Illinois Exploration and Production

IT Strategic Assessment Report

4/25/2022

Revision History

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Table of Contents

1. Executive Summary

Illinois Exploration and Production is an oil production company out of Southern Illinois. Currently, IEP has little information technology systems to help with automation, analytics, or work in the field. This document covers IEP's organizational structure, generic strategy, and competitive position as well as identifies areas of improvement and gives recommended courses of action.

2. History and Purpose

2.1 History of Illinois Exploration and Production

This year Illinois Exploration and Production will be approaching 14 years in business. Started as an LLC by Craig and Chris Weber, IEP has been able to acquire leases throughout the Southern Illinois Basin with the majority being in Crawford County Illinois.

2.2 Purpose and Mission of Illinois Exploration and Production

Illinois Exploration and Production produces oil in the Southern Illinois Basin in the most efficient and cost effective manner while considering environmental impacts for its customers in the supply chain.

3. Management and Business Processes.

3.1 Porter's 5 Forces

1. Threat of New Entrants

Definition: The Threat of New Entrants is the level to which new investors could enter the market. Variables include costs, barriers to entry, and assets needed to get started.

The Oil and Gas sector has high demand but relatively few suppliers due to the high barriers of entry. High start-up costs mean that few companies attempt to enter the sector especially at a more local level which Illinois Exploration and Production operate at. Pumpjacks can run anywhere from $3,000 - $15,000 depending on size and age. Land is also currently valued very high which drives up the cost to lease land to drill and produce on. High operating costs also tend to steer away new investors as it requires employees or contractors to run and maintain the wells. Most of all, the restrictions, laws, and regulations set forth by local and state governments force companies to comply with many environmental regulations that can sometimes require extra financial responsibilities to comply and be in good standing. The most important has come in the last few years with a huge drive in big oil and the amount of money these companies are willing to lose to drive down the price. This in turn makes smaller operations not economically feasible to run. Illinois Exploration and

Production has a little threat of new entrants.

2. **Power of Suppliers**

Definition: The power that Suppliers have over the price of the goods or services they provide. Variables include supply of goods and number of substitutes available.

The suppliers in Oil and Gas tend to change prices based on the current prices of Oil and Gas in the market, which are very volatile. Typically, the higher the price per barrel the higher it will cost for services and goods and vice versa. Illinois Exploration and Production uses a chemical supplier that delivers chemicals once a month to put into pumpjacks, some require a pump that is on a timer and will fill chemicals into the pumpjack at regular intervals. This prevents the rods that go into the earth from cracking, breaking, or getting holes which can leak oil into the ground. This is a big issue not only for the profit loss, but also the infraction of environmental regulations that can occur causing fines. Contractors will come to supply the service of taking out the rods one by one, finding the source of the issue then reinserting back into the hole. The suppliers of this service can cost around $800 per pumpjack. Currently, Illinois Exploration and Production uses an accounting firm to handle all of the books and file the taxes at the end of the year. There are little options to choose from in the area that they currently work in. Due to the importance of the suppliers and few options to choose from, Illinois Exploration and Production has a high Power of Suppliers.

3. **Power of Customers**

   Definition: The power customers have to reduce the price or increase the quality of goods or services provided. Variables could include substitutes and supply or demand in the market.

   The price of Oil and Gas tend to move rapidly, this can be caused by many factors such as world events, supply in the market, new technological innovations, and more. The price of oil is mostly determined on benchmarks which include the Brent Blend, West Texas Intermediate, and Dubai / Oman, what price Customer's use is typically determined by where they are located. Smaller operations will have a single customer and this customer will use a benchmark price. Illinois Exploration and Production sells its barrels to Bi-Petro which is out of Springfield Illinois. Once a month or when a tank gets full a representative will come and test the quality of the oil before transporting it. This is where they demonstrate the power of the customer, if the quality has too much debris or contains too much water it is on Illinois Exploration and Production to get the quality of the oil to acceptable levels. Overall, Illinois Exploration and Production has a low Power of Customers.

