

People development skill up through collaboration implementation

QUALITY LEVEL UP BY ROBOT CAMERA INSPECTION WITH AI TECHNOLOGY



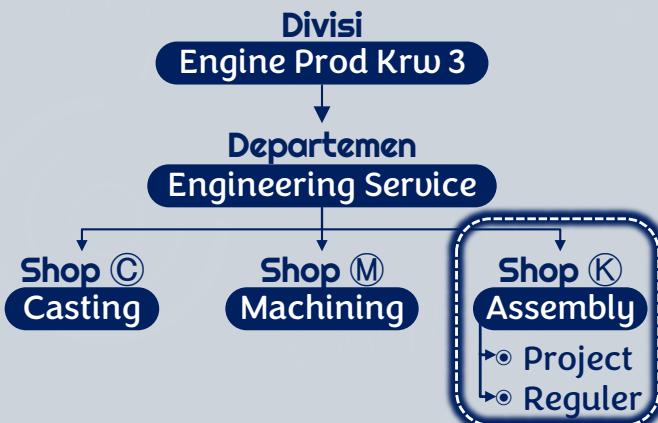
01

PERKENALAN

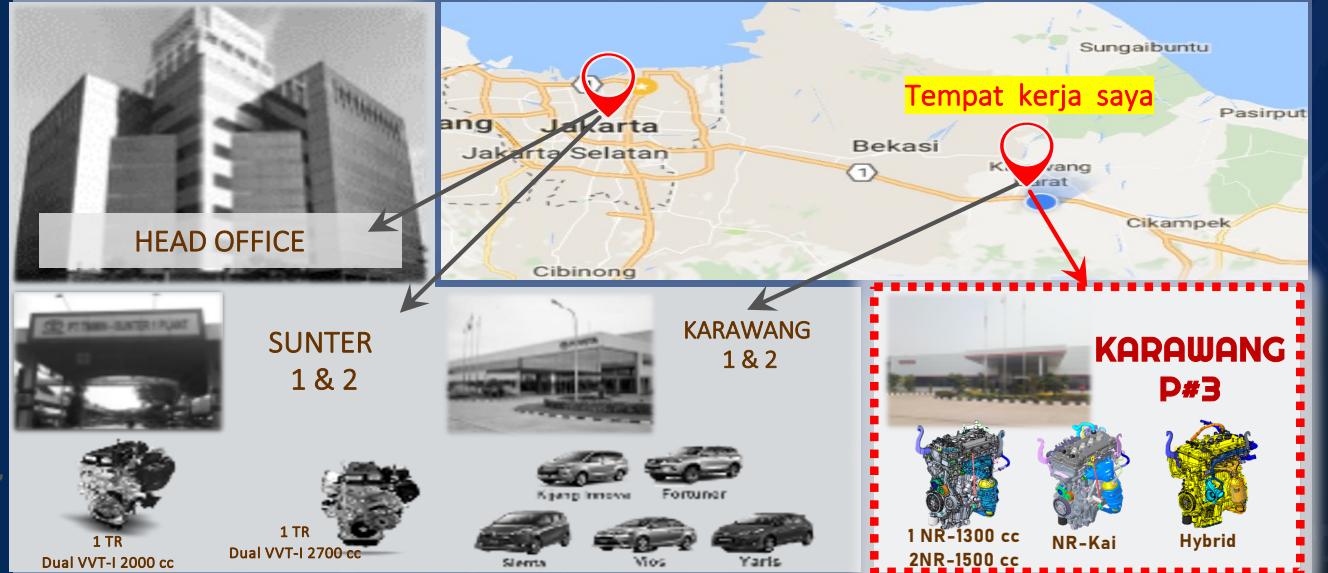
Hello!



Nama : Sujatna
Jabatan : Staff
Masa Kerja : 11 Th



TOYOTA MOTOR MANUFACTURING INDONESIA



Bussiness Process :

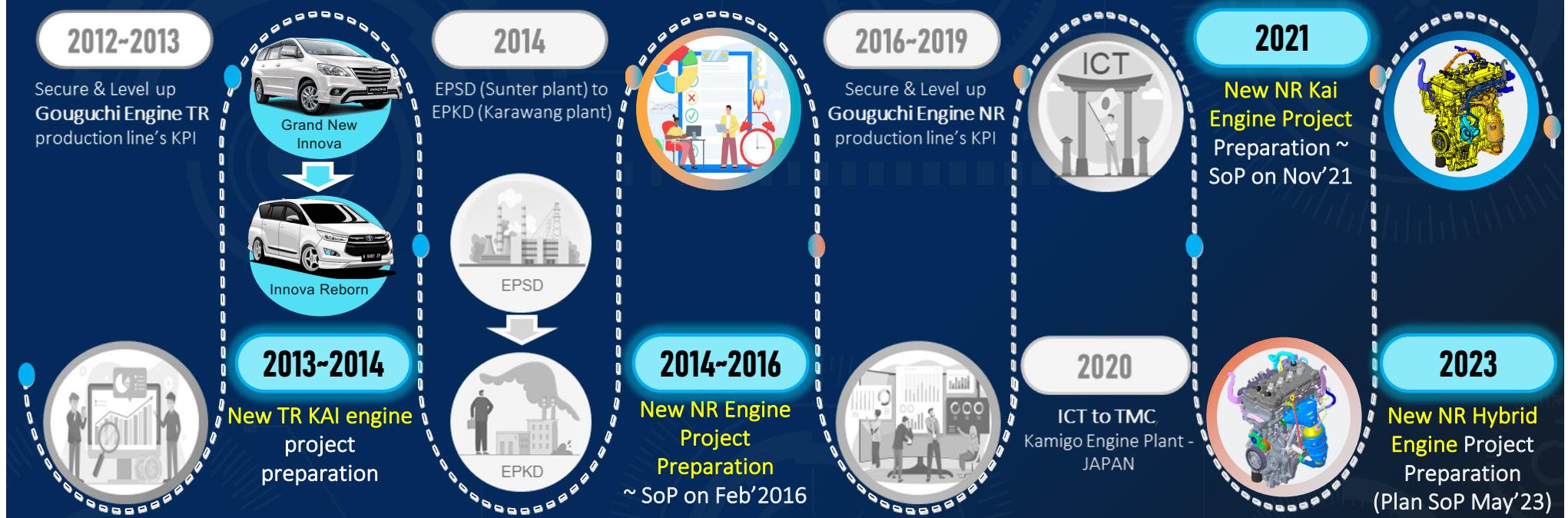


Peran Kerja :

Engineering Service Support

1. Project preparation new product engine line → 3 multi year project execution
2. Gouguchi improvement sustain KPI S,Q,C,P achievement

01 PERKENALAN



PRINSIP & FILOSOFI :

“ Jadikanlah setiap tempat sebagai sekolah dan jadikanlah setiap orang sebagai gurumu ” -Ki Hajar Dewantara



O2 PEMILIHAN THEMA

Hoshin

Directorate Policy :

