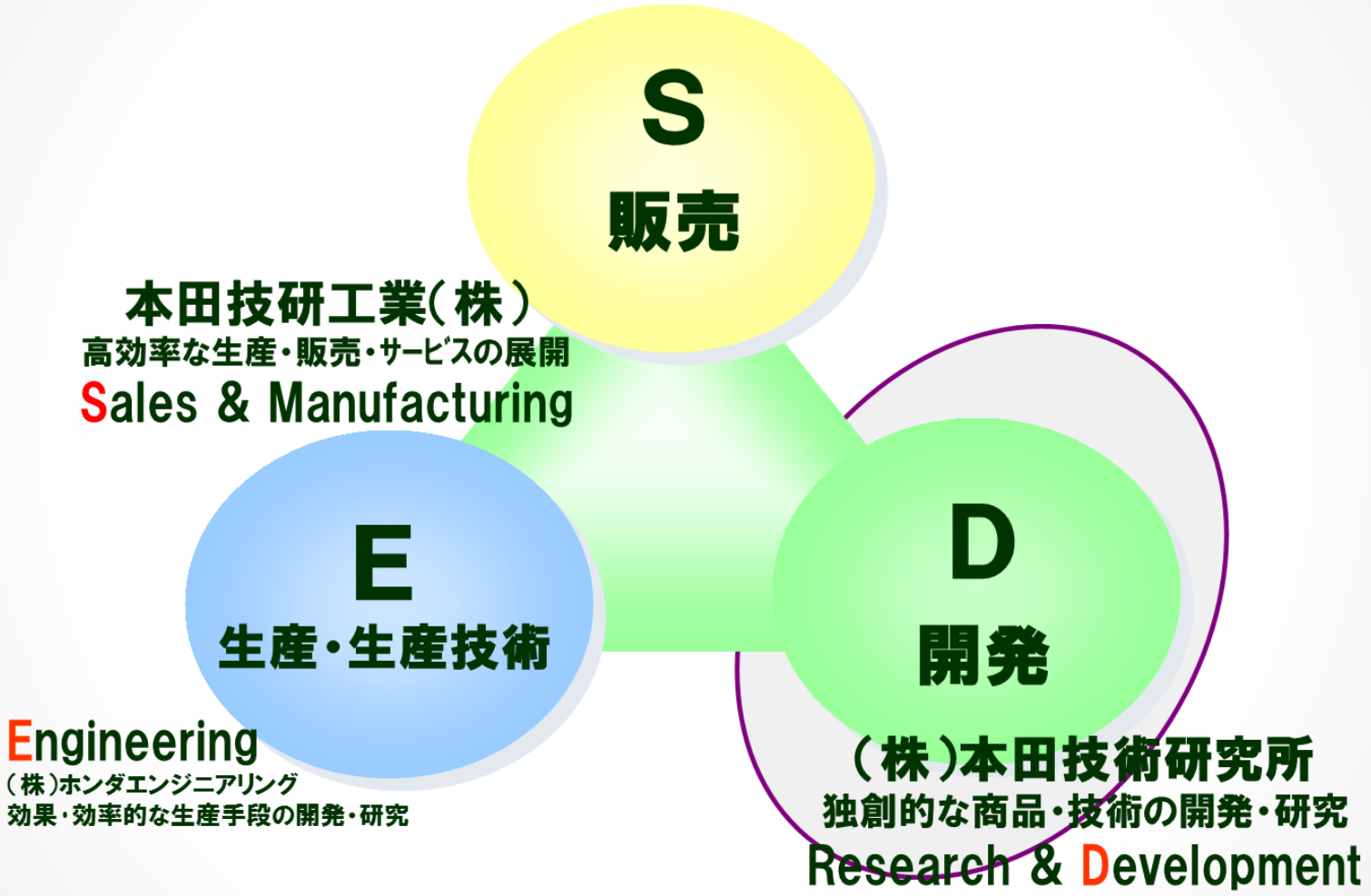
Congratulation!! 20th anniversary

"Introduction to SPDM project in HONDA R&D for Chassis design"

2015 Phoenix Integration User Conference
April 14–16 Marina del Rey, California
Honda R&D Co., Ltd. Autombile R&D Center at Japan
Hitoshi Naito and Tomoaki Utsunomiya

H O N D A organization



HONDA R&D organization

Motorcycles	Power Products	Automobiles		Aircraft	Robotics
二輪R&D センター (埼玉・朝霞市)	汎用R&D センター (埼玉・朝霞市)	四輪R&D センター (和光) (埼玉・和光市)	四輪R&D センター (栃木) (栃木・芳賀郡)	航空機ｴﾝｼﾞﾝ R&D センター (埼玉・和光市)	基礎技術 研究センター (埼玉・和光市)
二輪車 研究開発 	汎用製品 研究開発 	四輪車研究開発  		航空機 エンジン 研究開発 	先端技術 研究開発  

Test course

鷹栖・栃木 ﾌﾟﾙｰﾋﾞﾝｸﾞｾﾝﾀｰ

テストコース 

HONDA R&D organization

Overseas: 33 Bases

※海外：33拠点

Hokkaido

■PG管理室
鷹栖プルービンググラウンド
所在地：北海道上川郡鷹栖町
設　立：1996年

Test course

Tochigi

■四輪R&Dセンター
四輪R&Dセンター（栃木）
設　立：1986年

Automobiles

■PG管理室
栃木プルービンググラウンド
設　立：1979年

Test course

所在地：栃木県芳賀郡芳賀町

Saitama

Head office

■四輪R&Dセンター
四輪R&Dセンター（和光）
設　立：1960年

■二輪R&Dセンター
所在地：埼玉県朝霞市
設　立：1973年

Motorcycles

■航空機エンジンR&Dセンター
設　立：2004年

所在地：埼玉県和光市

■基礎技術研究センター
設　立：1991年

Aircraft

Robotics

■汎用R&Dセンター
所在地：埼玉県朝霞市
設　立：1979年

Power Products

Agenda

1. Background
2. Ideal design
3. Current Problems
4. Solution Approach
5. Design Process
6. Key points for design process system
7. Requirements for SYSTEMs
8. Why we chose MCC
9. Introduction of our Development Systems
10. Request for PHX

1.Background and philosophy

- Our philosophy is to provide pleasure to our customers through our products.
- For that purpose, it is necessary to provide products with new value exceeding customer expectations in a timely manner in the new model development.

