Revolutionizing Development:

Agmo's DevOps Journey- from Zero to Hero

ICT Strategic Management

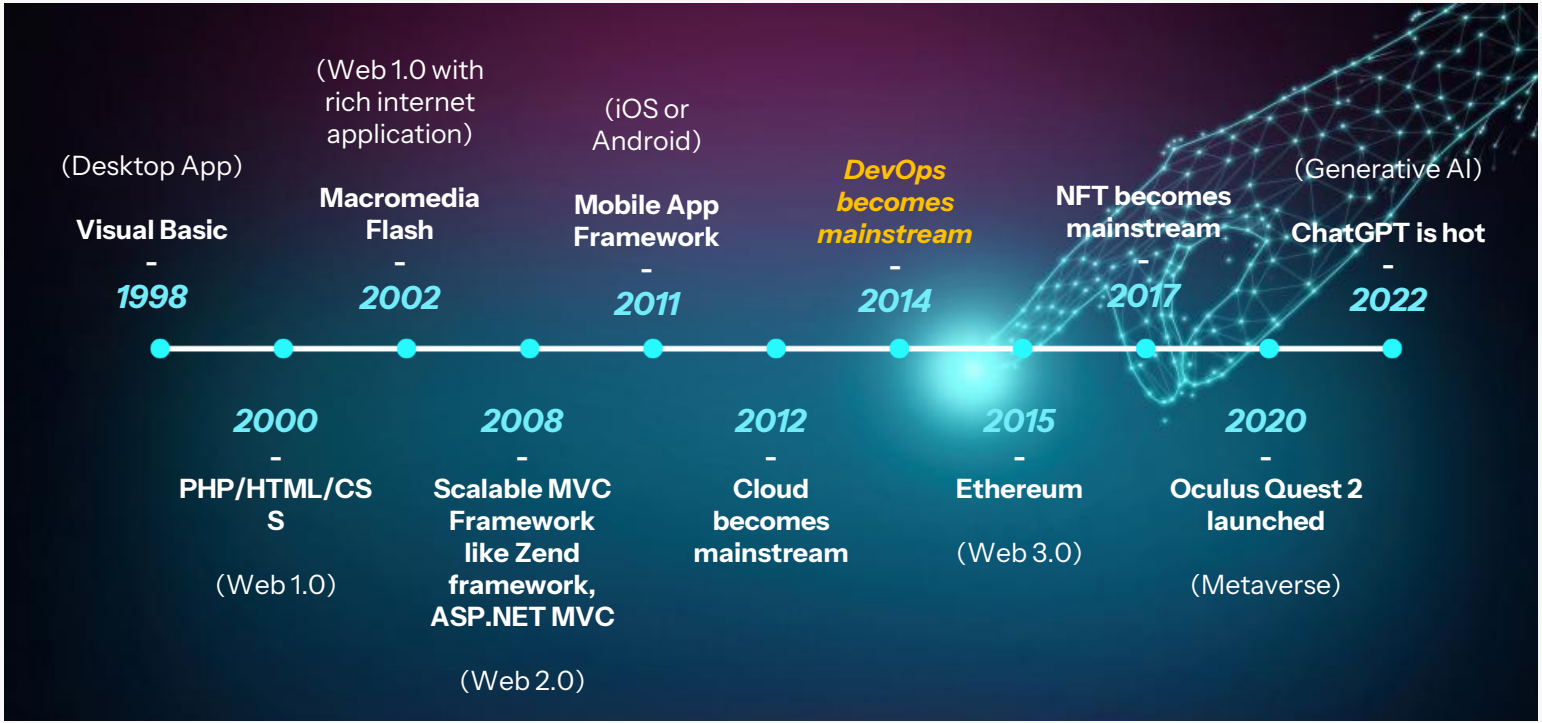
The Digital Influencer:

Ts. Tan Aik Keong (AK)

Founder & Chief Executive Officer of Agmo Group

From Software Developer to IPO (2022)

My technology journey (1998 to now)



My first application (2002)

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Introduction to DevOps

A transformative approach to Software Development & IT Operations

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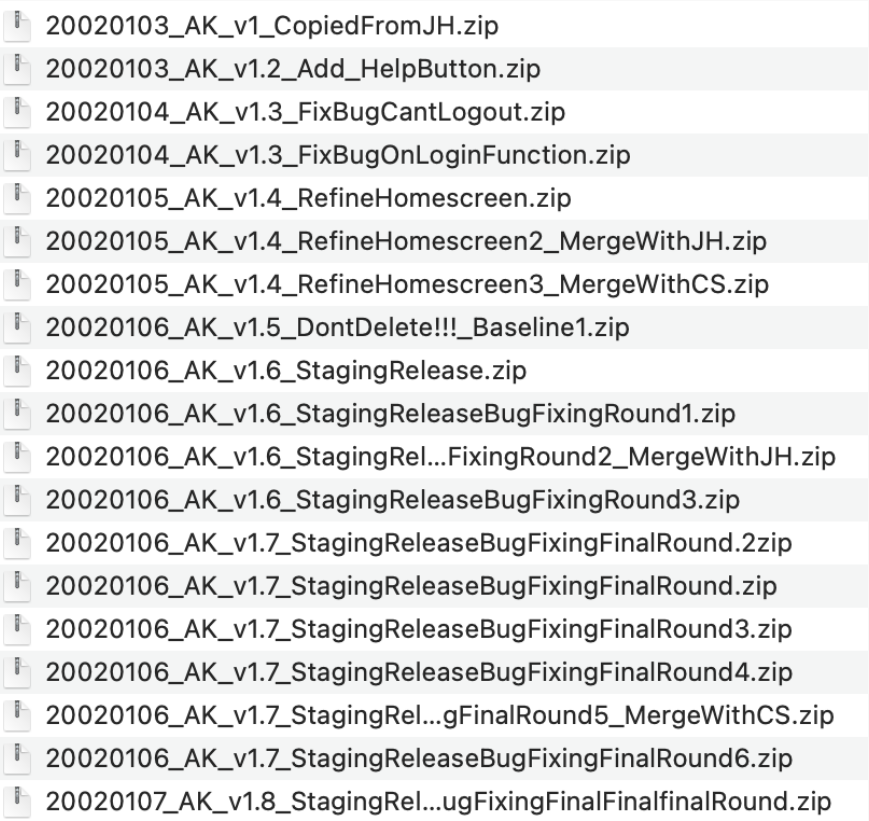
The old day
Development

The old day..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20020104_AK_v1.3_FixBugOnLoginFunction.zip
20020105_AK_v1.4_RefineHomescreen.zip
20020105_AK_v1.4_RefineHomescreen2_MergeWithJH.zip
20020105_AK_v1.4_RefineHomescreen3_MergeWithCS.zip
20020106_AK_v1.5_DontDelete!!!_Baseline1.zip
20020106_AK_v1.6_StagingRelease.zip
20020106_AK_v1.6_StagingReleaseBugFixingRound1.zip
20020106_AK_v1.6_StagingRel...FixingRound2_MergeWithJH.zip
20020106_AK_v1.6_StagingReleaseBugFixingRound3.zip
20020106_AK_v1.7_StagingReleaseBugFixingFinalRound.2zip
20020106_AK_v1.7_StagingReleaseBugFixingFinalRound.zip
20020106_AK_v1.7_StagingReleaseBugFixingFinalRound3.zip
20020106_AK_v1.7_StagingReleaseBugFixingFinalRound4.zip
20020106_AK_v1.7_StagingRel...gFinalRound5_MergeWithCS.zip
20020106_AK_v1.7_StagingReleaseBugFixingFinalRound6.zip
20020107_AK_v1.8_StagingRel...ugFixingFinalFinalfinalRound.zip

The Challenges

Local Copy

Once accidentally deleted, it is gone

No Version Log

Purely based on the file names

Difficult in Collaboration

Manually merging by eyeballing

2000

2005

2008

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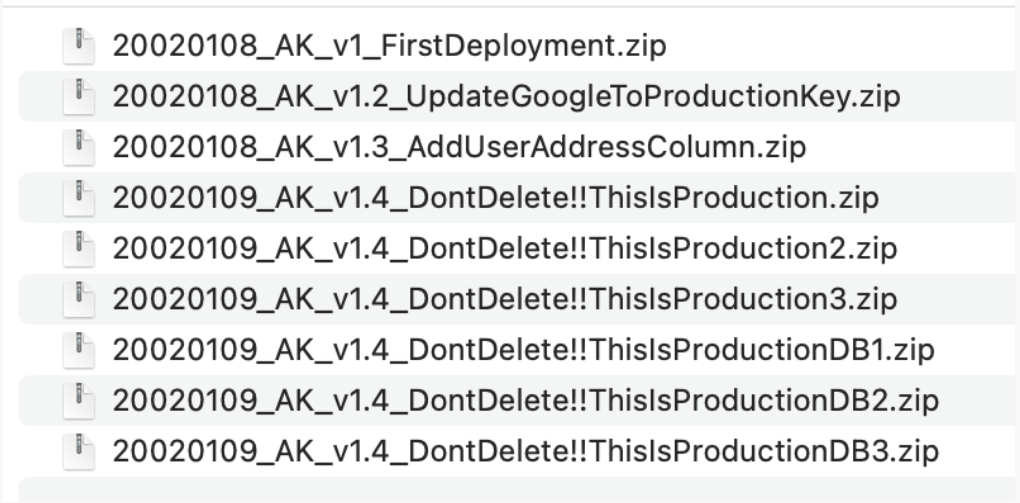
The old day Operations

The old day..
FTP uploads to servers



The Challenges

Local Copy

Once accidentally deleted, it is gone

No Version Log

Purely based on the file names

Difficult in Collaboration

Manually merging by eyeballing & could get accidentally source code replacement by other members

