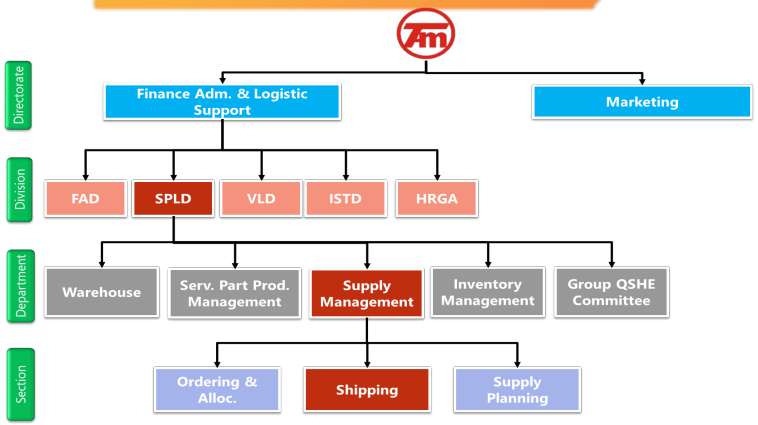
MENINGKATKAN EFISIENSI COST MELALUI OPTIMASI FILLRATE PENGIRIMAN REGULAR DALAM KOTA UNDER DEPO TABANAN

SOPIAN RIADY
TAM SPLD

1. PENGENALAN AREA KERJA

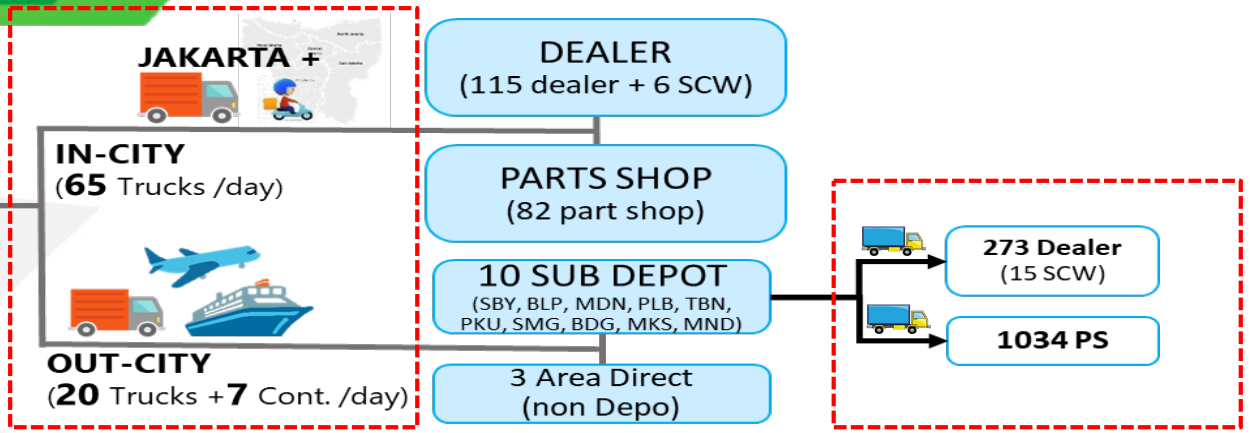
PT. TAM

SERVICE PARTS LOG. DIV.



SHIPPING SECTION

SCOPE

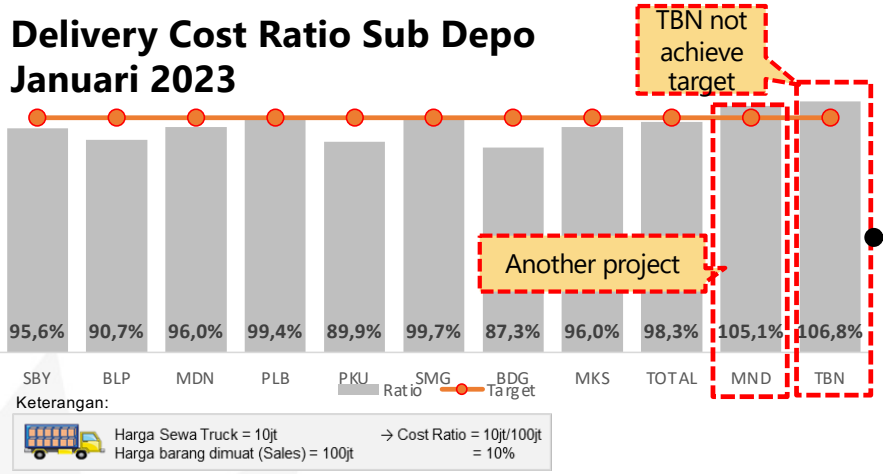


: Area Kerja

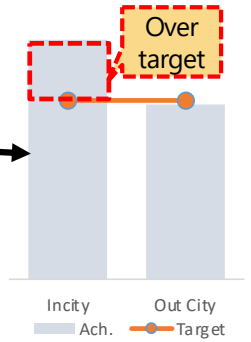
1. BACKGROUND

COST

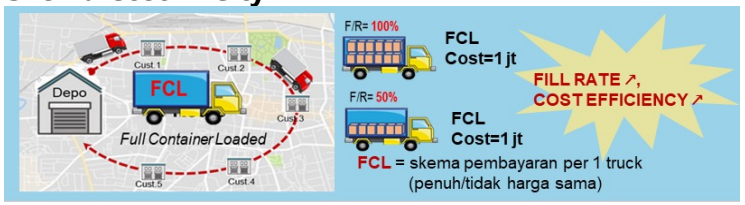
Delivery Cost Ratio Sub Depo Januari 2023