2019

[1st TD Collab in Asia & World]

2021

[ECC Leader in AP]

2022-2024

[To be ready as xEV manufacturer]

2025 onward

[Green & Sustainable Mfg]

A. Division Policy (2023 / 2024)

Structural Reform #2 Expansion :

HR Transformation	Cost	CN	
(Man) Productivity	(Material) Stock & lead time reduction	(Machine) Production Maintenance	
Safety	Quality	Environment	
Human Resources	Workplace	Communication	

② Beyond
S 3 es :
① TD
Monozukuri
& Foundation

Current Business / Project

- D13E Project (SoP May'23)
D89E Project (SoP Jun'24)
D37D (D13E Die Renewal Sop
T-DNGA Hybrid Aug'24) xEV
Transformation & Competitiveness
Productivity - Maintenance - Engser
Safety - Quality - Environment - HR

Future Opportunities :



EPK3D Way Of Thinking

Lead **future transformation**
in auto industry

Execution of **3 model multi year**
PJT of DNGA - TNGA for B-SUV
model in 2023

Prioritize **people development**

Transition to next generation by giving
opportunities to **explore new things**

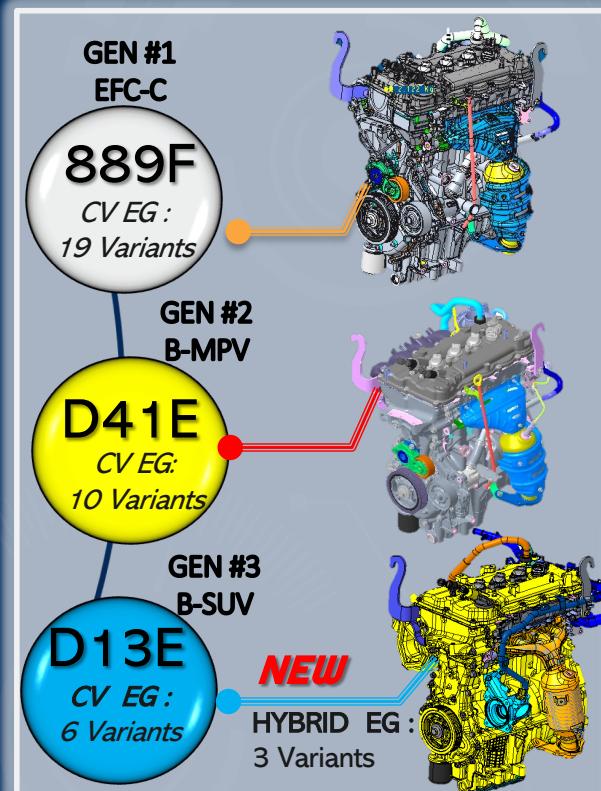
How to Utilize DX as tools speed up achieved our KPI

Think with
"YOU VIEW" approach

crossfunction collaboration with
speed, agility, & flexibility

O2 PEMILIHAN THEMA

3 multi years project



Line up terbaru produksi engine berpotensi
peningkatan terhadap volume produksi

How to Utilize DX as tools speed up achieved our KPI



Indonesian minister of industry propose

TMMIN to become an industrial lighthouse IR 4.0

While attending the release of the export Kijang Innova Zenix and Yaris Cross, there was a direction from Minister of Industry a proposal for TMMIN to become a National Lighthouse for IR 4.0

“Embracing Digital Transformation:
Leading the Way to Maximize Potential DX
to Achieve TMMIN Competitiveness”



Mr. Yandri Siregar
Administration Dir.



Mr. Bob Azam
Vice President

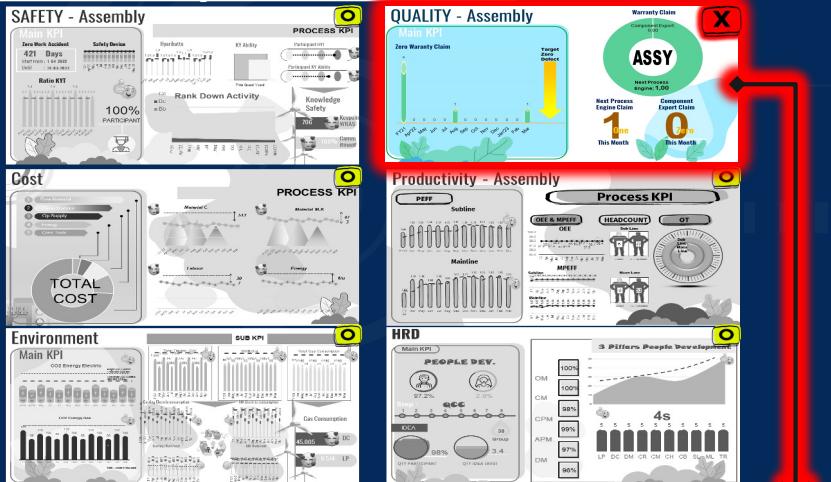
Keep Line by Line QAN Level 100% in daily shop floor
management Smart Q Factor
(Quality Up support by new technology)



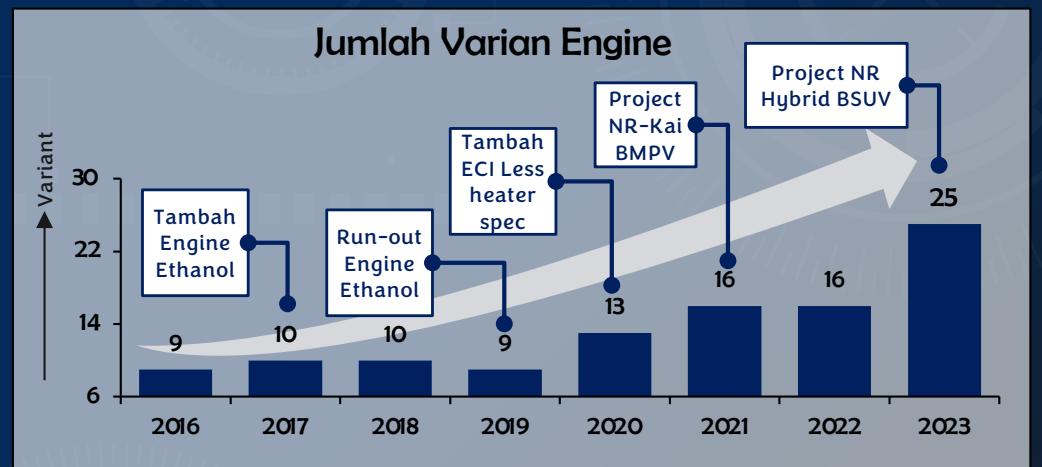
Mr. Oktavian Heru. B
Division Head EPKD Div.

O2 PEMILIHAN THEMA

► Pencapaian KPI FY22



► Dampak 3 Multi Years Project



Total varian engine terus bertambah [total 25 type]

Next Process Engine Claim



KPI Quality tidak mencapai target disebabkan adanya Claim (Outflow) 2 kasus selama FY22

Kadai / Tantangan :

Bagaimana bisa memperbaiki proses saat ini untuk menjamin tidak adanya defect next process terkait kesalahan pemasangan part.



