

DIGITIZATION IN GOVERNMENT SERVICE: LESSONS FROM THE TRENCHES

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A man with dark hair and glasses, wearing a dark suit jacket over a white shirt and a white scarf, is speaking at a podium. He is gesturing with his right hand. A small microphone is clipped to his scarf. The background is a dark, wood-paneled wall. In the foreground, a wooden podium is visible.

Prof Ben



DIRECTOR (2014-2019)

EXPERIMENTAL SYSTEMS &

TECHNOLOGY LAB (ESTL)

MINISTRY OF EDUCATION



Credit:Marvel

1 Jul 2014

started

30 Jun 2019



Why so
small?

~~More people
is better~~

good team

>> big team



Credit:ESTL, MOE

Don't hire in
a hurry

Good things
take time

SC MOBILE



SC:MOBILE

health



attendance



SOFTWARE DEVELOPMENT

~~OLD~~

Unit/Branch craft specs



Project manager
conducts tender



Vendor builds app



User acceptance test

NEW

On-site user research



ESTL distills needs



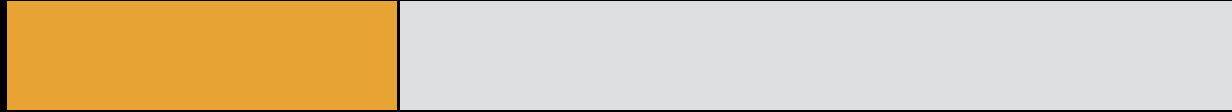
ESTL builds app



Software development
without writing specs!

TIME SPENT

App Development

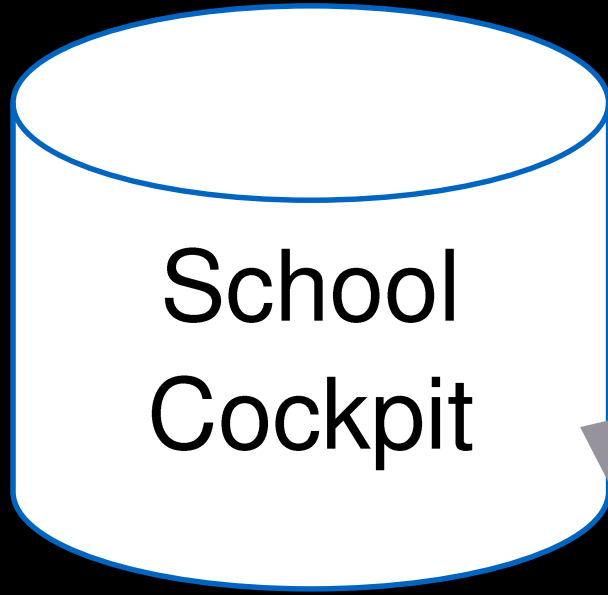


Time sinks

- Budget Processes
- Infrastructure
- IM8 + Security Compliance
- Integration with School Cockpit via APIs

