**SPE 112253**

# Real-Time Access to Expertise: Improving Decision Making and Collaboration through Unified Communications

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## Abstract

The days of easy oil have gone. It is harder and harder to replace world oil reserves, requiring all the skills possible to find and extract hydrocarbons. Now, more than ever, decision making is critical to the success of exploration and production. And decisions made by experienced people who understand the complexities of each situation, colored by their years of activity and exposure to global conditions are the best suited for making those decisions. The expertise that they bring, coupled with a nuanced view of their current environment allows them to make better decisions, bringing reserves online faster with less cost, and improves ultimate field efficiency.

But the people with the best skills and experience, the ones that can best make those decisions at the point of activity are becoming scarce. Additionally, an expertise gap exists between the experienced workers who are getting ready to retire and new workers the industry has hired. This gap, plus shortages of rigs and crews to support the rigs are requiring new ways to staff them, a way to "virtualize" the expertise by placing them in centralized operations centers and have them support multiple physical operations.

So this brings us to the overarching question: "How do we connect the experts to the problem, provide them with complete awareness of the remote environment, and let them collaborate and share information in real-time with those who need that expertise?"

The answer to this lies in the ability to create a platform of connectivity that enables you to bring the problem to the expert, provides a complete picture of the context of the situation, and ensures seamless collaboration between participants regardless of their location. We call this platform, Unified Communication…the ability to transform the collaboration experience and provide real-time access to expertise.

This paper will explore that capability and provide examples of how exploration and production companies are leveraging convergence in communications to allow data voice and video collaboration between experts and explore the value that it brings. Specifically:

- **Improving ad-hoc interaction** by identifying expertise in real-time, connecting with them in the context of the operational workflow
- **Extending transactions to interactions** to allow transformation of workflows that have person-to-person collaboration inherent to their performance
- **Introducing real-time decision making** and new business models by leveraging this new platform of communication and collaboration

This paper will include various case examples of where exploration and production companies are creating these experiences, as well as examples from other relevant industries.

## The Drivers: Improving Recovery Rates and Reserve Replacement

The days of easy oil have gone. It is harder and harder to replace world oil reserves, requiring all the skills possible to find and extract hydrocarbons. Now, more than ever, decision making is critical to the success of exploration and production. And decisions made by experienced people who understand the complexities of each situation, colored by their years of activity and exposure to global conditions are the best suited for making those decisions. The expertise that they bring, coupled with a nuanced view of their current environment allows them to make better decisions, bringing reserves online faster with less cost, and improves ultimate field recovery.

### The Complications: Putting Knowledge at the Point-of-Activity

But the people with the best skills and experience, the ones that can best make those decisions at the point of activity are becoming scarce. Years of cost cutting and layoffs, and a lack of "refilling the pipeline" has created a graying workforce eying retirement. While this is something the industry has been aware of and addressing for a number of years, and evidence shows that there is now a "youth bubble" moving into the industry by 2010 (see Fig below[1]), there is a knock on problem.

An expertise gap exists between the experienced workers and new workers the industry has hired. The new teams haven't been on board long enough to gain the insight required for nuanced decision making. So the challenge is determine and deploy the best way to transfer the knowledge from the older workers to the younger workers—in the context of performing their workflows.

This skills gap, plus shortages of rigs and crews to support the rigs are requiring new ways to staff them a way to "virtualize" the expertise by placing them in centralized operations centers and have them support multiple physical operations. This skills virtualization is being driven by safety and security concerns. One way to reduce the risk associated with operation is by reducing personnel on board. By letting centralized workers virtually work in multiple platforms and rigs, fewer staff are required at the well head. Fewer workers will mean less exposure during incidents.

A further complication is that even when you have the expertise in your organizations, contacting the right person is often difficult. Asset managers or field engineers may be away from their offices. Scientists may have many different devices for communication (a 2005 study by Sage Research found an average of 6.3 devices per person). This communications complexity means that decision making is impacted.

### The Challenge: Visibility and Context for Real-time Decision Making

So this brings us to the overarching question: "How do we connect the qualified experts to workers at the point of activity, provide them with complete the visibility to the problem and the interaction capability to address the problem in real-time regardless of location?"

### The Answer: Advanced Collaboration through Unified Communications

The answer to this lies in the ability to create a platform of connectivity that enables you to bring the problem to the expert, provide a complete picture of the context of the situation, and ensure seamless collaboration between participants regardless of their location. We call this platform, Unified Communication…the ability to transform the collaboration experience and provide real-time access to expertise.

