

ZODIAC Redefining TOS as Digitalization Solutions for Ports and Terminals

TECHNOLOGY & ROADMAP

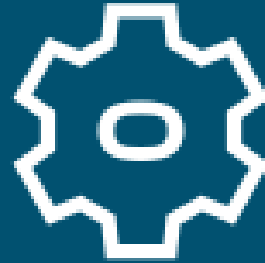
Paul Kim – Senior Manager -Professional Services
Zodiac FZE

APRIL 22, 2021

WHY ZODIAC?



SMART



Automation



Machine Learning



SMART

Make TOS intelligent to minimize human intervention.
Forecasting future work demands for CHE and orchestrate all CHE in the most efficient manner.

Provide standard integration API to integrate all surrounding systems required for terminal operation such as port community, Finance/Billing, Gate, weight bridge, RTLS, OCR, IoT, Engineering, Rostering, Crane automation, EDI, CFS system.

Zodiac Key Functions vs. Productivity Improvement Matrix

#	New Features	RTG Productivity	ITV Productivity	QC productivity	Saving on Manpower
1	SMART Yard Crane Scheduling	✓	✓		✓
2	Yard Strategy-Auto Yard Planning (No need of yard boundary setting)	✓	✓	✓	✓
3	SMART stowing for Laden Boxes	✓	✓	✓	✓
4	SMART workload distribution for RTG	✓	✓	✓	✓
5	SMART Job Queue Activation				✓
6	SMART CHE Range	✓			✓
7	ITV scheduler against Zone – Ripple Concept	✓	✓	✓	✓
8	Alert Center (Exception Dashboard)	✓	✓	✓	✓
9	Forecast CHE allocations to meet the demand (Increase or Decrease)	✓			✓
10	Generic empty loading & deliver rules	✓	✓	✓	✓
11	VMT Count Down	✓	✓	✓	

Zodiac Key Functions Explanation

#	Description
1	SMART Yard Crane Scheduling >> RTG will be deployed dynamically based on the workload – <u>Manually need to schedule and deploy the machines</u>
2	Yard Strategy – SMART Yard Planning (No Boundary Setting) >> Yard Strategy team to create only the rule no need to define the yard range. System automatically define the yard range based against outbound carrier berth – <u>Yard Planner to create yard boundary for the defined rules</u>
3	SMART Stowing for Laden Boxes >> System will create pre-plan based on MOVINS and load the container dynamically (Overcome out-of-sequence)
4	SMART Work Load Distribution for RTG >> Based real-time of machine / ITV location system automatically distribute the jobs – <u>Work load distribution will happen on the defined range only</u>
5	SMART Job Queue Activation >> The job queue will be activated automatically based on finishing of previous job (Finish to Start)
6	SMART CHE Range >> Equipment Controller no need to set the range. System automatically define the range

Zodiac Key Functions Explanation

#	Description
7	ITV scheduler against Zone - Ripple Concept >> ITV will get nearest job and will reduce un-laden distance – <u>Based on move-time NOT on ITV travel distance</u>
8	Alert Center (Exception Dashboard) >> Exception Alert Center – Manage operation by exception
9	Forecast CHE allocations for Resource Demand >> Machine Resource forecasting to increase or decrease the machine (<u>Manually calculate</u>)
10	Generic empty loading & delivery rules >> No need to create to MT Load List. System dynamically create load list based on age, easy access
11	VMT Count Down >> Monitoring Transaction Processing based on gantry speed, target position, machine cycle time.



Automation

Support terminal automation in the area of Quay Crane, Yard Crane, Gate operation as of today (Semi – Automation)

Plan to support Autonomous Guided Vehicle

01

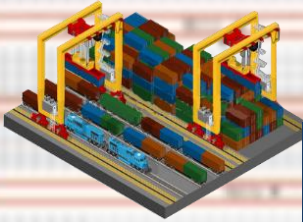
Quay Crane Automation



- Integrated with RTLS, OCR system
- Support single, twin, tandem lift
- Robust swapping algorithm which allows 100% ramble discharge and out of sequence load operations.

02

Yard Crane Automation



- Smart job promotion based on block entrance
- Automatic job scheduling based on heuristic algorithm
- Support for equipment movements like move and park orders

03

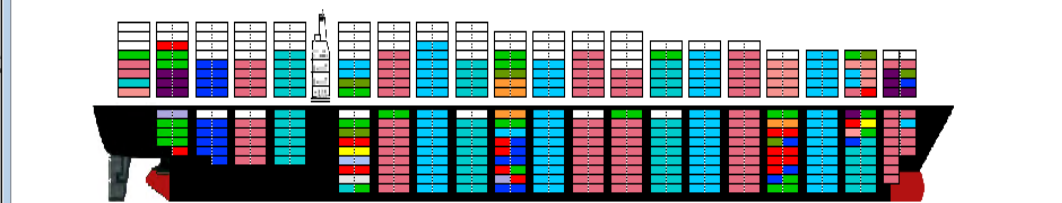
Gate Automation



- ML: Continuous self-learning, self improving
- Software driven with minimum H/W dependency
- Strong potential to future improvement (Facial recognition for safety, Automatic damage detection, Unregulated License Plate)

Remaining DS: 519 / Remaining RSDS: 27 / Remaining CC: 0
 Remaining LD: 911 / Remaining RSLD: 149
 Dock Dir: STARBOARD
 Remaining TTL = 1606
 Crane Intensity: 6.15/3.35