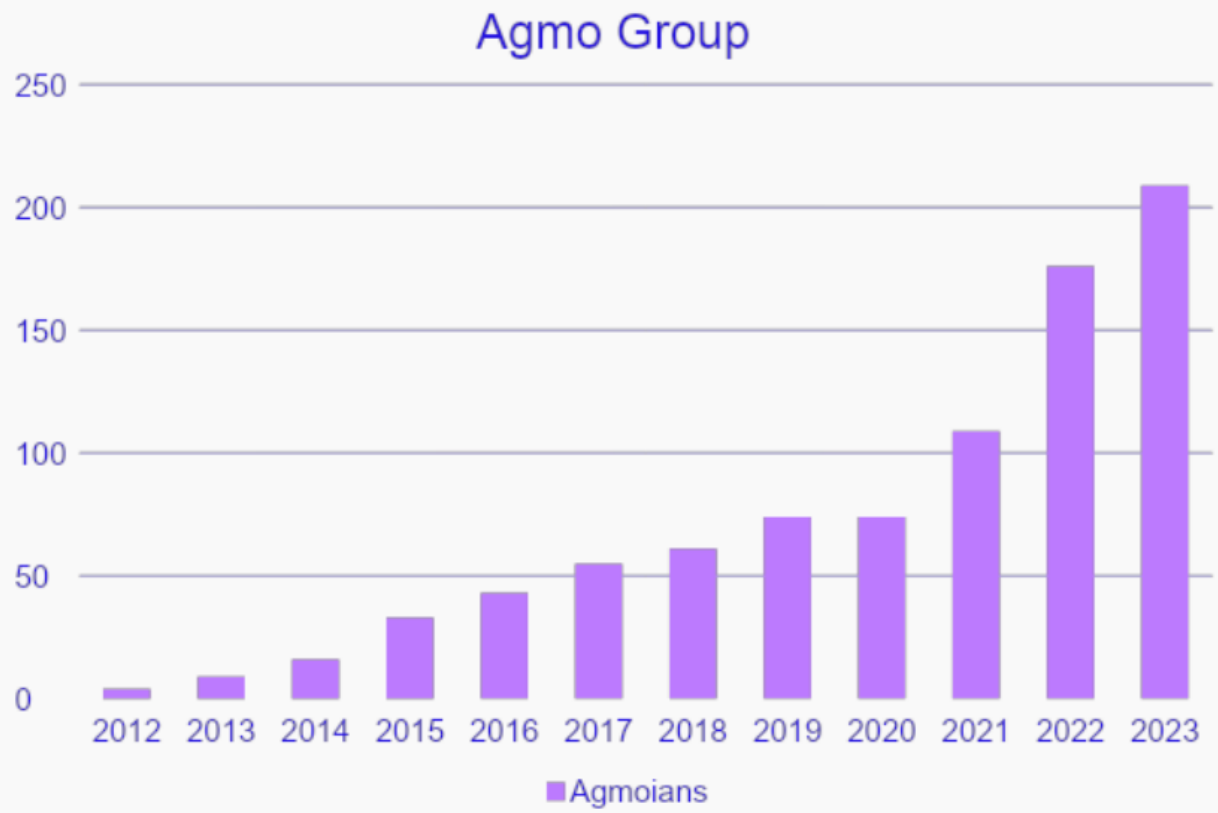
Jenkins

docker

2004

2012

2013


Agmo Group
250
200
150
100
50
0
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Agmoians

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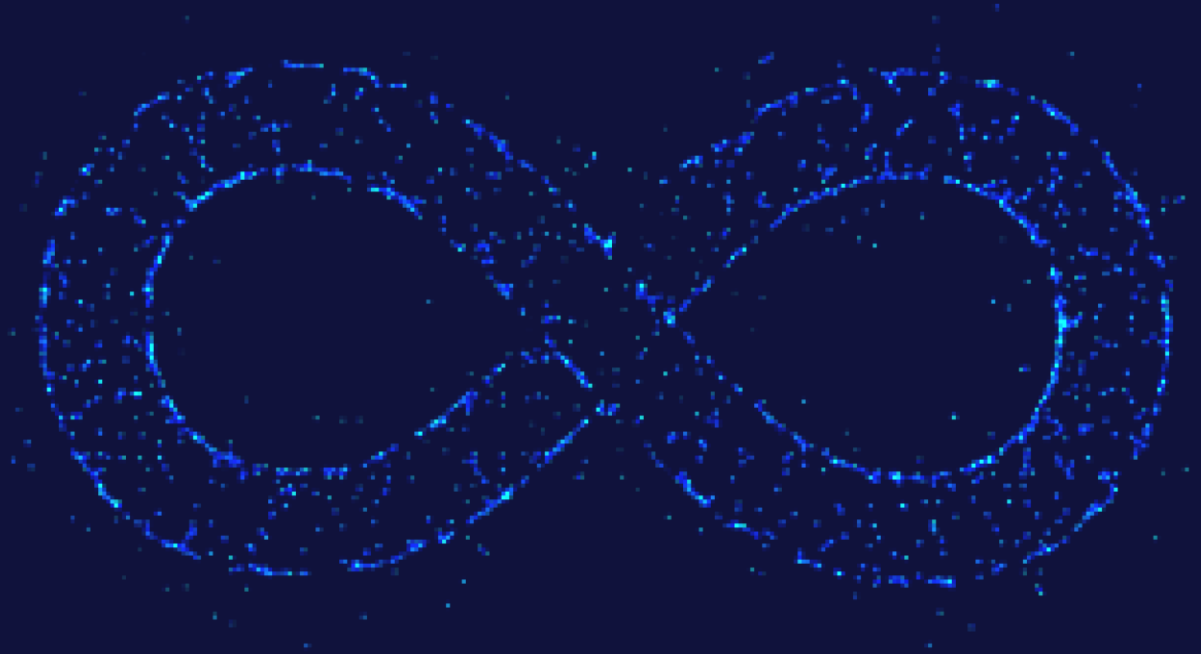
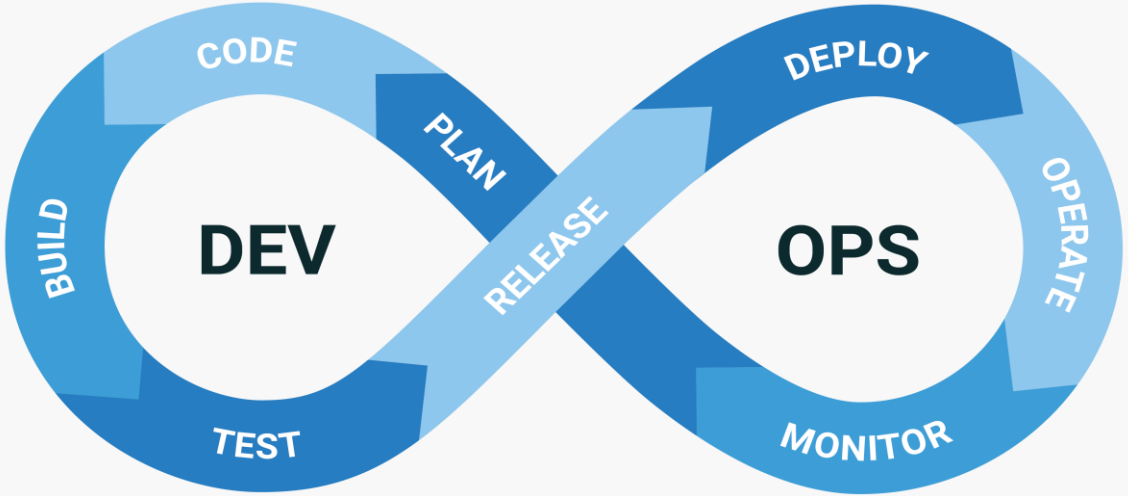
What is DevOps?





A set of ***Practices, Principles & Cultural Philosophies***

Aim to IMPROVE collaboration & communication between Software Development (Dev) and IT Operations (Ops) teams

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Streamline

Goal of DevOps

Automate

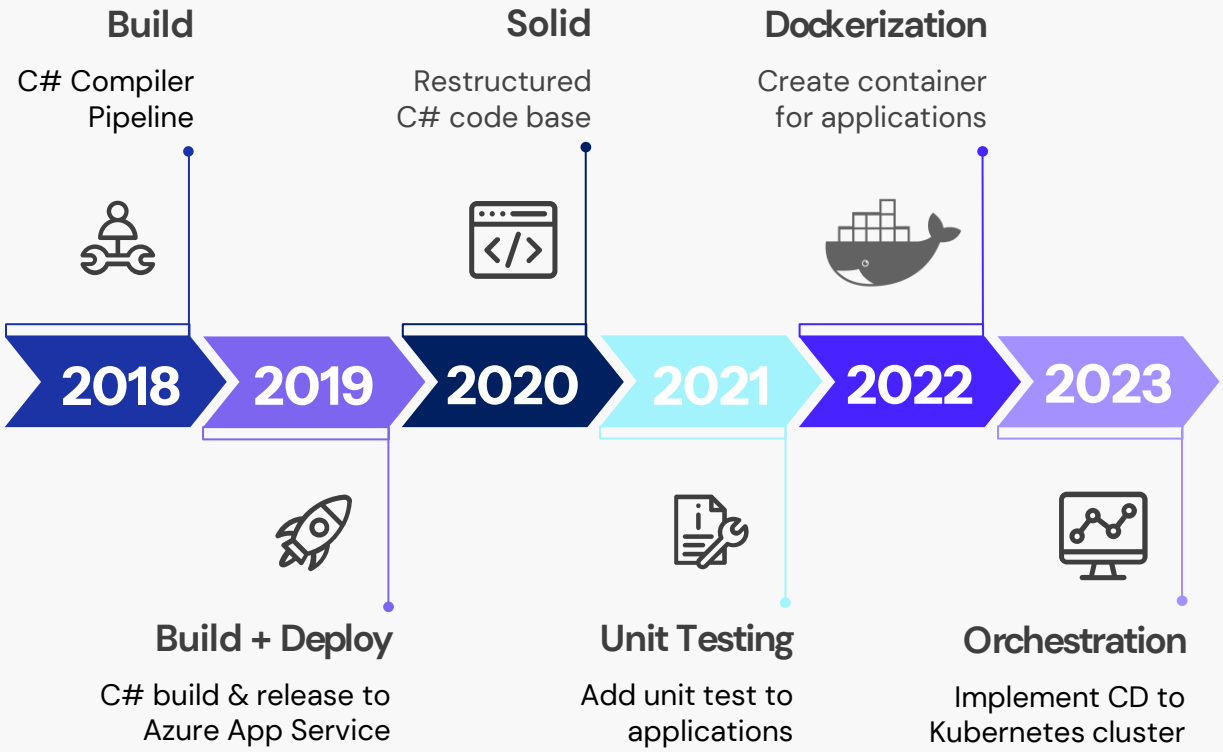
- The software development & deployment process
- Enabling organizations to deliver high-quality software

= MORE QUICKLY & EFFICIENTLY

Agmo's DevOps Journey

Agmo's DevOps Timeline from 2018 to 2023

DevOps Timeline



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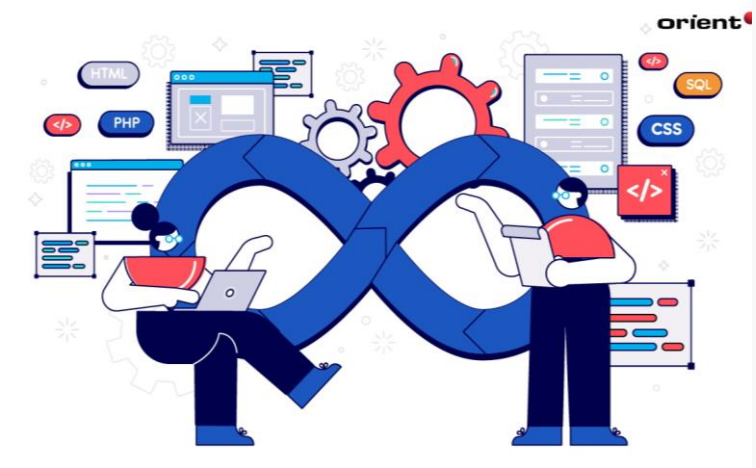
2018

