
Digital Transformation in Apparel Industry

How to improve efficiency of Apparel Factory Supply Chain

Dec. 16th



Webinar Video Links

- These slides were presented in a webinar
- To view the webinar online:
 - <https://youtu.be/jkwZdkfmbrs>
- To download the webinar video, kindly use the link below:
 - https://zoom.us/webinar/register/WN_KF4LUGhXQnCqU2mvj9ETTg

Digital Transformation in Apparel Industry

How to improve efficiency of Apparel Factory Supply Chain

Digital Transformation in Apparel Industry:

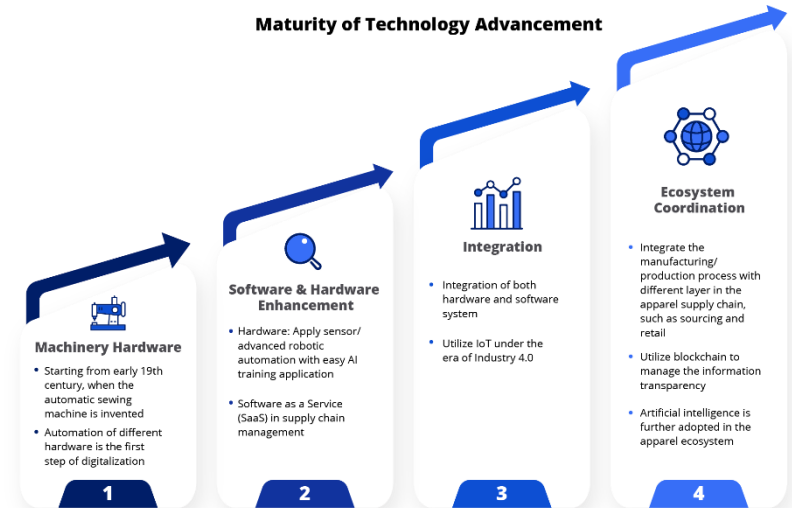
How to Improve Efficiency in Apparel Factory Supply Chain



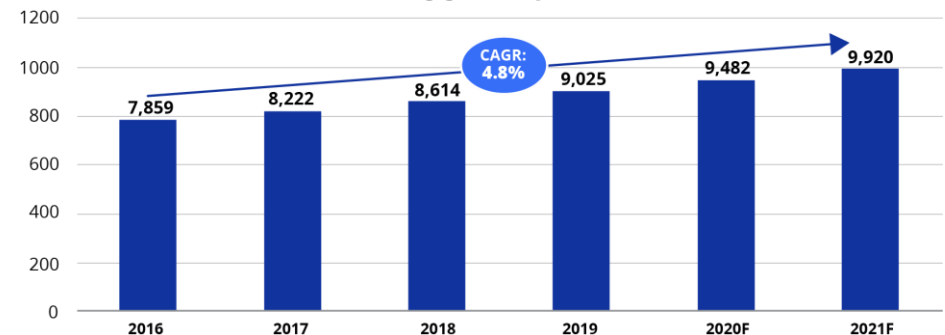
DECEMBER 2020

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Maturity of Technology Advancement



Global Apparel Manufacturing Market Size In USD Billion





Speakers' Profile

Speakers from YCP Solidiance, Brother Machinery (Asia) Limited and GPRO Global Sdn Bhd.

Moderator:

- **Yulin Huang** - Director of YCP Solidiance

Yulin Huang is the Director of YCP Solidiance in Hong Kong. She is involved in consultation services for strategy planning and potential investment evaluation opportunities. Prior to joining YCP Group, Yulin Huang was at Goldman Sachs and J.P. Morgan with industry focus on Technology, Media, and Telecommunications, and consumer related industries.



Speaker:

- **Gen Kimura** - General Manager of the BMA Solution Department

BMA Solution Department was separated from ISM Dept Industrial Sewing Machine Dept. He conducted initial marketing act for NEXIO system as General Manager of ISM Dept, strengthened the BMA governance matter as General Manager of Finance & Administration, he also accelerated digitalization of BMA operation.



- **Jordan Tang** - Founder and Executive Director of GPRO GLOBAL Sdn Bhd. GPRO is a leading technology-based company dedicated to designing and developing innovative I.T. , automation, IoT and process solutions for the apparel, healthcare and logistic sectors. Jordan has 28 years of entrepreneurial experience in managing I.T. based companies. He has brought a company he founded to a public listing in the Malaysia Stock Exchange (Bursa Malaysia) in 2004.





Agenda

- **Introduction**
 - Digitalization Transformation in the Apparel Industry
 - Evolvment of Digital Transformation in the Apparel Industry
 - Digitalization in the Apparel Industry's Supply Chain
- **BMA**
 - BMA's Company Introduction
 - NEXIO System Introduction
 - Case Study
- **GPRO**
 - GPRO's Company Introduction
 - Case Study
- **Outlook**
- **Q&A**



Agenda

Introduction

Sharing by BMA

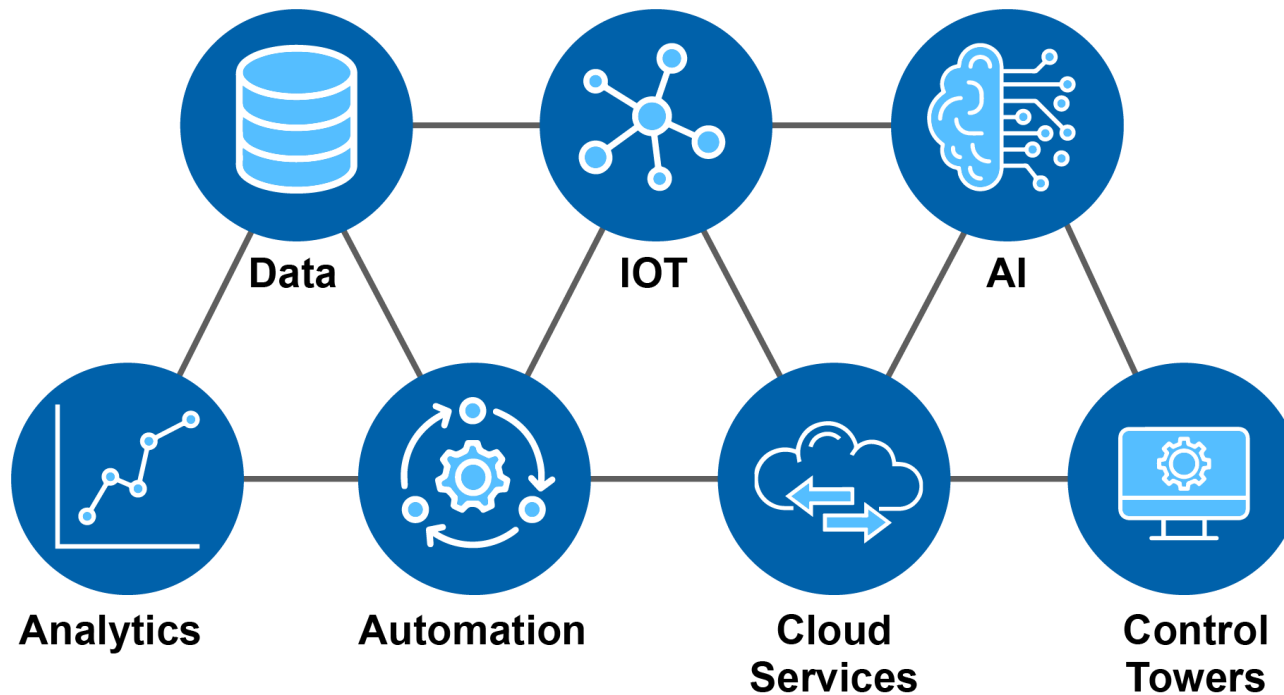
Sharing by GPRO

Market Outlook

Digital transformation is happening all over the world across all industries

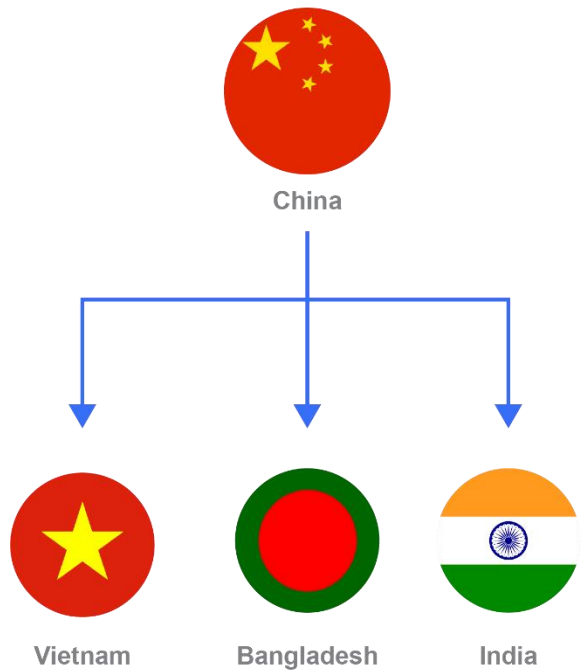


Digital transformation is the adoption process of the integration of digital technology into different industries and transforms businesses through replacing non-digital or manual processes, and it has been an inevitable trend happening in every industry, and the apparel industry is not exempted from it.



Cost cutting needs in apparel industry has driven the relocation of factories and technology advancement, Covid-19 has accelerated the Digital Transformation in Apparel Factories

Moving from China to other Asian counties



Covid-19



- Deduction of labour forces
- Increasing need of small lot production
- After Covid-19, the production volume will be reduced. Factory focus is changing from Output to Quality

