AG (Re)Evolution

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Siena, Tuscany
May 08th, 2018

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Company Structure

CNH INDUSTRIAL

Agricultural Equipment	Construction Equipment	Commercial Vehicles	Powertrain	Financial Services
CASE IH AGRICULTURE	CASE CONSTRUCTION	IVECO	HEULIEZBUS	FPT POWERTRAIN TECHNOLOGIES	CNH INDUSTRIAL CAPITAL
STEYR TRAKTOREN	NEW HOLLAND CONSTRUCTION	IVECO ASTRA	MAGIRUS		
NEW HOLLAND AGRICULTURE		IVECO BUS	IVECO DEFENCE VEHICLES		

The Agricultural Evolution

1.0

Mechanization

- Introduction of tractors
- Increase in efficiency
- But labour-intensive system
- Relatively low productivity

2.0

Green Revolution

- New agronomic management practices
- Use of fertilizer and pesticide
- Improve seed quality
- Increase yield

3.0

Precision Ag

- Guidance systems
- Yield Monitoring
- Variable Rate Application
- Telematics
- Data management

4.0

Digital Farming

- Farm Management system in real time
- Added-value services
- Automation capabilities
- Improve Agri processes & food value-chain (data platforms)

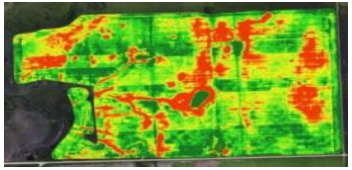
1900 — 1950 — 1990 — 2010 — Time

Precision Technologies

Planning	Soil Management	Seeding / Planting	Application	Harvesting

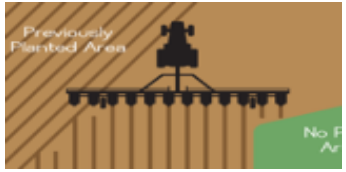
Which allows them to…

Make informed decisions and select the right seeds & fertilizers

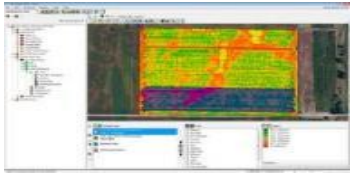


Guide the correct paths and manage in-field variability

Guide the correct paths and manage application rate



Plant/ Fertilize / Spray only where needed



Mapping & Data Collection

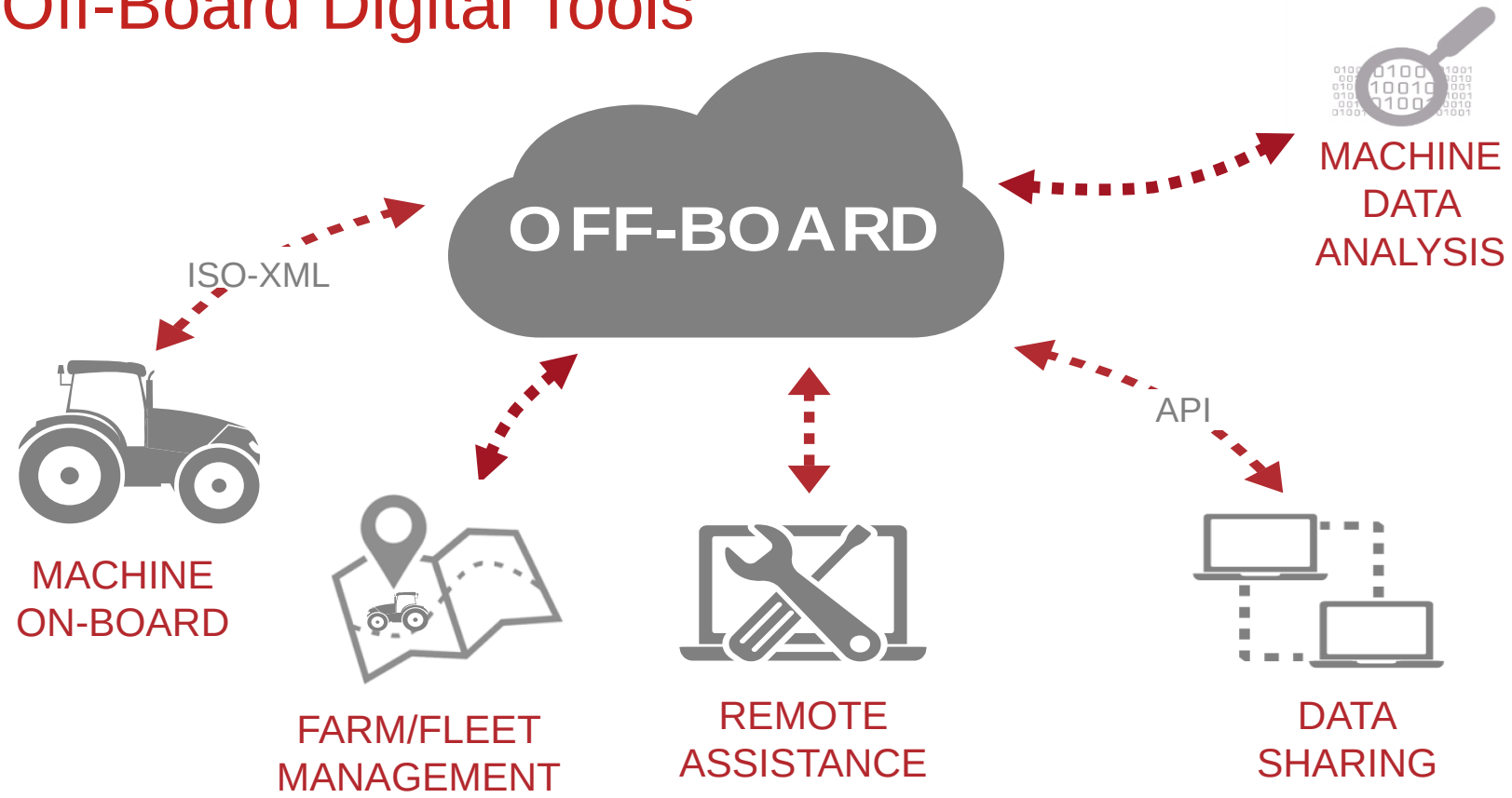
Enablers:
- Sensors
- Positioning
- HMI & Usability
- Wireless communication
- Mechatronics
- Path planning
- Web & cloud computing

