Who left the door open?
A story of connectivity and the future of metrology

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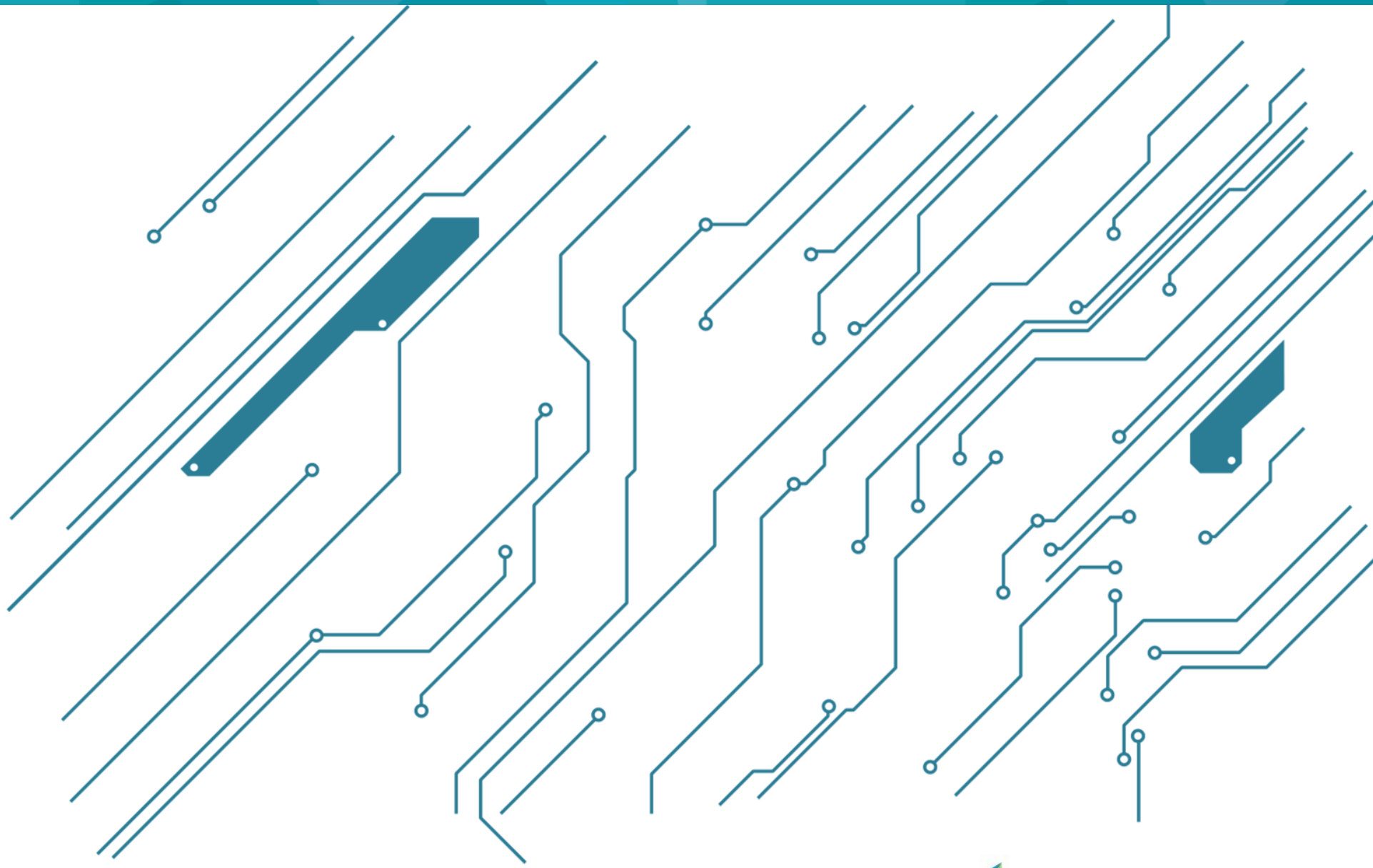
Agenda

1. Research
2. Insights
3. Results
4. MMS PULSE



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What is smart manufacturing?