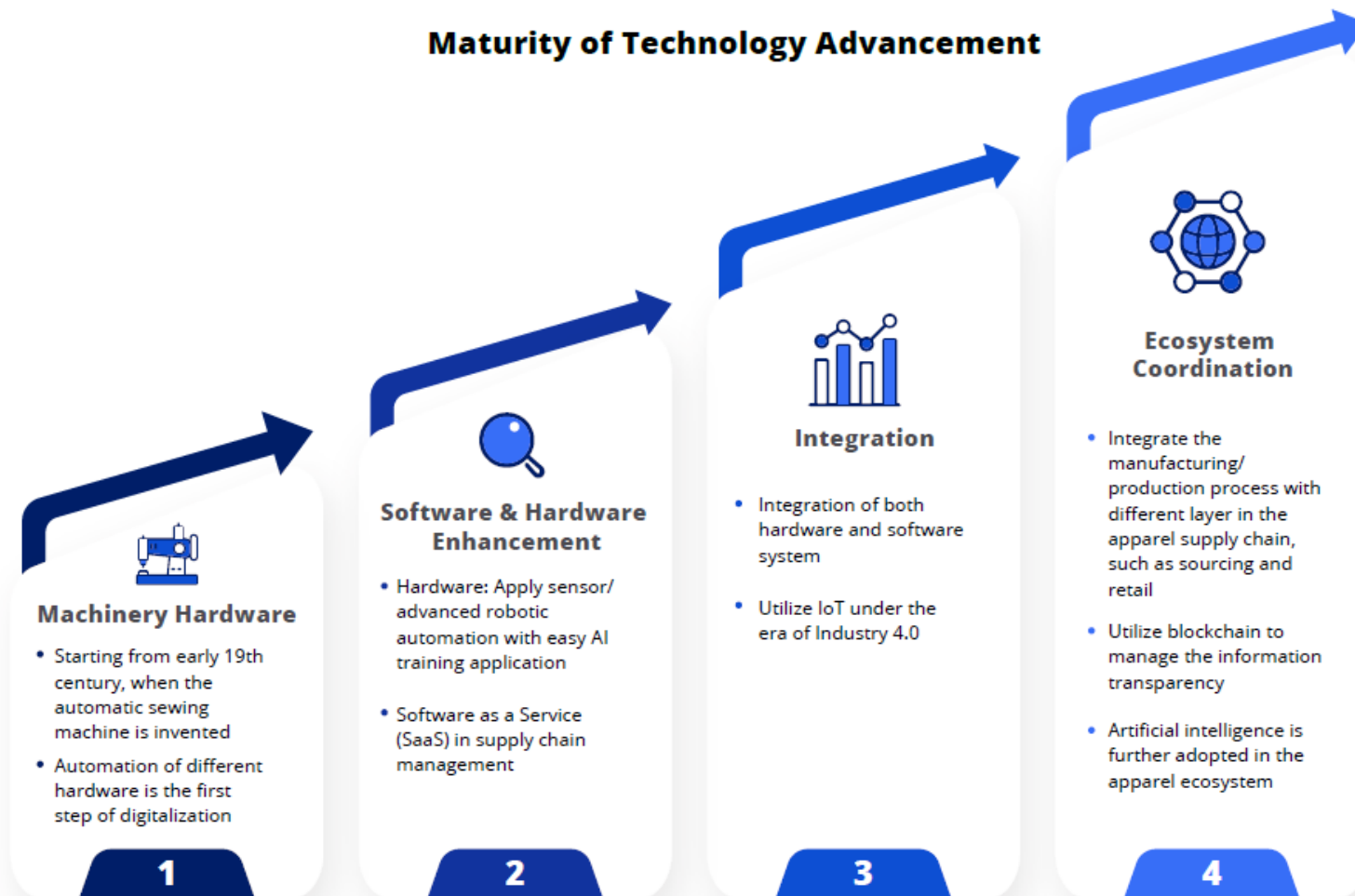


Urgent need of Digital Transformation



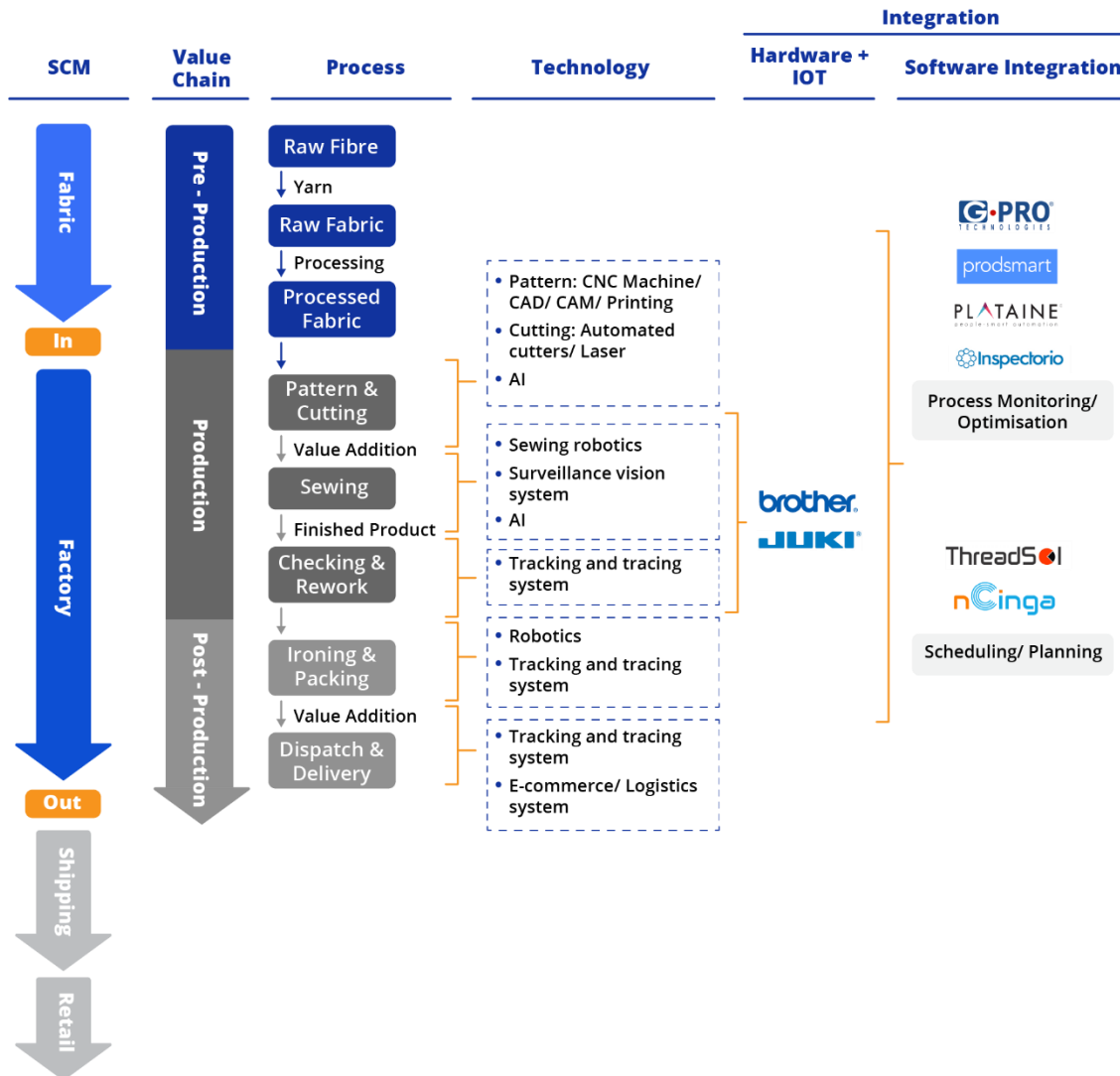


Evolution of Digital Transformation in the Apparel Industry





Digitalization in the Apparel Industry's Supply Chain Management



- **Fabric:** Cover the pre-production process in the value chain. Focus on preparing necessary materials and services, and includes line planning, sample development, and approvals, sourcing, and production scheduling
- **Factory:** Cover the production and post-production process in the value chain, which is whatever happened in the factory. During production, fabrics are spread, cut, bundled, and sew. Post-production includes pressing, inspection, folding and packing — to get goods ready for consumers
- **Shipping:** Once the product is out of factory, they would be shipped to the retail site by the logistics company
- **Retail:** The activity refers to selling directly to consumers or end-users



Agenda

Introduction

Sharing by BMA

Sharing by GPRO

Market Outlook

Brother Machinery (Asia) Limited



Location:

Hong Kong

Under:

Brother Industries, Ltd. located in Japan

Responsible for:

Industrial Sewing Machine

Garment printer business in **ASIA** region



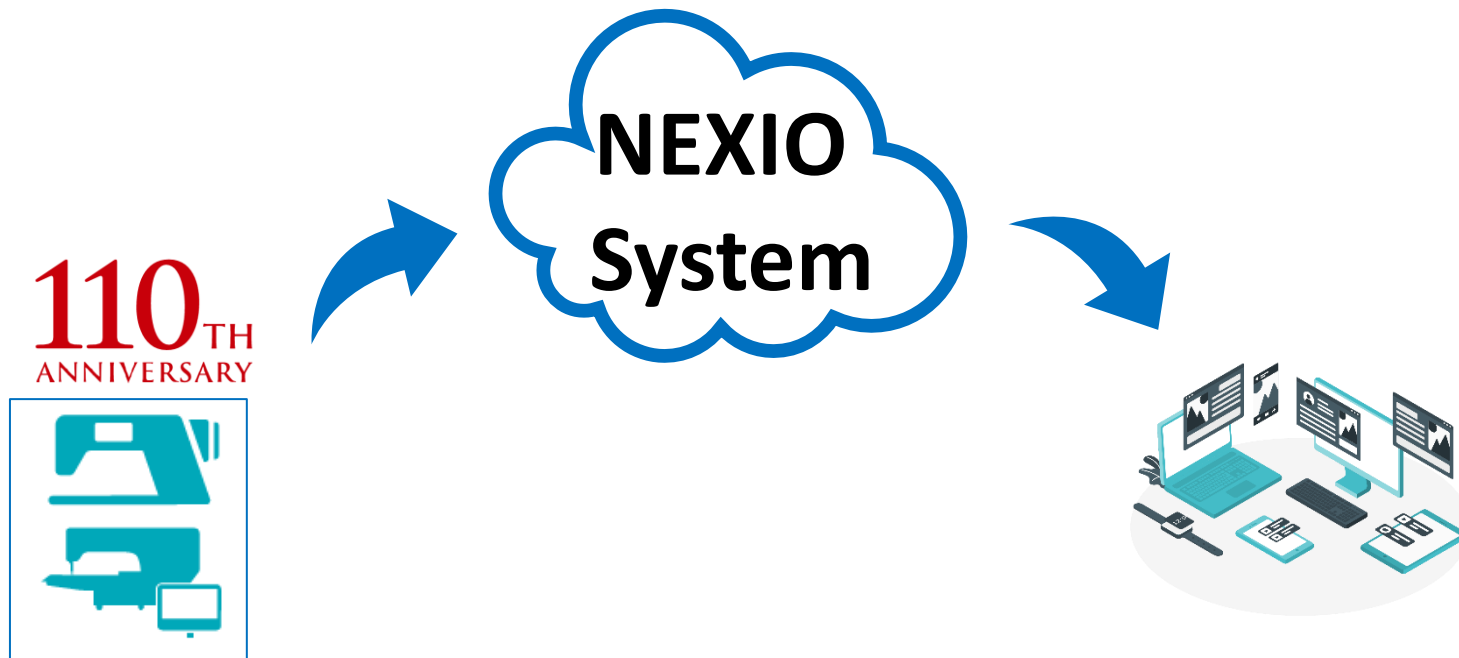
Sewing Machine



Garment Printer

Brother is now in software business

NEXIO system is the cloud base system which directly send sewing machine data for visualization.
Cloud system allows you to check data on real time basis.



1. NEXIO System reduces factory's manual work

Eliminate the manual work in production lines and never worry about missing your delivery dates!

Manual data collection requires



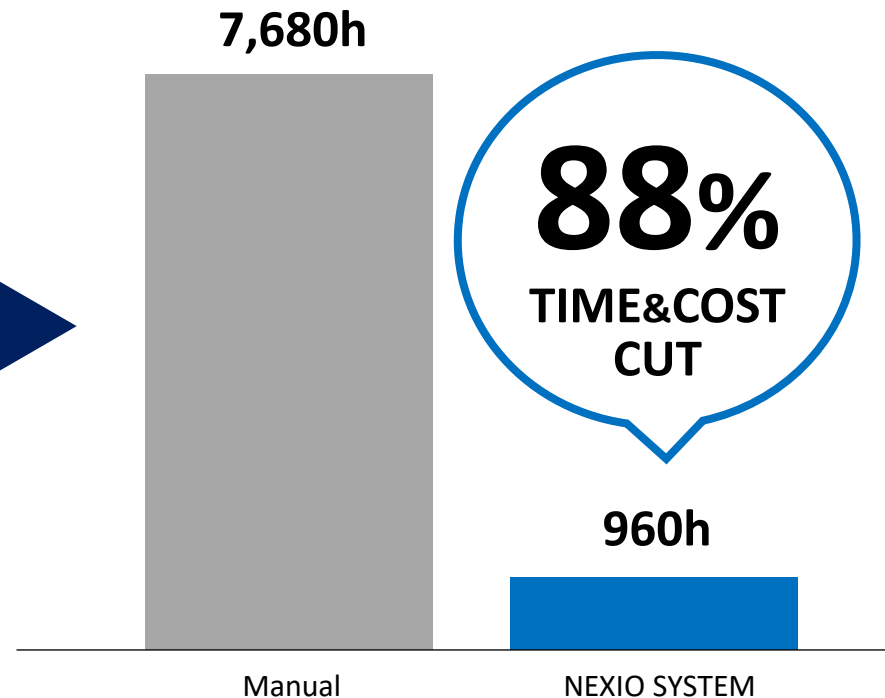
40%

of working time



\$23,000

in one year



*all figures are based on Brother's survey to 66 factories with IE department

Collect machine data automatically

Just inserting Wi-Fi communication module to your sewing machine.
It replaces your manual data collection and report creation by digitalizing the work process.



Just inserting a module and realizes:

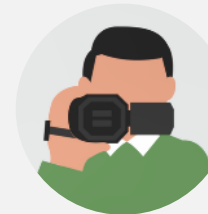
- EASY data collection
- WHOLE DAY monitoring
- ACUURATE data collection



