Implementation Advance Tech. to Improve EPSD Quality System

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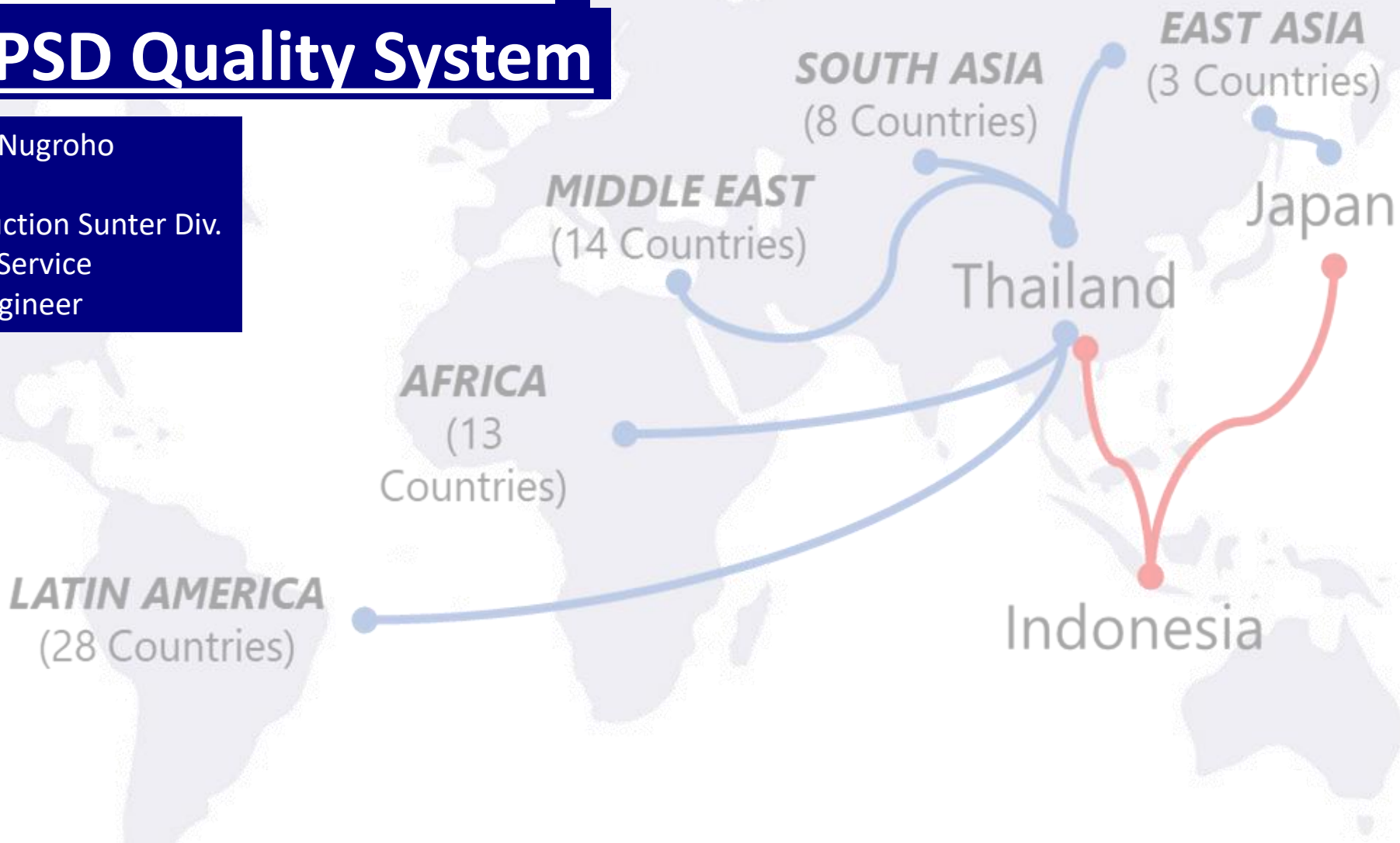
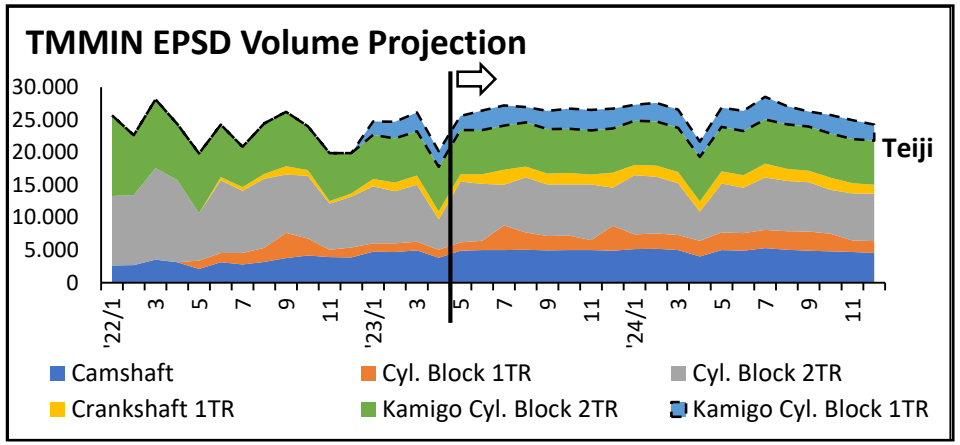
Department : Engineering Service
Position : Jr. Quality Engineer

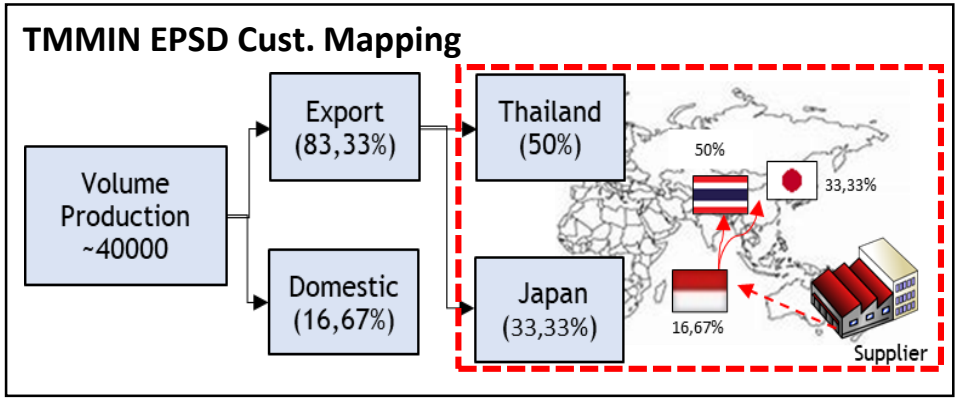


Background

Business Overview



2nd semester of 2023 is critical timing when **there's increasing in production volume due TR Centrallization**



If there's quality issue happen, could have negative effect to Toyota Global Reputation → To overcome this problem, we need to provide good risk management.

