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**Executive Summary**

Since the first Eagle Ford discovery well in 2009 and subsequent development of that eighteen-thousand square mile shale play, the increasing density of field operations caused a need for companies to keep workplaces safe and maintain high production volumes by securing spatial awareness. In atypical industry behavior and in the name of vigilance, operators began making independent attempts at connecting with rival companies to exchange operational geographic information system (GIS) data so that drilling and completion events can be mapped and scheduled to avoid conflicts stemming from manmade and geological field conditions. As a GIS professional, I recognized that attaining spatial awareness in this way is a geospatial exercise; I also observed that this informal framework for communication and data exchange lacked the levels of participation, coordination and leadership necessary for companies to safely operate towards their mission statements. To raise awareness of these issues and gain consensus among Eagle Ford operators about taking action to improve these efforts, I drafted and successfully presented a persuasive speech to the South Texas Energy and Economic Roundtable ([STEER](http://steer.com/)), an entity comprised of delegates from the most active drillers within the Eagle Ford shale play promoting itself as a facilitator of communication between operators. After gaining consensus among all delegates present about taking action to improve inter-operator communication and data exchange, I formally appealed for STEER to intercede. This report provides backgrounds of the project’s goals and associated challenges, describes how I strived to accomplish my goals and looks forward to the future implications of the project.

**Introduction/Background**

The Eagle Ford Shale play has grown so dense with horizontal drilling activity since development began that to achieve spatial awareness and avoid field hazards, oil and gas operators began resisting industry culture by exchanging operational GIS data with competitors. Operators attempt to share information describing the locations of drilling (creating a wellbore within the Earth) and completions activities (stimulating the wellbore to produce hydrocarbons). The process of completions involves introducing extreme pressures into the wellbore against the surrounding rock to create artificial spaces through which hydrocarbons can pass back to the surface. These pressure extremes travel in all directions and can potentially crush production casings of nearby wells, ceasing their production. Operators ‘shut-in’ or stop the flow of gas from their wells to build-up enough pressure within the bores to resist any outside forces. Additionally, high pressures can remain in the subsurface after completion operations have ceased, and unknowingly drilling into a ‘pressured-up’ geological formation can result in rig blowouts, equipment damage, production/revenue losses, personal injury or death (Turcios, 2014).

After eight years of leasing, permitting and drilling in the Eagle Ford, operators have recognized the need for information defining where and when these hazards occur so they can shut-in wells or reschedule operations to mitigate disaster. Without central organization, operators began to independently take steps to achieve awareness by sending group emails addressed to known competitors in the Eagle Ford, disseminating their own geospatially-enabled drilling and completion schedules and urging others to exchange data. This is noteworthy in that eight years ago, the sharing or exchange of proprietary operational GIS data was rarely practiced outside of official joint ventures; prior to the Eagle Ford boom, inter-operator communication was discouraged, mainly based on wishes to protect the intellectual efforts on which companies build their successes, fears of industrial espionage through collusion, and the industry practice of poaching valuable human resources by competitors (Vornsand, 2014).

Despite these Industry taboos, this first round of sharing reminded players in the Eagle Ford it would be in their best interest to communicate and exchange data that can help manage a current model of field activities and plan safe, profitable operations while avoiding hazards. Some companies ostensibly agreed, beginning to exchange data while others did not. Overall, there were low levels of participation, with frustration at times expressed by those volunteering data which was not reciprocated.

STEER emerged with the intent of bringing together the largest and most active operators in the Eagle Ford to discuss and enact issues at the Director- or C-Level of detail. However since development of the Eagle Ford began, no individual or group had addressed the need for organization at the level of those who rely on communication and data-exchange to keep the geospatial models of their work environments at a state of readiness for immediate, prudent and safe decision-making . At this level exists a group of people designated by their parent operators as ‘scouts’, having a spectrum of expertise working with geographic data and tasked with engaging geospatial technologies, available third-party drilling and completions data, and industry contacts to achieve spatial awareness. Scouts began to disseminate their companies’ operational schedules and data without realizing at times the data often wound up in the wrong hands (Martens, 2014).

