FUJITSU

# Overview of Service / Solution
## Fujitsu Digital Manufacturing
# FJVPS

Virtual Product and Process Simulator
The global standards tool of digital manufacturing
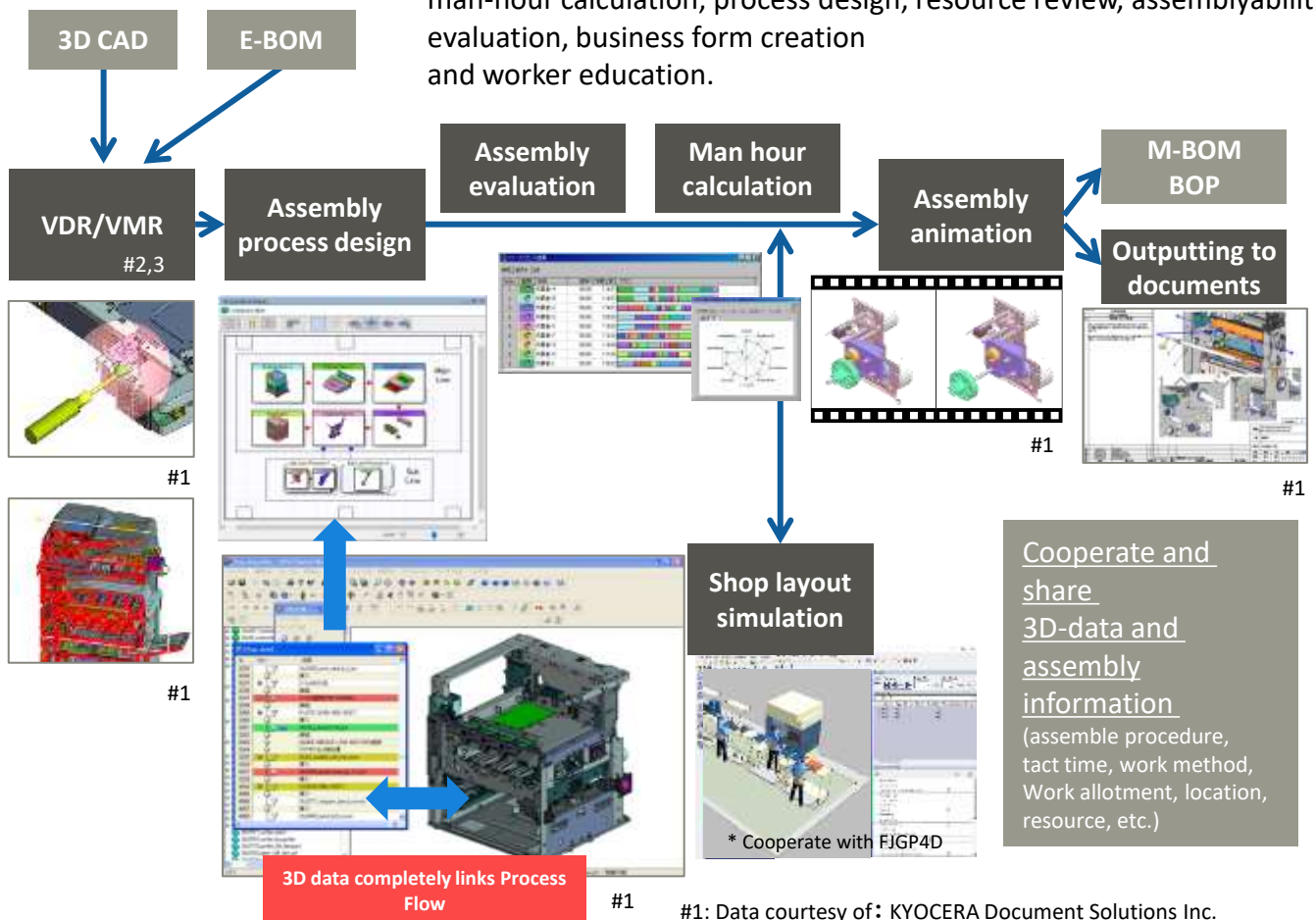
**FJVPS**

- What is FJVPS?
- Customers Benefits
- Features
- Case Study
- Module functions

## Digital Manufacturing

Supports production preparation work such as assembly procedure, man-hour calculation, process design, resource review, assemblyability evaluation, business form creation and worker education.