02 PEMILIHAN THEMA

► Komitmen [Kodawari] :

Tidak ada produk cacat yang lolos untuk *Customer Smile*

► Kesulitan :

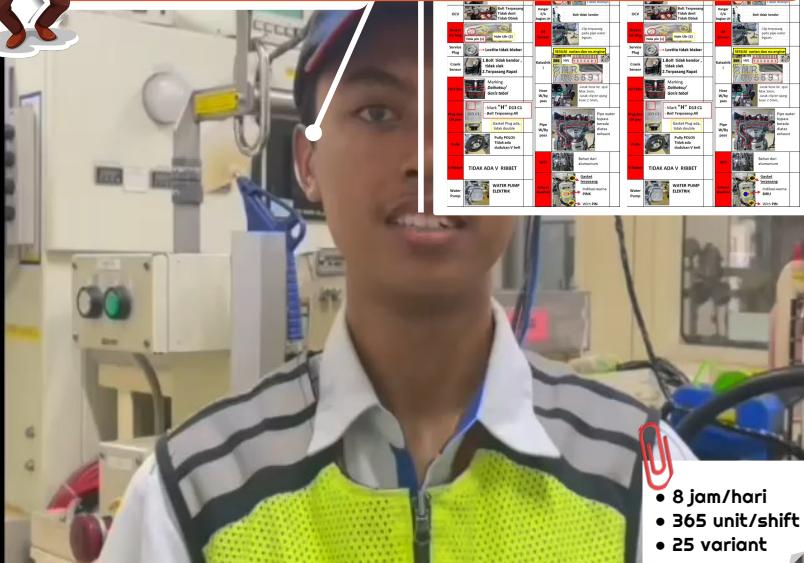


Pekerjaan ini tidak Easy & Enjoyable

Check Spesifikasi

Check Kebocoran

Quality Gate



► Kondisi Saat Ini :

Ideal : 0 kasus



GAP : 2 kasus

*Oil level gauge & intake manifold salah tipe

Aktual : 2
kasus

Banyak tipe engine yg harus di
ingat

NVW meningkat (Muda
Jalan)

Member Voice Quality Gate
↳ Mengambil Harigami
Ergonomi mata tidak
bagus

Hilang fokus

PRODUK CACAT LOLOS

- 8 jam/hari
- 365 unit/shift
- 25 variant

O2 PEMILIHAN THEMA



Foto Observasi Pos 1 Packing Engine Test Bench



TPS Group :



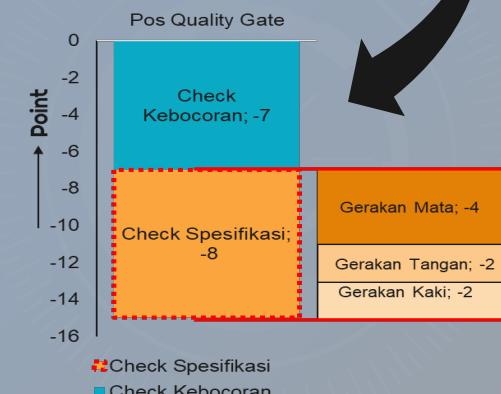
Waryo S
Check observasi point ergonomi



Dita N
Observasi point ergonomi menggunakan aplikasi LEA

Hasil Observasi Ergonomi

Ergonomic Observation Result		Mr.Waryo S [TPS Group]									
Category	Item	Mr.Waryo S [TPS Group]									
		1	2	3	4	5	6	7	8	9	10
Posture	Posture	1	2	3	4	5	6	7	8	9	10
Tool	Tool	1	2	3	4	5	6	7	8	9	10
Environment	Environment	1	2	3	4	5	6	7	8	9	10
Task	Task	1	2	3	4	5	6	7	8	9	10
Total	Total	1	2	3	4	5	6	7	8	9	10
		-15									



Video Observasi by LEA Application



02 PEMILIHAN THEMA

► Komitmen [Kodawari] :

Tidak ada produk cacat yang lolos untuk Customer Smile

► Kesulitan :

-  Banyak tipe engine yg harus diingat
-  NVW meningkat (Muda Jalan)
 - ↳ Mengambil Harigami
-  Ergonomi mata tidak bagus
-  Hilang fokus
-  PRODUK CACAT LOLOS

► Kondisi Saat Ini :

Ideal : 0 kasus



GAP : 2 kasus

*Oil level gauge & intake manifold salah tipe

Aktual : 2
kasus



Sehingga saya me-Challenge diri saya untuk dapat :

“Menciptakan Area Kerja Yang **Easy & Enjoyable** Dengan me-Level Up Proses Quality Inspection Melalui Pendekatan **Digital Transformation**”

02

PEMILIHAN THEMA

Robot Riko The Series

Robot Scan Engine + Camera

Engine

Spesifikasi part : Intake Manifold, Oil Level Gauge

Ubi Cilembu

Komunikasi dengan Atasan

1. Propose Idea

Pak saya punya ide terkait check spesifikasi e/g



2. Konsultasi Sumber Daya

Kemarin saya Benchmark ke STM, disana menggunakan Robot & Kamera Coba terapkan disini



3. Koordinasi Dengan SH Prod.

Gunakan simple robot (min.space) & pergerakan robot jauh dari tempat kerja manusia (faktor safety)



4. Koordinasi Dengan TL Prod.

Pastikan item2 check robot memenuhi QAN



Hasil komunikasi dengan Atasan & user :

1. Faried Y-SH E/S : Penggunaan robot & kamera
2. Ari W-SH Prod : Area harus jauh dari manusia (safety)
3. Julantiko-TL Prod. : Item cek harus me-refer ke QAN

Inspirasi Kerja Saya.....



"Ideas don't have to
be your own, but
observe, imitate and
modify."

