, on EXP's website and through posters placed in every work area; and accountability systems that included (1) measures and reporting structures that identified priorities and ensured that deliverables were completed well and on time, and (2) individual development plans (IDPs) that raised awareness about the importance of capability development and provided incentives for improvement.

4. Supermajor EXP's dynamic capabilities

While progress was made in strengthening all 10 dynamic capabilities listed above, in year one, EXP prioritized three that were considered vital, given current gaps and strategic imperatives. In this section, we describe the efforts of EXP leaders and managers to orchestrate and build these three dynamic capabilities.

4.1. Dynamic capability: accurate volume and risk predictions (the degree to which the subsurface reality is exposed when the well is drilled) in investment proposals

The goal of exploration activities is to accurately predict the presence of hydrocarbons within a subsurface geological formation, the extent of these deposits (volume), the amount of hydrocarbons recoverable (probability), and the subsurface reality (risk). Explorers conduct geological and seismic investigations; their findings are presented in proposals that Exploration leaders use to make investment decisions about what wells to drill.³ Once exploration wells are drilled and the size of the field is confirmed, the project is sanctioned and the field can be developed.

³ Going forward, the dynamic capability that brings intelligence to improve the effectiveness of investment decisions will be improved through reference to the recent UN Framework Classification for Fossil Energy and Mineral Reserves and Resources [13]. The UNFC's unique and very powerful property is that it distinguishes project contingencies that are in the technical/geological domain (finding the resource and developing it) and the contingencies in the social and economic domain (finding market, getting satisfactory legal, regulatory, fiscal and contractual frameworks, solving social and non asset HSSE issues. etc.)

An exploration well is a high-risk investment. Poor predictions about well performance can be costly. In 1982 BP spent about \$1.5 billion on its Mukluk well in the Beaufort Sea and came up empty. Costs for dry holes in other geographies are less, but still high. Typically, a shallow well in the North Sea costs \$10–30M (US); a deep water well, \$100M; conventional onshore well, \$1–3M. According to the US EIA [14], in 2010, within the United States, 36,611 Exploration and Development Wells were drilled; 4162 wells were dry holes. E&P companies pay a high price for poor science.

Shale gas has its own risks. Shale is one of several unconventional sources of natural gas; others include coal bed methane, tight sandstones, and methane hydrates. Because usual exploration techniques do not apply to shale formations, shale gas areas are often referred to as resource plays [15], rather than exploration plays. The geological risk of not finding gas is low in resource plays, but the potential profits per successful well are usually uncertain.

Unconventional predictions are complicated by a number of factors. While the geologist might be able to pinpoint the amount of gas in a shale formation, estimating how much of it is recoverable is problematic. Current estimates are based on relatively small sample of actual wells. Moreover, while a "technically recoverable resource" is able to be recovered given current technology, an "economically recoverable resource" is what can be recovered given the economics of producing it (costs of production vs. price of gas). Therefore, very often, a lot less of what is actually there can be recovered given technological and economic limitations. In 2005, the EIA calculated that for the Marcellus Shale, more than 90,000 wells would have to be drilled to fully tap this resource; but between 2005 and 2012, fewer than 4886 wells were drilled, due to a combination of technical and economic concerns [16]. Based on experience with these wells, the estimates of the "technically recoverable resources" at Marcellus dropped from 410 tcf to 141 tcf (EIA) [16].

As the complexity of making accurate predictions related to volume and risks deepens, so does the importance, given the need for increased production and the rising costs of discovering oil and gas. For EXP's leadership team to create sustainable value, crucial inputs into strategic decisions relied on the accuracy of the science and technical skills of the Explorer as reflected in the investment proposal, combined with costs of production and the price of oil and gas.

Increasing the accuracy of volume and risk predictions and production forecasts requires managers to orchestrate and manage a

strategic meta-process: a large cluster of activities, technical competences, operational processes and best practices that combine to improve the accuracy of predictions. EXP's Global Capability Team developed, introduced, implemented and reconfigured organizational and process innovations to manage the dynamic capability that serves this strategic imperative. Activities encompassed by this dynamic capability include the following.

