

Smartphone applications co-usage: Could we predict your next app?

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Abstract: Smartphone applications are becoming part of our everyday life. Cost of smartphone devices is dropping and development of smartphone applications is getting simpler. Moreover, these applications are spanning from entertainment to education, health, productivity, finance, payment, transportation - and much more. Based on a study of handset usage analytics we find that users are spending more than 88 minutes with direct interaction of their devices' screen, and initiates at least 38 Apps on a daily basis. Until September 2014, Apple Store has 1.3 million of active Apps and a cumulated download number of 75 billion apps. Google Play also shows similar volumes. In summary, these numbers lead us towards the era where our daily activities would be Apps centric, and our productivity would be driven by an appropriate selection of Apps.

In this study, we focus on discovering the co-usage effect of Apps: if a user considers gaming Apps, would he/she also prefers Pizza ordering ones? The key question here is: "Can we detect any significant co-usage effects when it comes to App co-usage?" We identify ways to measure co-usage, as well as factors that drive co-usage and propose a method based on graph analysis to measure co-usage.

Over a 6 month period we collected 11 billion records from 674 different Scandinavian users. Initial results show that many App pairs have a high probability of co-usage in comparison with what we expect from independent adoption. For example, Adobe Reader has high probability of being used together with Dropbox. Figure 1 illustrates the complex network of co-used apps in a 4 hour time window. The figure shows lonely clusters of apps with highly internal co-usage, like the bingo/monopoly cluster to the left, as well as highly connected apps like Facebook and Google Chrome. This complex graph behavioral network presents a challenge: to build sophisticated methods for understanding the dynamics of Apps and to predict App usage.

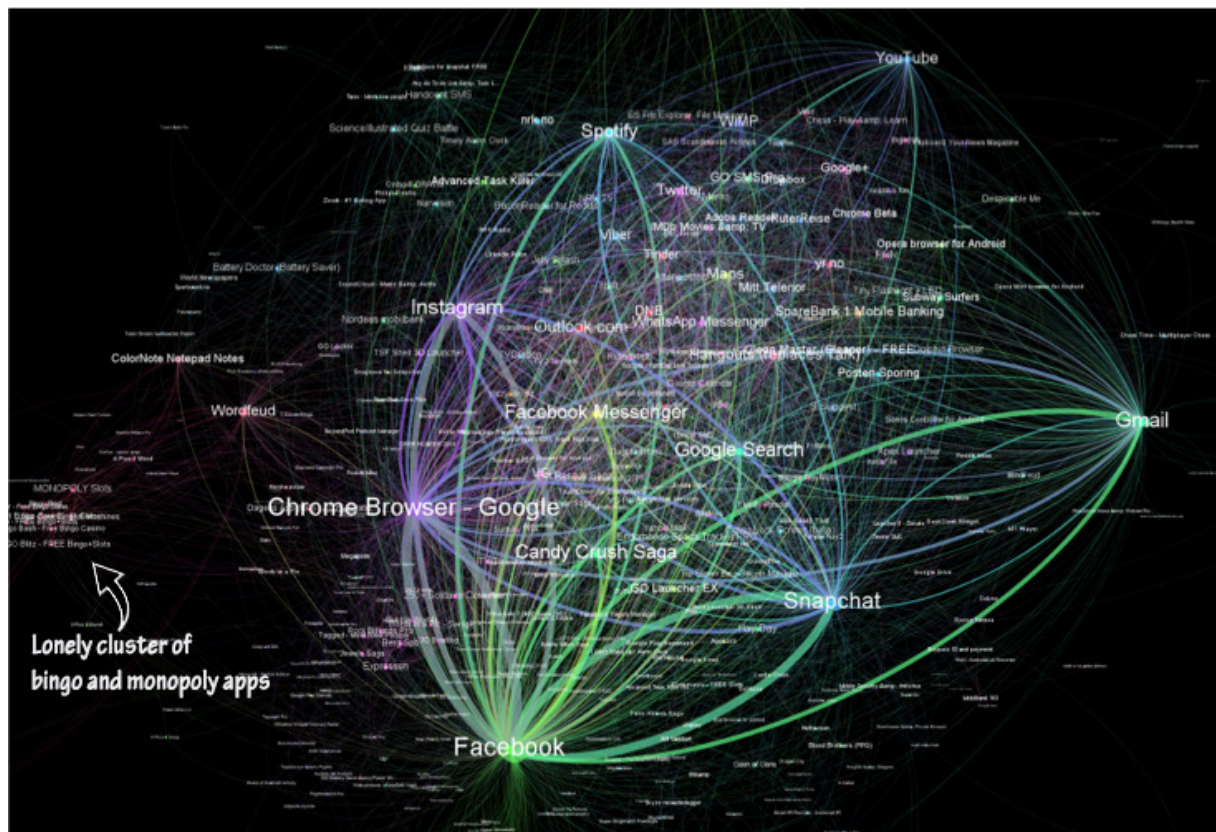


Figure 1: Apps being used together: Weighted co-usage of apps in a 4 hour time window. Colors represent clusters of co-used apps detected with an automated clustering algorithm.