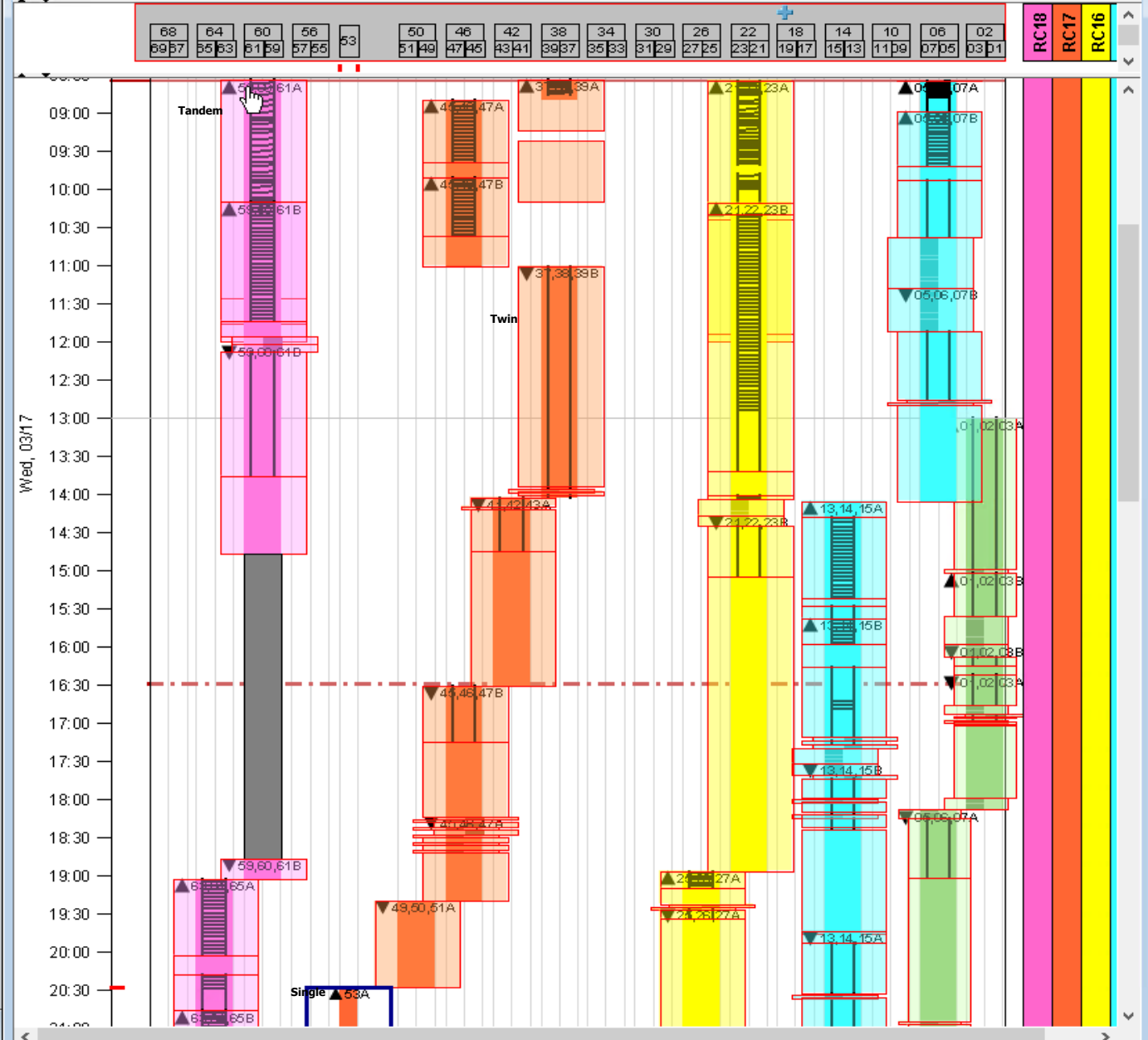
Discharge	8	10	2	25	7	4	8	15	30	Total	109					
Loading	14	76	8	28	16	28	11	9	37	14	17	13	9	10	28	318
Preplan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	00



Discharge	11	11	20	1	19	51	3	116		
Loading	35	26	14	13	60	3	31	17	15	214
Preplan	0	0	0	0	0	0	0	0	0	00

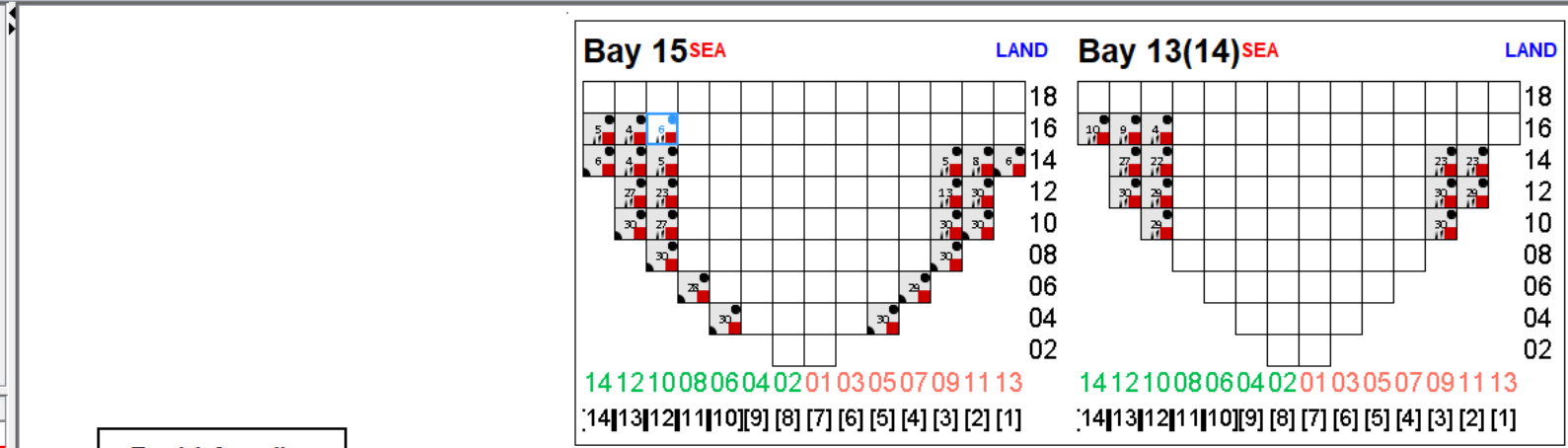
Tandem	10	14	36	6	14	6	57	20	163									
Quad								16	16									
Twin	2222	1111	1818	5656	7878	4242	6.6	6363	5151	1.1	696							
Discharge	11	8	21	2	45	7	1	4	19	8	65	33	224					
Loading	14	111	8	54	16	41	13	11	9	44	40	14	24	13	19	10	43	484
Restow																		49
Shifting																		127
Totals	14	122	16	75	18	42	58	11	16	60	41	18	67	21	92	43	43	757
Sum	14	173	16	101	18	79	177	11	20	218	43	24	157	36	259	194	66	1606

Visit ID: 862863 ETB: 21-03-17 02:45 ETD: 21-03-17 16:29 Port Hour: 13:44 BMPH: 241.6 Opt CI: 4.91 Actual Planned CI: 4.22
 Visit Name: CMA CGM MEKONG Docking Direction: STARBOARD Remaining Moves: 3128 DS:888 LD:2228 Restow:12 Shifting:0
 Average GMPH: -0.7 Port Stay Behind: 14:44 Lift Ratio %: Single(63.85) Twin(23.55) Tandem(12.61) Dual(0)



Below Deck Twin DS

14	14	16	39	16	38
13	12	16	37	16	36
12	10	16 2007700	35	16 1706283	34
11	08	67			
10	06	69			
09	04				
08	02				
07	01				
06	03				
05	05	68			
04	07	66			
03	09	14	43	14	42
02	11	14	41	14	40
01	13	60			



Crane Schedule

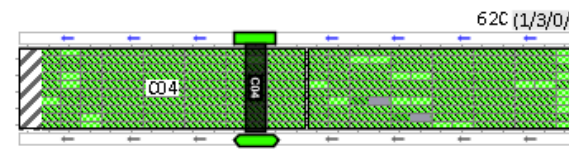
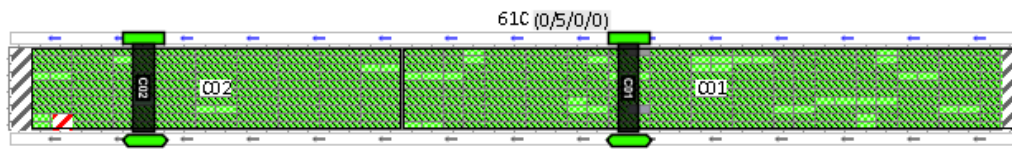
Qty	Lift
36	23
9	9
69	49
54	34
48	45
35	20
22	20

