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DIGITAL TWINING TECHNOLOGY

CONTEENTS:

What are Digital Twins

1. A Digital twin is a made up of data sets and it is a virtual representation of a physical object which can accurately mimic the performance of the physical object in a virtual performance

2. The concept of Digital twin was first used in Davin gall inger's 1991 book called mirror word

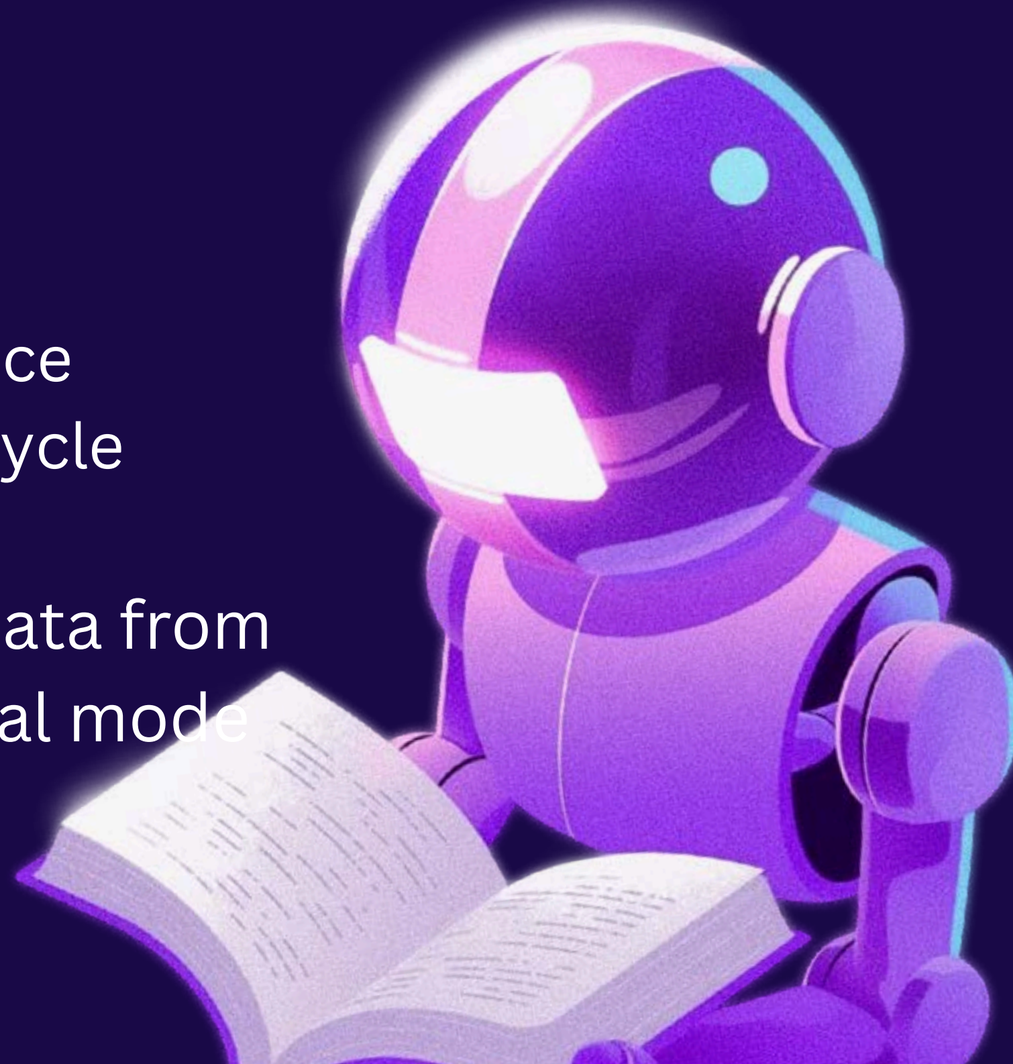
Why do we need Digital Twining:

1.It helps in designing and optimization part

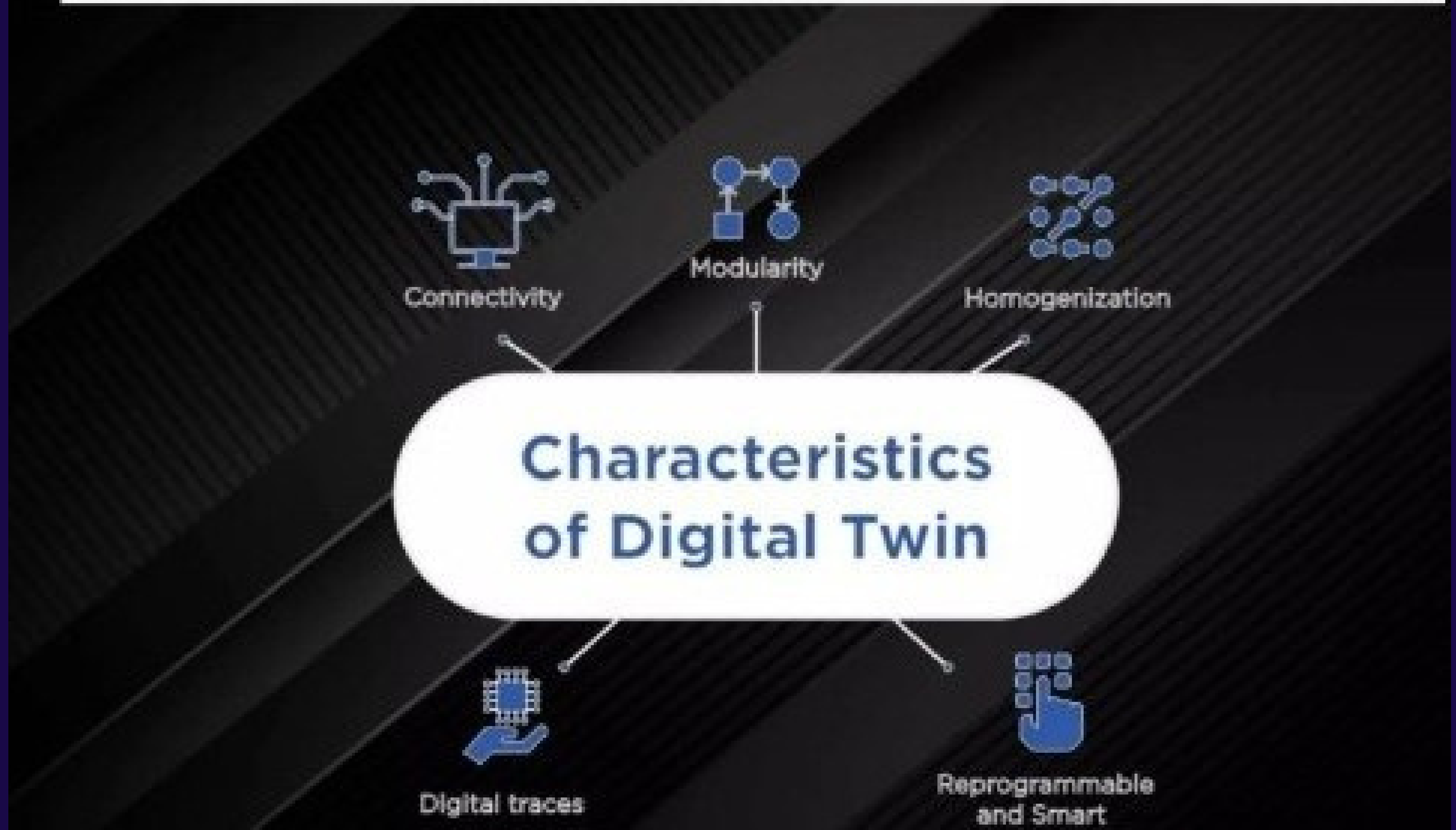
2.It helps to predict the aging effect

3.It os capable of monitoring the performance
of the physical object through of the whole cycle

4.Digital twin is also integreat historical Data from
past machine usage tofactor into its digital mode



CHARACTERISTICS OF DIGITAL TWIN



Characteristics of Digital twin

Conectivity:

A digital twin is based on connectivity. It enables connection betwee the physical element and its digital countornart The sensors create connectivity of physi ate and communicate data Back up now logies.

Homogenizatio

Homogenizatio has two components steps;firstly, spatially aligning data;and secondly ensuring the quality of the data is compatible Digital twins are both the consequences and enabler of homogenizatio of data. It allows the decoupling of information from its physical form

Digital Traces:

Digital twin technologies leave digital traces. The trails are helpful to diagnosis source of the problem that occurred in case of machine malfunction

