

Computer Science Workshop



**Be a coder for the day.
Solve problems.
Build skills.**

Lauriann's STEM Club



Lauriann's STEM Club

www.lauriannsstemclub.co.uk

Join us on: [Facebook](#) | [Instagram](#) | [Youtube](#)

- We raise awareness for STEM (Science, technology, Engineering & maths)
- Promoting STEM in Schools through our school outreach by delivering fun engaging workshops, activities and events
- We encourage more Women and Minorities into STEM
- Founded by Lauriann who has a background in Civil Engineering
- Based in the London Borough of Bexley

Outline of the Session



About Me and My Job

Software Development in the Real World

DIY - Do It Yourself!



Build a FakeBook News Feed

- Design
- Code
- Test
- Evaluate



Feedback

About Me - Jackie

I work as a **Software Developer** at **Credit Suisse** in **Canary Wharf**

Credit Suisse is a **Global Bank**

- 48770 employees
- head office in **Zurich, Switzerland**
- offices in 50 countries including **China, India, Poland, Singapore, UK, USA, Brazil**



About My Job - Software Developer



Also called:

- Application Developer
- Software Engineer
- Programmer
- Coder

A Software Developer **build apps**.

In a bank like CS there are literally **thousands** of apps!

(last count, 26,478)

About My Job - Software Developer

I've been working as a programmer for **20 years**.

I've worked on:



Road Accidents - An app which analyses the road accident information by the number of fatalities, finds the most dangerous sections of roads so that engineers can visit those sections of roads to see what can be done.



Vehicle Tracking - Apps which process messages from units installed on vehicles, detects accidents and automatically contacts 999 to send an ambulance to the vehicle's location.



Energy Trading - Oil/Gas/Airline Fuel - Apps which calculate the correct price of trades and highlight risks to the traders.



Liquidity Management - Apps which take the banks cash commitments, run a number of hypothetical scenarios to see if the bank will go bust.



FX Trading - Apps which analyse the trades which have already been done, calculating the correct price of the trades and highlight risk to the traders. App which checks if the price that was charged to clients was a fair price.

Python
C#
C++
Java
VBA
SQL

About My Job - Software Developer

It's fun!

*I work
with ppl*

*I enjoy
coding*



*Solve
Problems*

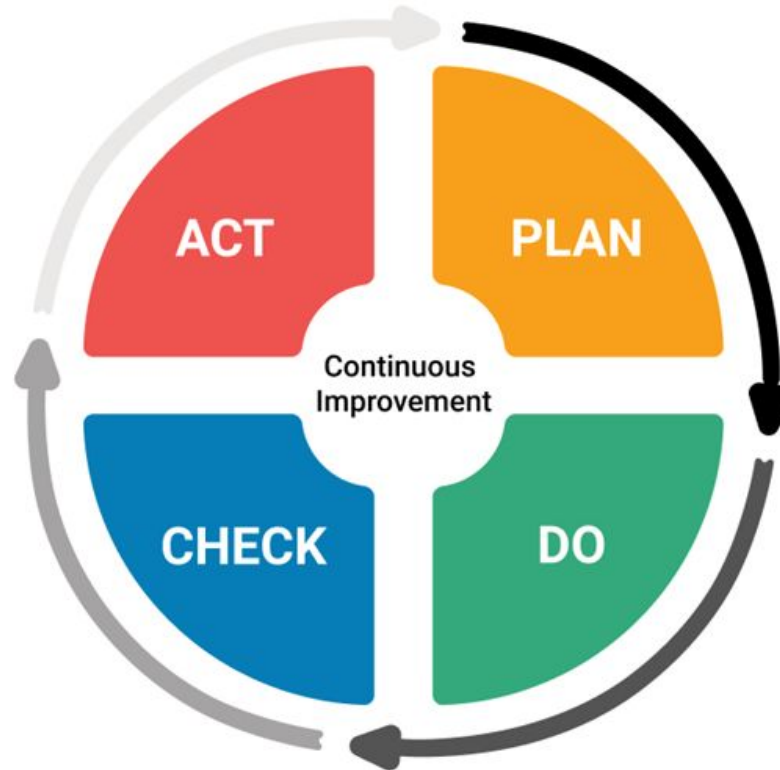
*Always
Learning*

*Helping
People*

IRL => The PDCA Cycle - Continuous Improvement

Retrospective
-How did it go?
-Can we improve?

