Week 4: Mobility Bibliography

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# Mobility Bibliography

## Evolution of Mobile Apps

Zhang et al. (2013) compare the evolution of mobile development against traditional desktop engineering. The basis of their assessment comes from Lehman’s law, which claims software is always (1) continuing to change, (2) increasing in complexity, and (3) declining in quality. Next, they measured four open-source application’s code churn, total commits, feature enhancements, and bug fixes. The authors quantified each data point by examining GIT commit messages and applying heuristics. Afterward, plotting these metrics shows that the projects are continuing to evolve with more features and defects. Ultimately, the central goal of proving Lehman’s law remains inconclusive.

Their study is deeply flawed for multiple reasons. First, the four chosen applications are two programs built upon two platforms. Any results are not generalizable without increasing the sample set. Second, a direct correlation between complexity and commits does not exist. This limitation comes from the unique-style that individual developers follow. For instance, some users commit changes every block versus others who wait until the end of the day. Another set of inherent challenges arise from merging and squashing branches. These standard behaviors skew the total lines within each change.

There are also several limitations to using defects resolved as a measurement of quality and complexity. Most software engineering processes refrain from resolving defects that are not severe enough to warrant the regression risk. This “bug bar” naturally fluctuates in response to the business cycle (e.g., before versus after a major release) and can generate misleading signals. Assuming a static bug bar, an increase in defects likely represents new investments into app features.

## Mobile Development Processes

Corral et al. (2013) examine the growing interest in agile processes within mobile development. They perform a light survey of competing strategies such as Mobile-D, Scrum, and Lean Six Sigma. Under Mobile-D, businesses began following an iterative waterfall-like process for building mobile software. This approach was wildly successful in the early 2000s, with variations like MASAM (Mobile Application Software Agile Methodology) reducing life cycle overhead. After examining the evolution of agile methodologies, the authors attempt to map the different requirements of mobile development to agile characteristics.

Most of these agile permutations lack real-world sponsorship residing within academic journals at the time of writing. Since then, Scrum and Lean methodologies became everyday staples while Mobile-D fell to the wayside. The primary driver of those processes’ success is the ability to remove waste and improve time-to-market. Businesses that can release features more quickly and economically have the opportunity to be more competitive. However, those same organizations need to align their delivery cycles with customer’s ability to consume those changes.

Consider Philip Hue’s Smart Light App that runs on Android devices and controls Smart LEDs’ coloration. Regardless of Philip’s Continuous Integration and Delivery (CI/CD) pipeline, customers will not update this app frequently. Unless that behavior changes, the engineering team’s incentive is to release higher quality versions at a slower pace. In contrast, Facebook’s Android app renders XHTML responses from a remote server. Since Facebook users instantly consume any change, FB can risk quality and promote innovation quicker. When a feature regression occurs, the operations team centrally deploys an update, restoring the previous experience.

## Challenges with Mobile Development

## Suitability of Agile for Mobile

## Improving Mobile Capabilities