The connection between all stages is the data stream

Need for Off-Board Tools

Results:
- Knowledgeable Farm Management Decisions
- Machine/Operator Efficiency
- Lower Input Costs
- Higher Yield Production
- Optimized Systems

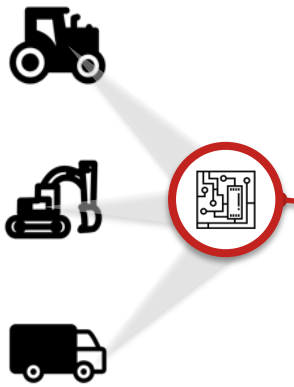
Off-Board Digital Tools



CNH Defined / Fully Integrated

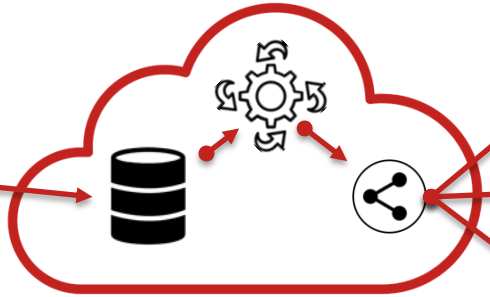
Connected CNH Industrial program

Vehicles



Vehicles are equipped with a device very similar to a **computer** that is able to collect **vehicle data** (such as odometer, working hours, fuel consumption, etc.) and **operational data** (such as agronomic information, driving style, etc.)

Service Delivery Platform



Data flowing from vehicles are transmitted through a **telecom network** to a **Cloud** storage and infrastructure…

… and are made available for **elaboration and statistical/historical analysis**…

… and in the end are **published** to be used for any purpose by a **specific business platform**

Business Platforms

Business platforms provide business-specific **applications** based on vehicles' data to offer to the customers **value-added telematic services**, improving customer operations as well as enabling 3rd party services integration.