Truck Information

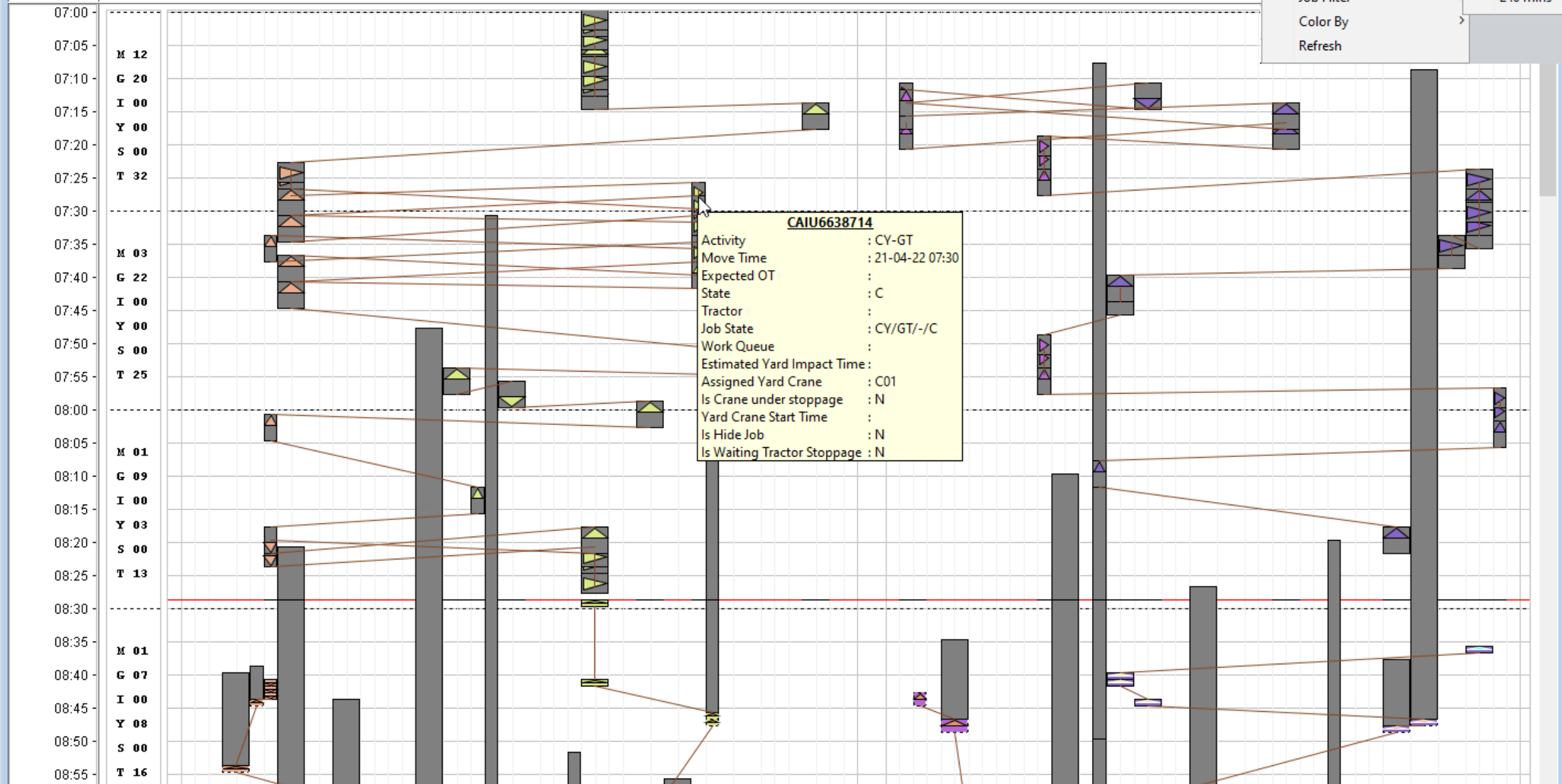
T1136 ON CRANE | 2 |

Job List

Seq	Dev	Move	TM	Cntr No.	Cntr R...	!!!	SS	ISO...	MType	CHE Carry	Job Step	QC Job Sta	Reject Rea...	Vsl ...	Req Pos	Reply P...	Lock Pos
34		TH1214		OOLU1706283			TS	22G1	DSCH	T1126	DS-Wait Qu...	Active		INTR...	131016		
35		TH1214		KOCU2007700			IM	22G1	DSCH	T1126	DS-Wait Qu...	Active		INTR...	151016		
36		+TH1216		TEMU0737647			IM	22G1	DSCH	T1191	DS-Wait Qu...	Active		INTR...	131216		
37		+TH1216		HLBU2301986			IM	22G1	DSCH	T1191	DS-Wait Qu...	Active		INTR...	151216		
38		+TH1217		TGHU1295881			TS	22G1	DSCH			Active		PLA...	131416		
39		+TH1217		YMMU11255...			IM	22G1	DSCH			Active		PLA...	151416		
40		+TH1218		FCIU5839327			TS	22G1	DSCH			Active		PLA...	131114		
41		+TH1218		DRYU2247923			IM	22G1	DSCH			Active		PLA...	151114		
42		+TH1220		FCIU4765132			TS	22G1	DSCH			Active		PLA...	130914		
43		+TH1220		TLLU2587892			TS	22G1	DSCH			Active		PLA...	150914		
44		+TH1221		OOLU1713066			TS	22G1	DSCH			Active		PLA...	131014		
45		+TH1221		TRHU1579576			IM	22G1	DSCH			Active		PLA...	151014		
46		+TH1222		OOLU1367976			TS	22G1	DSCH			Active		PLA...	131214		
47		+TH1222		UACU4161572			IM	22G1	DSCH			Active		PLA...	151214		
48		+TH1224		OOLU1881861			TS	22G1	DSCH			Active		PLA...	131112		
49		+TH1224		BSIU2533834			IM	22G1	DSCH			Active		PLA...	151112		
50		+TH1225		HDMU26381...			IM	22G1	DSCH			Active		PLA...	130912		
51		+TH1225		TRHU2093505			IM	22G1	DSCH			Active		PLA...	150912		
52		+TH1226		TCKU2724217			TS	22G0	DSCH			Active		PLA...	131012		



- Show Activity Monitoring
- Show CHE YCS Range 60 mins
- Show Completed Job 120 mins
- Mode 180 mins
- Job Filter 240 mins
- Color By
- Refresh



CAIU6638714

- Activity : CY-GT
- Move Time : 21-04-22 07:30
- Expected OT :
- State : C
- Tractor :
- Job State : CY/GT/-/C
- Work Queue :
- Estimated Yard Impact Time :
- Assigned Yard Crane : C01
- Is Crane under stoppage : N
- Yard Crane Start Time :
- Is Hide Job : N
- Is Waiting Tractor Stoppage : N

