International Standard

ISO 3151-2

Visualization elements of PLM-MES interface —

Part 2:
3D error feedback in heavy industry

Éléments de visualisation pour l'échange de données entre systèmes d'information de gestion du cycle de vie de produits (PLM) et de pilotage de la production (MES) —

Partie 2: Remontée d'informations d'erreur sous forme 3D pour l'industrie lourde

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Foreword

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Introduction

0.1 General

Although commercial products exist for the product lifecycle management (PLM)-manufacturing execution system (MES) interface,[20] there is no official standard for the PLM-MES interface. Separate international standards exist for PLM and MES, respectively. However, there is no international standard for interfaces for exchanging 3D product information and manufacturing information between PLM and MES.

Data models from existing PLM and MES standards can be used as starting points to establish the PLM-MES interface standard. Given the diverse and complex nature of the entire PLM-MES interface, this document focuses on 3D visualization elements that provide feedback on 3D error data found in the production department of heavy industry to the design department.

When the PLM-MES interface is visualized, details of the entire interface are hidden, and an intuitively displayed overall view is presented. The schemas of the existing PLM and MES standards can be used to standardize the text format feedback sent from the production department to the design department. However, since the main obstacle is 3D shape data, it is difficult to use the existing schema. The 3D visualization elements for feedback constitute the first step in developing the PLM-MES interface standard.

Figure 1 shows the contents defined by ISO/TR 3151-1, which outlines the visualization elements of the PLM-MES interface, and this document (ISO 3151-2), which pertains to this part of the PLM-MES interface. The left side of Figure 1 shows the scope of ISO/TR 3151-1, primarily an overview, while the right side shows the scope of this document, specifying 3D visualization elements for error feedback in heavy industry.
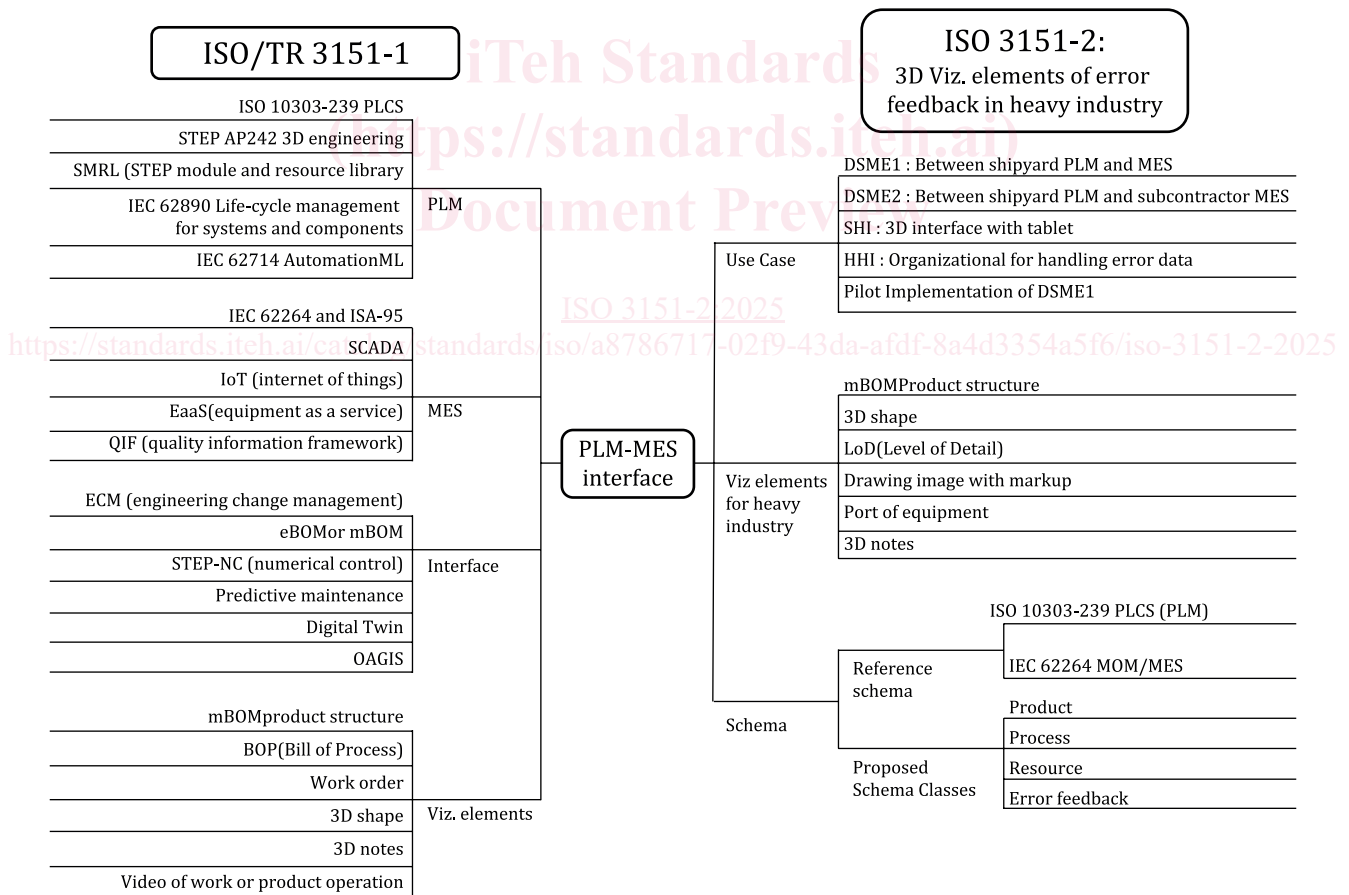

Figure 1 — Technology tree of PLM-MES interface

0.2 Simple and short-lifespan products versus complex and long-lifespan heavy industry products

Industry-specific product groups can be classified based on their economic lifespan. For example, there are clear differences in the economic lifespan of a nuclear power plant, an aircraft, a ship, an automobile, a TV, a smartphone, and mechanical or electronic parts.

An engineering plant, such as a power plant, consist of one million parts and has a service life of several decades. Being made-to-order (or custom-made), the demand for a 3D interface between PLM and MES in these specific use cases is generally high. See Annex C for use cases that illustrate the challenges of the 3D interface between PLM and MES.

On the other hand, less complex products such as motors, electronic components or control components used for communication or control have relatively shorter lifecycles. These products must be mass-produced to ensure economy validity and have a short economic life due to rapid technological advancement. Consequently, the demand for 3D interfaces between PLM and MES is not high. Manufactured products with a small set of parts are relatively less complex.

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