JT Story in HONDA

JT Day 2017 - Driving the Digital Highway
17. October 2017

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Digital Development Promotion Division
Honda R&D Co., Ltd. Automobile R&D Center
Honda Motor Co., Ltd.

- Established: September 24, 1948
- Capital: ¥86,067,000,000
- Employees:
  - Consolidated: 211,915 (As of Mar 31, 2017)
  - Non-consolidated: 21,903 (As of Mar 31, 2017)
- Main product:
  - Automobile, Motorcycle, Power Product
  - (agricultural products, generator, general-purpose engines, outboard engines)
- Consolidated subsidiaries:
  - 367 companies
  - including Honda R&D Co., Ltd.
  - and Honda Engineering Co., Ltd.
  - (As of Mar 31, 2017)
■ Unit sales by business category

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<td>Automobile</td>
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<td>Motorcycle</td>
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<td>Power product</td>
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■ Proportion of sales by business category

2017

- Financial services: 13.4%
- Power products: 2.3%
- Motorcycles: 12.3%
- Automobiles: 72.0%
Company principal of Honda Motor Co., Ltd.

Maintaining a global viewpoint, we are dedicated to supplying products of the highest quality, yet at a reasonable price for worldwide customer satisfaction.

Corporate objective of Honda R&D Co., Ltd.

As an integral part of Honda Motor Co., we supply product designs created by a unique system highly suited to leading-edge research in a wide range of fields. Toward that end, we encourage everyone at Honda R&D to develop their individual ability to its fullest potential.
Automobile R&Ds Worldwide Operation

26 global sites

- Honda R&D Europe
  - U.K.
  - Germany
- Honda R&D China
  - Guangzhou
- Honda R&D India
  - India
- Honda R&D Asia Pacific
- Honda R&D Japan
  - Tochigi
  - Proving Ground
  - Sakura
  - Wako
- Global Headquarters
- Honda R&D Americas
  - Los Angeles
  - Ohio Center
- Honda R&D Brazil

- Automobile R&D center
- Automobile R&D site (Local market research, development support for local companies, etc.)
JT Projects in Honda

1st Wave
JT for DRAWING
Released 2007

2nd Wave
JT for DMU (partly)
Released

3rd Wave
JT for STANDARDIZATION

Decide JT Format
Motivation

Motivation = 「We can read 3D Drawings 30 years later」

2D Drawing can "LTA" according to MF or TIFF

Convert LTA format

We have to keep as 3D Drawing
Why JT?

High Accuracy

Open Format

LODs + XT-Brep

JT Open

ISO 14306

Selected! In 2007

Support

CAD Vendors
Viewer Vendors

CATIA

Support

CATIA

CAD Vendors
Viewer Vendors

CATIA

JT

ISO
JT Conversion Process for Drawing

- **Design**: Designer
- **Check/Save**: Chief
- **Formal**: Drawing Management

**Convert form CATIA V5 to JT**

**Compare between CATIA V5 and JT**

- **Convert Error**
- **Compare Error**

**JT for Reference & LTA**
JT in BOM systems

Viewers: "JT2Go"

About **1 million** JT Files in E-BOM

All JT files can be referred.

Attached Trade Mark

*Trade Mark cannot be removed*
JT for Supplier – Reference JT

Current

Formal

Delivery

CATIA

Supplier

Next FY

Reference

Delivery

JT(No-Brep)

Next FY

Reference

Delivery

JT(No-Brep)

Honda R&D Automobile R&D Center
JT Projects in Honda

1st Wave
- JT for DRAWING
- Released

2nd Wave
- JT for DMU (partly)
- Released

3rd Wave
- JT for STANDARDIZATION

Decide JT Format

JT Day 2017 - Driving the Digital Highway
Improvement of verification process for Spot Weld