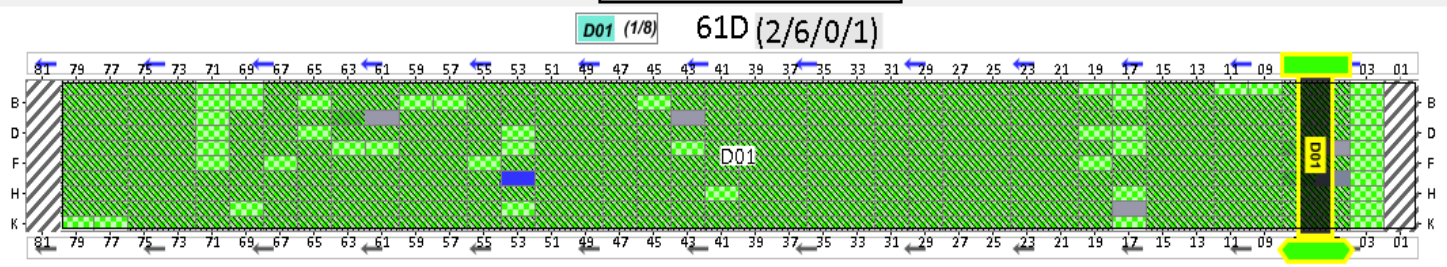
Equipment Information

CHE Icon	Dev Status Code	CHE Na...	Dev Move State	Dev Move Type	Dev Req	Cur Pos
	AUTOMATIC	D01	DRIVING TO PICK...	GT	blockShuffle	61D06

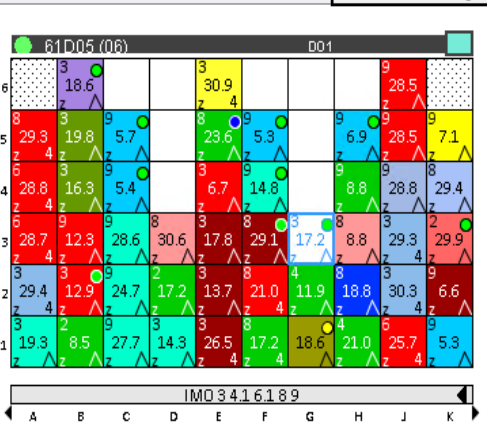
RCO Functions

- Arrive
- Deactivate Job
- Approach Lane
- Update Position On Chassis - ITV
- Open Position On Chassis Dialog - OTR
- ARMG - Abort Job
- ARMG - Send Clearance
- ARMG - Bypass
- ARMG - Resume
- ARMG - Fix Order
- Lift On
- Lift Off
- Swap Tractor
- Change Tractor
- Change to Dummy Truck
- Mark For Fetch Ctrl+Shift+M
- Mark For Priority
- Clear Mark Ctrl+Shift+D
- Cancel Work Order Assignment
- Reset Move Ctrl+W
- YCS Priority
- Validate Twin
- Yard Twin Up Alt+T
- Yard Detwin Alt+D
- Live Recap
- Copy Column
- Copy To Excel
- Export
- Print
- Edit Profile
- Save to Default Column Profile

Block View









Bay View
































Job List








CHE	ARMG Crane Job Sta	MType	Wait TM	Cntr No.	Wgt (MT)	CHE Carry	Planned Pos	Current Pos	Disp YCS Cr	Pos on Chs	Wrk Ln	Reject Reason	IMDG Class	Temp (C)	Rfr Plug Status	ISO Code	SS	Activity	Target Arrival Mod
D01	Processing	SHFL		ONEU0024225	17.2		61D06D.4	61D06G.3	D01				3			45G1	TS	MRE-GT	V
D01	Active	LOAD	19	UACU5950960	18.6	T1150	863544.180184	61D06G.1	D01	C	WS					45G1	TS	MRE-PU	V
D01	Active	DLVR	53	HLBU2131149	14.9	DXBQ83493	TIP	61D62C.4	D01		LS					45G1	IM	CY-PU	V
D01	Active	LOAD	6	TCLU2049570	21.2	T1183	863544.050986	61D53G.3	D01	F	WS					22G1	EX	MRE-PU	V
D01	Active	YARD	1	FCIU3286156	24.4	T1649	61D43A.4	T1649	D01	A	WS					22G1	EX	SHF-GR	V
D01	Active	DLVR	11	HAMU1132665	26.4	DXB96526	TIP	61D43C.3	D01		LS					22G1	TS	CY-PU	V
D01	Active	DLVR	11	HAMU1122517	26.4	DXB96526	TIP	61D43C.2	D01		LS					22G1	TS	CY-PU	V
D01	Active	DLVR	11	HLBU1746107	26.3	DXB96526	TIP	61D43C.1	D01		LS					22G1	TS	CY-PU	V
D01	Active	DLVR	5	FCIU4301255	2.0	DXB85945	TIP	61D17J.5	D01		LS					2200	ST	CY-PU	V
D01	Active	DLVR	14	BMOU6639639	23.6	AJMB70356	TIP	61D06E.5	D01		LS		8			45G1	IM	CY-PU	V

QUAY1 Vessels : 4 QCs : 9  4	65 - BELGIAN EXPRESS 863192 ETC :05:39 (-1:20) QC :2 25.50 28.06 3/16	RC19 562 ↓ 370 ↑ 192 26 15/33	RC18 589 ↓ 232 ↑ 357 25 49/97	64 - ONE MAGNIFICEN E 863544 ETC :10:14 (+14:46) QC :4 25.50 23.77 113/87/137/178	RC17 8 ↓ 0 ↑ 8 20 0/0	RC16 45 ↓ 1 ↑ 44 27 6/10	RC15 16 ↓ 0 ↑ 16 21 0/0	RC14 6 ↓ 0 ↑ 6 34 0/0	61 - DUBAI FORTUNE 864652 ETC :10:03 (-4:56) QC :1 13.00 21.20 9	RC04 34 ↓ 0 ↑ 34 13 5/13	61 - IRENES RYTHM 864550 ETC :12:36 (-10:23) QC :2 38.00 28.09 12/31/53	RC02 102 ↓ 48 ↑ 54 56 16/45	RC01 137 ↓ 133 ↑ 4 20 0/0
	1742 ↓ 838 ↑ 904 ⚠ 2	75 ↓ 1 ↑ 74 ⚠ 4	34 ↓ 0 ↑ 34 ⚠ 1	239 ↓ 181 ↑ 58 ⚠ 1									
													

