NISSAN AUTOMOTIVE TECHNOLOGY

8th BEFORE REALITY CONFERENCE

Connection automatic creation tool development at vehicle CAE model building

2019.5.20
Takashi Nasu
Vehicle Analysis Department

Agenda

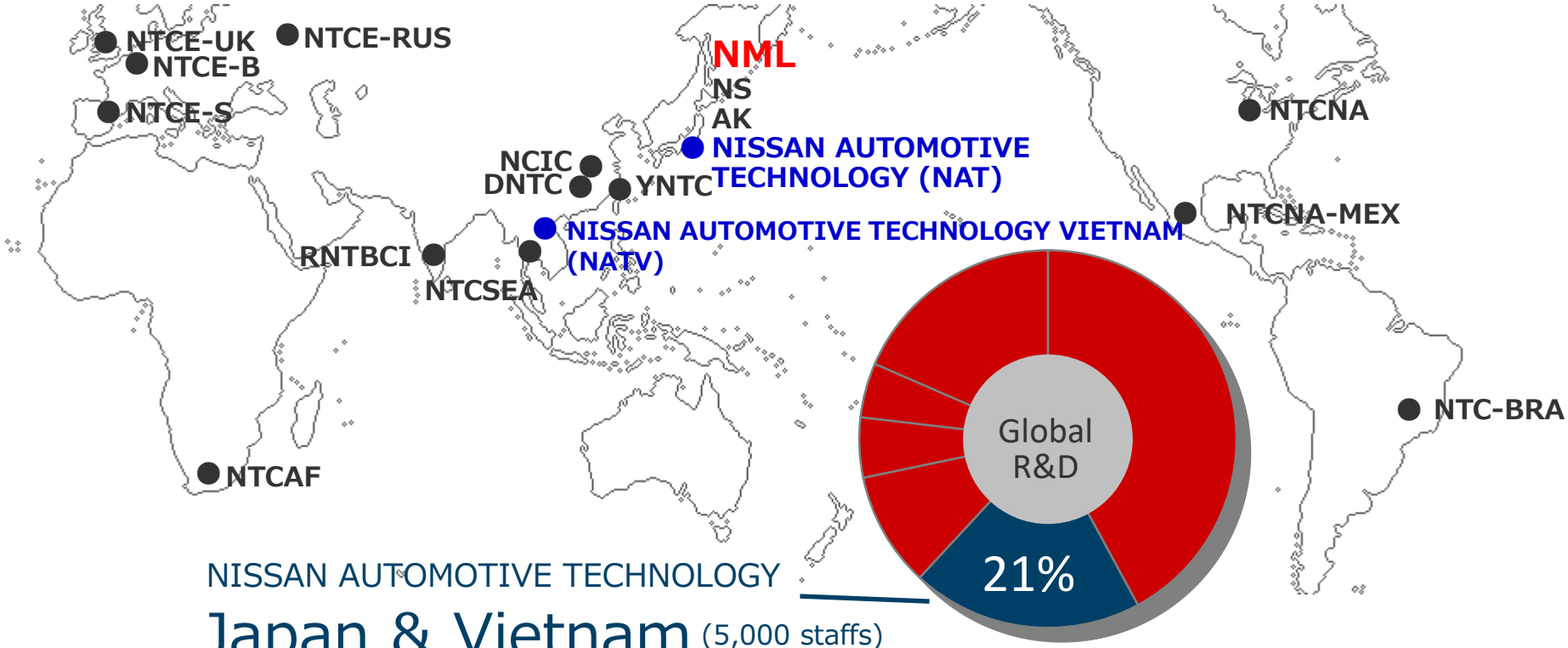
NISSAN AUTOMOTIVE TECHNOLOGY

- Company introduction
- Automate activity
- Future action plan

NISSAN AUTOMOTIVE TECHNOLOGY's position in NISSAN MOTOR COMPANY

- Engineering company of Nissan vehicle development
- The number of staffs is 21% in global Nissan group