During this round of sharing there were also no apparent joint efforts to standardize the schema of exchanged tabular geographic datasets, to make scouts aware of the variety of spatial reference metadata associated with GIS files or to suggest the utility of a centralized mapping interface to integrate and visualize disparate datasets into a single model representing the Eagle Ford shale play.

Noticing that geospatial technologies are central to these communication and data-sharing efforts and understanding their utility in modeling work environments for improved decision-making, I wished to impart my perspective as an industry geospatial professional on Eagle Ford operators to make them aware of the relationships between the field environment, operational GIS data, and the disconnected and leaderless attempts by scouts to share information. To do this, I set a goal of writing and presenting a persuasive speech to STEER delegates to gain consensus among members that STEER’s involvement can provide much needed publicity, participation and leadership to these undertakings. I acknowledged my company’s (Lewis Energy Group, [LEG](http://www.lewisenergy.com/)) role as a primary stakeholder and set a second goal of securing the support of LEG leadership, especially legal counsel, which vetted the speech’s content and helped protect the company’s image. Two immediate challenges associated with these goals were satisfying the multitude of stakeholders associated with STEER and LEG and crafting a consensus-building speech. A third challenge will involve exercising persistence when following-up on any decisions STEER will make to take action.

**Methodology**

After outlining an approach to accomplish my goals I was fortunate that a series of serendipitous forces helped ensure that all stakeholders were receptive and that resistance to the project was minimal. For example, I had not even known STEER existed as a facilitating entity when initially discussing the project’s background with LEG leadership. They determined that the project’s goals were in-line with both LEG’s and STEER’s mission statement and immediately recommended I approach the roundtable to present the issues for discussion and consensus-building. This favorable and well-timed interaction with LEG stakeholders eliminated the need to independently solicit hundreds of Eagle Ford operators or search for an organization able to facilitate the types of inter-operator cooperation central to this project’s goals.

I secured buy-in from LEG easily, but drafting and executing the presentation was an unavoidable challenge. I presented a persuasive speech, book-ended by consensus-building exercises, which directly engaged the audience and achieved on-the-spot consensus from all STEER delegates at the presentation’s end. LEG’s STEER delegate, who sits on the Senior Stakeholders Committee, assigned me a speaking slot at the [4th Annual Eagle Ford Consortium Conference](http://www.eaglefordconsortium.org/) held in San Antonio, Texas on May 28, 2015, where I spoke to a small live audience and via videoconference to fourteen STEER delegates situated across the United States.

From the onset I informed the audience why they were in attendance by making known the problems to be discussed and declaring that the purpose of the speech was to gain their consensus for moving forward with STEER’s involvement. I asked the audience a “softball” question (*“Who agrees that all good things can made better with improved communication?”*) to gain initial consensus by having them all answer in the affirmative; this also demonstrated to the delegates that it is possible for rival operators to be in widespread agreement on an issue. I educated the audience on the background concepts giving rise to the initial round of sharing, emphasizing the geospatial and operational nature of the exchanges. Next, I described the independent attempts by operators to promote data exchange through ‘e-mail hotlines’ or group emails meant to encourage participation. I reminded the audience that while these actions were well-intentioned, without inter-operator coordination, the backing of an information campaign or central leadership that can be provided by entities like STEER, participation levels may remain static.

The presentation utilized a slide with a GIS- and oil and gas-related timeline to provide historical context. The slide displayed milestones upon which today’s successes are predicated and visualized the demographic makeup of today’s O&G workforce. I directed the audience’s attention to our industry’s present-day position on the cyclical O&G pricing and rig count curves, which are presently declining and settling into a trough. This visualization of the current state-of-the-industry demonstrated how the past six month’s oil and gas price declines caused a ‘downtime’, and reminded delegates that the ideal opportunities to plan improvements are when drilling and completions activities have slowed. Mirroring the rises and falls of the commodities and rig counts, an additional curve illustrated historical numbers of petroleum engineering (PE) degrees granted over time. The O&G industry employs comparable amounts of geologists, geophysicists and related geoscience professionals as they do petroleum engineers, so noting how and where the numbers of PE degrees granted rise and fall along the timeline indicates relative ages of those working a variety of O&G roles. Based on available data, we know the industry is staffed with professionals who are either approaching retirement age or who are in nascent stages of career development (Heinze, 2014). I presented the idea to the audience that the youthfulness of the current labor force works in the industry’s favor, since they were exposed to geospatial technology earlier than their predecessors, since their mentors have decades of experience and because the voluntary exchanges of GIS data key to this project’s success are no different than the their daily social media exchanges (Robinson, 2014).

