HONDA

The Power of Dreams

Honda Industrial Italia – HIA solution for a **Smarter Manufacturing**

IBM Executive Briefing - “Supply Chain Visibility and Optimization for a smarter planet” - September 16 & 17, 2009 - La Gaude (Nice) -France

Honda Motor History

HONDA
The Power of Dreams

Honda Motor Company was founded in **1948** by **Soichiro Honda** and Takeo Fujisawa in Hamamatsu

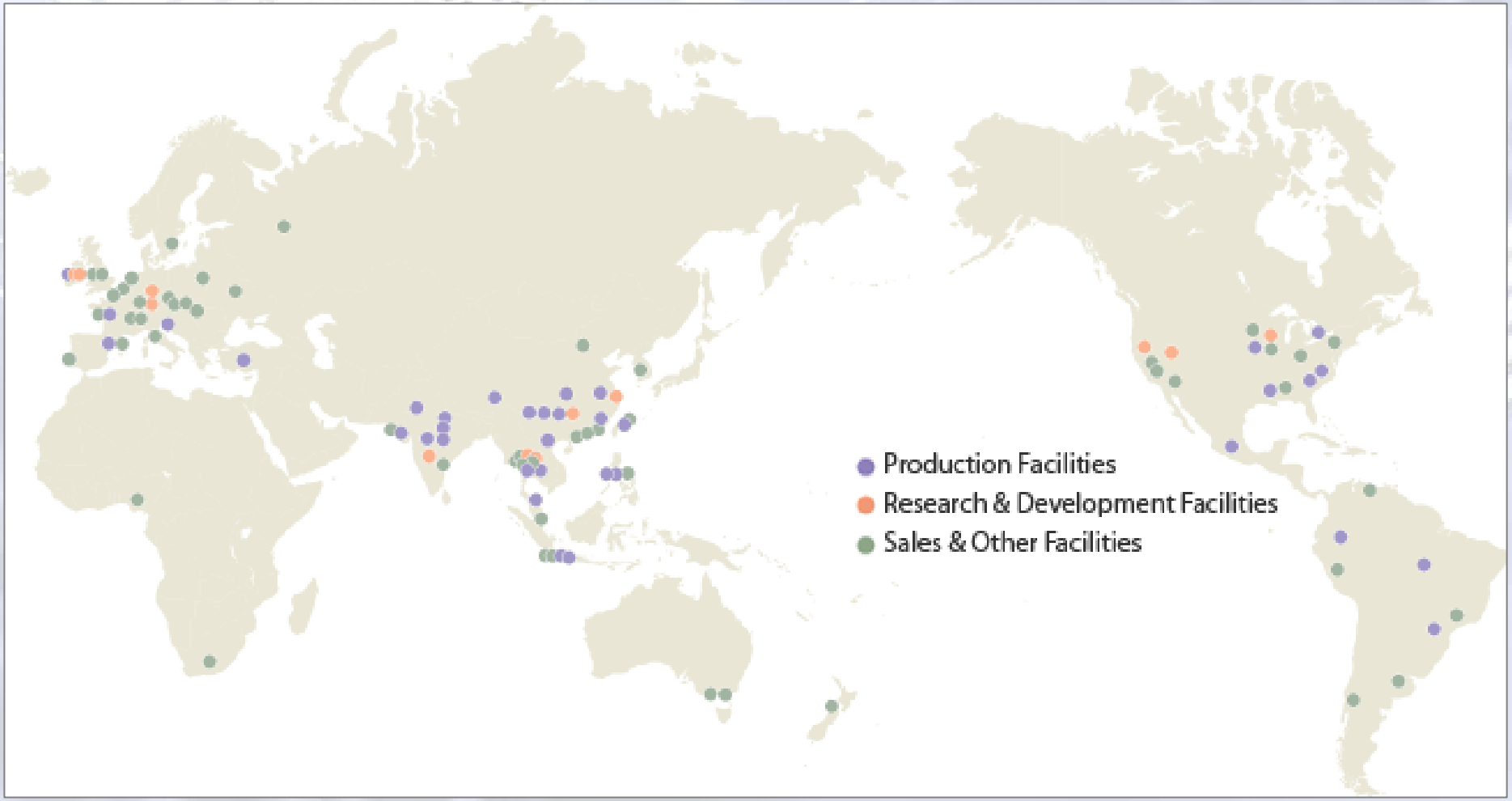
Soichiro Honda and Takeo Fujisawa

HONDA

Honda Motor Group

HONDA
The Power of Dreams

Honda Group comprises **507 companies,** a global network of **134 production facilities** in **30 nations** with about **167.000 associates.**



HONDA ITALIA INDUSTRIALE

HONDA
The Power of Dreams

"In 1971 our factory was the first established in Val di Sangro and afterwards many other factories followed, so that "Val di Sangro" became one of the most important industrial area in Italy.
I am proud to say that Honda Italia played a growing role in this area, thanks to the politic of continuous development and integration into the territory."

HONDA
The Power of Dreams

Honda Philosophy

"Action without philosophy is a lethal weapon.

Philosophy without action is worthless"

Soichiro Honda

HONDA

Honda Philosophy

HONDA
The Power of Dreams

Live the Honda Philosophy by Soichiro Honda:

Entertain the dreams which give us the strength to reach new products, new technologies and an outstanding quality system;

Promote the team work giving value to the importance of the individual.

Besides the awareness of such valuable principles, we are all available to share them with everybody.

HONDA

Honda Italy - History

HONDA
The Power of Dreams

1971 Honda I.A.P. Founded

1977 production start of the CB125 in a joint venture (50% of the shares owned by Honda motors)

1981 Honda motor acquired 100% of the stockholding

1982 the corporate name changed from I.A.P. to Honda Italia Industriale Ltd

1985 export of the XL125

1985 production start of the NS125 two stroke engine

1985 share capital increased to 16 billion lire

1987 export of the NS125 to Japan

1989 production start of the NX125 developed by local R&D

1989 Production start of the NN3 250 cc engine for export

1993 production start of the Bali SJ 50

1994 attainment of ISO 9002 certification

1994 production start of the dominator NX650, the first Honda maxi motor-cycle produced in Europe

1995 production start of the CB500

1995 production start of the engine GV100 for power equipment

1996 production area expanded to 140,000 sq.m.