Cost Ratio TBN by area



Skema Cost In City



TEMA :
MENINGKATKAN EFISIENSI COST MELALUI OPTIMASI FILLRATE PENGIRIMAN REGULAR DALAM KOTA UNDER DEPO TABANAN

HOSIN

1. **TOYOTA ENVIRONMENT CHALLENGE 2050**
   "Logistic CO2 Reduction"

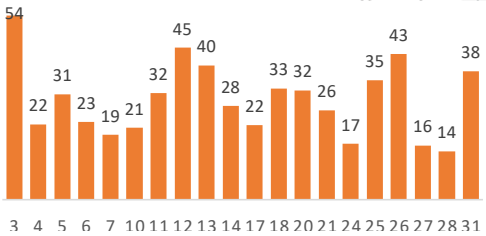
Producing Happiness for All
through Excellent "Service Parts" Supply
with **Most Competitive Cost**

2. **SPLD Hosin 2023**
   " Cost Optimization"

c. Shortest-Path Cheapest-Route Kaizen
- Staggered Delivery Review
- Remapping Shortest Delivery Route
(BDG to Ckrg, Krw) (CPD to Crb, Kuningan, Indramayu)

3. SM Dept. Action Plan 2023
   "Shortest – Route Kaizen :
   Staggered Delivery Review"

CHALLENGE



Fluktuasi volume harian bulan Januari 2023

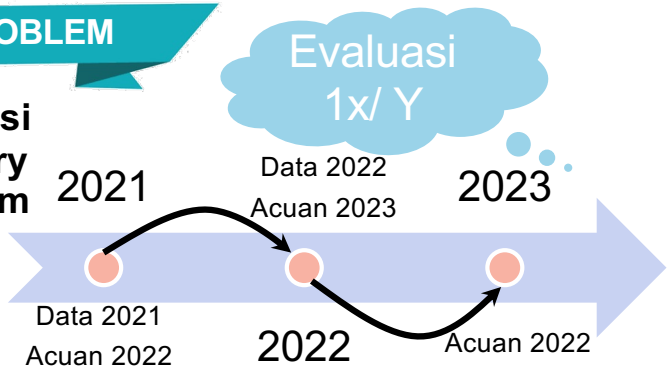
Free Forecast

2. ANALISA (PENENTUAN JUMLAH TRUK)

PROBLEM

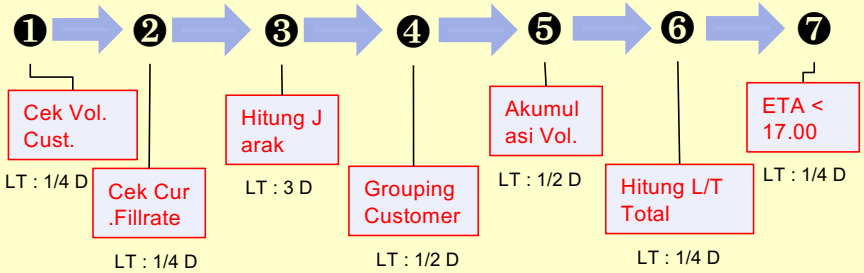
Evaluasi 1x/ Y

Evaluasi Delivery Diagram



IMPACT

Tahapan Evaluasi Delivery Diagram

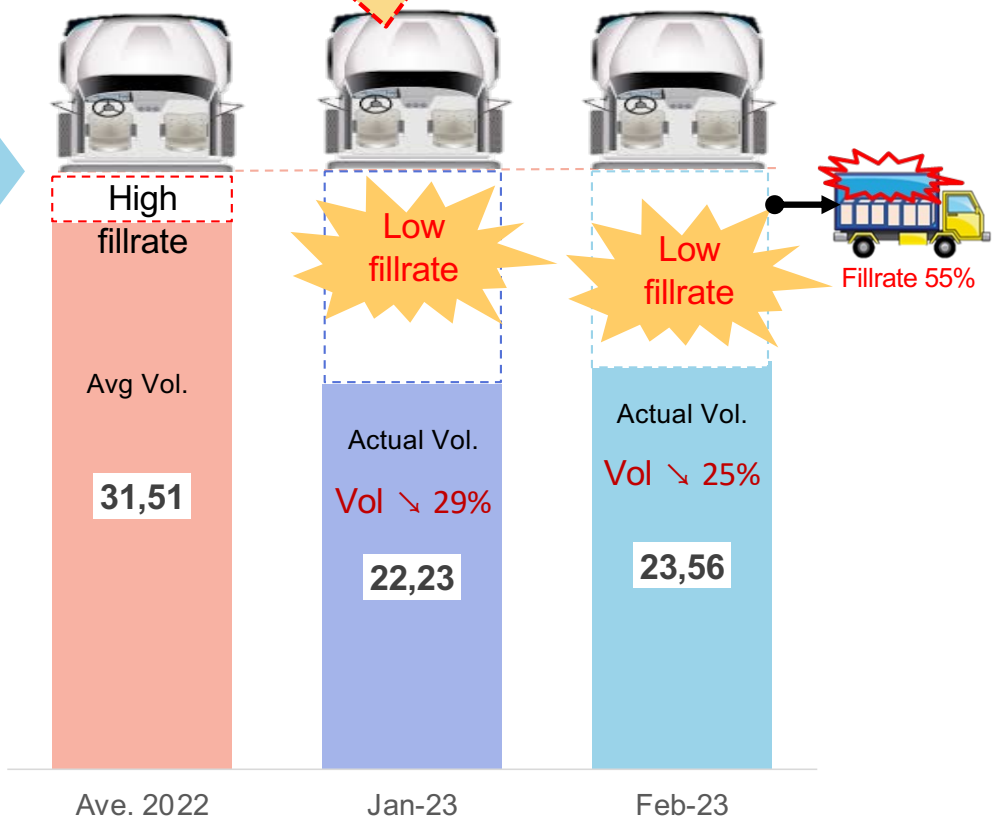


Semua tahapan dilakukan manual (L/T lama) : **5 D**