Hoshin

Transform Business Model through DX to increase efficiency

Mr. I Nyoman Winaya
TMMIN Director

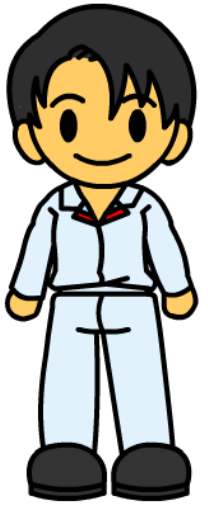
First Class Service to Global Cust. Through Adv. Tech and Operation Excellence.

Mr. Tagor J.D
SUNTER 2, EPSD Division Head

Digital Transformation for Product Tracing System

Mr. Juganda S
SUNTER 2, EPSD Deputy Division Head

I have to **improve current mindset** and **quality management system** by adopting **advance technology.**



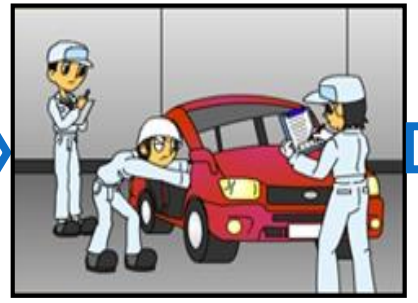
Background

Lead Time Analysis to Trace Product

Current

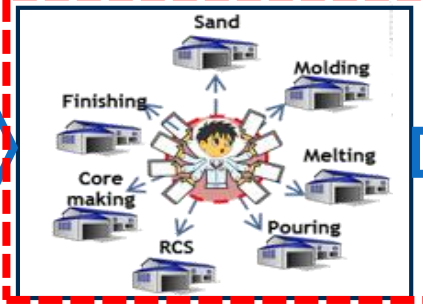
Muda Process

Claim from Customer Occurred



Check Manuf. Date

1 Hour

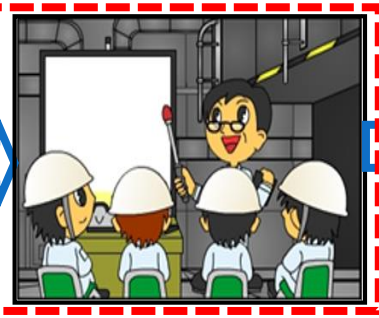


Confirm Abnormality Finding on related date (Henkaten, Etc)

3 Hour

Coordinate with stakeholders (M/T, Production, Warehouse)

2 Hour



Found Rootcause

4 Hour

*Ensure Customer With **Related Manuf. Date***

*Need **10 Hour***

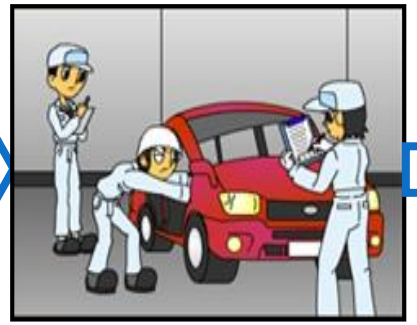
Effect Due to Current Condition

If not,

1. **Escalate** other claims
2. Effect to **TMMIN and Toyota Global Reputation.**
3. **Financial loses will increase.**

Ideal

Claim from Customer Occurred



Check Manuf. Date

1 Hour

Automatically detect data abnormality that related to claimed product.

*Only Need **1 Hour***
*→ **Still Have 9 Hour Gap***

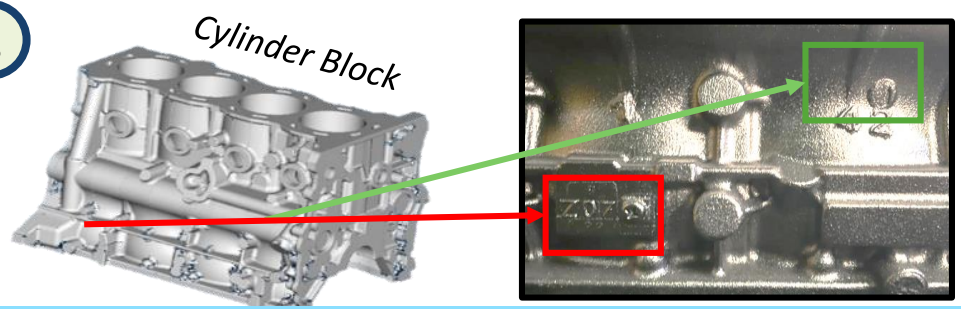
Ideal Concept for Quality

- Easy to **get Production Identity and Location**
- Manage **Product related range.**
- Easy to find **abnormality process** on related date.

