COST EFFECTIVE IMPLEMENTATION OF REMOTE MONITORING SOLUTIONS OR HOW I LEARNED TO LOVE WIRELESS TECHNOLOGIES

MARK V. GOLOBY

The energy market today can be summed up in one word, tight. It can almost be said that every molecule of gas found and developed is burnt within a day. As we have seen, these market conditions lead to price gyrations that can drive the producer crazy. However, it is precisely these market circumstances where money can be made with every price increase or decrease as long as you are in the right place at the right time. Ensuring your strategic position requires quality daily production information and constant monitoring of production. Luckily the convergence of onsite monitoring and wireless data technology such information is available and affordable. Adding in other ways companies can maximize the integration of this information within their companies and the case can be made that it is downright cheap.

Effective positioning in today's market requires that the efficient producer shorten the "data-to-action" cycle (see exhibit A). A compressor down over a weekend can result in the loss of 10% of a month's production. Conversely, an email alerting the producer with a report that a well is producing below a desired rate can lead to optimized production of 10%, 15% or even 20%. Such results have been documented. So much so, that the cost justification for these tools has dropped to wells producing as little as 75Mcfde and at today's prices even 55Mcfde. In applications where whole fields have been upgraded with such state of the art capability, producers have found lost and unaccounted for gas pockets and measurement discrepancies that have returned the investment in a matter of months.

The day when the data processing industry would deliver the long anticipated convergence of technology is here. Many convergences have been described under this banner but the most significant to the energy producing industry is the convergence of wireless data with the internet presentation of the data. Utilizing last mile technology from the well production information can be viewed online straight at the engineer's laptop, PDA or cellphone as well as digital messaging to send alarms, text messages and other alerts as may be desired.

Over the last 8 years the delivery of data to and from the last mile has been an exciting arena to watch. The array of comings and goings of some very exciting technologies was fascinating. Who can forget the Rah! Rah! of CDPD (cellular digital packet data) the thrill of Celemetry and Microburst? How many folks signed up for the RAM mobile data? Even the old private radio networks are somewhat a thing of the past unless you happen to hold the spectrum license. Yes, many solutions have been rolled out but the solutions left standing are typically satellite based or spread spectrum radio. Licensed radio networks are still being utilized but are generally legacy systems for spectrum allocated several years ago. For discussion purposes here, the focus is new deployments. Most SCADA and remote monitoring solutions are being delivered via Spread Spectrum radio or third party satellite. There are some renditions of digital cellular data solutions (CDMA and GPRS) with a repeat to the age-old cellular coverage issues, the fickleness of carriers to support these data applications and the work entailed in getting a carrier's ongoing support.

The primary solutions being implemented today are spread spectrum radio or satellite. Spread spectrum has the pleasant sounding refrain of no service fees as you own the network with the unpleasant aspect of having to build out your own radio paths, support the equipment and ongoing maintenance. Satellite solutions such as the Low Earth Orbit systems (LEO) are 100% scalable with 99% coverage but have that nasty bill that comes in each month. There is no one solution, there is no single answer, there are no silver bullets. The great news; both are excellent solutions that can be integrated to meet your data gathering requirements.

The benefits of access to real-time production data include:

- ☉A key operational advantage in knowing the current status and operational of all wells saves tremendous time and resources of redundant data accumulation.
- ☉The ability to compare flow rates and production reports at custody transfer points enables earlier identification and resolution of measurement discrepancies.
- ☉Forces a discipline of rectifying production problems
- ☉Reductions in data gathering costs lead to exponential reduction in operating costs
- ☉Allows for more efficient deployment of skilled personnel.

The overriding desire is shorten the data-to-action cycle. The result of shortening this cycle is to increase the velocity with which data is internalized throughout the organization. Now, in addition to meeting the traditional operation and engineering data needs, accounting, marketing, geologists, reservoir engineering and the many other disciplines required in a corporation today can get the critical information that management is expecting them to have. Such timely data generates the critical decision-making and feedback necessary to implement ideas and concepts that will lead to more efficient operations. Where are these critical decision making points? A critical decision making point is reached when the gathered data yields a decision that brings about action. For example, knowing your gas tank level is important, the critical decision making point is when the tank level, destination, personal comfort and access to gas stations yields the action to pull over and refill the tank.

Web based remote monitoring generates three data elements.