Volume 2022 vs Jan, Feb 2023

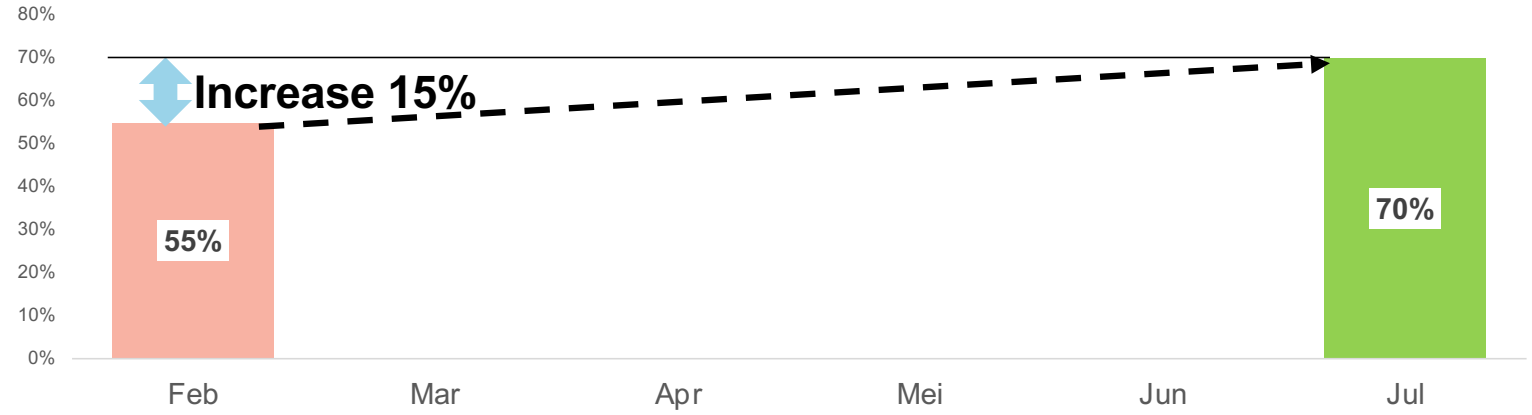
B'dasarkan data 2022, setting truk di 2023 : 7 truk

High fillrate : 70% – 90%
Low fillrate : < 65%



PROBLEM : Ave. Volume tahun lalu dijadikan data acuan tahun berikut nya

3. TARGET



TARGET: "Meningkatkan Fillrate Incity Depo dari 55% ke 70%"

S Meningkatkan fillrate delivery incity Depo Tabanan

M Satuan Ratio (Actual Volume / Ideal Volume

A Pernah tercapai pada 2022

R Agar Cost Ratio incity 2,1%, maka fillrate min. 70%

T Target akan tercapai pada Juli 2023

Rencana Aktivitas

NO	ITEM	MAR '23				APR '23				MAY '23				JUN '23				JUL '23				EVA
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
1	Study Current Condition							Libur Lebaran														O
2	Investigasi																					O
3	Penetapan Target																					O
4	Rencana Penanggulangan																					O
5	Koordinasi Pihak Terkait																					O
6	Penanggulangan																					O
7	Evaluasi Hasil																					O
8	Standarisasi & Tindak Lanjut																					O