Akio Toyoda

03 RENCANA AKTIVITAS

Resources & 4MIE

Faktor	Kadai	Action
Man	Tidak ada SDM	Bekerjasama dengan Out-house
Machine	Tidak ada Robot	Membeli robot
Material	Tidak ada kamera	Membeli kamera
Methode	Tidak ada skill robotic	Training robotic (internal) Maintenance
Environment	Posisi ideal robot VI	Study alternative posisi ideal robot VI

General Schedule

No	Activity	Incharge	Schedule			
			Ags'22	Sep'22	Okt'22	Nov'22
1	Riset dan analisa data	- Engser - Produksi	- Maintenance - Quality			
2	Nemawashi	- Engser - Produksi				
3	Pembelian part	- Engser				
4	Installasi & teaching	- Engser - Outhouse				
5	Trial & Evaluasi	- Engser - Produksi	- Maintenance - Quality			

03 RENCANA AKTIVITAS

•Riset & Analisa Data•

01. Study Harigami

Basic Thinking :
Evaluasi QAN
(Quality Assurance Network)



1. Robot check item criteria

Occurance	X	O	X
Outflow	X	X	O



2. Take out from Robot

Occurance	O
Outflow	O

Study Total harigami

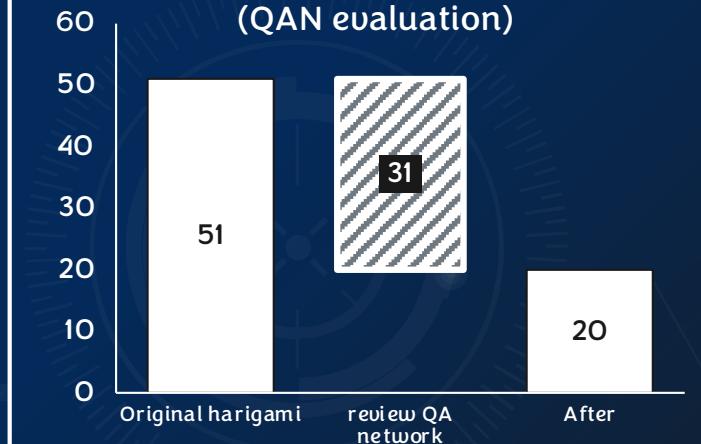
N = 51 item

PARTNAME	PARTNAME
TCC	WayOf_ClipVentilation
Hole_Mounting	Washer_WTS
Stampile_Indikasi_tester	Cover_Disc_Clutch
Stampile_OK Test Bench	Disc_Clutch
Sticker_Engine	Flywheel_Pin
Tensioner_VRibbed	Flywheel_Face
Oil_Filter	Stoper_DrivePlate
Face_Pulley	Flywheel and dumper
Marking_Pulley	Pin_Straight1
Plug_Oilpan	Pin_Straight2
Oil_Pan	Injector
Stick_OILLevel	Gasket_InMani
Guide_OILLevel	Face_Intake
Stamp_Katashiki	Bracket_ToBlock
AF_Sensor	Socket_KnockSensor
Gasket_Exhaust	Face_OilPan
Marking_Exhaust	Throttle_Body
Face_Exhaust	Face_HeadCover_Stud1
Hose_Water_Bypass3	Face_HeadCover_Stud2
Hose_Water_Bypass5	Bracket_CHC
Hose_Water_Bypass2	PCV
Position_HoseWater_Bypass1	Drive_Plate
WayOf_ClipHoseWater_Bypass1	Hose_Water_Bypass1
Pipe_Water_Bypass2	Bolt_DP
Hose_Ventilation_Tolntake	Bracket_Harness_Rear
Hose_Ventilation_ToPCV	

Evaluasi QAN

Reduce = 31 item

Review Item Check Robot (QAN evaluation)



Final item check robot

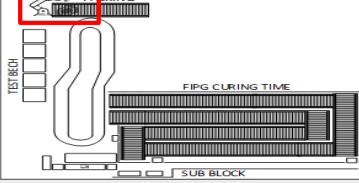
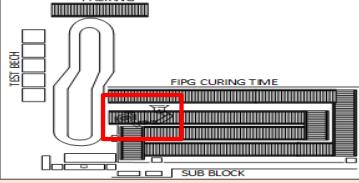
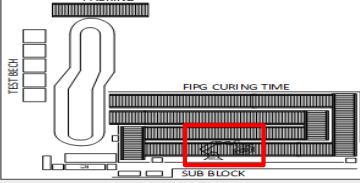
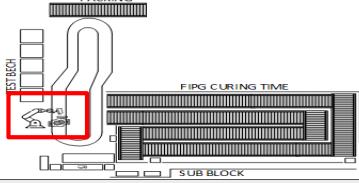
N= 20 item

NO	CHECK ITEM	PART NAME
1	HOLE_MOUNTING	Mounting_PinThreadedThread
2	STAMPE_INDIKASI_TESTER	Stamped_ThreadPinThread
3	TENSIONER_VRIBBED	VibratedWith_Hole
4	FACE_PULLEY	PulleyWithout_Groove
5	GUIDE_OILLEVEL	Bracket_FacingDown
6	HOSE_VENTILATION_TOINTAKE	HoseIntake_Mark_White
7	HOSE_VENTILATION_TOPCV	HosePOV_Mark_Yellow
8	WAYOF_CLIPVENTILATION	Clip_FacingRear
9	COVER_DISC_CLUTCH	Cover_Code_N2
10	FACE_INTAKE	Intake_BoltLH
11	BRACKET_TOBLOCK	Bracket_Flat
12	SOCKET_KNOCKSENSOR	Socket_Black
13	THROITLE_BODY	Cap_Green
14	FACE_HEADCOVER_STUD1	Cap_White
15	FACE_HEADCOVER_STUD2	Cap_Orange
16	BRACKET_CHC	Cap_Yellow
17	PCV	With_BracketCHC
18	DRIVE_PLATE	PCV_Orange
19	BOLT_DP	PCV_Black
20	BRACKET_HARNESS_REAR	B_Harness_Kai
		B_Harness_NR

03 RENCANA AKTIVITAS

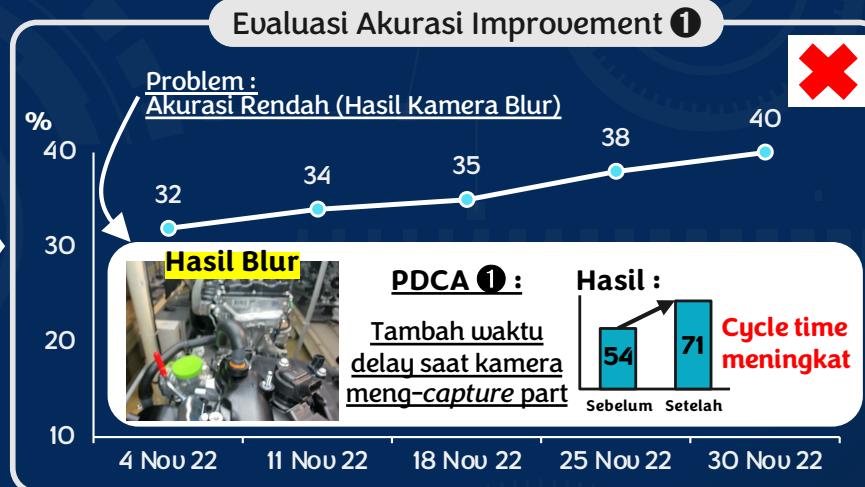
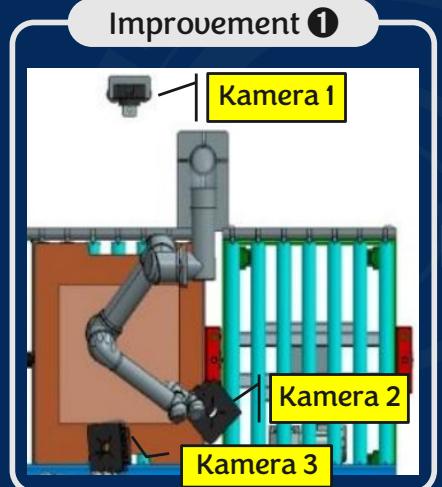
Riset & Analisa Data

