



# OGC Applied Technology and Innovation Center (ATIC)

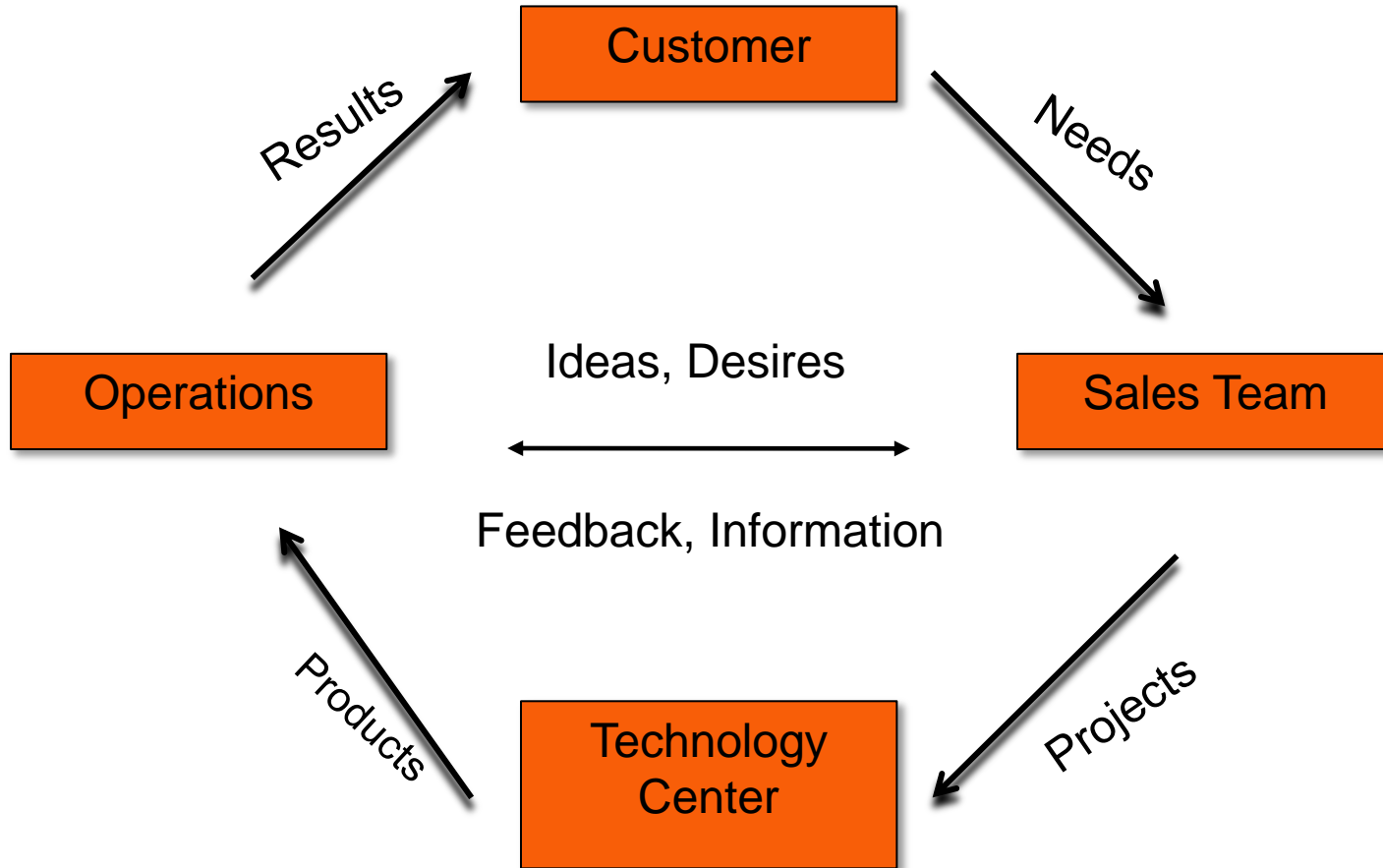
Gulf coast Conference October 17<sup>th</sup>, 2012

WHEN YOU NEED TO BE SURE



- Assure competitive advantage through market driven technological innovation:
  - Enhance the depth, width and competitiveness of our service offering
  - Focus on “Applied Technology” rather than pure “Blue Sky” research responsive to client and industry specific needs
  - With aim to generate solutions:
    - with important revenue potential
    - delivering cost reduction and efficiency enhancements

## TECHNOLOGICAL INNOVATION – INNOVATION CYCLE FROM OPPORTUNITY TO SOLUTION



- SGS in-house developed technologies
  - Allowed us to enter a mature market long dominated by major Oil Services houses
  - Set us apart from competition with services that others currently can not match
  - Increased our visibility and reputation with major oil companies
- Portable Analytical Laboratories (PAL)
  - Revenue USD 1.0 – 1.5 Mio/yr/unit – 15 units built
- MiniPVT® backbone of PVT both for PAL and Land based Laboratories
  - Cost reduction of USD 600k compared to available commercial units (e.g. VINCI)  
– Units used in Malaysia, Dubai, Columbia, Brazil, Mexico and USA
- AutoGOR, game changer for well testing and allocations through “real time”, on-site analysis
- GC/GOR System mainstay of analytical capabilities for PAL, Rapid Deployment Kit (RDK) and Land based Laboratories.

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- AutoGOR, game changer for well testing and allocations through “real time”, on-site analysis
  - Cost of USD 200k/unit, incremental revenue potential of USD 10 – 20 Mio/yr (internal) potential for licensing and support to companies such as Halliburton and Baker potential unknown at this time.
- GC/GOR System mainstay of analytical capabilities for PAL, Rapid Deployment Kit (RDK) and Land based Laboratories.
  - Cost of USD 60k/unit incremental revenue potential of USD 250k/yr ~ 20 units now in service in PAL, RDK and fixed labs

- Decision was made in 2006 that SGS should “take the laboratory to the field”
- To accomplish such SGS had to develop or adopt technologies that produce laboratory quality data in remote and harsh environments.
- Systems had to be user friendly, truly portable or transportable, conform to published methods, and highly accurate
- The fundamentals of Upstream analyses rely on the following tests
  1. Gas analysis – Extended Natural Gas (C1 to C15 + inert gases) – GPA 2186
  2. Liquids analysis – Extended Compositional Analysis (C1 to C35 plus C36+) GPA 2286\*
  3. Ability to analyze High Pressure (20,000 psi), High Temperature Fluids (~350F)
  4. Determine live fluid densities, Gas to Oil Ratios (GOR) Fluid shrinkage, and bubble point
  5. Cover a range of fluids i.e. Rich & Lean Gases, Condensates, Black Oils and Heavy Oils
- Being Hydrocarbons, Gas Chromatography is the fundamental to the to Characterization of fluids
- So the quest began!!

- Basic requirements
  1. Small and truly portable
  2. Fast
  3. Accurate
  4. Robust
  5. User friendly
  6. Reasonable Cost with respect to performance.
  
- Existing Mico GCs' Fell short of the mark due to
  1. Fragility
  2. Memory Effects
  3. Matrix Effects
  4. Costly to Repair
  5. Limited Range
  6. Suited to gases only
  
- Find an Alternative or default to laboratory instruments

- Basic requirements met
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  6. Reasonable Cost with respect to performance.
  
- Qualities that set them apart from the Competition
  1. Thermal Conductivity and Flame Ionization Detectors
  2. True low discrimination Splitter
  3. Suited for both syringe and valve injections
  4. Only Micro capable of analyzing complex liquid matrixes
  5. Simple to operate
  6. Methods are in true conformance with published methods



# The Analytical Triangle