1997 production start of the Transalp XL 600

1998 160.000 motor-cycles, maximoto and scooters produced

1999 attainment of ISO 14001 certification

1999 opening of the emission testing lab

2000 started 4 stroke engine scooters

2000 production start of the Transalp XL 650

2000 new office in Rome (HIR, HEM, HRE-I)

2001 production start of Hornet 600

2002 production start of new Pantheon F/i 4 stroke

2003 production start of models with ABS (CBF 500/600)

2004 start die casting plant

2004 attainment of Ohsas 18001 certification for safety

2005 Production new SH F/i (euro 3)

2006 installation V.O.C. plant (Volatile Organic Compounds) elimination

Production start CBF 1000 - PS 125/150 - SH 300

2007 production start “new” Hornet CB600

2008 attainment of EMAS certification

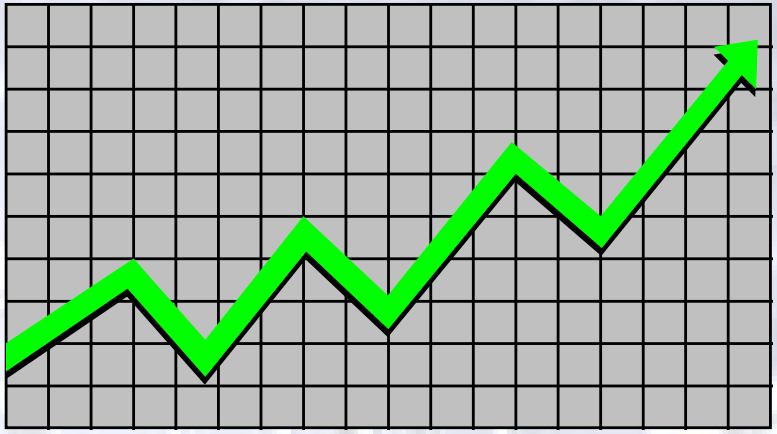
Production start new CB1000R

HONDA

Honda Italy – Smarter manufacturing Highlights

HONDA
The Power of Dreams

- **Improve factory's operative performances (50% reduction in revision campaign costs), with a dedicated Manufacturing Execution System**



- **A more efficient usage of operative resources (20% reduction in materials' movement costs), supporting better the manufacturing activities from initial scheduling to final after sales activities**

- **The combination of process and organizational changes, the enforcement of the operative processes through Consulting & IT integrated system, and the enlarged visibility brings benefit to all internal and external participants in the work-in-process network (with a project's ROI normally less than one year)**

HONDA

Honda Italy – Smarter Manufacturing

HONDA
The Power of Dreams

Introduction

Unsynchronized information causes a domino effect of problems for manufacturer.

How synchronize information with a single source of product with Rfid support can eliminate errors, improve customer and channel support, improve the tracing of products and processes, and the speed of product's after sales activities?

New traceability system, based on Rfid support

New Arianna IBM solution

HONDA

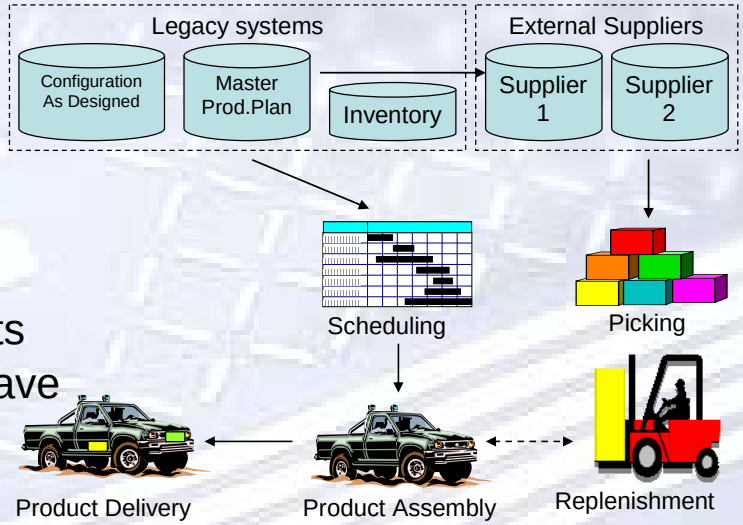
Why Arianna

Arianna in the mythology was the woman, who supported with a “thread” Theseo to exit from the labyrinth, where he killed the Monster “Minotauro”

Honda Italy - Problems statement

HONDA
The Power of Dreams

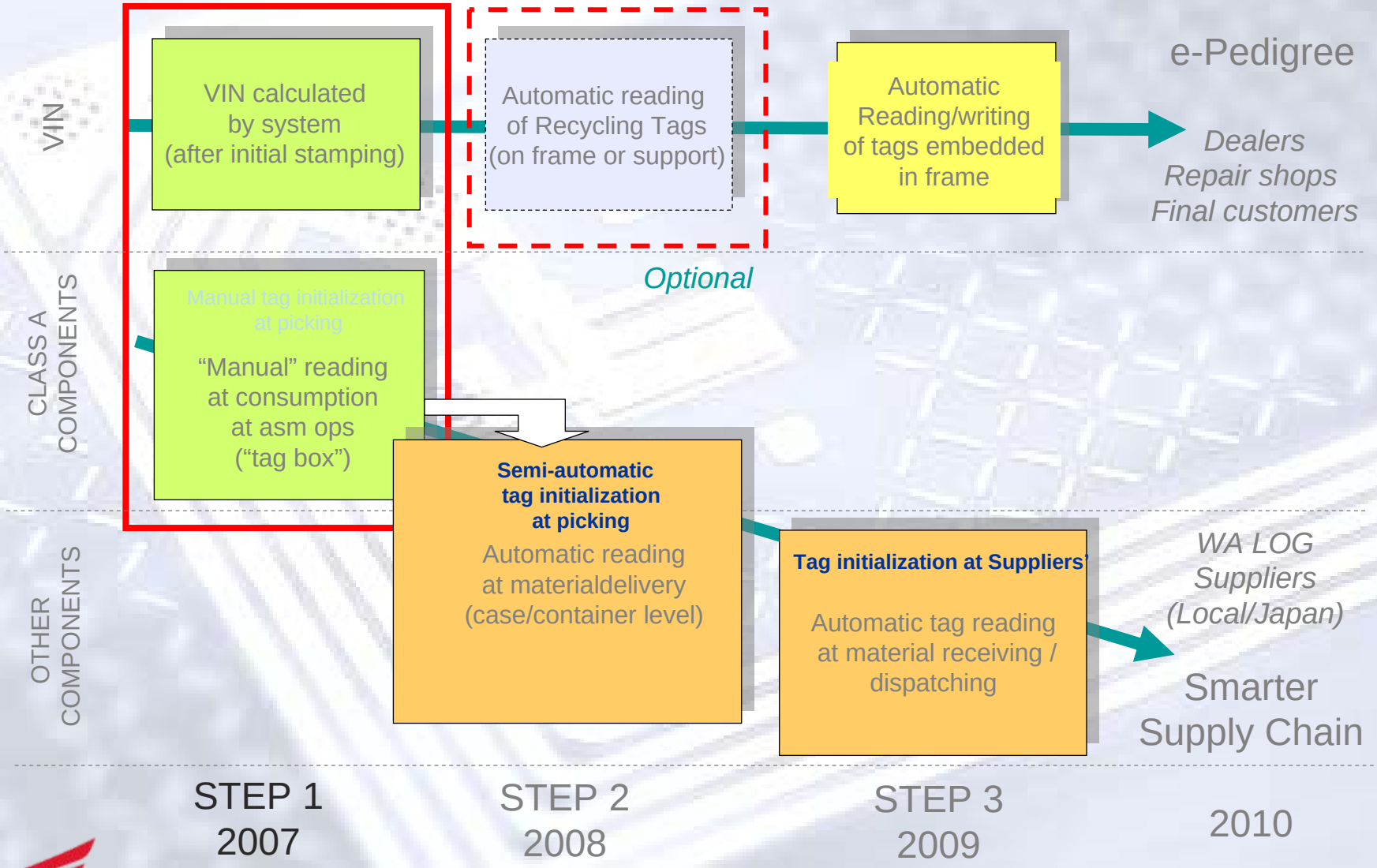
- **Currently, manufacturing resources and operations activities were scheduled or replenished by systems using "push" structured business rules. These rules were based on statistics of previous similar activities, with limited information of the real work in process of the manufacturing cycle. The previous system limitated operational efficiency.**
- **Most systems were challenged by sporadic & manual inventory activities that result in:**
  - Inaccurate counts
  - Additional man hours
  - Inadequate assembly documentation for tracing parts (for example, which parts from which production lot have been used for which final products
  - Loss of valuable real-time information