**3D CAD** → **E-BOM** → **VDR/VMR** #2,3 → **Assembly process design** → **Assembly evaluation** → **Man hour calculation** → **Assembly animation** → **M-BOM BOP** / **Outputting to documents**

**Shop layout simulation**
* Cooperate with FJGP4D

**3D data completely links Process Flow** #1

Cooperate and share 3D-data and assembly information (assemble procedure, tact time, work method, Work allotment, location, resource, etc.)

#1: Data courtesy of : KYOCERA Document Solutions Inc.
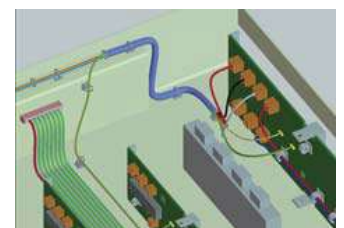#2 : Virtual Design Review  #3 : Virtual Manufacturing review

FJVPS realizes, improvement of quality and production time of the early period of mass production as well as early improvement with design quality.
The simple operation that even a CAD inexperienced person is usable.

### Benefits by FJVPS

### Q: Quality improvement

- 50-80% of the design error was detected on a virtual prototype beforehand.
- The remaining defect item concerning assembly vanished before it approved.
- The drawing change rate after approval became 1/6.
- Defective assembly was able to be reduced to 1/5 in 1.5 years.
- The assembly trouble 80% reduction that was the initial goal was achieved in four years.

### C: Productivity enhancement and cost reduction

- The start-up period of the prototype was able to be adjusted to 1/15.
- The development period was shortened to six months, and the development cost was reduced to 1/2.
- FJVPS harness option was used, and the design period was able to be moved up for one month.

### D: Shortening at lead time and period

- The man-hour of making the work procedure manual has been reduced by 30-40%.
- Communication between design and other business segment have been improved.
- Suggestions for improvement(ex. Mechanism operation, assembly, and check of serviceability) became possible without a real machine.
- The metal mold correction cost was reduced by half by the front-loading by FJVPS.
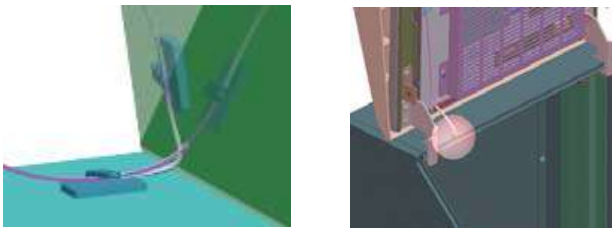
FJVPS Harness

making the work procedure manual

## Human / Tool model verification
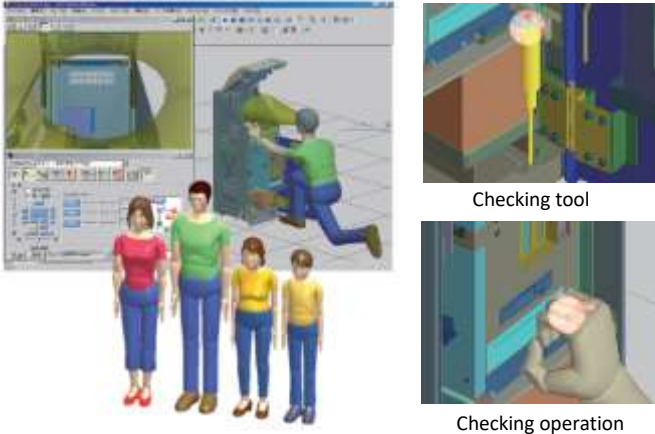


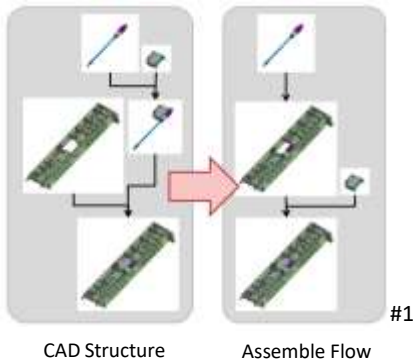Checking tool

Checking operation

## Create / Review Harness



The harness follows the moving parts. The length of the harness is calculated automatically.