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Research Breakdown

Sites Visited

12 USA
7 Germany
5 Turkey
4 Italy
4 Czech
3 France

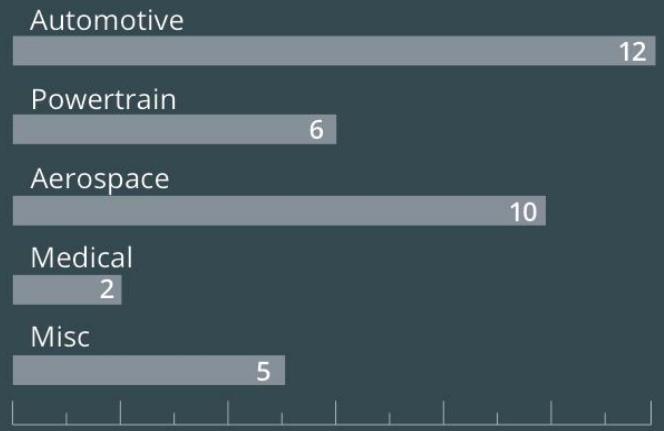
Machines Observed

27 Competitve machines observed

Machine location

96 Met Lab
14 Pop -p Lab
28 Shop Floor

Site Industry Sectors



of people interviewed

~ Hrs of Observation

Software types

25 PCDMIS
6 Quindos
4 Other

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Insight #1: Common Questions

Do you run your CMM unattended?

What is the effect on downtime?

How do you ensure that the CMM is measuring your parts in acceptable temperature and humidity conditions?

How do you know if there was a crash?

How do you handle a probe crash?

How do you know if there is any vibration?

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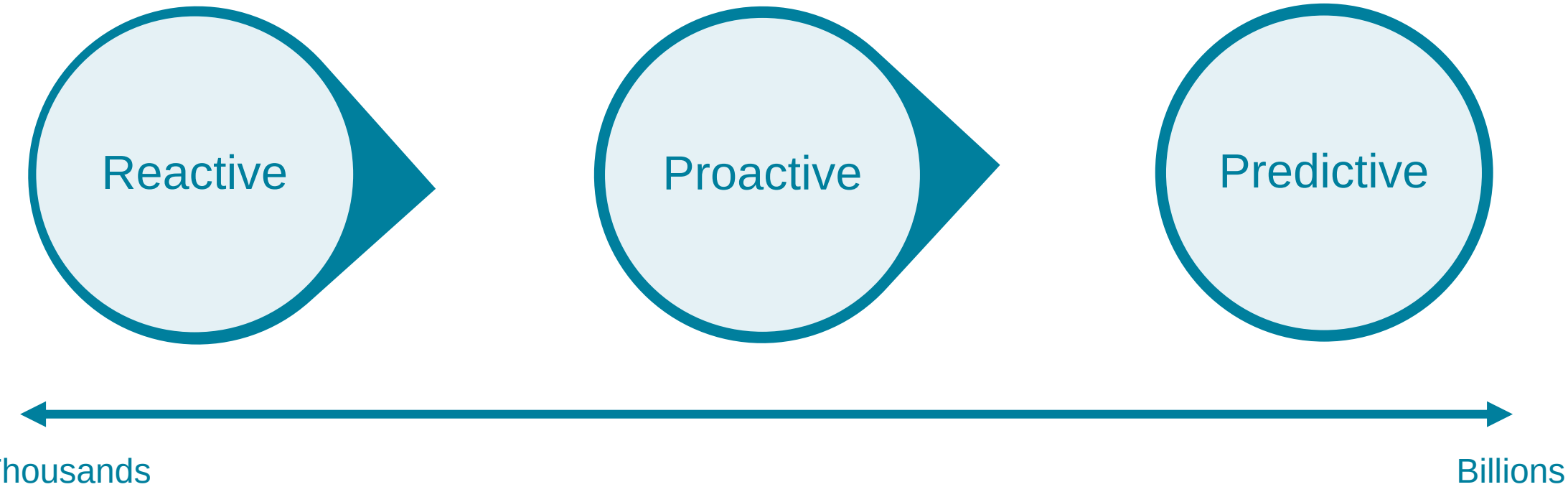
Insight #2: Customer Expectations Have Changed