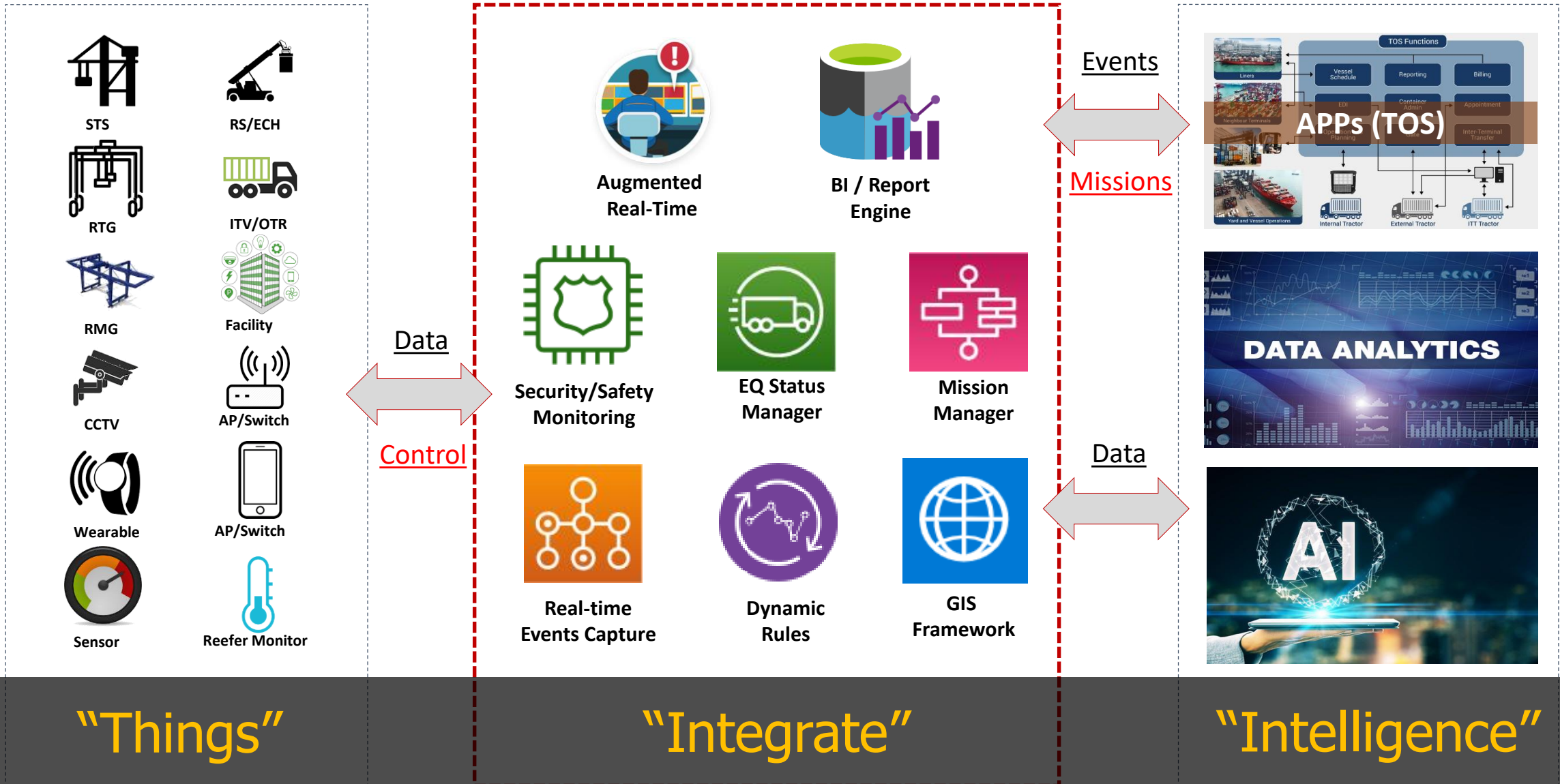
RTG - RMG RTG : 0 (0) Idle : 0 RMG : 0 (0) Idle : 0  0
--

RS - ECH RS : 1 (1) Idle : 0 ECH : 7 (9) Idle : 0  0
--

YARD NAP:2 57/46/51/ RF: 1 31/13 Rq. RTG(ECH):-35(-27)  21	61A 0/0/0/0/0 CHE : 0 MPH : 13.0  -  1  -	61B 0/2/0/2/0 CHE : 0 MPH : 16.0  -  1  -	61C 0/0/2/1/0 CHE : 0 MPH : 21.0  -  1  -	62B 0/1/0/1/2 CHE : 0 MPH : 23.0  -  1  -	62C 0/0/1/0/1 CHE : 0 MPH : 15.0  -  1  -	62D 0/1/0/0/0 CHE : 0 MPH : 32.0  -  1  -	62E 1/1/1/0/1 CHE : 0 MPH : 22.0  -  1  -	63A 0/2/0/0/0 CHE : 0 MPH : 6.0  -  1  -	63D 0/1/0/1/0 CHE : 0 MPH : 41.0  -  1  -
--	--	--	--	--	--	--	--	---	--

ITV - ROAD ITV's : 87 Idle : 0 External : 62 (84) Delay(Ext): 0 (18)  2	ROAD <table border="1"> <tr> <td></td> <td>RECV</td> <td>DLVR</td> </tr> <tr> <td>MTY</td> <td>20</td> <td>19</td> </tr> <tr> <td>FULL</td> <td>13</td> <td>32</td> </tr> </table>  13  -  -		RECV	DLVR	MTY	20	19	FULL	13	32	ITV REQ ITV : 85 UTIL ITV : 101 MPH : 2.7  7  3  -
	RECV	DLVR									
MTY	20	19									
FULL	13	32									

TloT Platform: Foundational framework for sustainable digital journey



TloT Platform: Foundational framework for sustainable digital journey



**Productivity
Efficiency**

Dynamic operation Optimization Utilizing real-time location & events

- Seamless integration with OPS 7 for system driven dynamic operation control (YCS, Equipment Pooling, Job allocation)
- Minimize waiting time and increase equipment utilization ratio, with high level automation (Higher performance / less equipment)
- Proven to be effective with +10% of productivity increase in Jebel Ali, Yarimca, replicable to other terminals



**Digital, Data
driven**

Advanced Data analytics for insightful improvement strategy

- Enriched data set record detailed job execution details, equipment status, collected non-intrusive, digitized way.
- Real-time events configurable to operation, security, maintenance purpose, with high accuracy and minimum human input
- Foundation for advanced data analytics for Operation, Safety and maintenance



**Augmented
HMI**

Augmented, enhanced, integrated operation monitoring

- Holistic operation monitoring in single, intuitive and data enriched graphical interface
- Early detection of deviation, accidents enabling earliest response to problems.
- Abundant, intuitive alarms and warning in highly configurable manner.
- Operation, safety and device/equipment status in one window.

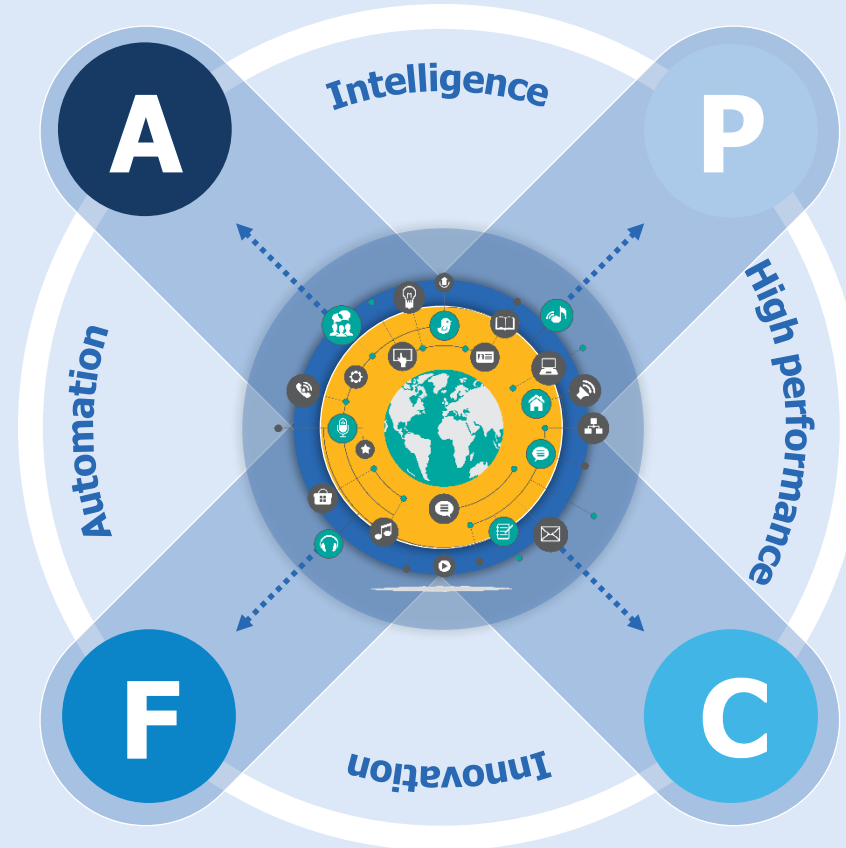
Key features of Zodiac Auto Gate System

Artificial Intelligence(AI)

