# Business Plan on Master Craftsmanship Succession

Dated December 1, 2019

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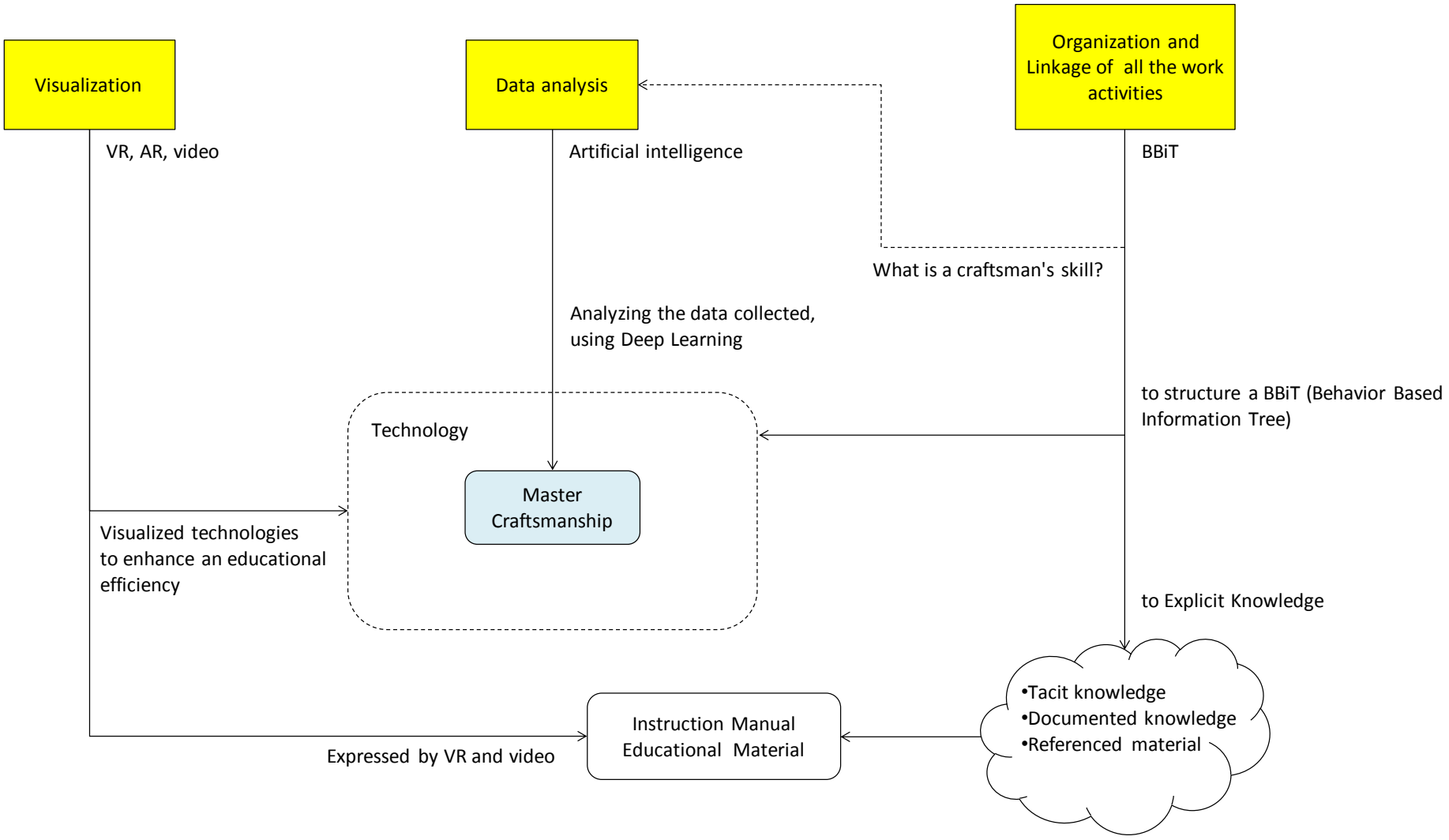
# Business Strategy