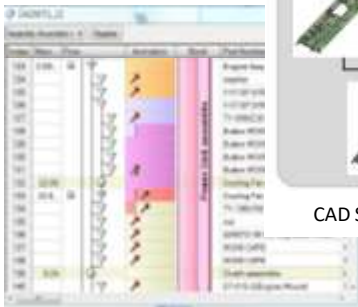Dynamic interference check / easy route modification

## Assembly process design

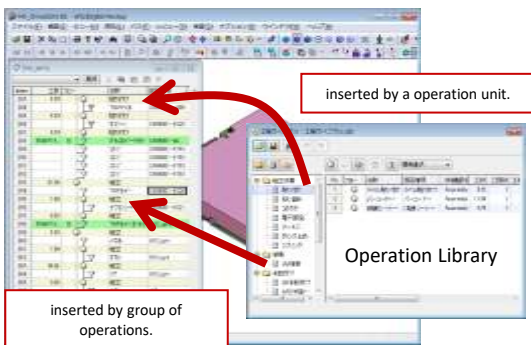Easy to edit to the structure and procedure for assembling the CAD assembly structure.



FJVPS MFG Flow

CAD Structure    Assemble Flow    #1

Operation information (structure, procedure, man-hour, jig/tool, auxiliary material and so on) necessary for product assembly can be entered on FJVPS MFG Flow.
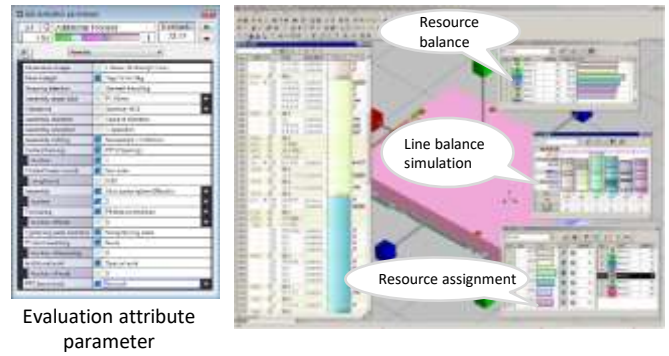


inserted by a operation unit.

Operation Library

inserted by group of operations.

These information can be registered with Operation Library and can be insert in MFG Flow automatically.

## Man hour calculation

Assembly man-hour can be calculated while checking 3D model.



Resource balance

Line balance simulation

Resource assignment

Evaluation attribute parameter

It is also possible to simulate the line balance by using the calculated man-hour information and 3D assembly animation.

## Create assembly animation

FJVPS distinguishes the installation direction of the part without depending on the product shape and defines an assembling direction and the viewpoint direction of the part for creating assembling animation by 1 operation. Because it can insert the assembling line, auto shape and images, it is possible to express the intention of the engineer easily clearly.
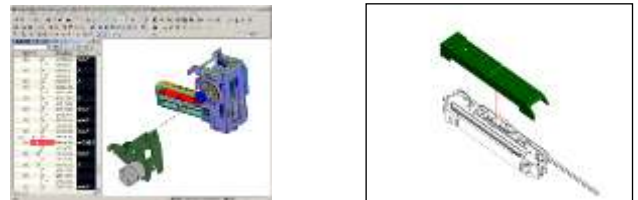


Batch assembly animation generation

Snapshot of the assembling work

## Outputting to documents

Manufacturing flow information and snapshots of each process are output by 1 operation and are used for various document making. Not only making time is shortened, but also can prevent the leak of the correction by outputting it from the latest 3D model data.
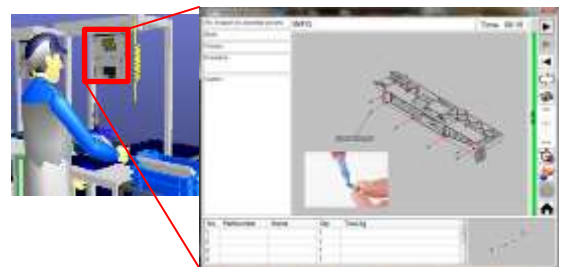


Work instruction manual    Parts control table    Parts list

## Work instructions on the production line

The screen display switches according to the progress of work. It is also possible to record working hours.