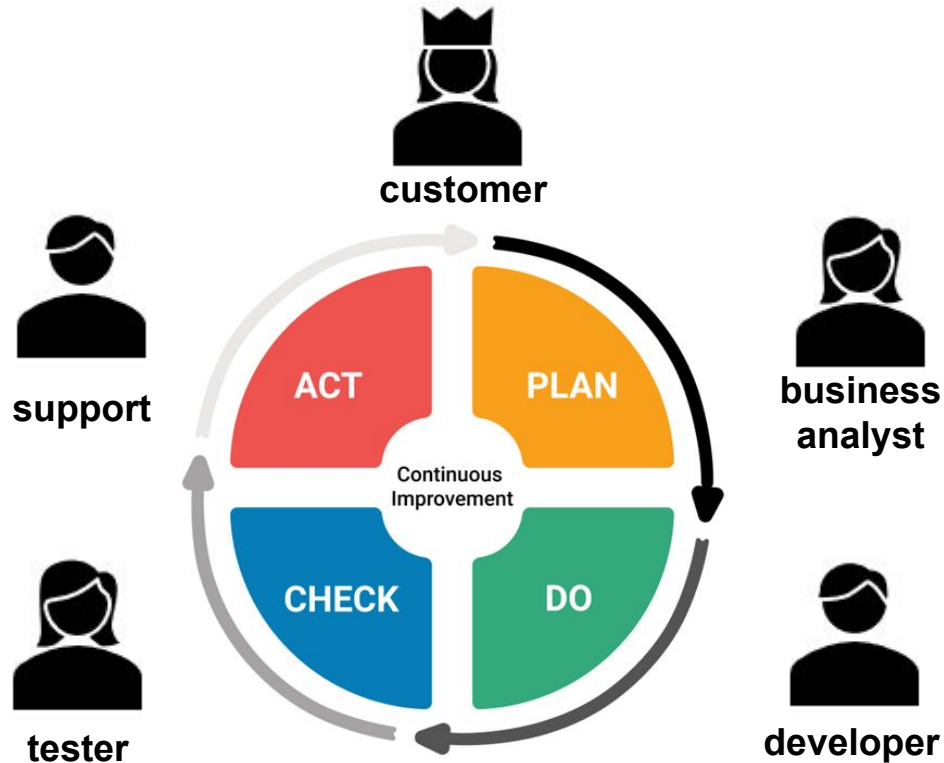
Test it!
-Internal
-External



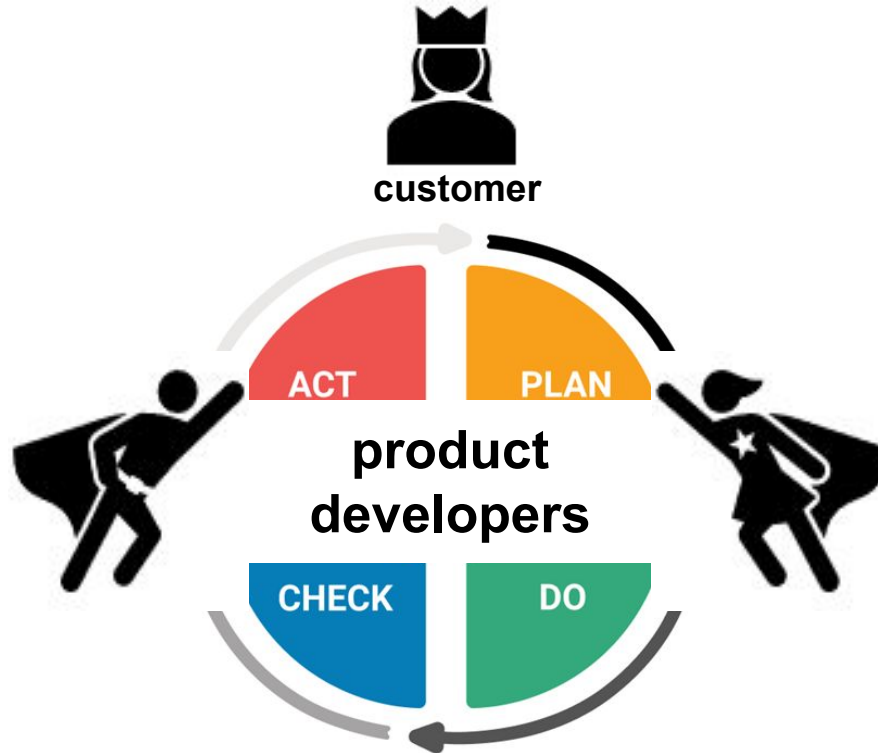
Requirements Analysis