- **These challenges had a direct effect on the accuracy and granularity of final information for the finished product; and this may inhibit the manufacturer's ability to respond in a timely manner when confronted with recalls and to accurately fulfil legal requirements for product liability.**

HONDA

Honda Italy – Smarter Manufacturing Stepped Roadmap



Honda Italy – Smarter Manufacturing
Preliminary guidelines and constraints

HONDA
The Power of Dreams

- **General guidelines**
  - VIN progression tracking along the supply chain
  - Pull approach in the operative production management
  - Changement on management support (Communication, Organizational alignment, Operational training)
  - Future extension to engine line assembly
- **Technical Description**
  - The VIN code is stored on a RFID Tag/Label, and read on specific RFID reading points on the assembly line
  - Tag of Critical Parts, attached to first item of the critical parts cage at the Location, is read using a RFID reading drawer/hole
  - The RFID System check all the Tag reads and sends Alerts or Notifications for errors during operations or for parts Replenishment
  - The RFID System creates a request of critical parts to supply to the assembly line
- **Benefits of new RFID system**
  - Determine the cadence of VIN's along the assembly line
  - Better tracing of the associations between Critical Parts and processed VIN.
  - Reduce error from free manual operation and middle check association
  - Improve Critical Parts availability at assembly line and reduce assembly line stops due to Critical Parts shortage

HONDA

Honda Italy – New traceability system

HONDA
The Power of Dreams

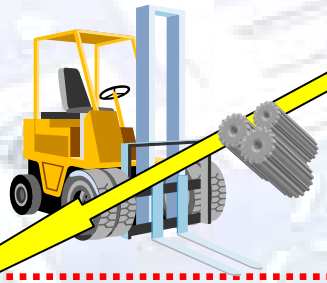
1 2 3 i 28 29 30

ASSY LINE

VIN: ZDCS987F00005050
TAG: E0040657T7A
POSITION: 0

VIN: ZDCS987F00005050
POSITION: i
Microlot: N00001167
Component: fork assy

VIN: ZDCS987F00005050
POSITION: 60
Microlot: N00001167
Component: fork assy

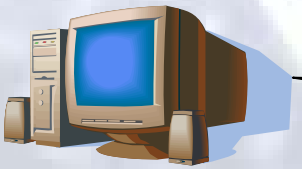


WAREHOUSE HONDA

Picking (ROL)