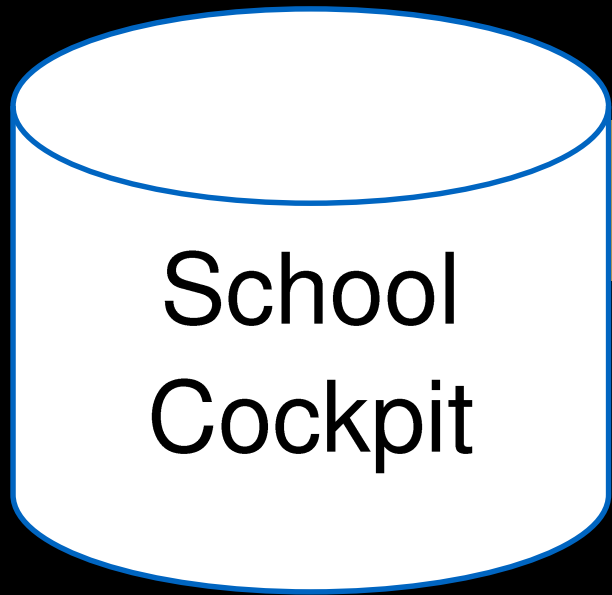
Dealing with legacy

old



INTRANET

INTERNET



new

APIs



FUTURE
SYSTEMS
+ SYSTEM
REFRESH

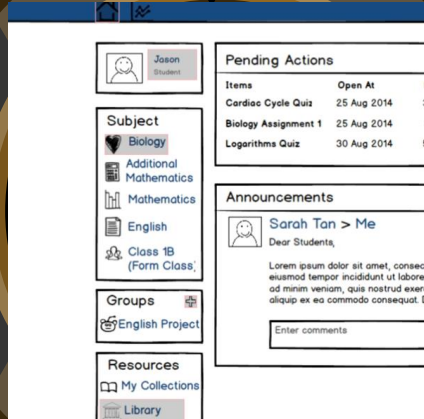


INTRANET

INTERNET

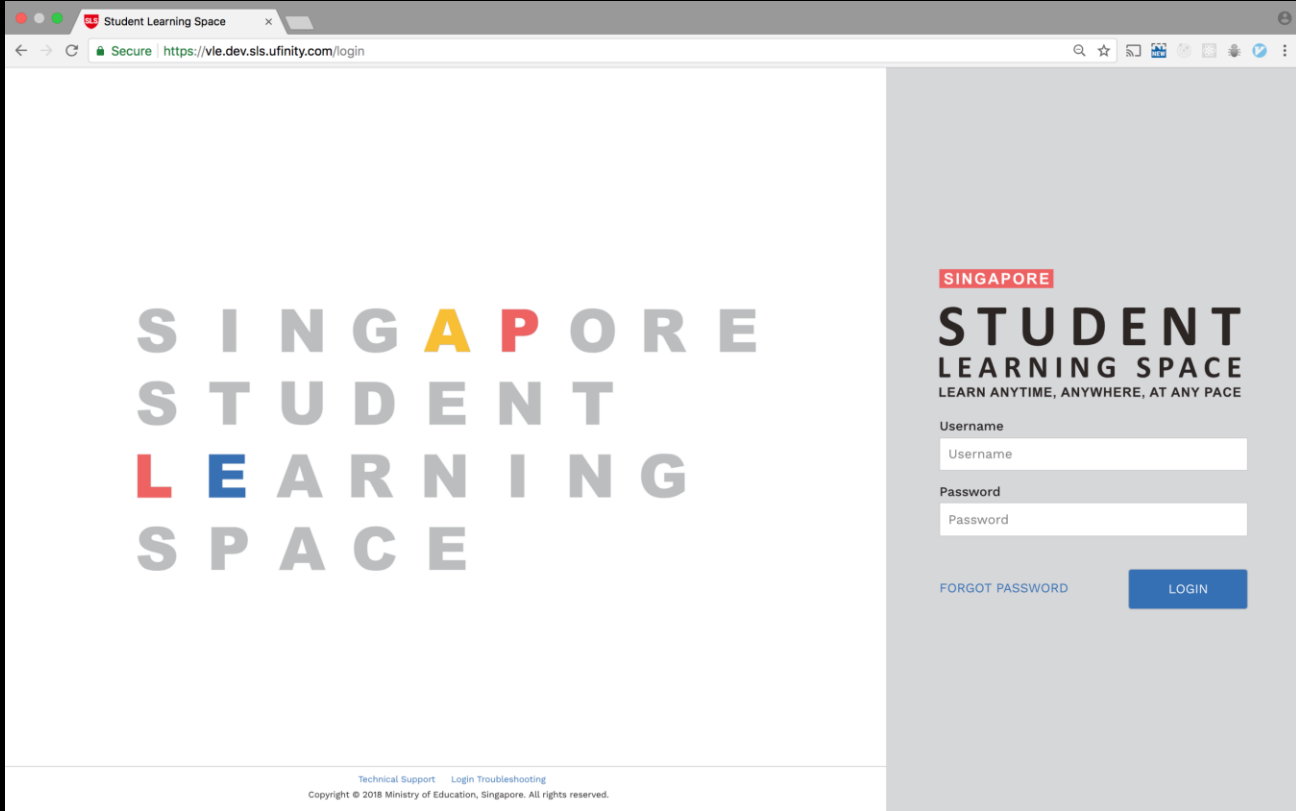
Big bang
replacements
are too risky

Good things
take time



SLS

Student Learning Space



S I N G A P O R E
S T U D E N T
L E A R N I N G
S P A C E

SINGAPORE

STUDENT
LEARNING SPACE
LEARN ANYTIME, ANYWHERE, AT ANY PACE

Username

Password

[FORGOT PASSWORD](#)

