Technology Standards for Operational Excellence

Standards are like DNA. They are the basic building blocks for all technology and economic systems” D.E. Purcell

Peter Wan
Heather Ednie
CIM Distinguished Lecturers 2014
Agenda

• What are Standards, Guidelines?
• Case study examples: how to and benefits
• Path forward: GMSG
• Projects underway
• What can you do?
From Romans...

...to railways
Standards are embedded in every aspect of our lives.
Why adopt Standards?

<table>
<thead>
<tr>
<th>Standards...</th>
<th>They are not...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve safety, quality</td>
<td>Legislation (but can set the wheels in motion)</td>
</tr>
<tr>
<td>Foster innovation, collaboration</td>
<td>Regulations (can formalize sharing of best practice)</td>
</tr>
<tr>
<td>Improve efficiency, cost-</td>
<td>Rigid and exclusive</td>
</tr>
<tr>
<td>effectiveness, productivity</td>
<td>“Reinventing the wheel”</td>
</tr>
<tr>
<td>Direct industry-wide change</td>
<td></td>
</tr>
</tbody>
</table>
Standards/Guidelines Need to be Relevant

Standards have to have business value, or they won’t be accepted.

Develop standards the industry is asking for through governance, Special Interest Groups.

Timely development of standards so they can help now. No “paralysis by analysis”
GPS had rapid uptake
- Great business case
- Immediate “pull” from industry

802.11 uptake had a lag
- Competing standards
- No “pull”...yet
The Case for Standards: Oil & Gas

In the Oil & Gas Industry, international standards simplify procurement and ensure quality.

Standards have facilitated technology change and implementation.

Have assisted in global trade, facilitating international operation.
Oil & Gas: Standards = Cost Savings

Practice 75 = US$200 million

Projects: CAPEX 5%, schedule 13%

ISO 15589-2 = US$20 million

Germany: 1% GNP
The Case for Standards: WITSML

Wellsite Information Transfer Standard Markup Language
- XML-based protocol
- machine-machine data transfer
- Emergence of digital oilfield, need to move data through supply chain

“...buy a PC you would not accept having to buy all the peripheral devices and software from the same vendor that manufactured the PC. This is where we were prior to the development of data standards.” – J. Pickering, BP
Connects rock excavation equipment to IT infrastructure
Open sourced, XML-based
Collaboration between miners and OEM’s

Automation = crucial component of safe, productive workflow
Potential for transfer of data and reports running into barriers through the work chain
Lack of interoperability between machines, hindrance to productivity and cost efficiency
Incompatible data formats = workflow stalled

“Our vision is to have all of our mobile equipment come under a mining standard.”
P. Cunningham, Vale
IREDES: Benefits

- Cost Benefits = efficient production, savings on integration
- Leverage existing infrastructure and existing reporting systems
- Interoperability standards lead to cost savings, boost production more efficient operations
Operational guidelines

Knowledge hub

Future Vision

www.globalminingstandards.org

Global mining collaboration on solutions to common industry problems, needs and technology through standards, guidelines and best practices.

Creating community to drive operational excellence.

Support

Facilitation

Standards

Innovation

Operational Excellence

Safety

Performance

Excellence
Current Projects

Access onboard data

Safety: leading indicators

Data requirements & KPIs

Comminution efficiency

Underground Communications Infrastructure

GMSG Strategic Plan
Truck - Shovel devices

- Proprietary devices
  - No common protocol
  - Duplication of features
- Integration
  - Custom interfaces required - expensive and time consuming
- Data access
  - Not always available
  - OEM-dependent
- Too many screens
  - Safety
  - Productivity
- Proprietary nature
  - Variety of stakeholders
  - Highly competitive
  - Every company wants cab “real estate”
- Information delivery
  - Prioritization concerns
  - Assimilation
Next Steps: API Development

- Enhance operator productivity, efficiency and safety
- Define metrics for hierarchy of priorities and alarms
- Determine most effective method to present & deliver information
- Enable operator customization, give technology providers control

Next Steps: API Development
Multiphase Rollout

1. Proof of Concept: shared screen
2. Suppliers send information to screen, define content, display
3. Support shared services from display
What next?

• Are you involved in any collaborative efforts for standards, guidelines, best practices?
• What are the burning topics?
• What value could GMSG bring?

• Learn more!
  ▫ Heather Ednie
  ▫ hednie@cim.org
  ▫ 514.984.8775