

Development & Implementation of
Auto Code Merger(ACM) Framework
into CI Automation Pipeline



About Speaker



Sunil Kumar Dhar

10+ Years of Automation Experience in CI CD systems.

Experience in Setting up Automation Labs for CI/CD Systems

Senior Technical Manager at Lab-Samsung R&D Institute, Bangalore,
Leading Automation efforts for Android Applications

Software Engineering Lab-Samsung R&D Institute, Bangalore
Karnataka India

ddhar.sunil@Samsung.com

Co Authors

Smita Basavaraj Kambi

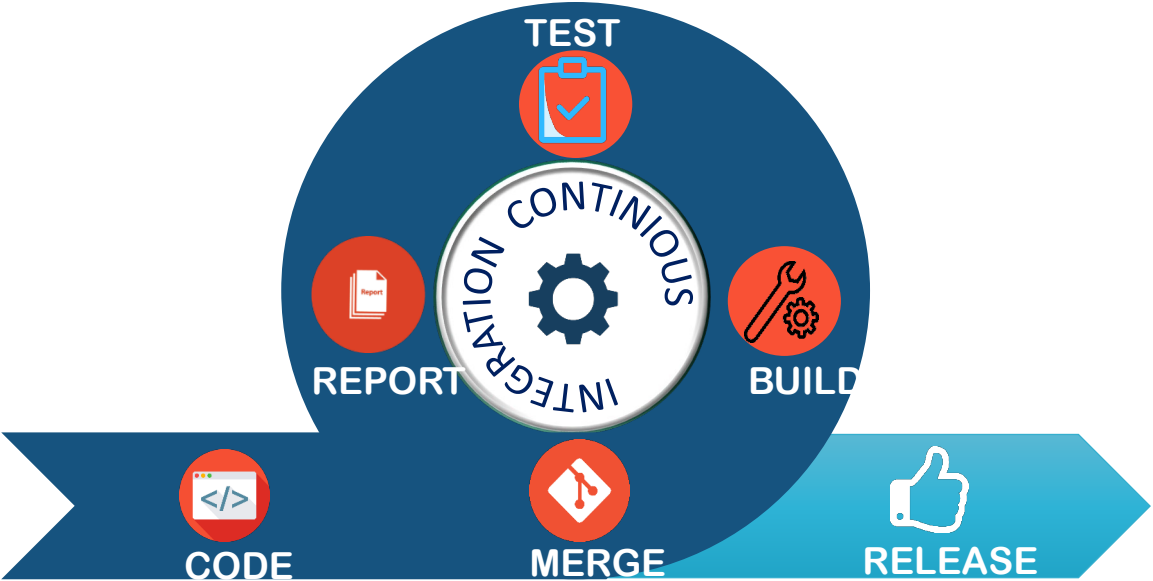
Software Engineering Lab-SamsungR&D Institute,
smita.kambi@samsung.com