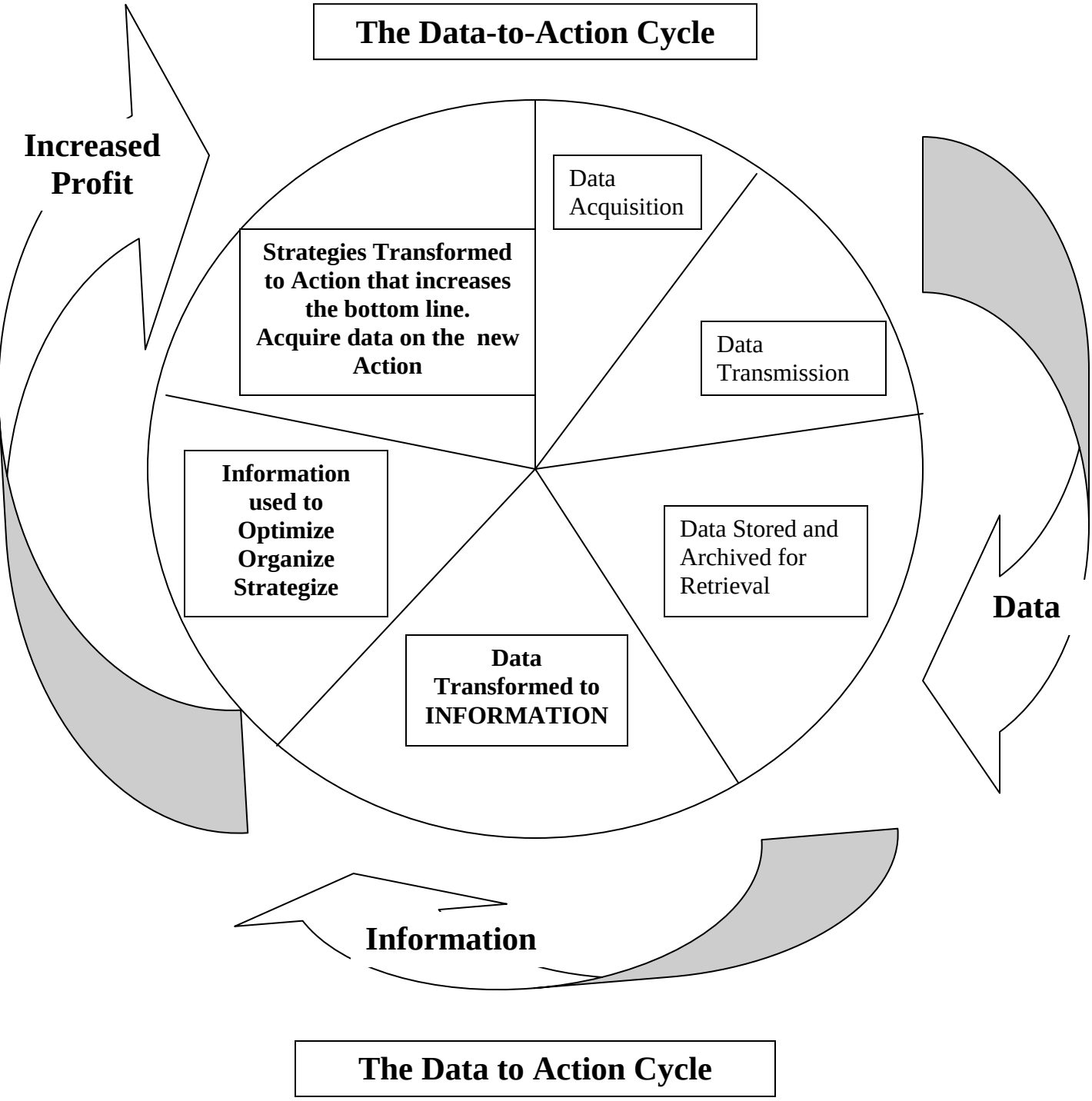
- ☉Status quo information of normal operating characteristics and production status.
- ☉“cry-out” or an alarm when an operating condition deteriorates into a failure or near failure mode that requires someone to physically go to the location to take action.
- ☉Exception reports are user defined edits of the data collected at the host. As they are user defined, engineering can write hourly exceptions on well performance parameters; while gas marketing, only interested in daily balancing exceptions, can write them on.

This combination provides the operator the ability to know what is happening at the well, receive cry outs when a compressor goes down and schedule routine maintenance for failing batteries, salting orifice plates or a variety of other processes it takes to support a producing well. For example, an orifice plate salting up. As this phenomenon manifests itself the DP begins to build up. An exception report written to capture this occurrence will notify the engineer. Remedial action can easily be scheduled for the field team to clean the orifice plate on their next rounds. Problem identified, monitored, notified and rectified as a normal routine event instead of an inordinate time checking and rechecking for a failure.

Over time such a system can become a repository of key information. Information of the changes that occur during the exploitation of any well i.e. orifice changes and gas analysis. An online history of gas analysis can document changes that could lead to further understanding of a well’s life cycle as well as the entire field. One reservoir engineer recently commented that they had an intern spend the entire summer bringing gas analysis files current. No history, just current to reflect actual conditions. By building these files electronically during the life cycle of the well, valuable information is documented and is available quickly and efficiently. Many times disputes are resolved in favor of the person who simply has the best documentation.

Today’s technologies applied appropriately will reduce the data-to-action cycle while speeding the internalization of the critical production data necessary to operate efficiently in a very chaotic market.

Exhibit A


The Data-to-Action Cycle
Increased Profit
Data Acquisition
Strategies Transformed to Action that increases the bottom line. Acquire data on the new Action
Data Transmission
Information used to Optimize Organize Strategize
Data Stored and Archived for Retrieval
Data
Data Transformed to INFORMATION
Information
The Data to Action Cycle