Presentation Outline

- Brief history of oilfield drilling technology
- Technology acceptance issues in oilfield
- Keys to accelerated technology acceptance
- Steps to crossing the technology chasm
1,500 Years of Drilling Technology Progress?

3rd Century AD

Early 1800’s
Oilfield Technology Chasm

Source: Geoffrey Moore
A Few Good (Bad) Examples!!

- Sub-sea trees
- GTL
- MWD
- Horizontal drilling
- 3D seismic
- FPSO
- Multiphase metering
- Subsea processing
- Downhole separation
- 4C seismic
- Slag cement
- Expandable casing
- Dual gradient drilling
- Seismic while drilling
- Smart wells
- Deepwater slimhole drilling
- Visualization

Periods with low activity
Not yet successful commercialized

Idea to prototype
Prototype to field test
Field test to commercial
Commercial to 50% penetration
E&P Pace of Innovation vs. Other Industries

Average duration of the four phases in different industries

- **Idea to prototype**
- **Prototype to field test**
- **Field test to commercial**
- **Commercial to 50% penetration**

- **Consumer products**
- **Medicine**
- **Telecom**
- **E&P industry**
Oilfield Technology Acceptance Observations

- Technology is the intellectual currency of service companies/manufacturers

- Oilfield service companies are unsurpassed at developing technology, but often uninspiring in choosing which technology to introduce and how to accelerate its acceptance

- Good marketing will sell little of an inferior product -- bad marketing will sell even less
Oilfield Technology Acceptance Factors

- Immediacy and magnitude of technology benefit is the engine that drives operator acceptance.
- Level of “early” reliability can affect the slope of the technology acceptance curve.
- Cost of ownership in comparison to previous generation of technology can be an inhibitor.
Decision Strategies Technology Cube Model

- 3 X 3 X 3
- 27 cubicles
- Plot each axis
- Rough rate of acceptance can be estimated

Source: RMI and Decision Strategies
Failure Modes In Technology Acceptance

- Introducing poor or niche technologies
- Commercializing technology that is not ready
- Poor product/service introductions
- Not understanding operator risk perceptions
- Too aggressive pricing schemes
Steps to Crossing the Technology Chasm

- Technology providers must become better listeners
- Focus: What they will pay for – not what they “want”
- Develop better operator feedback mechanisms
- Better marketing/new product introductions
- Form more alliances with oil companies
- Conduct more market research