Customers

- *Land monitoring*
- *FMIS*
- *Data Exchange*
- *…*

- *Fleet management*
- *Failure alerting*
- *….*

- *Driving style eval*
- *Fuel advisory*
- *Intelligent safety*
- *…*

Customers can easily **access the applications** provided by the business platforms wherever they are, should they control their fleets or verify the driving style of their drivers or understand the status of the yield or plan maintenance operations, or…

CNH Industrial Ecosystem

DATA

Agriculture Data Owner

- **Agrochemical**: Bayer, Dow, Syngenta, Monsanto, Dupont, BASF
- **Ag Data Provider**: SST Software, NOAA, esri, WinfieldUnited, Climate FieldView, Geosys
- **Ag equipment**: John Deere, CNH Industrial, Mahindra, Valmont, AGCO, Claas
- **Farm Coops**: Olam, Farmlands, CHS, Land O'Lakes, Inc.
- **Government & Research Institutes**: USDA, GOV.UK, ICRISAT
- **Ag Retail**: Growmark, Wilbur-Ellis, Crop Production Services
- **Food and Beverage**: Nestlé, Barilla, Arla, Cargill, Unilever
- **Livestock**: JBS, Australian Pork, Douglas Lake Ranch Inc.

Other Data Sources

Demand | Published | Weather | Crop inputs | Crop output | Imagery | Genome | Geospatial | Regulatory | Statistics and reports

PLATFORM

CNH Industrial

CNH Industrial Trusted Cloud platform

Create global, secure data exchange and transactional platform for all agriculture data from seed to fork