- Continuous self-learning, self improving (target over 99%)
- Software driven with minimum H/W dependency
- Strong potential to future improvement (Facial recognition for safety, Automatic damage detection, Unregulated License Plate)

Flexible Design

- Support flexible gate operation process (Single gate, Double Gate layout)
- Reusing existing H/W.
- Mobility support (Mobile gate, Mobile slip)



Performance

- Accuracy increase as per size of data without any further S/W changes.
- Less maintenance, less human intervention
- Enabled with IOT concept (Real-time device monitoring, remote control, history & Statistics)

Cost-effectiveness

- Minimum H/W, less infra requirement
- Complete technological governance without any license cost.
- IP, Design are all owned by ZODIAC, product overhead cost is minimum.

Installation in PNC, Pusan Korea (Since August, 2020)



Gate Operating System (GOS) web application

In Gate

In-Lane01

In-Lane02

In-Lane03

Out Gate

Out-Lane04

Out-Lane05

ECO

ECO-01

Gate Status Summary 🕒 👤 ⚙

In-Gate (Working status 2/3)

Lane ID	O/C	OP Status	Kiosk Status	Dev Status	Action
In-Lane01	O	LPDetected	Welcome	11 devices	📄 ✖
In-Lane02	O	Idle	Welcome	11 devices	📄 ✖
In-Lane03	C	Idle	Welcome	11 devices	📄 ✖

Out-Gate (Working status 1/2)

Lane ID	O/C	OP Status	Kiosk Status	Dev Status	Action
Out-Lane04	O	Idle	Welcome	11 devices	📄 ✖
Out-Lane05	C	Idle	Welcome	11 devices	📄 ✖

ECO (Working status 1/1)

Lane ID	O/C	OP Status	Kiosk Status	Dev Status	Action
ECO-01	O	Idle	Welcome	0 devices	📄 ✖

Today Summary 📊

Current staats

In	1
Out	0
Remain	1

Lane Assign Information (2) ⚙

Lane ID	Operator	Start at
In-Lane01	thomas	2020-11-16 15:11:52
Out-Lane04	thomas	2020-11-16 15:11:52

Alarm Information (1) ⚙

Type	Level	Code	Lane ID	Description	Create At	User	Resolve
GS	E	AG500		could not execute statement; SQL [n/a]; constraint [null]; nested exception is org.hibernate.exception.ConstraintViolationException: could not execute statement	2020-11-16 15:14:36	SYSTEM	📄

Landing page / Lane assignment

Gate Operating System (GOS) web application

Auto Gate System - Google Chrome
 Not secure | 172.21.4.198:8089/laneDetail/In-Lane01?laneIndex=1

Stream View **InGate / In-Lane01 / thomas** debug view

Rear	Top	Left	Right	Truck				
License Plate number Truck No Busan98sa3752 Correction <input type="text"/>	Container Info Fore Container No TGHU69932734 Correction <input type="text"/> Mission ID <input type="text"/> Mission Type <input type="text"/> Tare <input type="text"/> Max <input type="text"/> Position Fore <input type="text"/> Door Fore <input type="text"/>	Seal Condition Seal type DPW Seal <input type="text"/> Seal No <input type="text"/> <input type="checkbox"/> strip yard requested <input type="button" value="Add"/> <input type="button" value="Delete"/> <input type="checkbox"/> Seal Type Seal NO There is no seal	IMDG label IMCO <input type="text"/> UMDG <input type="text"/> <input type="button" value="Add"/> <input type="button" value="Delete"/> <input type="checkbox"/> IMCO IMDG There is no hazard	Information Op status : LPDetected Kiosk status : Welcome Truck No : Busan98sa3752 Gate in at : 15:14:36 Visit No: <input type="text"/>				
Driver Information Driver ID <input type="text"/> Correction <input type="text"/>	Container Info Container No <input type="text"/> Correction <input type="text"/> Mission ID <input type="text"/> Mission Type <input type="text"/> Tare <input type="text"/> Max <input type="text"/> Position After <input type="text"/> Door After <input type="text"/>	Seal Condition Seal type DPW Seal <input type="text"/> Seal No <input type="text"/> <input type="checkbox"/> strip yard requested <input type="button" value="Add"/> <input type="button" value="Delete"/> <input type="checkbox"/> Seal Type Seal NO There is no seal	IMDG label IMCO <input type="text"/> UMDG <input type="text"/> <input type="button" value="Add"/> <input type="button" value="Delete"/> <input type="checkbox"/> IMCO IMDG There is no hazard	Exceptions <table border="1"> <thead> <tr> <th>Code</th> <th>Desc</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Code	Desc		
Code	Desc							
				<input type="button" value="Damage..."/> <input type="button" value="GO to ECO"/> <input type="button" value="Correct"/> <input type="button" value="Inspection Done"/>				
				<input type="button" value="Print"/> <input type="button" value="Share"/> <input type="button" value="Download"/>				

Remote OP Monitoring / Manual correction

Gate Operating System (GOS) web application

The screenshot displays the GOS web application interface. At the top, there is a navigation bar with tabs for Gate Monitoring, Lane Detail, Lane Status (selected), History, and Admin. The user is logged in as User1 (Supervisor). The main content area is titled "Lane Status" and "Gate Status monitoring (100 / 80 / 20)".

On the left, there is a "Lane Info" sidebar with sections for "In-gate" and "Out-gate". The "In-gate" section lists lanes In_Lane_1 through In_Lane_6, with In_Lane_2 highlighted in orange. The "Out-gate" section lists lanes Out_Lane_1 through Out_Lane_3, with Out_Lane_2 highlighted in orange.

The main area shows six lane panels (In_Lane_1 to In_Lane_6). Each panel displays a visual representation of the lane with a gate and a kiosk. Below each panel, there is a "Current status" section with fields for Gate Status, Kiosk status, Printer status, and Other device. The operator name is also displayed at the bottom of each panel.

A modal window titled "Lane Access Control" is open in the center, showing details for "In-Lane 6". The modal contains the following information:

- Lane: In-Lane 6
- Type: Ingate
- Status: Closed
- Operator: User 2

Buttons for "Open" and "Cancel" are visible at the bottom of the modal. Red dashed arrows point from the modal to the In_Lane_2 panel and the In_Lane_5 panel. A red circle with the number "1" is located on the In_Lane_6 panel.