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Insight #3: Use of Data

less than

1%

of data used

Customer Interactions:

not **personal**
not at the **right time**
not **relevant**

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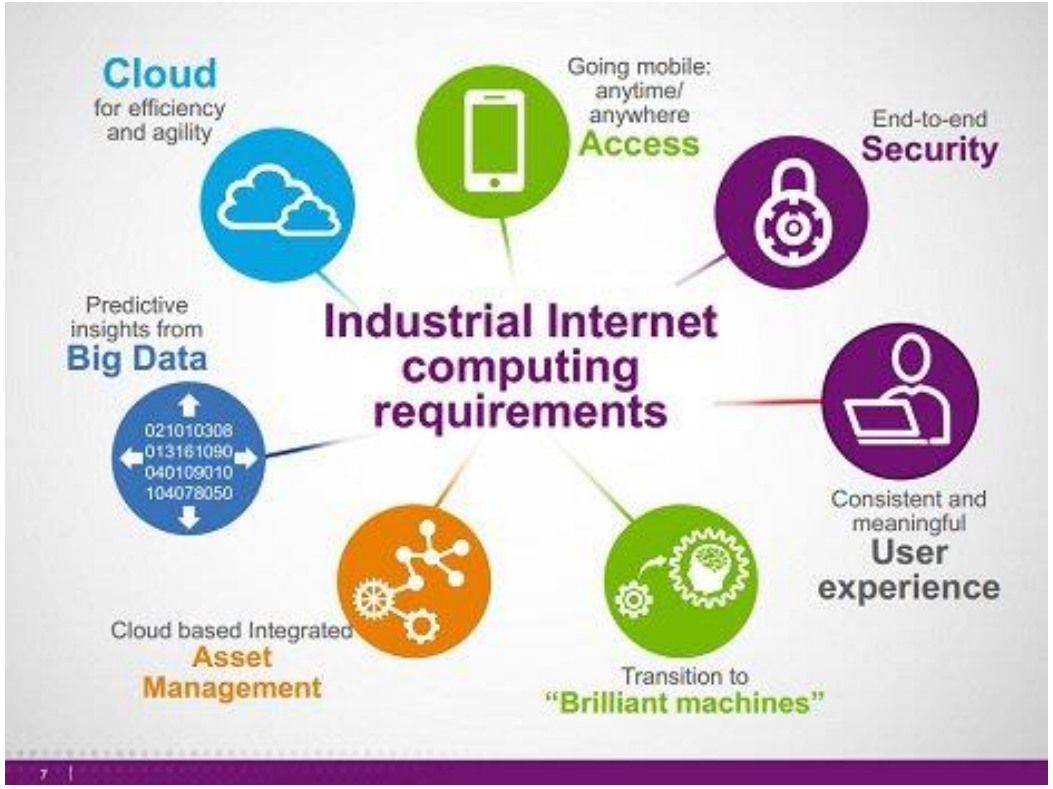
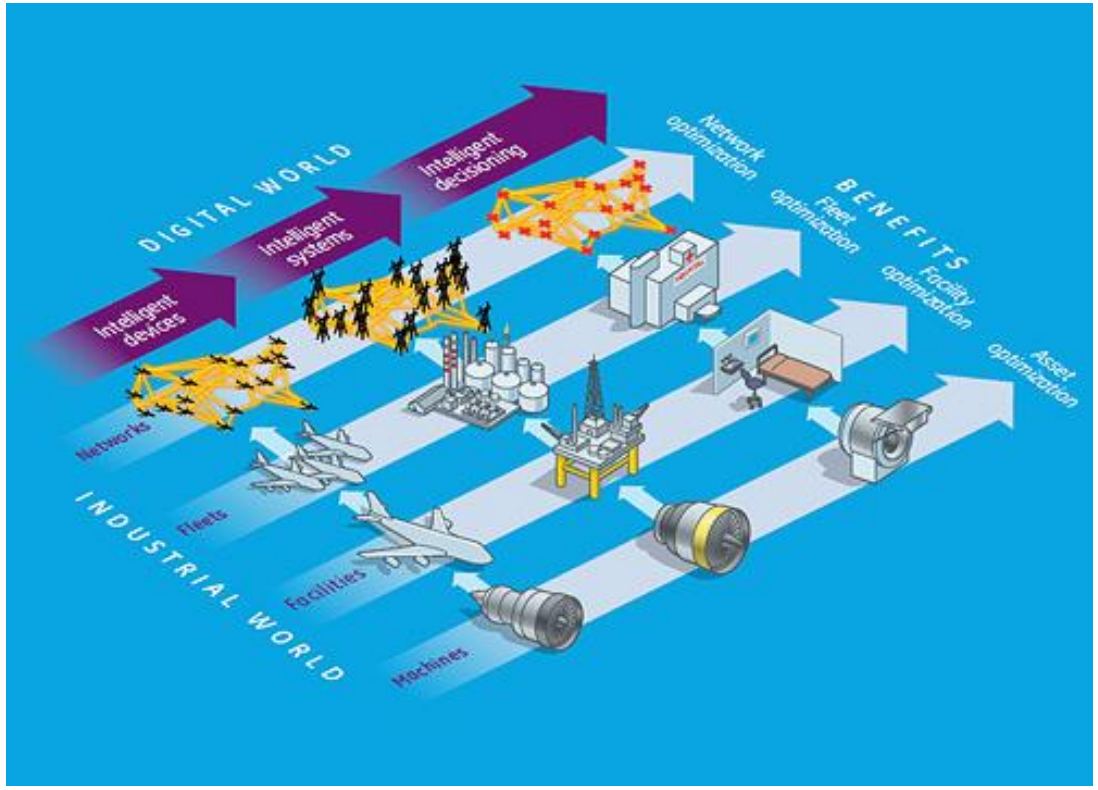
Example: GE