- The development, implementation and institutionalization of information and knowledge-gathering processes and assessment tools (Sensing) that regularly inform leaders and strategic managers on the current state of technical capability, and increase the depth of knowledge used to inform decision-making. Knowledge gathered include: (1) the best practices of competitors and firms in other industries (the external scan), and (2) levels of capability in every region, every venture, and every team, down to the individual (the internal scan).
- The implementation of an organizational innovation: the global capability "team" (Seizing). Overall leadership responsibility for technical capability improvement was given to a global leader (EVP), with a direct-line reporting relationship to the CEO.
- A taxonomy of technical capabilities was developed (seizing) and orchestrated to provide more granular managerial oversight, coordination and technical learning. Over 50 technical competences were organized under eight major categories. Subject matter experts were assigned to manage them.
- An annual capability improvement planning process was launched, which identified gaps in technical capabilities at global (across all regions) and local (within regions) levels. Executives developed and implemented the global plan; regional leaders and their managers developed and implemented regional plans. Major objectives of these plans focused attention on people processes (recruitment and deployment), learning (aligning coaching, knowledge networks and training opportunities with the strategic priorities of the ventures, e.g., Unconventionals), organizational and process innovations that could improve technical accuracy, HSSE, and culture.
- Several structures and actions kept technical capability improvement high in the conscience of all employees, thereby establishing technical capability improvement as a cultural imperative (transforming). Technical capability

was regularly identified and discussed by leaders as a strategic priority.⁴

4.2. Dynamic capability: the ability to orchestrate human resources: to recruit, train and deploy talent, in a timely and efficient manner, into the ventures and projects with the highest economic value (right people, in the right seats, doing the right thing, with the right people, at the right time)

EXP's leaders wanted their best talent working on the most difficult, time-sensitive and valuable projects. Research confirms that the quantity and quality of work done by top performers outpaces by a high percentage that of average performers working on the same job. In a recent study, which cuts across industries and involved over 600,000 employees, O'Boyle and Aguinis [17] found that the top 5% of the workforce produced 26% of the firm's total output, about 400% more than one would expect. Another study [18] found that not only do top performers excel at technical mastery and analytical skills, but they also possess a much higher percentage of other competencies that managers would want on their most important projects, including strategic and business acumen, passion, commitment and loyalty, continuous learning, adaptability and flexibility [18].

Moving people around in the Oil and Gas Industry, however, is not as easy as it used to be.⁵ Today, strategic deployment of top talent is inhibited by several factors, located both inside and outside the E&P companies.

As for internal barriers, in some E&P companies, despite the disproportionate impact of high performers, some in HR are locked into practices that "treat people equally." Some of this is driven by "equal opportunity regulations," by organizational or cultural values, or, in some countries, by strict privacy laws, which forbid unassured HR databases and hide performance evaluations from managers. To ensure fairness, other considerations take precedence in recruitment and deployment processes and make these processes complicated, cumbersome

and uninformed by data. We worked with one E&P Company, where, once a key technical position became vacant, it took on average over a year to fill it, either by transfer or by experienced hire. The recruitment of an experienced hire could not even begin until internal prospects were identified and had a chance to apply, which often delayed the start of the recruitment of experience hires by 6–8 months. At any one time, over half the ventures in that company had vacancies in key technical positions, including the most important ones, increasing their reliance on contractors. Sometimes regional leaders are understandably possessive of their top talent and strongly resist pressure to move them into more profitable regions.

Other more systemic factors can prevent the company's top talent from moving into high potential ventures/projects.

- Sometimes at the top, leadership either fails to prioritize the portfolio or fails to set up and manage processes that communicate the strategic priority of particular ventures/projects down the line to regional managers and those responsible for deployment. Regional managers do not know where their projects stand in relation to others.
- High-priority ventures are sometimes understaffed because the best people are already busy on other high-priority projects. There are not enough highly competent experts to go around.
- An increasing challenge for corporations who require mobile talents surfaces with employees who are married or in partnerships and must manage dual careers.
- Poor global IT infrastructure prevents talented people from working or collaborating on high potential projects. With a globally integrated IT infrastructure and databases shared across borders, it is not always necessary to deploy a talented expert to a new location; rather that person can work on projects around the world from her/his desktop (or from home). In some global companies, however, cultures that emphasize decentralization have allowed each region to have its own infrastructure, software and databases, militating against technical collaboration across borders.

External barriers to deployment of top talent into high-priority ventures or projects include: (1) foreign government regulations that prohibit or make difficult the employment within their borders of experts from particular countries or ethnic-religious backgrounds; and (2) political instability or geographic inaccessibility, which make certain assignments undesirable for experts and their families.

Supermajor EXP's leadership team recognized that as the need for increased production rises, as the geology becomes more complex, as strong technical competencies are stretched, as competition for top talent increases and as the autonomy of decentralized managers becomes crucial, the process of deploying highly competent people into the ventures with the highest economic value becomes a strategic imperative. They now manage a dynamic capability to deploy the strongest teams into the ventures where the economic stakes are highest.