Build



- We started small at year 2018
- Initial challenge where developer-written code was occasionally non-compilable
- Create a pipeline dedicated to code compilation during the pull request phase
- This pipeline became a cornerstone practice, ensuring that only buildable code was allowed into the development branch

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2019

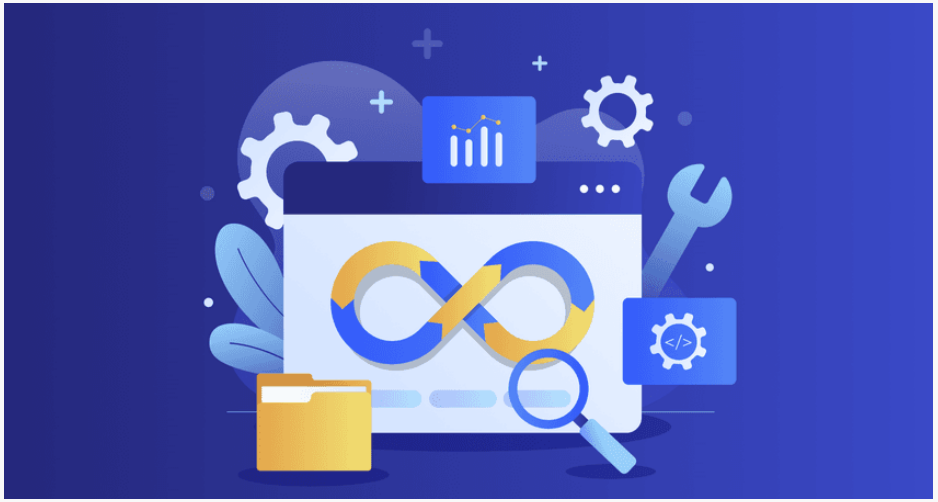
Build + Deploy

- Continued to expand and refine our DevOps journey
- The backend team grow, deployment became complicated
- As team members would need to work on different branches in our repository, it is prune to mistake such as deploying from wrong working branch
- Added continuous deployment to our dev, staging server

Manual Deployment

vs

DevOps



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Manual Deployment Average:

Time Spend for *Manual Deployment* → **30 minutes**

Deployment *Every Week* → **3 deployments**

Deployment *Every Month* → **~ 12 deployments**

Deployment *Every Year* → **~ 144 deployments**

Manual Deployment

Time Spend (Manual) in a year

= 30 minutes * 144 * 2 Environment
(Dev, Staging)

→ **8,640 minutes**

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DevOps Saving:

DevOps Development *Spent* → **2,400 minutes (300 hours)**

Manual Deployment for *Production* → **30 minutes * ~72 deployments**

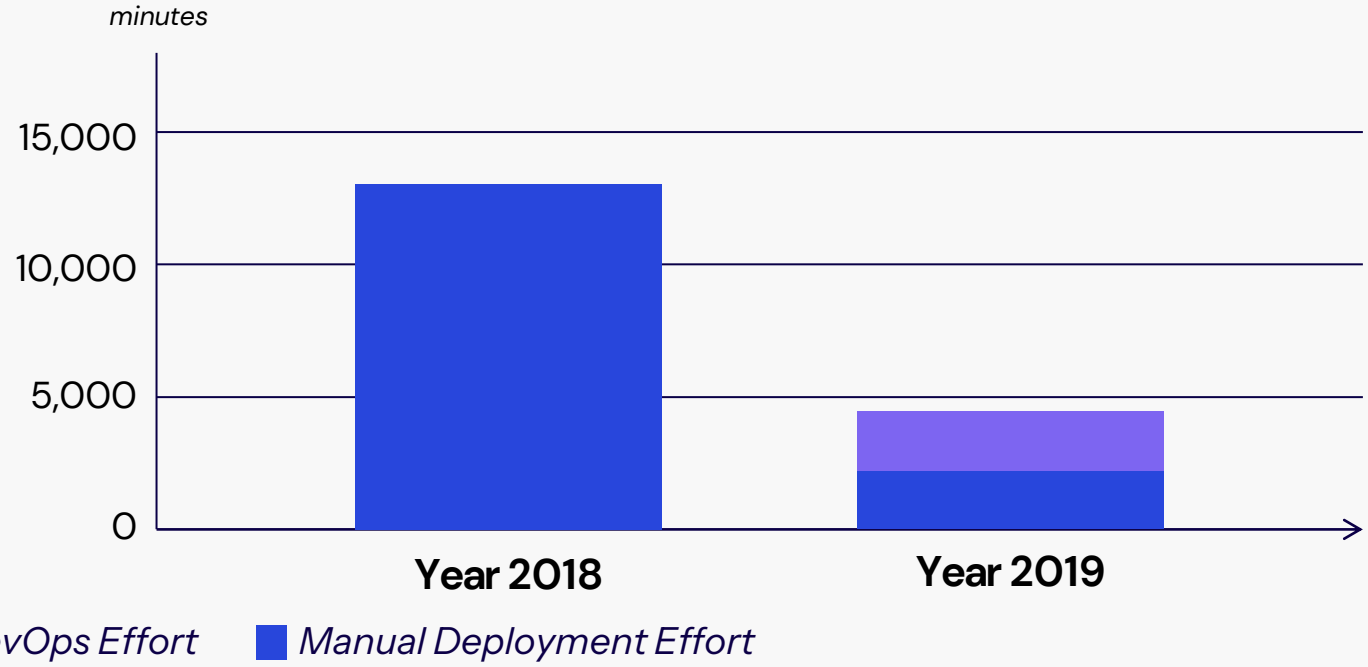
= 2,160 minutes

DevOps Savings

8,640 minutes (Manual Deployment)
– 2,400 minutes (DevOps Development Spent)
– 2,160 minutes (Manual Deployment for Production)

Saving → 4,080 minutes

Manual Deployment Effort & DevOps Effort



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2020

Code Restructuring

- Our backend code base continue to expand
- Become complex & hard to maintain
- Need to elevate the quality & maintainability of our codebase
- Restructuring our codebase to adhere to solid programming principles

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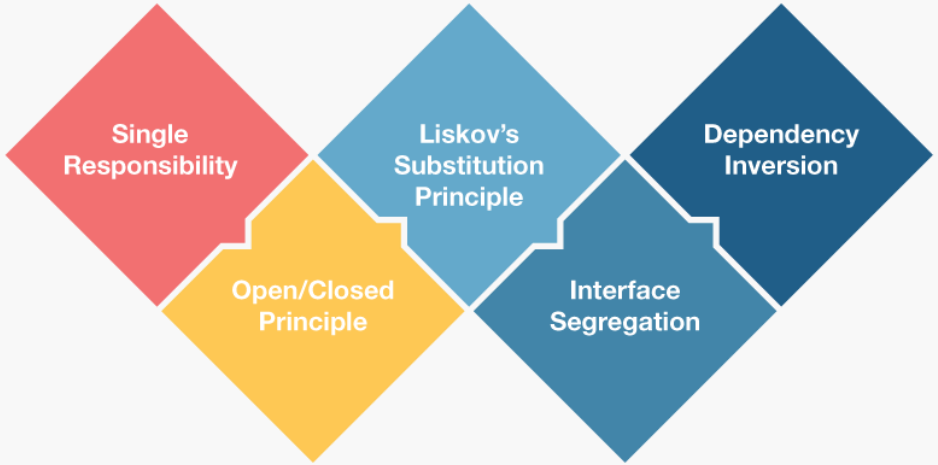
S.O.L.I.D.


Single Responsibility
Open/Closed Principle
Liskov's Substitution Principle
Interface Segregation
Dependency Inversion

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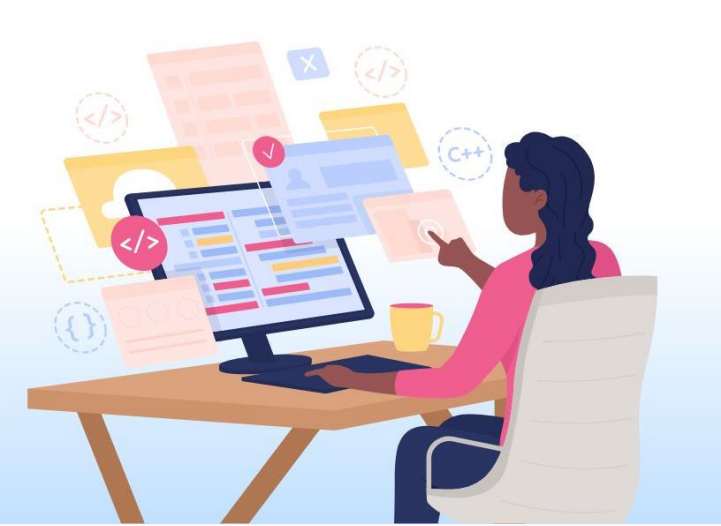
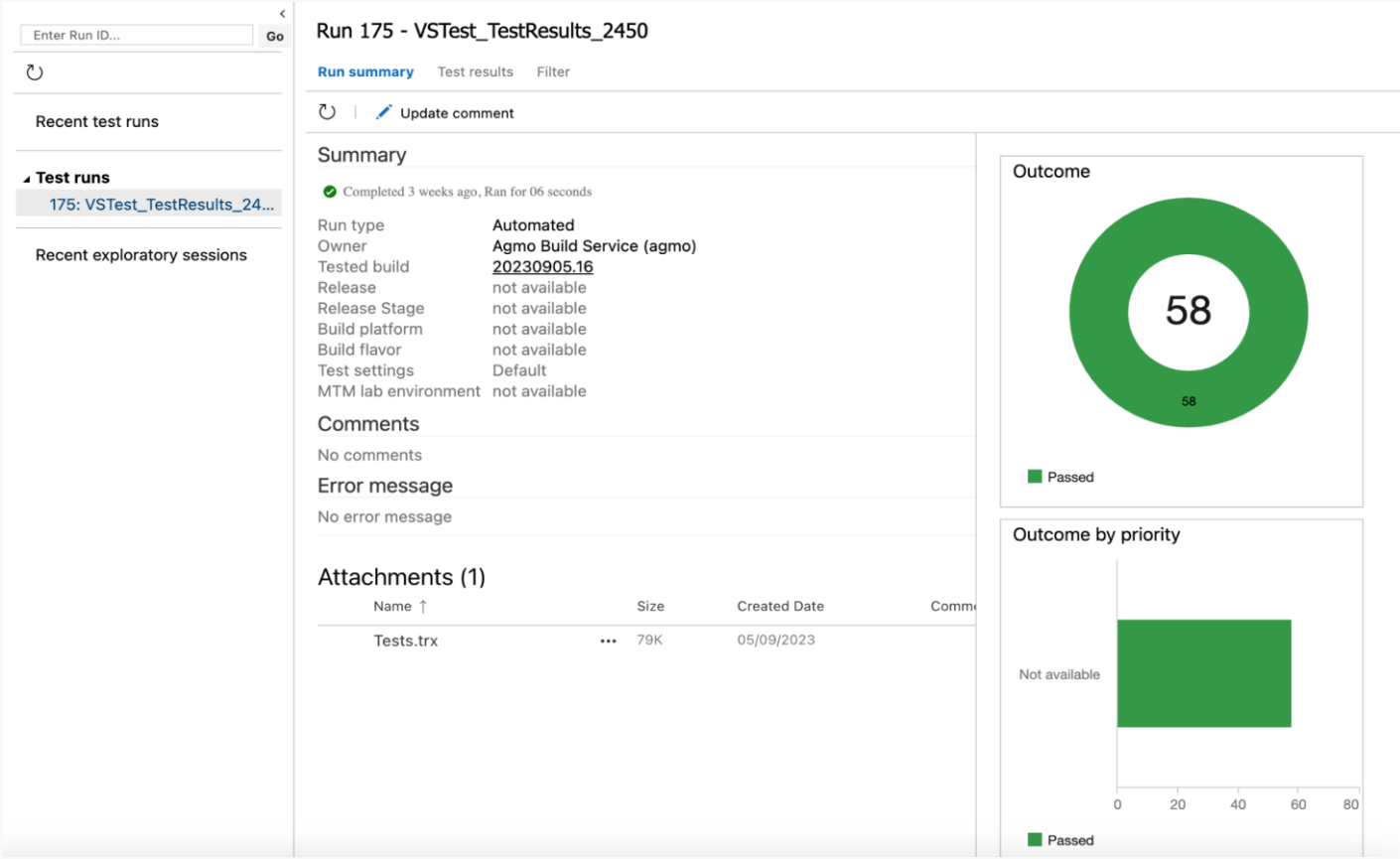
2021