No need for manual count



Stopwatch



Video



Hand Memo



Able to collect data with ANY MACHINES

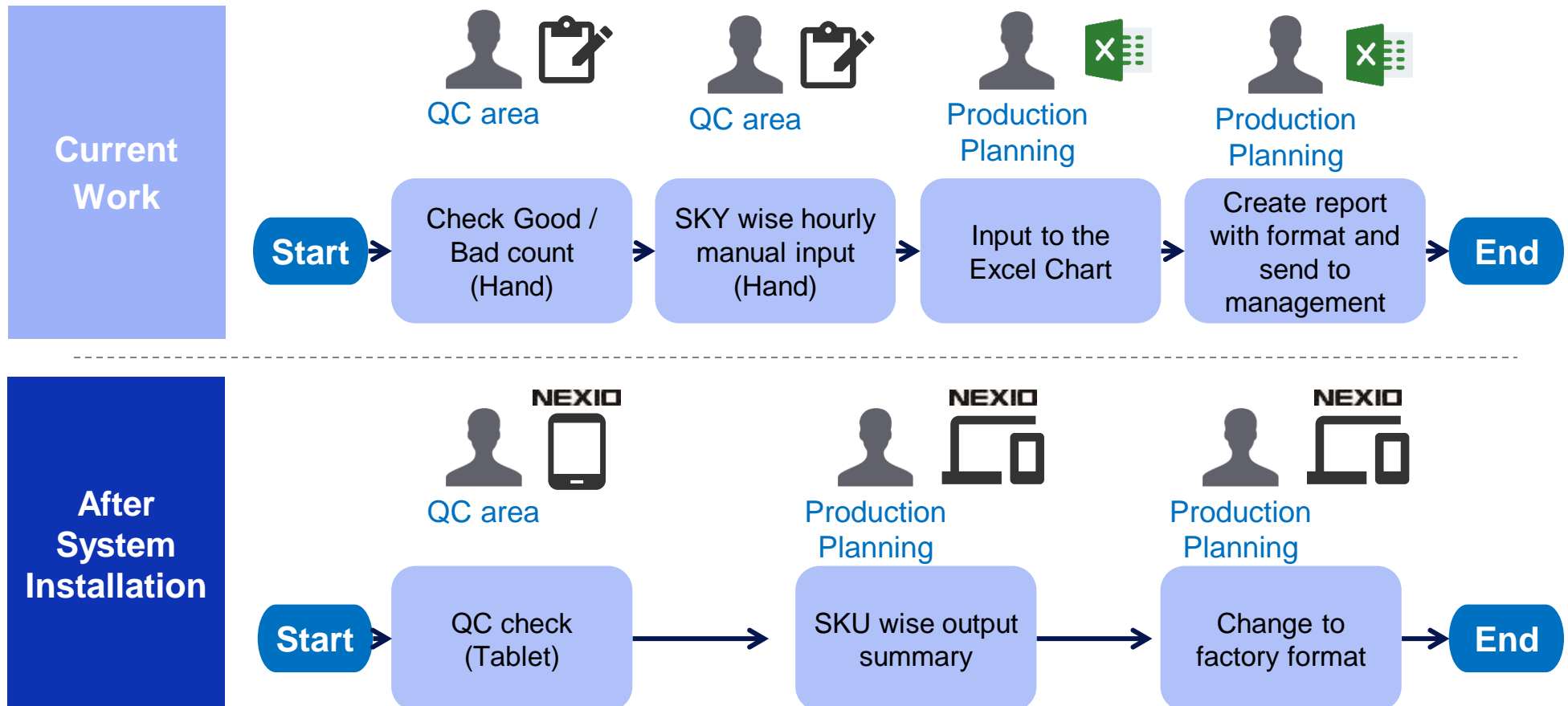
brother
at your side



Other Brand

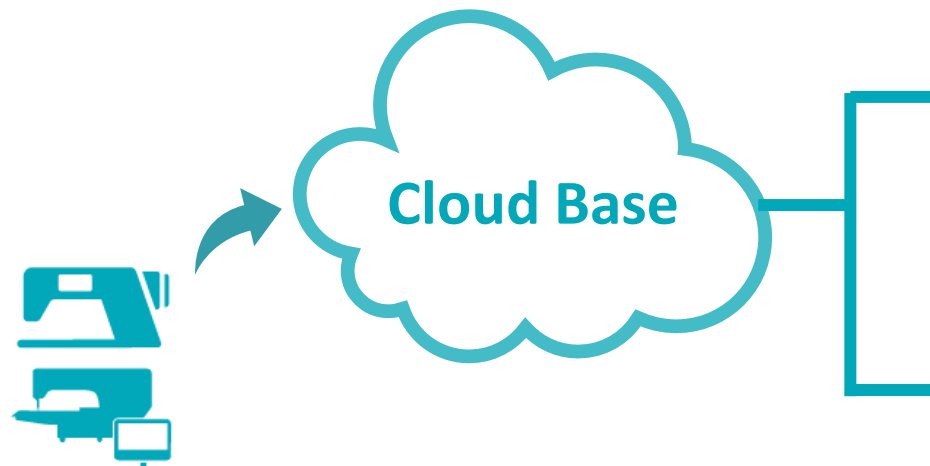


2. Enhancing paperless operation



Automatic Data aggregation and visualization

Just inserting Wi-Fi communication module to your sewing machine.
It replaces your manual data collection and report creation by digitalizing the work process.



Projection at the production line



Report Extract with Excel

Monthly	10/20	11/20	12/20	01/21	02/21	03/21	04/21	05/21	06/21
Line ID	Plan	Act	Plan	Act	Plan	Act	Plan	Act	Plan
LINE1									
01 Neck Top Block	100	100	100	100	100	100	100	100	100
02 Waist Case Label Attach	100	100	100	100	100	100	100	100	100
03 Waist Band Block Attach	100	100	100	100	100	100	100	100	100
04 Waist Label Attach	100	100	100	100	100	100	100	100	100
05 Waist Case Label Attach	100	100	100	100	100	100	100	100	100
06 Bottom Line	100	100	100	100	100	100	100	100	100
07 Total Piece	100	100	100	100	100	100	100	100	100
LINE2									
01 Neck Top Block	100	100	100	100	100	100	100	100	100
02 Waist Case Label Attach	100	100	100	100	100	100	100	100	100
03 Waist Band Block Attach	100	100	100	100	100	100	100	100	100
04 Waist Label Attach	100	100	100	100	100	100	100	100	100
05 Waist Case Label Attach	100	100	100	100	100	100	100	100	100
06 Bottom Line	100	100	100	100	100	100	100	100	100
07 Total Piece	100	100	100	100	100	100	100	100	100
LINE3									
01 Neck Top Block	100	100	100	100	100	100	100	100	100
02 Waist Case Label Attach	100	100	100	100	100	100	100	100	100
03 Waist Band Block Attach	100	100	100	100	100	100	100	100	100
04 Waist Label Attach	100	100	100	100	100	100	100	100	100
05 Waist Case Label Attach	100	100	100	100	100	100	100	100	100
06 Bottom Line	100	100	100	100	100	100	100	100	100
07 Total Piece	100	100	100	100	100	100	100	100	100

3 types of the data will be available

1



**Production
Piece**

2



**Defect
Analysis**

3



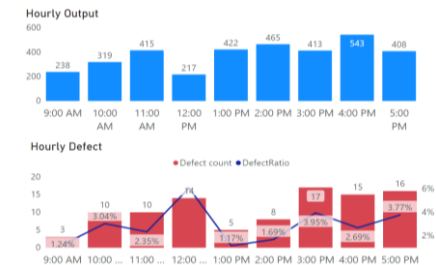
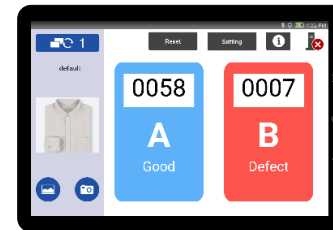
**Operation
Analysis**

1. Production Piece

SCM

Value Chain

- Production count By SKU
- Data connectivity with factory system



Sewing Area

- Real-Time Monitoring



Hourly	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	Total								
Item ID	Plan	Act	Plan	Act	Plan	Act	Plan	Act	Plan	Act								
[1] LINE1																		
A1 Hook Stay Stitch	370	308	870	404	870	515	870	312	870	404	870	356	870	370	277	2,800	1,498	
A2 Waist Case Label Attach	620	0	620	0	620	0	620	0	620	0	620	0	620	0	620	0	0	
A3 Front And Back Attach	620	140	620	197	620	192	620	102	620	160	620	197	620	192	620	102	1,417	
A4 Main Label Attach	620	309	620	420	620	403	620	314	620	469	620	420	620	447	620	410	2,244	1,806
A5 Main Label Attach	620	199	620	212	620	217	620	190	620	203	620	249	620	206	620	194	1,782	1,782
A6 Bottom Close	730	152	730	202	730	216	730	154	730	214	730	154	730	214	730	154	1,790	1,790
A7 Side Close	870	329	870	380	870	376	870	251	870	409	870	376	870	413	870	376	2,231	2,231
[2] LINE2																		
B1 Run Stitch	370	289	370	300	370	313	370	281	370	264	370	279	370	279	370	279	2,407	2,407
B2 Run Stitch	370	289	370	231	370	230	370	101	370	248	370	125	370	248	370	279	1,914	1,914
B3 Run Stitch	370	186	370	223	370	248	370	122	370	213	370	248	370	269	370	280	2,034	2,034
B4 Run Stitch	370	220	370	298	370	281	370	141	370	262	370	298	370	262	370	298	2,034	2,034
B5 Side End Taking	620	132	620	224	620	285	620	177	620	353	620	314	620	340	620	381	4,010	4,010
B6 Line 8 OUTPUT	1,560	340	1,560	250	1,560	249	1,560	173	1,560	275	1,560	275	1,560	400	1,560	340	14,840	14,840
[3] LINE3																		
C1 Run Stitch	370	289	370	346	370	411	370	230	370	362	370	357	370	357	370	357	2,534	2,534
C2 Run Stitch	370	0	370	0	370	0	370	0	370	0	370	0	370	0	370	0	0	0
C3 Run Stitch	370	220	370	353	370	442	370	262	370	439	370	410	370	396	370	410	2,839	2,839
C4 Run Stitch	370	248	370	347	370	441	370	247	370	371	370	371	370	371	370	371	2,839	2,839

Take small actions to improve the production

Real time action with back data generate proper communication with production line which helps to find best solutions.

IE / Line Manager

Line Supervisor / Manager

1. Real-Time Monitoring



2. IDENTIFY Line & Process

Line	Sewing M...	Item	8:00	9:00	10:00	11:00	12:00
SHR_ ASSEMBL	-	TARGET	54	54	54	54	13
		ACTUAL	54	100	102	210	229
SHR_ ASSEMBL	-	TARGET	5	64	120	180	229
		ACTUAL	54	54	54	54	12

3. Discuss with **DATA**



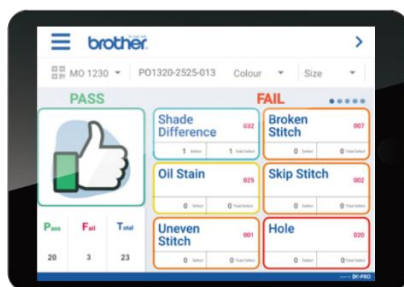
4. Take action!!

Training,
Standard process check,
Balance check
Feed support etc.



