Overview of Service / Solution

FUJITSU Manufacturing Industry Solution COLMINA Digital Manufacturing

FJGP4D

Virtual Product Line Simulator

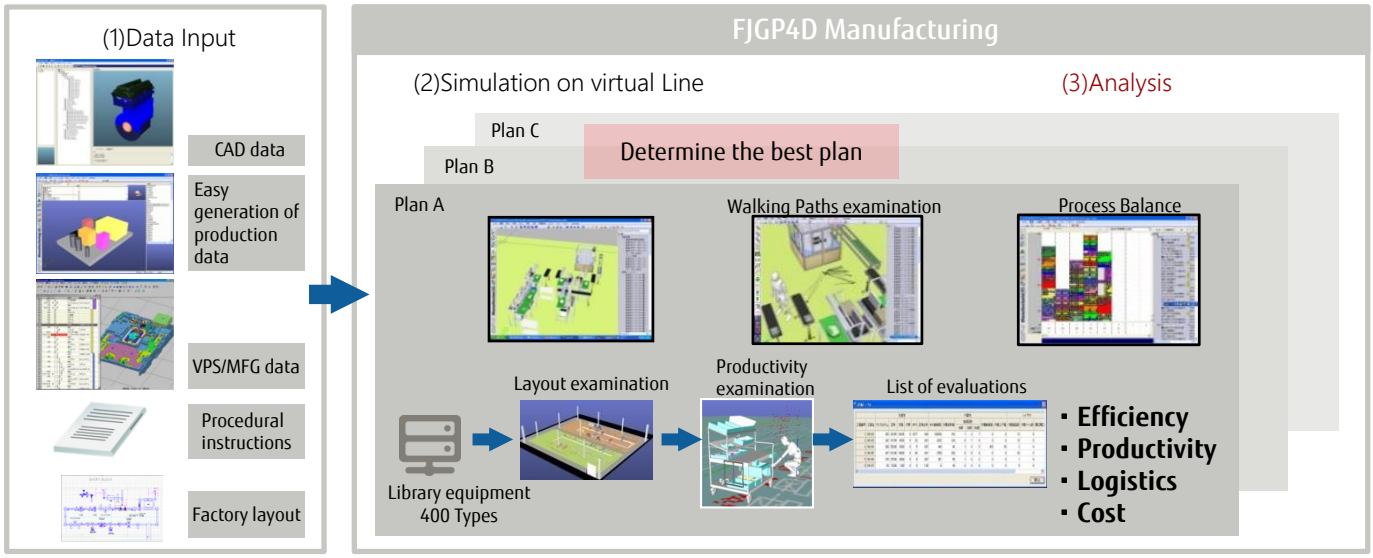
FJGP4D

- Customer Benefits
- What is FJGP4D?
- Features
- Case Study
- Issues with Process Planning, ICT Solutions
- FJGP4D to Improve Manufacturing Process Planning

Customer Benefits

- Launch global mass production efficiently and reduce costs.
- Plan without running actual trials. Calculate productivity quantitatively. Determine the best plan theoretically.
- Realize "KAIZEN" and high productivity without stopping the current line.

FJGP4D is a powerful production support tool for visualizing process design.
We support effective process design and various kinds of evaluation in the field of assembly and logistics.

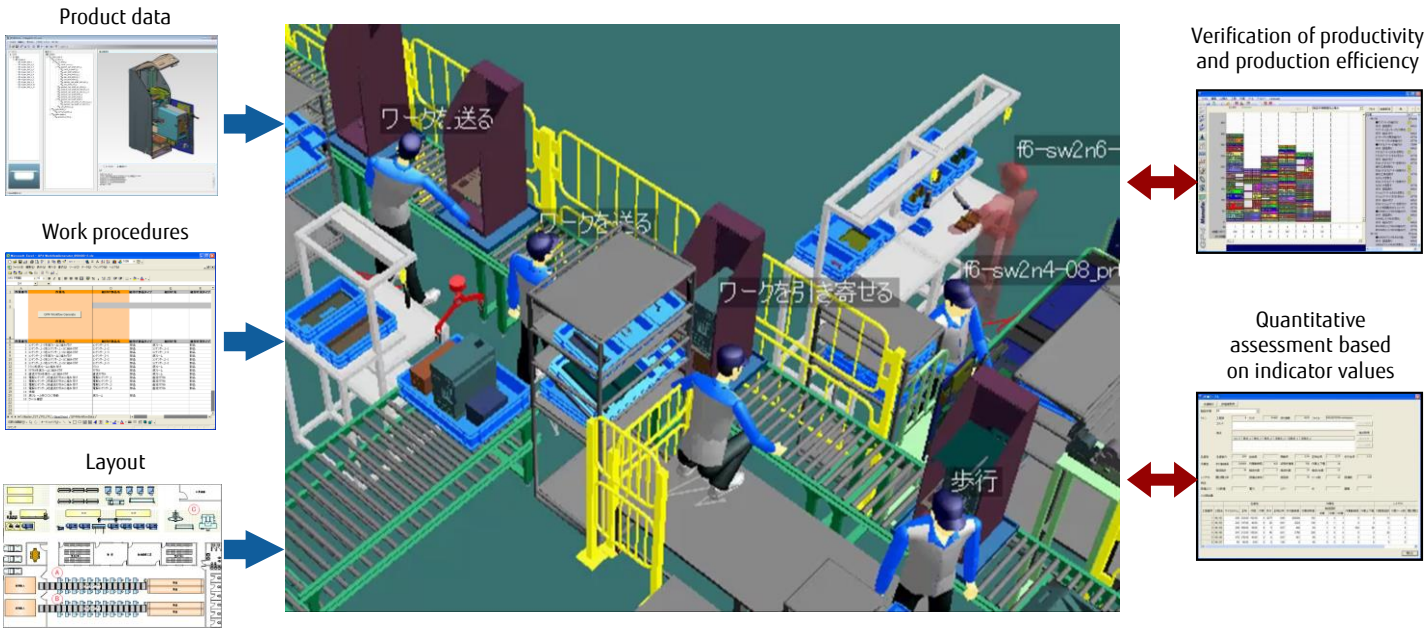


What is FJGP4D?