02. Study Lay Out (Alternative Posisi Ideal Robot)

LAYOUT	Idea#1	Idea#2	Idea#3	Idea#4				
	Robot VI in Packing Line	Robot VI in the end of the Curing Time	Robot VI in the middle of the Curing Time	Robot VI before Test Bench				
								
SAFETY	Potency interference with human	No interference with human	<input type="checkbox"/>	No interference with human	<input type="checkbox"/>	No interference with human	<input type="checkbox"/>	
QUALITY	Defect / abnormal find after testbench	O	Defect / abnormal find before testbench	<input type="checkbox"/>	Defect / abnormal find before testbench	<input type="checkbox"/>	Defect / abnormal find before testbench	<input type="checkbox"/>
PRODUCTIVITY	Waiting time in the packing process.		Eliminate waiting time.	<input type="checkbox"/>	Waiting time in the Curing Time process.		Waiting time in the test bench process.	
MIERUKA	Robot placement is not ideal so that it is not clearly visible.		Robot placement is ideal so that it is clearly visible.	O	Robot placement is ideal so that it is clearly visible.	O	Robot placement is ideal so that it is clearly visible.	O
NG TREATMENT	Repairs are carried out after Test Bench.		Repairs are carried out before Test Bench.	O	Repairs are carried out before Test Bench.	O	Repairs are carried out before Test Bench.	O
VISION CAPABILITY	Visualization is clear because it is helped by internal Cover lights	O	Visualization is clear because it is helped by Curing Time lights	O	Visualization is clear because it is helped by Curing Time lights	O	Visualization is not clear because there are no lights in area before Test Bench	
SUMMARY	8	15	13	12				

Keterangan : $\Delta = 1 \text{ Poin}$ $O = 2 \text{ Poin}$ $\square = 3 \text{ Poin}$

03 AKTIVITAS PENANGGULANGAN



Evaluasi Dampak Improvement 1

Kelebihan :

- Pergerakan robot sudah OK & Smooth

Kekurangan :

- Hasil gambar blur
↳ tackle by additional delay time
- Cycle time over
- Hasil capture tidak bisa di develop lebih lanjut ke Traceability system

Go to PDCA 2

Ide PDCA 2

- 1 Tambah Robot 1unit **X**
- 2 Explore New Things dengan teknologi AI



Pertimbangan Aspek

	S	Q	P	C	HR	Others	Total Score
Opsi 1 (Add Robot)	Potensi interference robot	Tangkapan gambar tidak jelas	Reduce CT	High Cost (more than 500 mio)	Same skill	Cannot support traceability	9
Score			<input type="checkbox"/>		O		
Opsi 2 (Ai-Tech)	Tidak ada potensi interference robot	Tangkapan gambar jelas	Reduce CT	Low Cost (only need 38 mio for pc system)	More challenge new skill	Possible to support traceability system	17
Score	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	O	

Keterangan : $\Delta = 1$ Poin $\circ = 2$ Poin $\square = 3$ Poin

05

RENCANA AKTIVITAS PDCA 2

Resources & 4M1E

	Kadai	Action
Man	Tidak ada SDM	Request & seleksi MP untuk develop robot VI
Machine	Tidak ada Robot	Menggunakan robot existing
Material	Tidak ada software & apk Python Yolo	Yokoten & Kerjasama dg underbody P#2
Methode	Tidak ada skill & pengetahuan tentang AI	Training AI Workshop dengan ISTD
Environment	Posisi ideal robot VI	Study alternative posisi ideal robot VI

Evidence



General Schedule

No	Activity	Incharge	Schedule									
			Dec'22	Jan'23	Feb'23	Mar'23	Apr'23	May'23	Jun'23	Jul'23	Aug'23	
1	Create team & Meeting basic concept	Prod, Maint, EngSer, ISTD, Internship student										
2	Nemawashi to superior	EngSer										
3	Benchmark to P#2											
4	Training coding python											
5	Create coding python	Maint & ISTD										
6	Create harigami part QC	QC, Prod, EngSer										
7	Order part & Instalasi hardware	Maint & Engser										
8	Teaching robot	Maint & Internship student										
9	Create traceability system	EngSer, Internship student, ISTD										
10	Collecting & training data robot VI	Maint, EngSer, Internship student, ISTD										
11	Trial error	Maint, EngSer, Internship student, ISTD										
12	Training to Production member for daily operation											
13	Update to Management											

Annotations on the schedule:

- 1-4 Persiapan SDM & Skill (Rows 1-4)
- 5-6 Riset & Analisa data (Rows 5-6)
- 7-9 Persiapan & Implementasi (Rows 7-9)
- 10-11 Hasil & Evaluasi (Rows 10-11)
- 12-13 Standarisasi & Sosialisasi (Rows 12-13)

05

RENCANA AKTIVITAS PDCA 2

1-4 Persiapan SDM & Skill

5-6 Riset & Analisa Data

7-9 Persiapan & implementasi

10-11 Hasil & Evaluasi

12-13 Standarisasi & sosialisasi

TIA Graduates 2017 & 2018

Team :



Mr. Sujatna
Engineering



Mr. Harry
Maintenance



Mr. Steven
Kaizen W/S



Ms. Hessa
Quality

Selective who have interest IoT & RB

Benchmark to Plant#2 (underbody)

Short Training IoT & Phyton

On Job Training (OJT)

TMMIN P#2, Dec'22

**BENCHMARK INTERNAL
TOYOTA INDONESIA**

**TMMIN
EPKD**

Role :

- Sharing kaizen (Insp. Under Body)
- Trainer phyton
- Trainer Robot

**Media Komunikasi
WA Grup**



Role : ➤ IoT & AI Know How sharing
➤ Training Facilitator

**UNIVERSITY
INTERNSHIP
COLLAB**

UNSIKA, Mar'23

Role :