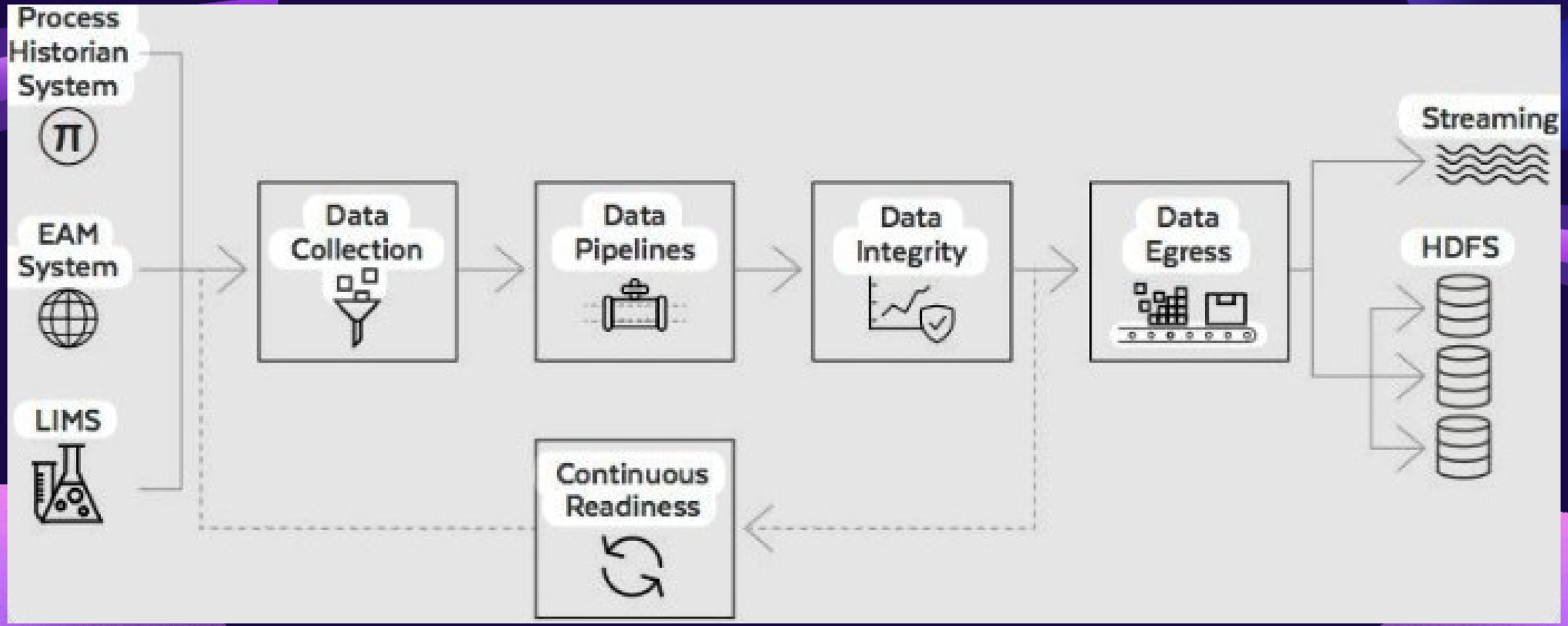
Modularity:

Modularity is referred to the design and customization of products and production modules. The addition of modularity to functional models helps manufacturers gain the ability to tweak machines and models.

Reprogrammable and Smart:

Digital twins automatically enable re-programmability through sensors , artificial intelligence techniques and predictive analysis.

Architecture Diagram:



Architecture:

The different stages in the architecture of digital twin service involve-;

1. Data and Data collection
2. Data Pipelines
3. Data Integrity
4. Data Egress

Δ Data and Data Collection:

There is two types of data;

Model Data:

Used to construct digital representation of real world thing by using graph models.

Time Series Data:

Represent the observation of the state of some physical thing at a given time. it can be continuous or discrete.

Δ Data Pipelines:

Merge all data sources from data collection into a Single model and exported into elements graph

Δ Data Integrity:

It also looks at the actual data stream for reducing issues with calibrations, connectivit physical issues with the instrumentation that collect the physical data. This is a set of analysis on either single varied or multi varied data.

Δ Data Egress:

The collected and organised data into digital twin is analyse to ensure the accuracy of that data. The final stage is making use of that digital twin, we have built to analogue a whole range of analytics value.

Advantages:

> Improved design
> Improved build
> Better early detection
and warnings
> New opportunities
> Aggregated Data

Disadvantages:

#The security is at stake.

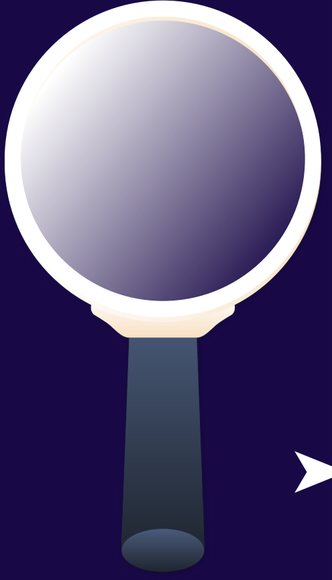
#The digital twins concept is based on 3D models. and not on 2D drawings

#Digital twin will be requíred across entire supply chains.

#The challenges involved here include globalization and new manufacturing techniques.

Conclusions:

combined with the latest machine learning and artificial intelliger tools which helping companies across many industries red operational costs, increase Productivity improve performance, change the way predictive maintenance is done.For product manufacturers in particular, digital twin technology is crucial is achieving more efficient production lines and faster time-to-market.



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THANK YOU!
We appreciate your time and attention.