Design

Build it!
-Implementation
-Development

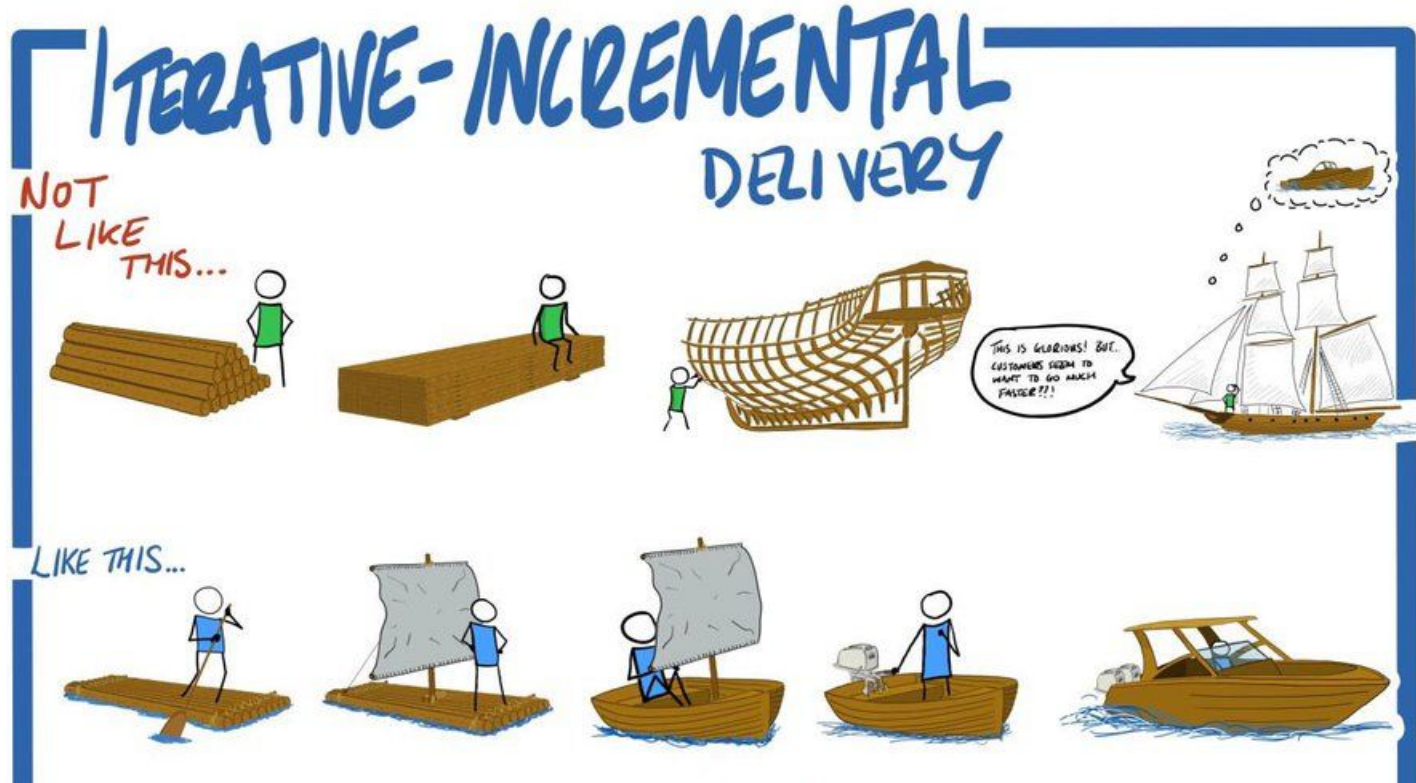
IRL => Software Development Roles... In the Past