GTM

CNH Industrial Ecosystem

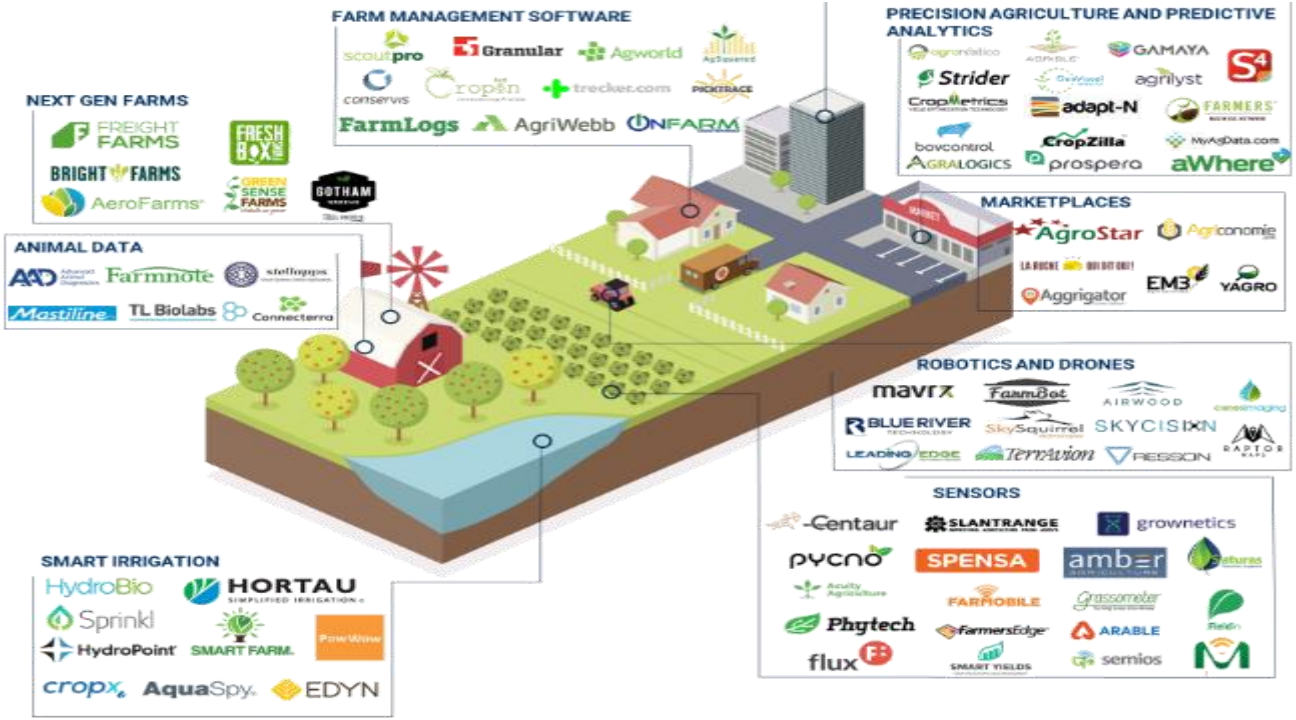
Ecosystem empowered Ag value chain

Agriculture Value Chain

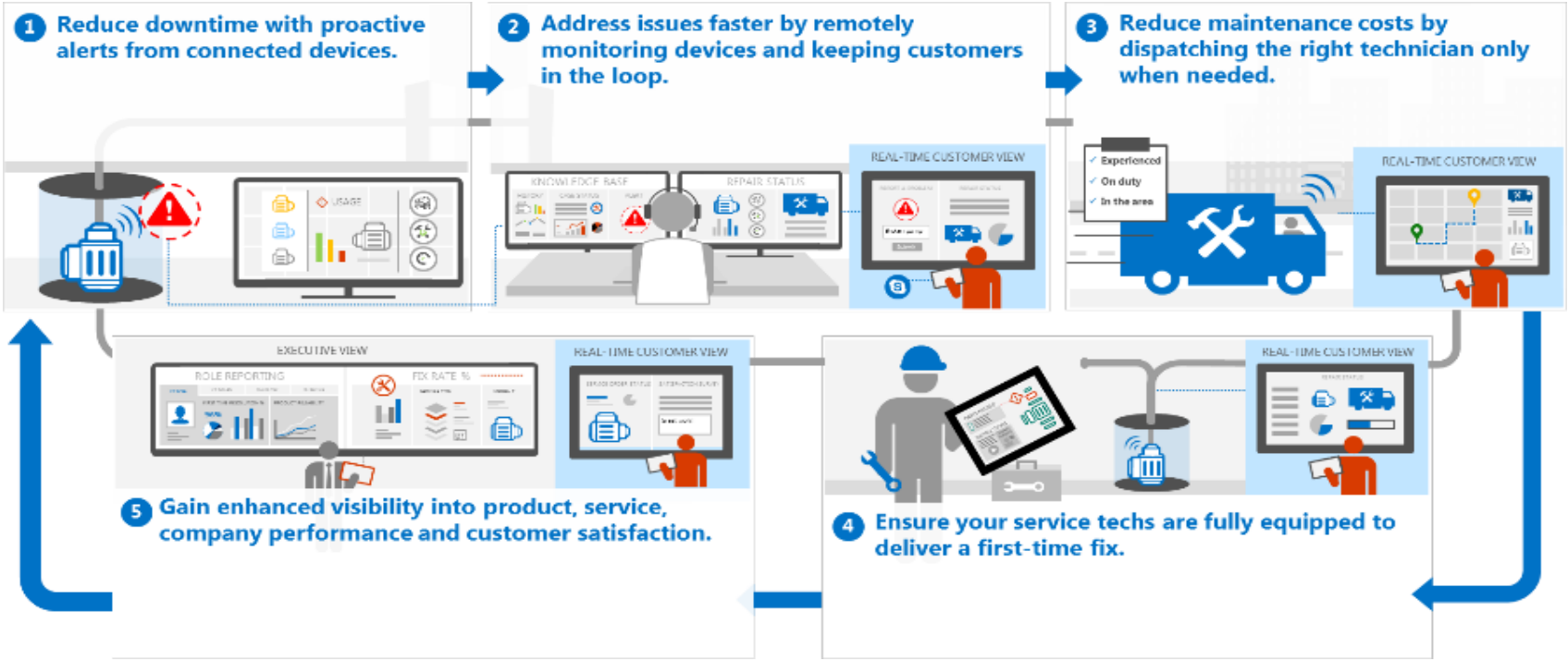
- **Agrochemical** – Seed, Herbicide, Fertilizer
- **Ag Equipment** – Tractor, Irrigation, Drones
- **Farmer** – Plant, Live stock,
- **Co-ops** – Consultants, exporters
- **Food & Bev** – Food, biofuel, raw material
- **Distribution** – Retail distribution, export
- **Retailer** – Grocery, mass merchants
- **Consumer** – Individual, consumer groups

AgTech: Startups and Unconsolidated Offerings

- Highly Dynamic space, with new entrants daily enabled by **Traditional Companies, Venture Capital and Private Equity**