**Current**
- BiW
- Spot Weld information
  - Open & Save
  - Build
  - Merge
  - Open & Output

**Future**
- BiW
- Spot Weld information
  - Collect data
  - Convert
  - Output
  - Output XML

**Preparation**
- CATIA

**Confirm**
- CAD + CSV
- Work on Excel
- Assignment of robot
  - Spot Weld order

**Verify**
- Read
- CAD + CSV
- Robot Simulation
  - JT + XML
Conversion form DMU to JT/XML

Open JT for DMU

Select Filter Condition

Search & Launch

* Vehicle no.
* Feature etc

Download
JT Projects in Honda

1st Wave
- JT for DRAWING
- Released

2nd Wave
- JT for DMU (partly)
- Released

3rd Wave
- JT for STANDARDIZATION
- We are Here

Decide JT Format
Background: PLM roll out

E-BOM
Dwg issue from Sep. 2001
Feature from Aug. 2002

VPMNavi
from Nov. 2008

ENOVIA (NAOnly)
from Nov. 2009

PDM collaboration

Link Test, design, and Dwg, which are separated, with human-intensive work.

Straight through by integrated platform
Background: Shift PDM to PLM

Management CATIA File

PDM

Management Designer’s Information

PLM

Verification/Simulation

Viewing

CAE

Manufacturing

CG

Background: Shift PDM to PLM

Management CATIA File

PDM

Management Designer’s Information

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Verification/Simulation

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Scope of Practical Standard Format Project

**Now**

Original Format for APL

- .XXX
- .YYY
- .ZZZ
- .WWW

**Planning**

Open & Extensible Based on International Standard

Practical Standard Format = STEP AP242 BO Model XML + JT ISO

Not Only Internal use, but also Distribution for Supplier
Evaluation plan for Practical Standard Format

TRYAL 1

3D Geometry exchange
CATIA V6 3D -> JT XT-Brep

TRYAL 2

Attribute exchange
ENO VIA V6 3D -> STEP AP242 + JT XT-Brep

Structure, Attribute, Semantic PMI...

3D Shape, Graphical PMI...

STEP AP242 XML Ed1

3D Shape, Graphical PMI...

JT ISO XT-Brep 9.5

सङ्घीय अध्ययन, सांस्कृतिक परिवर्तन, संस्थानीय परिवर्तन...
JT Projects in Honda

1st Wave
JT for DRAWING
Released 2007

2nd Wave
JT for DMU (partly)
Released 2014

3rd Wave
JT for STANDARDIZATION
WHAT'S NEXT?

Decide JT Format
Improvement of verification process for Spot Weld

Current
- BiW
- Spot Weld information

Future
- BiW
- Spot Weld information

Preparation
- Open & Save
- Build
- Compare
- Collect data
- Convert

Confirm
- CAD + CSV
- Work on Excel
- Assignment of robot Spot Weld order
- Compare

Verify
- CAD + CSV
- Read
- Robot Simulation

Original Format!!
Drawing by using GD&T  PMI

New Drawing with GD&T

JT for New Drawing

Original Viewer
Watch JT & PMI info

Future Plan

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3D or XML

PDM
- Part identification
- Physical part characteristics
- Document management
- General management information
- Activity and work management
- Effectivity
- Specification, breakdown and configuration

Presentation
- 3D rendering features
- 3D shape drawing
- 3D shape (explicit and parametric)

3D Composite design
- 3D model geometry
- 3D assembly constraints

Process Plans
- Requirements
- Design rules
- Rating definition

JDML
- JTML
- PMI

WHICH IS BETTER?

Spot Weld information
GD&T PMI

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Next Step : Standard Format for Attributes

System

Function

System

Function

Internal Format

SHIFT

ISO Standard

Spot Weld  3D PMI  Material

Kinematics for Robot  CG
3rd Wave is coming in Honda.

Discussion based on Use case is needed
Future Plan for ???

The Success Story of JT

Examples of Using JT in Different Industries
Status October 2016

Where is Honda?

The Success Story of JT – The Examples

Automotive OEM
- Audi
- BMW
- Daimler
- FCA
- Ford
- GM
- Mazda
- Mitsubishi
- Nissan
- Renault

Automotive OEM
- Suzuki
- Tata Motors
- Volkswagen
- Volvo

Aero Space
- Airbus
- ATK

Other Industries
- Caterpillar

Automotive Supplier
- Bosch
- Continental
- Delphi
- Schaeffler

Consumer Goods
- Lego
- P&G
The Power of Dreams
THANK YOU FOR YOUR KIND ATTENTION

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