"operational efficiency" and "quality improvement" are needed

2.Ideal design

Design without waste and rework

(Example: Design Process for parts)

- **Designers want to catch omitted examination items**

Set the Target value

↓

Consider structure / specification

↓

Verify suitability of target value

↓

Release drawing

2.Ideal design

Design without waste and rework

(Example: Design Process for parts)

- **Designers want to catch omitted examination items**
- **Designers want to get the needed information in a timely manner**

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↓

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Verify suitability of target value

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Release drawing

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(Example: Design Process for parts)

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Set the Target value

Consider structure / specification

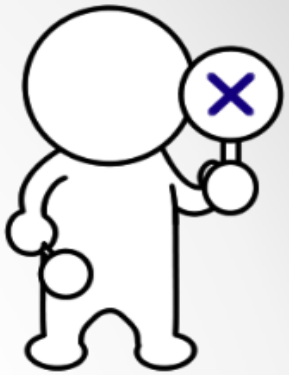
Verify suitability of target value

Release drawing

- **Automated input of design value**

3.Current problems

Design with waste and rework



(Example: Design Process for parts)

- Rework caused by omission of examination item
- Time wasted on information retrieval

Set the Target value

Consider structure / specification

Verify suitability of target value

Release drawing

- Manual input is too time-consuming
- Rework caused by mistaken inputs

4. Solution Approach

Solve these three challenges by developing a system and approach designed to eliminate waste and rework

(Example: Design Process for parts)

・ **Rework by omission of examination item**
⇒①*"Mieruka" for process

Set the Target value

Consider structure / specification

Verify suitability of target value

Release drawing

*** "Mieruka for Process"**
"Mieruka" mean is "identifying problems and bringing them to foreground"

4. Solution Approach

Solve these three challenges by developing a system and approach designed to eliminate waste and rework

(Example: Design Process for parts)

・Rework by omission of examination item
⇒①*"Mieruka" for process

・Time wasted on information retrieval.
⇒②Manage study／verification results

Set the Target value

Consider structure / specification

Verify suitability of target value

Release drawing

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Set the Target value

Consider structure / specification

Verify suitability of target value

Release drawing

- Manual input is too time-consuming
- Rework caused by mistaken input
  ⇒③Track related data

* "Mieruka for Process"
"Mieruka" mean is "identifying problems and bringing them to foreground"

5.Design Process

Solve these three challenges by developing a system and approach designed to eliminate waste and rework

