

Engineering, Product Development & PLM Experts

PTC® IoT SERIES
IoT PRODUCT PITCH ACTIVITY

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Arquitecto de Soluciones



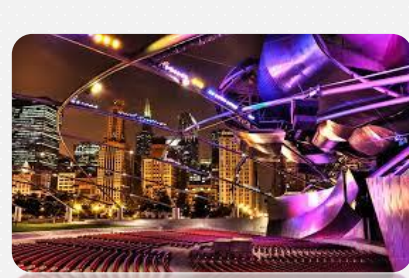
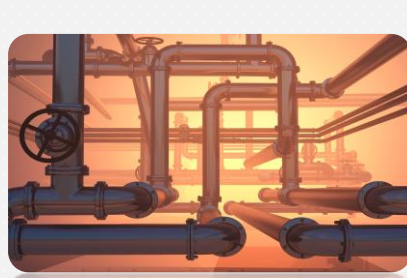
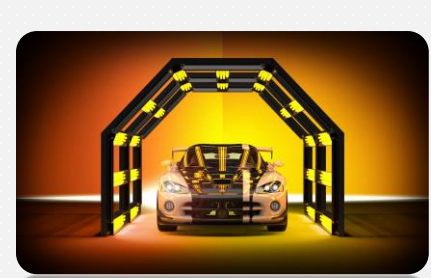
Smart Connected Wheelchair

Regain Your Mobility & Get Your Independence Back

The objective:

The wheelchair can be driven by a motor and its speed can be monitored by cell phone, its position can be known, and that it has an automatic light for driving at night.

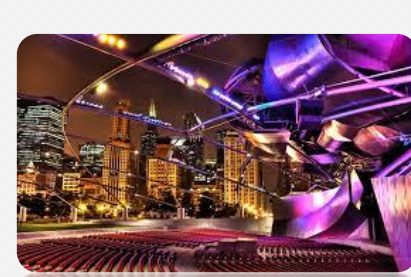
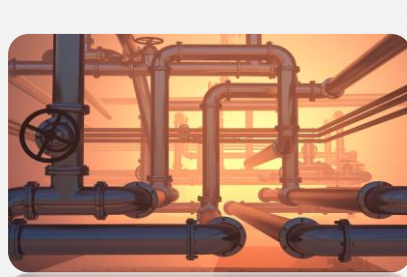
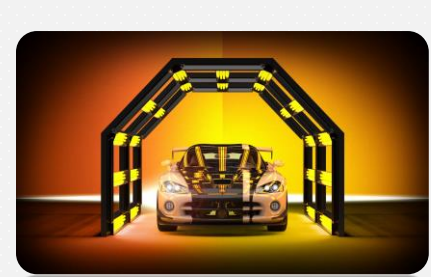