WA-LOG

NA System

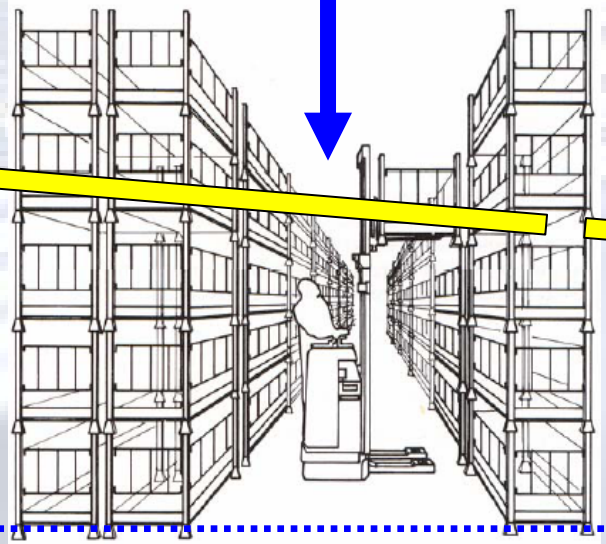


TAG VIN

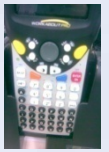
HF/UWB

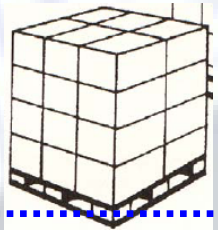
TAG microlot

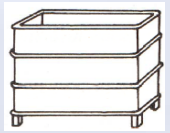
HF/UWB



Microlot: N00001167
Component: fork assy
Quantity: 120







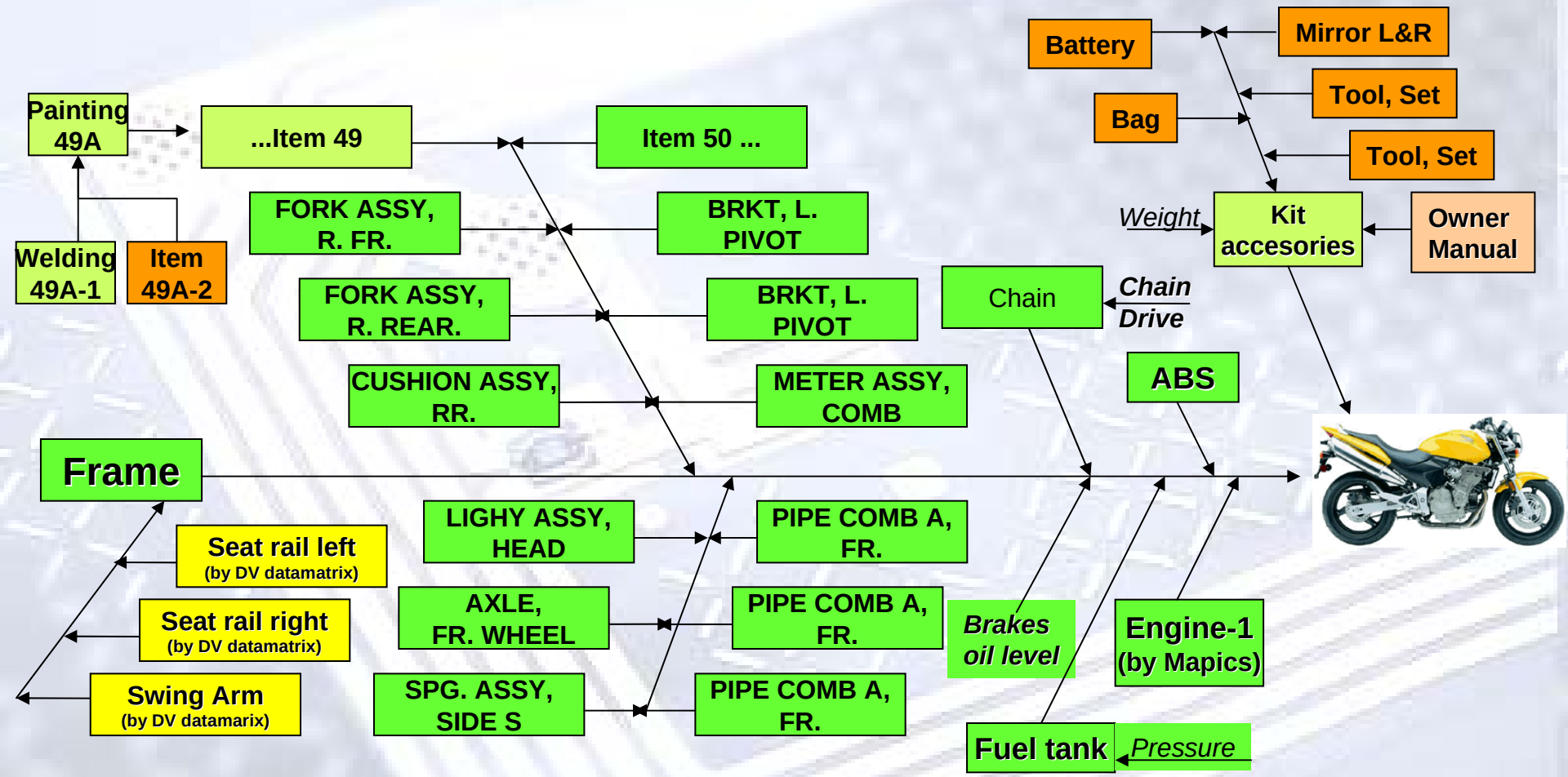
Honda Italy – New traceability system

HONDA
The Power of Dreams

HONDA

Honda Italy – New traceability system

HONDA
The Power of Dreams



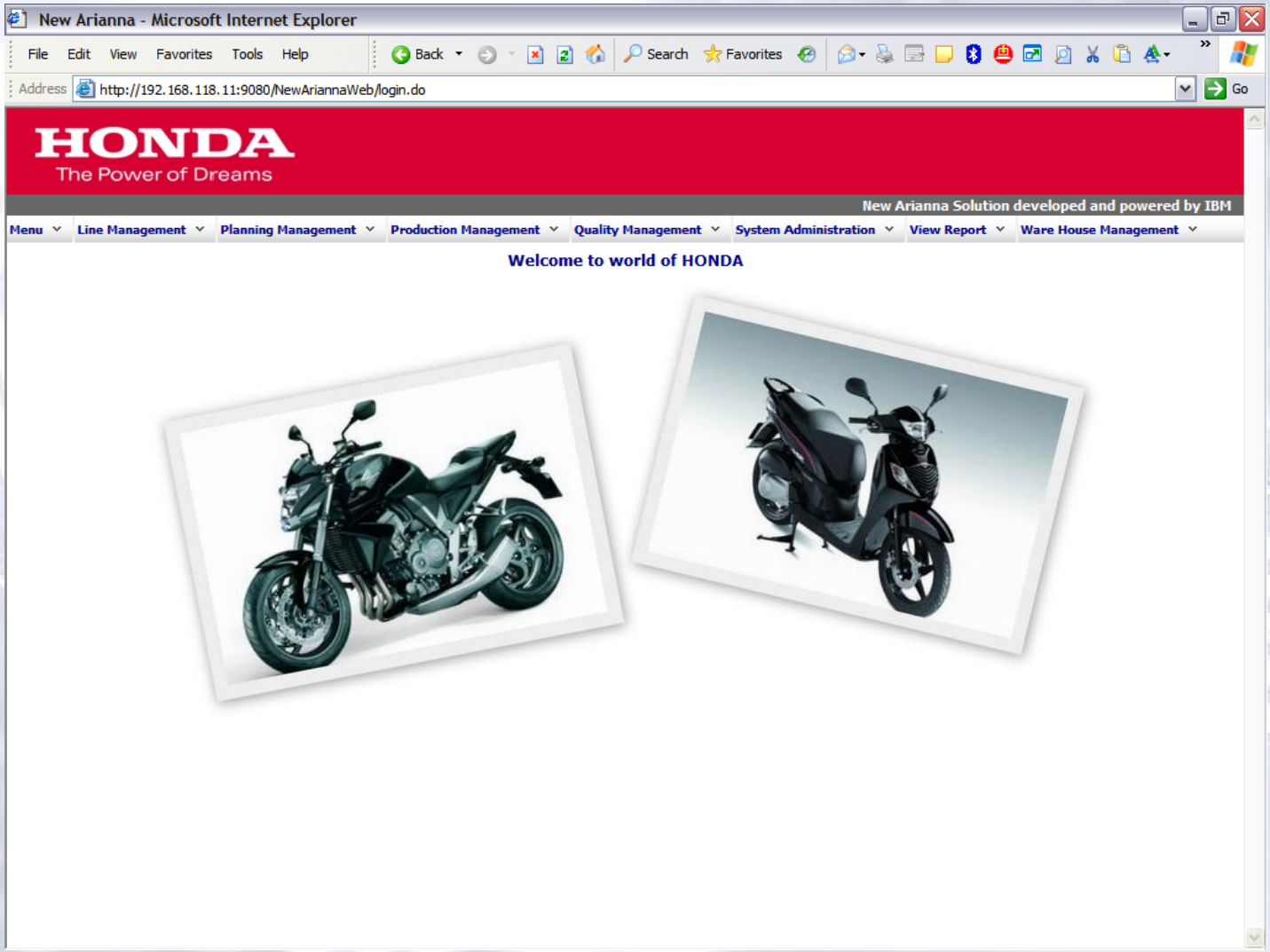
Legend: **Piece by piece**; **by microlot;** by picking

New Arianna NA-Assembly	NA-Sub assembly	Supplier lot	Supplier by ASN	Other automa-tic traceability	Manual traceability	any traceability