Asra Naseem

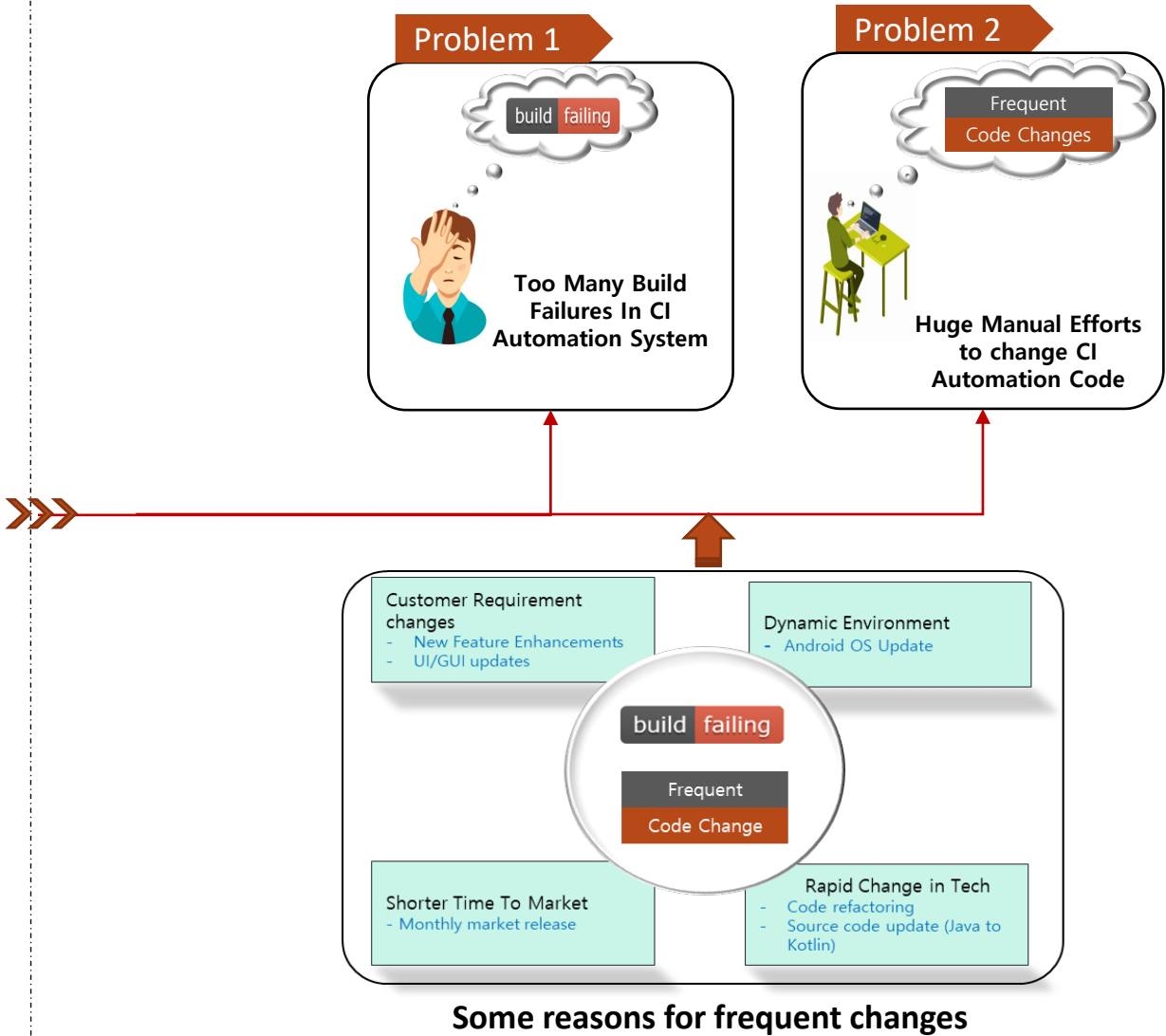
Software Engineering Lab-SamsungR&D Institute,
asra.naseem@samsung.com

Motivation / Problem Statement

Typical CI / CD System Execution



Problem Faced in CI Automation



Data Analysis & Action Item

Project Data Analysis

We started analysing the CI Automation Execution data from past 2yrs on Samsung Health project.

~296 Man-Days CI execution missed
~39.5 Man-Days efforts to fix issue

CI Execution Time Loss due to Build Fail

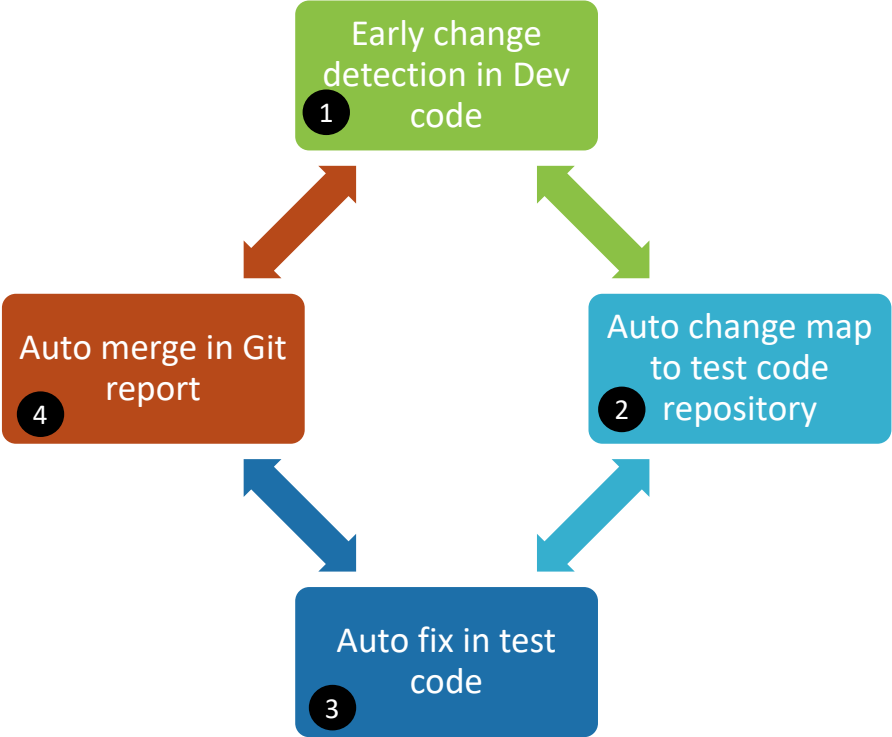
Year	Total Builds Initiated in CI System	Build Failures	Number of Jobs in CI Pipeline	Average Job Execution Time (hrs)	CI Execution Time Loss due to Build Failures (Man-Days)
Y2019	516	80	6	15	150
Y2020	507	78	6	15	146