### What is Unified Communications?

People communicate today in many different ways. Consider your own experience. In any given day, you might be on a desk phone, a wireless phone, a mobile phone, a radio, e-mail, voicemail, video conference, or instant messaging. Sometimes you are on multiple modes at the same time. And all of these operate independently. If someone wants to contact you, they have to guess which mode would be the best way. Communications research shows that 27 percent of projects are temporarily halted[2] because co-workers cannot reach the person to get information or decisions. This work stoppage is a by-product of the complexity that teams face when making decisions. Unified communications is about integrating all of these forms of communication into a common platform, and simplifying communications.

**Unifying the channels of communication**
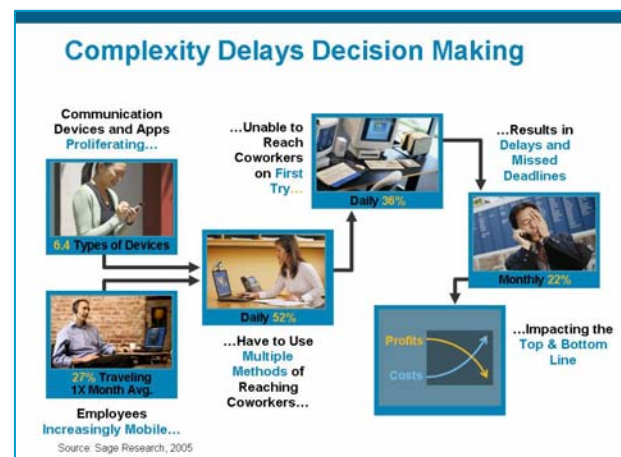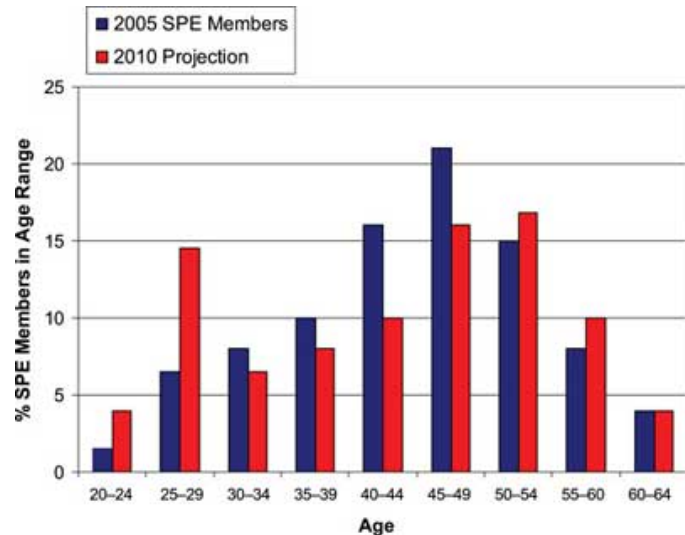
Simply put, unified communications is the unification of the different ways people use to interact; data, voice, and video over any device, anywhere.  Whatever you are using to communicate will work seamlessly with all the other forms of communication.  Your PC can behave like a phone, your phone can behave like a PC, and they both can record and play video, wherever you are.  And more importantly, all of these devices and styles of communication know about each other and work together seamlessly to create simple collaboration for context-rich interaction.  A comprehensive platform will unify

- **Data** communications such as email, instant messaging, and other computer based collaboration tools like virtual meetings and application sharing
- **Voice** communications such as your desk-phone, mobile phone, radio, voicemail, and even your home phone
- **Video** communications such as video conferencing, video telephony, "web-cams", and high-def Telepresence

All of these forms of communication become "aware" of each other and can interact.  You can use your data device (PC or PDA) as a voice device by running a "soft phone" client with a handset or headset.  You can run data applications on your desk or mobile phone to receive news, status, or do simple data entry without a PC.  Your voice call and application sharing are part of the same "call" and can interact between each other.  Video is streamed from and to your PC and phone, enabling rich interactions.

This unification is not about how the communication is transported, it is about how you use these services.  You no longer have to change devices if you want to do a different style of communication.  If you are working on your PC, say doing email, and you want to respond with a phone call, you don't have to stop what you are doing and dial the number on a phone.  Instead, you can "click to dial" and use the PC.  Or click to dial and have it ring your desk phone if you prefer.  Because it is all unified, transferring communication among the devices is transparent and seamless.