- Executive processes regularly assess the economic value or potential economic value of the portfolio of ventures to determine priority. Answers to the question, "What counts as evidence in the calculation of economic value?" extend beyond pure financial analysis to matters related to the technical and organizational capability of operations to deliver the venture.
- Communication linkages and protocols that align executive decisions about portfolio priorities and those responsible for staffing (recruiting and deployment) were established and are managed to ensure that clear instructions related to deployment of talent are received and executed in a timely manner.
- A process to develop capacity forecasts is updated on a quarterly basis. The process is managed by the Global Capability Team to anticipate vacancies well in advance and is coordinated with succession planning and efficient deployment management.
- EXP managers continuously scan the business ecosystem for technical capabilities. At the core of managing this (human resource based) dynamic capability is organizational agility in identifying, on-boarding and managing contractors, delegating through contractual relationships projects or parts of projects to services companies, and entering into joint ventures.
- The strategy, structure and operating priorities of the Capability Providers (Recruitment, Contracting, Learning & Development, and Deployment) are focused on meeting the requirements of the ventures. Organizational structures that create dialogue and contexts for negotiation are vital. Compromises that make HR processes more efficient and data-informed are being implemented and managed.
- A Global IT infrastructure that reaches with acceptable speed to the most remote locations in the world, and common software across regions enables cross-border collaboration on technical

⁴ Supermajor EXP also scheduled a global capability day, where for four hours the entire global organization (regional groups linked by teleconference and blogs) joined in an exercise that identified gaps, focused improvement efforts and elevated technical capability to the level of a strategic and cultural imperative. Data gathered at that event informed managerial oversight of capability improvement initiatives for months.

⁵ Twenty five years ago, the actual conversation between a team leader and his (and it usually was "his") direct report is today a standard joke throughout the industry, "Mark, we need you up in Alaska for a couple of years. You can pick up your check in Fairbanks on Friday."

innovations, the contributions of teams worldwide to particularly important projects, centralized quality control of top experts on well designs and increased dialogue between the center of the organization and its parts.

- EXP regional leaders developed and implemented “informal markets,” where, in regularly scheduled meetings, regional leaders or their delegates propose trades, in a manner similar to the general managers of baseball teams. If a particular region has an excess of volumetric experts, for example, but needs a stratigrapher, exchanges of talent can be arranged. Such negotiations are conducted with the knowledge and participation of HR. Like baseball players with “no-trade” clauses in their contracts, experts are encouraged and incentivized to make the move, but are free to refuse. Rules for derogations from established processes when triage is required to address a crisis, or to address a priority, can be established and managed by regional and national leaders and their designees.
- This dynamic capability also provides oversight of the company’s legal and fiduciary responsibility to provide for the safety, security and health of all employees deployed into other countries (expatriates), and particularly expatriates working in hostile environments or politically unstable countries [19]. Adding to managerial complexity are (1) the long list of possible negative events to manage, including terrorism, lawlessness, crime, political instability, natural disasters, infectious diseases, travel-related sickness, travel accidents, kidnapping and common travel problems (Claus [19] lists over 40 concerns); and (2) the fact that multinational companies must adhere to a myriad of laws, both supranational and country-specific, related to the care of employees [19].

4.3. *The ability of leaders to manage the centralized–decentralized polarity; to entrust managers in the ventures with managerial and operational decisions related to the specificities of the venture, while also protecting the need at the center of the organization for communication, cross-venture collaboration, HSSE, quality, efficiency and effectiveness*

Management of the centralized–decentralized polarity is essential for effective strategic management of upstream multinational E&P companies. Interests at headquarters (policies and procedures

related to quality, profitability, safety, compliance, etc.) often seem to conflict with the interests of the regions, where leaders and managers require flexibility and adaptability to achieve efficiencies given the specific geological, economic, legal and political exigencies they confront on a daily basis. Bringing the knowledge that resides in the regions, where the work is done, to the center of the organization, is crucial for making strong strategic decisions. Alternatively, some strategic decision-making must be decentralized. Many organizations experience these centralized–decentralized differences as “problems to solve.” We think that centralized–decentralized issues represent a polarity that must be managed dynamically, through strategic orchestration of a number of activities. Johnson [20] describes the polarity as a tension that is necessary for corporate systems to work efficiently. The conflicts between poles can never be solved, but must be well-managed to keep the organization from experiencing the downside of both: burdensome bureaucracy at the center and lack of accountability away from the center.