HOW WE WRITE TENDER SPECS

~~OLD~~

~~Project manager invites all
stake holders into a room~~

~~Stakeholders ask for what
they want~~

~~Project manager makes up
a list of wants into tender
specs~~

NEW

Stakeholders list out what
they need

ESTL draws the mockup

Mockup sent to
stakeholders

Write tender specs

←
Not
happy?

Users don't know
what they want

Even if they know
what they want, it's
hard for them to
express it.

Procurement challenges

Business needs
evolve

Agile

(SCRUM)

Quality of software

!= SCRUM

= Quality of software
engineers

Agile software
development needs
a product owner

Vendors will bid for
“unreasonable”
tenders!

Key focus of modern
Software development

***User
Experience***

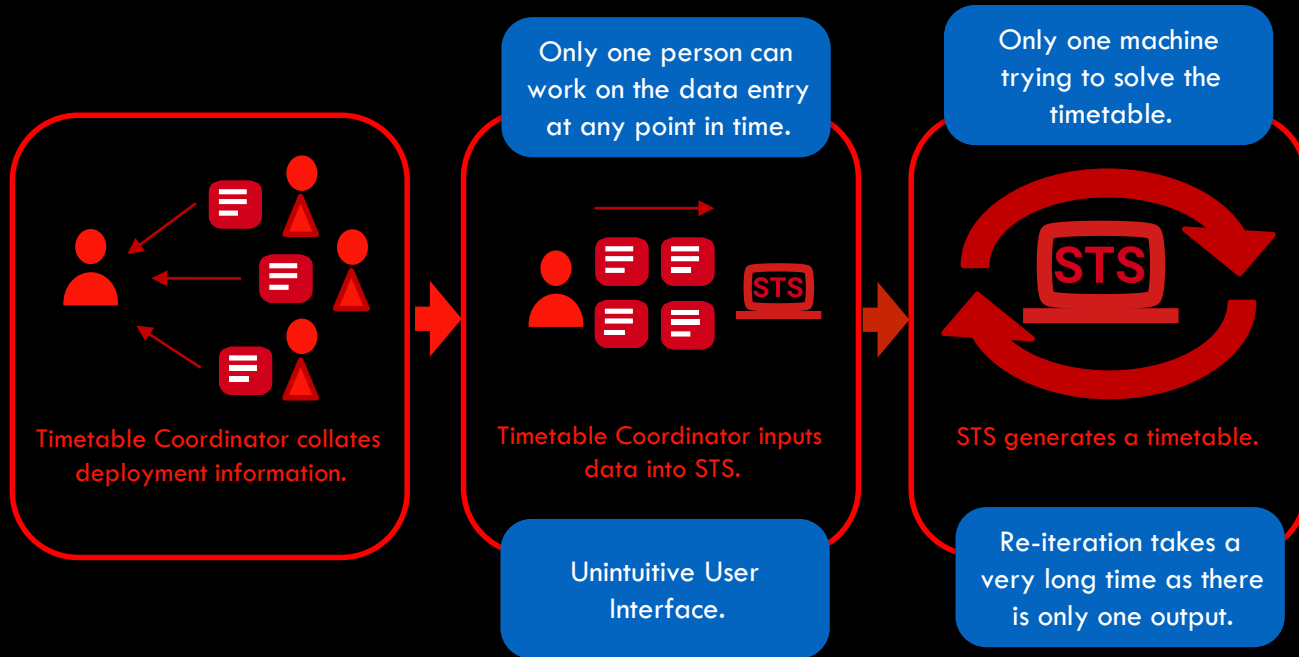
Principle of "Air"