Unit Testing



- Introduced unit testing as a standard practice
- Unit testing became a non-negotiable part of our development process, fostering a culture of quality & reliability in our codebase
- Automated test execution
- Tracking Code Coverage Metrics
- Reduced regression issue


Enter Run ID...
Go
Recent test runs
Test runs
175: VSTest_TestResults_24...
Recent exploratory sessions
Run 175 - VSTest_TestResults_2450
Run summary
Test results
Filter
Update comment
Summary
Completed 3 weeks ago, Ran for 06 seconds
Run type Automated
Owner Agmo Build Service (agmo)
Tested build 20230905.16
Release not available
Release Stage not available
Build platform not available
Build flavor not available
Test settings Default
MTM lab environment not available
Comments
No comments
Error message
No error message
Attachments (1)
Name
Size
Created Date
Tests.trx
79K
05/09/2023
Outcome
58
58
Passed
Outcome by priority
Not available
0
20
40
60
80
Passed

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2022

Dockerization

- Package & deploy applications
- Create consistent development environments
- Highly portable & scalable
- Integrated seamlessly into our DevOps pipeline

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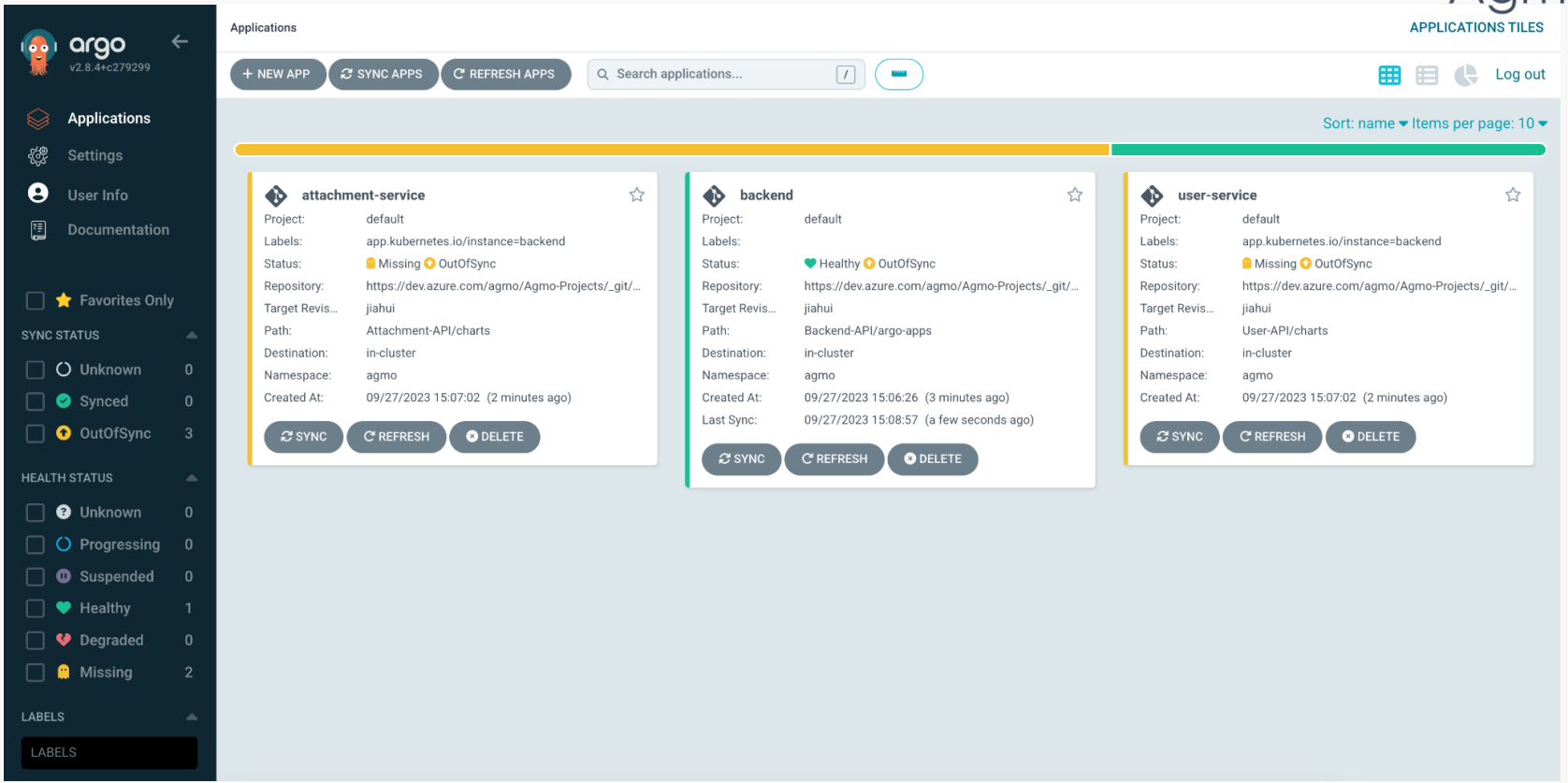
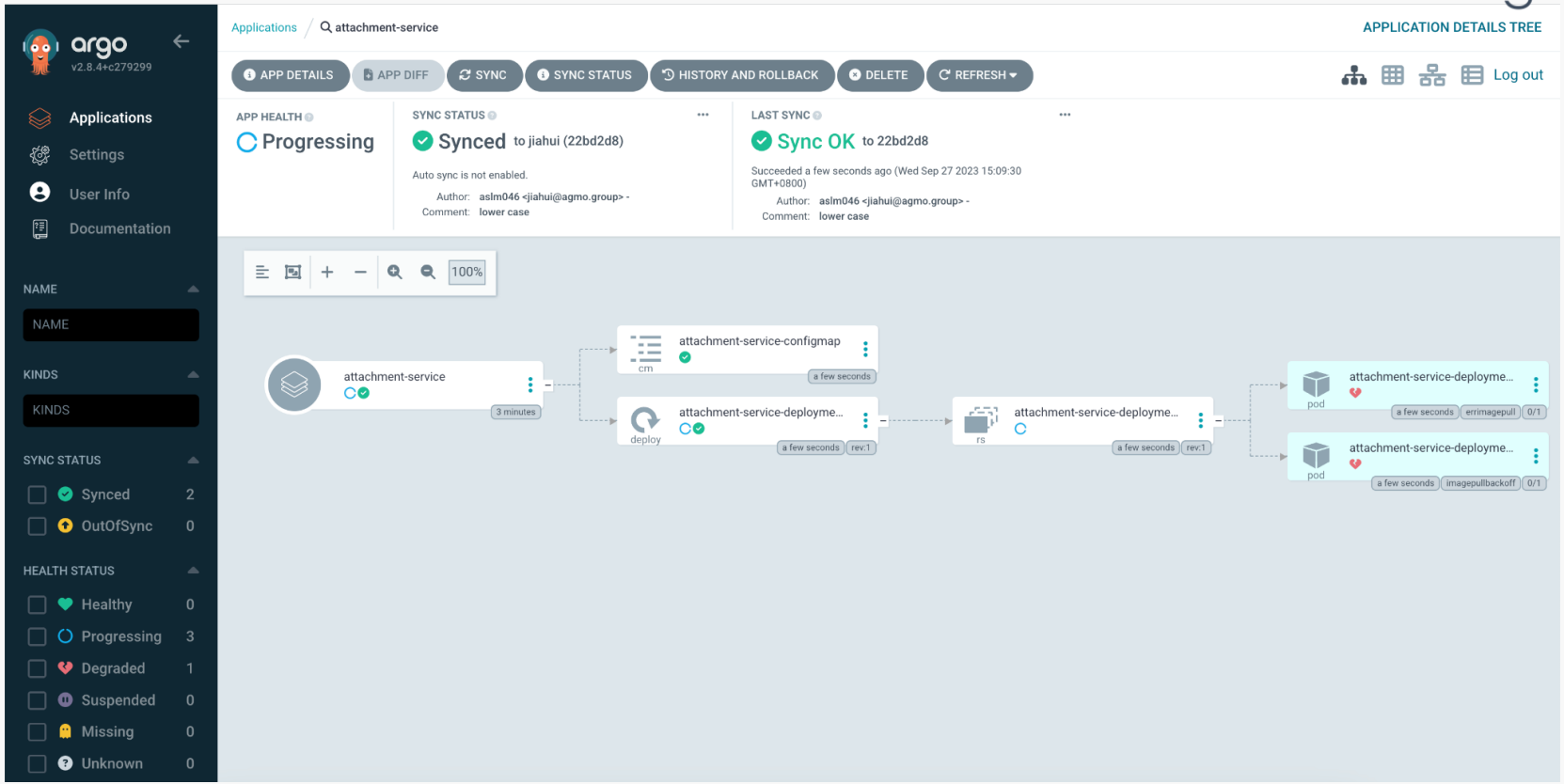
2023