Manual Effort Loss due to code change

Year	Total Builds Initiated in CI System	Build Failures	Avg. Build Failure Fix Duration (Manual) [per build / Hrs]	Manual Efforts to fix Build Failures (Man-Days)
Y2019	516	80	2	20
Y2020	507	78	2	19.5

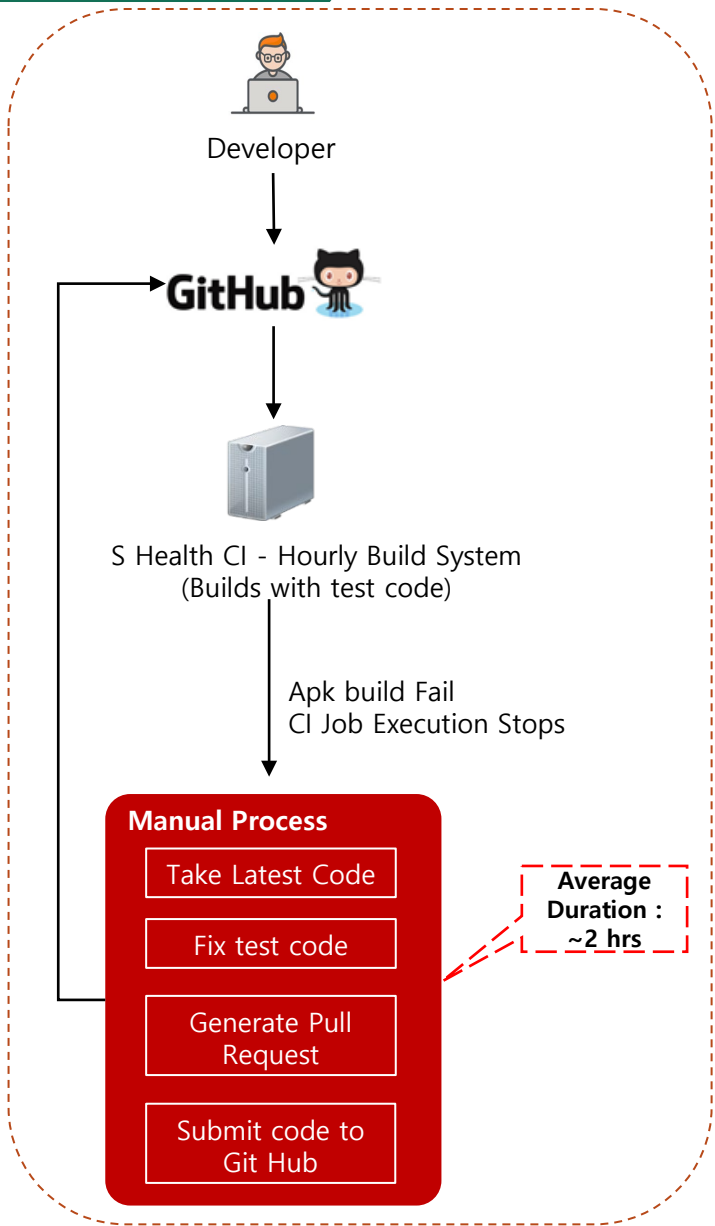


Action Item

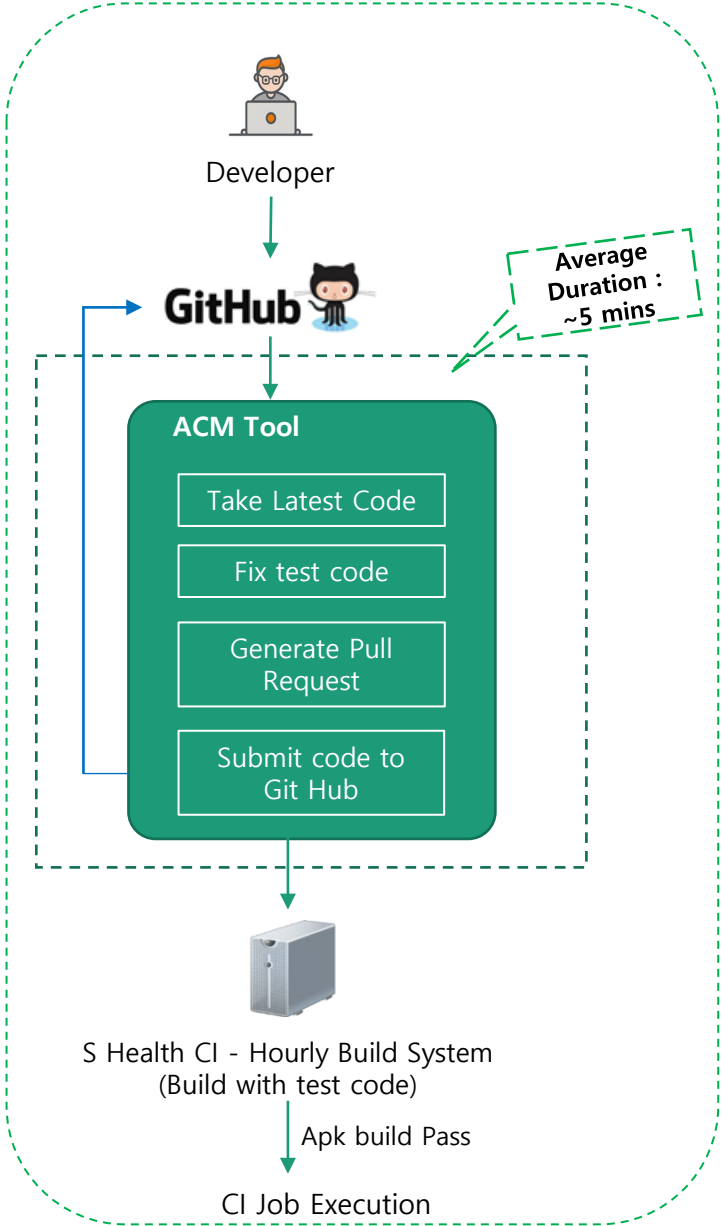


Implementation 1- ACM tool

CI Test Code Change Process - Before

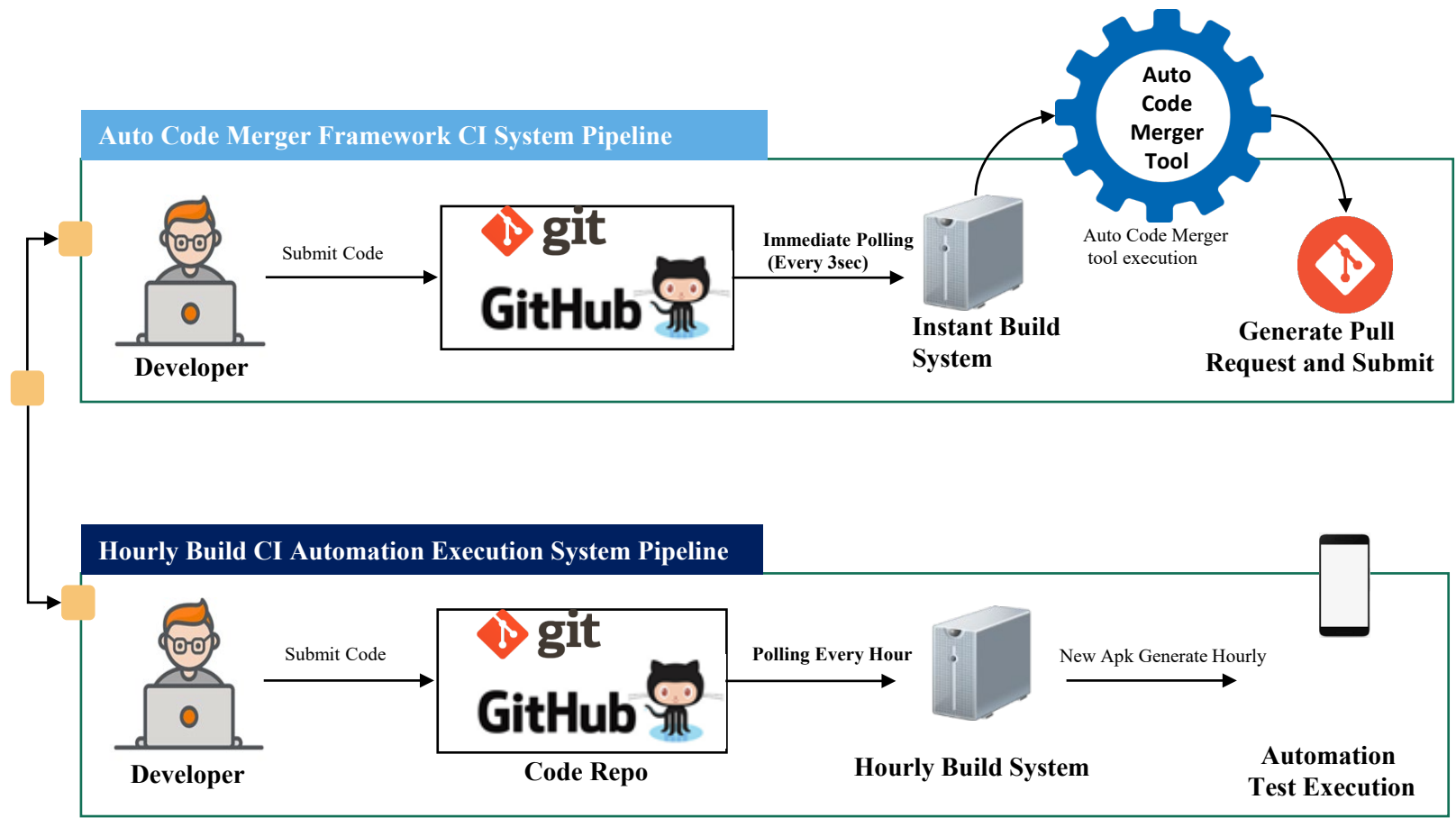