(2018.4月)



NISSAN AUTOMOTIVE TECHNOLOGY

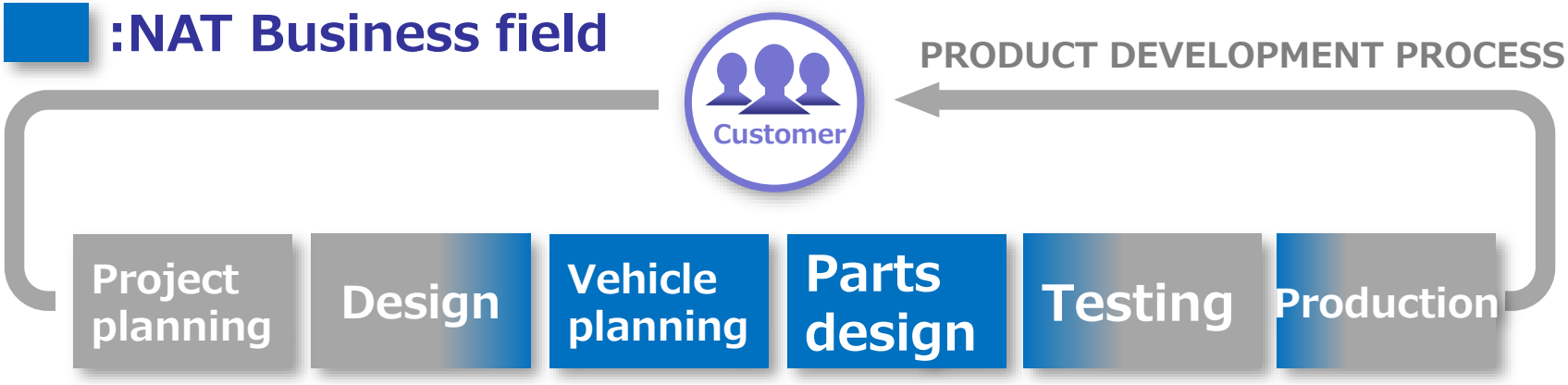
Japan & Vietnam (5,000 staffs)

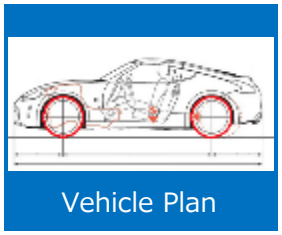
Business area

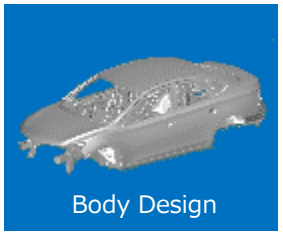
NISSAN AUTOMOTIVE TECHNOLOGY

- NAT has almost vehicle development function except Project planning, Design, Testing, and Production