Orchestration

- Kubernetes (K8s)
- Scaling & Load Balancing
- High Availability (HA)
- Infrastructure as Code (IaC)
- Continuous Deployment
- Future Growth


argo
v2.8.4+c279299
Applications
Settings
User Info
Documentation
Favorites Only
SYNC STATUS
Unknown 0
Synced 0
OutOfSync 3
HEALTH STATUS
Unknown 0
Progressing 0
Suspended 0
Healthy 1
Degraded 0
Missing 2
LABELS
LABELS
Applications
APPLICATIONS TILES
+ NEW APP
SYNC APPS
REFRESH APPS
Search applications...
Log out
Sort: name
Items per page: 10
attachment-service
Project: default
Labels: app.kubernetes.io/instance=backend
Status: Missing OutOfSync
Repository: https://dev.azure.com/agmo/Agmo-Projects/_git/...
Target Revis... jiahui
Path: Attachment-API/charts
Destination: in-cluster
Namespace: agmo
Created At: 09/27/2023 15:07:02 (2 minutes ago)
SYNC
REFRESH
DELETE
backend
Project: default
Labels:
Status: Healthy OutOfSync
Repository: https://dev.azure.com/agmo/Agmo-Projects/_git/...
Target Revis... jiahui
Path: Backend-API/argo-apps
Destination: in-cluster
Namespace: agmo
Created At: 09/27/2023 15:06:26 (3 minutes ago)
Last Sync: 09/27/2023 15:08:57 (a few seconds ago)
SYNC
REFRESH
DELETE
user-service
Project: default
Labels: app.kubernetes.io/instance=backend
Status: Missing OutOfSync
Repository: https://dev.azure.com/agmo/Agmo-Projects/_git/...
Target Revis... jiahui
Path: User-API/charts
Destination: in-cluster
Namespace: agmo
Created At: 09/27/2023 15:07:02 (2 minutes ago)
SYNC
REFRESH
DELETE


argo
v2.8.4+c279299
Applications
Settings
User Info
Documentation
NAME
NAME
KINDS
KINDS
SYNC STATUS
Synced 2
OutOfSync 0
HEALTH STATUS
Healthy 0
Progressing 3
Degraded 1
Suspended 0
Missing 0
Unknown 0
Applications / attachment-service
APPLICATION DETAILS TREE
APP DETAILS
APP DIFF
SYNC
SYNC STATUS
HISTORY AND ROLLBACK
DELETE
REFRESH
Log out
APP HEALTH
Progressing
SYNC STATUS
Synced to jiahui (22bd2d8)
Auto sync is not enabled.
Author: aslm046 <jiahui@agmo.group> -
Comment: lower case
LAST SYNC
Sync OK to 22bd2d8
Succeeded a few seconds ago (Wed Sep 27 2023 15:09:30 GMT+0800)
Author: aslm046 <jiahui@agmo.group> -
Comment: lower case
100%
attachment-service
3 minutes
attachment-service-configmap
cm
a few seconds
attachment-service-deployme...
deploy
a few seconds
rev:1
attachment-service-deployme...
rs
a few seconds
rev:1
attachment-service-deployme...
pod
a few seconds
errimagepull
0/1
attachment-service-deployme...
pod
a few seconds
imagepullbackoff
0/1

Welcome to the Future

The Future is now.

Agmo Holdings Berhad | DevOps

2023

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Latest Industry Trend

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01

HUAWEI CLOUD

Helping various industries achieve seamless integration between the virtual world & the real world

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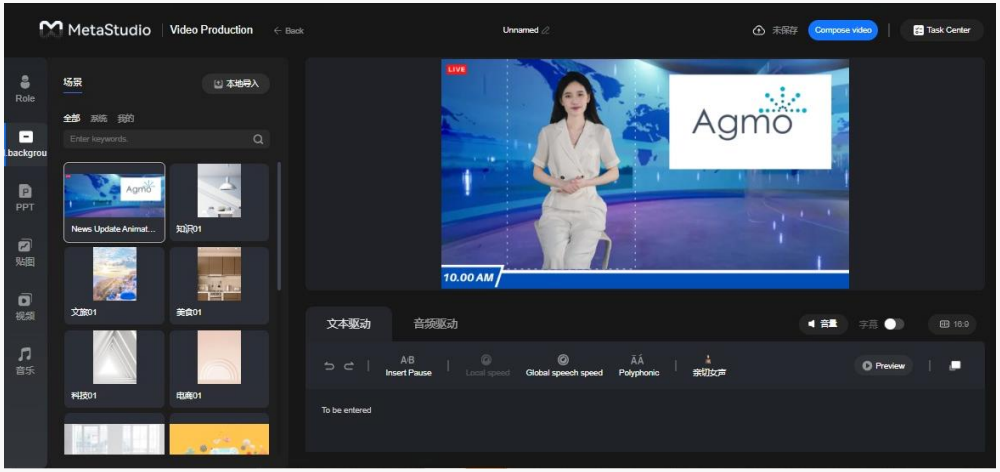
Huawei Cloud MetaStudio Introduction

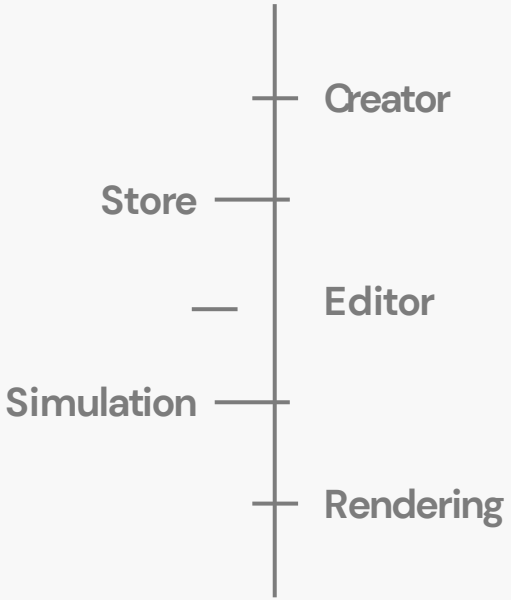
MetaStudio

Rely on two major media engines, Graphic Engine & Spatial Engine



This help partners & developers quickly build high-quality models for use in **virtual live boardcasts, virtual video content production**, and various scenarios such as **educational courseware, e-commerce promotion and social entertainment**.

5 Core Platform Capabilities



Example:

Selamat datang, welcome to ***Forum Pemodenan & Pendigitalan Sektor Awan***

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02

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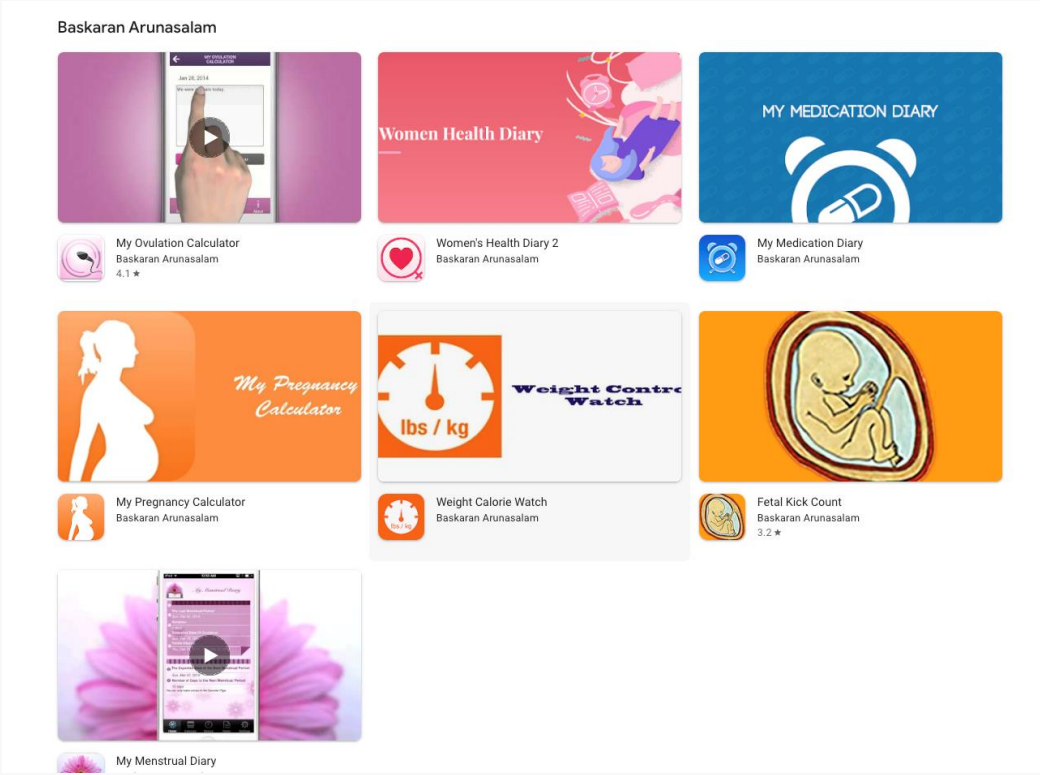
Alibaba Cloud EMAS SuperApp Introduction

The old day,

Users have to download multiple individuals apps to access:

1. *Various services*
2. *Functionalities*

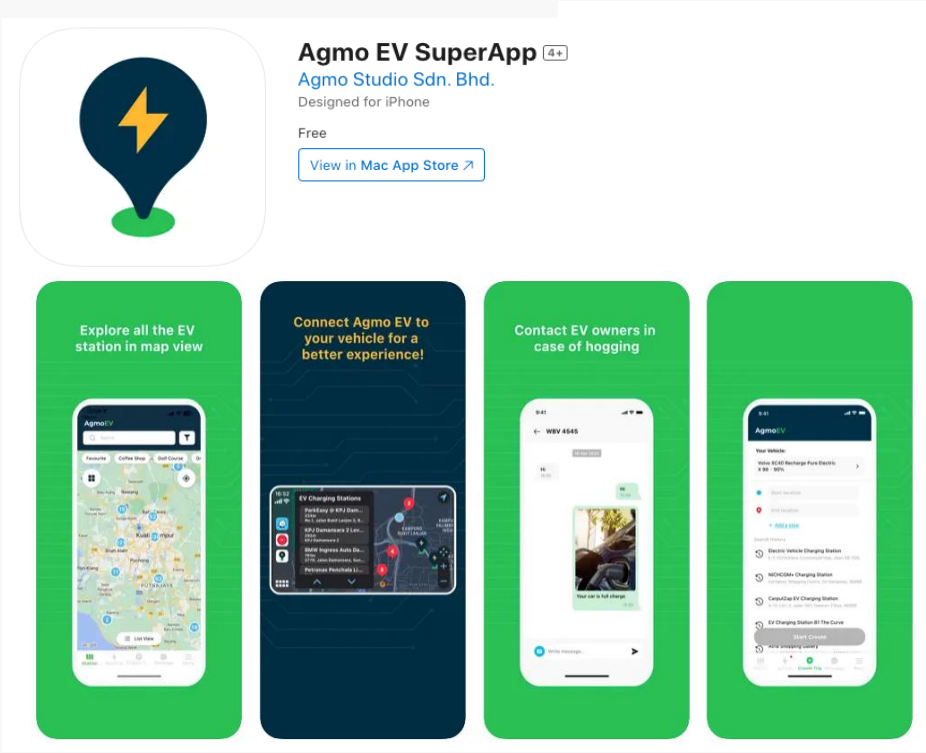


Now,

With Alibaba EMAS SuperApp:

1. *Consolidate multiple services & features into a single app*
2. *Offers convenience & efficiency*

One-stop platform for various everyday tasks & services.