CI Test Code Change Process – With ACM



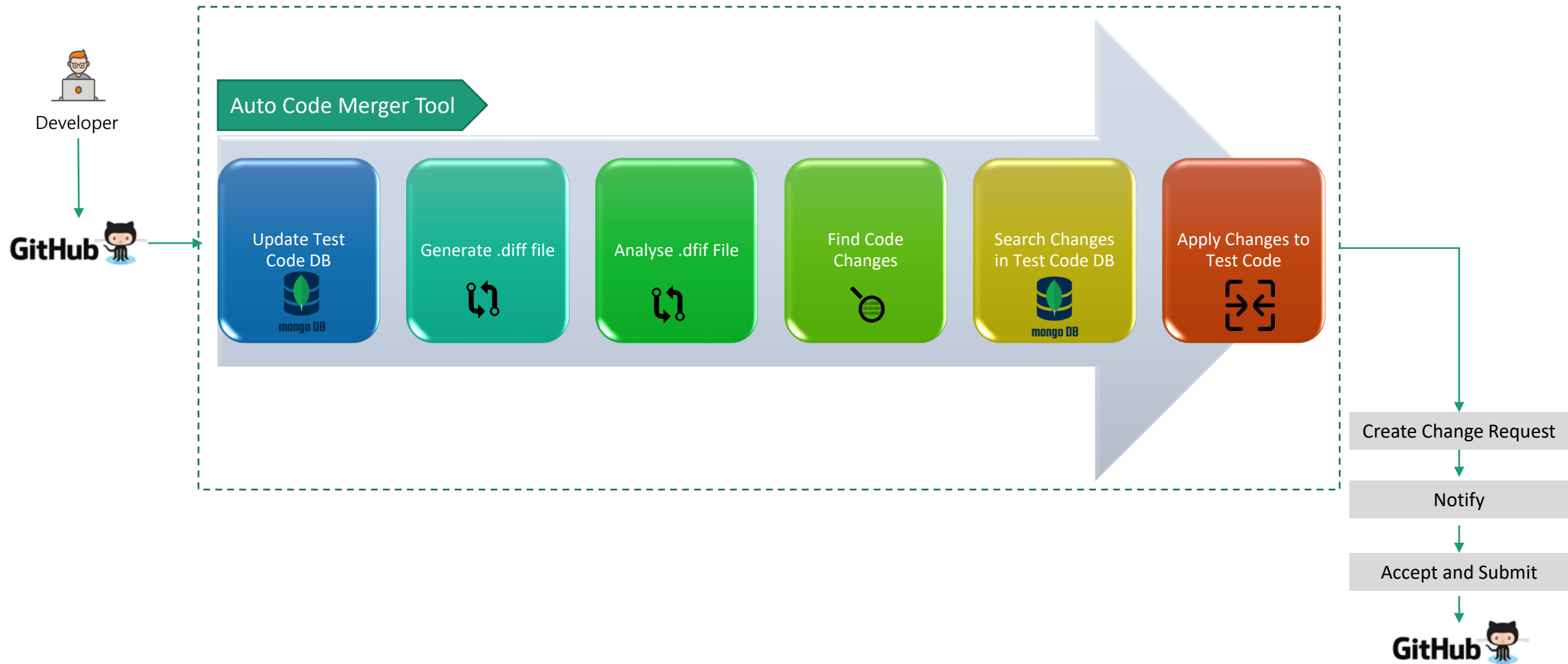
Implementation 2- ACM tool

Parallel CI Execution Pipeline



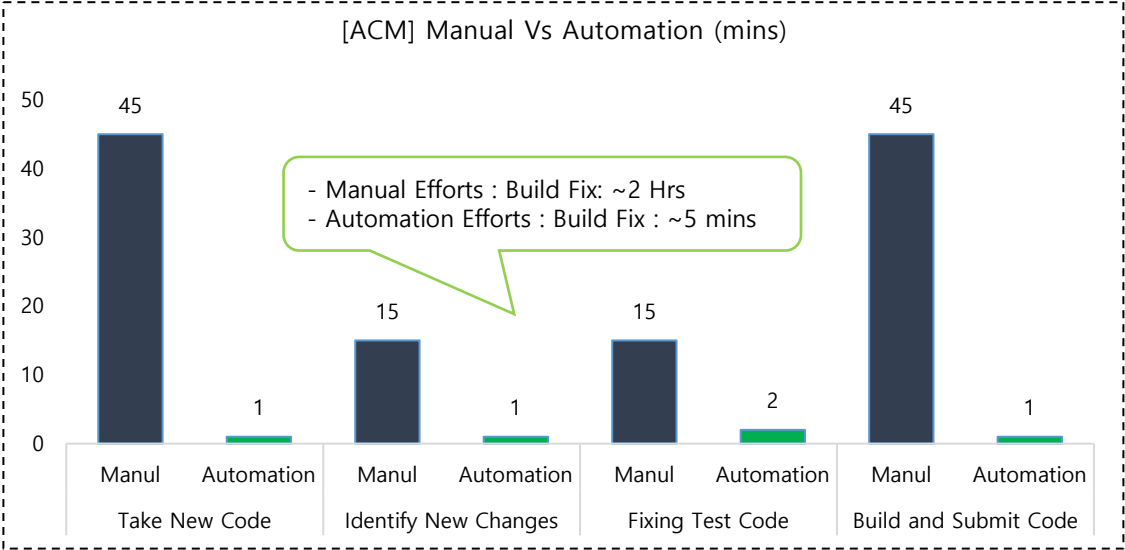
- ❑ Developed one CI Pipeline with Auto Code Review tool on parallel to Automation Execution Pipeline
- ❑ In Auto Code Merger (ACM) polling interval is very less
- ❑ ACM CI Pipeline detect and fix changes before build changes happens in Automation Pipeline

ACM Framework Development



Auto Code Merger Effectiveness

After applying Auto Code Merger(ACM) framework into our project, we have received better output from CI Execution. This data derived for duration of ~5months after ACM deployment.



~86 Man-Days CI execution missed
~11 Man-Days efforts to fix issue

CI Execution Time Saved by ACM

Jobs in CI Pipeline	Average Job Execution Duration (hrs)	Total Build Failures Saved	Man-Days Saved
6	15	46	86

Manual Effort Saved by ACM

Total Build Failures Saved	Manual Efforts (hrs)	Automation Efforts (hrs)	Man-Days Saved
46	92	3.8	11

Key Takeaways

- CI Automation Execution Quality improvement by reducing frequent build failures.
- Reduce Manual Efforts of code change fixes and drive towards New Focus Areas.
- Parallel CI Execution pipeline to handle rapid changes in S/W development environment.
- Reliability increased on CI build system by eliminating the build fail scenario much earlier

Thank You