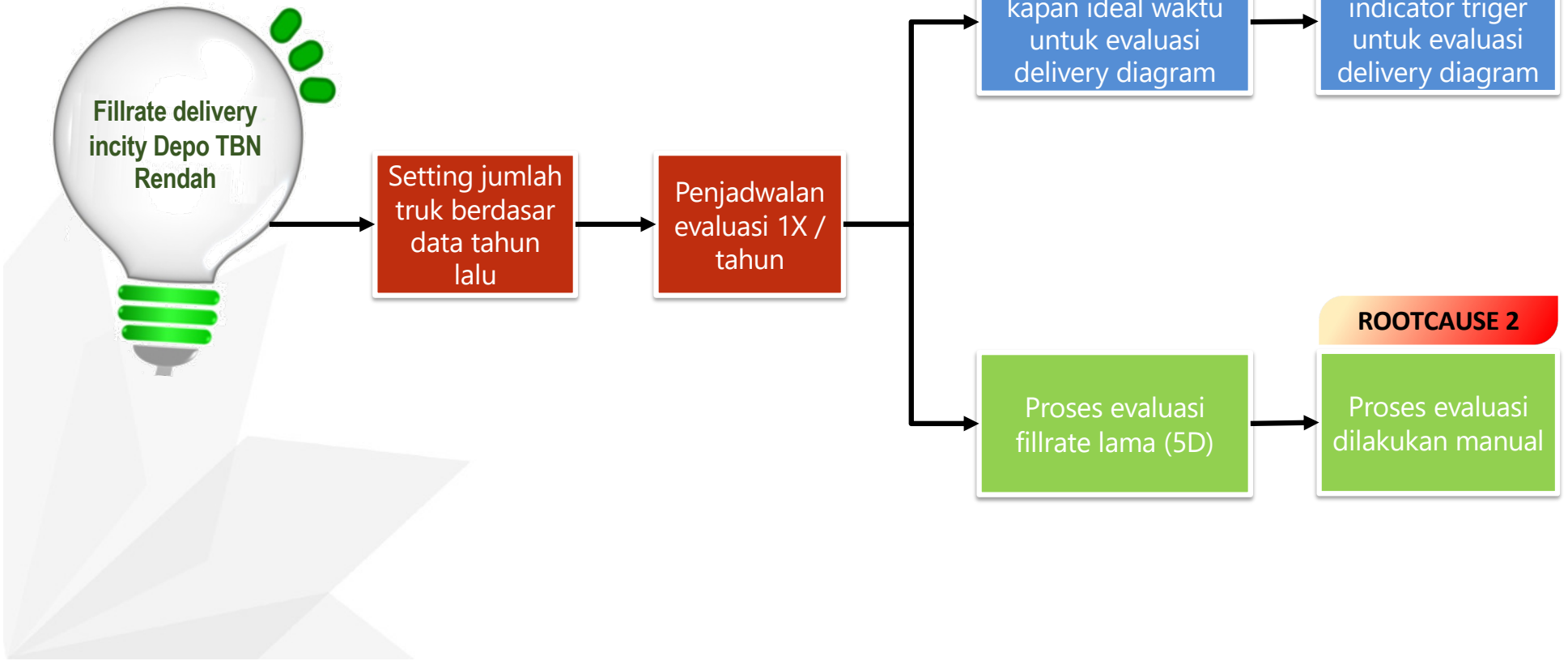
Meeting Koordinasi dengan atasan

Item Pembahasan :
1. Konsultasi aktivitas & saran
2. Fixasi ide
3. Planning Trial, Evaluasi dan Implementasi

Meeting dengan Pihak Depo TBN

Item Pembahasan :
1. Rootcause
2. C/Measure
3. Timing Trial, Evaluasi
4. Implementasi

4. ROOTCAUSE ANALISIS



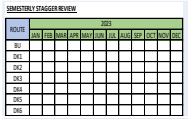
5. RENCANA PENANGGULANGAN

PROBLEM 1

Implementasi : 1. Sulit impl., 2. Bisa diimplement. 3. Mudah diimpl. **L/T** : 1. > 2 jbulan 2. 1-2 bulan 3. < 1 Bulan
Quality : 1. update data tahunan 2. Update data 6 bulanan 3. Update data harian

Problem

Tidak diketahui ideal waktu evaluasi diagram delivery

ALT.	IDE	ILUSTRASI	Quality	Implementasi	L/T	TOTAL	EVAL.
1	Evaluasi fillrate semesterly		2	2	3	7	X
2	Tools base on history, judgment base on trend		3	3	3	9	O

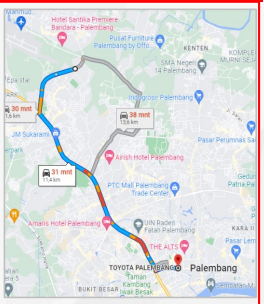
INSPIRASI

Display ketersediaan parkir di rest area

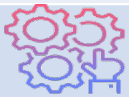
PROBLEM 2

Implementasi : 1. Sulit Impl.., 2. Bisa diimplement. 3. Mudah diimpl. **L/T** : 1. > 2 jbulan 2. 1-2 bulan 3. < 1 Bulan
Cost : 1. >Rp. 500.000 2. Rp.100.000 – Rp. 500.000 3. < Rp. 100.000

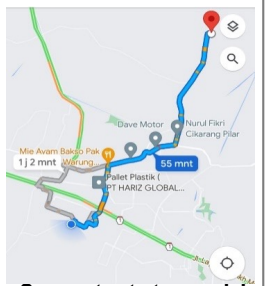
Problem



LT Evaluasi fillrate lama

ALT.	IDE	ILUSTRASI	Cost	Implementasi	L/T	TOTAL	EVAL.
1	Menambah MP untuk menjalankan proses		1	1	1	3	X
2	Menambahkan MH (overtime) untuk menjalankan proses		1	1	3	5	X
3	Develop Automatic tools		3	3	3	9	O

INSPIRASI



Suggest rute terpendek di google map

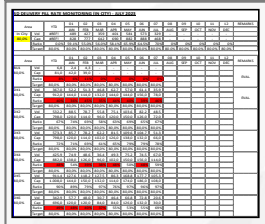
6. PENANGGULANGAN

PROBLEM 1

Problem

Tidak diketahui ideal waktu evaluasi diagram delivery

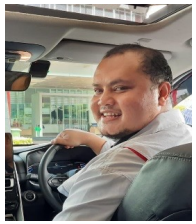
Countermeasure



Tools deteksi review stagger

Tim Partner SM Dpt : Pak Lucky R.

Sopian : Pak Lucky, saya ingin update data fillrate harian, file apa saja yang diperlukan ?
Lucky : TB_R_Sum_Shipping_Cost



Develop tools untuk mendeteksi timing evaluasi fillrate

SD DELIVERY FILL RATE MONITORING (IN CITY) - JULY 2023

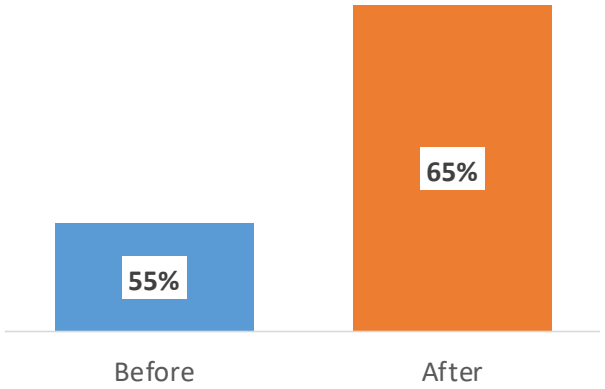
Area		YTD	01 JAN	02 FEB	03 MAR	04 APR	05 MAY	06 JUN	07 JUL	08 AUG	09 SEP	10 OCT	11 NOV	12 DEC	REMARKS
In City	Vol	3.705,4	489	427	359	401	581	573	528	-	-	-	-	-	
70,0%	Cap	5.806	828	777	642	690	882	888	750	-	-	-	-	-	
	Ratio	63,8%	59,1%	55,0%	56,0%	58,1%	65,9%	64,5%	70%	0%	0%	0%	0%	0%	
	Target	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	