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How do you obtain real time feedback about your machine’s operation?

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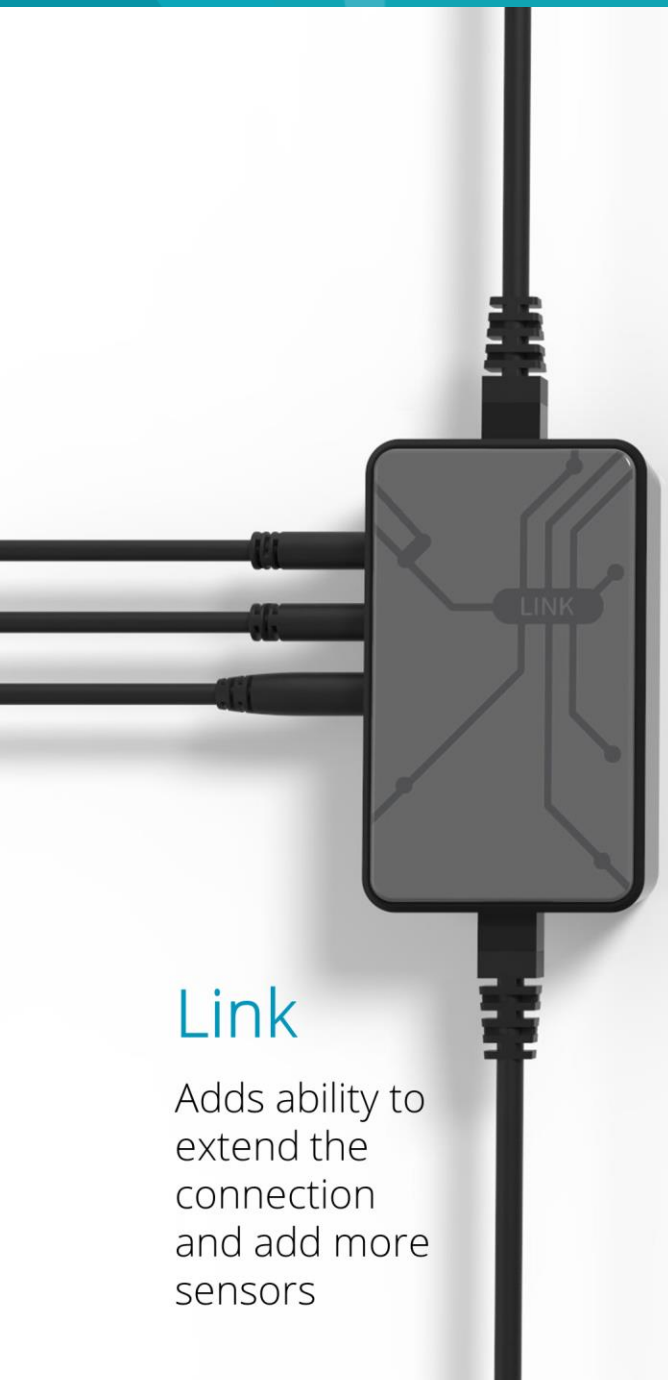