With your phone and your PC/PDA operating as a single unified device, adding intelligence to communication becomes possible.

**Adding intelligence to communication**

Once you have a unified platform for communication, adding intelligence to understand "context" and change the way communication takes place is possible.  The figure to the right describes the "intelligence" that makes unified communications different from traditional communications. Let's explore what this means for the oil and gas industry.

*Virtualization:*

The first element is to ensure that you "virtualize" services, and make them available on any device, at any time, anywhere. So your contact information and phone lists are not segregated by device.  If you have a speed-dial phone number on your PC, it is available on your mobile or desk phone as a quick dial. Your voicemail is available on your PC or your phone, wherever you need it.  If a service or feature is available as part of the platform, then it can be used anywhere, tailored to a specific environment.  You are no longer tied to a specific device or medium to get your information or to interact.



*What it means for Oil and Gas:*

- When an inspection engineer is on rounds, he has access to the same toll-plans and dial assistance as he does at his desk.  If he has speed dials or common phone numbers at his desk or on his mobile, they are available in both places.  This simplifies his experience and connects him to peers more quickly.
- Collaboration sessions between field and central personnel can be conducted where different participants have different devices and capabilities, (e.g. one participant on a mobile, one on a traditional phone, one on their PC Phone client) without a degradation of service. Field workers can be voice only, reservoir engineers can share data and email snapshots to the remote workers, and those with video can view either video streams from the field or video conferencing.  The interaction services are all virtualized and available to all participants based on their device capabilities rather than their location.

*Mobility:*

Mobility is the unifying of wired and wireless worlds and treating them as a single platform.  With unified communication and a wireless handset, you can have two phones that act as your "desktop" or wired phone.  Everything that is available on the desk phone is available on the wireless, anywhere in the field / asset.  This includes any presence

information and policy information set up (see below).  The call transmits over the same low-cost corporate LAN or Wireless LAN and gives effectively free mobile calls whilst on site.

This can extend into the Mobile (GSM/CDMA) phone space as well, with a single phone number ringing both the wired, wireless, and mobile phones simultaneously.  Nokia today offers a dual mode phone that will use a corporate WiFi network when in the office, and a GSM network outside the office.

The goal is the choice of phones doesn't dictate which services a user can consume, and multiple phones shouldn't complicate how someone is "seen" on the network.  Wired or wireless, you are available or not.  The intelligence is in the network.

*What it means for Oil and Gas:*

- If a maintenance or production supervisor receives a call on their desk phone, but then need to go and check some equipment, then can seamlessly transfer the call to the mobile phone and leave the office to check the equipment.  If they are on site when the call starts and walk back to the maintenance office, they can pick up the desk phone and continue the call.  They can use
- A mobile field worker can look at the presence information on their mobile wireless phone to find out which of their colleagues are currently available and place a call directly to them.  This avoids the need to leave a message or wait to get information needed to make a decision

*Speech:*

There are times when the ability to control your device by speech or to use text-to-speech/speech-to-text capabilities is important.  Mobile phones have had "voice activated dialing" for many years, but these have not translated into corporate phone systems.  Embedding the capability into the platform, available for any device to leverage means that more communication can take place "hands free" and make it easier for field personnel to operate.

*What it means for Oil and Gas:*

- A field service engineer can have his email read to him as he travels from well site to well site by using text-to-voice reading.  By leveraging this travel "down-time", he will have less time back at the field office at the end of the day to complete his work.  He can also reply to an email with a voicemail, all controlled without stopping to push buttons on his phone.
- An inspection engineer can use voice dialing to contact either the maintenance supervisor or a colleague to discuss the equipment without having to take off gloves or remember the phone number by using voice dialing

*Presence*:

Presence is the intelligence to know the current state of anyone on the communications platform.  The network will understand who is available and what devices they are available on.  The most common example of this is the "buddy list" in instant messaging applications. With one quick look you can tell if the person is connected, and whether they are in a meeting or otherwise engaged.  When you extend this concept across all forms of communication, it means you can quickly pick the right person to get a hold, the right medium to use and be assured of getting them the first time.  This reduces the time it takes to get the information needed for decision making.