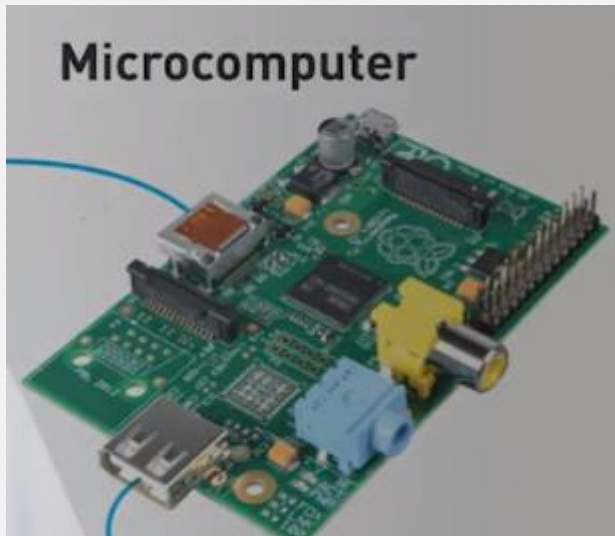
Product Infraestructure

The Wheelchair it self is the product infraestructure

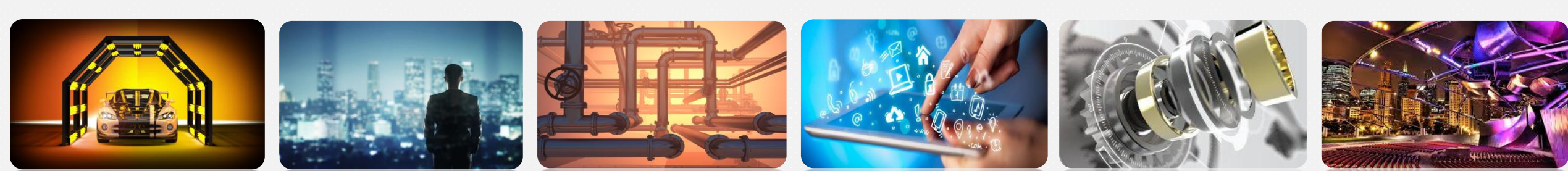




Sensors



Phenomena	Sensors	Data
Motion	Accelerometer GPS Gyroscope	Position Velocity Acceleration
Forces	Force transducer <input checked="" type="checkbox"/> Pressure transducer	Force Pressure Moment Torque Stress Strain
Location/Position	GPS Gyroscope Electronic compass Proximity sensor	Absolute position Relative position <input checked="" type="checkbox"/>
Heat	Thermocouple Digital thermometer Radiation sensor	Temperature Heat flux Conduction Convection Radiation Insulation
Light	Photovoltaic cell Light meter Video camera Camera Autofocus	Wavelength Intensity Color <input checked="" type="checkbox"/> Optics Amplitude