Process Parameter

Honda Italy – New Arianna solution

HONDA
The Power of Dreams



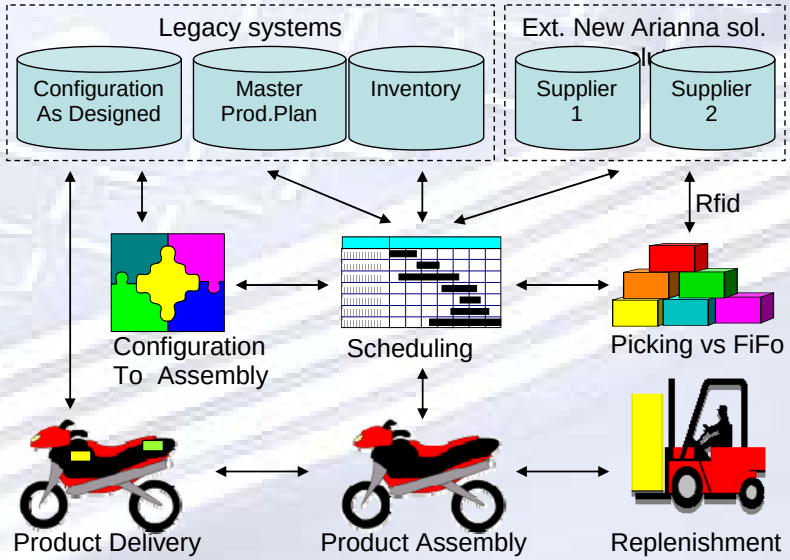
HONDA

Honda Italy – Smarter Manufacturing Business goals

- The business goals of Work-in-Process Management are more efficient use of operative resources and increased visibility into the supply chain and manufacturing process. This includes support of parallel manufacturing activities from scheduling to after-market requirements. This goal can be achieved through complete and real-time tracking of manufacturing activities and related resources. The benefits of this approach are outlined below at the individual steps of a manufacturing cycle:

Table 1. Work in process: Before and after implementation

Before	*After*
Visibility of activities' scheduling	Visibility of real products completed and on-going production cadence
Visibility of resources' replenishment	Visibility of actual requirements on the production lines
Sporadic inventory	Real-time inventory of each manufacturing activity completed
Production outages	Immediate notification of incorrect or missing items or process parameters out of limits
Documentation of production as planned	Tracking of each item assembled and parameters contained in final products
Product configuration documentation as planned	Accurate final product configuration as built



Honda Italy – Smarter Manufacturing
Operative goals

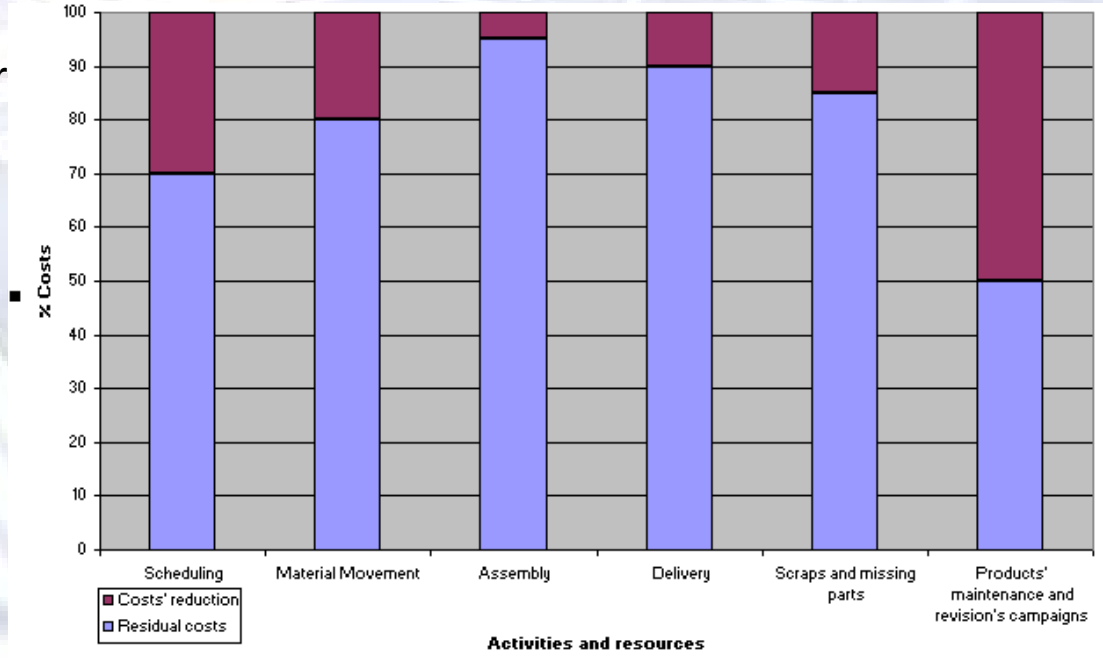
HONDA
The Power of Dreams

- **More support of production plans and pickings to other assy lines / subassy and esternal suppliers (see detailed presentation already sent)**
- **More items to trace in maximoto line**
- **More assy lines to trace (Scooter,Engine,Power)**
- **More subassy lines to trace hard (Fuel tank, ABS subassy, ect....)**
- **More items to trace soft (Microlot dispatching vs picking)**
- **More process parameters to check, record and analyse**
- **Microlots suggested vs FiFo logic**
- **Monitoring of traced items not assembled/recorded**
- **Configuration as mantained to trace**
- **Other microlot's types to trace (scraps, ect...)**
- **Applicable documents vs item p/n**
- **Worker tracing versu worker stations**
- **Operative errors and alarms monitoring**
- **Monitoring of assy line unplanned stops**
- **More support to the replenishment activities**

HONDA

Honda Italy – Smarter Manufacturing
Operational benefits

- Employees' time used to manually collect current production information and then reschedule production activities several times a shift
- Employees' time used for material receiving, movement, picking and replenishment in the production lines and returning unused items to the warehouse, with parallel urgent replenishment demands for last-minute scheduling and production changes
- Production workers' time wasted waiting on missing items or assembling wrong items
- Delivery workers' time lost after production to add missing items or replace incorrect items
- Missing detailed data to analyze and learn from real production timing data and production errors
- Unavailability of final product configuration details making after-market recalls difficult in identifying the defective products

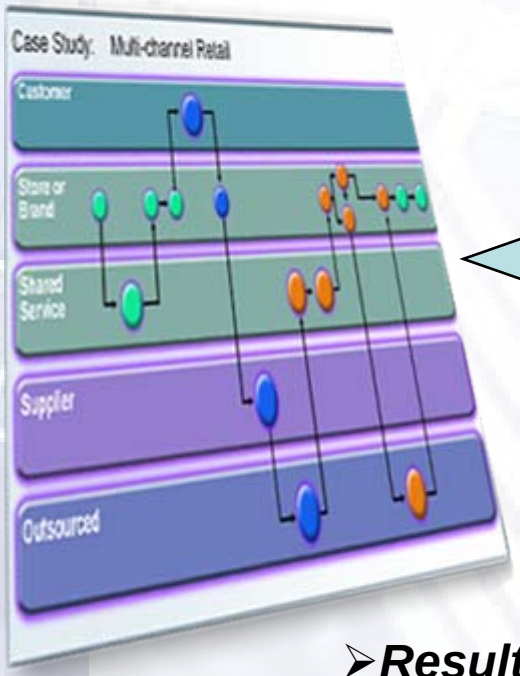


Honda Italy – Smarter Manufacturing
Rfid solutions and SOA enable process innovation