Real-time monitoring / Remote control

Gate Operating System (GOS) web application

GOS

Gate Monitoring
Lane Detail
Lane Status
History
Admin
User1 (Supervisor)

Lane Info

- In-gate -

In_Lane_1

In_Lane_2

In_Lane_3

In_Lane_4

In_Lane_5

In_Lane_6

- Out-gate -

Out_Lane_1

Out_Lane_2

Out_Lane_3

History Viewer

History Type VISIT Info. From : Jun/25/2020 13:30 To : Jun/25/2020 13:30

OTR Number. ABC123 Search

Truck	Rear	Top	Left	Right

5	Gate	Lane	Visit No.	Driver ID	LP #	Container #1	Container #2	Mission Code	In-Time	Out-Time
1	In Gate	In_Lane_1	202006221234 5	123455	123A5678	MRKU060128	HLXU137984 2	PL	Jun/25/20 13:30	Jun/25/20 14:00
2	Out Gate	Out_Lane_1	202006221234 5	123455	123A5678	SZLU362356 3	SZLU2039160	RL	Jun/25/20 13:30	Jun/25/20 14:00
3	...	...	...	...	...	...	...	...	...	...
4										
5										
6										
7										
8										
9										

Transaction history



Machine Learning

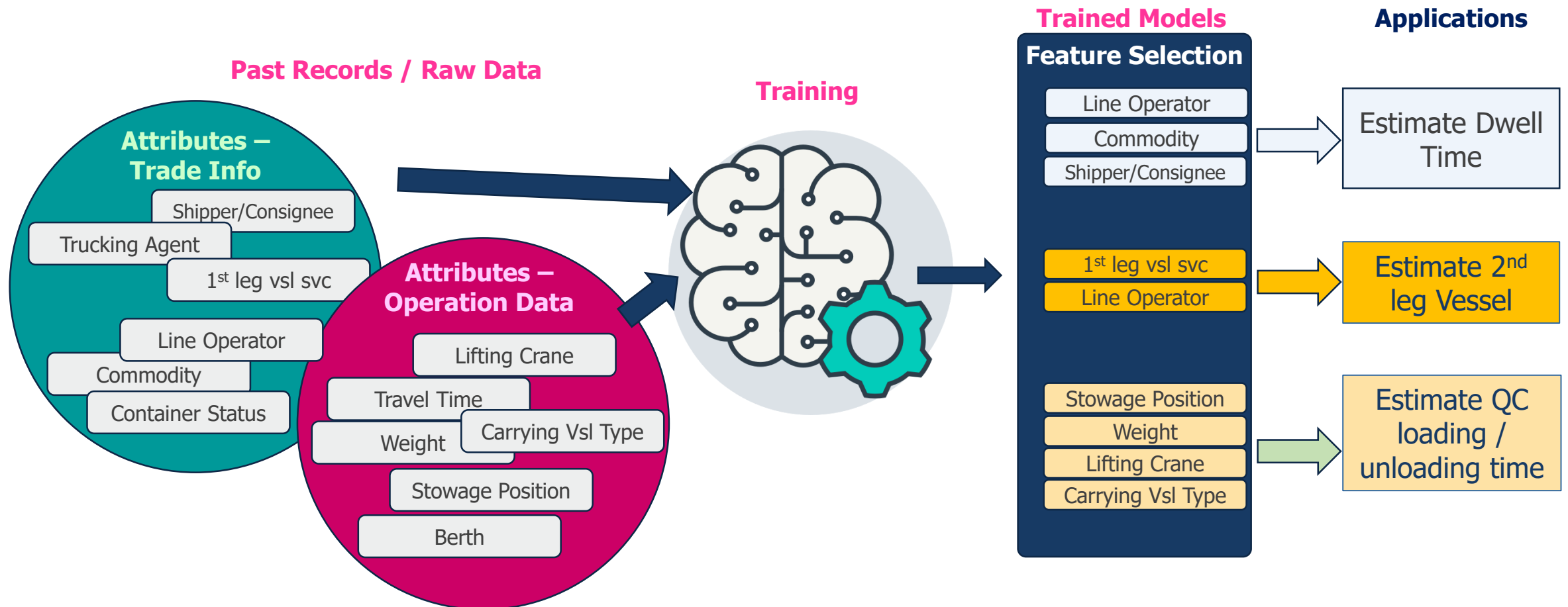
Make our TOS smarter by adapting artificial intelligence.

Develop a training model to forecast dwell time, 2nd leg of transshipment, QC loading/unloading time

Adapt Video Analytics and ML technology to improve accuracy and speed of OCR capability

Zodiac Machine Learning

- Zodiac Machine Learning module takes attributes from past operation data to “Train” up various data prediction models
- User can choose different attributes as selected “feature” to use in the model
- New data can be add to “re-train” the model



Video Analytics Server (VAS) Key Function

1. Container Number & ISO Code

Recognize the Container number based on Deep learning. (98% above and improving)

2. IMDG Label

The class of IMDG is automatically recognized.

3. Max, Tare weigh

Automatically recognize the Max and Tare weigh of the Container marked in the Rear of the Container.

4. LPR

The OTR number is automatically recognized based on deep learning. (98% above and improving)



5. Image stitching

Automatic generation of Container Full image based on video stream.

6. Seal presence

System automatically recognizes the seal presence using the real camera image. (Planned in 2021)

7. DC (Damage Container) detection

Based on the video entered from Camera, DC of Container is automatically recognized. (Planned in 2021)

8. Chassis position & Door direction

Automatic recognition of container location and door direction information.

9. Driver Facial Recognition

The camera installed in the kiosk recognizes the driver's face and automatically takes pictures and stores them. (Planned in 2021)



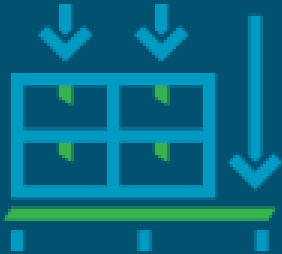
Truck detection and Start/End signal control