2. Defect analysis

Simple UI



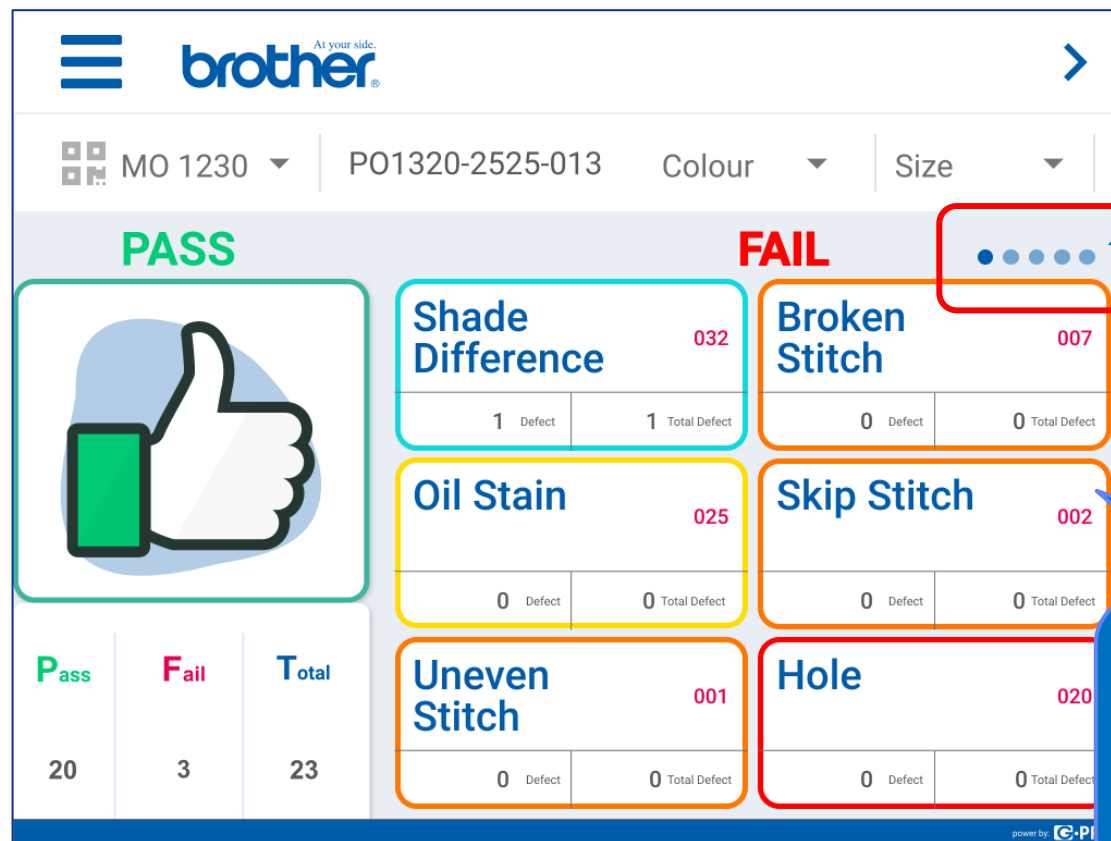
Defect Tracking



Multi-defects



Defect count simple UI

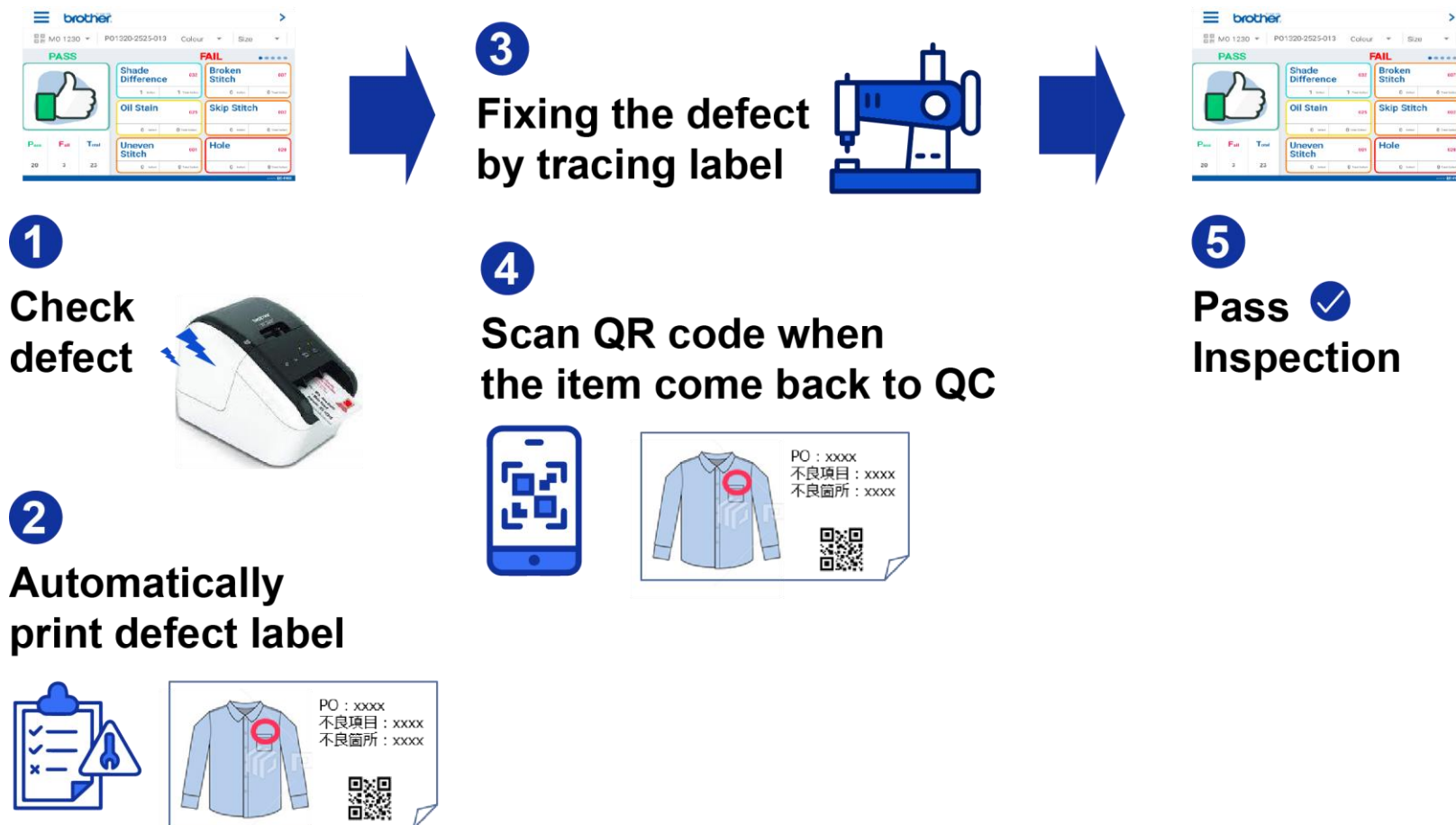


• By using scroll, it can be show as total 40 defects type

• Defect type can be access in front page to save time to search

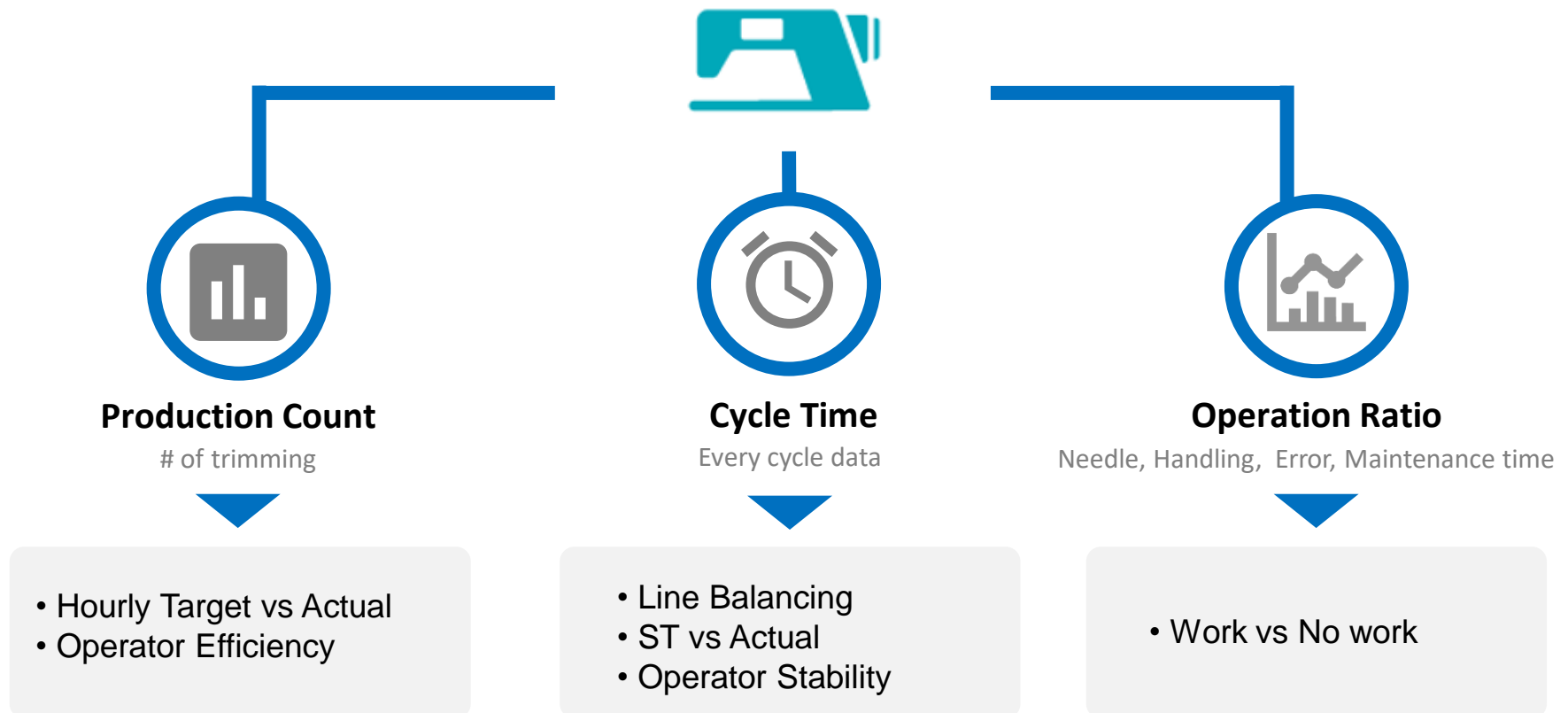
Defect tracing system

By using Brother label printer, customer can easily trace Defect product after inspection area



3. Operation Analysis

Data from sewing machine and flexible data export gives various type of analysis.



This report is available on 1-LA

Previous page report is already available to use.

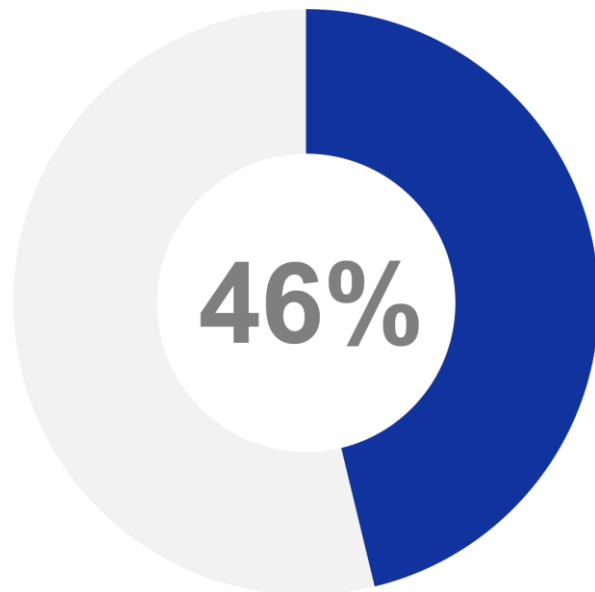


Simple data collection and Detailed report

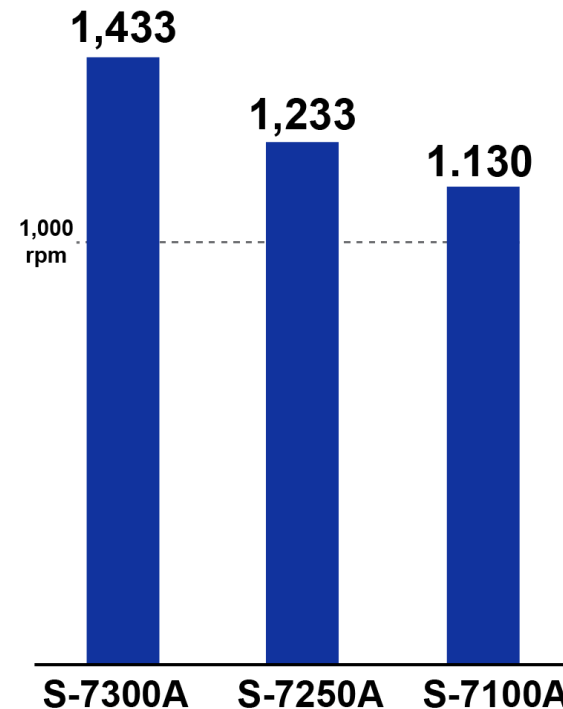
- Line balancing
- Cycle time
- Operation ratio
- Operator stability

Sewing Machine Average Speed

Slower than 1,000 rpm



Sewing Speed (rpm)