IRL => Software Development Roles... Modern



IRL => Agile - Incremental Delivery



Fakebook News Feed

Let's get started!

=====FAKEBOOK NEWS FEED - TOP 20 =====

Muhammad [21:11] => Why me (5 likes)

Oliver [20:02] => I've finally finished my Maths assignment (1 likes)

Isla [19:38] => Why me (3 likes)

Isla [19:32] => Wish I hadn't gone to bed so late last night... (3 likes)

Noah [19:20] => Christmas cups are here... just saying! (1 likes)

Muhammad [19:08] => Is that ref serious??? (2 likes)

Noah [18:56] => No seriously, who is doing the official posters for the new Matrix movies? They're so bad! (1 likes)

Noah [18:50] => Christmas cups are here... just saying! (5 likes)

Muhammad [18:38] => Thank you my CheChe for the delicious chocolates! (2 likes)

Noah [18:20] => No seriously, who is doing the official posters for the new Matrix movies? They're so bad! (0 likes)

Noah [18:11] => Wish I hadn't gone to bed so late last night... (0 likes)

Muhammad [18:08] => Christmas cups are here... just saying! (2 likes)

Isla [18:05] => Any suggestions for dinner tonight? So bored with FOOD! (3 likes)

Noah [17:59] => BC81 tonight - awesome music, felt really pumped. (2 likes)

Muhammad [17:56] => Yay Friday! Can't wait to CHILL (2 likes)

Noah [17:29] => Did anyone catch the sunset this afternoon? Wow. Just Wow. (2 likes)

Noah [17:20] => Had a really tough day today (0 likes)

Isla [17:11] => Wish I hadn't gone to bed so late last night... (5 likes)

Noah [16:32] => Did anyone catch the sunset this afternoon? Wow. Just Wow. (2 likes)

=====



Build a FakeBook News Feed

PLAN - 10 mins

You've been tasked with building a FakeBook News Feed.

Brainstorm in groups of 4. Find a project space to display your ideas.



Task 1 - Design

Come up with a very high level design for your FakeBook system
What are the parts of your Facebook system?
What do you need to build?

Draw your ideas on a piece of paper.



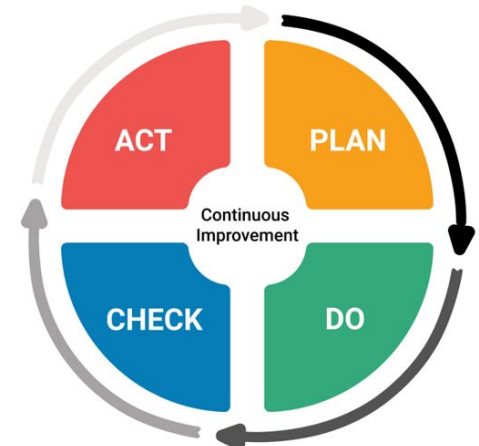
Task 2 - Requirements Analysis

What tasks will you need to do to build the system?
What are the most important tasks? Which tasks will you do first?