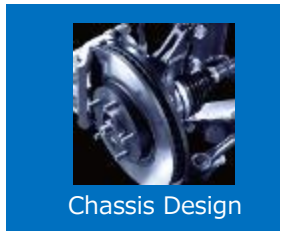
:NAT Business field




Vehicle Plan

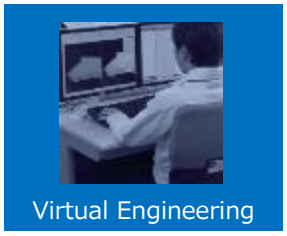

Body Design

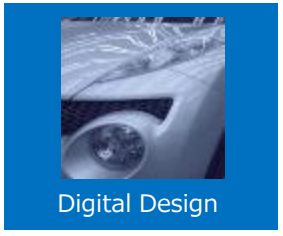

Interior/Exterior Design


Chassis Design

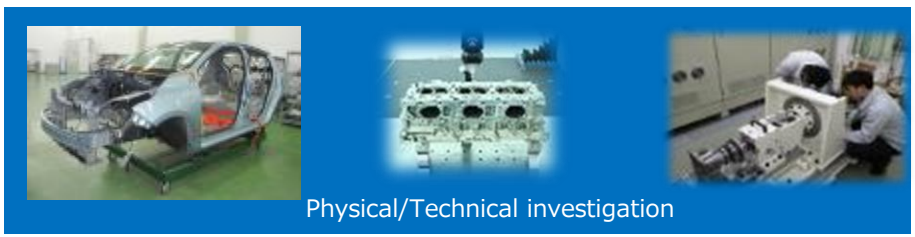

Electronics Design


Powertrain Design


Virtual Engineering

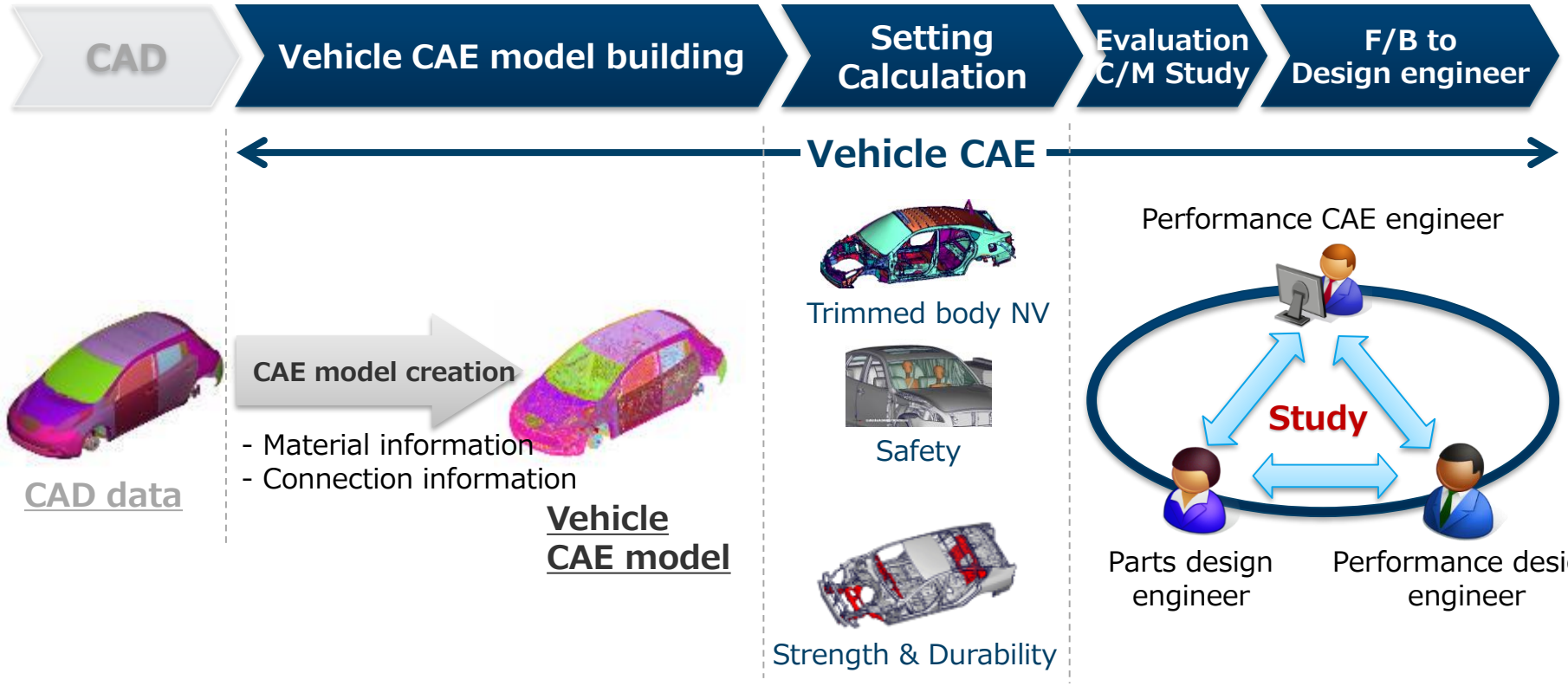

Digital Design


Vehicle CAE


Physical/Technical investigation

CAE work area of NAT

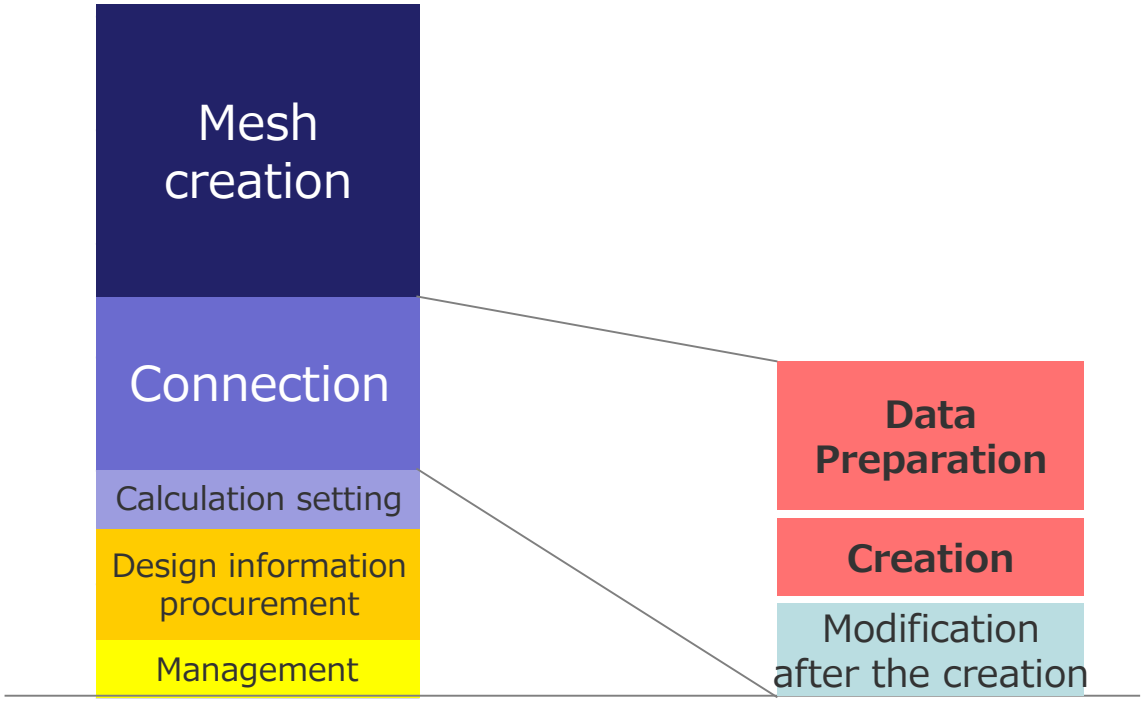
- All of CAE work is proceeding
- Especially, NAT has responsibility for all of vehicle CAE model building



Vehicle CAE work process

Scope of the automation

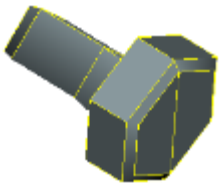
- Mesh creation's productivity improvement:
  Performance improvement of ANSA Batch mesh / Mid casting
- Connection:
  To reduce repeated operation, automate of it was studied



Operation volume ratio of Vehicle CAE model building

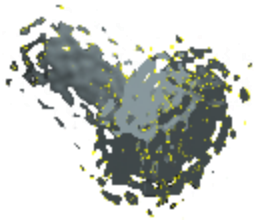
What is connection for vehicle CAE model building

- CAD data is classified by connection type, and them model are created with different model type
- There are 2 types CAD data: Internal & Supplier data
  -> Supplier CAD data have unique part name/No. with each suppliers