①"Mieruka" for process

②Manage study／verification results

Created『Process Flow of parts design』

Reliability **Marketability** ・・・

Saving and reference

Data Base

The results

Data Base

The results

Target value A → **Examination item A-1** → **Examination item A-2**

Target value B → **Examination item B-1**

・・・

Connect the process

③Track related data

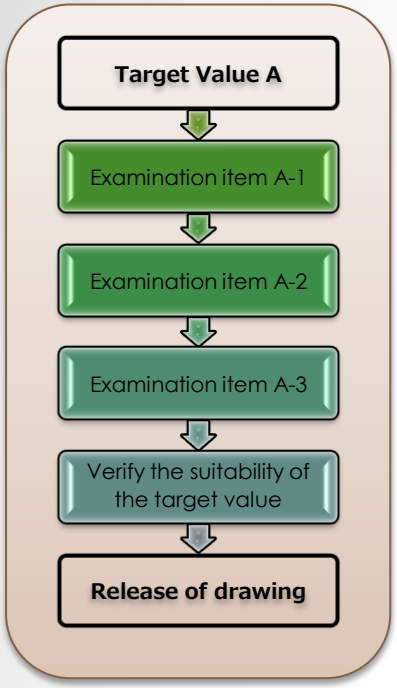
Examination item C

Verify the suitability of the target value

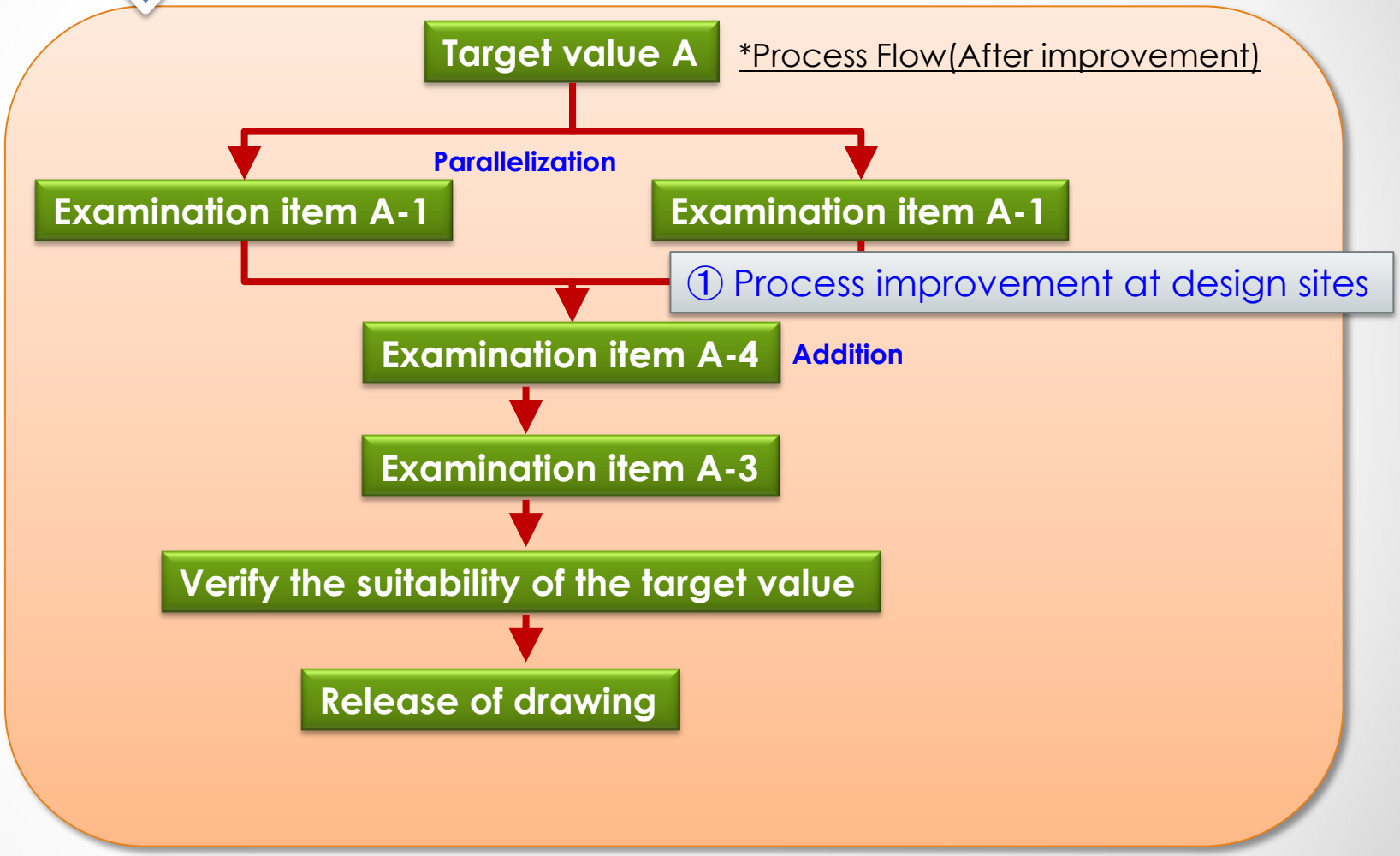
Release of drawing

6. Key points for design process system

Base Process Flow

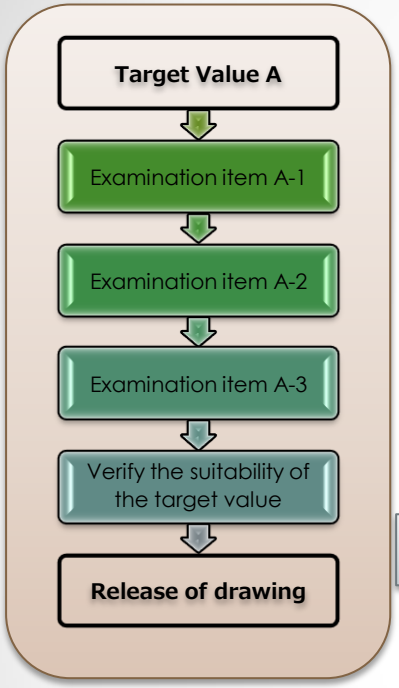


【System important matter】

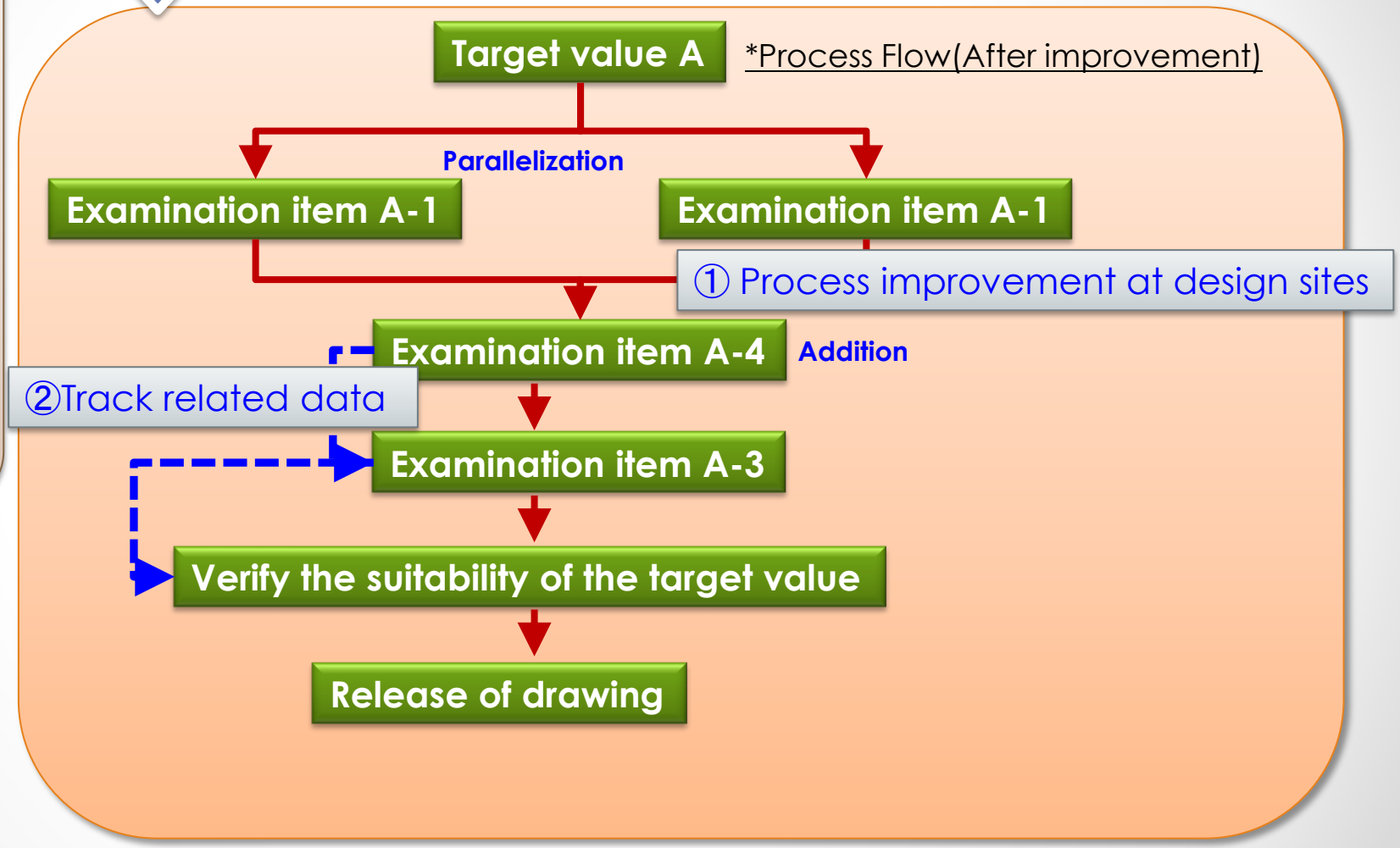


6. Key points for design process system

Base Process Flow

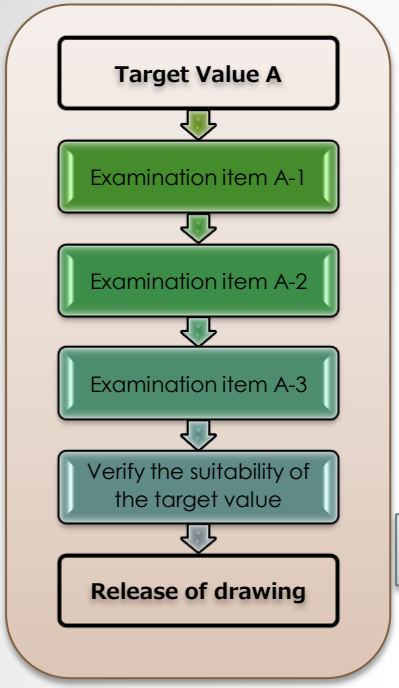


【System important matter】



6. Key points for design process system