Link

Adds ability to extend the connection and add more sensors

Sensors

Vibration Accelerometer

Crash Accelerometer

Temperature

Humidity

Future Development

Light Control

Light level control with a built-in proximity switch

(must have illumination light)

Hub

Central unit with all the power to collect and stream the data

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How can you know everything about your measurement process at
any time, any place or on any device?

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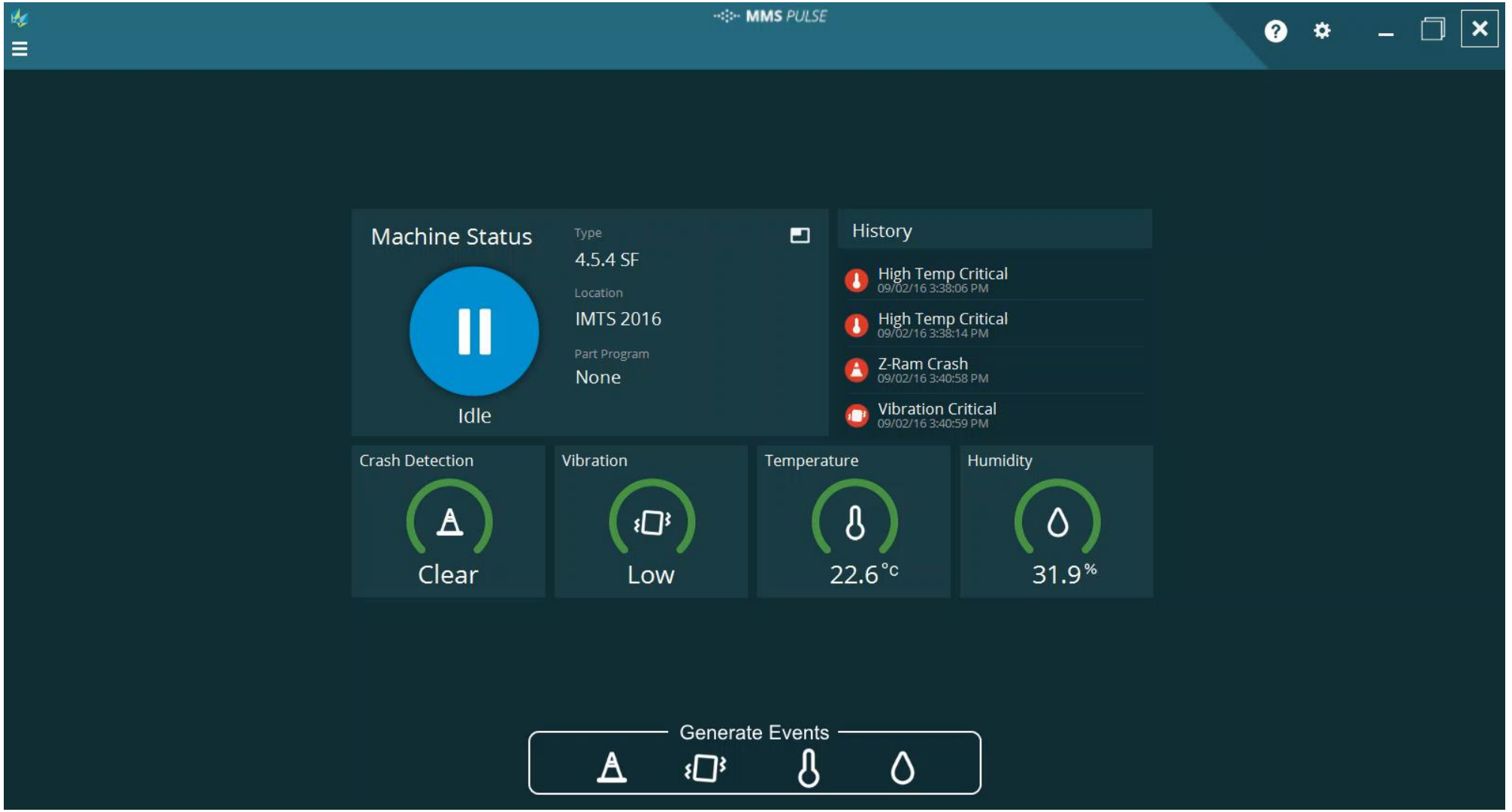