4. **Threat of Competition**

   Definition: The Threat of Competition on the business and how they could possibly affect profits or ability to operate in the market.

The Illinois Basin which covers Southern Illinois, Western Kentucky, and Eastern Missouri has over 800 drilling and pumping permits in current rotation. In Robinson, Illinois, where Illinois Exploration and Production is located, there are multiple other oil companies. Due to the volatility of oil prices it is always a possibility that workers will need to be laid off in order for the business to survive. Workers will tend to flow towards the company that will offer the most stability or workers will leave the industry entirely. This is the only real threat that competitors have, as for production the customer doesn't set the price of the oil being sold and oil and gas firms are paid by how much they can produce in a given month. The Threat of Competition for Illinois Exploration and Production is low.

5. **Threat of Substitute Products**

Definition: The Threat of Substitute Products refers to any good a consumer can use as a substitute of the good being sold by a firm.

In recent years there has been a shift away from fossil fuels and a movement towards renewable energy resources. Electric vehicles (EV), including battery electric and plug-in hybrids, made up 7.2% of global car sales in the first half of 2021, up from 2.6% in 2019 and 4.3% in 2020 (Walton). This is up 80% from where it was 3 years ago. By 2025 the highest predictions have electric cars will take over roughly 25% of all car sales in the entire United States. Currently, in the United States renewable

energy takes up roughly 12.5% of all energy usage.(Hop) The current goal is to have this number to 30% by 2030 and 75% by 2060.(Hop) Hydro and Wind Power lead the way making up for the majority of renewable energy sources with solar following. Although renewable resources are on the rise according to the US Energy Information Administration oil production is expected to increase to 12 million barrels produced a day with 80% coming from the lower 48 states. This is because the sheer amount of products that require oil will keep the demand high for years to come. Some of these products include rubber, nail polish, and floor wax. Due to the years it will take for electric cars to develop and the market to slowly shift paired with the amount of other products that require oil Illinois Exploration and Production has a low Threat of Substitute Products.

3.2 Generic Strategy

Illinois Exploration and Production produces oil in the Southern Illinois Basin. Current Production includes 26 pumpjacks which are currently producing just over 2,000 barrels of oil a month. Illinois Exploration and Production sells its barrels to BI-Petro out of Springfield Illinois. The price at which barrels are sold is determined by West Texas Intermediate, they are the common price that companies in the United States will base their daily price off. Thus the goal for Illinois Exploration and Production is to produce the most amount of barrels possible while keeping the operating costs low. Illinois Exploration and Productions Generic Strategy is Cost Leadership.

3.3 Organizational Structure

Illinois Exploration and Production is owned by Craig and Chris Weber. They employ a secretary who handles all of the day to day managerial work. This includes collecting daily readings of oil production and sending these to an accountant who then files them. They also will collect all mail and write all checks to be signed and sent by Craig or Chris Weber. All accounting work is contracted out to Kemper CPA firm. They collect the amount of oil produced each day and all transactions to be able to file taxes at the end of each calendar year. All of the work on the pumpjacks has been contracted out, they will observe the daily oil intake and report to the secretary. These contractors are also responsible for if one of the wells were to shut down and maintenance is required. Illinois Exploration and production has a Functional Organization Structure.

3.4 Stakeholders

- Craig and Chris Weber
    - Owners of Illinois Exploration and Production
- Kemper CPA
    - Accounting firm who files taxes and records daily oil production logs
- Employees
    - Secretary who handles administrative tasks
- BI-Petro
    - Sole customer of Illinois Exploration and Production

- Contractors
    - Perform daily check ups on pump jacks and provide maintenance if necessary
- Environmental Agencies
    - Includes the Illinois Environmental Protection Agency (EPA). Monitor pump jacks and oil tanks for leaks or anything that could cause harm to the earth or wildlife.