Base Process Flow



【System important matter】

Target value A

*Process Flow(After improvement)

Parallelization

Examination item A-1

Examination item A-1

① Process improvement at design sites

Examination item A-4

Addition

②Track related data

Existing database

Reference

Examination item A-3

Save

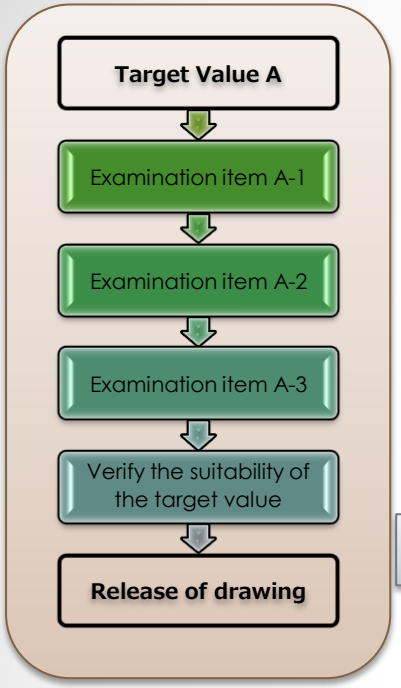
Verify the suitability of the target value

Release of drawing

③Transfer of data from existing sources

6. Key points for design process system

Base Process Flow



【System important matter】

Target value A

*Process Flow(After improvement)

Parallelization

Examination item A-1

Examination item A-1

① Process improvement at design sites

Examination item A-4

Addition

②Track related data

Existing database

Reference

Examination item A-3

Save

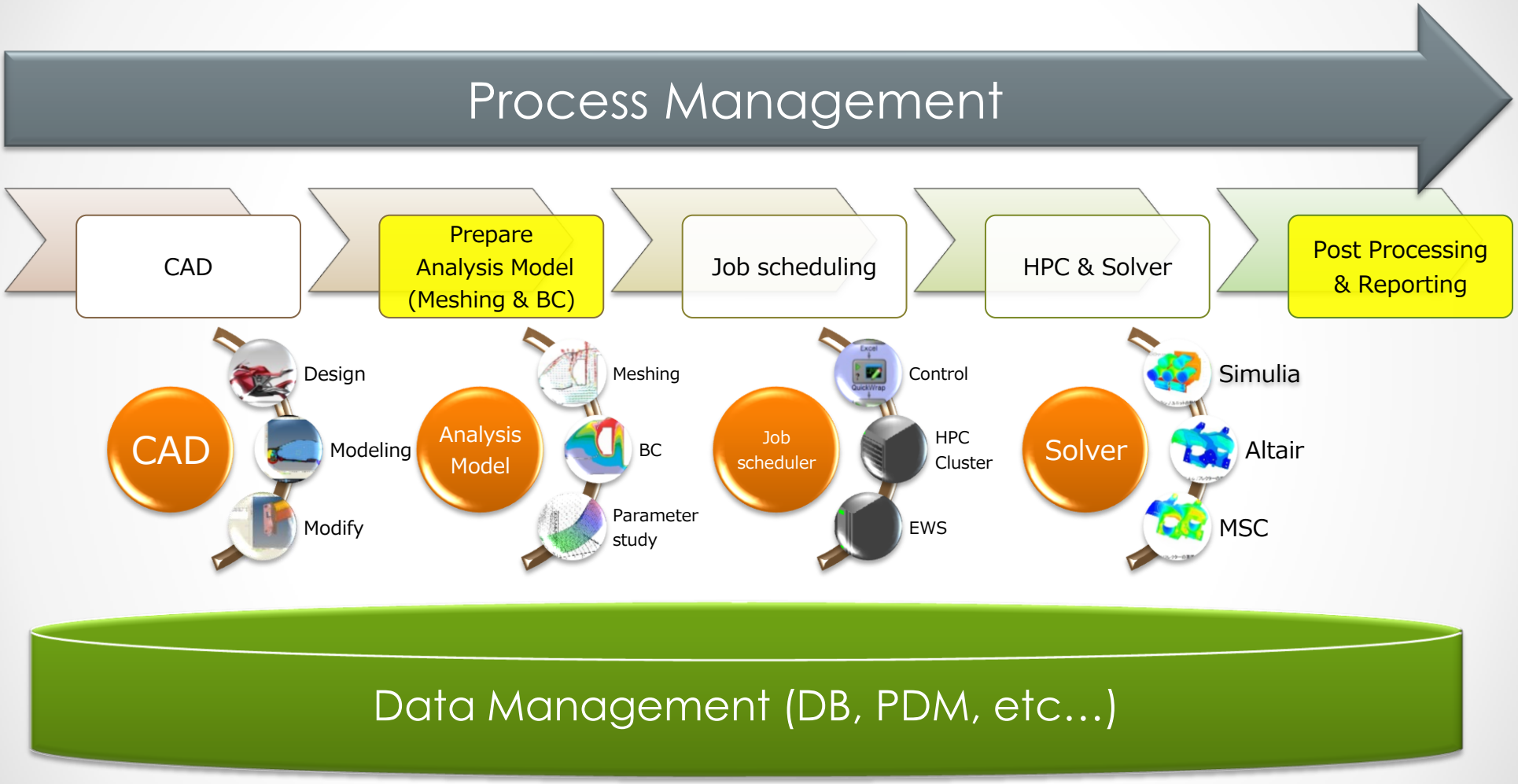
Verify the suitability of the target value