Brother machine
running over

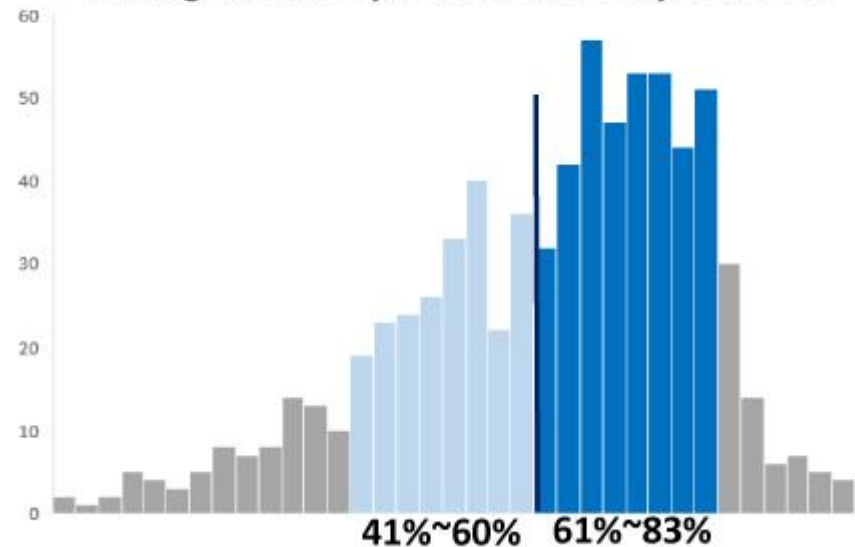
1,000 rpm

Sewing Machine Operating Ratio

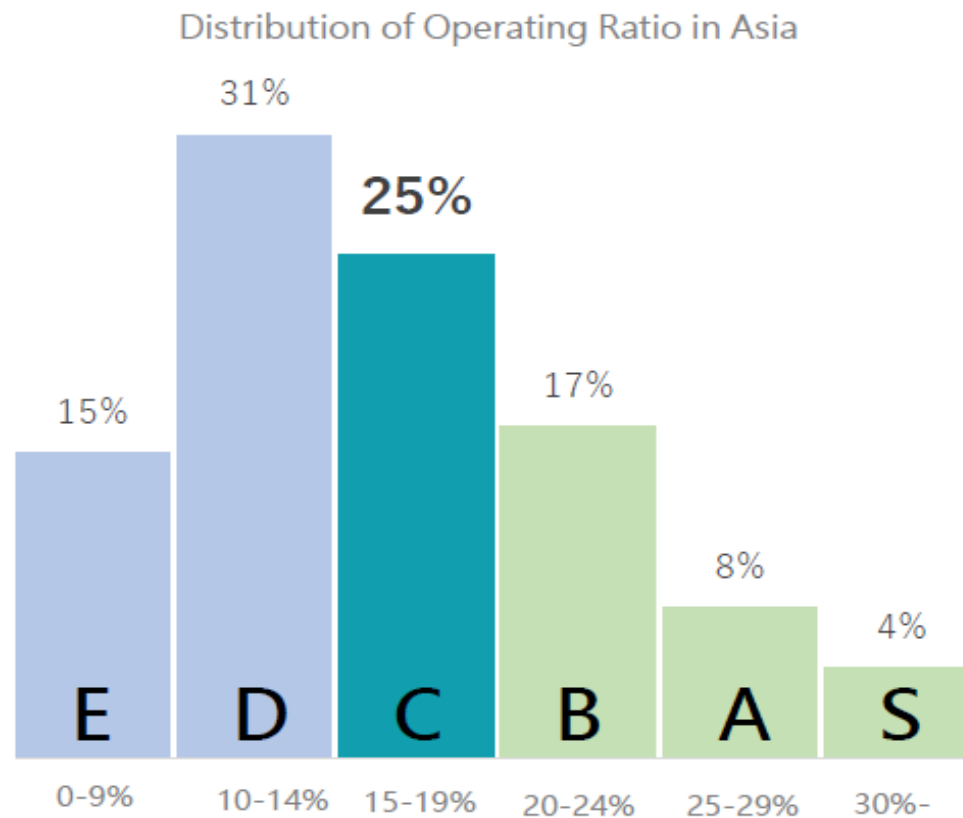
Operating Time is 61%



Histogram for Operation Ratio by factories

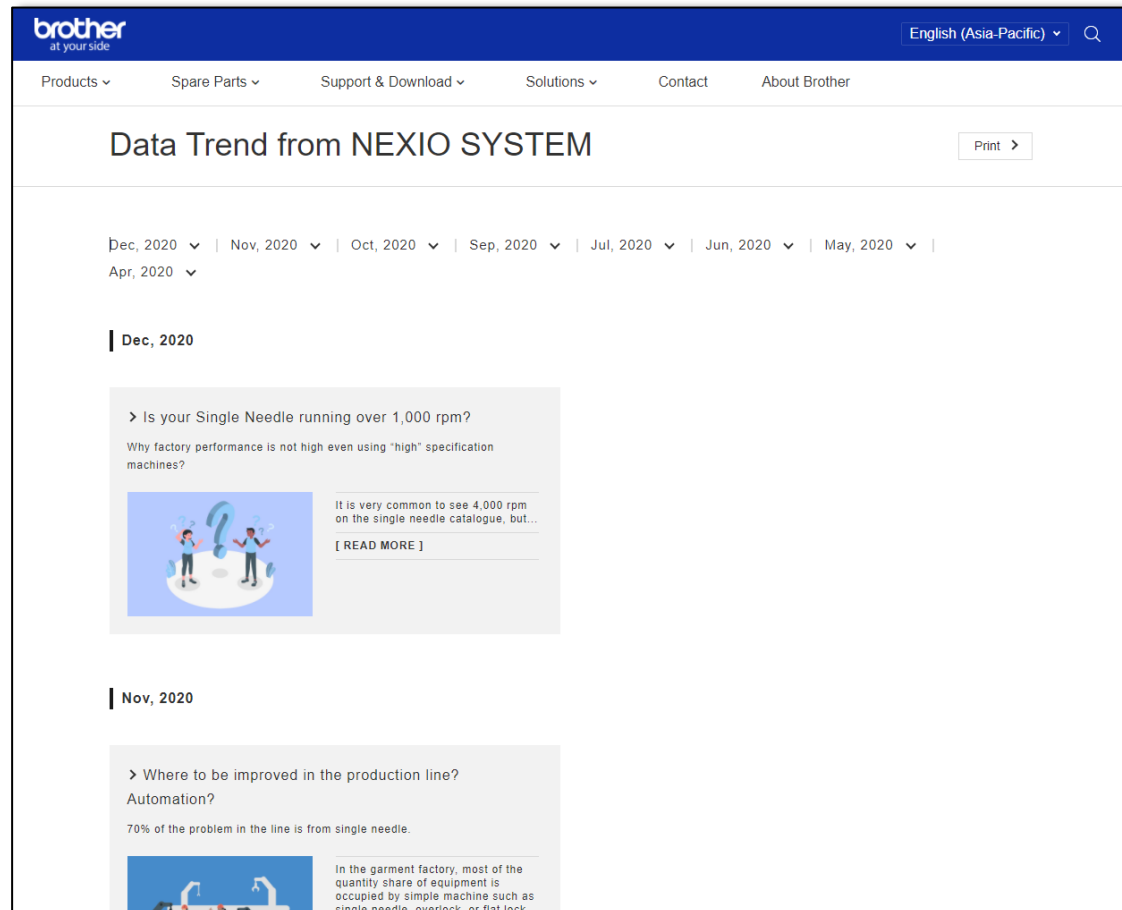


Operator Score Ranking



Brother Data Column: <https://industrialsewingmachine.global.brother/en-ap/news-column/data/jun-2020/>

<https://industrialsewingmachine.global.brother/en-ap/news-column/data/index>



The screenshot displays the Brother website's 'Data Column Reference' section. The header includes the Brother logo, a language dropdown set to 'English (Asia-Pacific)', and a search icon. A navigation bar lists 'Products', 'Spare Parts', 'Support & Download', 'Solutions', 'Contact', and 'About Brother'. The main heading is 'Data Trend from NEXIO SYSTEM' with a 'Print' button. Below this is a month selection bar showing 'Dec, 2020' through 'Apr, 2020'. The 'Dec, 2020' section is active, featuring an article titled '> Is your Single Needle running over 1,000 rpm?'. The article text discusses factory performance issues and includes an illustration of two people with a large question mark. A '[READ MORE]' link is provided. Below this, the 'Nov, 2020' section is partially visible, featuring an article titled '> Where to be improved in the production line? Automation?'. The text mentions that 70% of the problem is from single needle and includes an illustration of sewing machines. The footer contains the copyright notice '© 2020 Brother Machinery (Asia) ,Ltd.'.

GOOD CASE: Small lot improvement

This is a customer case who successfully improved production in small lot order which they used to give up.

Before 700 pieces/day. Production complete within 2 to 3 days.

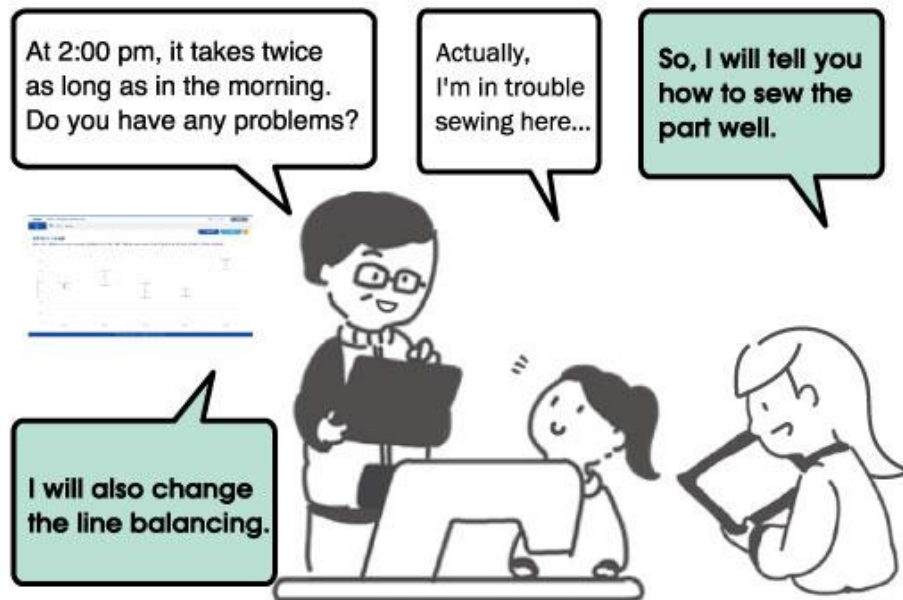
- No time for time study
- Sample study result cannot convince operator



GOOD CASE: Small lot improvement

This is a customer case who successfully improved production in small lot order which they used to give up.

- After**
- Instant data collection & automatic calculation
 - Discuss with operator with data to find out solution together.



Production
5%UP



Agenda

Introduction

Sharing by BMA

Sharing by GPRO

Market Outlook

GPRO GLOBAL

INSIGHT . INNOVATION . IMPACT

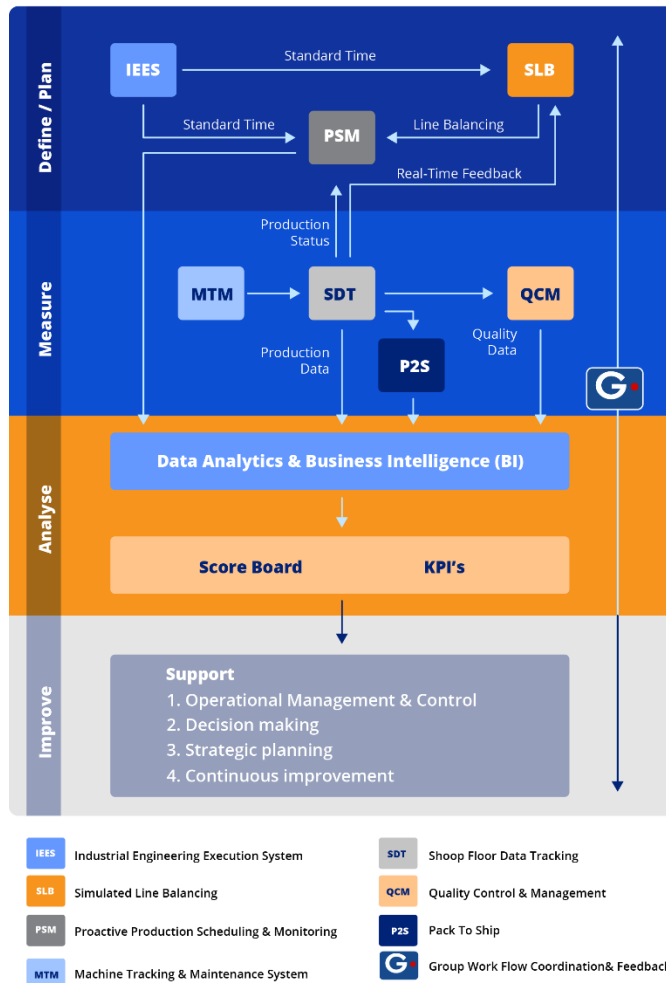






GPRO's Suite of Digital Solutions for Apparel Manufacturing Industry

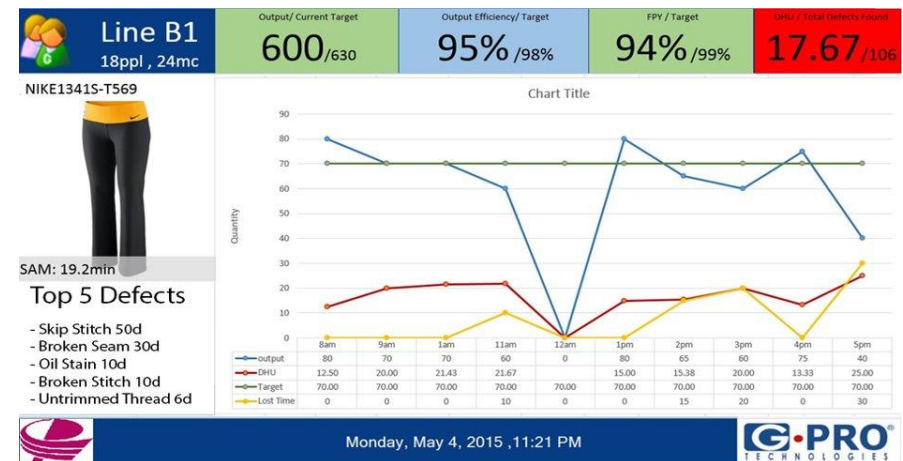
GPRO is a company engaged primarily in high technology R&D activities in RFID, IoT, Industrial Engineering, Robotics, and Process Automation for Apparel Manufacturing industry.



- **Industrial Engineering Execution System (IEES):** Pre-determined Motion Time System for labour costing, benchmarking and planning
- **Simulated Line Balancing (SLB):** Manpower/ machine requirement calculation
- **Proactive Scheduling & Monitoring (PSM):** Resources utilization and timely delivery optimization
- **Shop Floor Data Tracking (SDT):** WIP and production tracking
- **Quality Control & Management (QCM):** Real time quality information
- **Machine Tracking & Maintenance (MTM)**
- **Pack To Ship (P2S)**
- **Warehouse Management System (WMS)**
- **Group Work Flow Coordination & Feedback (G.WORK)**

Company P is a state-owned garment manufacturing company located in Vietnam. The production floors occupy 16,000 sq meters and production facilities have monthly capacities for 540,000 pieces of jeans, 200,000 pieces of woven shirts and 230,000 pieces of casual and active pants.

- **Results after implementing GPRO-SDT (RFID) and QCM Systems:**
 - Efficiency of sewers improved more than **20%** at the end of two months
 - Defect rate reduced by **30%**
 - Lost time reduced by **50%**
 - Machine down-time reduced by **30%**
 - Frequency of bottle-neck situation reduced by **80%**
 - On-time delivery improved by **80%**
 - Staff for data collection and computation reduced from 10 to 3 persons.
 - At **6 %** productivity gain, the ROI was around 11 months.





