Reimagining Manufacturing with Digital Technologies

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Make Digital Real | Execute Smart

The Digital Five Forces and Composite Forces

How AI can help Reimagine Businesses?

Neural network based AI systems with hardware acceleration aided by GPUs and FPGAs have surpassed human cognitive capabilities in key areas

Humans

AI

5.1% — Voice Transcription (word error rate) — Google: 4.9%

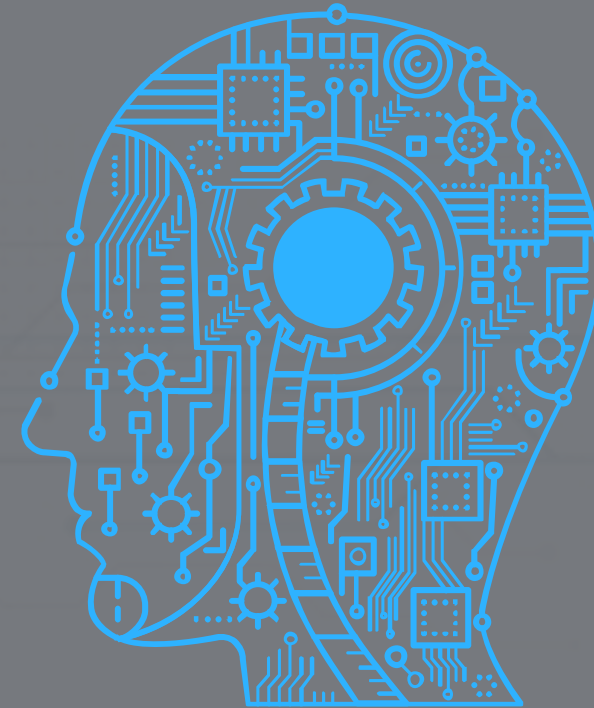5.1% — Image recognition (ImageNet top 5 categories error) — ResNet152: 2.25%

Dermatologists: 86.6% — Detecting skin cancer based on images — CNN: 95%

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Enterprise Reimagination Driven by Digital

Leveraging next generation technologies to
reimagine an enterprise along six dimensions

Business Model

Products & Services

Customer Segments

Sales Channels

Business Processes

Enterprise Experience

DOMAIN + TECHNOLOGY + CREATIVITY + CONTEXT

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Digital Creates New Enterprise Equity

Business Model + Products & Services = **Data Equity**

Customer Segments + Sales Channels = **Brand Equity**

Business Processes + Enterprise Experience = **People Equity**

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American Engine Manufacturer Creates New Source of Revenue with Digital

Business Challenge

Maturing product lines in competitive industry limit revenue growth

Lack of demand visibility for spare parts

Customer dissatisfaction due to sudden product failures

Solution

Telematics data from engine transmitted to Cloud in near real-time

Stream processing of engine telematics data using Big Data on the Cloud to proactively predict failures hours in advance

Advisory messages to driver with route map to nearest service station

Benefits

Proactive prediction of engine failures prevents unexpected breakdowns

New revenue source from predictive maintenance service

Use of actual engine data (compared to limited test-bed data) for product design improvements

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Global Oil & Gas Engineering Leader Aspires to Create New Business Models with Digital

Business Challenge

Need to find new sources of revenue leveraging core capabilities

Lack of visibility into platform performance post installation

Difficult to penetrate maintenance business due to heavy dependence on skilled workforce

Solution

Digital Twin of operational platform with sensor data integrated with platform PLM model

Real-time data ingestion, distribution and processing using modern Big Data technologies and AI

Prioritized statuses, alarms, and actuations for predictive performance

Benefits

New commercial offering of digital enabled maintenance services with disruptive business model

Increase project win rate by differentiating from a technology enabler perspective

Platform for add-on new services and better platforms design

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Middle-east Shipping Company Enforces Safety Policy with Computer Vision

Business Challenge

Accidents causing avoidable loss and production downtime

Manual enforcement of safety is error prone and costly

Cannot install additional equipment and have to use existing cameras and sensors

Solution

Convolutional Neural Network based Deep Learning algorithms to detect presence or absence of personal safety equipment on workers

Lowering of bandwidth usage by using low frame rate (as low as 1 frame/second)

Evidence stored based on activity detection

Benefits

Accurate detection of safety equipment use violations

Use of already installed cameras. No additional hardware investment needed

Reduction of safety related unplanned downtime

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Global Printer Manufacturer Creates New Distribution Model for Consumables

Business Challenge

Unexpected toner outage results in lost productivity and customer dissatisfaction

Lack of demand visibility causes inventory mismatch and pricing inefficiency

Channel dependency removes direct connect to consumers

Solution

Sensors in printers to detect toner ink levels and communicate to central Big Data system

Streaming data collection and processing at very high data velocities

Interconnect with e-commerce system to enable automatic ordering of ink based on prior contract

Benefits

Better experience for customer due to availability of ink always

Better prediction of inventory levels, demand and production forecasting

Direct connect with customers

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Australian Retailer Wants to Reduce Shrinkage with AI

Business Challenge

'Sweet-Hearting' problem and other internal theft in liquor stores leading to 1/3rd of all shrinkage

Manual enforcement of Point-Of-Sale discipline is costly and unpleasant

Cannot install additional equipment and have to use existing store setup such as cameras

Solution

Advanced 'activity detection' algorithms using Convolutional Neural Networks

Video from existing cameras

Interconnect with Point-Of-Sale data for forensic evidence

Benefits

Reduction of $25 million in shrinkage per year

High-level of accuracy without additional hardware investment

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European manufacturer reduces unplanned downtime with predictive analytics

Business Challenge

Unplanned conveyor belt downtime costly

Scheduled maintenance also not most optimal

Excess inventory to account for possible breakdowns

Solution

Inexpensive smart sensors retrofitted into existing conveyor belt motors

Comprehensive rules for condition monitoring and prediction of failures

Benchmarking of quality and efficiency through KPI monitoring

Benefits

Excess inventory no longer needed to cover possible breakdowns

Parts and supplies replaced only when needed

Cost effective and highly scalable

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Global Car OEM Wants to Personalize Cabin Experience with AI

Business Challenge

Opportunity to provide personalized in-car experience for comfort and safety features

Drivers not keen on intrusive and user driven personalization

Cost of car components need to be kept to minimum

Solution

Neural network based vision algorithms for driver identification, emotion detection, gaze direction and distraction level

Driven by video from in-cabin camera

Integration with car systems for proactive responses from car

Benefits

Effective personalization without user intervention

Single in-cabin camera can detect and track driver and passenger behavior – cost effective

Drastic improvement in safety in addition to occupant comfort

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