- Skilled engineers having master craftsmanship usually perform judgement of products, defective or conforming based on their experience and institution, that is, by seat-of-the-pants.
- Considering such traditional manner, data analysis from sensors have been recently applied to innovative manufacturing processes to more precisely perform such judgement instead of skilled engineers.
- We have summarized such data analysis and related technologies as follows:
  - ✓ Visualization technologies such as VR , AR
  - ✓ Ontology for data cleaning
  - ✓ Artificial Intelligence

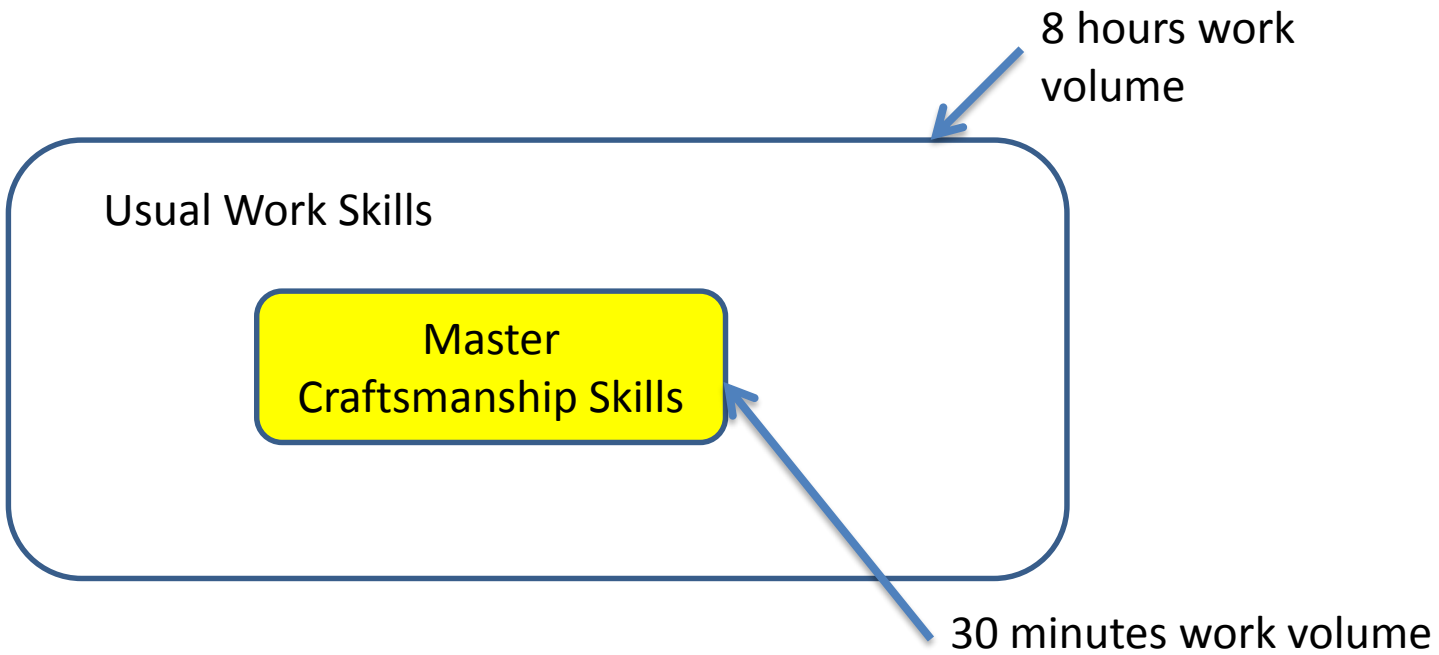
# Example of the Company “A”:

- The Company “A” has installed image processing inspection systems in theirn production lines to judge and identify defective products, and they have, however, further selected doubtful products (might be defective, and these would be most probably production lots back and forth defective products) according to their past experiences, which have been defined as suspended products (re-inspected products).
- There have been still unknown in their procedures, which parameters they have used or how they have judged. This procedure would be also replaced by artificial intelligence.
- Please note that this could be applied to defective products, not to be applied to any equipment or device.
- Such product  qualities are very much sensitive to operating conditions.