Internal CAD data

Part name: Internal standard
(Bolt_***)
Part number: Internal standard



Supplier's CAD data

Part name: Defined by each supplier
(ABC123 etc.)
Part number: Defined by each supplier

Difference of information btn 2 types CAD data

Bottleneck of Automatic connection

- Connection CAD data don't have standardized information
  -> connection type classification is needed by visual confirmation
- 1 vehicle has around 3,000 connection parts
  -> 3,000 times repeated manual operation is needed

①CAD data download

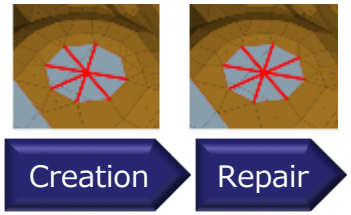
Vehicle CAD data

②Classifying connection CAD data by visual confirmation

3,000 Parts

Connection CAD data

③Connection model creation 1 by 1

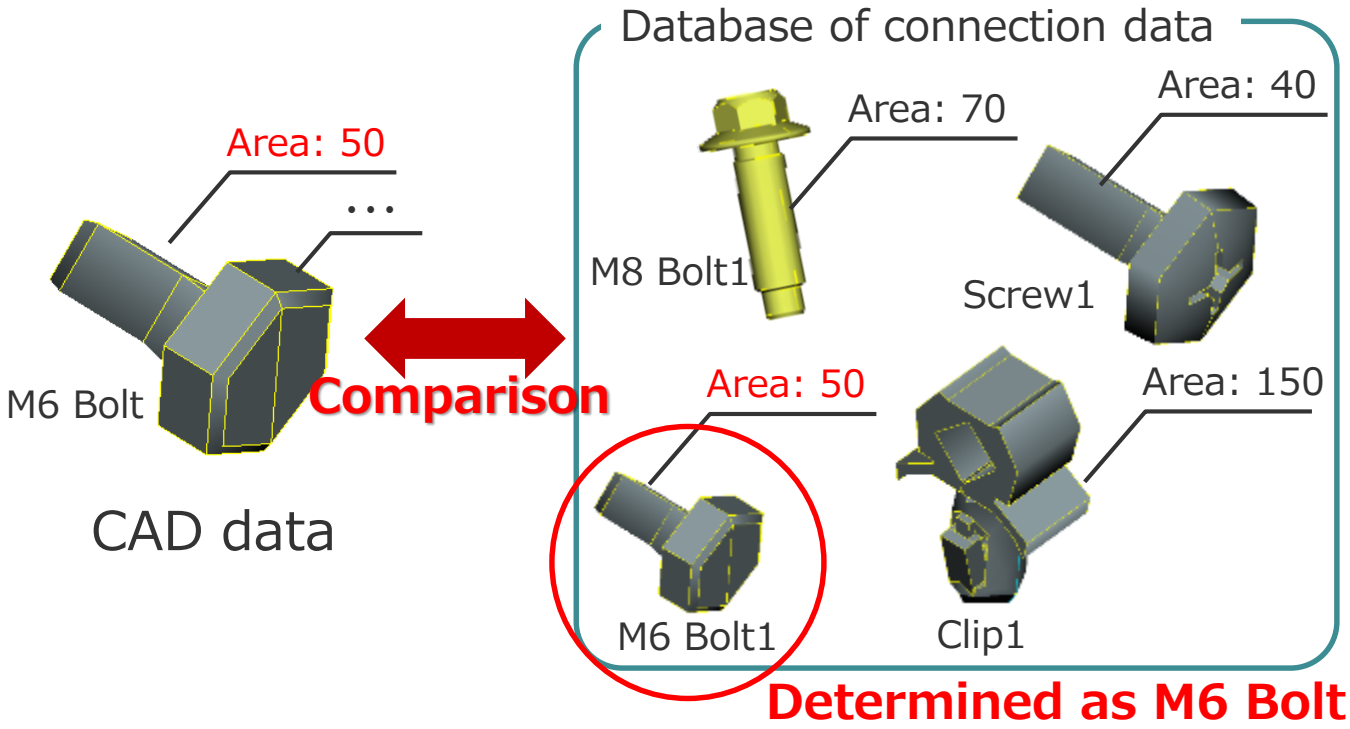


Connection CAE model which modeling based on connection type

Current connection model creation process

Solution: Automatic classification

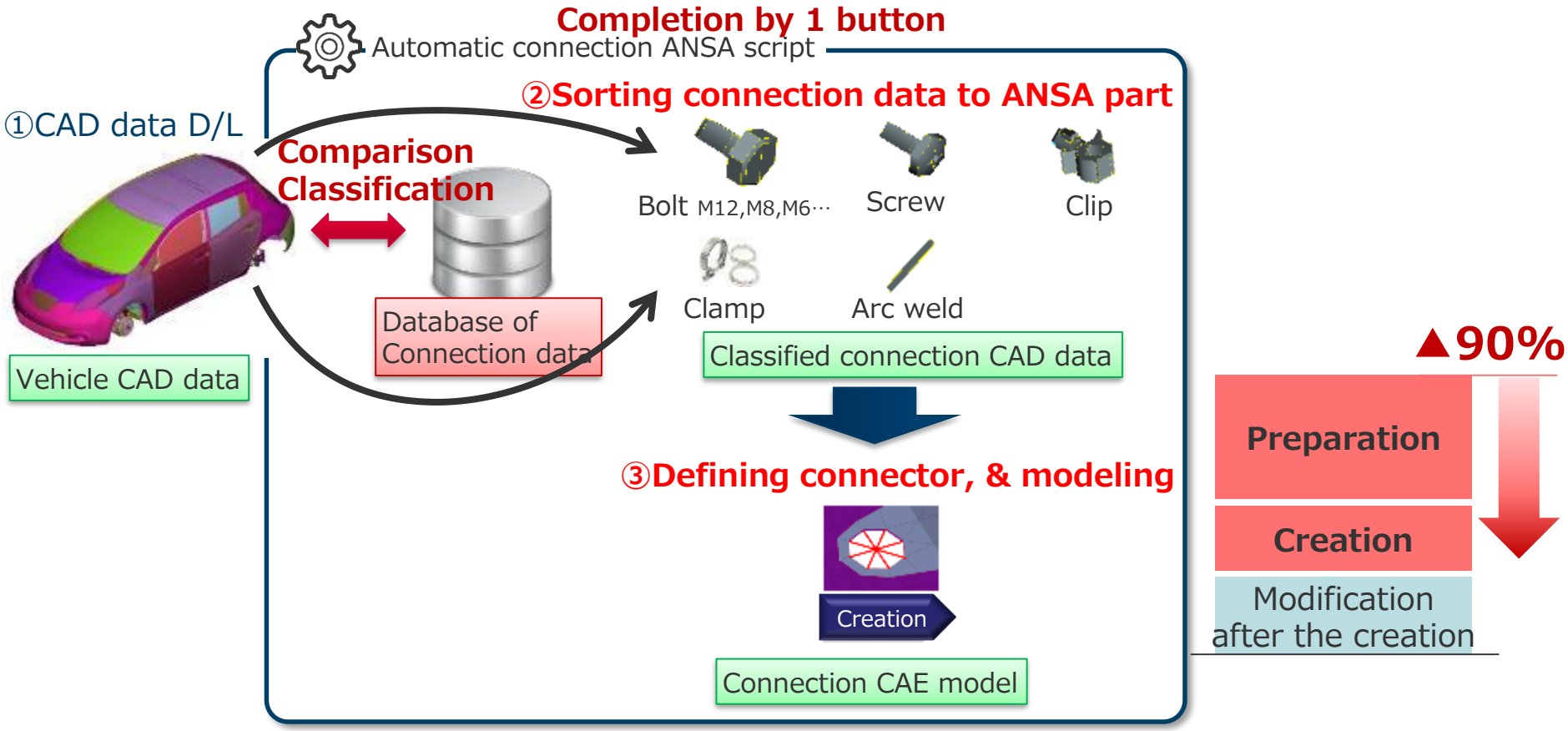
- Classification of CAD data feature difference can be realized by area, length… & such kind of numerical data
- Database of connection CAD data is constructed, and numerical data is compared btn CAD data & Database -> Each type of connection CAD data can be classified