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Search:
Agmo EV SuperApp

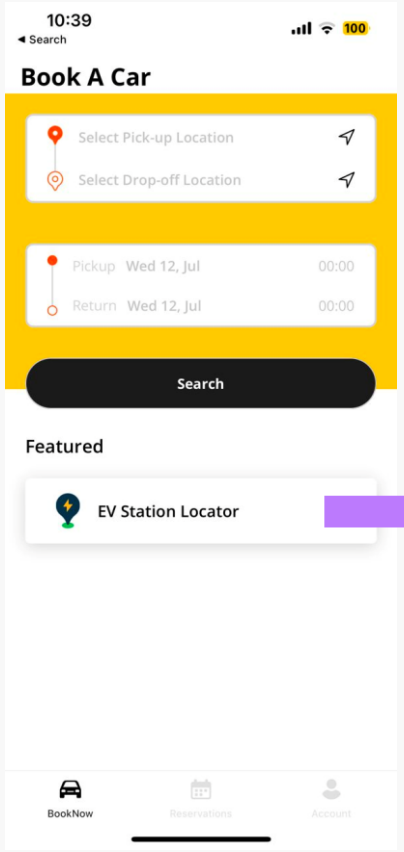
Download on the App Store

GET IT ON Google Play

Download now and experience!

And also,

App can also exist as a mini program in other app.



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03

Lead the AI era with the
Microsoft Cloud

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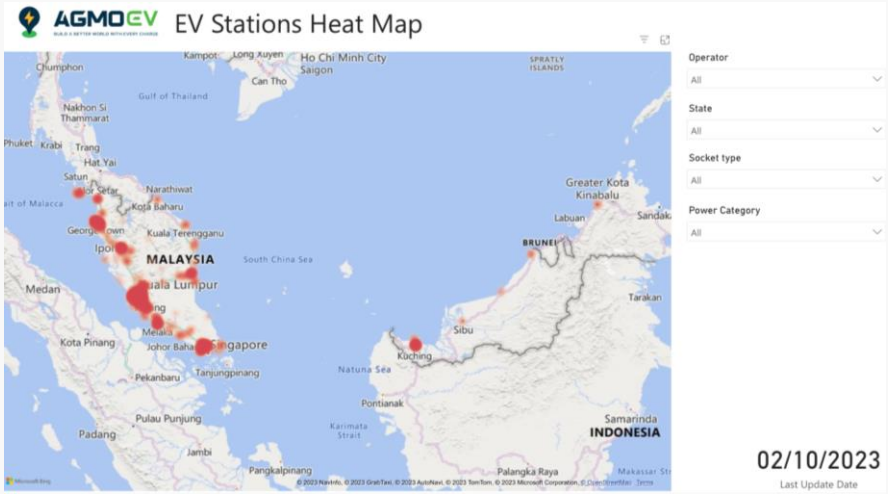
Microsoft Power BI & Azure AI Introduction

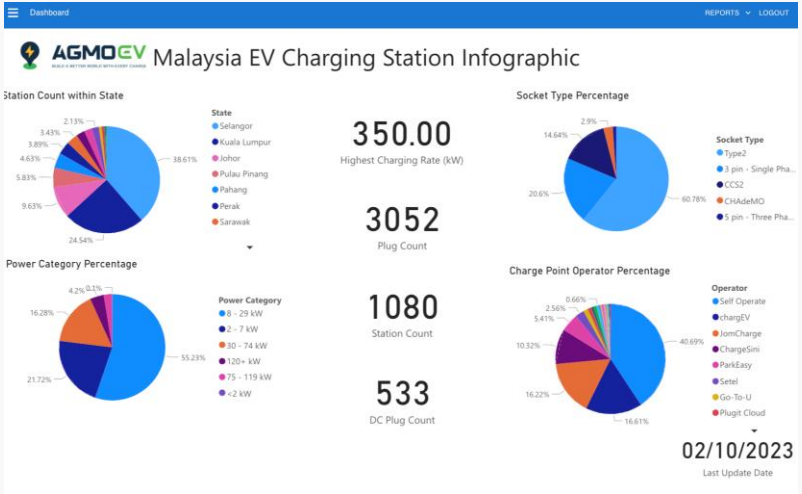
Before, *Plain Boring Excel*

F1 | power

	A	B	C	D	E	F	G	H
1	Station Name	latitude	longitude	Plug Share Id	cost	power	CPO name	description
2	(AC Charger) Rhadium & Raytech Seremban, Negeri sembilan	2.704635	101.940201	478656	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(2) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)Apps Download Link : htt
3	(AC Charger) Rhadium & Raytech Seremban, Negeri sembilan	2.704635	101.940201	478656	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(2) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)Apps Download Link : htt
4	(AC Charger) Amerin Mall, Seri Kembangan	3.024839	101.751541	469572	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(3) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)*Idle fees charge schedul
5	(AC Charger) Amerin Mall, Seri Kembangan	3.024839	101.751541	469572	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(3) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)*Idle fees charge schedul
6	(AC Charger) Amerin Mall, Seri Kembangan	3.024839	101.751541	469572	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(3) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)*Idle fees charge schedul
7	(AC Charger) BLH ECOENERGY , KUANTAN	3.841507	103.336868	495362	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(2) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)*Idle fees charge schedul
8	(AC Charger) BLH ECOENERGY , KUANTAN	3.841507	103.336868	495362	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(2) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)*Idle fees charge schedul
9	(AC Charger) OE Resort, Negeri Sembilan	2.815522	101.912743	483078	NULL	NULL	ChargeSini	ChargeSini Network Operator(2) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)*Idle fees charge schedul
10	(AC Charger) OE Resort, Negeri Sembilan	2.815522	101.912743	483078	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(2) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)*Idle fees charge schedul
11	(AC Charger) OE Resort, Negeri Sembilan	2.815522	101.912743	483078	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(2) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)*Idle fees charge schedul
12	(AC Charger) Oriental Melaka Straits Medical Centre, Melaka	2.207943	102.213966	478657	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(5) 11KW AC Type2 (Please go to apps press I'm here for active the packing lock)Apps Download Link : htt
13	(AC Charger) Oriental Melaka Straits Medical Centre, Melaka	2.207943	102.213966	478657	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(5) 11KW AC Type2 (Please go to apps press I'm here for active the packing lock)Apps Download Link : htt
14	(AC Charger) Oriental Melaka Straits Medical Centre, Melaka	2.207943	102.213966	478657	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(5) 11KW AC Type2 (Please go to apps press I'm here for active the packing lock)Apps Download Link : htt
15	(AC Charger) Oriental Melaka Straits Medical Centre, Melaka	2.207943	102.213966	478657	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(5) 11KW AC Type2 (Please go to apps press I'm here for active the packing lock)Apps Download Link : htt
16	(AC Charger) Oriental Melaka Straits Medical Centre, Melaka	2.207943	102.213966	478657	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(5) 11KW AC Type2 (Please go to apps press I'm here for active the packing lock)Apps Download Link : htt
17	(AC Charger) Raytech Bangi	2.961205	101.752068	456245	RM 0.40 / mi	22	ChargeSini	Website : Chargesini.comProduct Enquiry : Sangitech.my Email : support@chargesini.comCustomer Service Support : wa.me/601116
18	(AC Charger) Raytech Bangi	2.961205	101.752068	456245	RM 0.40 / mi	22	ChargeSini	Website : Chargesini.comProduct Enquiry : Sangitech.my Email : support@chargesini.comCustomer Service Support : wa.me/601116
19	(AC Charger) Raytech Maluri, Kuala Lumpur	3.128197	101.720963	471728	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(1) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)Apps Download Link : htt
20	(AC Charger) Raytech Puchong, Selangor	3.04223	101.618088	474973	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(1) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)Bring Your Own Type 2 Ca
21	(AC Charger) Raytech Sekamat, Kajang	3.019086	101.776482	474974	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(2) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)Apps Download Link : htt
22	(AC Charger) Raytech Sekamat, Kajang	3.019086	101.776482	474974	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(2) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)Apps Download Link : htt
23	(AC Charger) SMILE HOTEL SHAH ALAM, Shah Alam	3.085349	101.522308	483348	RM 0.40 / mi	22	ChargeSini	ChargeSini Charging Network2 x 11KW AC T2 sockets (Please go to apps & press "I'm here" to release the packing lock)*Idle fees charge
24	(AC Charger) SMILE HOTEL SHAH ALAM, Shah Alam	3.085349	101.522308	483348	RM 0.40 / mi	22	ChargeSini	ChargeSini Charging Network2 x 11KW AC T2 sockets (Please go to apps & press "I'm here" to release the packing lock)*Idle fees charge
25	(AC Charger) TERMINAL 1 - Domestic and International Cuisines, Genting Hig	3.438709	101.69323	470421	RM 0.20 / mi	11	ChargeSini	ChargeSini Network Operator2 x 11 kW AC Type2 sockets(Please go to apps press I'm here to unlock the packing bay lock)Apps Downlo
26	(AC Charger) TERMINAL 1 - Domestic and International Cuisines, Genting Hig	3.438709	101.69323	470421	RM 0.20 / mi	11	ChargeSini	ChargeSini Network Operator2 x 11 kW AC Type2 sockets(Please go to apps press I'm here to unlock the packing bay lock)Apps Downlo
27	(COMING SOON) ECO ARDENCE	3.095158955	101.4817238	521087	RM 0.80 / kW	22	chargEV	chargEV charging hub2 x StarCharge Jupiter 60 DCFC Dual CCS2 (60kW/200A/63kVA) - 2 x 60 kW DC CCS2 (1 CCS2/stall plugged in)- 4
28	(COMING SOON) ECO ARDENCE	3.095158955	101.4817238	521087	Free	22	chargEV	chargEV charging hub2 x StarCharge Jupiter 60 DCFC Dual CCS2 (60kW/200A/63kVA) - 2 x 60 kW DC CCS2 (1 CCS2/stall plugged in)- 4
29	(COMING SOON) ECO ARDENCE	3.095158955	101.4817238	521087	Free	60	chargEV	chargEV charging hub2 x StarCharge Jupiter 60 DCFC Dual CCS2 (60kW/200A/63kVA) - 2 x 60 kW DC CCS2 (1 CCS2/stall plugged in)- 4
30	(COMING SOON) ECO ARDENCE	3.095158955	101.4817238	521087	RM 1.20 / kW	60	chargEV	chargEV charging hub2 x StarCharge Jupiter 60 DCFC Dual CCS2 (60kW/200A/63kVA) - 2 x 60 kW DC CCS2 (1 CCS2/stall plugged in)- 4
31	(COMING SOON) ECO ARDENCE	3.095158955	101.4817238	521087	Free	22	chargEV	chargEV charging hub2 x StarCharge Jupiter 60 DCFC Dual CCS2 (60kW/200A/63kVA) - 2 x 60 kW DC CCS2 (1 CCS2/stall plugged in)- 4
32	(COMING SOON) ECO ARDENCE	3.095158955	101.4817238	521087	Free	22	chargEV	chargEV charging hub2 x StarCharge Jupiter 60 DCFC Dual CCS2 (60kW/200A/63kVA) - 2 x 60 kW DC CCS2 (1 CCS2/stall plugged in)- 4
33	(COMING SOON) ECO ARDENCE	3.095158955	101.4817238	521087	Free	60	chargEV	chargEV charging hub2 x StarCharge Jupiter 60 DCFC Dual CCS2 (60kW/200A/63kVA) - 2 x 60 kW DC CCS2 (1 CCS2/stall plugged in)- 4
34	(COMING SOON) ECO ARDENCE	3.095158955	101.4817238	521087	RM 0.80 / kW	22	chargEV	chargEV charging hub2 x StarCharge Jupiter 60 DCFC Dual CCS2 (60kW/200A/63kVA) - 2 x 60 kW DC CCS2 (1 CCS2/stall plugged in)- 4
35	(COMING SOON) ECO ARDENCE	3.095158955	101.4817238	521087	RM 0.80 / kW	22	chargEV	chargEV charging hub2 x StarCharge Jupiter 60 DCFC Dual CCS2 (60kW/200A/63kVA) - 2 x 60 kW DC CCS2 (1 CCS2/stall plugged in)- 4
36	(COMING SOON) ECO ARDENCE	3.095158955	101.4817238	521087	RM 1.20 / kW	60	chargEV	chargEV charging hub2 x StarCharge Jupiter 60 DCFC Dual CCS2 (60kW/200A/63kVA) - 2 x 60 kW DC CCS2 (1 CCS2/stall plugged in)- 4
37	1 Sentul Condominium	3.200006	101.689575	521074	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(2) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)*Idle fees charge schedul
38	1 Sentul Condominium	3.200006	101.689575	521074	RM 0.40 / mi	22	ChargeSini	ChargeSini Network Operator(2) 22KW AC Type2 (Please go to apps press I'm here for active the packing lock)*Idle fees charge schedul
39	28 Mont Kiara	3.173298	101.653021	292003	RM 1.00 / mi	7	JomCharge	
40	28 Mont Kiara	3.173298	101.653021	292003	RM 1.50 / mi	11	JomCharge	
41	3 Damansara	3.130474898	101.6269304	108618	RM 1.50 / 10	3.7	chargEV	chargEV network2 x 3.7 kW AC T2 cabledParking charges applyBasement 1-B17 40 / 1-C17 3