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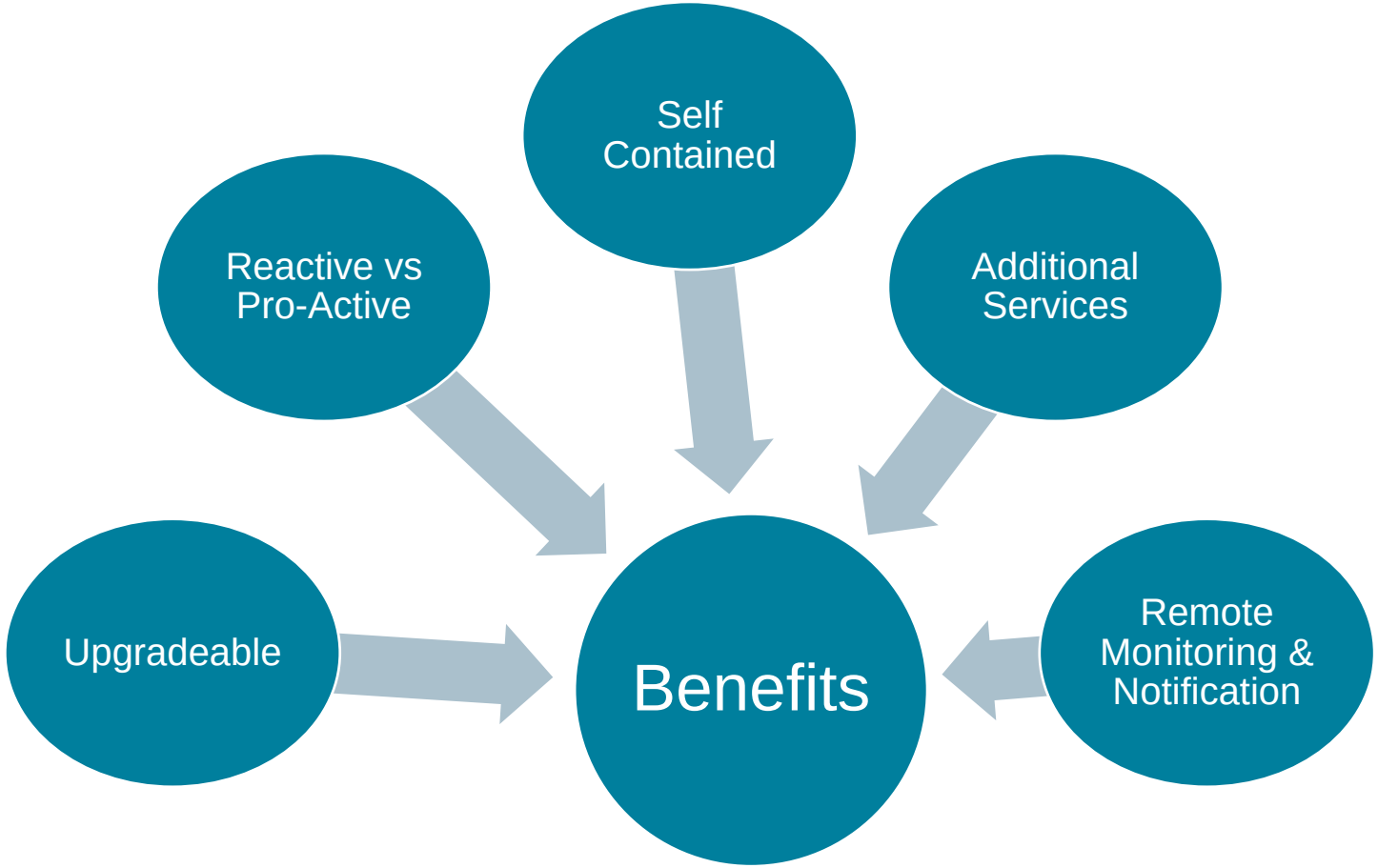
MMS PULSE

