Surface Mining Association for Research and Technology (SMART)

Update Meeting
May 8, 2010

Comments on Vision/Scope

- **<u>SMART Vision Scope #1: Communication Networking:</u>** The current and future trend will be that mines will own the communications network, overall infrastructure and everything flowing through these systems. In this regard, mines want OEMs/OTMs to "de-couple" components from systems to minimize obsolescence and upgrade costs as the base communications technology evolves.
- **Modular's response: Modular has also identified this trend and has embraced it. Many of Modular's customers have installed their own communications network and run our applications on their network. However, Modular cautions that at this time not all customers have the requisite expertise to scope, select, install, and support an appropriate communications technology platform. In recognition of the above, Modular also offers customers a complete applications solution that includes our proven MasterLink® communications system – a fully compliant 802.11 standards-based system.**

Comments on Vision/Scope

- **SMART Vision Scope #2: Hardware Platform and Operating System Software**: In many mining operations today, multiple operator displays are installed on one piece of equipment. The inefficiencies and issues that result can be overcome via the use of a single and common operator interface that can run applications from multiple suppliers. Either the suppliers or the mines will provide such an "off the shelf" component that uses open standards for communications and operating system to permit such a capability.
- **Modular's response: Modular believes that there is merit in the concept of interoperability of applications and hardware. Currently, however, there are no agreed upon standards that would provide for this level of interoperability. In the absence of such standards, Modular has chosen to adopt commercial, "off the shelf" technology components that have wide acceptance outside of the mining industry, such as:**

  Modular has adopted Microsoft's .NET platform for future application development and enhancement

  Modular has adopted Microsoft's SQL database to allow mining customers to have transparent access to the data

  Modular has adopted standards based 802.11 architecture for its MasterLink® communications backbone

  Modular has adopted Microsoft's Windows CE operating system for its next generation of mobile hardware

  Modular believes that adopting commercially accepted technologies in this manner provides the framework necessary for the interoperability that the mining industry desires.

Comments on Vision/Scope

- **SMART Vision Scope #3: Third party software applications: In parallel to the above, software applications would be provided by the OEMs/OTMs or the mines to run on a mine-selected display. For this to be viable, OEMs/OTMs need to provide clearly defined and published (with recognition of the intellectual property aspects for all their applications and algorithms) data formats and types, interfaces and resource (i.e. hardware & software) requirements.**
- **Modular's response: Modular believes in this long term vision, but holds that it will be challenging to address the intellectual property and business model issues in today's competitive marketplace. Although Modular has been successful in interfacing with numerous OEMs, often we have met with resistance and outright refusal to the sharing of data formats – published or otherwise. Modular believes that SMART could play a valuable role in this regard, and looks forward to the results of their effort.**

Comments on Vision/Scope

- **SMART Vision Scope #4: Data accessibility:** To meet the requirement by the mines for FULL control and selectivity of data access at any level, the OEMs/OTMs need to provide clearly defined and published (with recognition of the intellectual property aspects for all their applications and algorithms) data formats & types ("data dictionary"), interfaces & resource (i.e. hardware & software) requirements. In addition, the mines require read-only access to all and any raw data that is created in real-time. To ensure optimal system performance, the mines will manage & control the communications throughput and bandwidth to permit the required data access by all parties.
- **Modular's response: Modular provides our mining customers with access to all data that is created and captured by their licensed IntelliMine® system.**

Comments on Vision/Scope

- **SMART Vision Scope #5: Data ownership:** The mines will own all and any data and information created by the equipment (fixed or mobile) that is owned by the mine operator. In addition, the mine operator has the right to analyze the data and information as required including providing any generated data and information to a 3rd party supplier to integrate and use as part of a specific application. The mines are insistent that the raw data and information - regardless of manipulation or processing - always remains the sole property of the mine operator. However, the mines are aware of the intellectual property rights of the OEMs/OTMs to the various applications and algorithms that generate the data and information.
- **Modular's response: Modular agrees with this vision and has always believed that any data created or captured within Modular applications is the property of the customer.**

Questions

- Has SMART agreed upon a governance model for its members?
- What are the selection criteria for member representatives?
- Who are the current representatives of the Association members?

- Has SMART defined a process by which these technologies will be defined?
- How are new technologies/ideas brought to the Association decision making body?
- What are the selection criteria for the technologies?

- Are all members of the group obligated to use the platforms defined?
- Or will they have the flexibility to decide on their own?

Questions (Cont'd)

- What are the minimum resources and skill sets required on site to support the platforms identified?
- Who will be responsible for the on-site support of the selected technologies?
- How does the application provider fit into this support model?
- Who is responsible for providing an integrated toolset necessary for identifying the source of a problem when it occurs?

- Does SMART have a process that addresses lifecycle management and obsolescence issues?
- What is the expected life cycle of the hardware?
- How often would SMART anticipate revising the minimum requirements?

Questions (Cont'd)

- What were the selection criteria SMART used in defining the hardware platform in the document? (We specifically would like to understand why Windows Mobile/CE and WiMax were disqualified.)

- Finally, we note that SMART has proposed the use of a low cost LCD display. Has the Association identified a supplier for hardware that meets this specification?
- Where could we obtain one for testing purposes?
- Has a video specification been defined?
- Why was a widescreen format chosen?

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Thank You

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