FJVPS Assembly Instruction Viewer    #1

## Shimadzu Corporation (analytical & measuring instruments)



Liquid chromatograph mass spectrometer "LCMS-IT-TOF"

(1) The start of production duties was hastened by a design revue using FJVPS.
Rework and frequency of trial productions of actual equipment were decreased.
(2) Man-hours required for document preparation were cut in half.
assembly procedure sheets, parts lists, service manuals, instruction manuals, etc.
Man-hours required for the illustrations of harnesses and cables has been reduced by 10%.
(3) Product information data sharing with the FJVPS server.
Work efficiency, consistency and maintainability are improved

## AMADA (Metalworking machinery and devices )
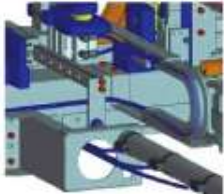


Prior study/review, decision of wiring and piping routes

Reduction of indirect operations, logistic cost, and improvement of maintenance serviceability have been achieved in addition to a 50% reduction of the product development period.
(1) Promoting front loading, and aiming at reduction of development period & cost reduction.
It was possible to shorten the period from development to release on the market to 11 months, which had conventionally required about 2 years.
(2) A study/review for grouping and routing of wiring, hoses, etc. by utilizing FJVPS is executed from the planning stage.
The development man-hour and time related to wiring and piping were reduced by 40%.
(3) FJVPS has also been utilized for the study/review on optimization of efficient loading methods on trucks as well as containers for overseas transportation. The success of such efforts has brought about a 19% reduction in logistic expense and a 30% reduction in the logistic delivery period.

## Jatco (Automatic transmission for automobiles)
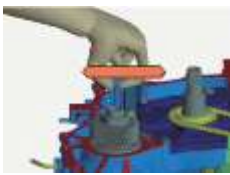


Animation for proficiency in work at vital points

(1) Challenges in reducing lead time before starting mass production.
Jatco has undertaken formulation of the environment for utilizing 3D data where the functions of products, component characteristics and names, relationship with preceding & post processes about components to be assembled in charge, and precautions for safety can be learnt virtually
(2) Work proficiency before formulation of a mass-production line is realized using the animation function of FJVPS.
・ The staff in charge of the production site can routinely make full use of DMU, and feedback knowledge of the site into the animation for work proficiency by themselves.
・ The variability of the teacher side was also reduced on a global scale on certain projects, and as a result, the man-hours on the student side after proficiency was also reduced by nearly 40%.

## Module functions

| Module | Display 3D-model shape | Display MFG flow, MFG animation playback | Measurement , Cross section | Create / review harness | Create assembly annotations | Edit assembling flow | Assembly / disassembly animation creation | Detecting collisions in animation | Output flow info, Output snap shots | Interference / clearance check | Mechanism setting | Human , Tools | Design review | Engineering change | Man-hour estimation | Assemblability evaluation | Operation library | Process split, Resource assignment | Edit process information | Touch panel operations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FJVPS Standard | ◆ | ◆ | ◆ | | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ |
| FJVPS Harness | | | | ◆ | | | | | | | | | | | | | | | | |
| FJVPS Assembly Animation (Create Assembly Animation) | ◆ | ◆ | ◆ | | ◆ | ◆ | ◆ | ◆ | | | | | | | | | ◆ | | | ◆ |
| FJVPS Document Interface | | | | | | | | | ◆ | | | | | | | | | | | |
| FJVPS Viewer | ◆ | ◆ | ◆ | | | | | | | | | | | | | | | | | ◆ |
| FJVPS Assembly Instruction Viewer | ◆ | ◆ | | | | | | | | | | | | | | | | | | ◆ |

FJVPS Standard, Harness: Floating license
FJVPS Viewer: license free

FJVPS Assembly Animation, Document Interface : Floating license and Stand alone license
FJVPS Standard necessary to run FJVPS Harness.
FJVPS Assembly Animation is necessary to run FJVPS Document Interface.

## CAD Data Interface

NX, PTC Creo Elements/Direct , PTC Creo Parametric, SolidWorks, Solid Edge, CATIA V5*,
Autodesk Inventor, FJICAD SX, FJICAD MX, Parasolid*, JT*, STL, VML 2.0
All Interfaces except CATIA V5, JT and Parasolid * are offered free.

## Contact

Information in this document is as of March,2022 and is subject to change without notice.