Remote Assistance: a sample scenario



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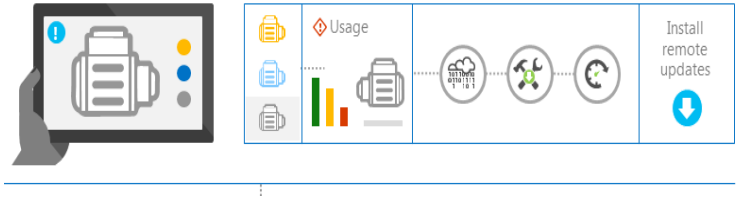
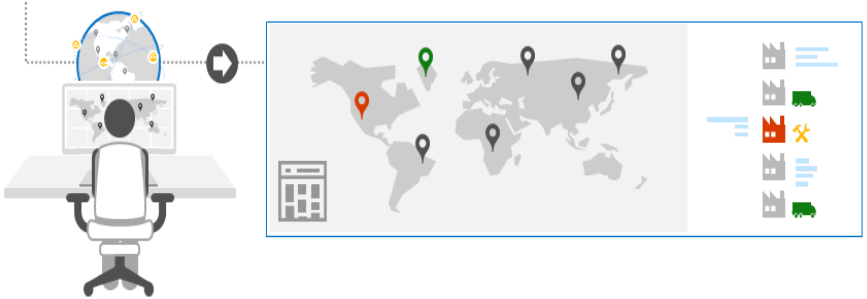
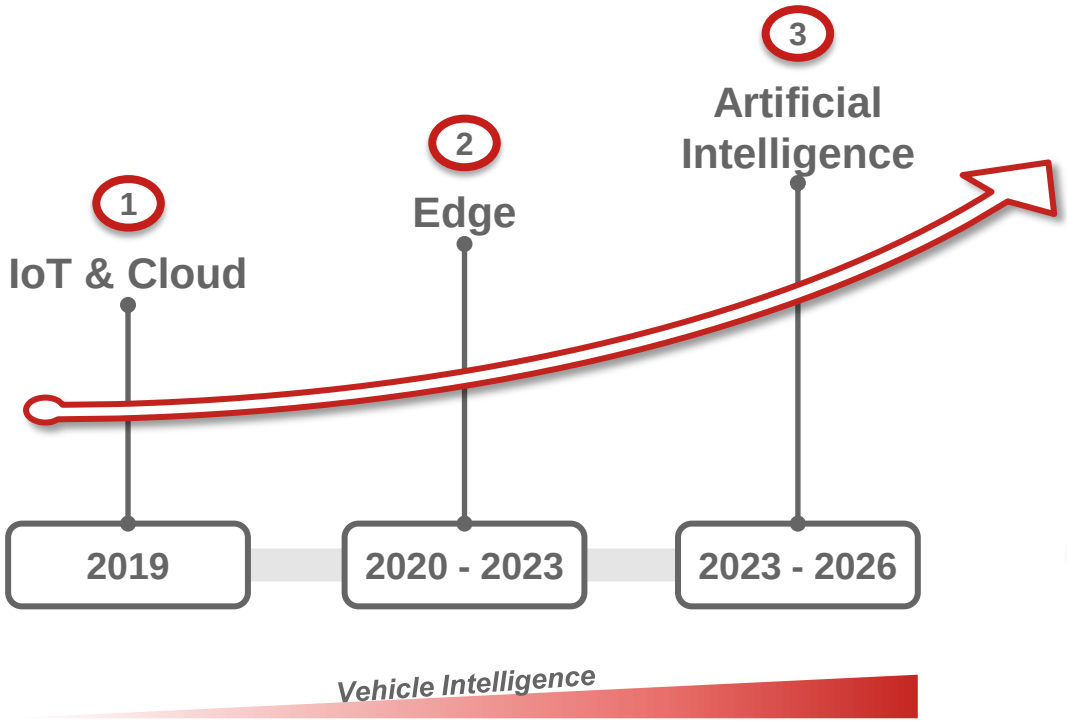




CNH Industrial Digital Roadmap



1

IoT & Cloud are the enablers to exploit vehicle's connectivity, providing value added services such as **Control Room** and **flexible maintenance plans**