- collaboration study & execution



05

RENCANA AKTIVITAS PDCA 2

1-4 Persiapan SDM & Skill

5-6 Riset & Analisa Data

7-9 Persiapan & implementasi

10-11 Hasil & Evaluasi

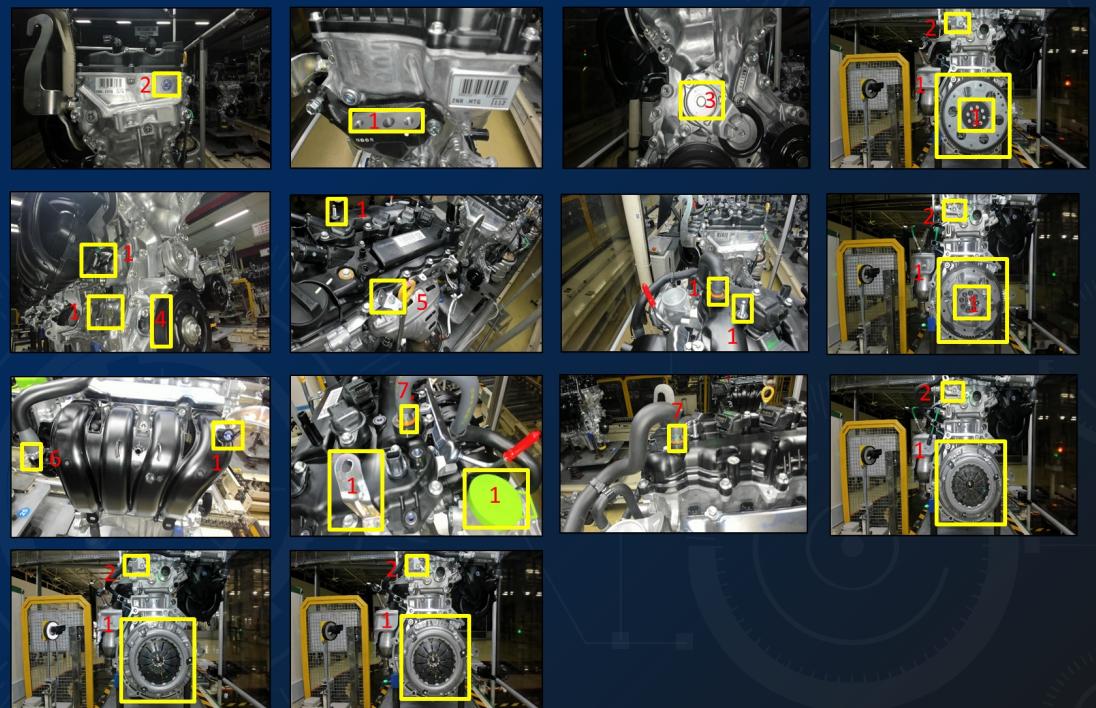
12-13 Standarisasi & sosialisasi

03. Way Point Definition

I. List Check Item

NO	CHECK ITEM	SUB CHECK ITEM	NO	CHECK ITEM	SUB CHECK ITEM
1	HOLE_MOUNTING	Mounting_PinThreadThread Mounting_ThreadPinThread	10	FACE_INTAKE	Intake_BoltRH Intake_BoltLH Intake_SpecialHybrid
2	STAMPLE_INDIKASI_TESTER	StampelOK_Tester			Bracket_Flat Bracket_Bloated
3	TENSIONER_VRIBBED	VribbedWith_Hole VribbedWithout_Hole	11	BRACKET_TOBLOCK	Bracket_Flat Bracket_Bloated
4	FACE_PULLEY	PulleyWith_Groove PulleyWithout_Groove	12	SOCKET_KNOCKSENSOR	Socket_Black Socket_Gray
5	GUIDE_OILLEVEL	Bracket_FacingDown Bracket_FacingUp			Cap_Green Cap_White Cap_Orange Cap_Yellow
6	HOSE_VENTILATION_TONTAKE	HoseIntake_Mark_White HoseIntake_Mark_Pink	13	THROTTLE_BODY	Stud_1 Stud_2
7	HOSE_VENTILATION_TCPVC	HosePCV_Mark_Yellow HosePCV_Mark_Green	14	FACE_HEADCOVER_STUD1	With_BracketCHC
8	WAYOF_CLIPVENTILATION	Clip_FacingRear Clip_FacingRight Clip_FacingFront	15	FACE_HEADCOVER_STUD2	PCV_Orange PCV_Black
9	COVER_DISC_CLUTCH	CoverCode_N2 CoverCode_O2 CoverCode_O1A CoverCode_Exedy CoverCode_Aisin CoverCode_SpecialHybrid	16	DRIVE_PLATE	DP_NRK DP_NR
		17	BOLT_DP	Bolt_DP_Black Bolt_DP_White	
		18	BRACKET_HARNESS_REAR	B_Harness_Kai B_Harness_NR	
		19			
		20			

II. Visualisasi



06

AKTIVITAS PENANGGULANGAN PDCA 2

1-4 Persiapan SDM & Skill

5-6 Riset & Analisa Data

7-9 Persiapan & Implementasi

10-11 Hasil & Evaluasi

12-13 Standarisasi & sosialisasi

Dokumentasi

- Koordinasi Meeting All Dept



- Installasi Hardware

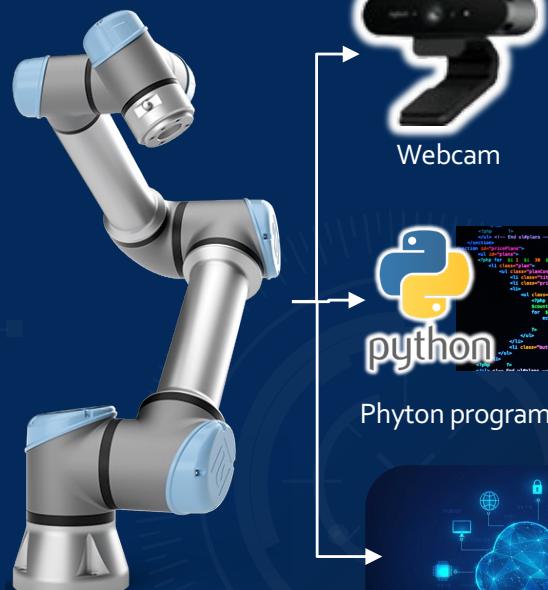


- Installasi software & program



Gambaran Infrastruktur

INPUT

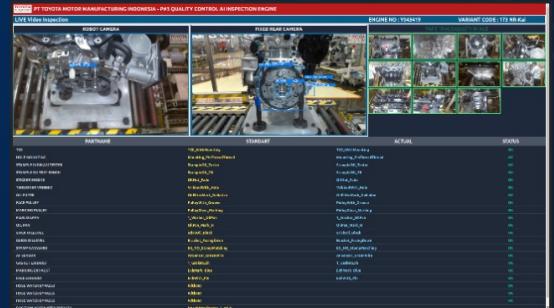


Phyton programming software



Collaboration Robot

OUTPUT (RESULT)



Trace by date

Trace by EG number



Trace by picture

Storage Data = 1 TB
For 2,8 Years
[1engine = 1,8 mb]