FJGP4D automatically estimates production capacity from a process plan in order to obtain maximum performance.

Review of a new production line

Making improvements in advance



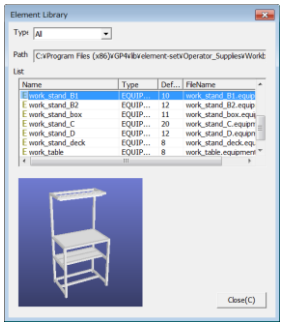
FJGP4D (semi-) automatically simulates the movements of persons and flows of materials.

- **Predicts productivity, work efficiency, and costs**
- **Develops measures to prevent potential problems**

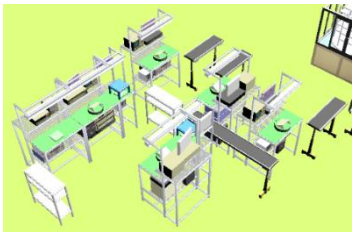
Features

- The followings are the features of FJGP4D.
  - Import of 2D-CAD data or image files as a sketch.
  - Creation of production lines without 3DCAD, as FJGP4D has about 400 types of facilities and equipment. It is also possible to import 3D-CAD data of facilities and equipment.
  - Generation of the movement of operators and the flow of materials without any programming.
  - Generation of operator's walking routes that avoid obstacles automatically.
  - Visualization of process balances and productivity by Operator Balance Chart (Yamazumi) that is automatically generated.
  - Evaluation of quantitative productivity that are value and non-value added works, and workability such as working postures and walking distances.

3D Layout without 3D-CAD

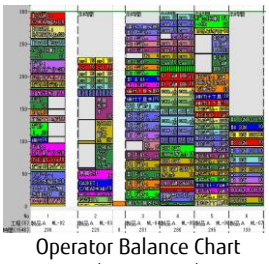


Element library



Verification and Evaluation

Walking routes



Operator Balance Chart (Yamazumi)

Case Study

OESSE Italy(heat exchanger manufacturer)

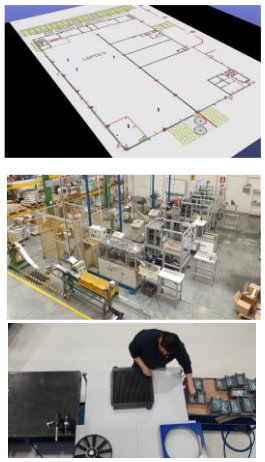
Challenge:

- To provide a highly customized product by specifying points to be improved in production
- In order to increase production, it was necessary to make effective use of production space and processes

Approach:

- Problems to be improved in the production line were visualized by the Fujitsu production line simulator.
- Estimate the production capacity of a process to achieve maximum performance.

Create 3D production line



Create the current layout of the production process

Generate simulation data

Affiliation Process	Time (min)			
	Hand	Walk	Wait	Total
Assembly operator	217,9	6,7	0,1	224,7
Machining operator	94,6	7,0	110,5	212,1
Press operator	31,7	14,0	195,3	241,0
SG welding operator	218,1	4,4	18,5	241,0
Tank welding operator	180,6	9,5	65,9	255,9

Find issues on a virtual production line.

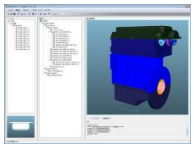
Benefits

- Cycle time reduction of 13% (from 257 minutes to 226 minutes)
- Improving line balancing and work ergonomics

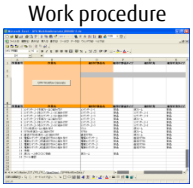
Issues with Process Planning, ICT Solutions

Current production line plans

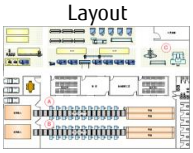
Product data



Work procedure



Layout



- No detailed descriptions
- Based only on imagination
- Impossible to guess what actual production will be like

Level of planning **Low**

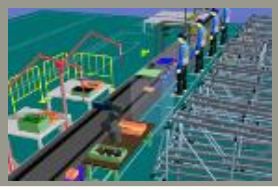
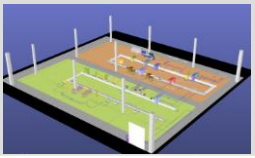
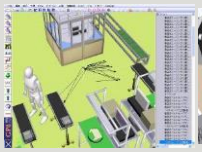
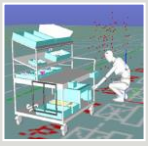
Line plans developed using FJGP4D

- Plans provide relative positions for different processes
- Specific procedures
- Processes can be examined

Level of planning **High**

FJGP4D to Improve Manufacturing Process Planning

FJGP4D develops multiple models for 3D line plans made during the planning stage.
The software can be used to assess layout designs, line balance, movement lines, and workability, as well as whether production indicators achieve target values– all without creating actual production lines.

		Target value	Plan A 	Plan B 	Plan C 
Assessment item		Layout design 	Line balance 	Movement lines  	Workability  Plan C adopted
Assessment	Flow of materials	m	15.2m	20m	18.7m
	Area efficiency	%	22.3%	12.1%	13.5%
	Line efficiency	%	95%	91%	93%
	Productivity per m²	No. of products	10,000	10,500	12,000

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