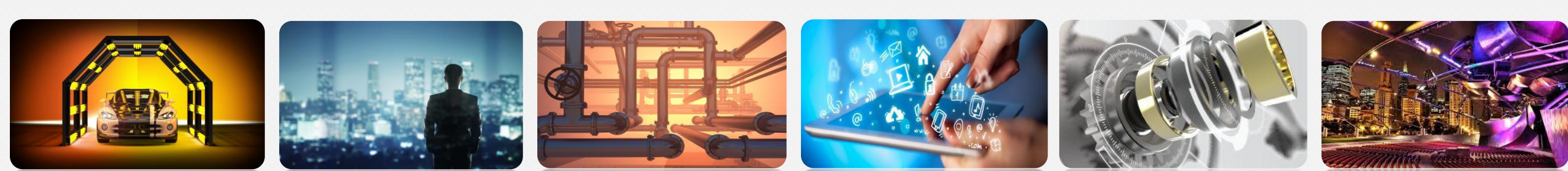


Connectivity

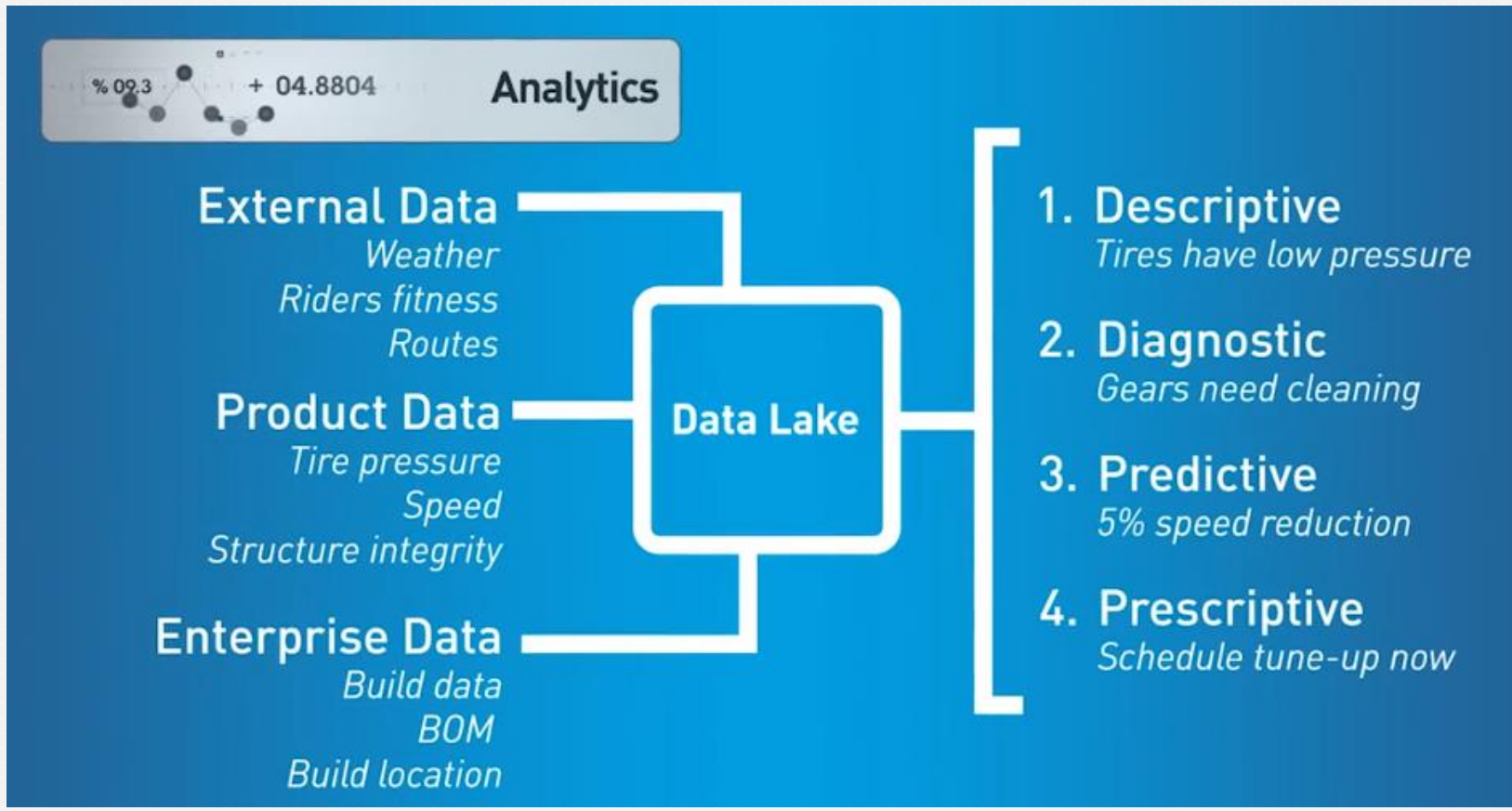


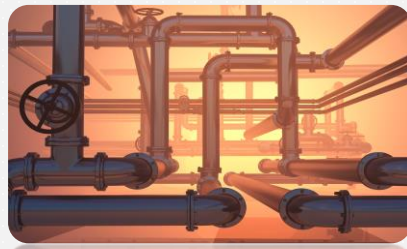
The data will be sent via WiFi to the Thingworx server





Analytics





Smart Apps

The screenshot shows a web browser window displaying a ThingWorx application. The browser's address bar shows "about:blank". The application interface features the ThingWorx logo (A PTC Business) and a central image of a wheelchair. Surrounding the wheelchair are several data points represented by circular gauges:

- STEERING ANGLE: -13 DEGREES
- ACCELERATION: -1164 M/S²
- SUSPENSION LINK ANGLE: 12 DEGREES
- SPEED: 52.0 MPH

At the top of the browser window, there are navigation buttons (back, forward, refresh) and a toolbar with icons for "Aplicaciones", "Herramientas", "Calidad", "PTC", "Schneider", "AVEVA", and "Sn".



Use Case

PEOPLE with cognitive/motor/sensory impairment, whether it is due to disability or disease, rely on power wheelchairs (PW) for their mobility needs. Since some people with disabilities cannot use a traditional joystick to navigate their PW they use alternative control systems like head joysticks, chin joysticks, sip-n-puff, and thought control [1]–[5]. In many cases PW users have difficulties with daily maneuvering tasks and would benefit from an automated navigation system. Mobility aside, people with disabilities are heavily reliant on their caregivers for eating and drinking, handling items, and communicating with others, especially in large groups.

To accommodate the population of individuals who find it difficult or impossible to operate a PW, several researchers have used technologies originally developed for mobile robots to create smart wheelchairs [4], [6]–[9]. A smart wheelchair (SW) typically consists of either a standard PW base to which a computer and a collection of sensors have been added, or a mobile robot base to which a seat has been attached [10]. Pineau et al. 2011 argue that the transition to wheelchairs that cooperate with the user is at least as important as that from manual to powered wheelchairs, possibly even more important since this would mark a paradigmatic rather than merely a technological shift [11].

Thank You



Confidential & Proprietary