07

EVALUASI & HASIL PDCA 2

1-4 Persiapan SDM & Skill

5-6 Riset & Analisa Data

7-9 Persiapan & Implementasi

10-11 Hasil & Evaluasi

12-13 Standarisasi & sosialisasi

• Hasil •

Visualisasi Improvement

BEFORE



Visual inspection by human

AFTER



Visual inspection by robot and AI

Traceability Data
Real Time
Oil Level Gauge



Intake Manifold



....Dan 18 item lainnya

07

EVALUASI & HASIL PDCA 2

1-4 Persiapan SDM & Skill

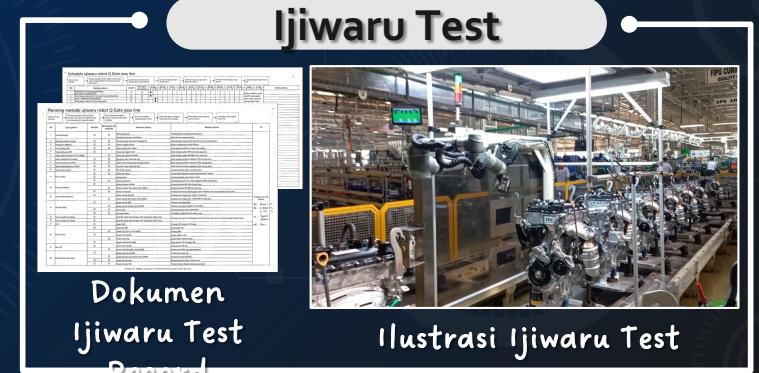
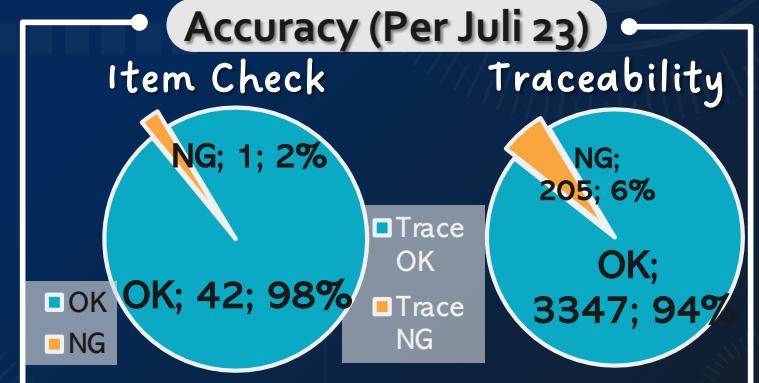
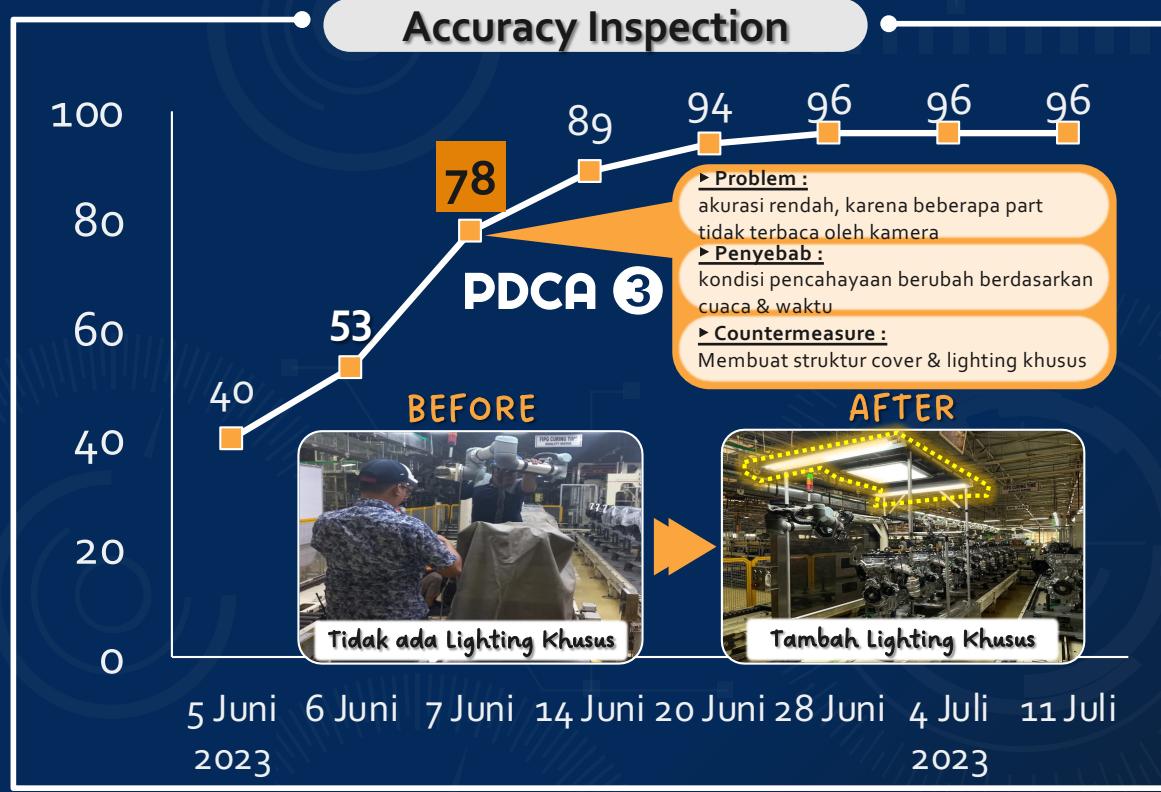
5-6 Riset & Analisa Data

7-9 Persiapan & implementasi

10-11 Hasil & Evaluasi

12-13 Standarisasi & sosialisasi

Evaluasi Hasil Akurasi



07

EVALUASI & HASIL PDCA 2

1-4 Persiapan SDM & Skill

5-6 Riset & Analisa Data

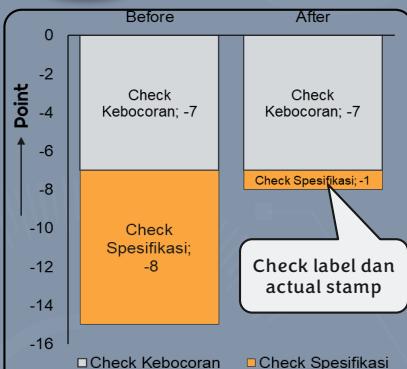
7-9 Persiapan & implementasi

10-11 Hasil & Evaluasi

12-13 Standarisasi & sosialisasi

Evaluasi KPI

Safety



Pengamatan Ergonomic dengan menggunakan tool

Aplikasi Ergonomi AI

Quality

- 1 Zero Defect Outflow
↳ Pengukur & pemasukan level oli tipe missal yang tidak normal berjenis dapat dideteksi oleh Inspeksi Visual Robot dengan AI sebelum Test Bench

- 2 Level up Traceability untuk memberikan bukti terjadinya ketidaknormalan

Productivity

- Total prod 1 hari 748 unit
- Cost per jam 114.000
- Reduce = 0,5 min/unit
- $0,5 \times 748 = 374$ min/hari
- $374 / 60 = 6,23$ jam / hari
- $6,23 \times 22 = 137,06$ MH/bulan
- $137,06 \times 12 = 1644,72$ MH/Thn
- $1644,72$ MH/Thn
= Rp 187.498.080

$$\begin{aligned} \text{Reduce } 0,5 \text{ min/unit} \\ = 137,06 \text{ MH/Bln} \\ = \underline{\underline{1644,7 \text{ MH/Thn}}} \end{aligned}$$