I presented a short chronicle of events giving rise to the ubiquity of geospatial technology in our world and its burgeoning role in the O&G industry, and reminded the audience of the central geospatial nature of the data exchanges. I referenced STEER’s mission statement, which identifies the organization as the ‘*premier facilitator for communication*’ and ‘*liaison facilitating effective collaboration within the industry*’. I summarized the speech’s key themes and momentarily invited the delegates to reflect on them. All STEER delegates reached consensus after they responded “yes” when asked if STEER’s involvement can improve current communication and data sharing efforts. On behalf of industry scouts and operators attempting to maintain field safety and production, I formally appealed to STEER delegates and asked for their involvement.

**Discussion**

STEER delegates reached a consensus about committing their resources towards advancing the existing communication framework because I successfully convinced them that the interplay of historical actions, current industry conditions, human resources and STEER’s mission statement created a climate ideal for improving these exchanges. Though I achieved the project’s goal, STEER’s awareness of the project and their pledge to intercede does not instantaneously improve circumstances.

Improvements in communication and data exchange will require continued effort into the future and will be built on the intentions and principles of the pioneering scouts. The speech pleased STEER’s Vice President of External Affairs because it articulated issues discussed recently by other roundtable delegates. She proposed adjusting the message for Executive-level members of STEER and setting future dates for recurring presentations. Looking forward, not only should any geospatial professionals involved in the project’s development contribute their knowledge, skills and abilities towards the responsible use of technologies and exchange of GIS data by participants, but it is critical that they share their perspectives as they provide guidance and champion the development of project training and workflows. These future exercises will present opportunities to provide elements which were missing from the first round of sharing, such as standardization of data for integration, collaboration on issues of spatial reference metadata and generation of a dynamic operational and economical model of the Eagle Ford shale play. STEER needs only to look within its own membership to observe effective communication and data-sharing workflows that can be applied towards future project planning. For example, the GIS Team at LEG actively contributes towards field hazard avoidance through promotion of inter-departmental communication and data exchange via online GIS platforms.

Anticipated results include increased operator participation and safer, more efficient operations, translating to increased production, revenue and similar injections of cash into the South Texas economy. It is expected that as STEER’s involvement develops, reasons may emerge as to why the early attempts at exchange experienced low levels of participation. To get these results in other shale plays throughout world, perhaps before future upswings occur, the steps taken in this project can be reproduced to create awareness among O&G competitors about increasing safety and production levels and consensus about taking action to improve inter-operator communication and data exchange.

**Conclusions**

The most important aspect of this project was that it successfully demonstrated my ability to apply advanced knowledge and skills gained in the MGIS program towards a substantial contribution to my profession. To identify and solve a geospatially-related problem with so many stakeholders across a geographically wide region, I drew from lessons learned while enrolled in classes concerning project management, geospatial system analysis & design and responsible scholarship & and professional practice.

The O&G industry has always demonstrated advanced thinking with respect to the evolution and adoption of technologies that increase the efficiency of drilling and completions processes. With respect to the adoption of *geospatial* technologies and workflows that can help safeguard those processes as well as associated revenues, the industry is receptive but has not fully embraced them. STEER supported taking action, so any future objectives met may spark enthusiasm throughout the industry to further invest in geospatial resources.

Because human resources are an organization’s most important asset, it was appropriate to have the audience make connections between the demographics of today’s O&G labor pool, the anticipated future of the industry and the commonality of geospatial technology among the issues; it was also imperative to equate the concept of exchanging data to the everyday practice of exchanging social media. This understanding will help STEER capitalize on the youthfulness of today’s workforce when formulating and deploying any information campaigns or promoting communication and data-sharing behaviors.

Equally important is the satisfying of project stakeholders. The project’s straightforward execution benefitted from the industry’s need for such a project to emerge. The fortune of being connected with a receptive STEER audience and the timing of this project with respect to the industry downturn also caught operators at a time when they were more likely to reach consensus and be flexible with regard to inter-operator cooperation.

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