Paper 2

1) **Title:** An Empirical Study of Build Failures in the Docker Context

Authors:

1. YiwenWu*
2. Yang Zhang
3. Tao Wang
4. Huaimin Wang

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2) **Introduction:** Docker is one of the most mainstream containerization instruments in current DevOps practice. It empowers the embodiment of programming bundles into holders and can run on any framework. Those works have risen a ton of extraordinary discoveries and carried numerous reasonable ramifications to engineers, yet were not intended to investigate the subtleties of Docker fabricates. Building is critical to the product improvement process, which mechanizes the procedure by which sources are gathered, connected, tried, bundled, and changed into executable units. broken forms can assist engineers with identifying issues ahead of schedule before conveying items to end-clients. As of late, the recurrence and effect of assemble disappointments have been evaluated in numerous specific situations, e.g., C++ and Java constructs [7], Ruby forms [2], and Continuous Integration (CI) fabricates [4, 9, 11]. In any case, as far as we could possibly know, little is thought about the disappointment recurrence and fix exertion of works in the Docker setting.

Motivation:

The underlying RQ targets seeing how regularly Docker manufactures come up short. Past investigations found a middle of 37.4% of C++ fabricates and a 29.7% of Java works at Google to be falling flat [7], and a 13.2% in the Visual Studio Context [5]. In any case, despite the fact that Docker is broadly utilized in the open-source network [3], little exploration has been led on the Docker assemble disappointments. Along these lines, researching the recurrence of broken forms will assist us with characterizing the significance of fabricate disappointments in the Docker setting, and persuade the significance of our investigation.

3) Research Methodology:

In the Docker context, 152,897 of the 857,086 (17.8%) studied Docker builds fail, which is above the 11% as reported by Zhang et al. (in the CI builds context) but below the 28.5% as reported by SEO et al. (in the Java builds context). As discussed in the Previous study build failure rates are highly sensitive to changes in context. Further, we find that 3,260 (85.2%) projects have at least one broken build; 389 (10.2%) projects have at least 50% of broken builds. Thus, build failures are very common in the Docker context, and affect most of the open-source projects.

Here, we present our study results with respect to the three RQs 17.8% of Docker builds in our dataset fail, affecting 85.2% of projects. Also, 31.5% of projects have more than 20% of broken builds. However, frequently-built projects are associated with a relatively low ratio of broken builds.

4) Result:
Executing the construct procedure (i.e., building) is essential to the delicate product advancement process. Numerous earlier investigations have been distributed depicting fabricate disappointments in various settings, as far as we could possibly know, this examination is the first to direct an enormous scope exact investigation of manufacture disappointments in the Docker setting. We evaluate and break down Docker manufacture disappointments, including recurrence, fix exertion, and their development dependent on 857,086 Docker works from 3,828 GitHub open-source ventures. Our discoveries spur the requirement for gathering more experimental proof to all the more likely see how designers fabricate Docker compartments and to control future procedure refinements and apparatus advancement to improve Docker building proficiency.