e.g. Classification of Bolt (M6) CAD data

Automatic connection model creation process

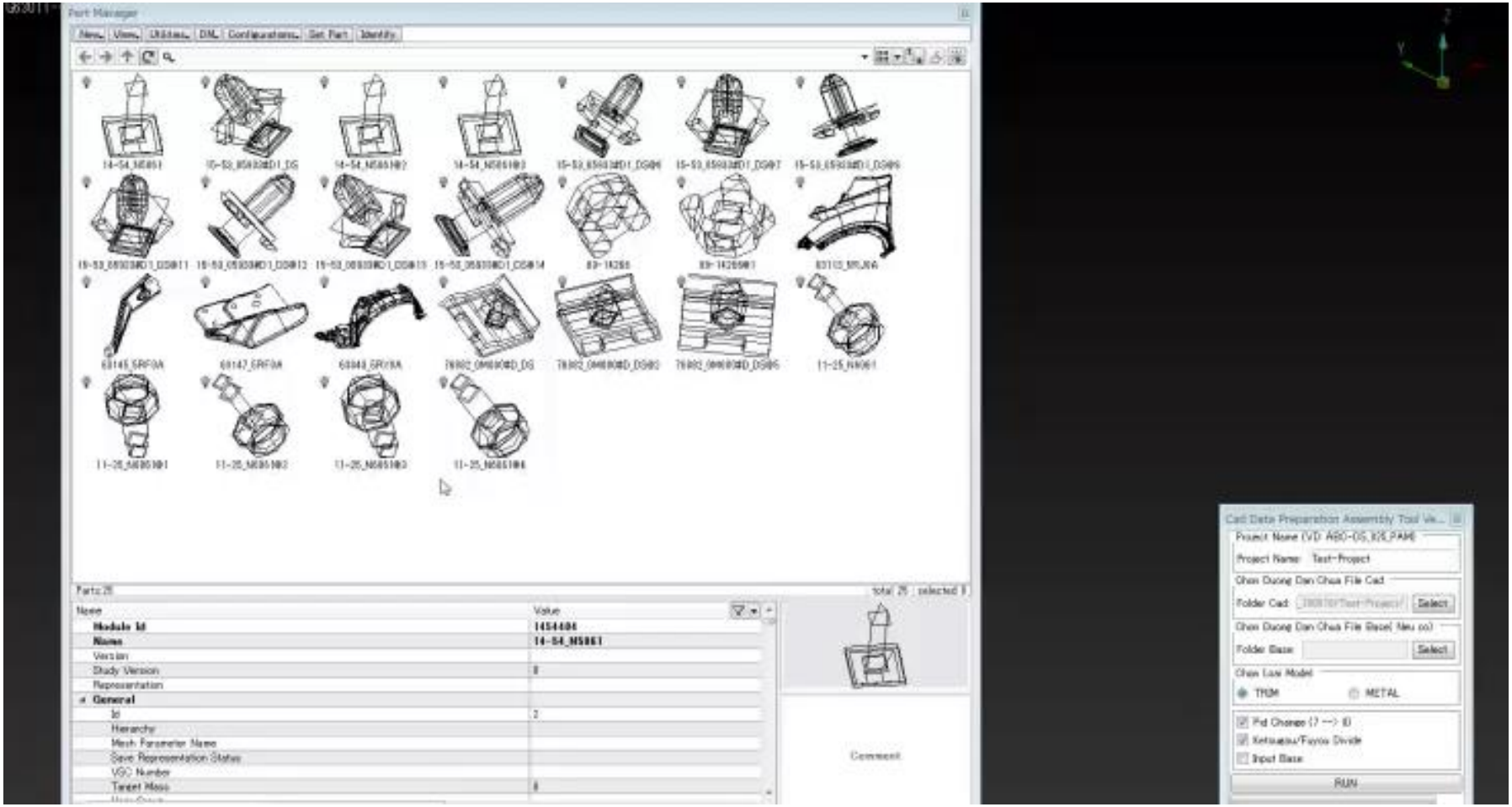
- Connection type classification to modeling can be summarized as 1 ANSA script