Area		YTD	01 JAN	02 FEB	03 MAR	04 APR	05 MAY	06 JUN	07 JUL	08 AUG	09 SEP	10 OCT	11 NOV	12 DEC	REMARKS
BU1	Vol	6,8	2,4	4,3	-	-	-	-	-						
70,0%	Cap	81,0	42,0	39,0	-	-	-	-	-						
	Ratio	8%	6%	11%	0%	0%	0%	0%	0%						
	Target	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%						
DK1	Vol	389,7	52,2	51,3	46,8	62,7	57,0	61,1	58,6						
70,0%	Cap	966,0	144,0	114,0	132,0	144,0	144,0	156,0	132,0						EVAL.
	Ratio	40%	36%	45%	35%	44%	40%	39%	45%						
	Target	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%						
DK2	Vol	566,8	88,5	78,7	55,8	75,1	103,6	82,2	93,1						
70,0%	Cap	840,0	120,0	114,0	96,0	120,0	150,0	126,0	114,0						EVAL.
	Ratio	67%	74%	69%	58%	63%	69%	65%	67%						
	Target	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%						
DK3	Vol	609,9	85,7	78,2	62,2	81,5	109,6	104,7	87,9						
70,0%	Cap	840,0	120,0	114,0	102,0	126,0	138,0	132,0	108,0						
	Ratio	73%	71%	69%	61%	65%	79%	79%	78%						
	Target	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%						
DK4	Vol	468,5	74,9	48,6	36,4	49,3	75,2	74,5	109,6						
70,0%	Cap	960,0	138,0	126,0	96,0	102,0	150,0	156,0	192,0						EVAL.
	Ratio	49%	54%	39%	38%	48%	50%	48%	57%						
	Target	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%						
DK5	Vol	974,5	127,6	118,2	127,5	86,3	168,8	177,7	168,4						
70,0%	Cap	1.074,0	144,0	150,0	132,0	114,0	174,0	186,0	174,0						
	Ratio	91%	89%	79%	97%	76%	97%	96%	97%						
	Target	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%	70,0%						
DK6	Vol	342,9	57,7	48,0	30,7	46,4	66,8	72,8	20,6						
70,0%	Cap	636,0	120,0	120,0	84,0	84,0	126,0	132,0	30,0						EVAL.
	Ratio	49%	48%	40%	37%	55%	53%	55%	69%						

HASIL

1. Tools bisa dirunning kapan saja
2. Tersedia data fillrate di setiap bulannya
3. Tersedia daily fillrate di bulan berjalan
4. Tersedia indicator kapan harus dievaluasi

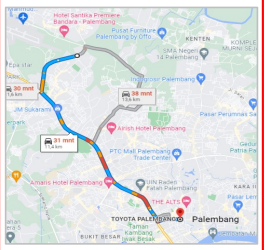
Fillrate Achivement



6. PENANGGULANGAN

PROBLEM 2

Problem



LT Review Stagger Manual lama & sulit

Task Force

- Sopian-TAM Leader (UR, Conceptor)
  - Cyntia - TAM Technical Expert
  - I.M. Putra - SELOG Depo Inspector

Sopian : Bu Cyntia, saya mau develop automatic tools unt uk evaluasi diagram delivery, rekom dari Ibu apa ya..?
Cyntia : VRP phyto n, via konsultan, da n worksheet Pak

Cost : 1. >Rp. 500.000 2. Rp.100.000 – Rp. 500.000 3. < Rp. 100.000
Implementasi : 1. Sulit Impl.., 2. Bisa diimplement. 3. Mudah diimpl.
L/T : 1. > 2 jbulan 2. 1-2 bulan 3. < 1 Bulan

AL T.	IDE	Cost	Implementasi	L/T	TOTAL	EVAL.
1	Autostagger via phyton	2	1	1	4	X
2	Autostagger via konsultan	1	2	1	4	X
3	Autostagger via VRP Worksheet	3	3	3	9	O

Countermeasure

Develop automatic tools

Input data

1.Locations	Number of customers	25	[1:200]
	Pickup / Delivery?	Delivery	
2.Distances	Distance / duration computation	Bing Maps	The distance unit is km for 'Geodesic Approximation' and 'Bing Maps'
	Bing Maps route type	Fastest	Recommendation: use Fastest
	Average vehicle speed	70	Not used for the 'Bing Maps' option
3.Vehicles	Number of vehicle types	1	Heterogeneous VRP if greater than 1
4.Solution	All vehicles must be used?	No	Flexible fleet / Fleet mix if 'No'
	Vehicles must return to the depot	Yes	Open VRP if no return
	Time window type	Hard	
	Work start time	08:00	[00:00,23:59]
	Driving time limit	8:00	
	Working time limit	10:00	
	Distance limit	500	Positive
5.Optional - Visualization	Visualization background	Bing Maps	
	Location IDs	Location IDs	
6.Solver	Warm start?	Yes	
	CPU time limit (seconds)	60	Recommendation: At least 60 seconds.
	LNS minimum removal rate	10%	[5%, 30%]
	LNS maximum removal rate	40%	[5%, 50%]
	LNS candidate list size	2	[1, 5]
	Random number seed	12345789	[1,2147483647]