By putting the presence intelligence in the network, it becomes available to any device or application that wants to leverage it.  So communication tools such as email and productivity applications such as MRO or Proxima can take advantage of presence.  Even your exploration applications supporting team-based workflow, such as reservoir modeling or simulation can embed the ability to quickly contact a person into the application, improving the team work aspect of the workflow.

*What it means for Oil and Gas:*

- A reservoir modeler can quickly review the people on the reservoir team to find out what means of communication is best suited for them at that time, easily selecting the person and medium appropriate for their interaction.  When the person isn't available, you can either select a different person, or elect to leave the person a message…and the message can be voice mail or email, depending on the preferences of the recipient.  This means it takes much less time to collaborate during a workflow.
- A field engineer can take himself "offline" when performing a field task to eliminate unwanted interruptions.  When finished, they can go back "online" and pick up their messages, either read them or listen to them, regardless of how they were created.

*Policy:*

Policy intelligence is about defining the desired behavior of communications. Communications is highly diverse and independent process. What works well for one person, doesn't for others. So why do virtually all traditional communications systems work the same for everybody? It comes down to a lack of intelligence around policy.

To start with, policy is about defining a profile with preferences. Who are you, and how do you like to communicate? Are you a voice mail person or email person? Do you answer your mobile phone during meetings or would you prefer it to roll into voicemail or show you as unavailable? What about for your boss or partner, would you take their call during a meeting? Do you want a specific message reply back to certain people when you don't answer the phone? These are the type of preferences that you can set up that change the behavior of the unified communication platform.

These preferences then need to be enforced with a common policy across all communications devices. This means that you get the experience that works for you, not a generic experience that doesn't do it the way you like. The only way that can happen is when the intelligence about preferences and policy are embedded in the network. This ensures that every communication request is filtered based on how the recipient wants to get that communication, regardless of the source of the request.

*What it means for Oil and Gas:*

- A geologist is getting set to do some seismic interpretation and doesn't want to be disturbed, but is expecting a call from his boss. The geologist sets a policy that says "only let these 'VIP' people get through directly…show unavailable to everyone else." This allows them to focus on their task without unnecessary interruptions, while still allowing critical communications.

*Video*

"A picture is worth a 1000 words" is a commonly held belief, which is naturally extended to "A video is worth a 1000 pictures". Communicating by words (voice) or pictures (data) does not deliver the full context of the situation nearly as well as through video. Communications expert research[3] show that words and voice account for only 45% of how people listen and receive communication. That means that 55% of the message is lost if you cannot see the person delivering the message. Video is the mechanism to close the gap and improve communications by delivering full visibility to the interaction.

However, video is historically very difficult to integrate into communications. Video conferencing is typically limited to dedicated "advanced collaboration" rooms with finicky controls while video telephony seemed like science fiction decades after it was first discussed in business. Unified communication, with the built in intelligence to handle video traffic eliminates these barriers. Finally, organizations can build the capacity to deliver video one time, and have it apply to all communications regardless of place, time, or device.

Putting video intelligence into the network enables the complete range of video options, from high-end "virtual presence" Telepresence systems, through other room based and legacy video conferencing, down to desktop video telephony. Each of these become just another endpoint, and video becomes just another communication stream that is deployed and managed efficiently and centrally in a secure environment.

*What it means for Oil and Gas:*

- A geologist in the field can fully participate in and advanced collaboration conference from their standard IP phone using a simple "web-cam". They can view the video feed from the rooms' video conference system on their PC, share any application such as well logs or reservoir modeling in real time with the team.
- A field team, acting without local medical team through staff scheduling, can use a hand-held video streaming device with voice to discuss a medical situation on board a platform or rig to determine the best way to respond.

**Integrating Unified Communication into the way we work**

Using the network as a platform for unified communications, with the intelligence embedded in the network and available for every communication, offers Oil and Gas companies many opportunities to change the way that they work. This transformation can be classified in three ways:

**Ad-hoc communications** – Improving the way people interact in normal day-to-day basis

**Automating interactions** – Including communications into process automation to extend from basic transaction processing into rich interactions

**Real-time decision making** – Connecting people with data in the context of making decisions in real-time or "right time"