Write your ideas down on post-it notes and arrange them in order.

Remember: Incremental Development

First build the simplest thing that will work, then add more fancy features if you have time.



PLAN - Design



PLAN

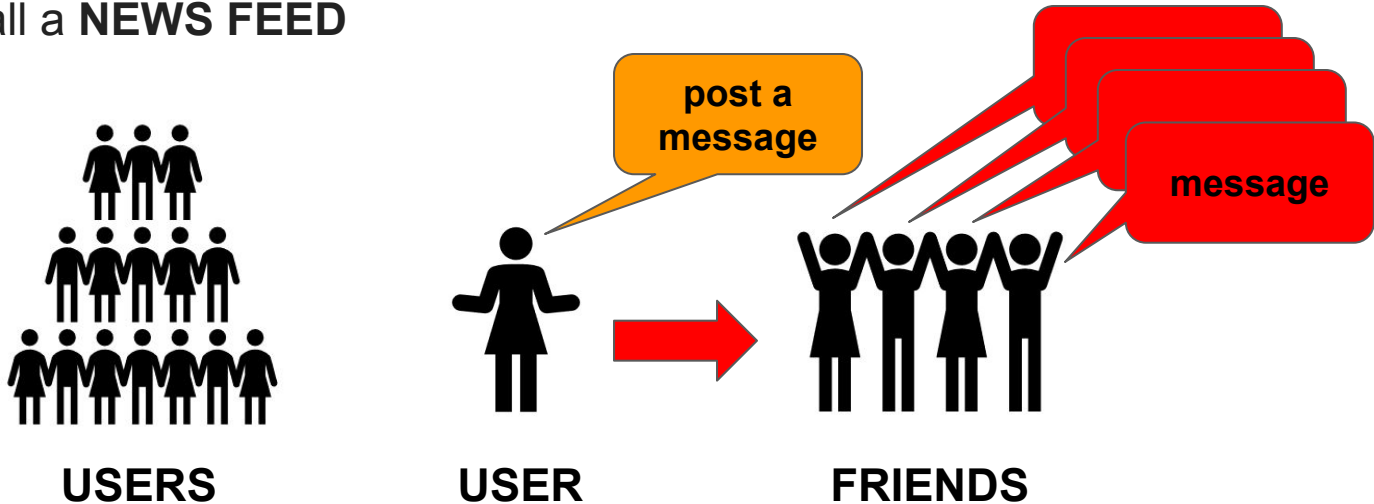
The system has a list of **USERS**

Each user will have a group of **FRIENDS**

A user can **POST** a message which only his friends can see

A user needs to be able to read recent messages from his friends...

this is what we call a **NEWS FEED**



PLAN - Requirements Analysis



PLAN

Task List

1. Build and Display a List of Users
2. Build and Display a List of Friends
3. Check if a User is a Friend
4. Randomly Generate some Posts for Testing
5. Add Friends
6. Build a News Feed
7. Add a Post
8. Like a Post

**Assume we are already logged in for a single user.*



DO - Let's build it!

DO - 30 mins

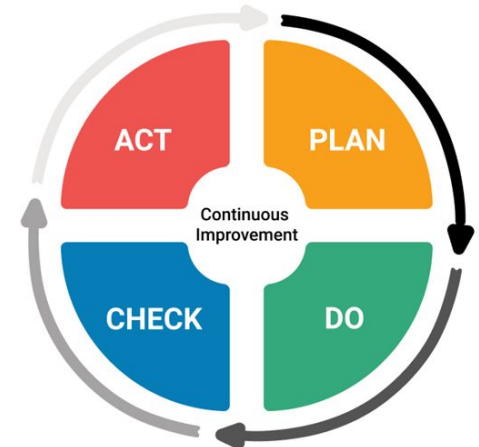
Fast forward a week and your team has already completed these features:

1. Build and Display a List of Users - DONE
2. Build and Display a List of Friends - DONE
3. Check if a User is a Friend - DONE
4. Randomly Generate some Posts for Testing - DONE

