GMG Mobile Equipment Open Data Project: Defining the Industry Challenges

Outcomes from GMG workshops held on May 21 and June 11, 2020

About the project

This project aims to develop a consensus between mine operators and original equipment manufacturers (OEMs) on open data and clarifies industry priorities around what should and shouldn't be open, and the acceptable use of information. It aims to enable mine operators to make data-driven decisions to maximize equipment safety, utilization, and performance mine and enable innovation and continuous improvement.

The first edition of the GMG *Mobile Equipment Open Data Guideline* (2016) identified onboard datasets that should be available to equipment owner/operators in real or near real-time, read only format. Since its publication, the shift towards digital technologies has made the issues surrounding open data even more demanding and complicated while also making their resolution more pressing. For example, autonomous equipment often carries out safety-related functions, so the inability to access data related to them can have safety implications. However, meeting these increasingly complex data needs can also increase concerns for the OEM around intellectual property.

Legal requirements and standard definitions were identified as most pressing issues that require collaboration and consensus-building. Education was seen as a key enabler for addressing some of the other challenges identified around data usage, access and quality.

Key Challenge: Legal Requirements

Legal requirements, particularly around contracts and agreements and the perceptions around them, were identified as one of the biggest challenges that hinder data access.

CHALLENGE	DESCRIPTION	COLLABORATION NEEDS
Contracts and agreements	Contracts such as non-disclosure agreements (NDAs) and data privacy agreements can be restrictive and can make it difficult not only for all parties to deliver value but also have potential safety implications if they restrict access to machine data.	Alignment on developing contracts and agreements that offer both sufficient protection for the supplier and enable the user to deliver value.
Perceptions around legal requirements	Rigid perceptions around these legal requirements can be used as a reason to withhold data instead of taking a collaborative approach.	Demystify legal requirements and guidance on a collaborative approach.
UNDERLYING CHALLENGES		

- **Regulatory differences:** Data privacy laws and regulations are affected by cultural and geographic differences. Data ownership can also be affected by regulatory and regional differences.
- **Data ownership:** There is a need for alignment around data ownership and how much can be shared and how data are used outside the customer / supplier relationship

Key Challenge: Standard Definitions

One of the great challenges round data access and usage is a lack of standardization. If data from different sources are defined and handled differently, it is difficult for the user to derive insights from them.

CHALLENGE	DESCRIPTION	COLLABORATION NEEDS
Underuse of established languages and protocols	While established languages and protocols (e.g., ISA95, SAE J1939) exist, they are underused, and the lack of a standardized approach complicates integration and increases the margin for error.	Knowledge sharing about what is out there and industry alignment on which existing languages and protocols are useful in which contexts.
Common naming conventions	There is currently little agreement on common conventions for naming data in software or databases.	Agreement on common naming conventions.
Standardized categorization	It is important to be able to categorize event data once it is gathered to enable analysis, especially when the data are used to prevent or mitigate safety incidents (e.g., type of failure, mode of failure).	Definitions of categories with consideration given to context.
Context for different users	There may need to be different types of standardized data definitions for different stakeholder uses. For example, OEMs and operators need to use equipment data for different purposes. Even different roles within a mining company may need different information.	Identification of different user requirements and guidance on how to standardize

Other Challenges with Data Access, Usage, and Quality

Other key challenges include:

- **Data access:** limited knowledge and understanding around how to access data, no common gateway for accessing data from multiple sources, difficulty accessing basic data locally, and inconsistent access to sensor data
- **Data use:** storage and integration often requires post-processing before use, automation is changing operator needs, need for secure and reliable access for data used in safety-critical solutions
- **Data quality:** lack of data integrity from operating sites, data are often transformed so that raw value is not accessible, unreliable acquisition model

Addressing the challenges around legal requirements and standardization can help address some of these challenges as well. Many of these challenges can also be addressed through education because a large part of the challenge with data access, usage and quality is the limited understanding around it. For example Project engineers do not always have the experience or knowledge to know exactly what data are available and how they would analyze or use it while OEM dealers may not always be aware of how to meet the operator's data needs.