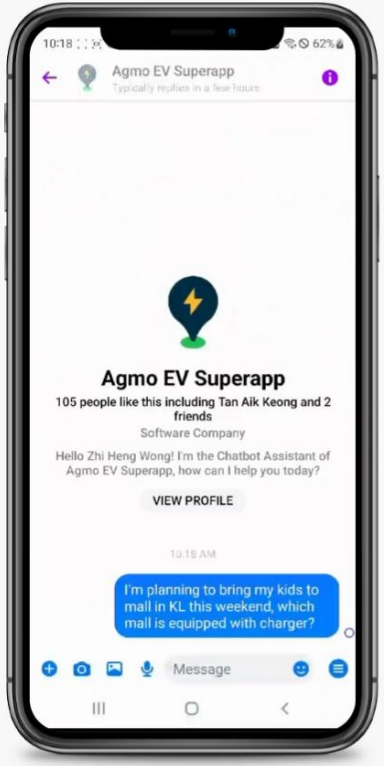
After, *Visualize with dashboard*

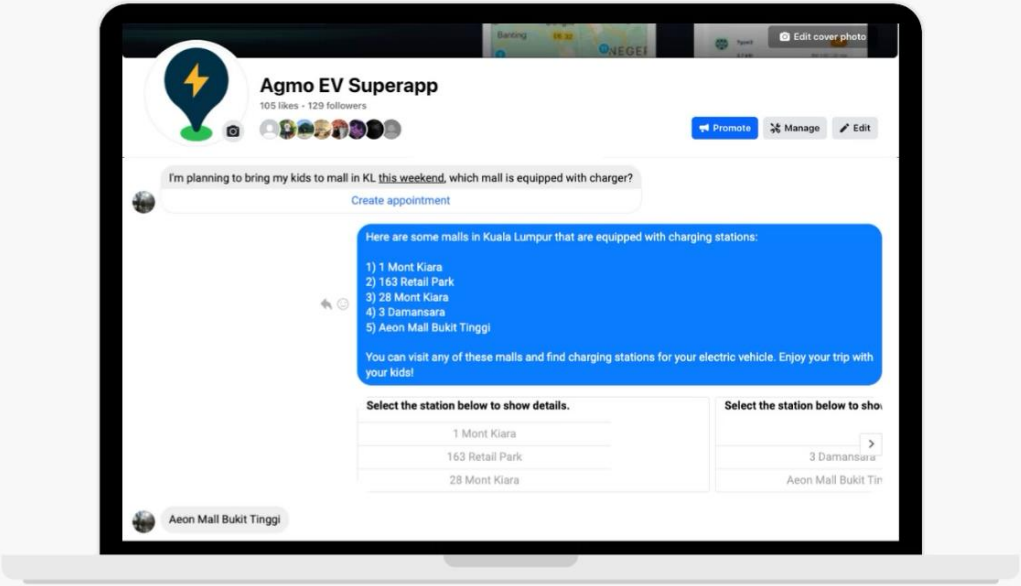


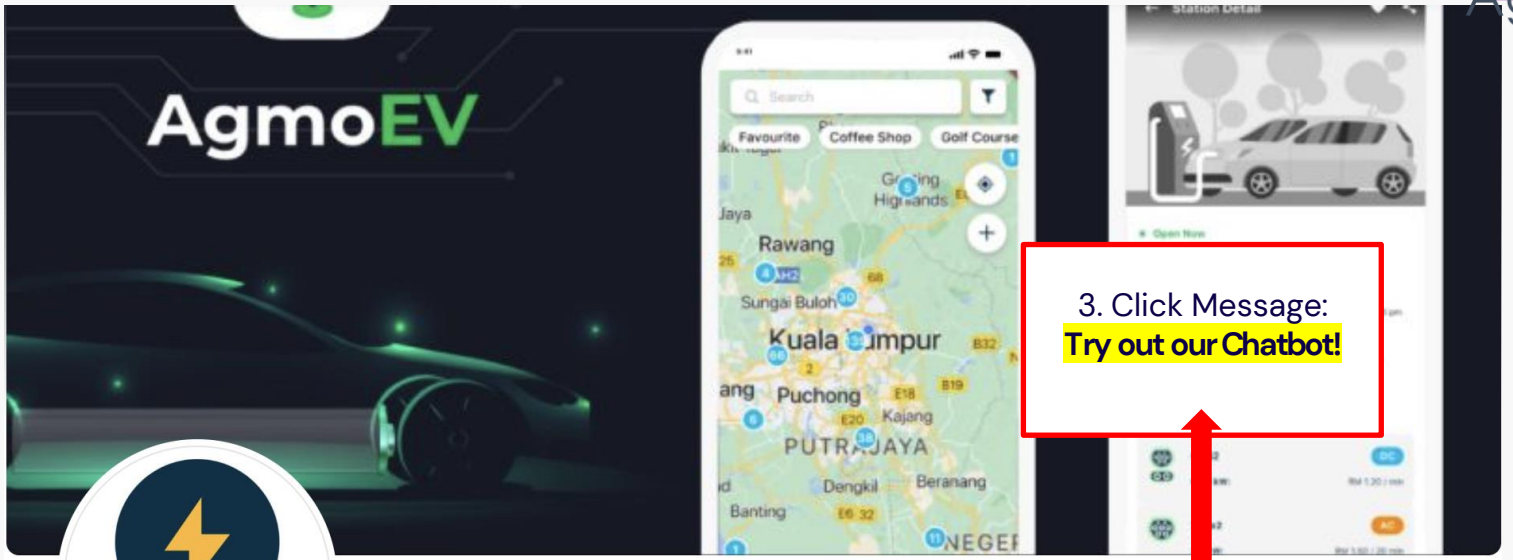


Azure ChatGPT

Agmo EV SuperApp Facebook page using Azure ChatGPT as chatbot to interact with users.







