Observations on Collaboration for Drilling Automation

Moray Laing

Halliburton Digital Solutions
Outline

- A brief history of DSATS
- Competing relationships
- A lesson from another industry
- Creating a common framework
- Observation on Interoperability
- The need for definitions
- Moving forward with DSATS and the DSA-R JIP
The Society of Petroleum Engineers
Drilling Systems Automation Technical Section - DSATS


- To accelerate the development and implementation of drilling systems automation, DSATS supports initiatives which communicate the technology, recommend best practices, standardize nomenclature, and help define the value of drilling systems automation. Appropriate initiatives include workshops, forums, lectures, and technical and white papers, among others, and DSATS actively encourages participation of automation experts from outside the drilling industry.
Collaborative adversaries

Operators
- Shell
- Chevron
- Etc.

Equipment
- NOV

Service CO.
- Halliburton
- Schlumberger
- Etc.

Rig Contractors
- H&P
- Maersk
- Etc.

Business Collaboration

Technology Collaboration
AUTOSAR – A lesson on collaboration

Cooperate on Standards
Compete on Implementation
A COMMON DECISION AND CONTROL FRAMEWORK

Level 0 - Well Construction
- Actual physical processes

Level 1 - Well Construction Machine Control
- Activities involved in sensing and manipulating physical processes.
- Machine Control
  - Drawworks, Topdrive, Mud Pumps

Level 2 - Well Construction Execution Management
- Activities of monitoring & controlling physical processes.

Level 3 - Well Construction Operations Management
- Activities of the work flow to produce the desired end products.
- Drilling Process Management
  - Sequencing, planned durations, resource loading, quality control, tracking
- Well Design
  - Basis of Design
  - Detailed Design
- Well Proposal
- Cost Estimation and Control
  - Budget
  - AFE
  - Cost Approval
- Scheduling
  - Wells
  - Locations
  - Hook up
- Risk / Uncertainty Management

Level 4 - Enterprise Well Construction Management
- Business-related activities needed to manage an operational organization.
- Well Proposal
- Cost Estimation and Control
  - Budget
  - AFE
  - Cost Approval
- Scheduling
  - Wells
  - Locations
  - Hook up
- Supply Chain Management
- Machine Control
- Drawworks
- Topdrive
- Mud Pumps
- Drilling Process Physics
  - ROP Optimization, Tripping, Steering
- Well Design
  - Basis of Design
  - Detailed Design
- Well Proposal
- Cost Estimation and Control
  - Budget
  - AFE
  - Cost Approval
- Scheduling
  - Wells
  - Locations
  - Hook up
- Risk / Uncertainty Management

SPE/IADC 173010 – Drilling Systems Automation Roadmap

INTEROPERABILITY IS KEY
OBSERVATIONS IN INTEROPERABILITY

Common Controls.
- Compete on look and feel
- Level 1

Integrated Devices
- Compete on ease of use
- Level 2

Extensible Devices
- Compete on Personal Experience
- Level 3
The need for definitions

- On of th most common acronyms in Drilling is ROP
- ROP = Rate of Penetration

  • Depth averaged 1 ft, 5 ft, or 10 ft?
  • Time averaged 1 second, 5 second, or 30 second?
  • Measuring Hole change or Top Drive movement?

- It’s not the definition that’s important, but the access to the current definition
- Data without Context is like Mac with no Cheese.
THANK YOU