Release of drawing

③Transfer of data from existing sources

④Intuitive operation and quick operability

7.Requirements for SYSTEMs



7.Requirements for SYSTEMs

User requirements are as follows:

- Easy implementation of in-house tool
- Easy implementation of various tools
  - Database, PDM Systems, CAE tools, Office Tools, CAD, HPC, Job Scheduler, etc.
- Openness of architecture
- Flexible rearrangement and control of process by external tools
- Future development potential
- Can use system for a long time (Continues to evolve)
- GUI (easy to use)

Three years ago, we researching then Argo-Graphics (one of Distributor in Japan), introduced for us of PHX Products, ModelCenter and CenterLink, then we started the Proof-of-Concept!

7.Requirements for SYSTEMs

Requirements for the tool are as follows:

- Process flow can be easily improved according to designer specifications
- Can be linked to existing database or other data sources
- Web GUI is best solution for easy operation and flexibility for customization
- Performance

8.Why we chose MCC

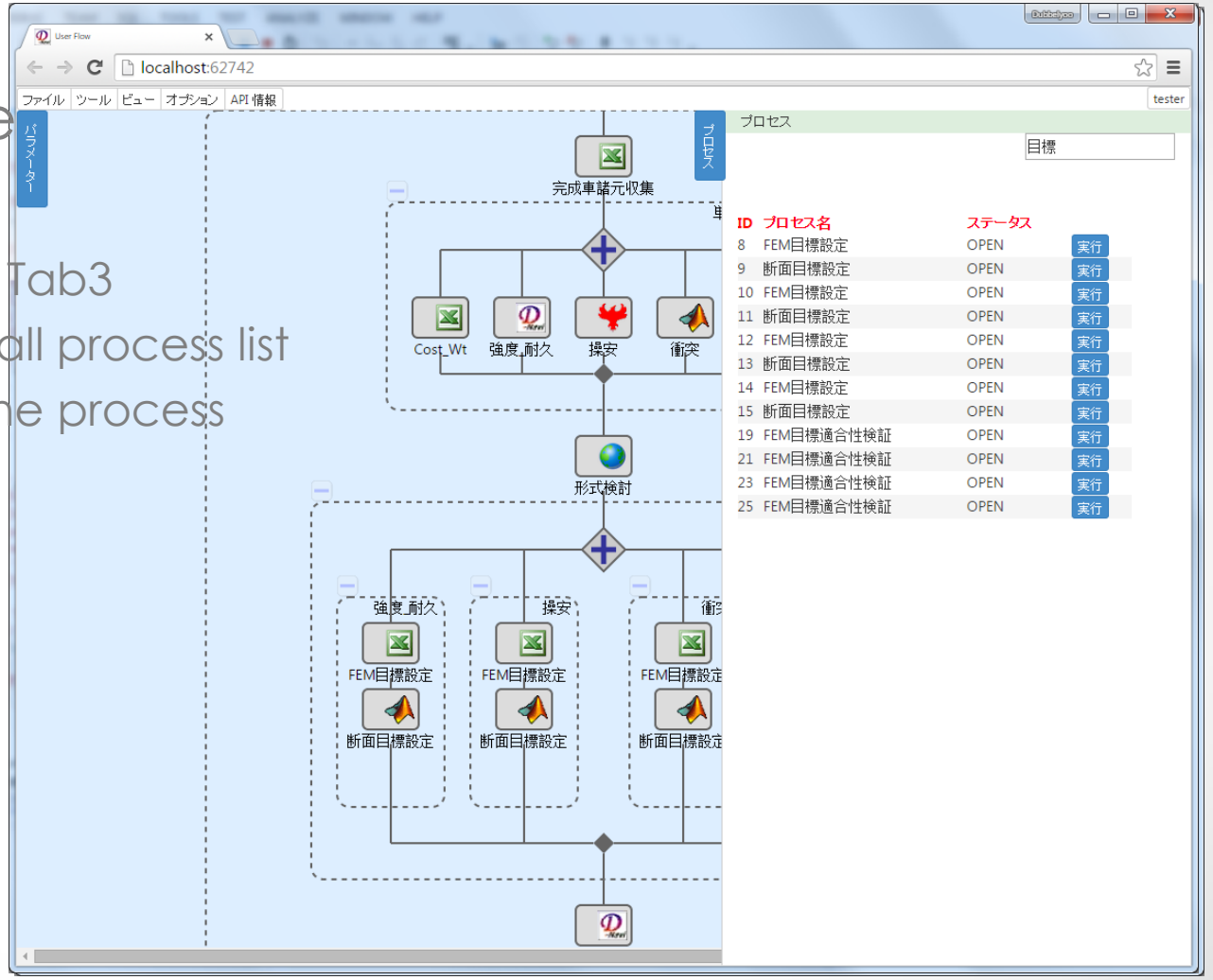
*MCC=Model Center Cloud

- Firstly, we research and try Proof Of Concept for some tools.
- Reasons for selecting PHX
  - Openness
    - API preparation
    - User can make Plug-In, etc…
  - Flexibility
    - Easy to control process
  - Web architecture based system using modern technologies