Lost Time Analysis

Date :

Shift Code :

Factory :

Prod. Group :

3/19/2020

3/19/2020

DAY

▼

F31

▼

Select all

K2

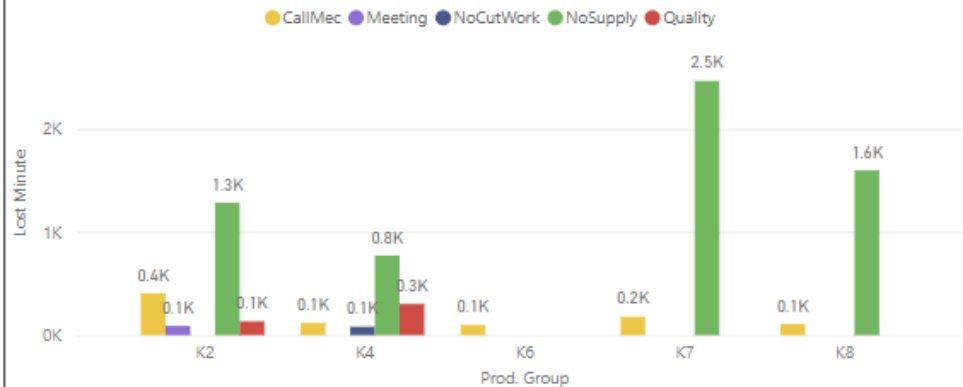
K4

K6

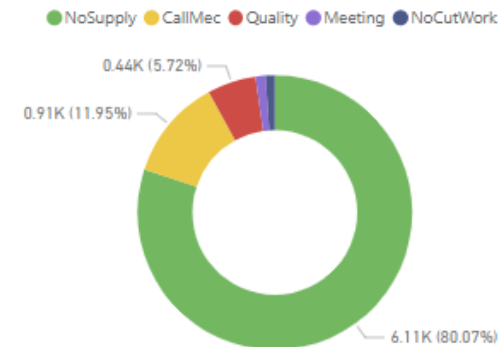
K7

K8

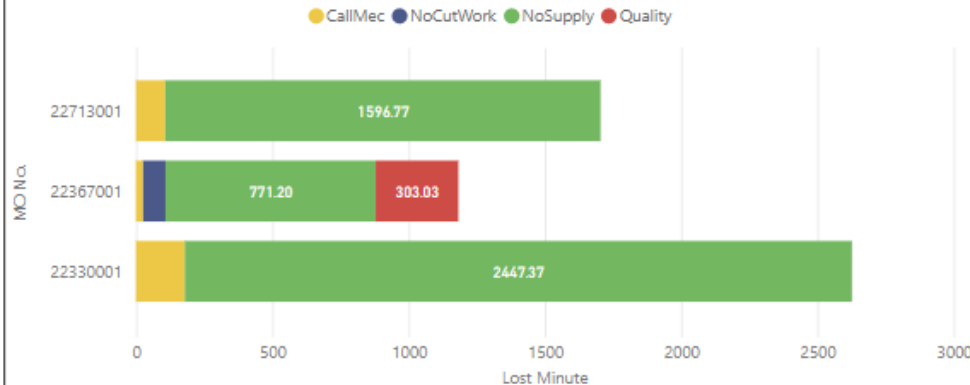
Lost Time by Prod. Group



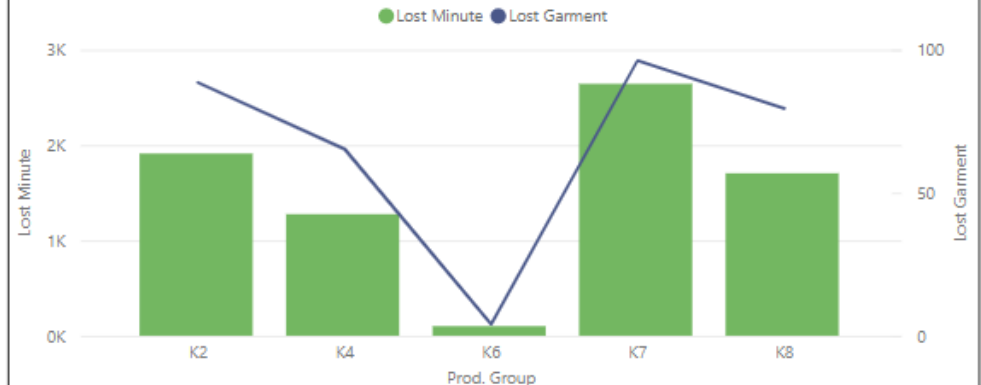
Lost Time by Lost Type

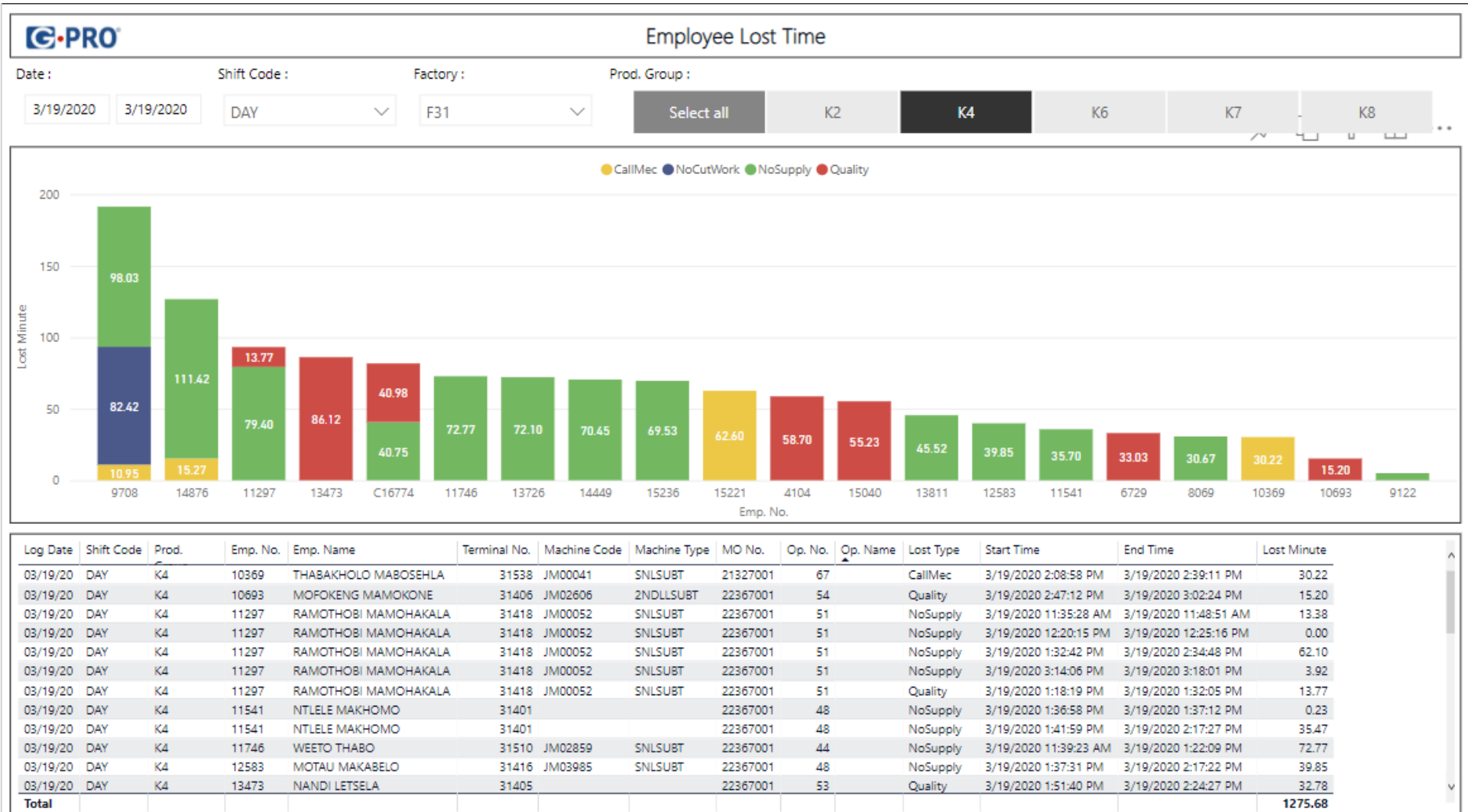


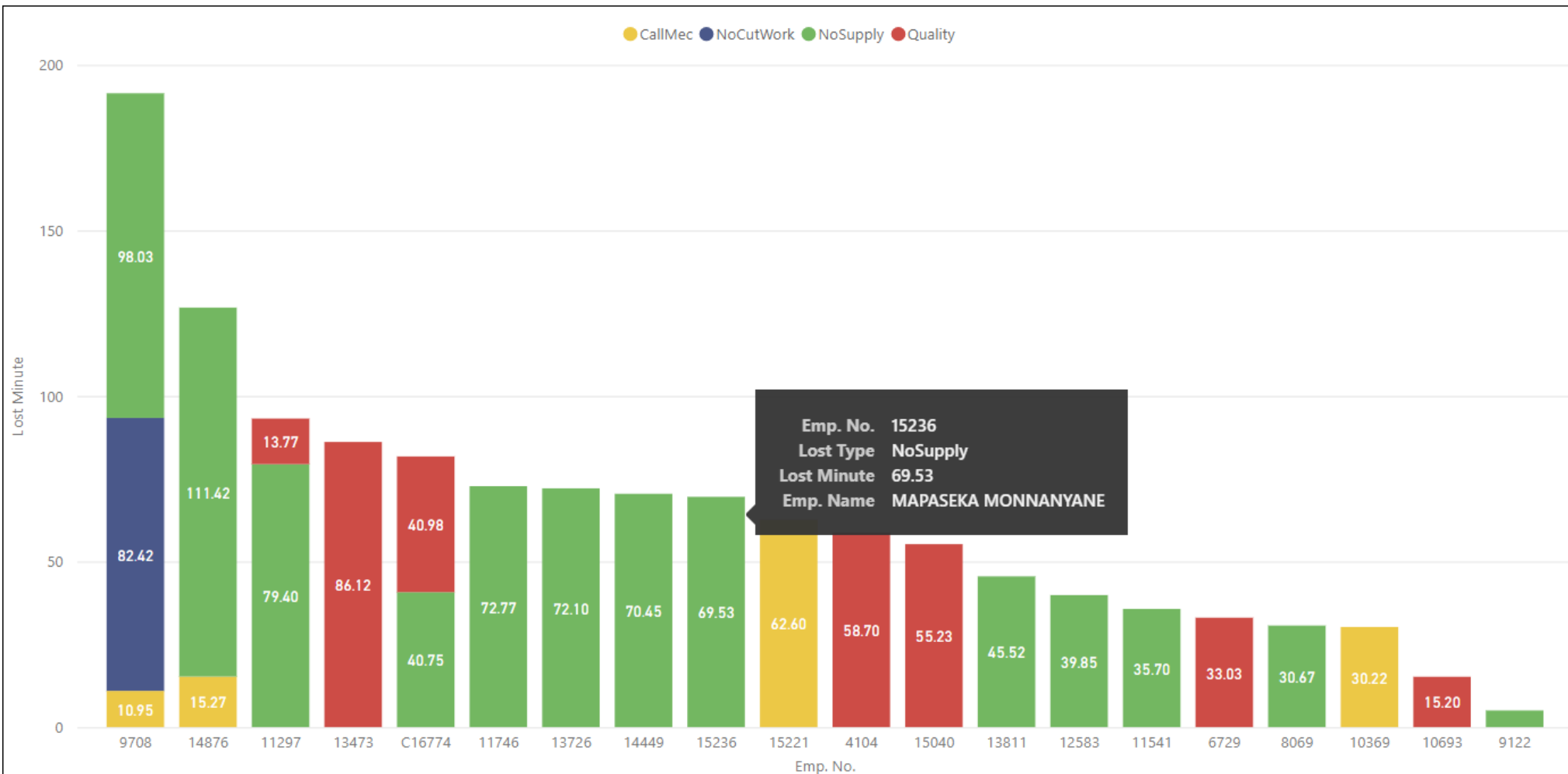
Lost Time by MO (Top 3)



Lost Time vs Lost Garments (by Prod Group)







GPRO's Data Analytics



Mechanic Performance (Total)

Date :

Shift Code :

Factory :

Prod. Group :