3.5 Information Flow

At Illinois Exploration and Production contractors relay information about the different pump jacks up the chain to the secretary who then relays the information to the accounting firm and owners. From there the owners can then decide on what course of action to take and send it back down the chain. These decisions include fixing a pumpjack or shutting it off, what course of action to take to fix a pumpjack, or what changes need to be made to comply with the Illinois Environmental Protection Agency's requirements to comply with current regulations. Another information flow that owners use to decide course of action is from BI-Petro oil. From here action might be needed to filter out substances from the oil tank to achieve a high enough rating to be sold. In the case of this action, contactors will need to heat the tank to separate the oil from other substances. Another course of action taken off this information flow is whether or not to hire or let go of employees to keep the company afloat. Oil prices fluctuate often,

sometimes going from $100 a barrel to $15 a barrel. If a low price is sustained for a period of time Illinois Exploration and Production will need to use the data gathered from the sale of oil to make informed decisions about where to reduce costs. Illinois Exploration and Production has a model where data goes up the chain and information goes down the chain.

3.6 Major Projects

Major projects are undertaken when the price of oil is very high or very low. When the price of oil increases new acquisitions can occur or drilling can take place if a Geologist believes a plot of land could have a large oil concentration below it. Often this is done by using seismic surveys on land and in the ocean to find the right places to drill wells. A drilling operation can take months to undertake and several hundreds of thousands of dollars. It also is not a guarantee that there will be that much oil underneath the surface. It is a huge risk that could have a high reward. The safer bet is to buy existing pump jacks that have a good oil return yearly. These typically are wells that were drilled within the past 10 years and have consistently produced oil. Although these are expensive over time they should be a great return on investment. On the contrary, if the price of oil is low then projects might need to be undertaken to minimize costs. One of these is to shut down a well that is under performing and thus costing more money to run than to keep it going. The cost to shutdown a pumpjack is also very expensive as certain measures must be done to prevent oil from leaking into the earth. It also is hard to get them up and running again as now you must undo all of the measures just done to plug the well. Often it is best

to wait out for as long as possible so oil prices can go back and thus return a profit again on said pumpjack. Another option that must be made is whether or not to lay off employees as this is typically the highest expense in any company.

3.7 Current Labor Characteristics

- Owners
    - Craig and Chris Weber
        - Have last say in all decisions, in charge of managing the finances and payables. Make all HR related decisions.
- Employees
    - Secretary
        - Works part time and handles all administrative work. Writes up checks and coordinates with accounting firm
- Contractors
    - Kemper CPA
        - Does all daily logging and filing. Completes and files the taxes at the end of the year.
    - Full time contractors
        - Work on all of the leases and provide maintenance if necessary
    - Part time contractors
        - Only work on some of the leases depending on variables such as

location and if extra hands are needed at one of the main leases.

3.8 IT Topology

The current IT topology at Illinois Exploration and Production can be broken down into 2 parts. Physical and Logical, physical describes the way that all of the different nodes are connected within the business of the company. The logic describes how data and information flow between the nodes in a business topology. For physical at Illinois Exploration and Production all of the different nodes are all connected through the local wifi within the building. This would be a Star Topology, which is where all nodes are connected to each other either through wires or local wifi/bluetooth that route through the local area network. As for logic, all of the different nodes can send data to each other seamlessly. The company has no backup or backup plans if something were to fail.