Background

Kadai

1

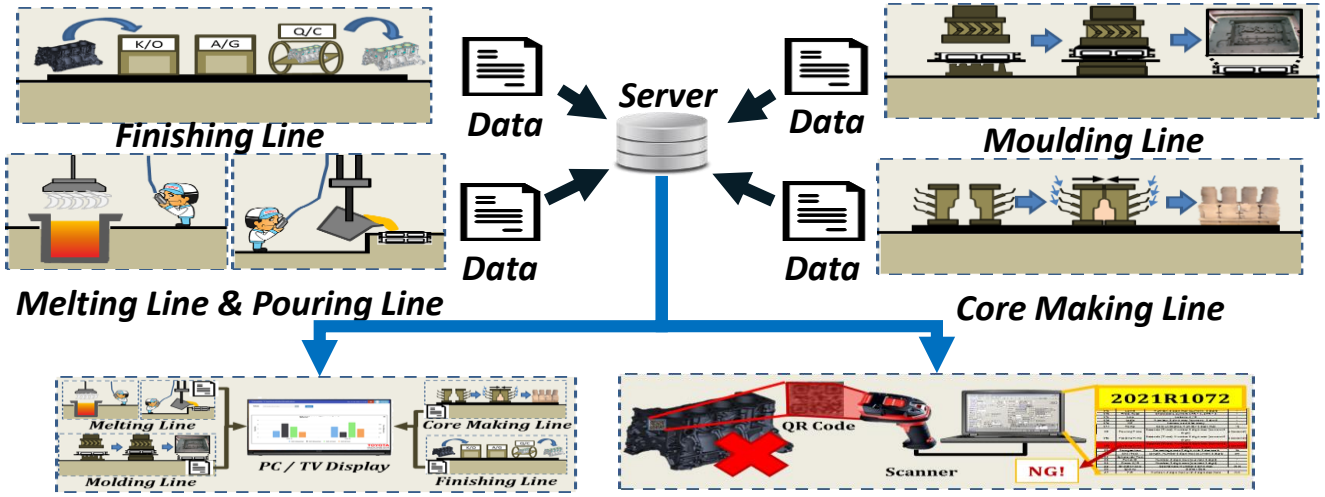


Product Identity is **difficult to read (not reliable) and possibly miss reading due to unclear profile**

2

Island by Island Prod. Operation with Manual Parameter Input effect to **Manual Verification Process (Long lead time) → Poor Accuracy, incomplete data**

Ideal Concept



A. Create Product Identity

B. System that integrate all parameter

If there's abnormal parameter (Out of Std.) →**All product related will not sent to machining**

Strategy?

1 **Benchmark** with other **Iron Foundry**

PT. AT INDONESIA

AICC PT.ASIAN ISUZU CASTING CENTER

Others: Kamigo, STM

2 **Discuss** with related **stakeholders**

- **ISTD** → IT.Tech Dev. (Part of TMMIN DX roadmap).
- **Hardware Team**→ Define H/W
- **Casting Management**
- **Prod. Team** → Work Style

Feedback from Mgmnt:
"Please do massive training to operator and leader about do's and don'ts related new tech"

Project Development Activity

Development Milestone

Start

Create Product Identity

2nd

Define Critical Parameter

3rd

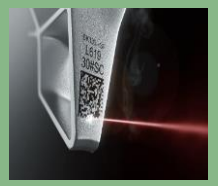
DATA

Integrate and Visualize Parameter

Now

Level Up

4th



Research for best tracing method

5th

- PC
- Network
- Laser Marking
- Sensor

Define Hardware

FINISH

NG!

Auto Judgement based on:
- Pouring Time
- Sand Char.
- Temperature

Auto Alert System

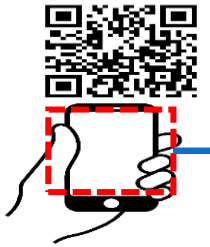
Concept Development

Hardware Development

Background

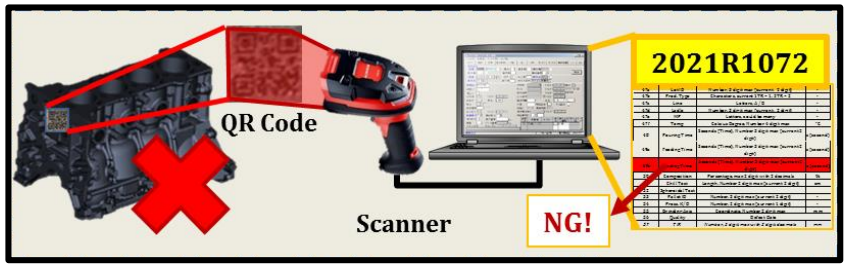
Inspiration

Basic Concept

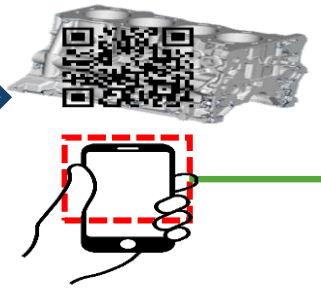


- Food
- Beverages
- Snacks
- Dessert

Using scan QR while ordering food, **automatically shown all menu.**



Basic Concept



- Location
- Parameter
- Related Prod.
- Henkaten

QR Code Application for **Casting Production Traceability System (CASPER)**

**Collaborate with ISTD and being part of TMMIN DX*

Project Goals

- **Decrease lead time NG Product treatment process at customer.**
- Before problem escalated, **we could manage first.**

Project Development Activity

Project Schedule

Activity	2022				Jan-23					Feb-23				Mar-23					Apr-23				May-23				Jun-23					Jul-23				Aug-23			
	04	11	18	25	01	08	15	22	29	05	12	19	26	03	10	17	24	31	07	12	21	28	06	13	20	27	03	10	17	24	30	06	13	20	27	06	13	20	27
Digitalize Parameter Input	1 Research for Vendor				2 Define Critical Parameter									3 Define Interface					Programming				4 Member Training				5 User Test				TR		GO LIVE						
QR Code Application	1 Feasibility Study									Study Concept									Installation								6 TR				7 Parameter Integration								

1 Research for Vendor

Vendor Scope	Job
Software Team	Create Database web and interface
Hardware Team	Define PC, Panel, PLC, etc
Jig Programming	Define Jig for Laser Marking

Kadai

- ❑ Need **special industrial spec** due to **casting environment.**
- ❑ **Complexity data** integration due to **island-by-island processes.**
- ❑ Need **highly engineering skill** due to unique casting.
- ❑ Difficult to find vendor with casting knowledge.