Good things
take time

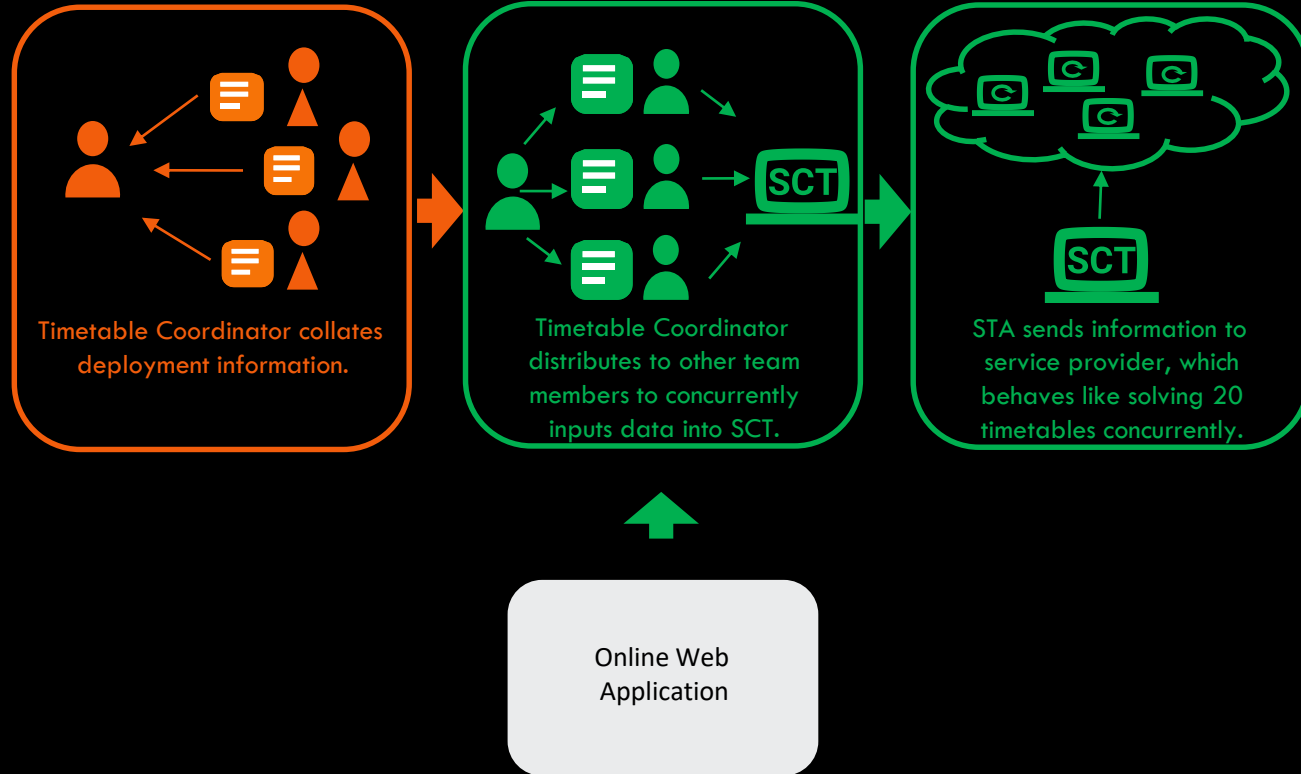


School Timetabling Application

In the previous system...



With the new system...



Don't "cloud it" just
because everyone
else is doing it.

Think: business
process
re-engineering

Think: better
collaboration

School Timetable App (STA)

STA
2019-SEM1 (47)
TIMETABLE
RESULTS
Pre-Generation
STAFF
0000000050001
LOGOUT

MANAGE TIMETABLES

SETUP

- Timetable
- Subjects
- Resources
- Class Formats
- Classes
- Teachers
- Time Preferences
- Deploy
- Lesson Sequence