Advantages of this topology include: (Leming)

- Centralized Control
- Less Expensive
- Easy to Troubleshoot
- Good Fault Tolerance
- Easy to scale
- If node fails other nodes won't be affected
- Easy to reconfigure

Disadvantages to this topology include:(Leming)

- If the central device fails they all fail

- The number of devices in the network is limited

4. Current IT Environment

4.1 Hardware

1 Laptop

1 Monitor

Keyboard

Printer

WI-FI router

4.2 Software

Microsoft Suite

Formerly used Wolfpack

4.3 Staff IT Skills/Training

None

4.4 IT Budgeting and Spending

Dependant on needs of employees

Willing to spend money to improve the value of the company

5. Envisioned IT Capabilities

5.1 Leadership's Vision

The current leadership vision revolves around how we can produce the most amount of barrels for the least amount of cost. With the current fluctuations with oil prices leadership is either hoping to reduce costs thus making a better ROI than before or to sell off the leases either keeping only the ones that produce good quantities or to sell the whole operation at an uptick. Currently, they are hoping to find a IT solution that can help with operations of the business run smoother allowing them to focus on more tasks outside of Illinois Exploration and Production or to provide value that will increase the price upon selling out.

5.2 Top 10 Technology Issues

1. **Lack of training within the staff**

   Currently most of the contactors are older and are hesitant to upgrade technology. This includes upgrading phones, trackers, etc. There has little training in the past when a new system was introduced thus most employees refused to adapt

2. **Lack of Data collection System**

   Currently data collection is done manually by having a contractor or employee go out to each tank and measure the amount of change at the start of the day and at the end of the day. From here they report the numbers to the secretary who then will send it off to the

accountant.

3. **Lack of Back-up and storage abilities**

   Currently if a system were to be put into place there would be no way to backup any data collected as there are no cloud or on prem options available

4. **Lack of Long term analytical abilities**

   A lot of decisions that are made are based on “experience” and made without using any data or facts. This can cause wells to be shut down or repairs to be made that are out of budget.

5. **No automation for any activities**

   As it stands today no activities are automated. Not even bills are paid online through automation. If activities were automated then time could be saved and used elsewhere.

6. **No Information Security measures**

   If more systems were to be put into place firewalls are going to need to be installed on all systems. When devices are out in the field they often will get stolen so physical measures will need to be in place as well.

7. **Need for cloud services**

   Currently, IEP uses Microsoft suite that is not hooked up to one drive. IEP needs to set up

One Drive so that these files are not lost if something were to happen.

8. **Tech used in the past was too expensive**

   In the past IEP used WolfPack for a lot of automation with tank recording and filing. Today there are many services that can be paired together that are cheaper in cost.

9. **Outdated Equipment**

   The laptop and printer are older and because none of the files are backed up it hurts with the acquisition of newer equipment.

10. **Lack of Physical Security for hardware**

    As stated before, a lot of the time when advanced systems have been implemented (or anything of value) it tends to get stolen or damaged in the field. Physical security measures will need to be instituted to prevent this from happening.

6. Closing the Gap

6.1 Recommendation 1

Set up One Drive for cloud backup purposes. Currently, IEP uses Microsoft suite of products for document drafting, spreadsheet work, etc. All of the old files and templates are saved on the secretary's laptop. If it were to crash all of these old files would be lost.

One Drive is a free cloud backup service provided by Microsoft and is easy to set up, from here the owners would be able to view lease updates and sign documents without having to actually go into the office saving time. One Drive is also highly scalable if IEP were to need more space. The version that comes with Microsoft 365 is free then can be scaled up if needed to the enterprise version for $38 a month. This is a great low cost solution to solve IEP's backup problem.

6.2 Recommendation 2

Implement a low cost ERP (Enterprise Resource Planning) solution. In the past IEP used WolfePac, a cloud ERP solution but discontinued it because the cost did not justify the solution it provided. My recommendation would be to use ScoutFDC, ScoutFDC's pricing model is a pay-what-you-use. This is a better option because in the past WolfePac cost $1,700 per license per month but offered a bunch of features that were never used, ScoutFDC is $300 per feature per month. I would recommend IEP get the mobile data capture feature, which allows operators in the field to capture production levels daily and upload them to the cloud seamlessly. Tracking can be done online or offline and when the user has a connection the data is backed up seamlessly. The current system is for operators to write down oil production by hand, call the secretary at the office who then writes them in a spreadsheet, then relays the information to Kemper CPA who logs the daily production levels. The current bill from Kemper CPA is $1000 a month for this service. If IEP were to switch to ScoutFDC this would cost $300 per month saving $700 monthly, allowing for a more accurate data tracking, and a cloud backup option so data is

not lost. ScoutFDC allows for the data to be printed out in a report which can be sent to Kemper CPA for the annual tax filing.

