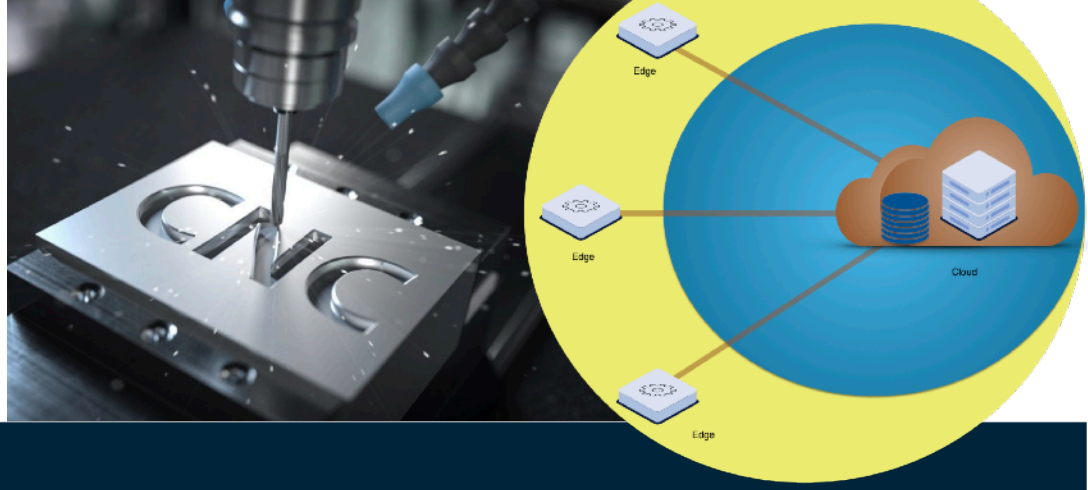




AGNEYAS LABS



Agneyas Smart Factory

Digitising the CNC machine operations in a factory shop floor help accelerate time to market, increase production efficiency while reducing downtime.

Solution Brief

Version 1.0

September 2022

Agneyas Smart Factory

Digitising CNC Machine Operations

Agneyas Smart Charging - At a glance:

- Automated data collection from machines and transfer to cloud/server
- Easy configuration and management remotely through Web Application
- Digital view of operational state and metrics in a graphical dashboard
- Deep visibility into shop-floor operations and data-driven insights
- Certificate based authentication and secure data transmission
- Seamless integration of existing workflows simplifies the overall effort
- AI/ML modules for learning and decision support that improves over time

What is Agneyas Smart Factory ?

Digitisation of physical operations lend themselves to be managed by a data driven management systems which significantly improves operational efficiency while greatly reducing downtimes.

The historical data collected enables these systems to learn and predict future events using emerging technologies such as AI/ML to make the operations more effective.



In this data-driven world, manufacturing companies require real-time insights and the ability to remotely monitor and manage the shop-floor operations to remain competitive.

A typical shop floor consists of several types of machines and systems that generate innumerable data pertaining to its operations.

Harnessing this data we can obtain valuable insights into the history of what has been going on, what is the current state and even predict how it is going to be in future.

Using these insights it is possible to device action plan that minimises the down time, improves the quality of the produce and optimises the overall performance outcomes.

Rules can be set to generate alerts when important events occur or when any chosen parameter crosses the allowed range of values. The alerts can trigger messages or emails to call up on the people to attend the matter in a timely manner.

Agneyas Smart Factory is a digital transformation solution for manufacturing operations based on industry 4.0 and provides a set of technology infrastructure and services for end to end factory wide deployment.

The solution consists of a data backbone infrastructure that integrates data from disparate machines and sensors from factory shop floor and securely transfers the data onto a common cloud or server system.

The solution also provides a set of data services to process the data and derive specific insights using advanced analytics and AI/ML.

Whats more, the entire solution is accessible from a standard web browser securely over the internet (or office network) so that the right information is available to the right people almost instantly to visualise and manage the entire shop floor.