FIX DEPLOYMENTS

GENERATE

REPORTS

GO TO RELIEF PLANNING MODULE

DEPLOYMENT SETUP

ADD NEW DEPLOYMENT
DELETE DEPLOYMENTS
BAND
UNBAND
SET TIME PREFERENCE
ASSIGN TEACHERS

Filter by keywords

<input type="checkbox"/>	Teacher	Class	Subject	Periods	Band Grp	Resources	No. of Resources	Day Distribution	Time Pref	Duplicate	Delete
<input type="checkbox"/>	SIOW XY	1E1	ART	2	-	ART RM	1	1, 2, 3, 4, 5	-		
<input type="checkbox"/>	MATTHEW	1E1	EL	2211	-	-	-	1, 2, 3, 4, 5	-		
<input type="checkbox"/>	AMY, PRABHLEEN	1E1	FCE	3	-	FCE RM	2	1, 2, 3, 4, 5	-		
<input type="checkbox"/>	HIS, KEIRA	1E1	HIS	211	-	-	-	1, 2, 3, 4, 5	-		
<input type="checkbox"/>	SIVAKAMI	1E1	LIT	2	-	-	-	1, 2, 3, 4, 5	-		
<input type="checkbox"/>	PRATHAP	1E1	LSS (BIO)	2	-	-	-	1, 2, 3, 4, 5	-		
<input type="checkbox"/>	LOW HM	1E1	LSS (PHY)	211	-	-	-	1, 2, 3, 4, 5	-		
<input type="checkbox"/>	JOY	1E1	MU	2	-	MUSIC RM	1	1, 2, 3, 4, 5	-		
<input type="checkbox"/>	JONATHAN	1E1	PE	22	-	PE VENUE	1	1, 2, 3, 4, 5	-		
<input type="checkbox"/>	LOW MJ	1E1, 1E2, 1E3, 1E4	HCL	2	SEC 1 MTL	SPARE RM	1	1, 2, 3, 4, 5	-		
<input type="checkbox"/>	DHINESH, GAN YN, GOH SH, JONATHAN, KASUMAWATI, PRATHAP, ROZAINA, SIVAKAMI	1E1, 1E2, 1E3, 1E4	CCE	2	SEC 1 CCE	-	-	1, 2, 3, 4, 5	-		

School Timetable App (STA)

STA
STAFF 0000000050001 LOGOUT

2019-SEM1 (47)
TIMETABLE

RESULTS
Pre-Generation

FIX DEPLOYMENTS

MASTER
CLASS
TEACHER
RESOURCE

View as: Class

Show rows for selected lesson only

UNSLLOT ALL
FIX ALL
UNFIX ALL
DUPLICATE TIMETABLE

Class	Mon													
	3 2	4 3	5 4	6 5	7 6	8 7	9 8	10 9	11 10	12 11	13 12	1 0	2 1	
1E1	ASSEMBLY	MTL PW DING CHAO,FAJT1,FAJT2,FA...	RECESS		EL MATTHEW		HIS HIS,KEIRA		TL,CL,HCL... GANDHI,LO...	MA GOH SH,YONG LP		ASSEMBLY	ASM JONATHA	
1E2	ASSEMBLY	MTL PW DING CHAO,FAJT1,FAJT2,FA...	RECESS		HIS KEIRA		PE MATTHEW,UGT2		CL,TL,HCL... DING CHAO...	EL HIS,RONALD		ASSEMBLY	ASM DING CHAO	
1E3	ASSEMBLY	MTL PW DING CHAO,FAJT1,FAJT2,FA...	RECESS		LSS (PHY) LOW HM		EL SANDRA		TL,HCL,ML... GANDHI,LO...	HIS SAMANTHA		ASSEMBLY	ASM SHIAN PK	
1E4	ASSEMBLY	MTL PW DING CHAO,FAJT1,FAJT2,FA...	RECESS		LSS (PHY) JAMES TAN	FCE AMY,GRACE			CL,TL,HCL... FAJT2,GAND...	MA STELLA		ASSEMBLY	ASM GAN YN,KE	
1N5	ASSEMBLY	MTL PW DING CHAO,FAJT1,FAJT2,FA...	RECESS		LSS (PHY) EVAN		EL RONALD		CL,TL,ML... FAJT5,SHAN...	MA GOH SH,YONG LP		ASSEMBLY	ASM GOH SH	
1N6	ASSEMBLY	MTL PW DING CHAO,FAJT1,FAJT2,FA...	RECESS		LIT GAN YN,SANDRA		ART CHEW YY		CL,TL,ML... LU JING,SH...	HIS KEIRA		ASSEMBLY	ASM NAR SK	