Activity

Held **training** to vendor about **iron casting**

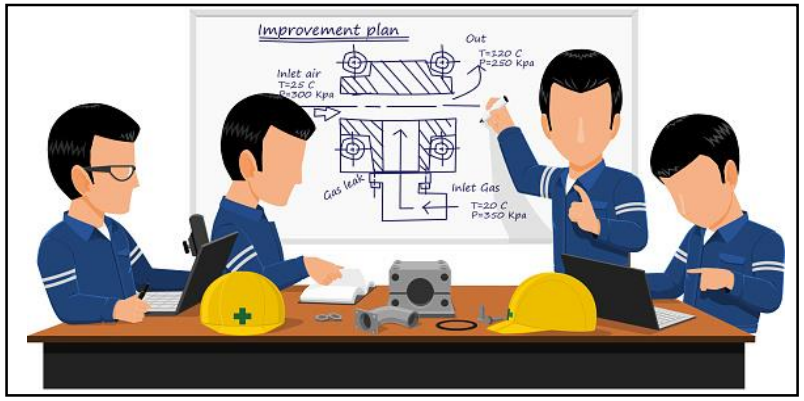
Project Development Activity

2 Define Critical Parameter

Concern:

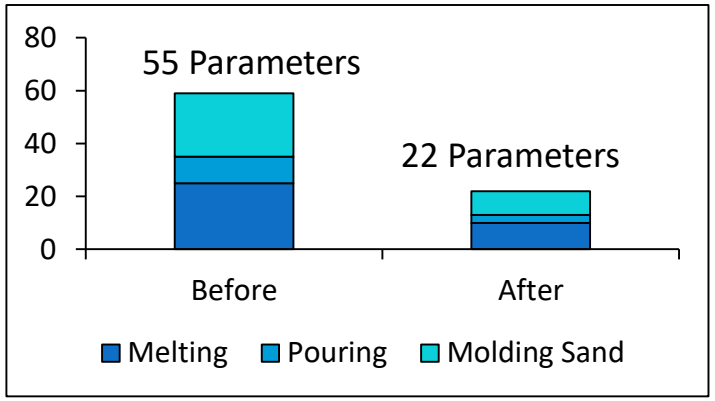
- **Time to trace abnormal product**
- **Time** for **software development.**
- **Minim vendor** with **iron casting** and **metallurgical knowledge**

Activity



Massive discussion with Prod and Maint. Team to define **critical parameters based on exp. and scientific approach**

Result Number of Parameter Control



Why need to decrease critical parameter?

- **More effective** analysis
- **Fasten traceability** system

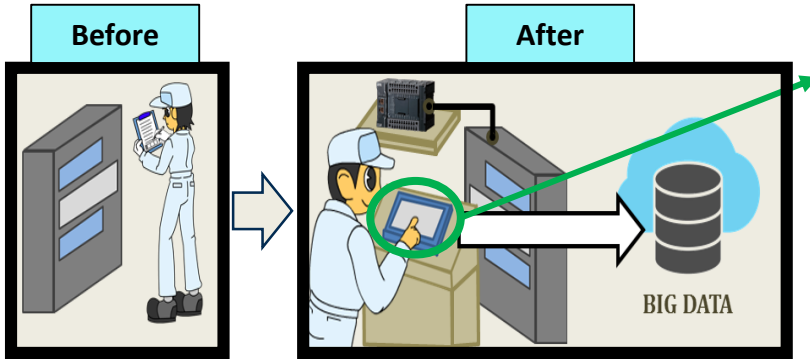
After massive discussion, could **define list parameter need to highly monitor.**

3 Define Interface

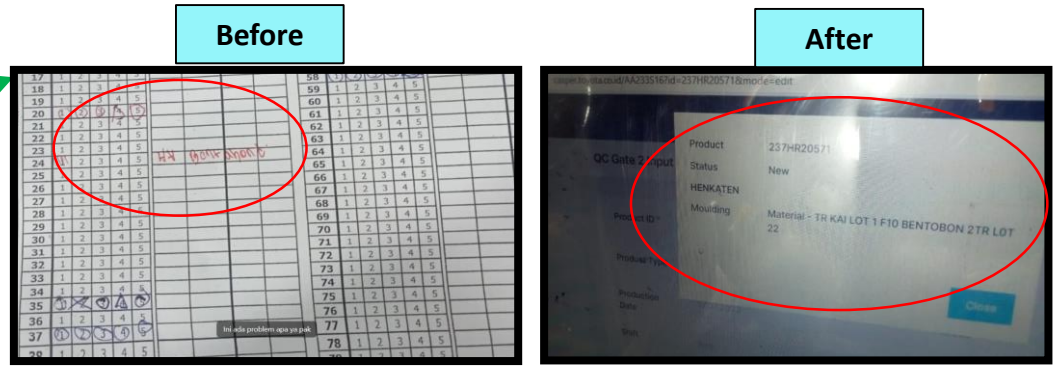
Concern:

- **User friendly** interface (**easy** to understand)
- **Same format** with manual input.
- **More ergonomic** for **working style**
- **More accurate** and **linkage** at **one database system**

Concept Transformation



Example Case: Request Try by Engineering



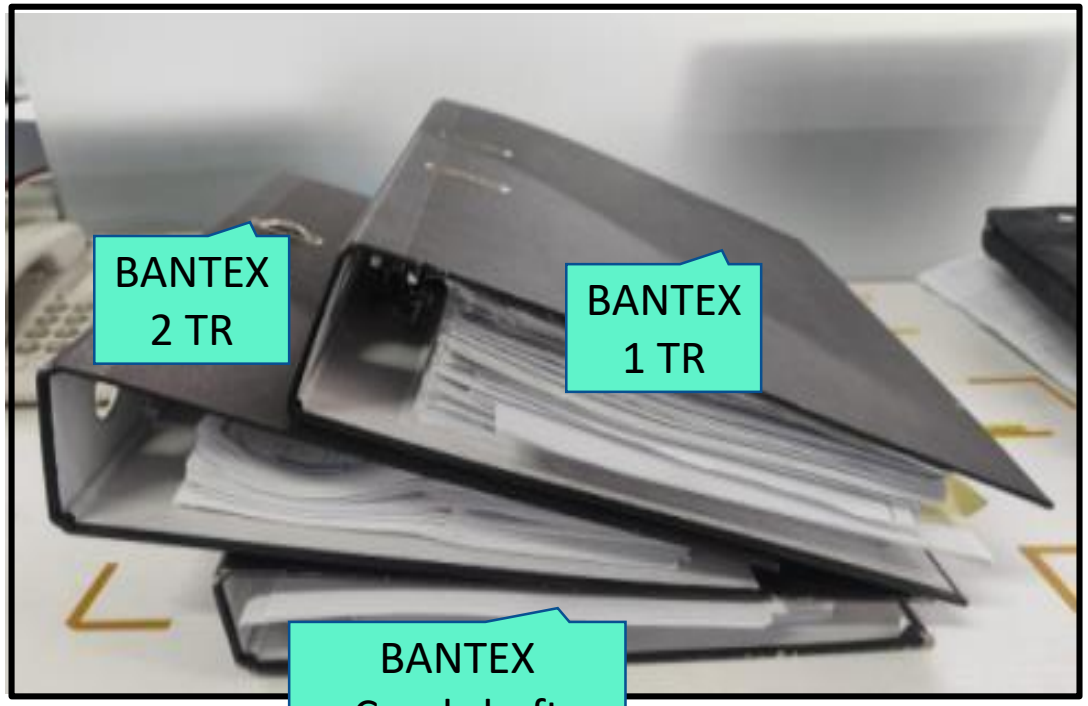
Potential outflow for trial product due to **manual sign** at paper