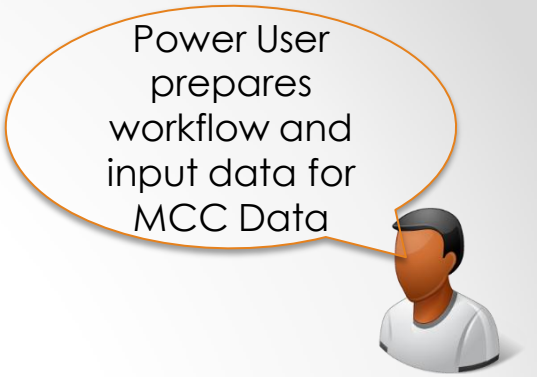
9.Introduction of our Development System

- Main GUI image

- 1st select the Process Tab3
- 2nd user can see the all process list
- 3rd user can search the process



System Image

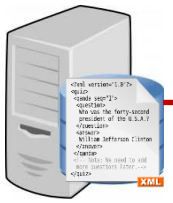


Set the Target value

Consider structure / specification

Verify suitability of target value

Release of drawing


CAE Data server


Data Server


Notes Data Base

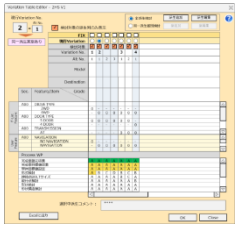

Power User [ModelCenter]