6.3 Recommendation 3

Currently, all decisions in the field are made from a “gut” decision. This means when a well needs to be shut-off or more chemicals added for example the person in the field makes a decision based on their experience. I propose adding a business intelligence software that can take the data from ScoutFDC for production and inventory uses and create a dashboard with live data so that quantitative decisions can be made instead of relying on “gut” decisions. My software of choice is PowerBI, I chose PowerBI due to its ability to create a wide array of ‘widgets’ that are completely customizable to the information that provides the most value to the user. PowerBI can also be backed up on OneDrive, Microsoft's cloud solution that was already recommended in Recommendation 1. Additionally, data can be passed from ScoutFDC through a data gateway allowing for data to be turned into information seamlessly. This can be set on a refresh timer that could add the new data daily. ScoutFDC actually comes with its own analytics tool that can take the data inputted into its system and spit out a report for you. Although it's a great feature, the price would be an additional $300 per month vs. PowerBI Pro is only $9.99 per month and includes more customization and features. ScoutFDC also allows exporting data from its software for free making the pipeline from ScoutFDC to PowerBI smooth and automated. PowerBI would give information on each well and how they are performing, it would also allow for chemical and inventory to be tracked and studied.

This information can tell how much money needs to be put in, in order to achieve the highest efficiency possible at the lowest cost possible. For example; Using PowerBI's web scraping tool to get the real time price for oil, then comparing this to current production levels against the costs accrued for the month to date. Now Illinois Exploration and Production can make an informed decision on whether they can expand operations or need to make cuts in order to profit that month. This is just one of the many insights this great tool can provide.

6.4 Recommendation 4

Conduct a training session to train employees and contractors on the new systems in place and how to adequately use the new software being brought into use. One of the downfalls of WolfePac was the lack of training that employees had on the system. Some of the factors in the Technology Acceptance Model that are causing friction in the use of technology are Effort Expectancy, Age, and Experience. Most of the workers for Illinois Exploration and Production have been working in the field for a long time. The amount of effort perceived to use the new system and the experience of using the same process from the entirety of their careers has caused changes to be accepted. If adequate training is implemented for the new software and processes then it can show how this will positively affect the business. Also this can be a time for the Owners of Illinois Exploration and Production to set controls for required actions that haven't always been followed in the past from contractors and employees. By setting specific work behavior that is expected from each employee, the system will be used in a proper manner saving

Illinois Exploration and Production time and money.

6.5 Recommendation 5

Lastly, I would recommend that Illinois Exploration and Production implement some physical security measures to keep their office and technology safe. First I would install a ring doorbell at the office that can notify you if someone were to be trying to break in and allows you to see the live video of the suspect. These cost $99.99 for the newest version and have had great reviews. I would also recommend that all IT in the office have passwords. This is a very simple but super effective way to keep all of your information secure. This includes all laptops, phones, OneDrive backup, and even printers. It is always in the best interest to have a password on everything possible. My last suggestion would be to include padlocks or combination locks at all wells that have electrical boxes or engine rooms. Not only does this prevent humans from attempting to sabotage but animals as well there has been many reported incidents where animals have managed to shutdown operations or worse.