Automatically show at tablet if there's trial product → **More Efficient**

Project Development Activity

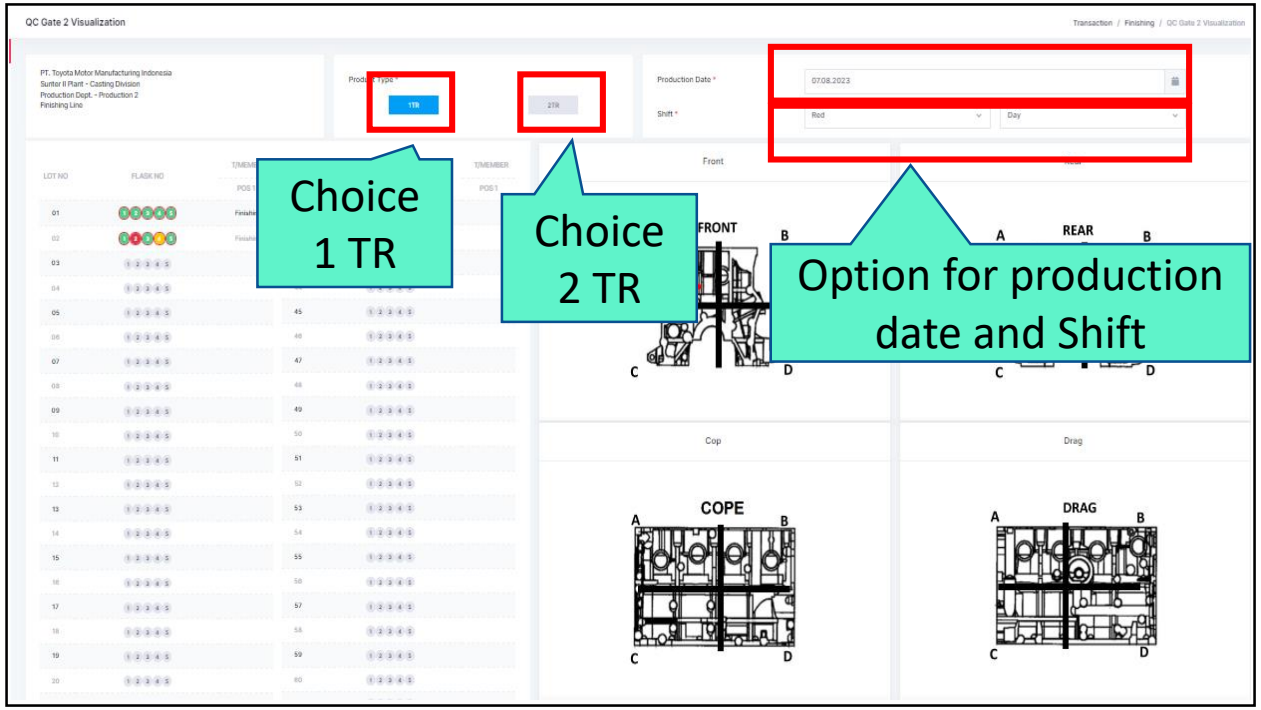
3 Define Interface

BEFORE



Need to search quality recap **bantex by bantex**

AFTER



Just **Sort related product** and **manuf. date**

Project Development Activity

4 Member Training

Concern:

- **Transform Work Style** from **manual** to **digital**
- **Member knowledge** about **dos** and **don'ts** to hardware problem.
- **Change Management.**

Activity:

Massive Training for member in both **2 shifts.**

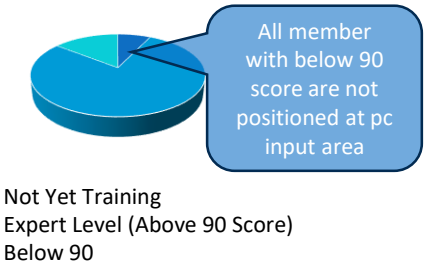
What is the training content?
- Hardware operation, troubleshooting,

Who get the training?
- Operator and Leader Production and maintenance

Who is the trainer?
- Engineering, and maker

Skill Mapping Result:

#Operator Skill Result



#Leader Skill Result

Average score for all member during training has achieved **97,8 (Good Result)**

5 Product Performance Test

*Massive Production Scheme for 2 weeks

Concern:

- **Application Performance need to as fast as possible**
- **Hardware (infrastructure and performance)**

NO	ITEM	ACHIEVEMENT CRITERIA	ACHIEVEMENT RESULT	JUDGEMENT
1	**Application Deliverable**	**100% Ready for Module : 31 Function**	100% module has been established and Tested	**OK**
2	**Performance Test**	Average response < **3 seconds**	CASPER average response time for all menu is 1,47 sec	**OK**
3	**Development Issue (PU-UT)**	Open **issue < 0**	0 Remaining Open Issues	**OK**
4	**Infrastructure Readiness**	Server & Network are available for each area w/ minimum 1 backup.	100% H/W & N/W has been installed & prepared to be used	**OK**