HONDA
The Power of Dreams

Business Operations Domain

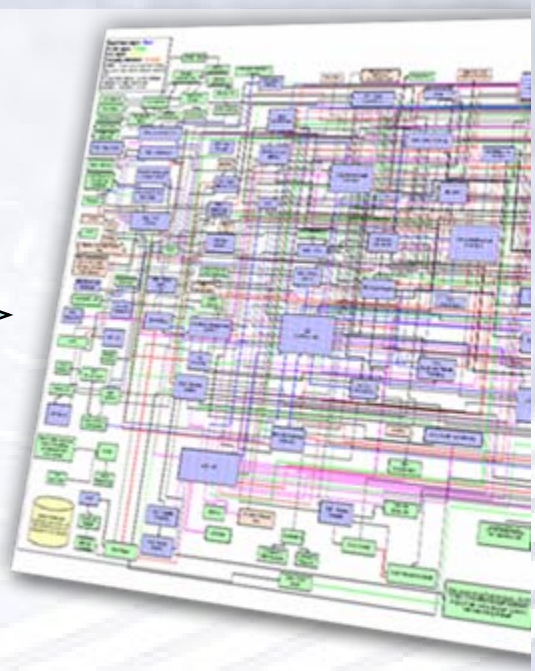
IT Domain



SOA enables the business flexibility and responsiveness required for process innovation.

RFID Enabled Business Processes

New insights from RFID and sensor data are a catalyst for SOA business process change.



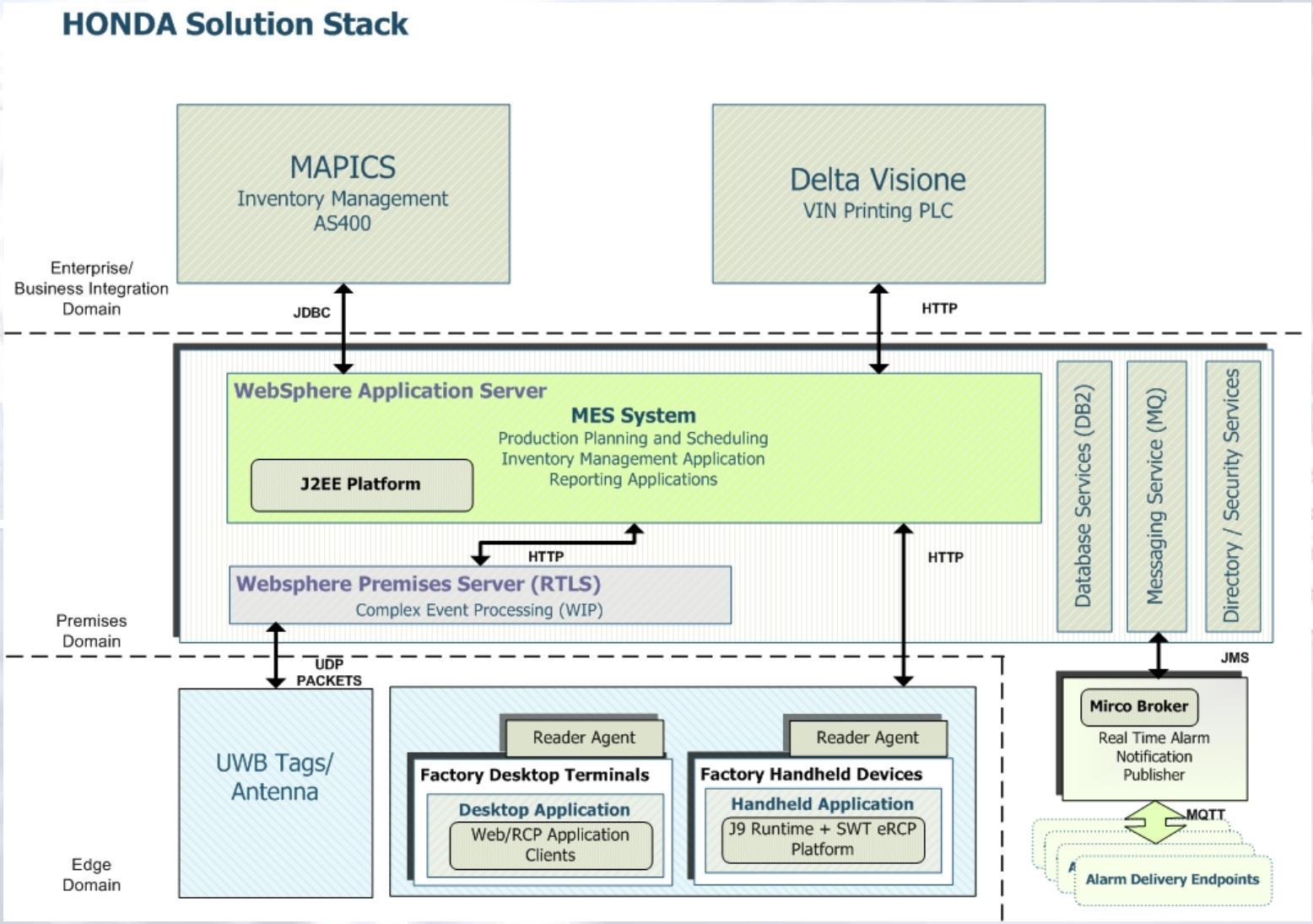
➢***Resulting in Faster Time to Value: The first time & ongoing…***

Honda Italia has chosen IBM, our partner from 1982, because IBM offers a comprehensive solution across virtually all middleware, integration platforms and portal platforms, with the robust development tools we need to succeed.