These three categories of transformation are central to how exploration and production companies can receive value from unified communications.
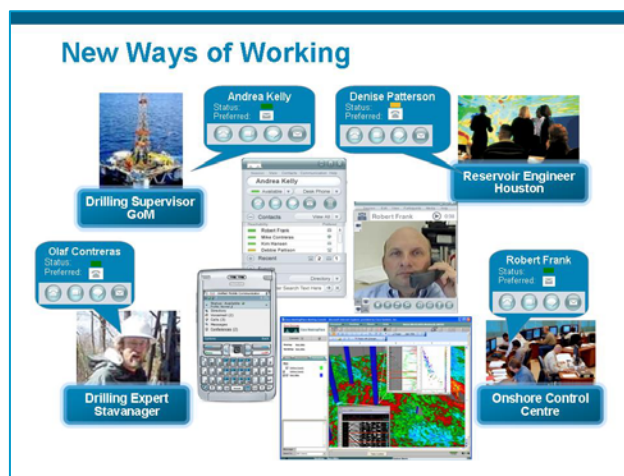
## What is the Value of Unified Communications in Exploration and Production?

**Ad-hoc communication**

Work is getting more collaborative. You can no longer sit at a desk or work individually in the field to get your job done. Every day, you make unscheduled phone calls, send email or text messages, instant message or have meetings with colleagues as part of doing our jobs. You have to reach out to get information, decisions, or participate in workflows, and all of these are done with independent tools. Your mobile phone, your desk phone, your PC, your Fax, physical and virtual meetings are typically all separate tools, that don't share information or functionality. When you are on a phone call and want to share your presentation or other application, that's a separate tool. You have to stop the call, interrupt the flow and work out how to begin sharing with a different tool. Once the sharing begins you have to pick up the flow of creativity again. This productivity loss slows decision making.

In unified communication, all of these tools become integrated. If you are on a phone call and want to share data from an application, it is a natural act that doesn't disrupt the flow of the conversation. It's as simple as "hey, look at this well-log" and a couple of clicks and everyone on the call is now viewing the data. Adding people to the call is simple as well, achieved with a search-click or drag-and-drop of a name into the call and they are viewing the same data. If a person wants to share video stream (e.g. "here's what the mud is looking like now") they can bring a camera feed into the phone call and all participants can view the picture. It is this simple because the camera is just another endpoint to unified communications.

Ad hoc communications is a natural part of our daily jobs. Unified communications makes all forms of communications seamlessly interact, leveraging the intelligence of presence, mobility, policy, and video to remove the friction in real-time interactions.

*Example*

Petrobel (an Egyptian drilling operator for ENI), had a common business challenge. They were working on a field previously abandoned due to pressure and temperature complications. New technology was allowing them to re-enter the field and reassess the economic viability of getting to the reservoir. During this complex drilling with new technology, the drilling supervisor needed to communicate with the experts in Italy frequently. However, communications on the rig were limited to radio when they left the office block. To speak with the experts, the drilling had to be paused while the supervisor went to the office block to call, and then resumed when the supervisor got back to the drilling floor.



By extending the unified communications solution with Zone 1 EX-Certified wireless mobility to the doghouse, Petrobel's drilling supervisor was able to avoid work stoppage and improve their decision making. In addition, they could use video collaboration from the office block using the UC video telephony. All over the existing VSAT link used to get communications back to shore. In the future, if they could secure an EX certified PC, they could actually extend video and data collaboration down to the drilling floor. For Petrobel, unified communication could mean a $9,000,000 annual savings in operating costs, enable faster well completions, and improve access to decision makers in real-time.

**Moving from Transactions to Interactions**

Today, many business processes have been automated to remove inefficiencies. This is usually done by mapping out the process, applying workflow technology to automate data capture and route the information to improve control and visibility. Maintenance and Repair Operations (MRO) is a common example from the Oil and Gas industry. Taking the maintenance work-order through purchasing and repair automates the flow of forms and data and improves efficiency.

But even this highly automated process has gaps, where the next step of the process mapping calls for person-to-person or team interaction. For example, the process may call someone in scheduling to find out if an engineer is available, or an engineer may need to call the manufacturer for support on a part installation. The system provides the visibility to see that the PO is at a certain approval stage, but you may have to call the person to find out why they haven't approved it. These types of "soft" interaction are traditionally very difficult to automate.

This limitation is removed with unified communication. When the intelligence to quickly connect people, capture that the contact took place, and capture any value or decisions made during the contact is brought to bear, it releases a whole new wave of productivity in automation. This is called transforming a transaction into an interaction, where the transaction is surrounded by the context of the situation to improve and speed decision making in transactional processes.