ModelCenter Cloud Data & Execution


Designer PC EWS


Original GUI Case Management

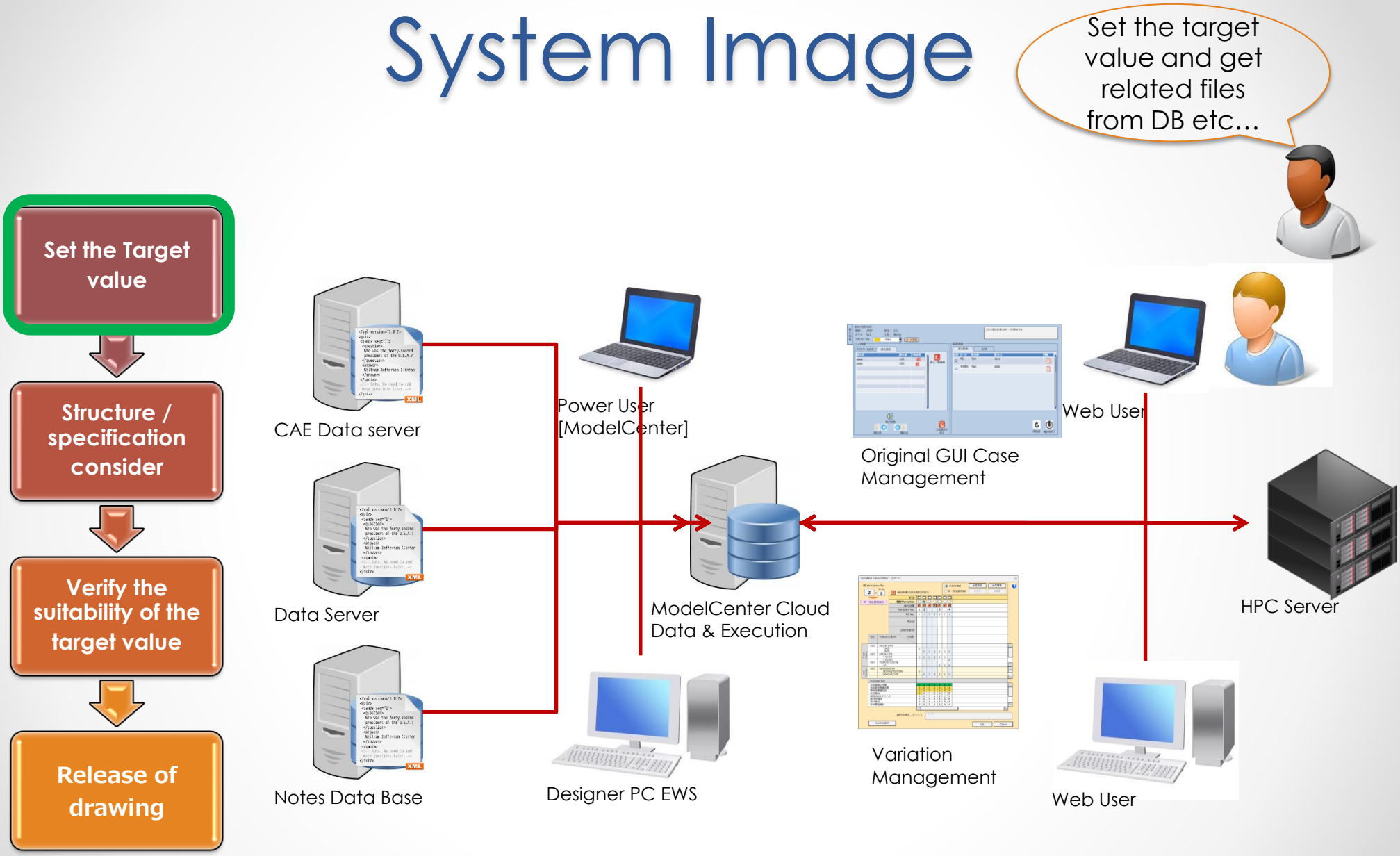

Web User


Variation Management


Web User


HPC Server

System Image



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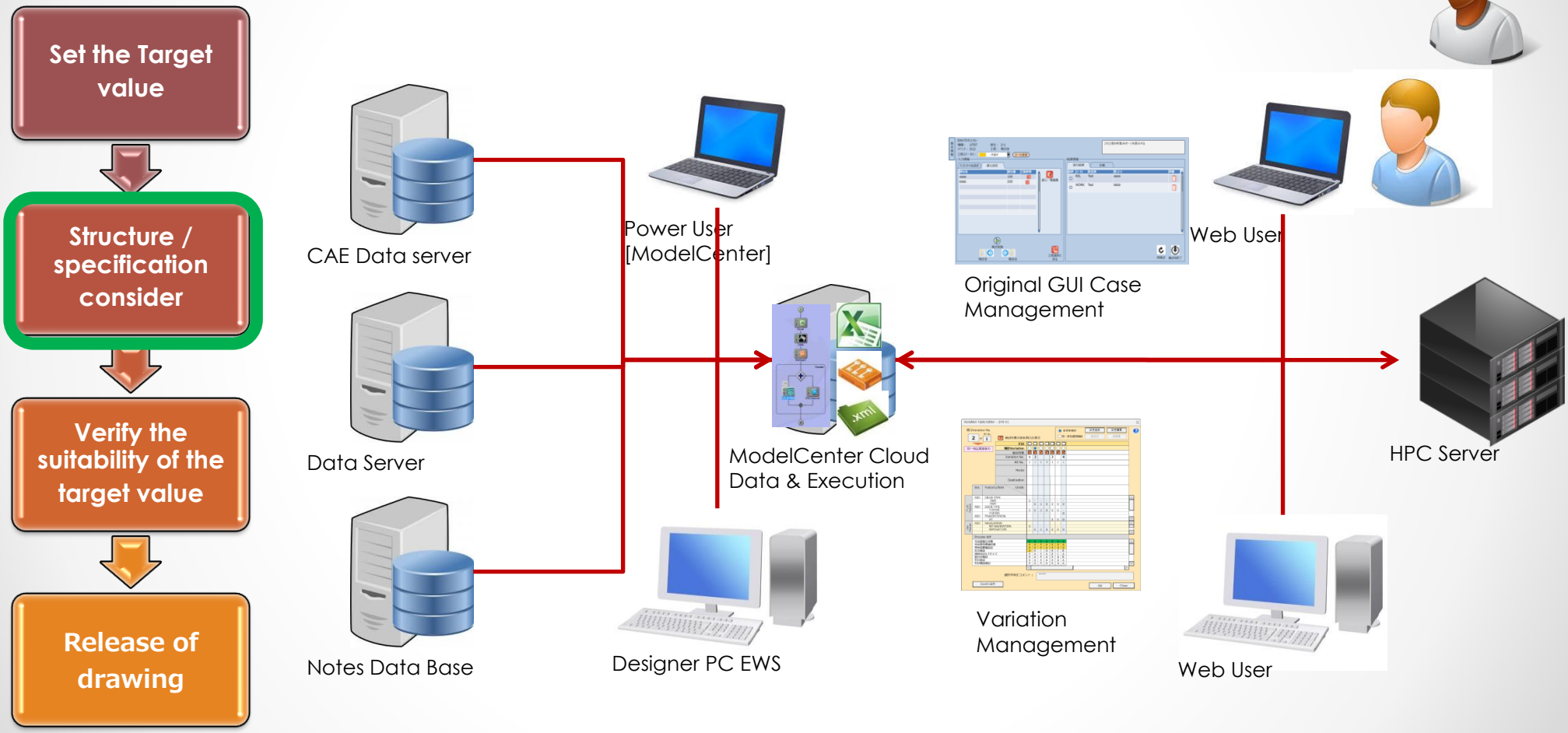

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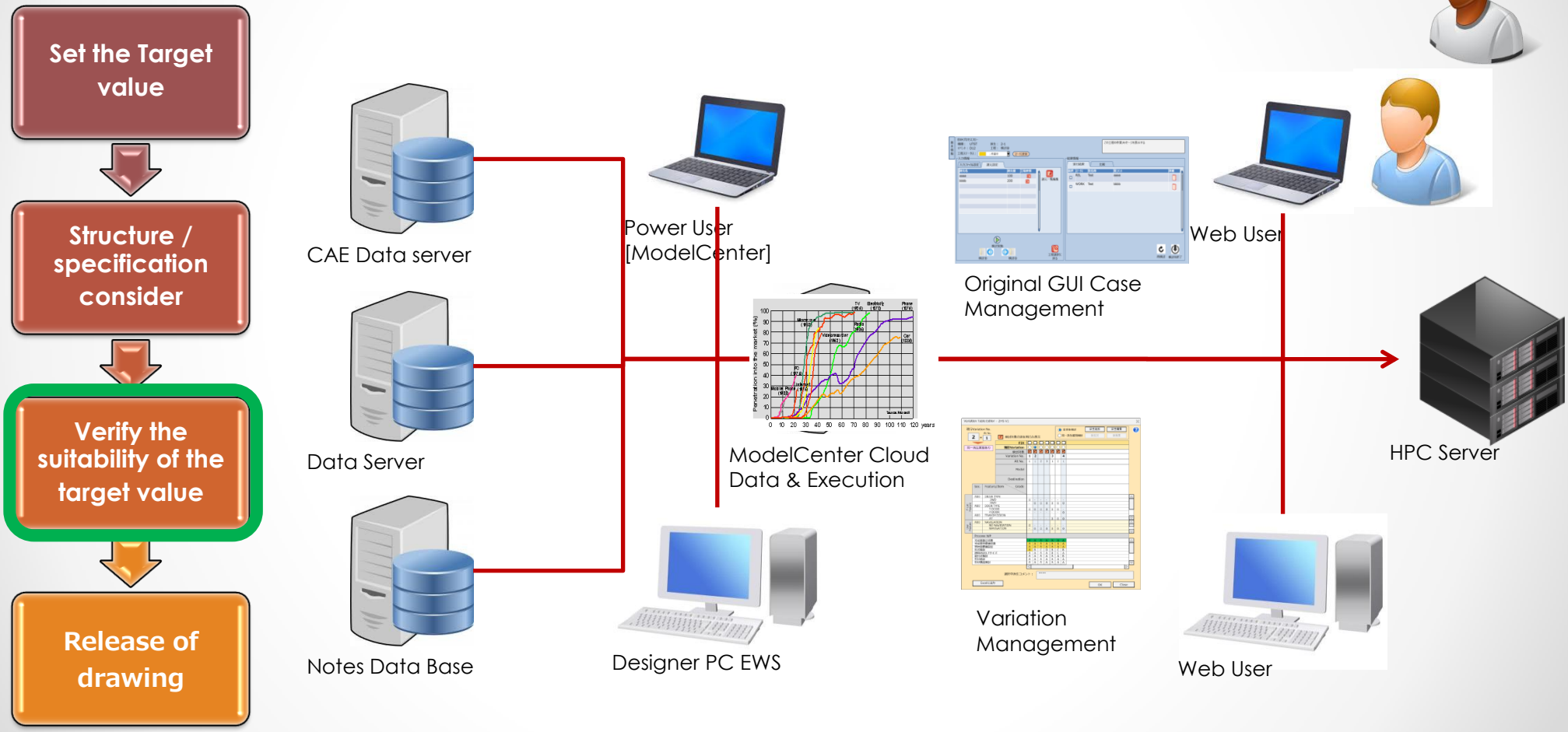