MMS PULSE is self contained. Works independent of host software. That way it can live on non-Hexagon equipment too.

MMS PULSE is real time. Provides immediate monitoring and notifications. Can be integrated with cloud services life Salesforce for immediate connection to Hexagon internal systems like Servicemax.

MMS PULSE is reactive. Builds a system towards providing pro-active services (MMS CADENCE). Hexagon will know before machines need attention for better scheduling and in turn this will work towards providing zero unplanned down time.

MMS Pulse is upgradeable. We will be adding more sensors, cameras and services in the future.



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What if there was an “easy” button for CMMs?

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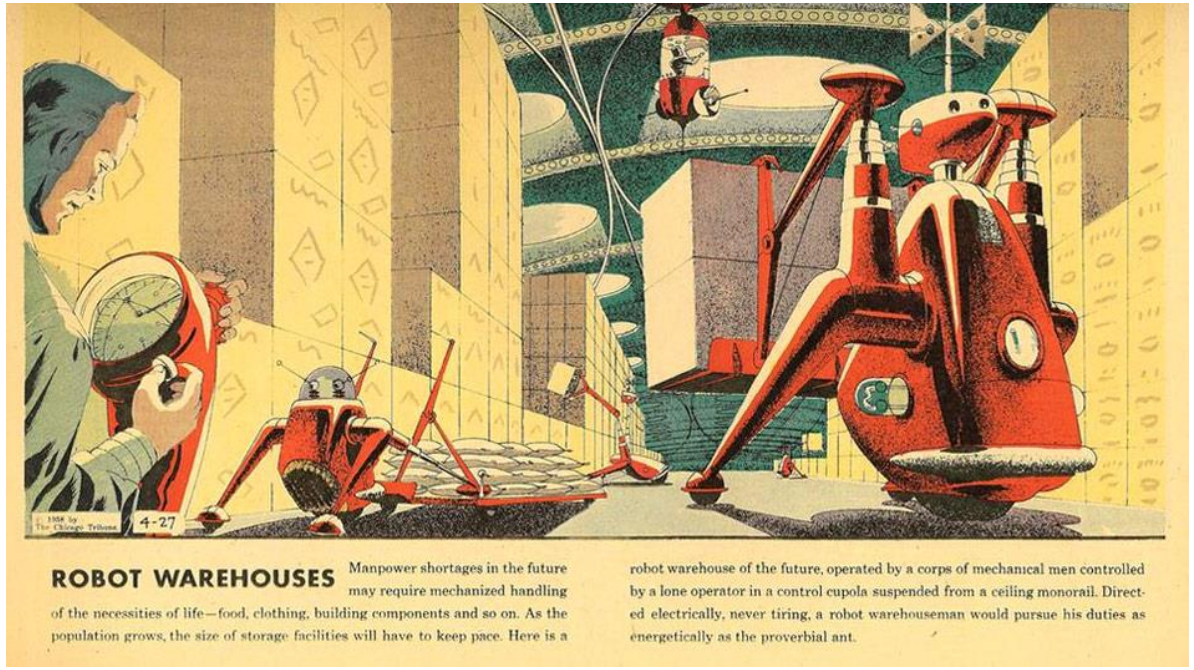
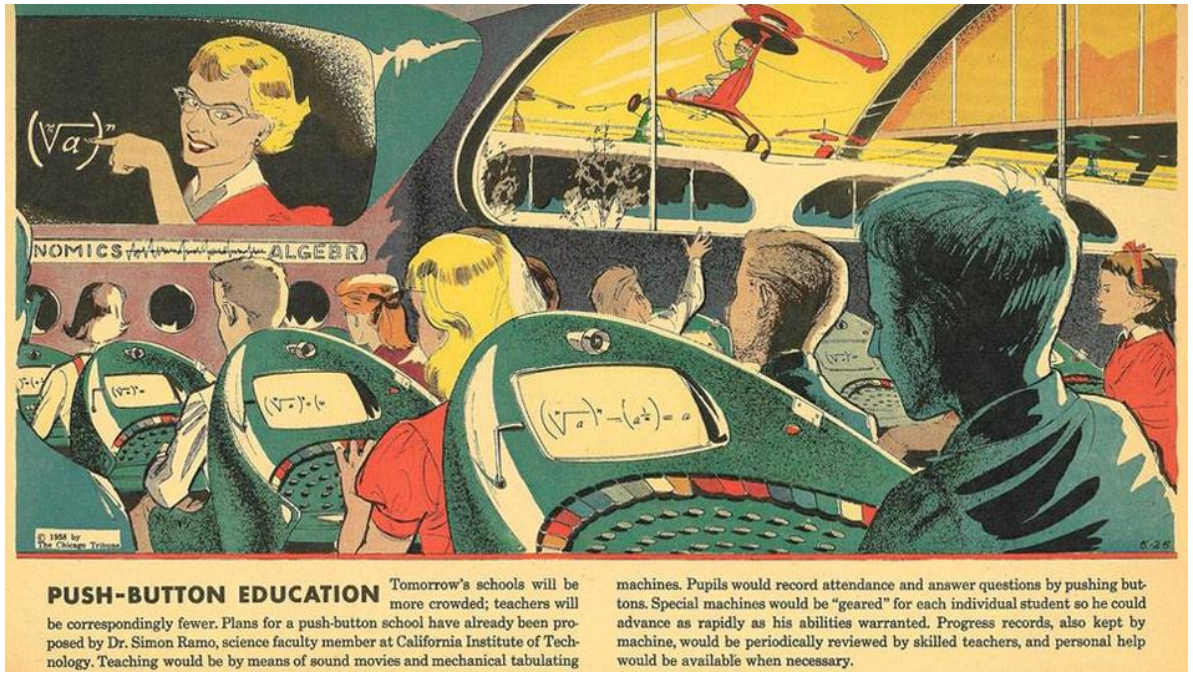
What does the future look like?



ROBOT WAREHOUSES Manpower shortages in the future may require mechanized handling of the necessities of life—food, clothing, building components and so on. As the population grows, the size of storage facilities will have to keep pace. Here is a robot warehouse of the future, operated by a corps of mechanical men controlled by a lone operator in a control cupola suspended from a ceiling monorail. Directed electrically, never tiring, a robot warehouseman would pursue his duties as energetically as the proverbial ant.



PUSH-BUTTON EDUCATION Tomorrow's schools will be more crowded; teachers will be correspondingly fewer. Plans for a push-button school have already been proposed by Dr. Simon Ramo, science faculty member at California Institute of Technology. Teaching would be by means of sound movies and mechanical tabulating machines. Pupils would record attendance and answer questions by pushing buttons. Special machines would be "geared" for each individual student so he could advance as rapidly as his abilities warranted. Progress records, also kept by machine, would be periodically reviewed by skilled teachers, and personal help would be available when necessary.

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Key Takeaways

- There is more and more desire to connect machines and view important data on any device, at any place and at any time
- MMS PULSE is a first step towards Industry 4.0 with many more exciting products to come
- Working on adding AI to machines to help make them execute repetitive tasks

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THANK YOU

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