7. Conclusions

Illinois Exploration and Production has solidified themselves in the Illinois Basin as one of the top producers for oil in the region. They have managed to survive the turmoil and ups and downs over the years through great leadership and direction. This report serves as an assessment regarding Illinois Exploration and Production's Strategic IT positioning currently and gives recommendations tailored specifically to help cut costs, increase efficiency, and stay competitive in this ever changing market. Illinois Exploration and Production has expanded and retracted due to changes, these recommendations are all scaleable to the current position and future positions to whatever they might be. In an organization that operates in this field all costs matter, these recommendations all include features that allow them to pay for themselves in savings or are little to no cost. I personally hope you find this report to be useful in aligning your IT direction for the future.

8. Appendices

8.1 Basis of Analysis

CIA Triad

Recommendations 1 and 6 focus on keeping the IT architecture of Illinois Exploration and Production Secure and safe. The CIA Triad of Information has 3 parts: Confidentiality, Integrity, and Availability. All organizations need to plan to prevent

Destruction, Alteration, and Disclosure with the addition of OneDrive this will keep the information at IEP Available and will uphold Integrity in the case of a loss.(Cash) The Ring Doorbell and other physical security measures will uphold the confidentiality of the data that IEP maintains from being stolen.

ERP

An addition of an Enterprise Resource Planning (ERP) system will come with many benefits. ScoutFDC has all of the features that IEP could need, with the added benefit to scale up or down if needed. Early on I would recommend only using one feature and purchasing more later on if seen fit. This ERP would simplify data transfer for the business while lowering costs.

Characteristics of Information

In recommendation 3 I suggest the use of a business intelligence tool to help IEP with the ability to make quantitative decisions. “Decisions made with no information is just a guess”.(Cash) Information must be complete, accurate, relevant, and timely. Without these 4 pillars data cannot be made into information.(Fried) The tool I chose, PowerBI, has all of the necessary capabilities to fulfill these needs.

Control Systems

In recommendation 4, I state the need for setting specific work behavior and controls for employees. Cash states that controls are needed “To increase the probability that people

are going to do what they are supposed to do to generate a good outcome". (Cash) The three aspects of Controls are people, actions, and the results that follow. By setting the criteria with precise numbers this will remove the variance of the outcomes seen.

Tech Acceptance model

In recommendation 4 I mention the Technology Acceptance Model, this model demonstrates how employees use systems and the causes for the interaction between the two to fail. Most notably Effort, Expectancy, Age, and Experience are the major friction points that could cause the addition of these new systems to fail.(Cash) Proper training needs to be done in order for the employees to see the major benefits of these systems and how they help IEP as a whole. IT assemulation is better when employees see the tech as a reward vs. a punishment.

8.2 Technology Inventory with Recommendations

Hardware

In addition to the current hardware referenced in section 4, some changes will be adding a Ring Doorbell for physical security measures. This will allow for security monitoring of the premise and recording if necessary. An IPad will need to be purchased for employees who do not have a smart device to download the ScoutFDC application. This number could increase depending on the employer's tolerance to BYOD (Bring Your Own Device) and allowing employees to have access to this data. If needed, IPad's will need to

be purchased for the employees or contractors.

Software

In addition to the current software referenced in section 4, OneDrive will need to be set up and installed, this will allow for the backup of Microsoft suite products. ScoutFDC will need to be purchased and downloaded, this will allow for data collection in the field. PowerBI will also need to be installed and set up for Business Intelligence. The app for Ring Doorbell is on the app store and can be easily downloaded. This is how users interact with the device from anywhere.

Staff IT Skills and Training

The contractors and employees will need to receive training on the new software that are being implemented. This will need to be done by someone who is qualified and knowledgeable using the technology to conduct demonstrations and be on standby if questions ever were to arise.

IT Budgeting and Spending

Below is a list of the recommended additions and the costs for each product.

- ScoutFDC: $300 Per Month
- PowerBI Pro: $9.99 Per Month
- OneDrive: Free (Included in Microsoft Suite)
- Ring Doorbell: $99.99
- Ring Doorbell App: Free
- IPad: $329+ Per Device

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