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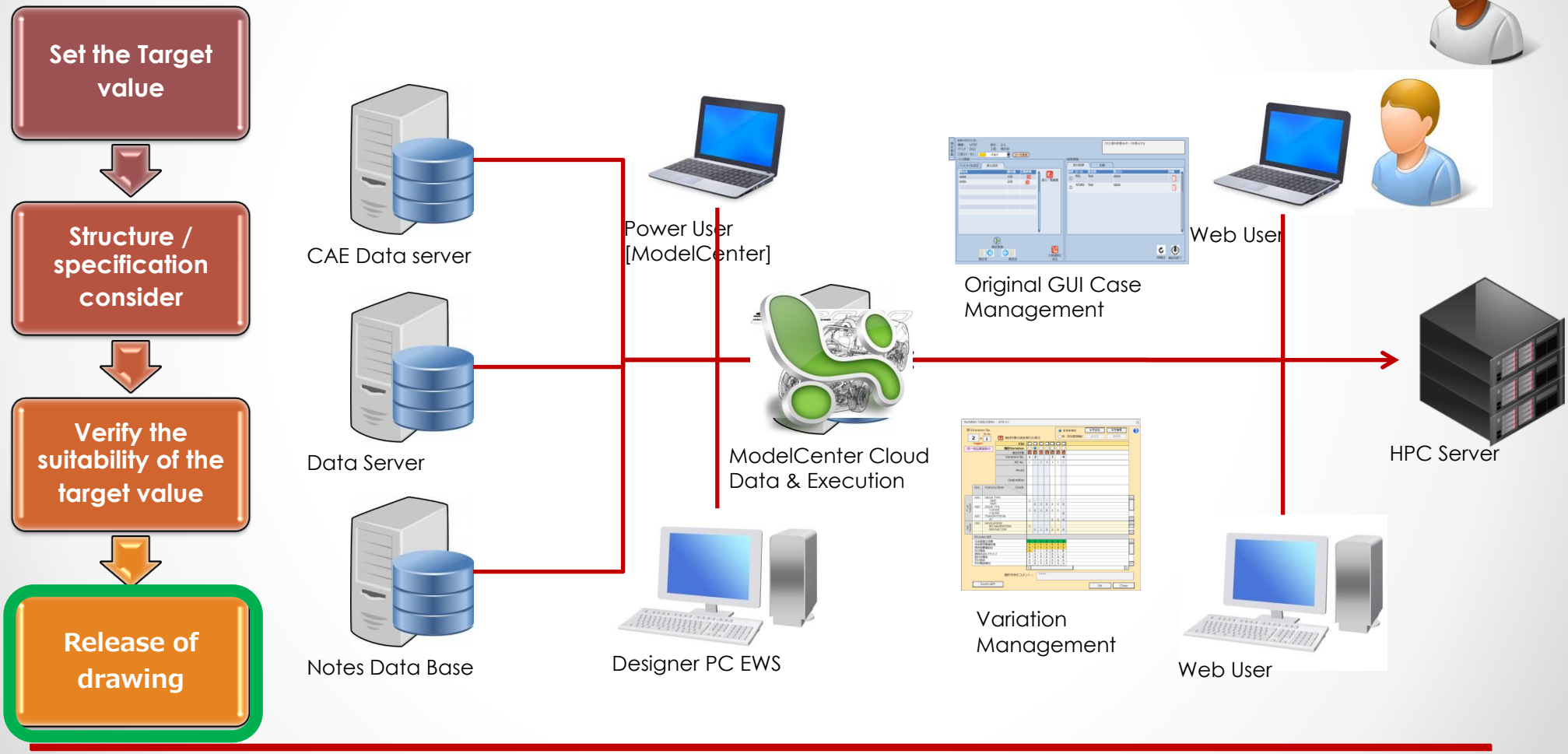

10. Request for PHX

Could you please understand the Honda spirit!

- Match to “HONDA SPIRIT ”
  - SPEED
  - Challenge
  - Best in the World
  - Dream

  ...etc.
- Please continue to support Honda and our development team at Argo-Graphics


The Honda Humanoid Robot ASIMO
ASIMO
HONDA
Thank you for your attention!


HONDA
The Power of Dreams

Final Target: Real PLM System