Report 2: Simulation Software

Digital twin software creates a virtual representation or simulation of a physical asset, which may then be used to track the asset’s performance in real-time. These technologies are used to simulate performance, estimate maintenance requirements, and ultimately optimize the asset for peak performance. Sensors are embedded in physical assets to create the data needed to inform a digital twin. They can track and monitor the actual piece of machinery by converting the assets into IoT-enabled devices. These tools are frequently used in conjunction with IoT device management software or CAE software (computer-aided engineering). A product must meet certain criteria to be considered for the Digital Twin category. Sensors are used to track data produced by the physical object. Allow users to optimize the physical asset’s performance depending on the data generated by the asset.

# Service Providers

Today’s Digital Twin Softwares are incredibly versatile, and because of strong competition, have remained a relatively low-cost investment for most. Currently, with dozens of options available for Digital Twin Software in the market – finding the right Digital Twin Software can be tricky.

A review of the best available Digital twin/Simulation software, both specialized and non-specialized for the mining industry, is provided as follows.

|  |  |  |
| --- | --- | --- |
|  | **Pricing** | **Key Features** |
| **Specialized Software** | | |
| **HAULSIM**  **(RPM Global)** | - | * Discrete Event Simulation * Different haulage vehicle (electric, hydrogen, hybrid) * Industry's largest public equipment library * Easy to learn and use * 3-D interface * Travel time calculation * Schedule validation, * Scenario analysis * Fleet comparison * In-person/Online Training Course * 24x7 Support and Service |
| **SIMULATE**  **(RPM Global)** | - | * Discrete Event Simulation * Fully customizable equipment library * Different haulage vehicles (electric, hydrogen, hybrid) * Scenario analysis * Import GPS data for road modeling * Customized and branded reporting * Personalization * Easy to learn and use * 24x7 Multilingual Support |
| **SimMine**  **(4Sight)** |  | * Directly import mine layoute * Powerful 3D animation * Displaying mine development sequences * Equipment fleet movement * Dynamic mining progress * Specialized mining simulation and optimisation software package |
| **Non-Specialized Software** | | |
| **Prespective Software** | * Student license: Free * Premium: 1000 euros/year | * Discrete Event Simulation * Modular Asset Library * Unity real-time 3D-engine * Throughput Analysis * Data Communication, PLCs, MQTT, etc. * Support and Training for premium licence |
| **Azure Digital Twins** | * $4.00 Monthly / 1 million messages, querries and operations | * IoT Platform * Comprehensive digital models of entire environments * Open modeling language * Live execution * Data entry: IoT protocols, Rest API * Data Output: All downstream services, data explorer, analytics, event hub, etc. * Augmented with Ansys Twin Builder |
| **Simio**  **(4Sight)** |  | * Rapid and flexible modelling * 3-D animated models * Easy to learn and use * Free Training Materials |

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| --- | --- |
| **Advantages** |  |
| **Cost Effective** |  |
| **Reliability** |  |
| **Flexibility** |  |
| **Scalability** |  |
| **Licensing** |  |
| **Error Free** |  |

|  |  |
| --- | --- |
| **Disadvantages** |  |
| **User Friendly** |  |
| **Security** |  |
| **Compatibility** |  |
| **Maintenance** |  |
| **Drivers** |  |
| **Support** |  |

# References