Cost

► INVESTMENT COST :

- Robot
- Lampu
- Kanopi
- Labour Cost

= IDR 600 Mio

► COST SAVING :

- MH Reduction /Thn IDR 187,5 Mio
- Lost Cost Reduction IDR 89,5 Mio [Trauel, Parts,MH Repair]
- Total Cost Saving/Year IDR 277 Mio

BEP = 2,1 Year

07

EVALUASI & HASIL PDCA 2

1-4 Persiapan SDM & Skill

5-6 Riset & Analisa Data

7-9 Persiapan & implementasi

10-11 Hasil & Evaluasi

12-13 Standarisasi & sosialisasi

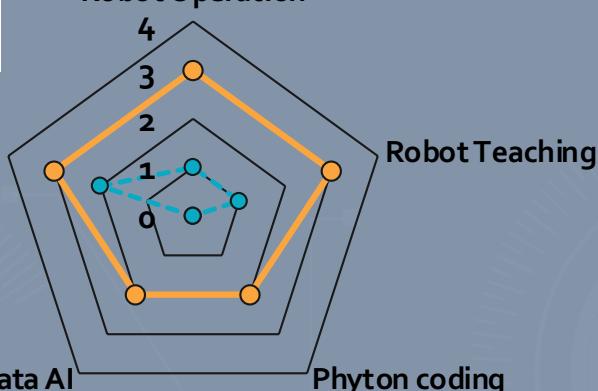
Evaluasi Skill & Testimoni

HR Development

—●— Before
—○— After

Camera / scanner setting

Robot Operation



0 : No Have Skill / knowledge 3 : Can do byself
1 : Have knowledge 4 : Expert
2: Can do byself with assist ↴ can teach the others

Skill Up Member Regarding Robotic & AI system

Testimoni After Improvement



Member Quality Gate

Mr. Nurhadi :
“Easy Process & Enjoyable Work”



Management : Mr. Dwira



“Expand Improvement ke level data environment yang lebih luas (contoh : integrasi dengan NES & directly connect to Prod. Daily Report MGT”

06 STANDARISASI & SOSIALISASI

1-4 Persiapan SDM & Skill

5-6 Riset & Analisa Data

7-9 Persiapan & implementasi

10-11 Hasil & Evaluasi

12-13 Standarisasi & sosialisasi

SOP / JIS

Power ON Robot Ai Visual Insp.



Power OFF Robot Ai Visual Insp.



Jika Terjadi Engine Menumpuk



SOSIALISASI



TRAINING PENGOPERASIAN ROBOT KE TL PRODUKSI



Sharing ke Internal & External
TMMIN
(Kouryukai 15 Juni 2023)



Daily Digital TPM Monitoring System

Detail Ledger TPM

	Detail Ledger TPM	Detail Ledger TPM
1. Overview		
2. Assets		
3. Activities		
4. Performance		
5. Metrics		
6. History		
7. Reporting		
8. Settings		

TPM Monitoring Daily

	TPM Monitoring Daily	TPM Monitoring Daily
1. Overall Status		
2. Asset Health		
3. Activity Progress		
4. Performance Metrics		
5. Historical Data		
6. Reporting Summary		

Karawang
TOYOTA
Engine Plant

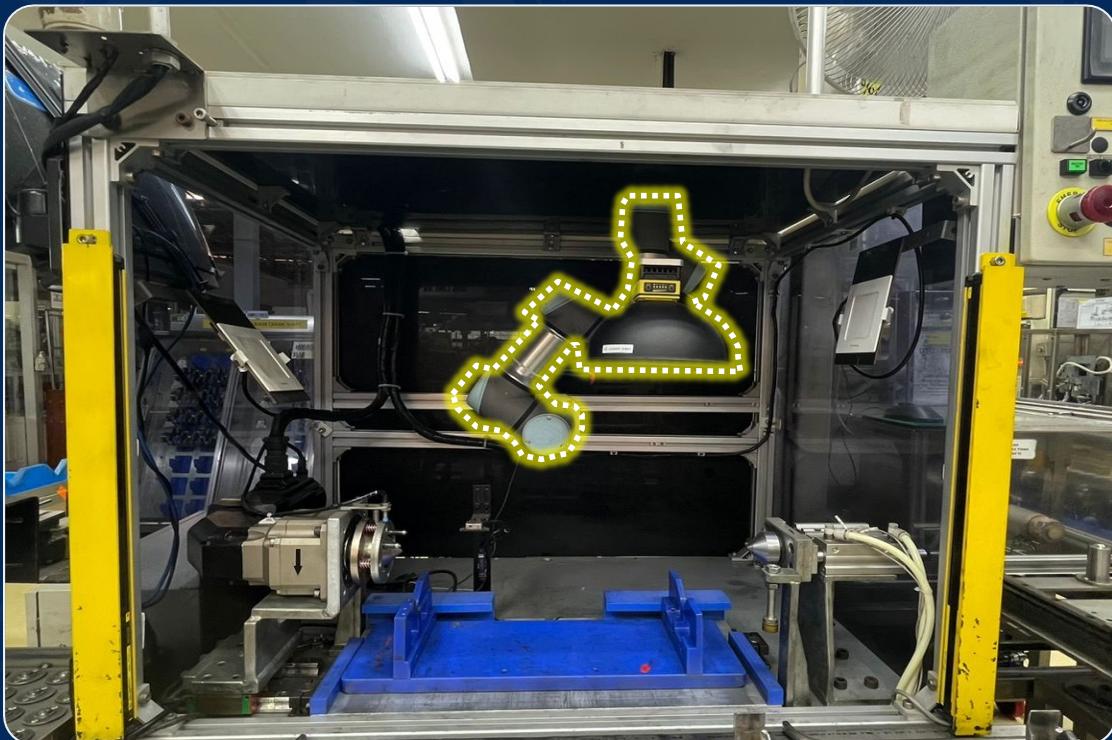
Competitiveness in collaboration and grow together as one Asia team

TMMIN, 15-16th June 2023

07

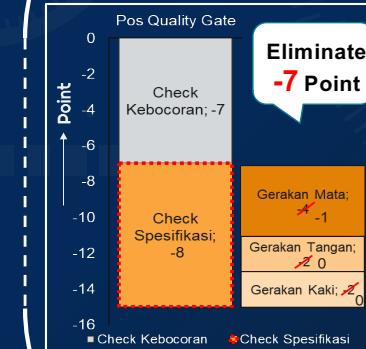
YOKOTEN & NEXT ACTION

Yokoten



Yokoten System Robot Inspection di Machining-Line Crank Shaft

Grafik Ergonomi Pos Quality Gate



Next Action

- Eliminasi Cek Kebocoran [Akhir FY23]
- **Challenge** integrasi ke NES & Production Daily Report MGT





Thanks!
Sujatna
1223198

sujatna@toyota.co.id
+62 812-8781-9059

+++