Test the features your team already wrote, and then work on the remaining tasks:

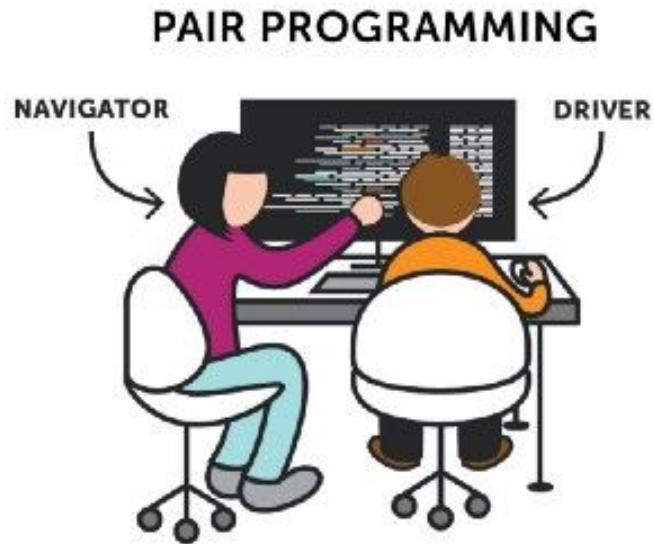
5. Add Friends
6. Build a News Feed
7. Add a Post
8. Like a Post

Work in pairs. Assume we are already logged in for a single user.



IRL => Pair Programming

DO



Task 1 - Test Existing Features

DO

Fast forward a week and your team has already completed these features:

1. Build and Display a List of Users - DONE
2. Build and Display a List of Friends - DONE
3. Check if a User is a Friend - DONE
4. Randomly Generate some Posts for Testing - DONE

Test the features your team already wrote:

```
print users()
```

```
print friends()
```

```
print(is_friend("Jackie"))
```

```
print(POSTS)
```

Task 2 - Add Friends

DO

You have no friends!
How sad...

Let's fix that by adding some friends:

- a) Hard-code adding a friend
- b) Ask the user to choose a friend's name
- c) Ask the user to enter 5 friends' names



```
# HINTS

# you can add a friend like this
add_friend('Jackie')

# you can get input from the user like this
some_input = input("Get input from user")

# you can use a for loop to repeat some code
for i in range(0,5):
    <do something here>
```

Task 2 - Add Friends



DO

```
#a)
add_friend('Noah')
add_friend('Isla')
add_friend('Adam')
add_friend('Muhammad')
add_friend('Oliver')
```

```
#b)
friend = input("Please choose a friend: ")
add_friend(friend)
```

```
#c)
print("You can choose 5 friends.")
for i in range(0,5):
    friend = input("Enter a friend's name: ")
    add_friend(friend)
```

```
#CHECK IF YOU HAVE ANY FRIENDS NOW?
print_friends()
```

```
print("Is Noah a friend?")
print(is_friend("Noah"))
```

```
print("Is Mayaa friend?")
print(is_friend("Maya"))
```


Task 3 - News Feed

DO

Trying to display the POSTS just doesn't seem to work - it's a MESS!

There are just far too many to read and it doesn't look pretty...

- a) Build a News Feed to display all Posts
- b) Build a News Feed to display only Posts from a Friend
- c) Build a News Feed to display only Posts from your Friends
- d) Build a News Feed to display only the last 20 Posts from all your Friends



```
# HINTS
```

```
# you can loop through the posts
for post in POSTS.values():
    print(post)
```

```
# you can check which user posted the msg
post.name
```

```
# you can check if a user is a friend
is_friend("Jackie")
```

Task 3 - News Feed



DO

```
#a)
print("FAKEBOOK NEWS FEED")
for post in POSTS.values():
    print(post)
```

```
#b)
print("FAKEBOOK NEWS FEED - Noah ONLY")
for post in POSTS.values():
    if post.name == "Noah":
        print(post)
```

```
#c)
print("FAKEBOOK NEWS FEED - FRIENDS ONLY")
for post in POSTS.values():
    if (is_friend(post.name)):
        print(post)
```