**Real-time Decision Making**

The heart of the challenge for reducing time-to-first-production or to improve recovery rates is enabling real-time decision making. To connect the people making the decisions together with the data that they need to base those decisions on will improve efficiencies and speed the exploration and production processes. Traditional solutions to this involve

knowledge management systems such as "knowledge databases", collaboration tools such as discussion groups or wikis, or web portals and data analytics to expose data and trends from underlying systems. All of these are designed to help people find the information they need to best address their problems.

These traditional decision making aids are crippled by one common limitation, connecting people and data requires many different, independent tools that cannot easily be brought together. Integrating voice and video communications to give the complete context of the situation into the analytical tools such as seismic interpretation, SCADA historians, or reservoir modeling is beyond traditional communications solutions. Even when they are brought together, in the form of an Advanced Collaboration Environment (ACE), they are high cost projects that require special rooms to be built and maintained which limits their scope of collaboration.

Unified communications, with it's unique simplicity for combining data, voice, video, and mobile communications becomes a key enabler of real-time decision making. Including presence, "click-to-talk", multiple styles of video together with any PC or data application brings people together in rich context, regardless of their location. A work-over manager on a control truck in the middle of an oilfield can interact with the same voice, video, and collaboration tools that are used in any office around the world. Because of the intelligence in the network and the ability to expose all collaboration services to any application developer, sophisticated

*Example:*

In the US, Public sector organizations have deployed first response trucks to incidents such as floods, fires, and potentially pipeline or oilfield explosions to quickly connect to the crisis management team, the local asset manager, and local emergency response teams on site. Through specially equipped command vehicles, radio, telephony, video streaming, Telepresence, and data applications such as SCADA historian portals can be viewed by everyone in the response team. This can be extended anywhere in the incident area using mobility options such as WiFi video cameras.

Unified communications forms the platform for this rich collaboration environment, which eliminates communication breakdown between disparate radio networks, gives participants a common understanding of the current state of the incident, and improves decisions made to respond to the incident. For health safety, and environmental (HSE) incidents, this real-time decision making can save lives.

## What is the Future of Unified Communications in Real-time Access to Expertise?

Unified communications capabilities can deliver many benefits to oil and gas companies today. And tomorrow, they can do even more to connect less experienced workers to experts that have the experience to make the right decisions quickly. This section will show how other industries are solving the same problem that oil and gas are facing using unified communications.

### Advanced collaboration virtualizes experts in Financial Services

The first example is in Financial Services, specifically, retail business banking in India[4]. A leading bank was looking for ways to reduce revenue leakage and improve margins in servicing it's small business customers. The commonalities with the exploration space lie in the lack of experienced personnel in the field to answer complicated questions about technical products. Where exploration doesn't have enough experienced personnel, such as drilling supervisors, for every rig, the bank could not afford to put a expert every product in every branch. This skills gap led to the bank loosing sales because the decisions to be made in the branch required expertise that they didn't have onsite.

To address this problem, the bank had to figure out how to "virtualize" the expert from a central location into the field office. And to this in a way that provided the customer with enough feeling of engagement and "context" to capture the sale. But the expertise needed at any given time weren't known until the opportunity came up. The field agent needed to be able to quickly find the right expert given the business challenge at the time. A further goal was that the field agent would be party to the interaction, which will increase the skill of the local resource and improve their ability to perform the task in the future.

In other words, they needed to locate an expert in a specific product or skill set from the broader organization and collaborate in a context rich, real-time manner to reach a decision…very much the same problem set as oil and gas

Their solution leveraged unified communications to:

- Let the local branch representative use presence to locate an expert in the specific financial product they needed to sell to the customer
- Enable "one-click-connect" to that expert
- Provide a rich media collaboration, sharing web applications and video telephony to collaborate with and sell the customer
- Capture the data in real-time with the customer to speed the financial transaction and close sales that would have been lost before.
- Improve the experience for high value customers by creating special all-in-one options for interaction

The net result is that the customer uses virtualized expertise to captures sales at enhanced margins, transfers knowledge to the local resources, and gain market share in a growing market, which could ultimately mean a $3.5M annual benefit for the company

**Collaborative Medicine in Health Care**

Another industry that shares characteristics with the oil industry is health care. In health care, as in exploration and production, day to day activity can be highly specific and technical where decisions require expertise that is best achieved through years of experience. Paradoxically, at the point of activity such as the local clinic or hospital, there are typically no specialists that have those years of experience. So healthcare, like E&P, must somehow virtualize the knowledge and expertise in those few experts out to the assist the younger physicians and clinicians in their diagnosis and response out in the field.