Agmo EV Superapp

105 likes · 129 followers

Liked | Message | Search

3. Click Message:
Try out our Chatbot!

1. Facebook search:
Agmo EV Superapp

2. Like/ Follow:
Agmo EV Superapp

Agmo

04

outsystems

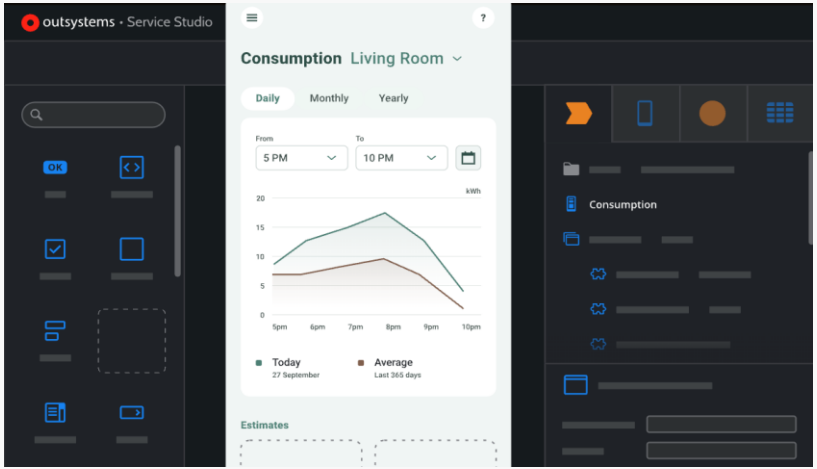
The #1 Low-Code Platform

iOS App Development Journey

2011 *2014* *2017* *2021*

Low-code development platform that enable organizations to rapidly

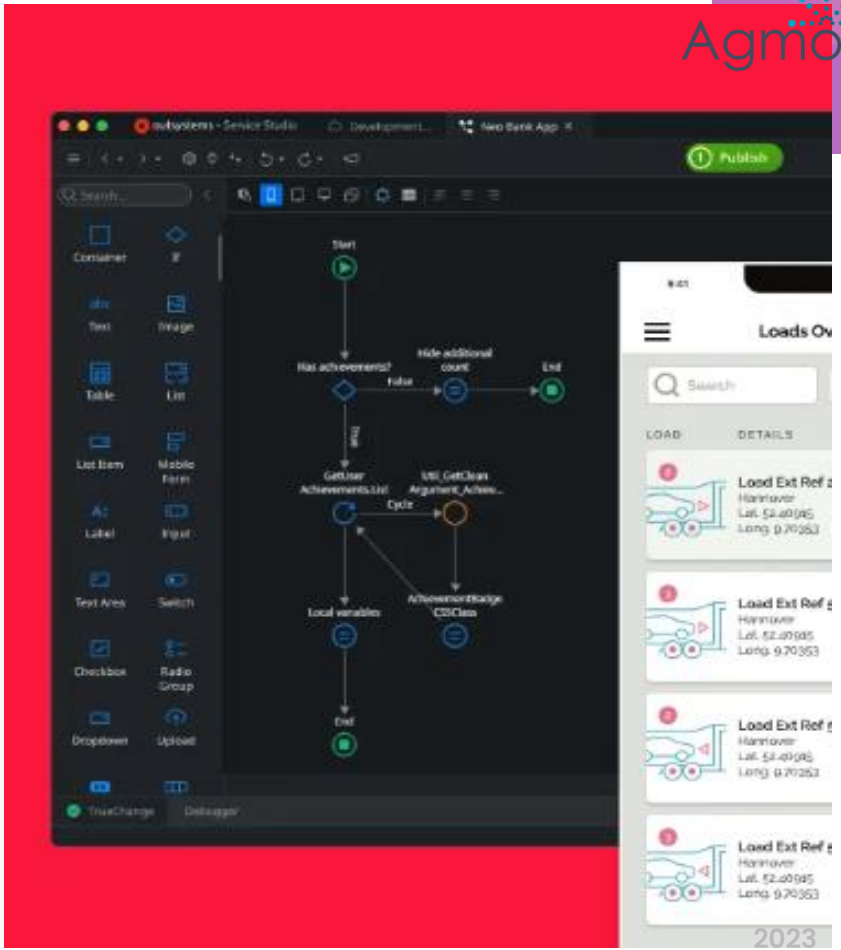
Build & **Deploy**



Web and mobile applications with minimal hand-coding and manual programming.

Key features & aspects of OutSystems include:

- Visual Development
- Low-Code
- Integration
- Deployment
- Scalability
- Security
- Monitoring & Analytics
- Collaboration



05

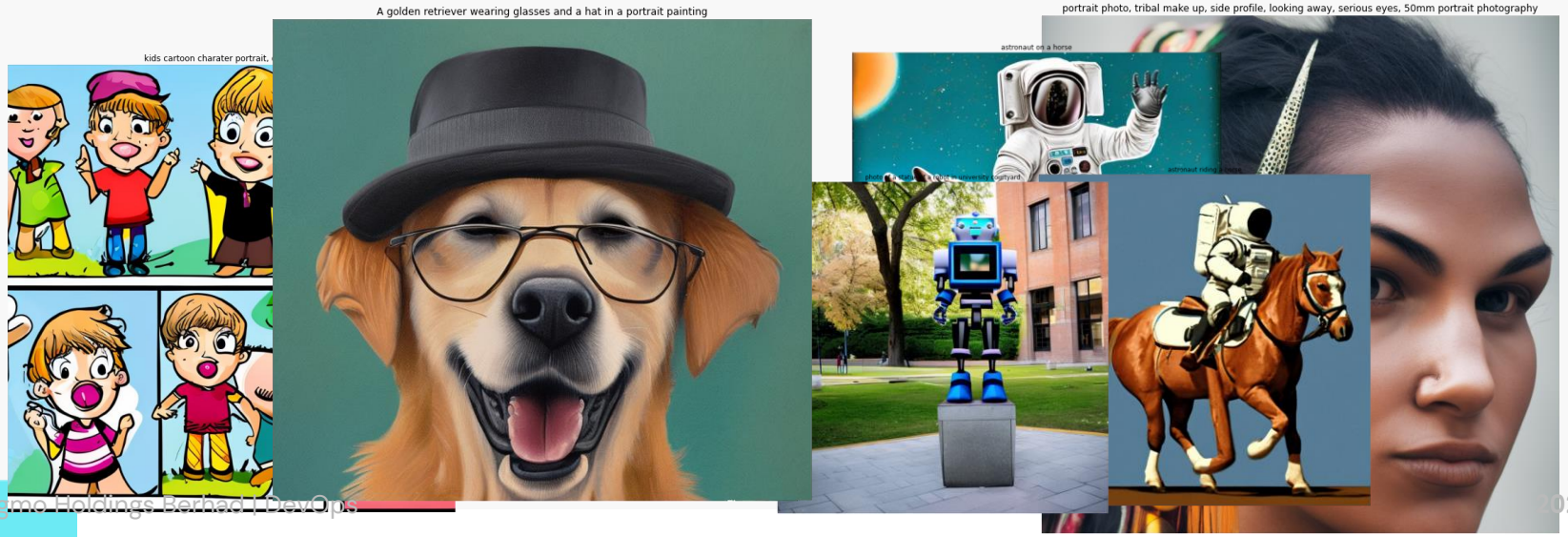
Agmo

AWS Generative AI Introduction

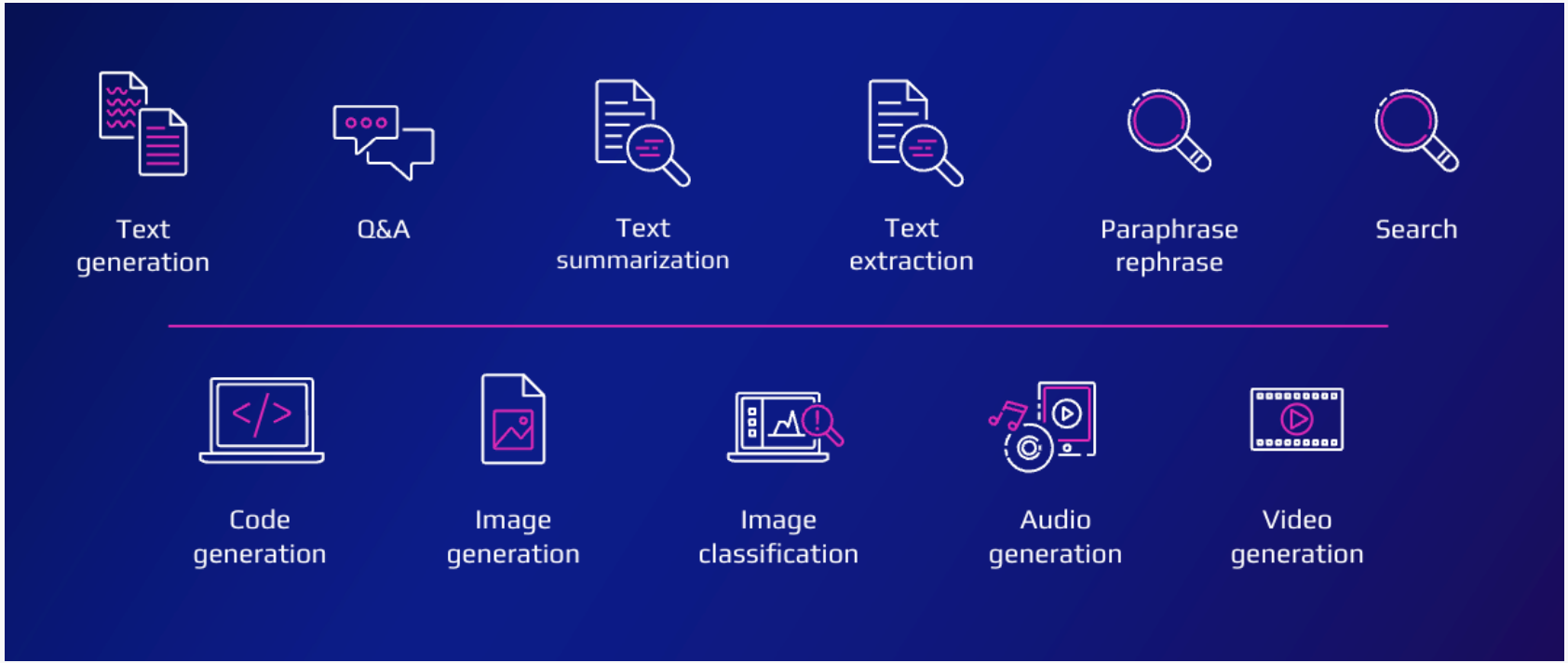
What is Generative AI?

1. Creates new content & ideas, including **conversations, stories, images, videos & music**

2. Powered by large models that are pretrained on vast corpuses of data & commonly referred to as Foundation Models



Common Use Cases



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Let’s explore what
the future of Kuala Lumpur
looks like *when using Generative AI?*
Agmo Holdings Berhad | DevOps
2023

Triple Towers *with High Tech Rail*

- Generated by Generative AI

Space Ship *as Public Transport*

- Generated by Generative AI

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Agmo is HIRING!

- Project Manager/ Business Analysts
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- Mobile Apps Developers
- Backend Developers
- Data Scientist
- Quality Assurance
- Technical Support
- UI/ UX Designer
- Business Development

Apply at hr@agmogroup.com

Let's connect!

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Quiz time!

The winner will be determined based on the **highest score achieved** within the **shortest time frame**

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Join via QR code

Game Code 876333

1. Use any device to open

joinmyquiz.com/pro

2. Enter join code

876333

Let's connect!

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