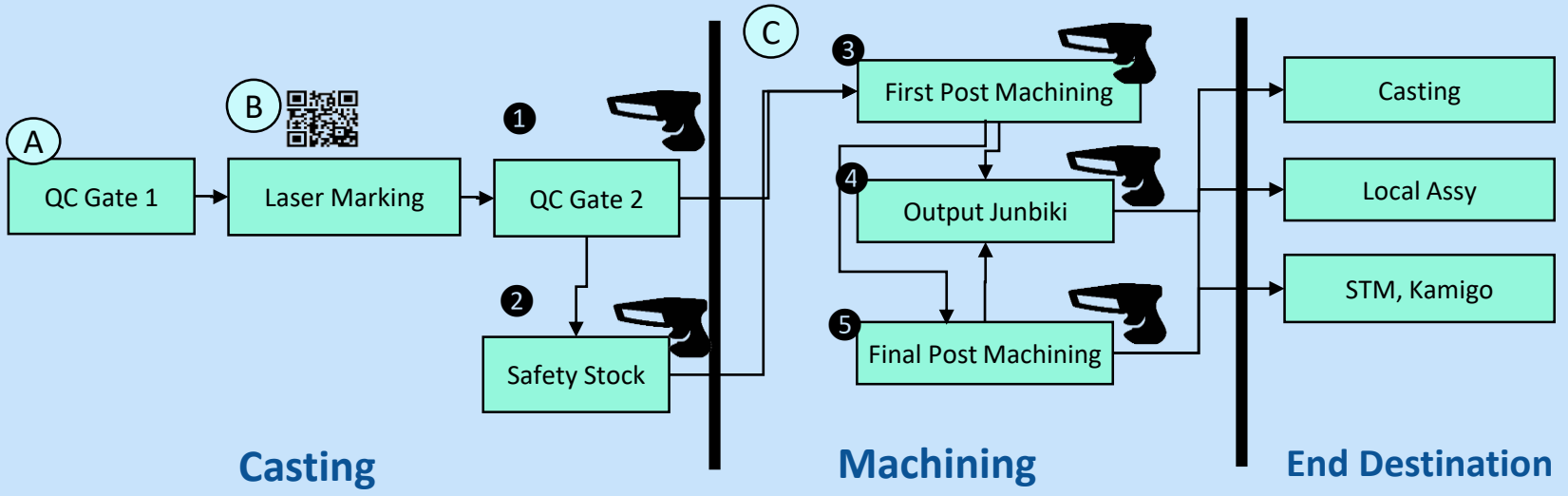
Current system are **ready to live** in Jul 2023 with **continue PDCA cycle**.

Project Development Activity

6 Product Identity Result

Concern:

- Integrate **2 identities (casting and machining).**



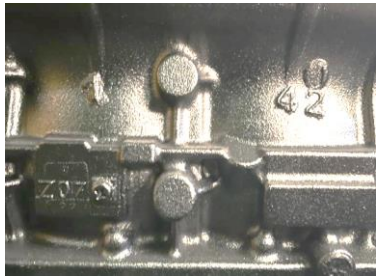
Remarks

1. Scanning → Automaticly Sunter 1 Status
2. Overwrite data for product location from Junbiki → Safety Stock
3. Pair Pouring date and Work Id
4. Update Product Status for NG In line Process
5. Update Product Status for OK/NG and end customer location

Product ID Generation

Process	Pouring Date (No FIFO)	Work Id (FIFO)	Machining Date
A	O	X	X
B	O	O (Visual)	X
C	O	O (Visual)	O

Before



Casting Identity → By Dymo

After

QR Code by Laser Marking

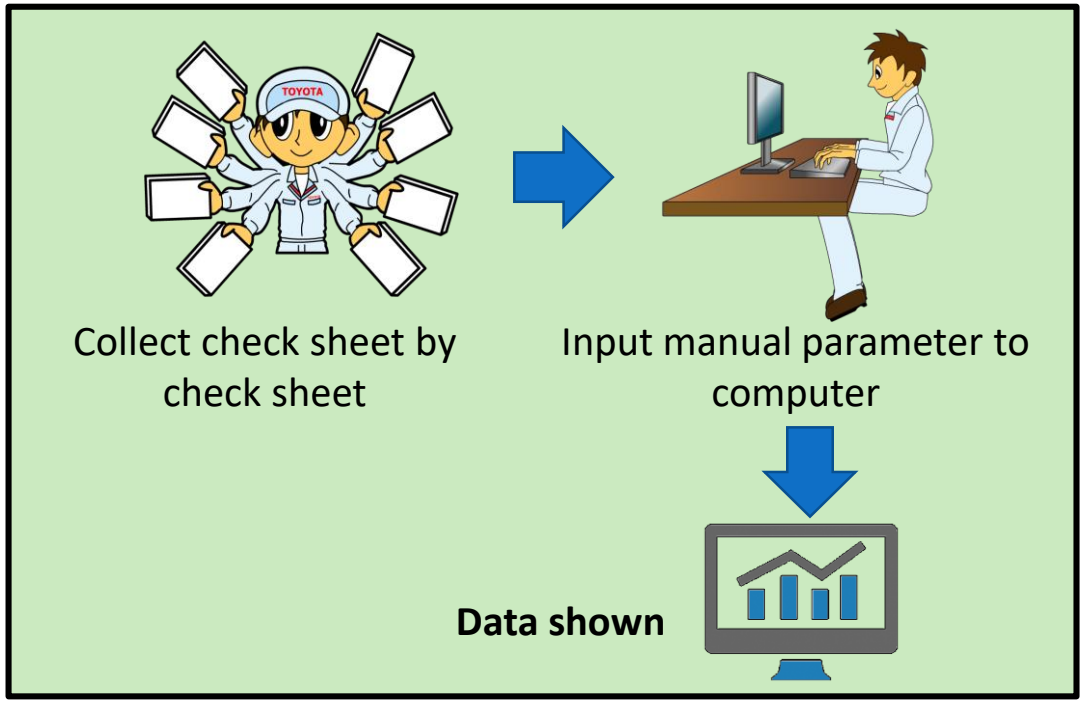
There will be 3 Product Identity:

1. Casting Pouring Date (Server)
2. Casting Work Number (Visual)
3. Machining Work Number (Server

Project Development Activity

7 Parameter Integration Evaluation

BEFORE

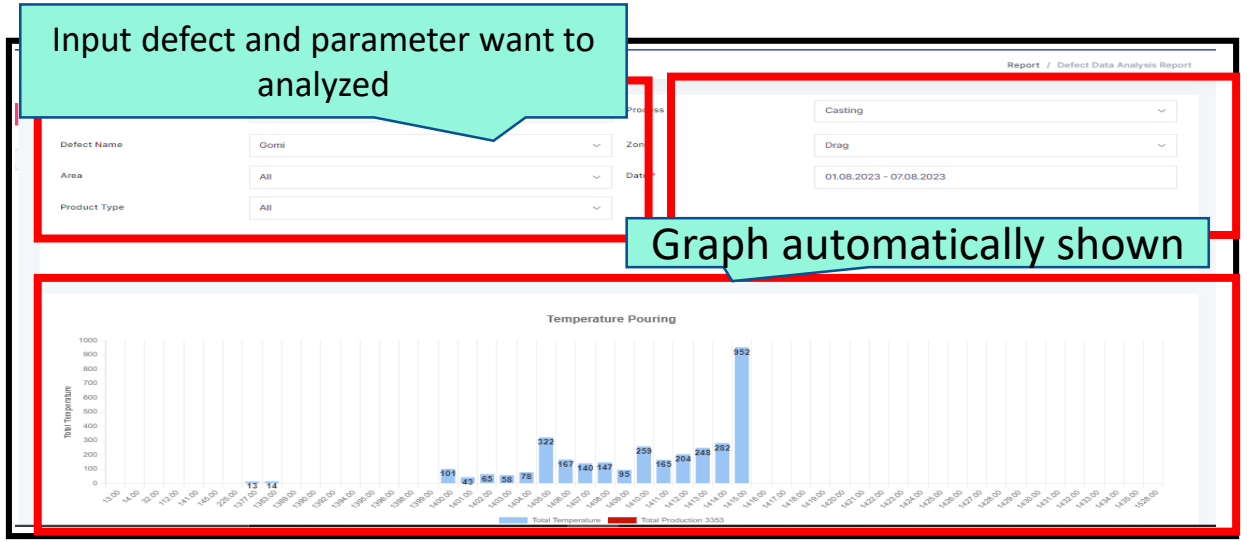


AFTER → Establish casper.ytoyota.co.id

Feature:

1. **Auto daily report**
2. **Auto defect analysis**
3. **Auto real time parameter and defect**

Sample to identify defect



Need to search quality recap **bantex by bantex,** then manually input to computer for further analysis

Just sort **related defect** and **sort** what **kind of parameter need to analyzed** → Establish (casper.toyota.co.id)

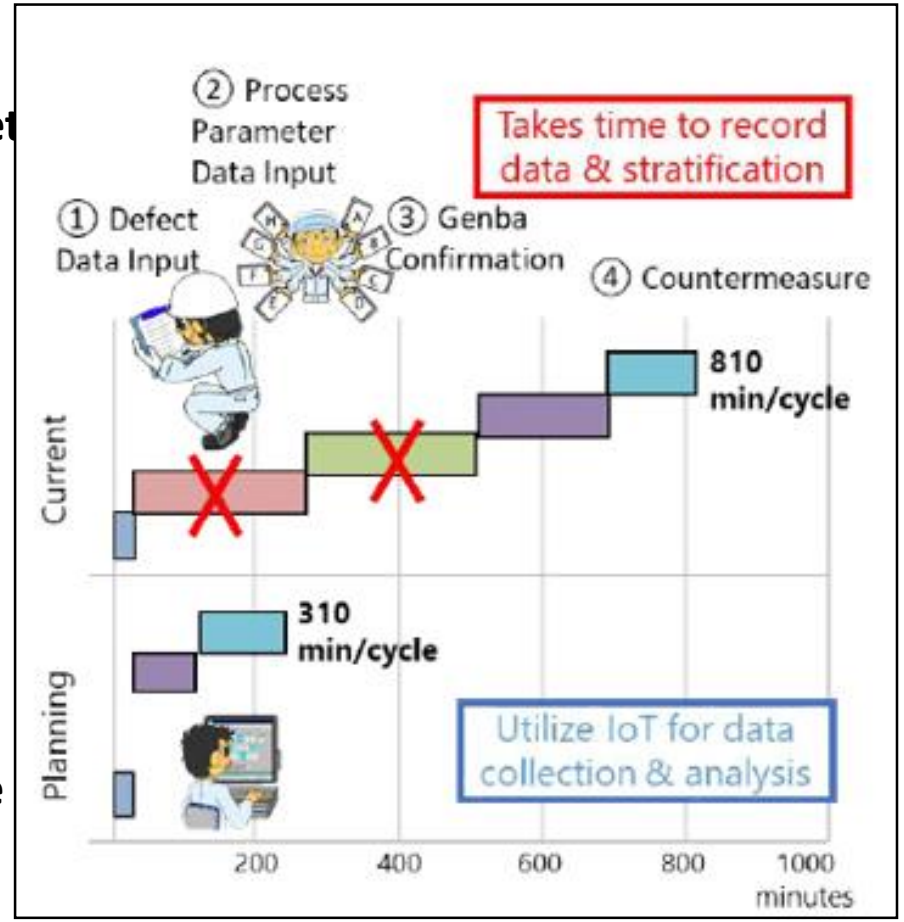
Video Before After

BEFORE:

- Need to collect parameter **check sheet by check sheet and line by line**
- Need to input **manually data one by one from check sheet**
- **Manual analysis** (Create graph, etc).

AFTER:

- Just go to the “defect analysis” menu, and **chose what parameters want to analyzed**



Benefit

Customer View

1. **Get Explanation why the problem occurred**
2. Others customer could **understand either their products were related or not.**
3. **With easier way to trace related product**, dealer and related parts **could anticipate escalation.**

TMMIN View

❑ IDL Cost Saving

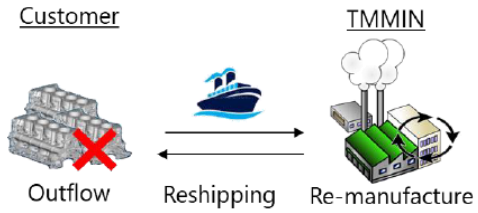
→ Eliminate Muda Job for indirect labor

- Additional Reduce MH for Defect Stratification

Amount/year: Rp 1,537,536,000

❑ Cost Loss for Responsibility to Cust.

→ Saving cost for material loss and Remanufacturing cost due to defect



Remanufacture Cost					
Cost/Unit	Defect Reduce	Amount	Cost Saving	Shipping Cost	Total Saving (Rp/Year)
1.328.000	10%	150	**199.200.000**	140.000.000	**339.200.000**

Amount/year: Rp 339,200,000

❑ Cost Saving for Defect Reduction

→ Saving cost through parameter control for defect reduction

Amount/year: Rp 160,965,000

❑ 3 Months Stock Guarantee

→ Assume 15K prod./month

Amount Month	Prod/Month	Total Saving
3	15000	**IDR 67,500,000,000.00**

Others:

- Reduce lead time for defect analysis by **Engineering Team**
- Improve working style for **operator** (more accurate data collect).