MANAGE TIMETABLES

SETUP

FIX DEPLOYMENTS

GENERATE

REPORTS

GO TO RELIEF PLANNING MODULE

The AWS instance

STA 2019-SEM1 (47) TIMETABLE (Read-only) RESULTS Pre-Generation STAFF 0000000050001 LOGOUT

GENERATION RESULTS

TERMINATE SELECTED RUNS

Filter by Keywords

Click on a row to view the details of the run.
Click on the view icon of a row with a Run Status of **Complete** to view the results in the timetable view

<input type="checkbox"/>	JOB ID	RUN NO.	RUN STATUS	DATE STARTED ▼	DATE RESULTS UPDATED	LESSONS SENT TO SOLVER	UNSLOTTED LESSONS	VIEW RESULTS
<input type="checkbox"/>	624	1	Starting	2019-03-17 14:33	-	450	0	
<input type="checkbox"/>	624	2	Starting	2019-03-17 14:33	-	450	0	
<input type="checkbox"/>	624	3	Starting	2019-03-17 14:33	-	450	0	
<input type="checkbox"/>	624	4	Starting	2019-03-17 14:33	-	450	0	
<input type="checkbox"/>	624	5	Starting	2019-03-17 14:33	-	450	0	

MANAGE TIMETABLES

SETUP ▾

FIX DEPLOYMENTS

GENERATE ▴

Generate

Results

REPORTS ▾

GO TO RELIEF PLANNING MODULE →

Poor UX?

I agree!

Change
management is
difficult, but very
important

Security policy vs.
Common sense



R U N / F I

1.6/2.4 km

Run Monitoring System
(Run/Fi)