At MIT, Orlikowski and Hofman [21] developed a method for managing the centralized–decentralized polarity when organizations implement major IT transformations. The model has been tested and shown to be effective in a wide range of industries [22], including oil and gas. The model is based on jazz. Listen to a jazz combo and you hear a lot of improvising. The clarinet, trumpet, trombone, string bass and piano players each take turns displaying their virtuosity with improvisations that they often create on the spot, based on their expertise as professional musicians. It all sounds very decentralized. However, while the individual soloists do not decide beforehand what notes to play, they do operate as a unit based on common agreement. At the center of the group, they make prior agreements on what musical composition will form the basis for their performance, a common rhythmic structure, a common tempo, and a shared understanding of the genre. Once the performance begins, each player is free to explore and innovate, within the agreed upon “rules” previously established. This “management” of centralized and decentralized interests creates great music! This concept is not unrelated to the concept of “Virtuoso Teams” [23].

Managing the polarity requires establishing ground rules at the center, but anticipates a series of changes, unpredictable at the start, that evolve from practical experience with “local” realities. This model encourages leaders of multinational companies to start with an objective at the center, not necessarily a plan, and based on that objective,

allows decentralized entities to respond and adapt to conditions as they arise.

The dynamic capability that effectively manages centralized–decentralized polarity depends on four enabling factors [21]: (1) dedicated resources must be allocated and roles and responsibilities assigned to manage the polarity; (2) the culture of the organization must be adaptable; (3) decentralized input into all strategic technological, organizational, structural or business model innovations is essential; and (4) all innovations originating at the center of the organization, must be open-ended (i.e., locally adaptable by “end-users,” with features that can be customized for relevance and efficiency). Essential here is the ability to link and leverage local knowledge, strategic decisions and managerial processes that encourage and constrain the ability to adapt to relevance processes that are standardized at the center [24].

This improvisational dynamic capability was managed effectively by Supermajor EXP related to several projects that involved the centralized–decentralized polarity. Early in the process, the Global Capability Team conducted a workshop which determined the initiatives to be centralized and those that could be developed by the regions. For the decentralized initiatives, primary objectives were communicated and a set of guidelines and best practices shared, but the regions were free to develop and modify their processes on an ongoing basis.

- Supermajor EXP employed the improvisational dynamic capability to achieve regional alignment with the basic exploration process (ORP), an audited series of steps that had to be completed by explorers from the beginning to the end of the exploration process. In the past the process had been rigidly enforced, creating inefficiencies since some of the steps were irrelevant for some ventures. Application of the improvisational dynamic capability created a derogation procedure, which allowed each regional leader to bypass certain steps under certain conditions agreed upon at the center.
- The improvisational approach was also used to manage centralized–decentralized issues related to Team Leader (TL) development. The process for developing the TLs is now left up to regional leaders; due to the variety of settings in which TLs work (deep water; onshore, Unconventional, etc.), different proficiencies are required. The center’s objective however is clear – all TLs must have a specific development plan that tracks progress, and ongoing mentoring must be provided. In addition,

the center sponsors and coordinates learning opportunities and regional team leader workshops to discuss best practices.

5. Conclusion

To our knowledge, no treatment of dynamic capabilities in the strategy literature provides insight into how dynamic capabilities are actually selected and developed by firms. This case study endeavors to fill this gap by describing the process by which Supermajor EXP identified and developed 10 dynamic capabilities it considered essential for strategy execution. The case demonstrates that dynamic capabilities do not simply emerge or represent what firms do well; rather they are identified and built through the intentional effort of leaders and managers, who configure, orchestrate and sustain clusters of activity to gain and maintain competitive advantage in rapidly changing and highly complex business environments.

Over a one-year period, EXP introduced key organizational and business model innovations that helped them identify and begin to manage 10 dynamic capabilities vital to their strategy execution. The case demonstrates how the three characteristics of dynamic capabilities initially described in this article were present in the processes EXP used to identify, build and sustain their dynamic capabilities framework. First, their dynamic capabilities required managerial orchestration of clusters of ordinary capabilities, technical skills and best practices; these clusters of activity were essential for EXP to achieve its value creation objectives. Second, EXP's dynamic capabilities were identified and prioritized through strategic assessment, were built through dialogical, collaborative and iterative processes that were informed by learning, were sustained through the establishment of organizational

structures and leadership that provided systematic oversight and training, and were reinforced by executive leadership and culture. Third, EXP's dynamic capabilities were relevant throughout the strategy development and execution process (sensing, seizing and transforming).

Given current capability gaps and strategic imperatives, EXP prioritized three of their dynamic capabilities; we described these in detail: (1) accuracy of volume and risk predictions in investment proposals (the degree to which the subsurface reality is exposed when the well is drilled); (2) strategic deployment of talent into the ventures and projects with the highest economic value (right people, in the right seats, doing the right thing, with the right people, at the right time), and (3) effective management of the centralized–decentralized polarity. These capabilities have not been perfected but are being continuously improved through iterative processes informed by learning.

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