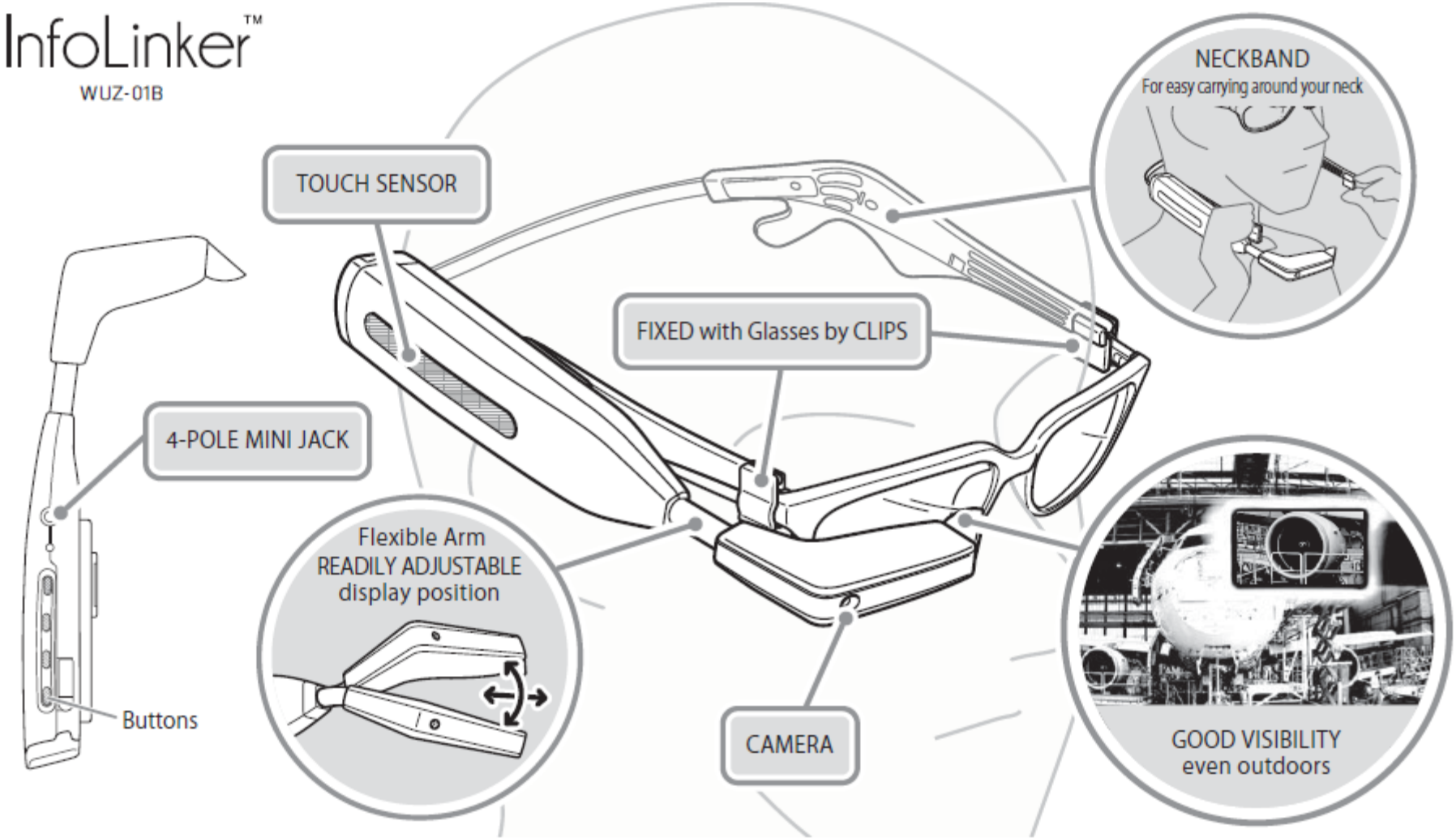

Visualization
Data analysis
Organization and Linkage of all the work activities
VR, AR, video
Artificial intelligence
BBiT
What is a craftsman's skill?
Analyzing the data collected, using Deep Learning
to structure a BBiT (Behavior Based Information Tree)
Technology
Master Craftsmanship
Visualized technologies to enhance an educational efficiency
to Explicit Knowledge
•Tacit knowledge
•Documented knowledge
•Referenced material
Instruction Manual
Educational Material
Expressed by VR and video

An Ontology specialist has carried out the Ontology-applied projects, around 10 references. His specialized procedure contains the following work activities:

- ✓ to analyze the business process
- ✓ to extract the master craftsmanship (In general, the contents of a master craftsman's skill are included in normal skills and techniques, and the true craftsman's skill is extracted as per the work activities structured.

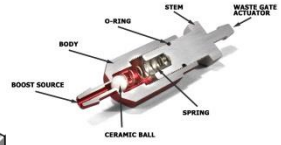