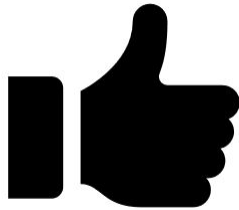
```
#d)
print("FAKEBOOK NEWS FEED - TOP 20")
post_count = 0
for post in POSTS.values():
    if is_friend(post.name) and (post_count < 20):
        print(post)
        post_count = post_count + 1
```

Task 4 - Add and Like Posts

DO

Time to start interacting with the world!

- a) Add a Post
- b) Like the Post you Added
- c) Like all Posts from a Friend



HINTS

you can add a post like this

```
post_id = add_post("User", "Your Message Here")
```

you can see the likes of a post

```
POSTS[post_id].likes
```

Task 4 - Add and Like Posts



DO

```
#a)
post_id = add_post("Noah", "Hey Guys Whatsuuuuuuuuuuupppppp")
```

```
#b) Like a Post
POSTS[post_id].likes += 100
```

```
#c) Like all Posts from a Friend
```

```
for post in POSTS.values():
    if post.name == "Isla":
        post.likes += 100
```

Extension Ideas

DO

1. Change the names of the 20 Users and change the Random Messages
2. Generate 200 Random Posts instead of 100
3. Change the way the Post is displayed to look nicer
4. Make sure that no Post is repeated by the same User
5. Have you noticed that there is a bug? When you add a new post, it is displayed last in your feed instead of first. Modify the Post class to save the full timestamp, and sort the posts before displaying them.

TEST - Does it work?

CHECK - 5 mins

Hopefully, as you built each piece of functionality, you tested it and checked that it worked.

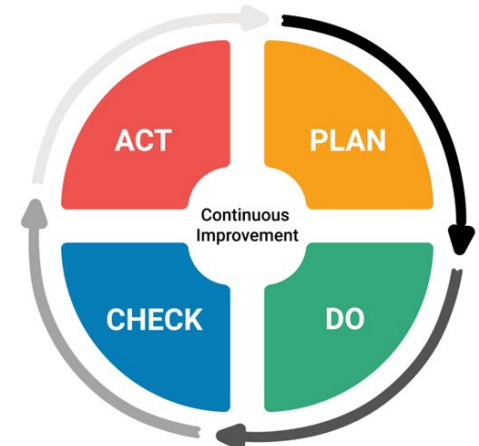
Now... let's deliver it to the customer!

Invite someone from another team to check what you have built:

Does it work?

Do they like it?

Do they want you to change anything in the next version?



Retrospective

ACT / ADJUST - 10 mins

A Retrospective is when a team reflects on the past to improve the future. We think about what worked, what didn't, and why.

In your original groups of 4, you are going to write down some ideas on post-it notes:

Start:

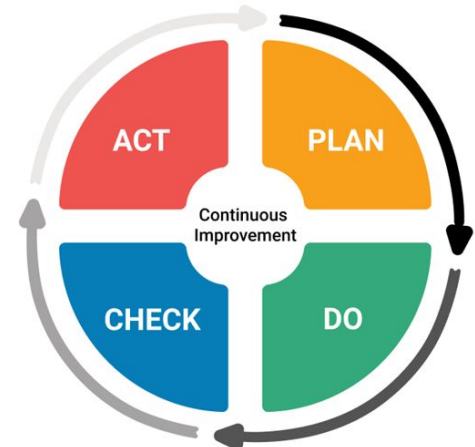
*Things that would
be good to start
doing next time*

Continue:

*Things that we did
well that we want
to keep doing next
time*

Stop:

*Things that were
not good that we
don't want to do
next time*





Feedback Forms

Please give your honest feedback on today's session so that we can improve for future sessions!

<https://tinyurl.com/LauriannStem>