HONDA

Honda Italy – Smarter Manufacturing Solution stack

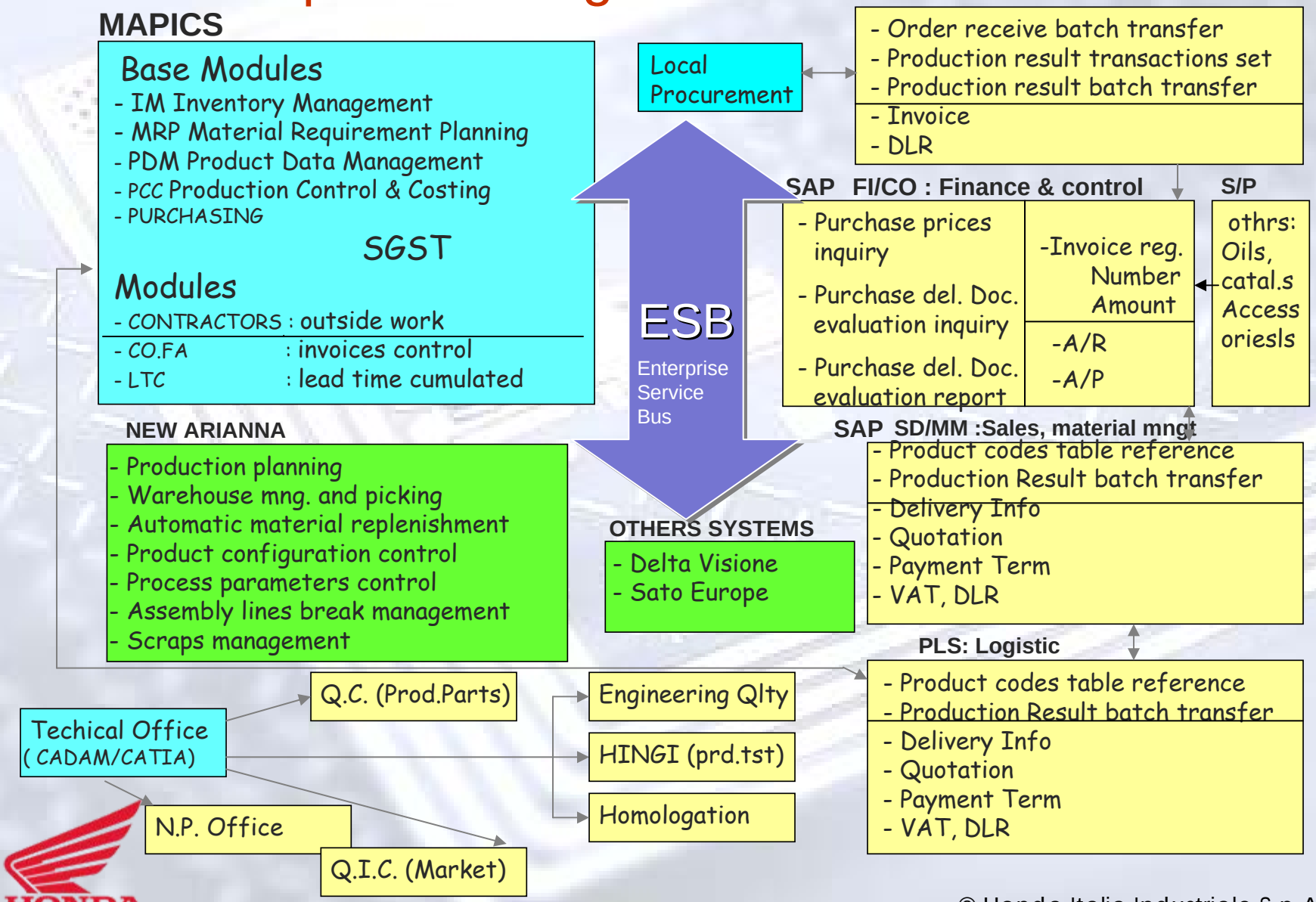
HONDA
The Power of Dreams



HONDA

Honda Italy – Smarter Manufacturing

Solution component integration via ESB



Honda Italy – Smarter Manufacturing
New Arianna IBM Solution & Products' Support

HONDA
The Power of Dreams

New Arianna is built on a strong foundation of IBM System hardware.

- **Honda deployed a total of three IBM** (eServer xSeries 336) **servers** running the "SUSE Linux V10" operating system **to support powerful IBM WebSphere software** and an IBM "DB2 9" data server

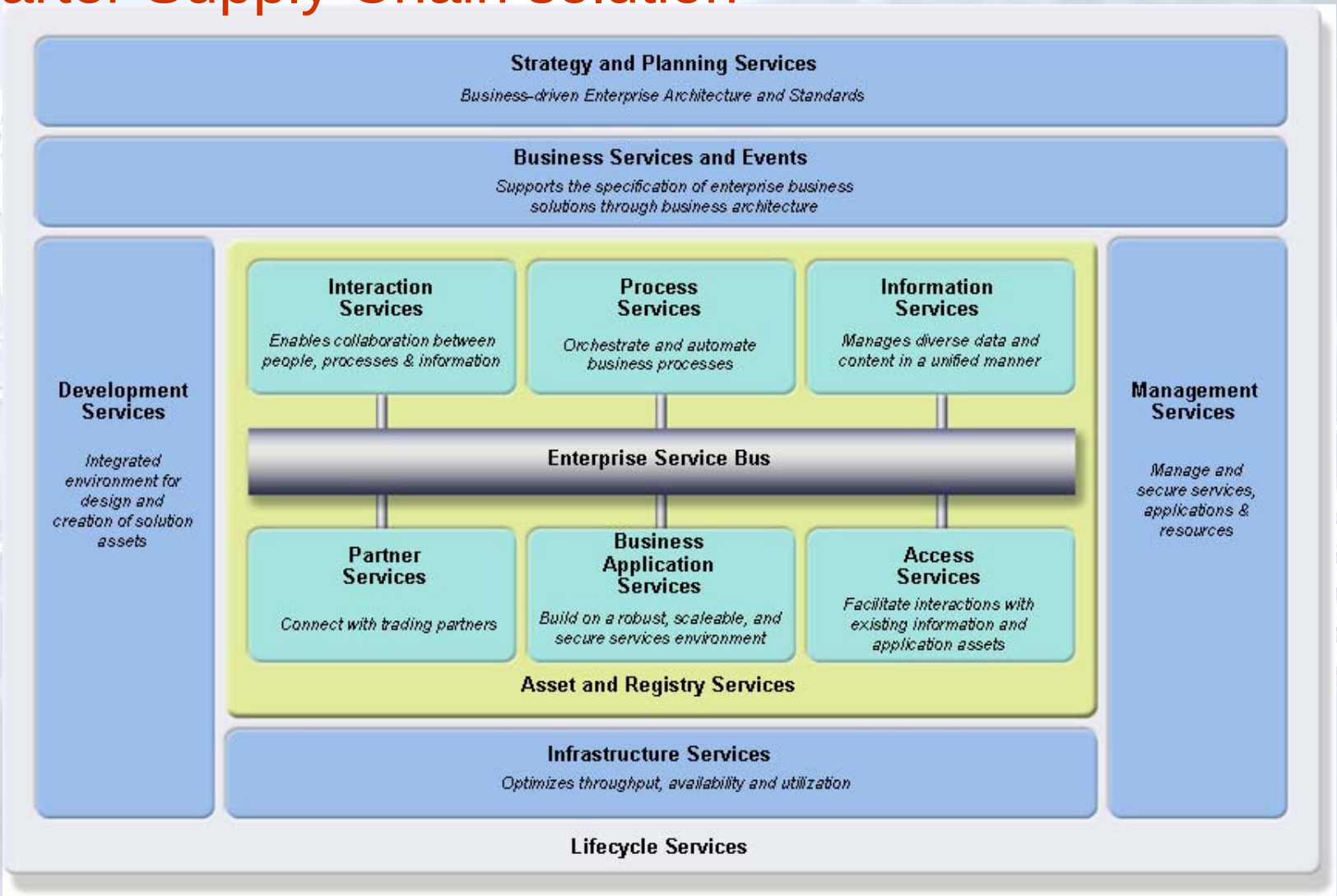
- **Honda's employees use wireless devices to scan RFID-tagged components and VINs into the system**; all data is subsequently collected by the IBM data server "DB2 9", which is responsible for managing 10,000MB of VIN and component-related information