In the UK, they began a expert-system project to transfer this wealth of information from the experts to the younger doctors called the "Map of Medicine" (MoM). This system, a first of its kind, aggregated and documented the standard practices around healthcare. From descriptions of symptoms through the protocols for treatment that non-experts could use to find the latest practices in a given specialty, the system proved a wealth of practical information.

While successful in its own right, it did suffer from the same limitation of traditional expert systems. There was no way to interact with the experts, only the system. When a younger doctor wanted some advice on how to interpret the data in the system, they would have to rely on some other form of tracking the experts down and connecting with them.

Unified communications holds the answer to this problem. Using the intelligence in the platform, the team behind the MoM is developing a prototype that will:

- Allow doctors to find the symptoms that they believe best apply (data application)
- Locate the pre-identified experts that are currently available and what method they can be contacted (presence)
- Select a method to connect to the expert and automatically connect them
- Unify the voice and MoM browsing, taking the expert to the same part of the map that the local doctor is viewing
- Enables the expert to direct the local doctor to browse the map together, confirms diagnosis and decide what the best course of treatment will be
- Ensures that the local doctor makes a better decision about treatment.
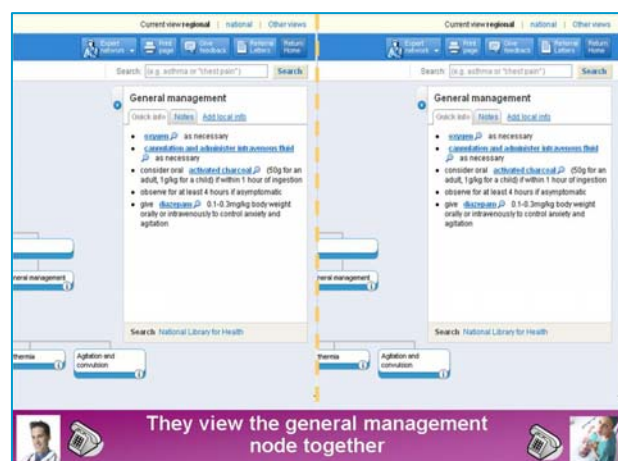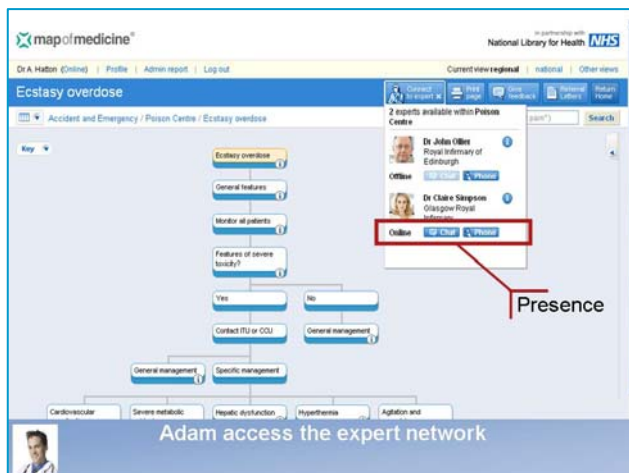
The results of this will be that rather than just having the data of the system to help make decisions, local resources will have rich interaction with the experts around a specific domain, providing the context and nuance to the decision making process.  This will result in better decisions and more effective patient care.

## Unified Communications: The Platform to Connect, Collaborate and Compete

Through these examples of what other leading organizations are doing in oil and gas and other industries with similar needs to exploration and production, you can envision what these could do applied to your specific problems.  Unified Communications, with its ability to unify data, voice, and video communication into a seamless experience available anywhere from any device, provides E&P companies to

**Connect** – experts and field workers together quickly and easily

**Collaborate** – with rich context and interaction unifying voice and video with the data and analytics from their applications

**Compete** – through better decision making enabled by real-time access to expertise delivered at the point of activity.

The challenge of transferring the decades of experience from the people who have "been there, done that" to the next generation of engineers is not an easy one.  Unified Communications can simplify interactions and be an important part of the journey.

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