Vendors' systems

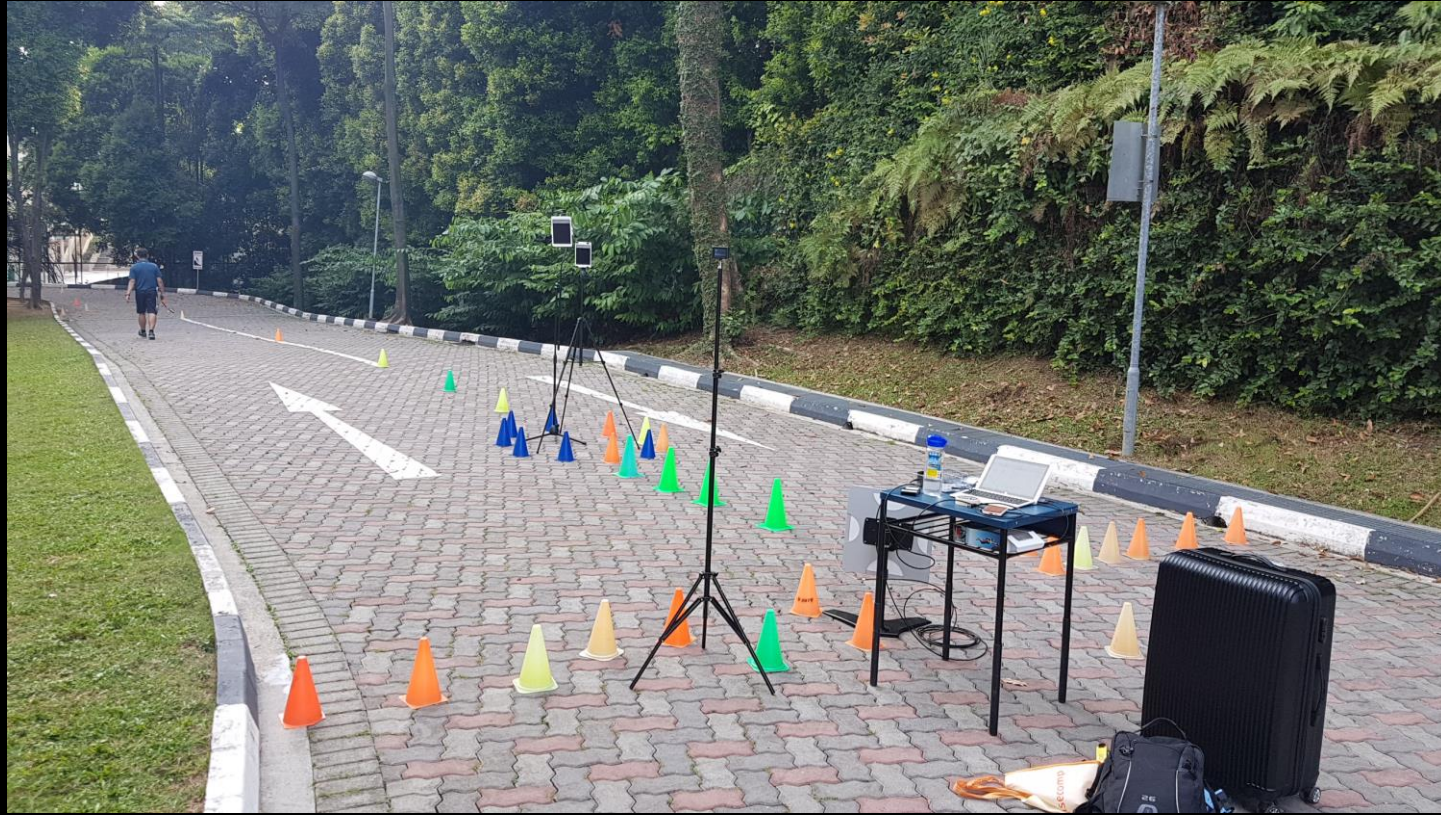


Requires purchase
of dedicated laptop

Requires power
supply

Heavy &
bulky





Lightweight, portable by one person, AC power not required.

Some "failures"
are inevitable

Software/AI is
no silver bullet



Will AI or ChatGPT make software engineers obsolete?



No, AI or ChatGPT is not likely to make software engineers obsolete in the foreseeable future. While AI has made significant progress in recent years in automating certain aspects of software development, such as generating code, testing, and debugging, there are still many complex tasks that require human intelligence and expertise.



Software engineers play a critical role in designing and developing software applications, ensuring their quality, security, and performance, and maintaining them over time. They also bring a deep understanding of user needs and business requirements, as well as experience in collaborating with other team members and stakeholders.

In addition, the field of software engineering is constantly evolving, with new technologies and tools emerging all the time. As such, software engineers will continue to play a key role in shaping the future of software development and ensuring that the software applications we rely on every day meet the needs of users and businesses. While AI and ChatGPT can support and enhance the work of software engineers, they cannot fully replace the critical thinking and creativity that software engineers bring to the table.



Will AI or ChatGPT make lawyers obsolete?



No, AI or ChatGPT is not likely to make lawyers obsolete in the foreseeable future. While AI has made some progress in automating certain routine legal tasks, such as document review and contract analysis, there are many complex legal tasks that require human expertise and judgement.



Lawyers play a critical role in providing legal advice and representation, interpreting and applying the law to specific cases, and advocating for their clients in court or in negotiations. They also bring a deep understanding of legal principles and procedures, as well as experience in dealing with legal issues and disputes.

Moreover, the legal profession involves a range of soft skills such as communication, empathy, and strategic thinking, which are not easily replicated by AI. Lawyers also provide their clients with strategic advice and help navigate the legal system, which requires a deep understanding of the law, as well as experience and judgement.

While AI and ChatGPT can assist lawyers in some tasks, such as legal research and document analysis, they cannot replace the complex problem-solving and decision-making skills that lawyers bring to their clients. As such, it is unlikely that AI or ChatGPT will make lawyers obsolete in the foreseeable future.

Technology
exists to support
the business

Do the thing right

Do the right thing

Digitization is a
people/business problem.

It is not a tech problem.

(Custom)
software is
very expensive

Maintenance
can be a
hidden cost

People

really matter

Good things
take time

QUESTIONS?