- **Approximately 100 users will leverage the data server, 60 of whom can access it contemporary**. A custom-developed Java Platform application, "Enterprise Edition (Java EE)" - powered by IBM WebSphere Application Server (Software: Network Deployment V6) will permit to the employees to track inventory throughout the production lifecycle

HONDA

Honda Italy - Next evolution
Smarter Supply Chain solution

HONDA
The Power of Dreams



HONDA

Honda Italy - Smarter supply chain solution
Operative targets

HONDA
The Power of Dreams

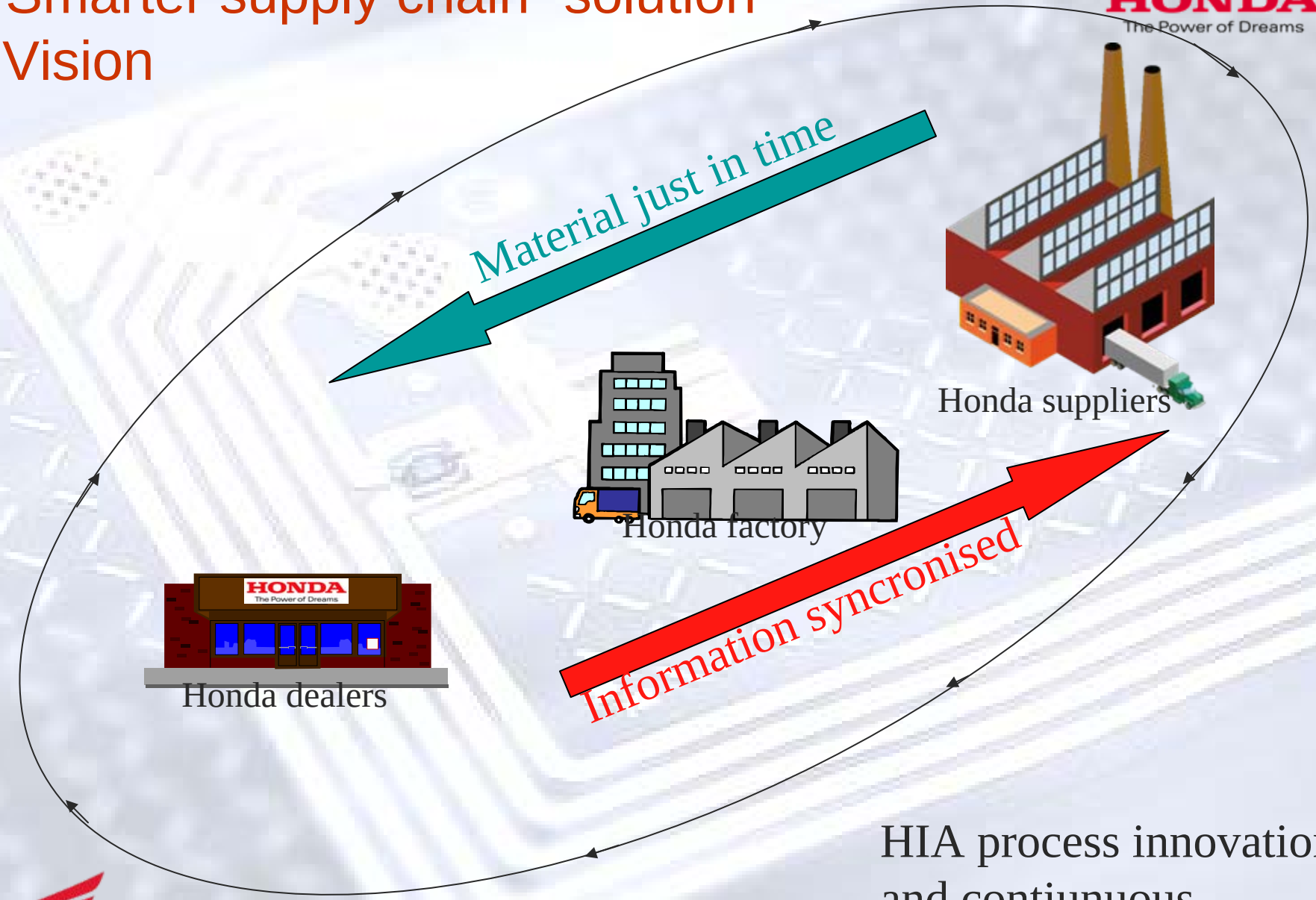
- short term - increase 500% the items&products tracking, to assure immediatly the related tracing (last july we have track 400.000 item assembled in maximoto and scooters, and monthly target is 2.000.000 by end of december including also engines and powers

- medium term - increase the activities planning & final balance, with informations syncronised, to assure just in time the real necessary items&products, without any useless activities & products for HIA

- long term - increase the tracking not only of items&products, but also workers, equipments&tools, ect... to know the real total cost of the final products (and then avoid all costs without any value added)

HONDA

“Smarter supply chain” solution
Vision



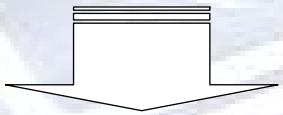
HIA process innovation and contiunuous improvement

Honda Italy – Smarter Manufacturing Conclusions

- **Honda Italy has the opportunity to increase the competitive advantage** and exploit the first hand experience (alreadyy gained with the successful implementation of the initial pilot solution based on the emerging RFID technology)

- **IBM is willing to help and contribute with its technologies and capabilities** to support Honda Italia in a middle term towards an increasing of RFID technologies and other IBM solutions across production, logistics, and quality processes

- **We have joined our forces and started** before with Smarter Manufacturing and now with Smarte Supply Chain



HONDA

The Power of Dreams

Honda Industrial Italia – HIA Solution

Smarter Manufacturing

franco.massi@it.ibm.com

IBM Executive Briefing - “Supply Chain Visibility and Optimization for a smarter planet” - September 16 & 17, 2009 - La Gaude (Nice) -France