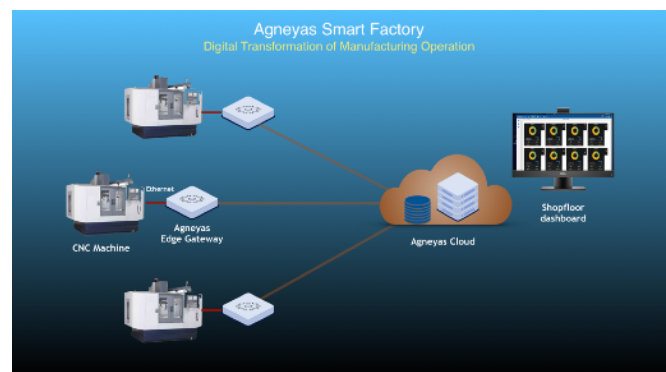
Reports can be generated for different time periods including shift/day/month/year wise and downloaded covering operational metrics such as downtime, performance, quality etc.

More importantly, Agneyas Smart Factory solution also has framework to integrate existing workflows in the factory to unify the data streams.

Working Of Agneyas Smart Factory

Each machine is connected to a Edge Gateway (EGW) which runs a controller service to acquire and process the data from the machine and sensors using the protocol they understand.

The data is processed locally on the EGW and relevant data is transported over a secured tunnel to the cloud/server where its processed according to the application requirement.



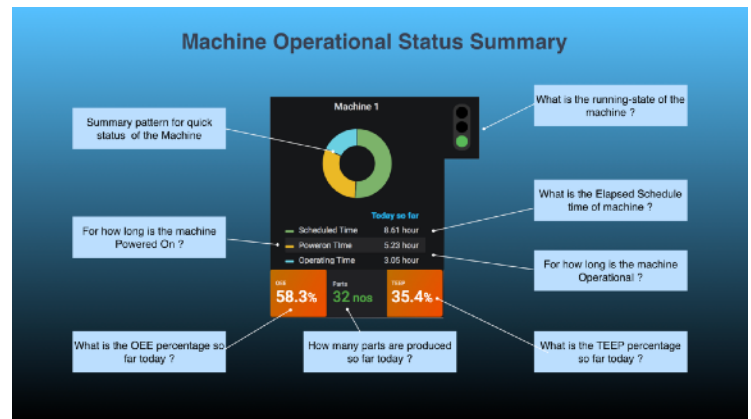
Data from multiple such machines are aggregated at the cloud/server. The data services, running in the server, process the data based on the business logic built into them and then stores the data into a time series database.

A web application running in the server/cloud end that provides user access to the database via any standard web browser.

The web application provides various modules to configure and monitor the status of the machines and operating processes:

- The Shop-floor module provides a digital replica of the machines in terms of the most relevant parameters and metrics for quick status as shown in figure 2

- The analytics module provides a graphical view of all the components of OEE and TEEP plotted over the day/week/month etc.
- The dashboards provide one or more views on the state of the machines in details including the machine state, servo and spindle load, voltage, power etc.
- The rule engine to configure conditions to trigger the alerts and notifications
- The data viewer and reports generator for different aggregations and time periods



Agneyas Operations Insight

One of the key components of Agneyas Smart Factory is the insights module which provides a deeper and real-time view of the uptime, performance, quality and resource utilisation.

It's no longer enough to collect, transfer and process the data offline. In order to create value one should be able to derive deep insights from the data in real-time as it flows through the data infrastructure so that actions can be taken to minimise inefficiencies.



Downtime analysis, for instance, automatically generates detailed drill down on the states the machine gets into and provides facility for operator inputs to assign and explain reasons for above normal delays.

Stream processing along with advanced analytics and ML are used in producing real-time insights which can be used to improve and optimise the overall operation.

In many cases the insights are specific to the company operations and can only be derived working with the domain experts in the company.

Benefits of Agneyas Smart Factory

Digitisation enables data-driven management of operations and historical data can be used to learn and predict events in future. With real-time data dashboards and data-driven operational insights the digital factory provides the following benefits in general:

Accelerate time to market by optimising productive time, minimising downtime and predicting completion time and tracking the movement through the work-flow.

Increase production efficiency through accurate analysis data for loading/unloading time, run-time, resource usage, downtime analytics etc.

Improve quality and reduce downtime through 24/7 condition monitoring, alerting operators of potential problems and easier analysis and correction if error events occur.

About Agneyas Labs

Agneyas Labs help industrial companies digitise their physical operations, harness the power of IoT data and AI/ML to produce actionable insights and fuel digital growth. Its edge to cloud platform with focus on manufacturing and automotive operations provides easy integration of data from disparate machines and systems and is highly customisable to drive operational efficiency and deliver time to value.

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