From this activity we can potentially secure benefit
IDR 69,537,507,600/Year

Next Action:
- Yokoten to Inspection and Core Making Line

Material Attachment

Communication Route

No	PROCEDURE	CONDITION	DIVISION	Sub Incharge	Follow-up Escalation			
					T	T+1	T+2	T+ ∞
1	ABNORMAL CONDITION (HARDWARE/ NETWORK) **Criteria :** 1. PC cannot communicate to Server 2. PC remote off	Hardware/ application error	EPSD	Engineering Services	Problem Occured → Follow-up Problem	Prep Backup	Operation normal ← Change Hardware	
			ISTD	IT Technical Support	Genba		Throubleshoot Hardware	
				IS Custodian	System Check			
		Network connection problem	EPSD	Engineering Services	Problem Occured → Follow-up Problem			
			ISTD	IT Technical Support	Network Troubleshoot		Throubleshoot Hardware	
				IS Custodian	System Check			
2	ABNORMAL CONDITION (SYSTEM) **Criteria :** 1. Cannot access thingsboard 2. Data in dashboard not update	System Problem Gateway Server	EPSD	Engineering Services	Problem Occured → Follow-up Problem	Prep Backup	Operation normal ← Change Hardware	
			ISTD	IT Technical Support	Genba		Throubleshoot Hardware	
				IS Custodian	System Check	Throubleshoot Services		
			EPSD	Engineering Services	Manual Input backup			

Stabilization Period:

1. Lead by Current team Project .
2. If any issue will be recorded and evaluated each problem until stable (MA Phase)

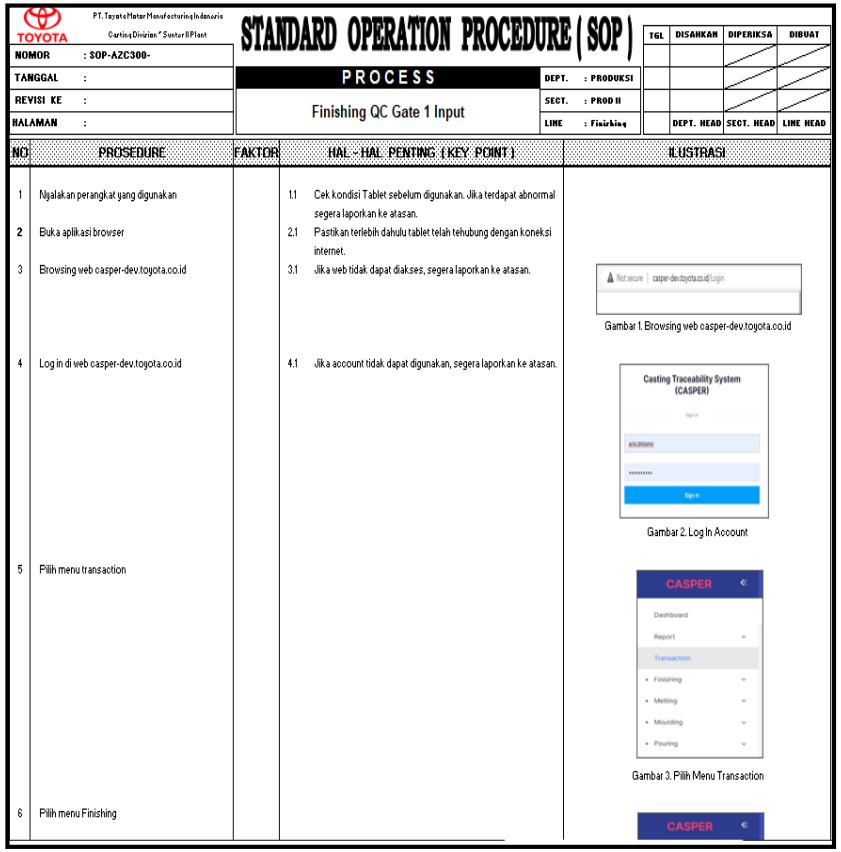
ISTD Support :

- IT Technical Support (H/W), it-techsupport-str@toyota.co.id
- IT Application HD (App), app.helpdesk@toyota.co.id
- Aidiel F., pji.aidiel@toyota.co.id
- Amirullah., amirullah@toyota.co.id
- Lukman K., lukman.khakim@toyota.co.id
- A. Hanindito, abi.hanindito@toyota.co.id

Engineering Service :

- A. Bhismo N., ario.bhismo@toyota.co.id
- A. Sismantoro., abdilah.sismantoro@toyota.co.id
- Aldino F., aldino.felani@toyota.co.id
- Juganda S., juganda@toyota.co.id

Standard Operation Procedure



PT. Toyota Motor Manufacturing Indonesia
Casting Division * Sunter II Plant

STANDARD OPERATION PROCEDURE (SOP)

NOMOR	: SOP-AZC300-
TANGGAL	:
REVISI KE	:
HALAMAN	:

PROCESS: Finishing QC Gate 1 Input

DEPT. : PRODUKSI
SECT. : PROD II
LINE : Finishing

TGL	DISAHKAN	DIPERIKSA	DIBUAT
	DEPT. HEAD	SECT. HEAD	LINE HEAD

NO	PROSEDURE	FAKTOR	HAL - HAL PENTING (KEY POINT)	ILUSTRASI
1	Nyalakan perangkat yang digunakan		1.1 Cek kondisi Tablet sebelum digunakan. Jika terdapat abnormal segera laporkan ke atasan.	
2	Buka aplikasi browser		2.1 Pastikan terlebih dahulu tablet telah tehubung dengan koneksi internet.	
3	Browsing web casper-dev.toyota.co.id		3.1 Jika web tidak dapat diakses, segera laporkan ke atasan.	Gambar 1. Browsing web casper-dev.toyota.co.id
4	Log in di web casper-dev.toyota.co.id		4.1 Jika account tidak dapat digunakan, segera laporkan ke atasan.	Gambar 2. Log In Account
5	Pilih menu transaction			Gambar 3. Pilih Menu Transaction
6	Pilih menu Finishing			

There's already **communication route** as **risk management** If problem occurred during production

THANK YOU