

The Oil Industry, Technology and the Field Ticket of the Future

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In the summer of 1859, Edwin “Colonel” Drake and William A. “Billy” Smith found they had a problem. The well they were drilling for the Seneca Oil Company outside of Titusville, Pennsylvania kept filling with water. The innovative pair had a local foundry provide a fifty-foot length of tubular steel to shore up the sides and prevent water from flooding the wellbore. Rumors had been making the local rounds about the shaky finances surrounding “Drake’s Folly” for some time. Undoubtedly, the foundry insisted on payment immediately upon delivery of what would eventually be known as a casing string at the well site. The receipt left behind would have been the industry’s first field ticket. The document itself is lost to history, but the process of tracking goods and services provided at the well site began when the first successful oil well was drilled in the United States.

Ironically, Colonel Drake wouldn’t see a whole lot of difference between that receipt and field tickets issued used today. The field ticket is used to confirm delivery of goods and services, and provide a field estimate of costs to allow an operating company to track their daily expenditures. Copies are provided to the company man, to the service company’s field office and, ultimately, as confirmation of delivery for invoices provided to the operator. Goods/service, quantity and extended price are the basics of virtually every field ticket.

Reluctance to change

So why is there so little difference in the process over the [last 150 years?](#) Part of the reason can be attributed to the oil and gas industry’s conservative attitude towards adopting new technologies and partly to the change-management challenge related to a broad industry initiative. Altering the field ticket paradigm involves engaging the entire supplier-operator ecosystem.

There is no question innovation has been a hallmark of the industry. Step changes in performance and capability have been driven through such technologies as 3-D Seismic interpretation, Top Drive drilling systems, Steam Assisted Gravity Drainage, and walking rigs. When problems unique to the business are encountered, operators, suppliers and academia respond quickly and creatively to resolve them. Technical differentiation is a significant factor in separating successful companies from those that struggle. North American land operations are almost unrecognizable before and after the recent shale boom.

Yet, the industry is relatively slow in adopting broader horizontal technologies. According to a 2018 Gartner report “the sense of urgency for harvesting the benefits of digitalization is higher than ever, the harsh reality is that culture and methods change slowly within oil and gas companies.” This has been a long-acknowledged truth by senior technology executives and “baked into” solution evaluations and adoption plans. For example, the “Digital Oilfield of the Future” initiatives of the early 2000s was a failed effort to introduce vertical automation technologies to the oil patch.

Technology adoption cycles

Let’s look at the adoption cycle for previous step-changing technologies. In 1981, the first IBM PC was made available to the public. The promise of having computing power of that nature on a desktop was seized on by a number of industries and became commonplace by the end of the 1980s. An obvious use for oil and gas operations was at a rigsite, providing reporting and engineering support for drilling operations.

Drilling morning reporting systems were introduced to industry in the mid-1980s. It wasn't until the late 1990s, however, that adoption really took off. Hardware costs and change management challenges were often cited as barriers to faster adoption. Early adopters had to show significant value before the early majority would get on board. However, there was one very interesting correlation – rigsite morning reporting system adoption paralleled the penetration of PCs into the North American domestic market. As personal computers started showing up in homes and became an every day part of people's lives, the perceived change management barriers began to come down. From 1994 to 1998, annual PC sales quadrupled, the same time PC-based drilling morning reporting systems began to become standard in rig shacks.

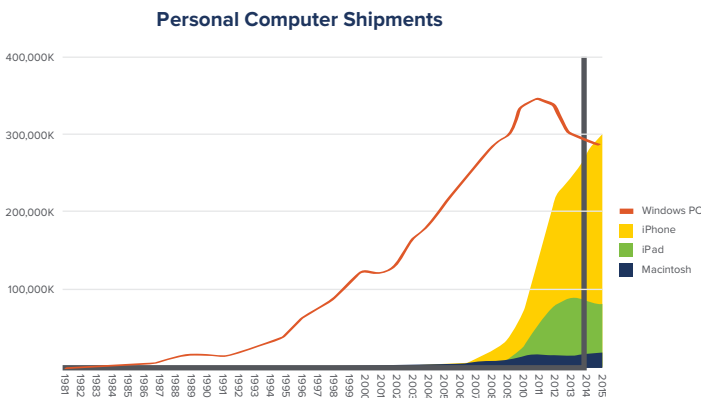


Chart 1: PC shipments since 1981. Data from [Asymco](#).

Now, every drilling and completion operation is supported by PC-based morning reporting systems. It took 17 years from the introduction of the PC and over 12 years since the introduction of morning reporting systems for that to take place.

Field Ticket Evolution

Digital Field Ticketing is poised to take up widespread adoption within the oil industry, particularly in North American Land operations. The remote nature of operations, geographical dispersion of activity, and the huge number of suppliers supporting the industry provides a number of compelling reasons and opportunities to drive value. Efficiencies have been driven through every other part of the industry Procure-to-Pay process. Digitalizing the field ticket is the equivalent of the “last mile” in true end-t- end process automation.

Much like the penetration of the PC into the mainstream in the 1990s, the ubiquity of the mobile phone has changed the game for oil companies and adoption of digital field tickets. Smartphones are no longer an accessory for upwardly mobile Gen-Xers – you can be sure the water hauler or the hot oil operator uses one daily.

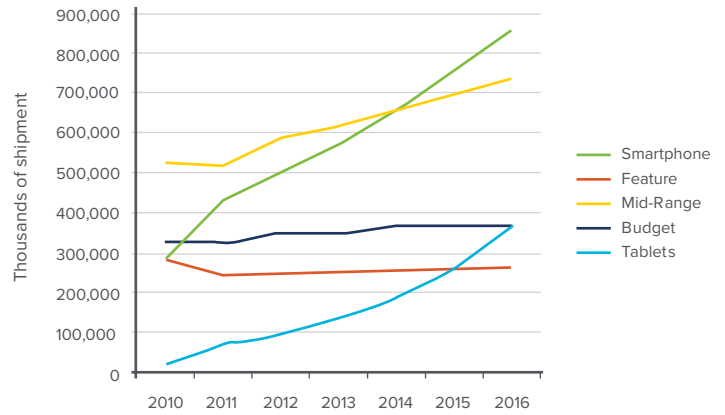


Chart 2: Mobile device penetration. Data from [Forward Concepts](#).

Digital versions of field tickets are beginning to appear on mobile devices. The promise is huge. As an example, Oildex has analyzed the process improvement gains relative to digitizing the field ticket process. In one case study involving an operator interacting with over 200 suppliers, cycle time for service delivered to invoice approval were reduced by 20 percent simply by providing electronic copies of field tickets to match invoices; however, an opportunity for 50 percent reduction is possible with mobile devices. And a significant safety element was introduced – suppliers are no longer chasing company men all over the oilfield for approvals. Getting oilfield workers off the road is a significant consequence of the digital field ticket.

This provides tremendous opportunities for process improvement and closer cooperation between operators and suppliers. Early Pay discounts are now more realistic. Operators can become “preferred customers” based on reliable payment cycles, ensuring access to equipment and superior crews thanks to the relationship.

Colonel Drake might not recognize a top drive or a 30 stage frac job, but he would recognize opportunities for innovation. If previous behavior predicts performance, the time is ripe for digital Field Ticket adoption in the oil industry.

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