Automatic connection modeling process on ANSA

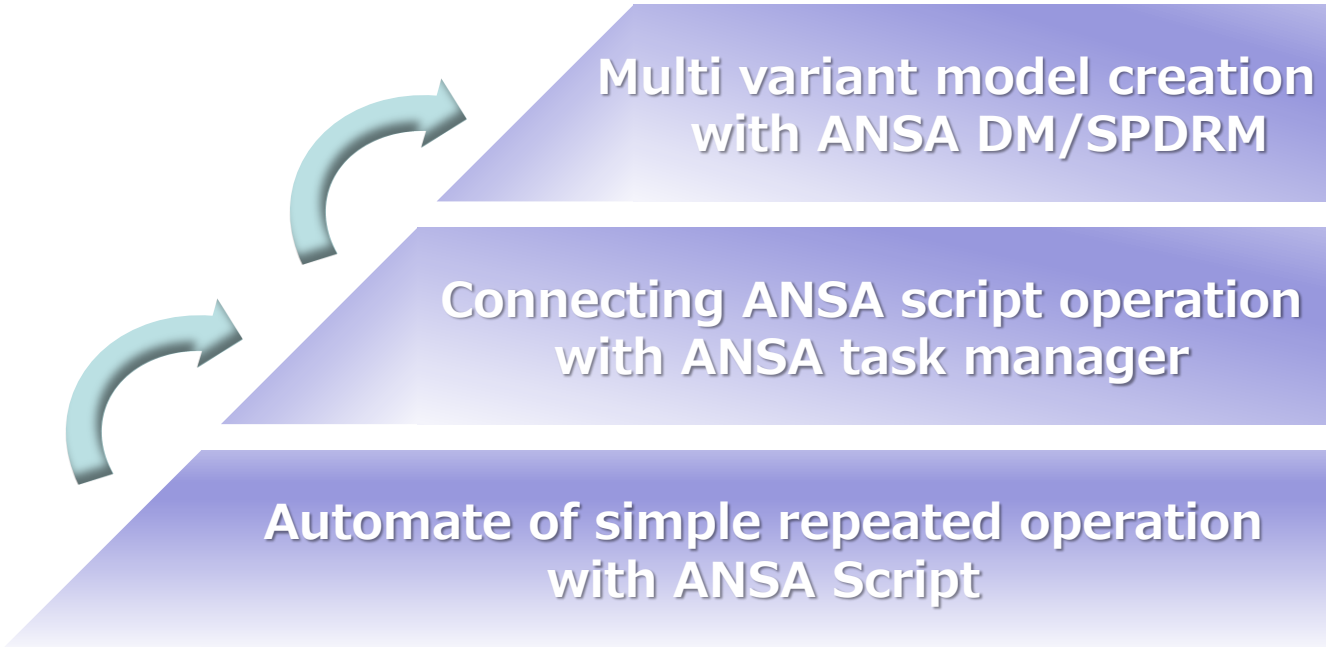
Demo-video for connection type classification

NISSAN AUTOMOTIVE TECHNOLOGY



Next step

- Focusing on multi variant model creation productivity with efficient data management by ANSA DM, SPDRM



Step-up image for vehicle CAE model building