Hitung jarak : otomatis dan cepat

From	To	Distance	Duration
Depot	PT ASTRIDO JAYA MOBILINDO	23,81	0:48
Depot	BALI MOTOR	26,61	0:54
Depot	UD.WISMA MOTOR	28,96	0:59
Depot	EKA JAYA MOTOR	27,37	0:56
Depot	KIAN JAYA	27,37	0:56
Depot	KING MOTOR	29,87	0:56
Depot	MADE SUARDANA	25,96	0:53
Depot	JAYA RAYA MOTOR	25,83	0:48
Depot	HADI	28,63	0:54
Depot	CV. JAYA MOTOR PARTS	26,66	0:49
Depot	RAYA PRIMA MOTOR	26,23	0:48
MAJU JAYA MOTOR	Depot	29,80	0:57
MAJU JAYA MOTOR	MAJU JAYA MOTOR	0,00	0:00
MAJU JAYA MOTOR	PT PARAMITHA AUTO GRAHA	8,18	0:19
MAJU JAYA MOTOR	PT. PERMATA AUTO GALLERY	8,18	0:19
MAJU JAYA MOTOR	CV. PARAMITHA AUTO GRAHA	8,03	0:20
MAJU JAYA MOTOR	SUKARTA I NYOMAN	9,02	0:22
MAJU JAYA MOTOR	LAI KIAT	6,41	0:14
MAJU JAYA MOTOR	TOKO PUSAKA JAYA	6,63	0:16
MAJU JAYA MOTOR	MARGA SAKTI	7,85	0:18
MAJU JAYA MOTOR	AUTO 88	5,32	0:13
MAJU JAYA MOTOR	MUJI MOTOR	5,69	0:13
MAJU JAYA MOTOR	GDE KOMANG SUGIHARTA	8,36	0:18
MAJU JAYA MOTOR	ADI JAYA MOTOR	7,13	0:15
MAJU JAYA MOTOR	BINK MOTOR	4,08	0:09
MAJU JAYA MOTOR	PT. SUKSES BERSAMA MOTOR	7,54	0:17

Hasil running VRP, route terpendek

Stop c	Location name	Distance	Delivered	Driving time	Arrival	Departure	Working time
0	Depot	0,00	0	0:00	08:00	08:00	0:00
1	PT ASTRIDO JA	23,81	0,2509322	0:48	08:48	08:48	0:48
2	PT. SUKSES BER	23,81	0,9326231	0:48	08:48	08:48	0:48
3	ADI JAYA MOTO	25,06	1,0973361	0:51	08:51	08:51	0:51
4	CV. JAYA MOTO	26,71	1,1375159	1:00	09:00	09:00	1:00
5	TOKO PUSAKA J	29,97	1,7065726	1:04	09:04	09:04	1:04
6	LAI KIAT	30,19	2,0676781	1:05	09:05	09:05	1:05
7	PT PARAMITHA	31,95	2,1819758	1:09	09:09	09:09	1:09
8	PT. PERMATA A	31,95	2,3898584	1:09	09:09	09:09	1:09
9	SUKARTA I NYO	34,13	2,4121626	1:14	09:14	09:14	1:14
10	AUTO 88	38,65	2,6121272	1:27	09:27	09:27	1:27
11	MUJI MOTOR	39,16	3,0026457	1:29	09:29	09:29	1:29
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

Stop co	Location name	Distance	Delivered	Driving time	Arrival	Departure	Working time
0	Depot	0,00	0	0:00	08:00	08:00	0:00
1	CV. PARAMITH	23,77	0,1335561	0:49	08:49	08:49	0:49
2	MADE SUARDA	27,76	0,3059674	0:59	08:59	08:59	0:59
3	BALI MOTOR	28,41	0,45451	1:00	09:00	09:00	1:00
4	UD.WISMA MO	32,37	0,4583197	1:08	09:08	09:08	1:08
5	EKA JAYA MOTO	38,28	0,4584946	1:20	09:20	09:20	1:20
6	KIAN JAYA	38,28	0,4948564	1:20	09:20	09:20	1:20
7	KING MOTOR	42,70	0,5210712	1:33	09:33	09:33	1:33
8	MAJU JAYA MO	42,70	0,6988731	1:33	09:33	09:33	1:33
9	HADI	45,72	0,9704857	1:39	09:39	09:39	1:39
10	BINK MOTOR	46,88	2,7011161	1:42	09:42	09:42	1:42
11	RAYA PRIMA M	47,74	2,8735865	1:44	09:44	09:44	1:44
12	JAYA RAYA MO	48,02	2,9897932	1:45	09:45	09:45	1:45
13	MARGA SAKTI	50,68	2,9912787	1:52	09:52	09:52	1:52
14	GDE KOMANG S	52,56	3,0035803	1:56	09:56	09:56	1:56
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

HASIL

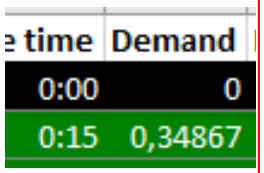
time	Demand
0:00	0
0:15	0,34867

Tools kurang praktis, masih ada proses manual input volume

6. PENANGGULANGAN - PDCA

PROBLEM 2

Problem

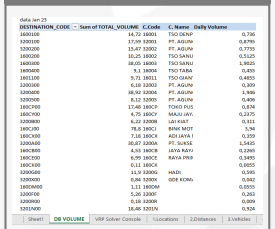


Proses tidak praktis, input manual volume

Proses tidak praktis

Data volume diinput satu persatu → File volume terpisah dengan file VRP → **ROOTCAUSE 1**: Tidak ada query yang bisa langsung refresh volume data di VRP worksheet