License plate detection & Recognition



Container / ISO code detection & Recognition

Image Stitching



General Cargo

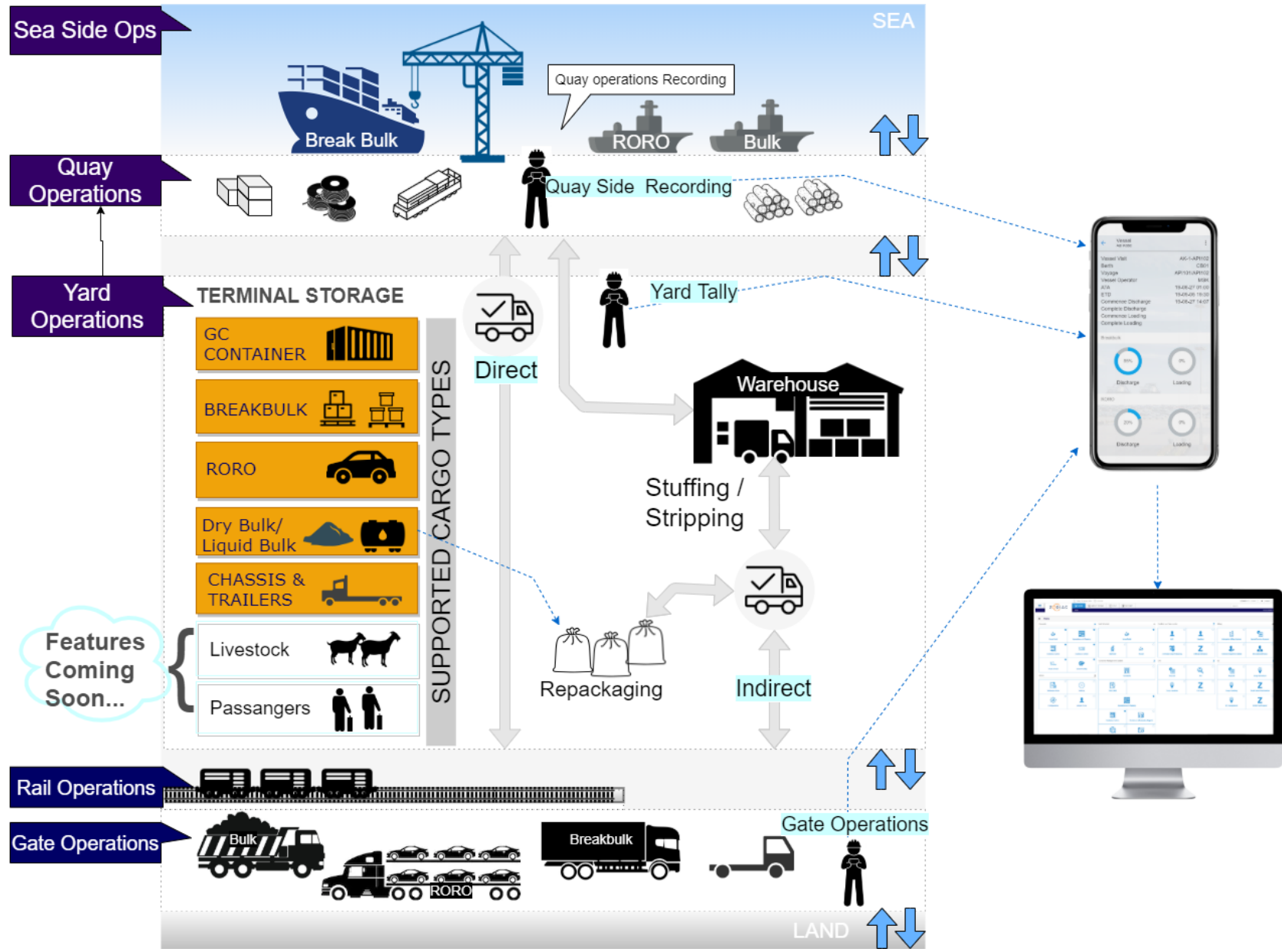
Fully support multi purpose terminals handling RORO, break bulk, liquid bulk, dry bulk, passenger, and container.

Support Container Freight Station operation

Zodiac General Cargo (GC)

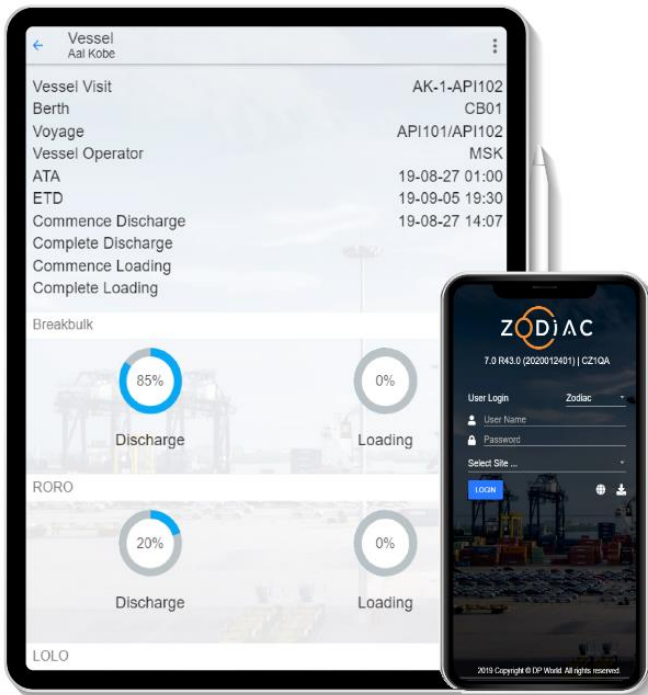
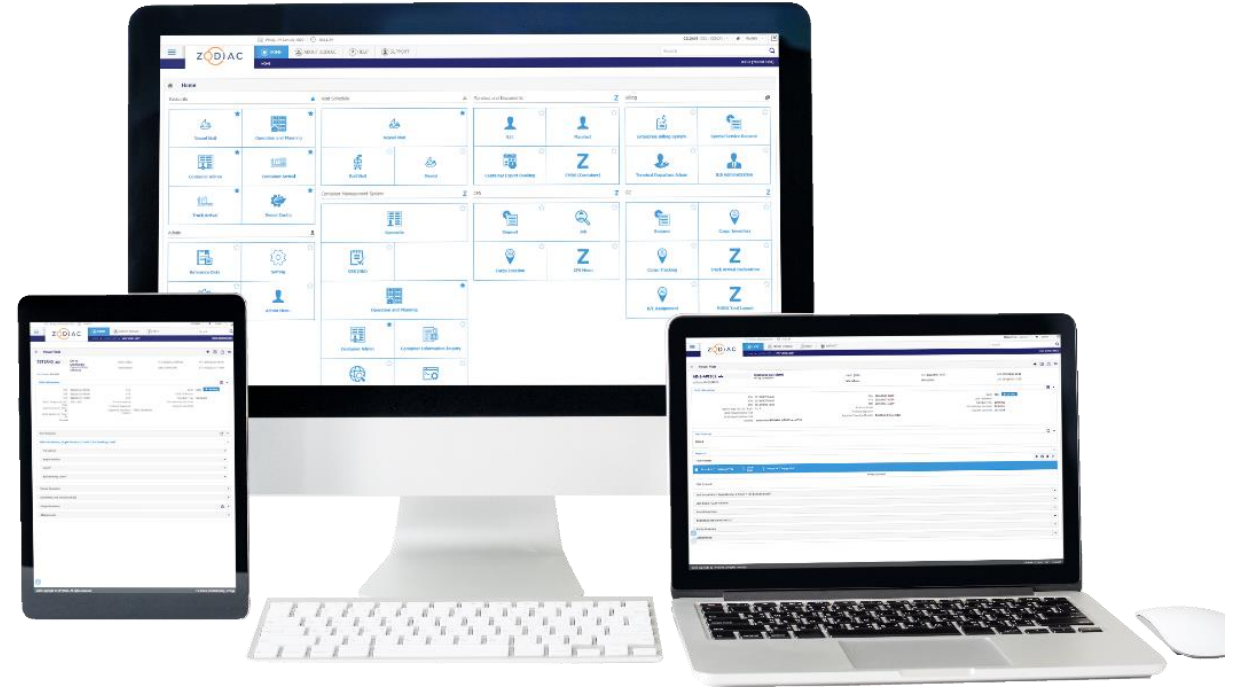
Caters to different types of cargo and container businesses

- GC Container
 - Break Bulk
 - Dry Bulk
 - Liquid Bulk
 - Ro-Ro
-
- Inland Terminal
 - Container Depot
 - Container Freight Station
 - Container Repair



Zodiac UI/UX

- ✔ **Responsive web design**
- ✔ **Slickly crafted interactive UI/UX**
- ✔ **Advance search features**
- ✔ **Permission based user access control**



- ✔ **Real-time operation recording via mobile devices**

CARGOES

TOS+

Thank you for
your attention