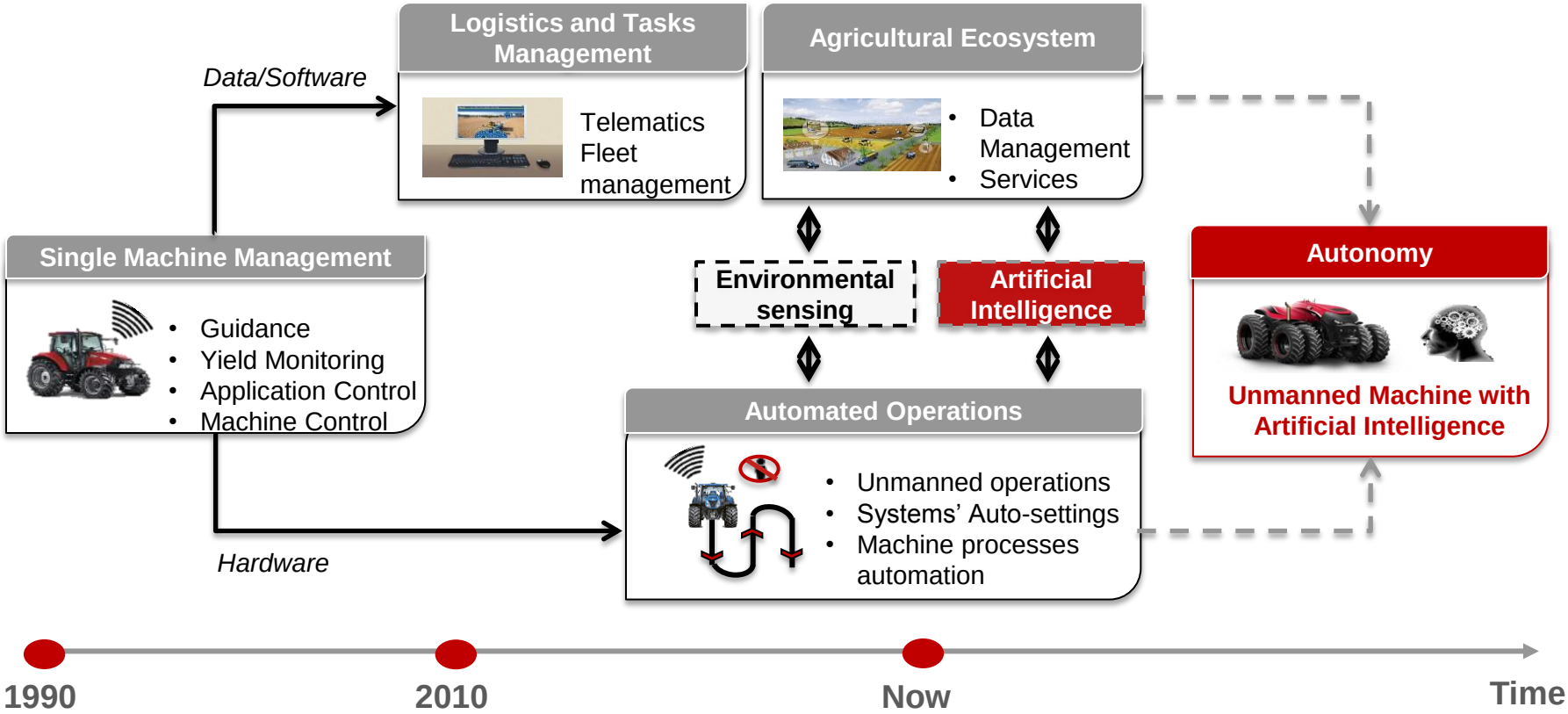
2

Edge technology will provide the vehicle with *enhanced computing capabilities* allowing services such as **Coordinated Vehicle Control** and **Advance Machine Auto-Setting**

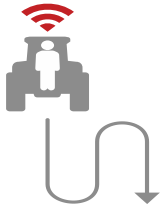
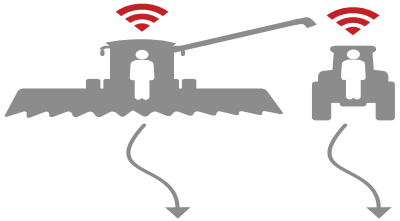
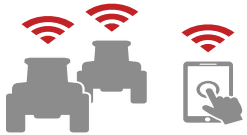
3

Artificial intelligence will extend the set of services provided on the vehicle offering **the next step of Autonomous Vehicles** through **cognitive capabilities**

CNH Industrial Roadmap to Autonomy



CNH Industrial Autonomy Milestones

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
GUIDANCE	COORDINATION & OPTIMIZATION	OPERATOR ASSISTED AUTONOMY	SUPERVISED AUTONOMY	FULL AUTONOMY
*All manned vehicles	*All manned vehicles	*Manned back-up	*In-field supervision of unmanned vehicles	*No local supervision
				
1999+	2018 +	2020 +	2023 +	2025 +

Evolution to Autonomy

Available now

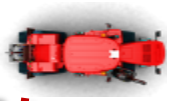
Access & Control
Hardware Components

Environmental Perception
Hardware Components

Remote Monitoring
Software

Machine Communication
Hardware Components

Planning
Software



Autonomy
Take decisions based on analytics and artificial intelligence

The Autonomous Concept Vehicle