Countermeasure

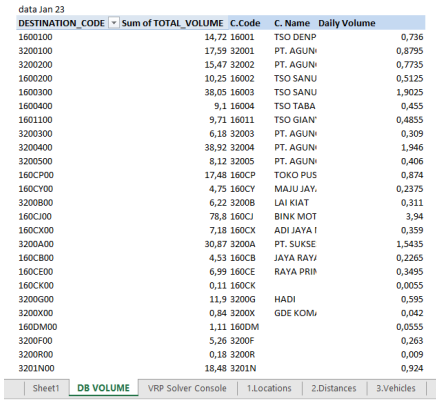


Insert query volume di VRP worksheet

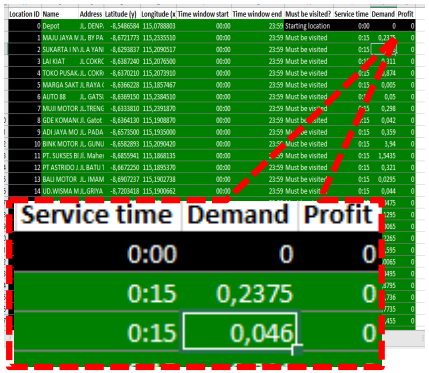
Planning

Insert query volume di file VRP Worksheet

Penanggulangan



Query volume sudah masuk ke dalam VRP worksheet

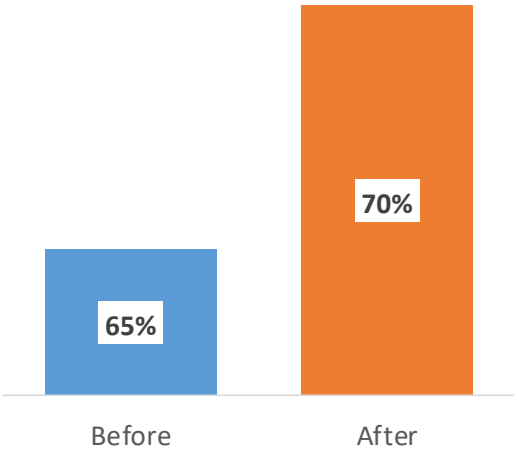


Data Volume / Demand terisi otomatis

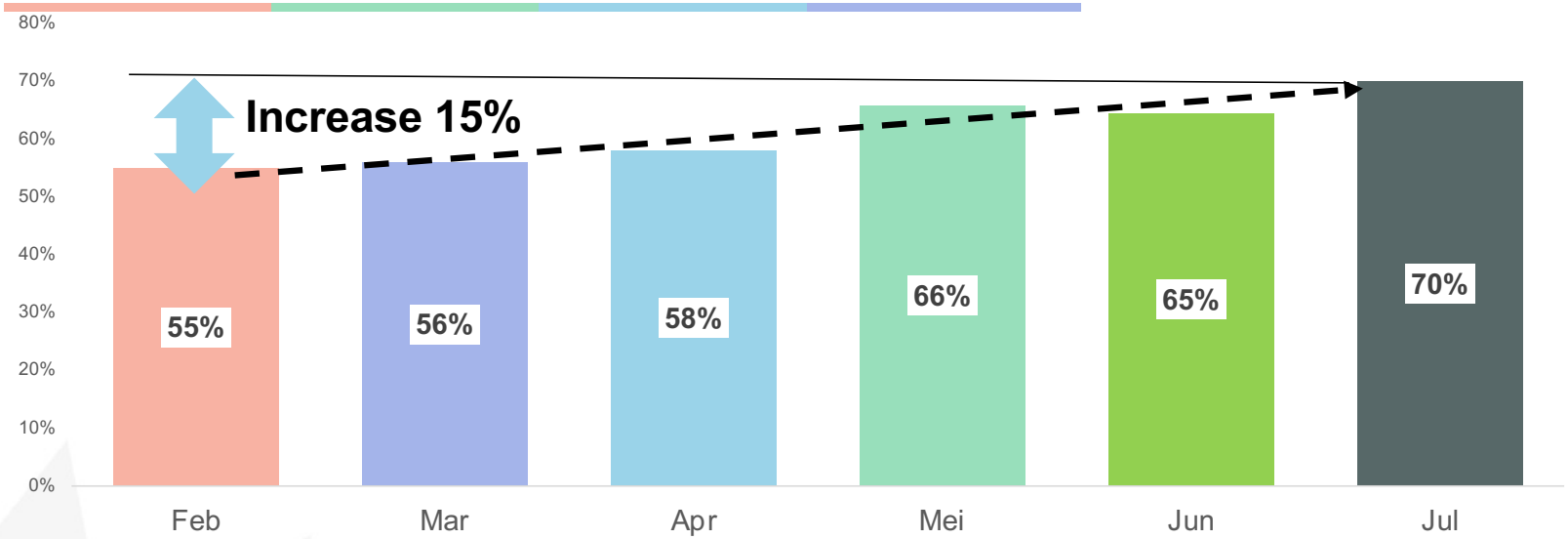
LT running aplikasi = 30 menit

HASIL

Fillrate Achivement



7. EVALUASI HASIL

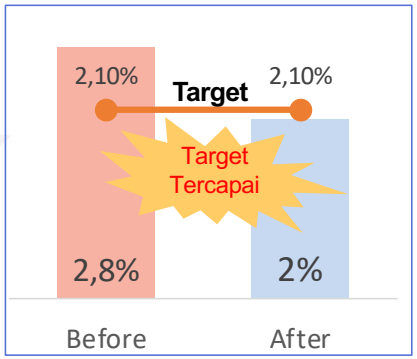


Pada bulan Juli 2023, fillrate 70%

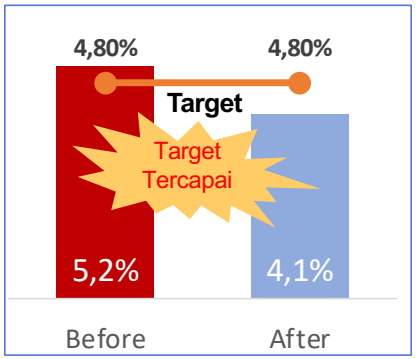
Impact

A. Truk Reduction

B. Incity Ratio



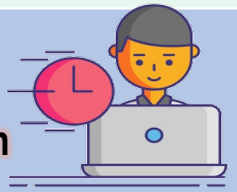
C. TBN Cost Ratio



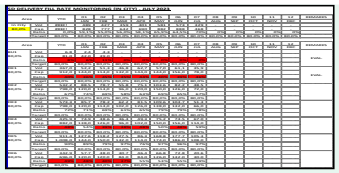
D. Fillrate

Before 55% **After 70%**

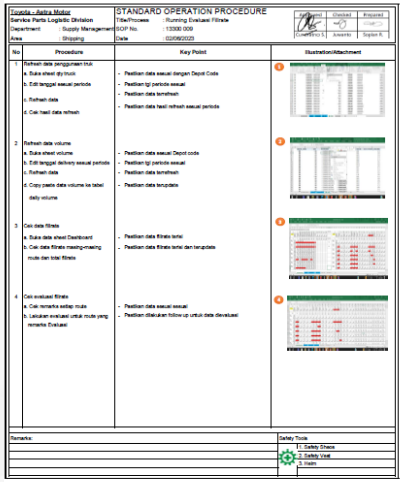
7. EVALUASI HASIL (BENEFIT)

Aspek	Before	After	Benefit
Cost	Cost Delivery Regular Incity 7 truk : 7 X Rp. 681.200 X 22 = Rp. 104.904.800	Cost Delivery Regular Incity 5 truk : 5 X Rp. 681.200 X 22 = Rp. 74.932.000	Saving Cost : Rp. 29.972.800 / Bulan **Rp. 359.673.600 / Tahun** Setara All New Yaris HEV  Harga Yaris Cross HEV : 350 juta