# Visualization
# using a wearable device




KYC Machine Industry Co., Ltd. (one of our grouped companies) : Manufacturing and sales of Construction machineries and Plant equipment, Scaffolding, Environment related products. They have developed the above device for remote maintenance service for their products.

Manufacturer




Maintenance Manual

Server

Internet

Our Team

Customer

# Application of Ontology

## Organization and Linkage of all the work activities

# Organization and Linkage of all the work activities

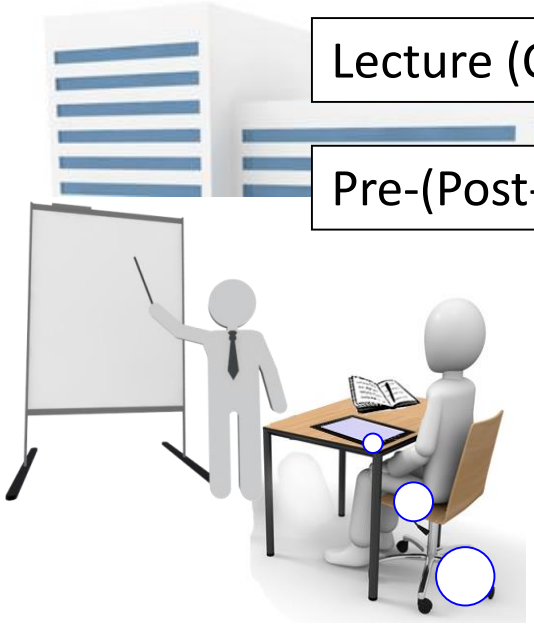
The following example is to be described on the application to an intelligent maintenance manual:

- Considering maintenance work activities performed by a customer, even if any support or help by any supplier or related company in Japan is available for such maintenance service, training of a maintenance team of the customer would be mandatory required.
- For such purpose, we can provide them with an intelligence, smart and electronic based maintenance manual.
- The said manual has been developed and prepared based on BBiT (Behavior Based Information Tree) and such concept is described in the following slides:

# Use for training

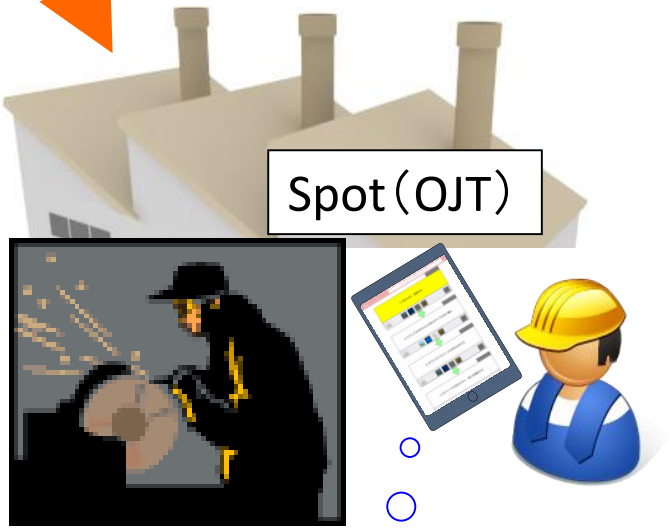
Lecture (Classroom style)

Pre-(Post-) study



Manual to BBiT
Educational tool for
maintenance worker

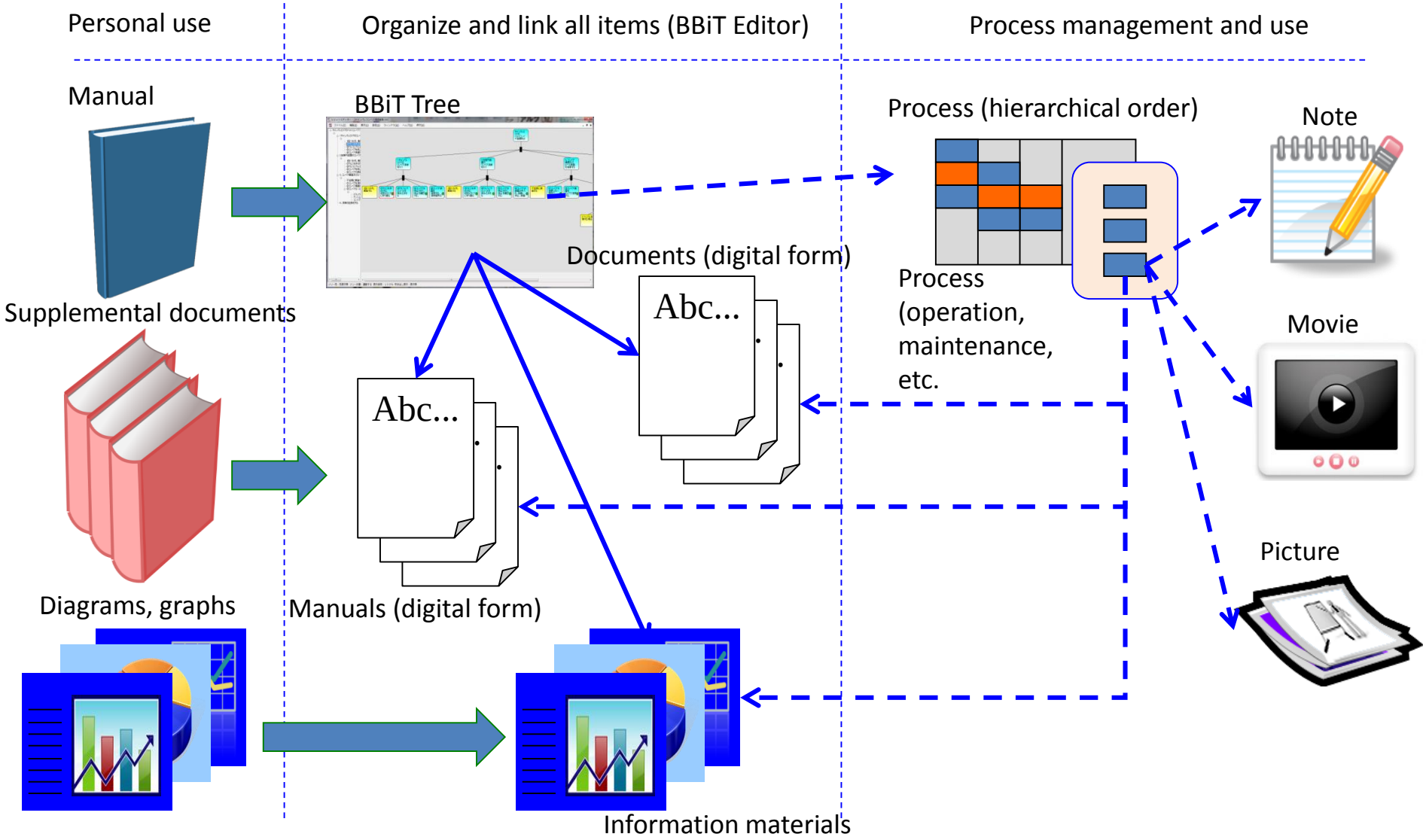
Spot（OJT）



Procedure model
+
Linked materials
（movies, pictures,…）

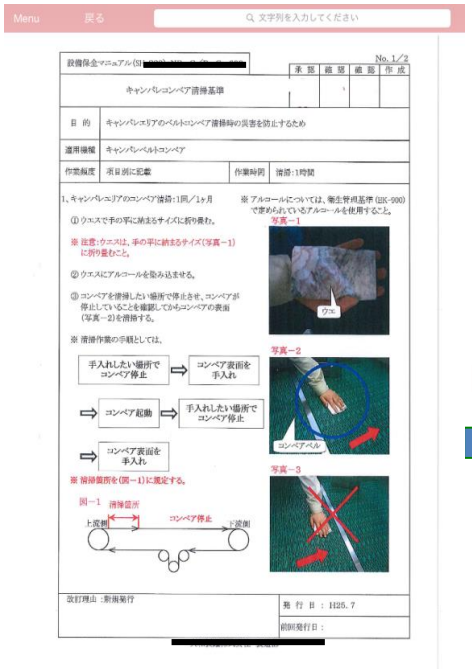
Check, record, remark
maintenance procedures

# Digital manuals



# Application for maintenance manual

Paper manual




