Ratings and Version Updates in the Mobile App Market
(Extended Abstract)

With a market size surpassing $25 billion in 2013 and projecting $77 Billion in 2017, mobile apps are a centerpiece of the mobile digital economy. As the two largest mobile app stores, Google Play and Apple’s iOS App Store each offered more than 1.5 Million mobile apps for download on the Android and iOS platforms, respectively, as of mid-2016. As of July 2013, these two mobile app stores had seen more than 50 Billion app downloads each, and Apple announced its 100 billionth download milestone in June 2015.

One of the key features that distinguishes mobile apps from other types of digital goods (such as movies, songs or books) is that they have versions. A developer typically releases an app into a mobile app store, and then adds, removes, and edits features of the app in subsequent version updates. In mobile app stores, as in many online stores, versioning is complemented by user reviews. Customers browsing for apps encounter prominently displayed summary statistics about the ratings that each app has gathered so far (usually the average and the volume), as well as more detailed information such as the distributions of submitted ratings and the text reviews themselves. Empirically, versioning occurs relatively frequently and results in improved user ratings.

While any software has versions and most products now have reviews, the app economy uniquely makes its entire selection of products and reviews available in a single marketplace. In that marketplace, customers purchase the product and leave reviews, while developers upload new versions with the marketplace’s approval. Moreover, the apps are developed by third-party firms distinct from the marketplace itself. This setting presents a novel research opportunity to examine how customers and developers make decisions, with direct managerial implications for the marketplace operator.

For the developer, versioning affords several economic advantages. First, the option to version encourages experimentation: developers can quickly ascertain the quality of their newly released apps in the marketplace and then use versioning to improve quality as warranted. By
allowing the developer to better manage its market risk through incremental investments in quality, versioning facilitates the release of riskier new apps, potentially enhancing and enlarging the platform’s overall marketplace. Second, developers may assess real-time ratings when deciding the timing of versioning updates. Leveraging current information permits developers to make cost-effective quality investments by versioning in response to users’ needs. Lastly, versioning over time likely delivers quality more efficiently than a heavy, upfront endowment. Paced improvements supply fresh content and features better attuned to satisfy evolving user needs. Corroboratingly, evidence suggests that versioning updates are marginally more impactful on an app’s ratings when its ratings have declined beforehand or started poorly.

While the existing literature on intertemporal versioning and product updating emphasizes how rational firms account for demand-side considerations (e.g., Dhebar (1994), Padmanabhan et al. (1997), Fudenberg and Tirole (1998), Brecko (2017)), as represented by the state of user reviews, it is readily apparent that firms also decide when to version based on supply-side factors. Notably, firms institute organizational constraints around their internal processes and development timelines (Krishnan and Ulrich (2001)). For example, the ridesharing app Lyft announces a new update every week, while the academic course platform Canvas releases versions every three weeks.

We develop and empirically estimate a structural model of digital product versioning that accommodates both demand-side and supply-side considerations. We thereby investigate whether developers are attuned to reviews when deciding on the timing of their versioning updates, shedding light on the predominant source of developers’ incentives and how intensively they parcel and manage their demand-related market risks through dynamic versioning.

Accordingly, our primary contributions and findings summarize as follows.

1. We are the first to construct and empirically estimate a model of digital product versioning that accounts for both demand-side and supply-side considerations.

2. We demonstrate that for a significant number of genres, developers are indeed attuned to customer reviews (e.g., Entertainment), but there are certain genres (e.g., Games and Business) where this is not the case.

3. In explaining why developers may choose to be more demand-side or supply-side oriented, we demonstrate multiple contributing facets ranging from the customers’ sensitivity to quality to the developer’s own cost to update and release a new version.
4. Finally, we demonstrate, using a counterfactual study, the sizeable impact of marketplace design decisions on overall quality and developer behavior. Notably, the two major app stores have enacted different policies for displaying apps’ ratings: Google Play allow apps’ profiles to accumulate ratings and reviews across versions, whereas the iOS App Store “restarts” them upon each versioning event – which design better serves the marketplace and its customers in apps’ quality?

In this way, while an extensive literature has studied ratings from the perspective of consumer choice (e.g., Chevalier and Mayzlin (2006), Li and Hitt (2008), Luca (2011)), our prescriptions newly account for developers’ incentives (beyond presuming the common wisdom that more ratings information better induces quality). We address how these marketplace design findings extend to apps on emerging platforms, such as Amazon’s Alexa and Google Home.

References