Man Hour	Lead Time proses evaluasi stagger fillrate : 5 Hari	Lead Time proses evaluasi stagger fillrate : 0,5 Jam	Reduce Man Hour : = 4,94 Hari / tahun **= 39,5 jam / tahun** 
Enviro.	Emisi CO2 yang dihasilkan dari proses pengiriman Regular dalam kota : 2,31 Ton / Bulan	Emisi CO2 yang dihasilkan dari proses pengiriman Regular dalam kota : 1,65 Ton / Bulan	Reduksi CO2 : **0,66 Ton / Bulan** 

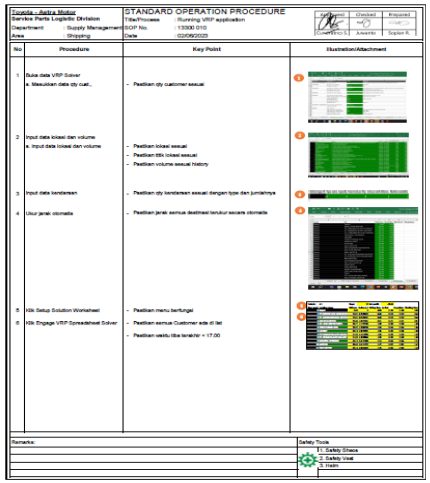
8. STANDARISASI

No.	Item	Key Point	Ilustrasi	Prevention
1	**Running Tools Fillrate Monitoring**	Pastikan tools bisa running setiap hari, sehingga bisa dilakukan review sesuai dengan trend nya		Kirim data fillare monitoring ke TAM SPLD setiap hari nya
2	**Running VRP tools**	Pastikan VRP dirunning saat ada triger dari fillrate monitoring		Stagger manual jika aplikasi tidak berfungsi

SOP Tools Evaluasi Fillrate



SOP VRP running

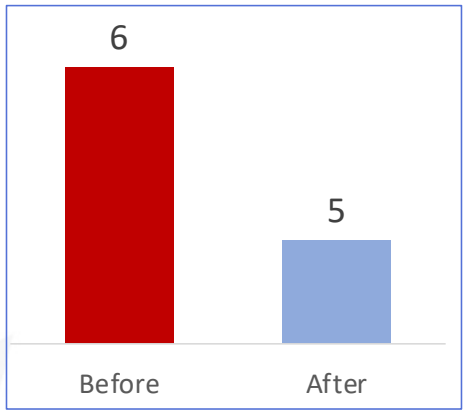


9. YOKOTEN

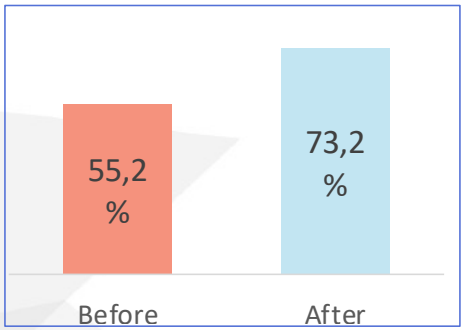
Dengan cara yang sama, diyokotenkan ke Depo Palembang dan Depo Bandung

DEPO PALEMBANG

Qty Truk Harian

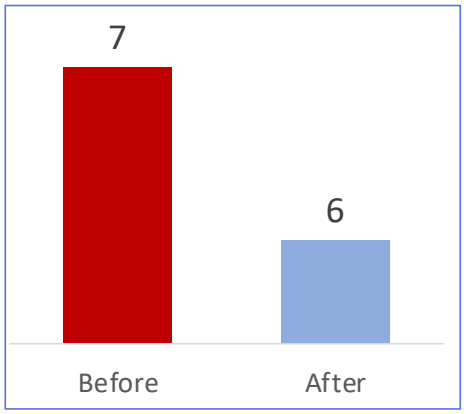


Fillrate

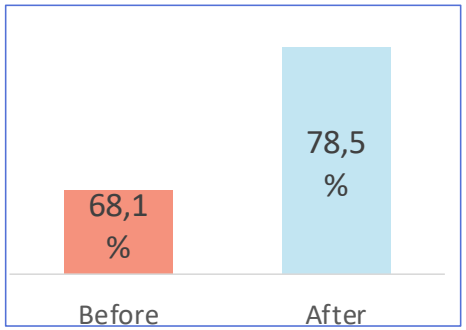


DEPO BANDUNG

Qty Truk Harian



Fillrate




Thank
you