Procedure (hierarchical)


Hierarchical modeling

Link information material

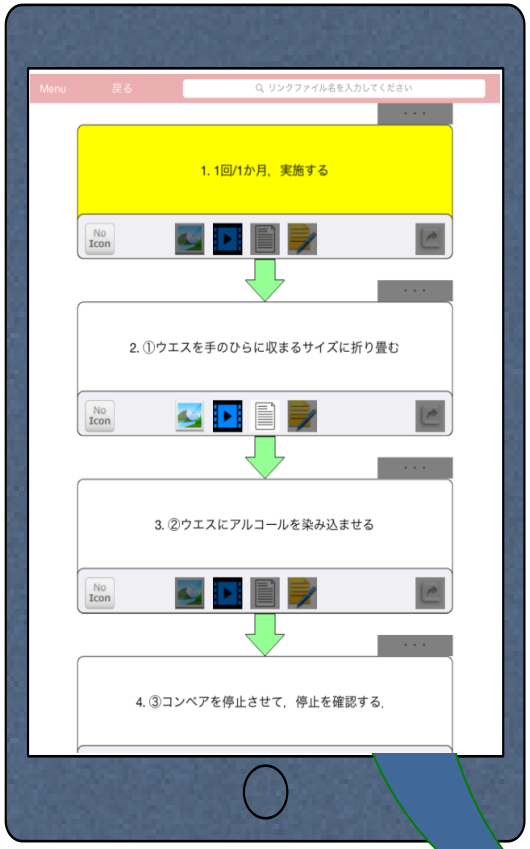
BBiT Manual


Paper manual: convert to PDF and Link

# Link multimedia material

Movies by customers (on the

Procedure model




Original movies by customers can be imported and linked

Link a step with movies for supplemental information

Browse movies related to the step