1/6/2019

6/11/2020

All

All

All

4089

Total Breakdown

5041

Total Repair

25.48K

Total Repair Minutes

107.84K

Total Response Time

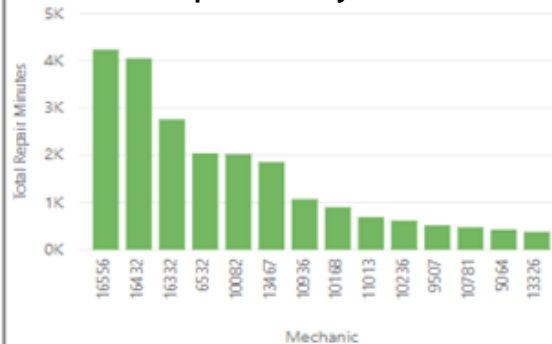
231.26K

Total Downtime

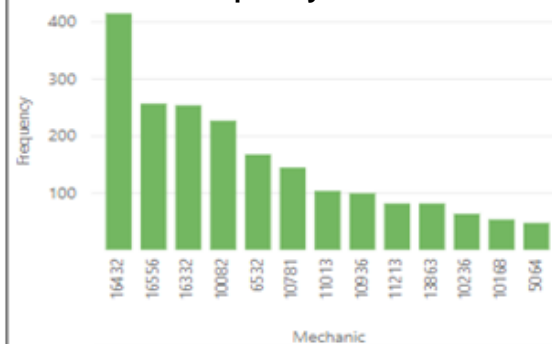
952

Running Breakdown

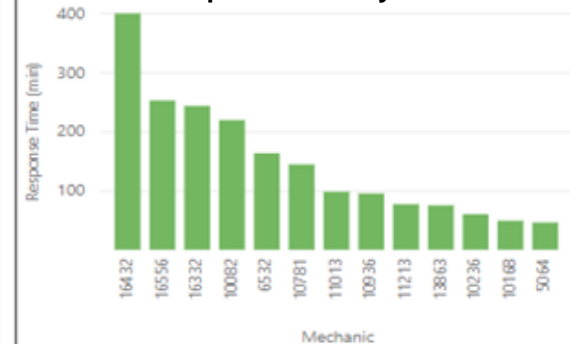
Total Repair Time by Mechanic



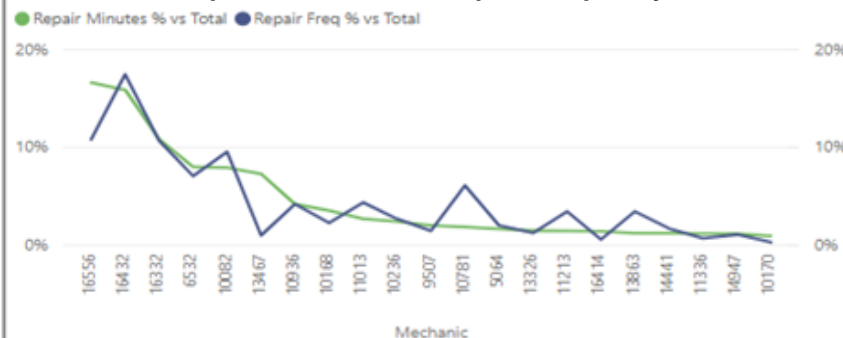
Total Repair by Mechanic



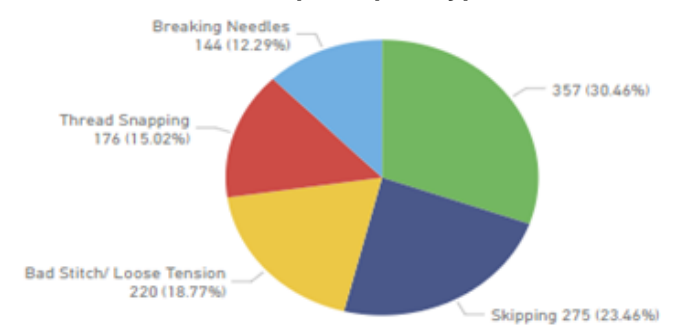
Total Response Time by Mechanic



Repair Minutes % vs Repair Frequency %



Top 5 Repair Types





Daily Production Summary (Factory)



Login Manpower
(Avg)

128.11

Total Output

15K

Factory Eff % (Avg)

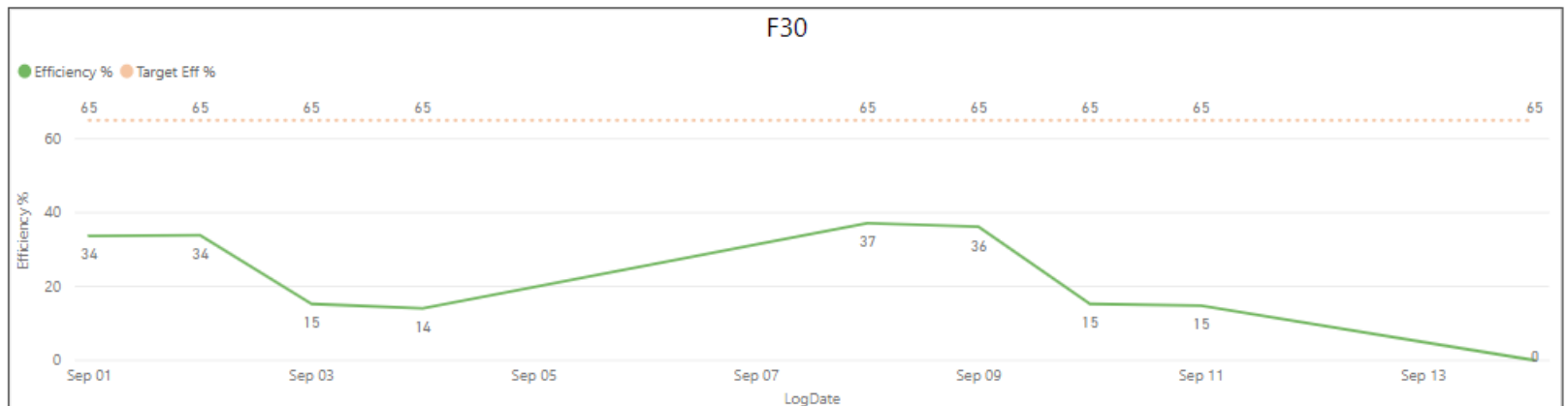
22

On Std Eff % (Avg)

64

Total Lost Minutes

89K



Log Date	01-Sep-20			02-Sep-20			03-Sep-20			04-Sep-20			08-Sep-20			09-Sep-20			L
Prod Group	Line Eff	Output Qty	Login MP	Line Eff	Output Qty	Login MP	Line Eff	Output Qty	Login MP	Line Eff	Output Qty	Login MP	Line Eff	Output Qty	Login MP	Line Eff	Output Qty	Login MP	
F30 A.WASH							0	0	7	0	0	7							
J1							71	488	41	69	485	42							
J2							51	533	38	42	504	44							
J3	71	977	67	71	924	73							77	1027	73	69	884	73	
J5							67	1135	64	63	1086	68							
J6																			
J7	64	950	64	64	910	63							72	819	61	77	866	60	



Daily Production Summary (Line)



Login Manpower
(Avg)

66.00

Total Output

3796

Line Eff % (Avg)

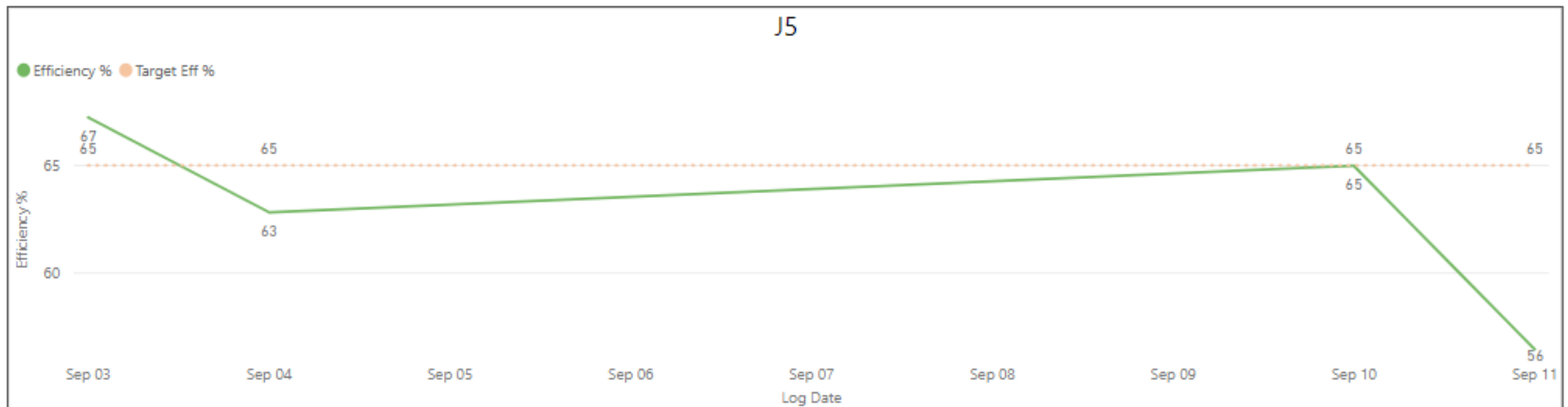
63

On Std Eff % (Avg)

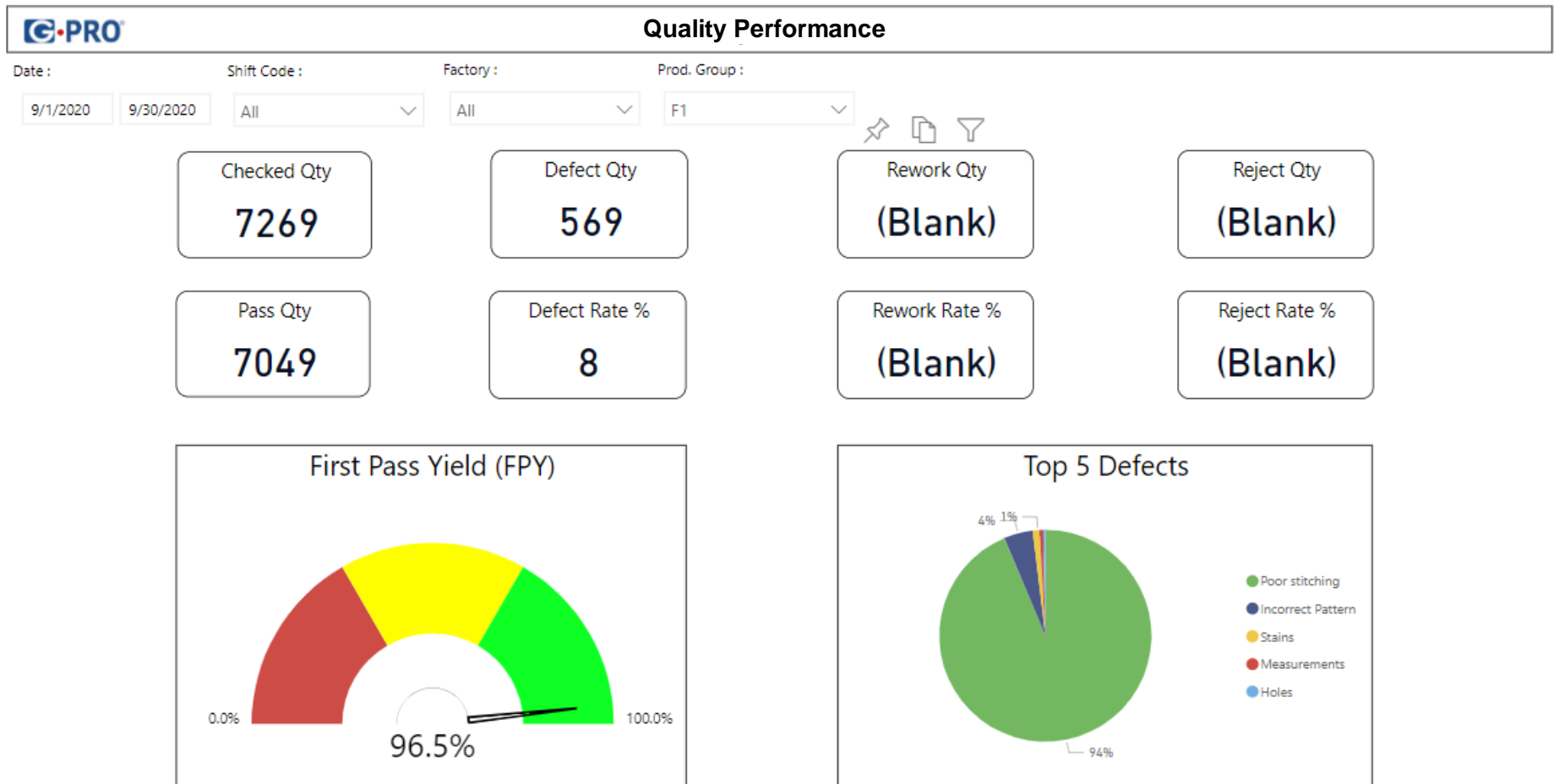
76

Total Lost Minutes

29K

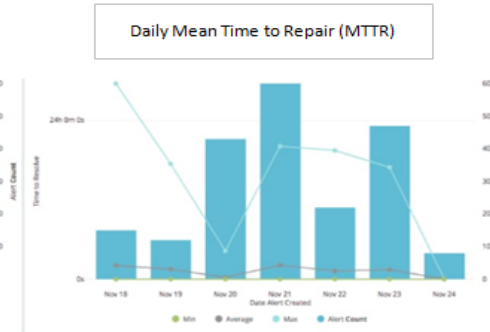
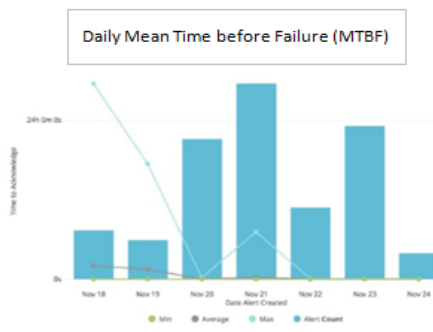
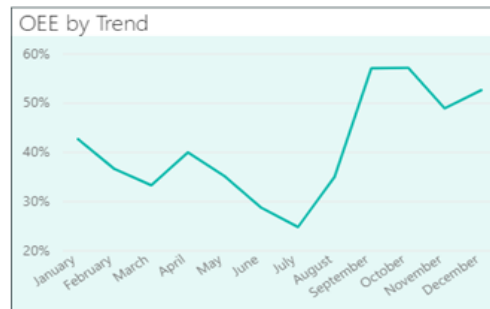
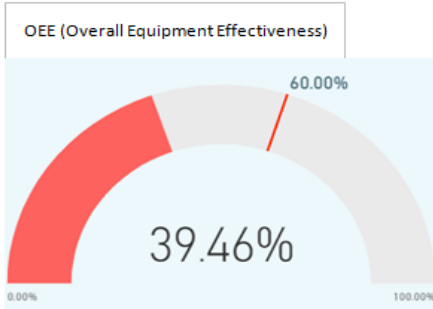
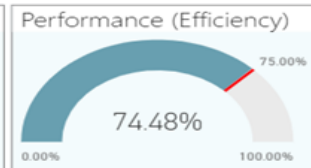
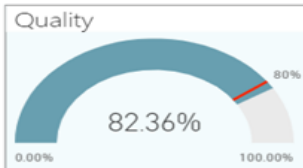
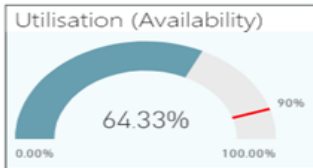


Log Date	Shift	ProdGroup	Login MP	Target MP	Output Qty	Target Qty	Output Variance	On Std Earn Min	Output Earn Min	Total Available Min	Target Available Min	Lost Min	On Std Eff %	Line Eff %	Target E
03-Sep-20	DAY	J5	64	61	1135	1595	460	24799	23880	32236	35520	2661	84	67	
04-Sep-20	DAY	J5	68	61	1086	1635	549	25446	23710	34371	37740	3881	83	63	
10-Sep-20	DAY	J5	67	61	799	1329	530	16524	24164	34164	37185	10754	71	65	
11-Sep-20	DAY	J5	65	61	776	1445	669	14790	20370	34239	36075	11640	65	56	



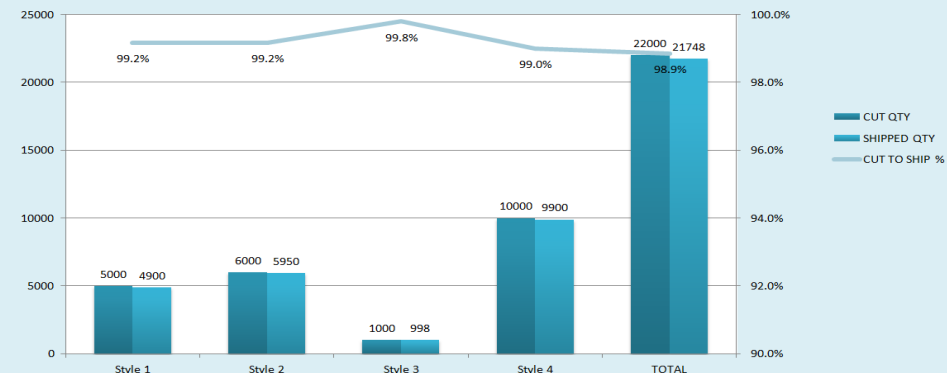
ASSET PERFORMANCE METRICS

Prod Group



G·PRO

STYLEWISE CUT TO SHIP PERFORMANCE

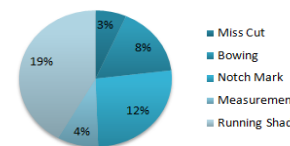


G·PRO

QUALITY PERFORMANCE

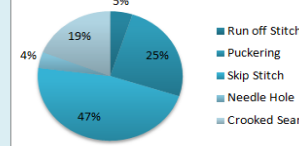
Department Wise

Cutting Defects



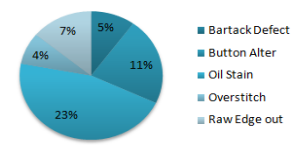
Total Cut Qty - 5000
Good Cut Qty - 4987
FPY % - 96.5%
DHU % - 6.5%
Recut % - 2%
Reject % - 0.3%

Sewing Defects



Total Order Qty - 17500
Output - 17356
FPY % - 92.3%
DHU % - 5.4%
Rework % - 4.8%
Reject % - 1.2%

Finishing Defects



Total Order Qty - 17500
Output - 17150
FPY % - 97.9%
DHU % - 4.32%
Rework % - 3.1%
Reject % - 0.75%





Agenda

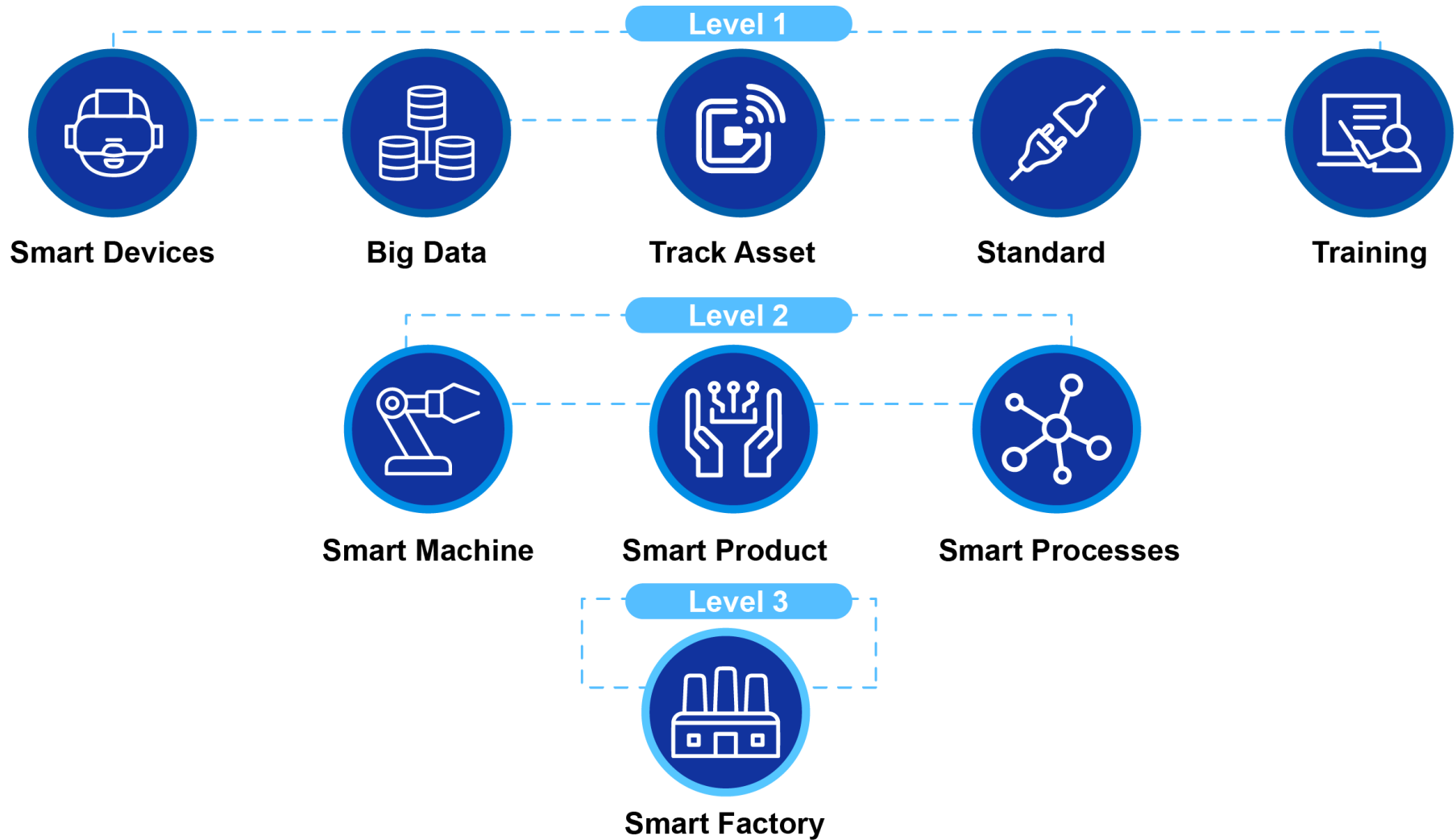
Introduction

Sharing by BMA

Sharing by GPRO

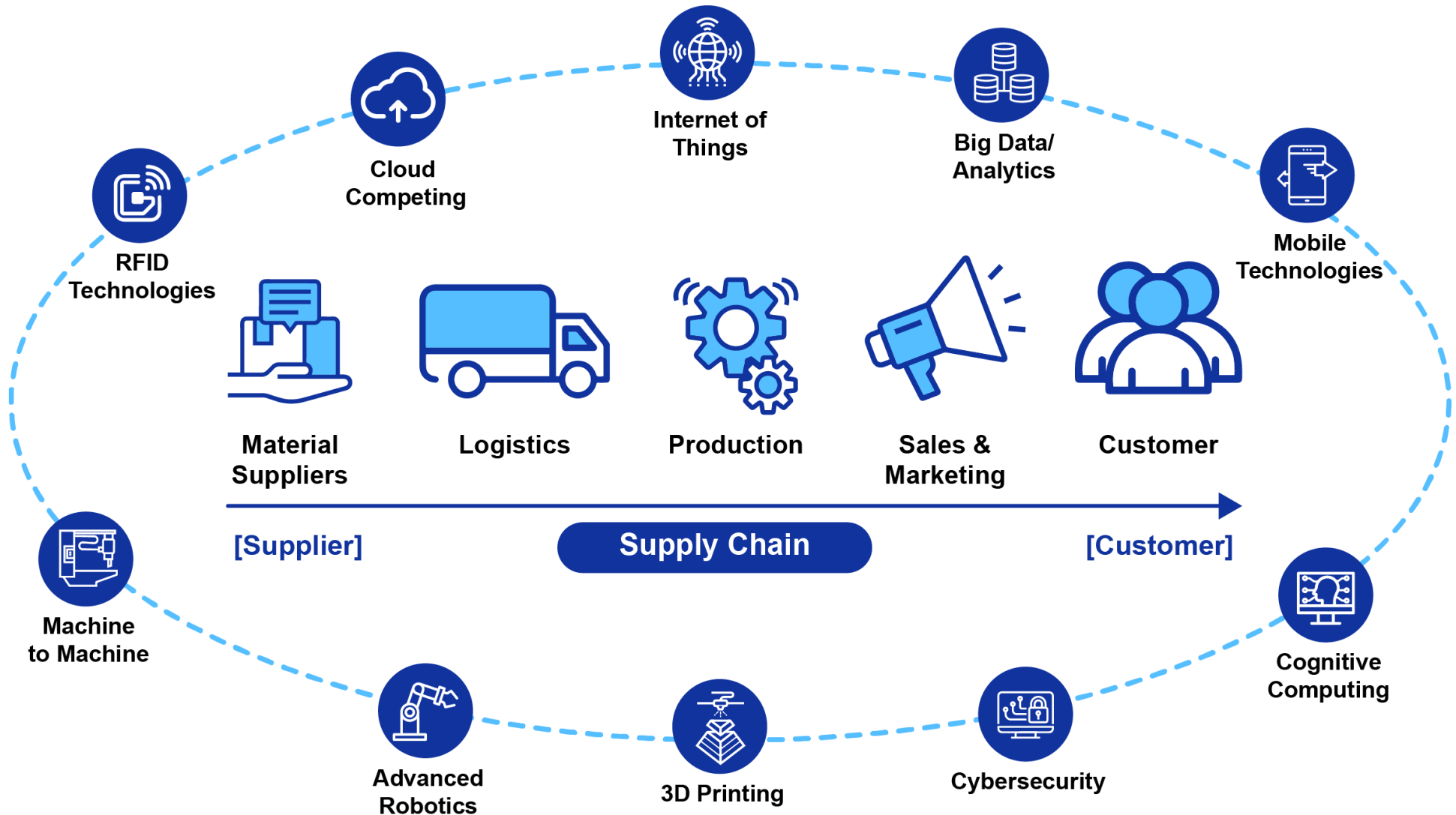
Market Outlook

Future outlook: Smart Factory and apparel industry ecosystem technology advancement





Digitalization across the whole apparel supply chain





Agenda

Q & A

Please Enter Your Questions by clicking the “Question” button at the bottom of the screen.

Speaker, Respondent



Gen Kimura

General Manager

BMA Solution Department

Speaker, Respondent



Jordan Tang

Founder, Executive Director

GPRO Global

Moderator



Yulin Huang

Director

YCP Solidiance



White paper Download Link and Contacts

We also issued a White paper along with the Webinar, please find below the download link:

<https://bit.ly/apparelwp>

If you have any further questions or enquires, please reach out to:

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GRPO contact: info@gprotechnologies.com





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