

Managing Business Model Objectives through Platform Strategies

A Case Study of the Google Android Ecosystem

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Abstract: The goal of this research is to study how organizations achieve and balance their conflicting organizational objectives with the help of dynamic platform strategies. This is done by analyzing the Android platform where the translation of the organizational objectives of the platform controller Google into its platform strategies is examined through a series of cases. The analysis is done through the lens of the competing values framework where changing organizational goals of platform controllers are mapped and understood through the enactment of their platform strategies.

1 INTRODUCTION

Cross disciplinary research in the fields of evolutionary psychology, biology and neuroscience has led to the understanding that people are driven by four biologically determined needs that can be used to describe all human behavior. These are the drives to bond, to learn, to acquire, and to defend (Lawrence and Nohria 2002). Like human beings, an organizations business model should propagate objectives such as creating new innovation, facilitating collaboration, controlling the evolution of a product or platform and compete successfully in the industry (Quinn et al 2010). These values are not at harmony often and can be conflicting most of the time. The dominance of certain values over others and the conflict in values are determined by organizational goals and various forces in the industry (Porter 1979).

Companies like Google that play the role of a platform controller have to constantly adapt their organizational values to survive in the market place. Android is among the fastest evolving platform and is competing with other platforms to become the dominant design. Innovativeness of the platform has led to the attraction of an early install base, which is critical to the success of these platforms. The organizational value creation through innovation is a key value to drive growth. To become the dominant design and increase the pace of innovation companies have transitioned their strategy from

closed products to platform centric ecosystems. This model of dealing with complexity and accelerating innovation by building an ecosystem is achieved through the process of open innovation; a strategy where firms use external as well as internal ideas and internal and external paths to market, as they look to advance their technology (Chesbrough, 2006).

Once an organization decides to make its platform available to entities outside its boundary, it creates a software ecosystem (Bosch 2009). Due to the global diaspora of knowledge workers, the knowledge and skill sets required to create new innovation is often not present within the firm's boundaries; hence firms leverage the global talent pool for exploration activities through open innovation. Hence innovation in mobile information infrastructure ecologies such as Android is no longer the sole responsibility of the platform owners but a shared responsibility of various stakeholders such as app developers, handset manufacturers, content providers and mobile carriers. The design and evolution of these information infrastructure ecologies impact both the platform owners and the various stakeholders who are part of the ecology. Hence the organizational value of collaboration by managing stakeholder interests is one of the key determinants of the success of these platforms (Selander, Henfridsson and Svahn 2010). The concept of generativity is the system's capacity to produce unanticipated change through unfiltered contributions from broad and varied audiences

(Zittrain 2008). The generative ability of mobile platform's such as Android to create new functionality through interfaces such as API's is a lead determinant of the platform becoming the leader (Koski & Kretschmer 2007) by attracting an early installed base. Using generativity to drive the organizational value of competition can assist in platforms becoming a dominant design.

The goal of this paper is to analyze how platform controllers like Google achieve their organizational objectives to innovate, control, compete and collaborate through their platform strategies and how they manage strategic tensions between platform creation and control, and simultaneous collaboration and competition with various stakeholders in the ecosystem. Four cases each representing an organizational objective is analyzed with the help of competing values framework and information infrastructure theory and various generalizations are drawn from the discussions. This research aims to contribute to the existing field of organizational strategy, information infrastructures, platforms and ecosystems research.

2 THEORETICAL PERSPECTIVE

The invention and rapid adoption of large complex systems such as mobile platforms and the Internet poses several challenges, which can be effectively addressed by learning from existing well established large scale infrastructures such as railroads and highways. Information infrastructures are complex systems that are shared, continuously evolving, open for interconnections, based on standards and heterogeneous installed bases (Hanseth and Monteiro 1998). The study of Information Infrastructures promotes the understanding of the design and interaction of many Information Systems and components that interact with each other to produce a functioning infrastructural backbone.

Mobile platforms such as the iOS and Android exhibit the traits of information infrastructures and are a sum of their parts as they contain various separate systems such as the kernel, modules, interfaces and apps and hence requires a holistic perspective for analysis. The control of the evolution of Information Infrastructures is often distributed and negotiated due to their complexity, hence a key challenge in the design of information infrastructures is in dealing with negotiations between control and generativity in the evolution of the Information Infrastructure. The concept of generativity is the system's capacity to produce

unanticipated change through unfiltered contributions from broad and varied audiences (Zittrain 2008). Some of the key drivers of generativity are leverage, adaptability, ease of mastery, accessibility and transferability. Leverage of a generative system indicates how extensively a system leverages a set of possible tasks to create value for the user.

The greater the functionality of a system the greater is its ability to produce change and be generative. Adaptability of a generative system is determined by how easy it is to extend or modify the system to broaden its use. Leverage and Adaptability are closely linked in the case of mobile information infrastructures. Ease of mastery determines the easiness for different types of users to understand, adopt and adapt the technology. The concept of accessibility is determined by ease of access to a technology. Barriers to accessibility are factors such as expense of producing and hence consuming the technology, taxes, regulations associated with its adoption or use, and the secrecy its producers adopt to maintain scarcity or control (Zittrain 2008). Transferability indicates the easiness with which the changes in the technology can be communicated. An information infrastructure is considered fully transferable if the adaptation of the technology by highly skilled users can be easily communicated to a user with lesser skills and know-how of the technology.

2.1 Competing Values Framework

The competing values framework (CVF) is a strategic analysis framework that is useful in understanding organizational strategy and its effectiveness (Quinn et al 2010). The framework also assists in the recognition of guidelines that can assist in the management of relationships, congruencies, and contradictions among the various aspects of organizations (Quinn & Cameron 1983). Organizational strategy with the help of CVF can be analyzed through four quadrants each denoting a value of the firm. CVF describes that organizations are structured around two basic opposing needs; the need for flexibility and autonomy versus the need for control and stability; and the focus on internal concerns versus responsiveness to the external environment. These values represent competing assumptions of the firm's beliefs and strategy. Being successful in the collaborate quadrant entails creating and sustaining commitment and cohesion. Collaboration deals with open communication, which entails a deep understanding of the concerns

of various stakeholders. Collaborators perform both exploration and exploitation activities with stakeholders within and outside the boundaries of the firm. Collaborators manage intra and inter organizational conflict and promote innovation (Quinn et al 2010). The community created through collaboration shares beliefs, competencies, vision and values. Being successful in the control quadrant entails establishing and maintaining stability and continuity. The management of the control quadrant deals with compliance of rules and regulations. Control quadrant ensures performance, efficiency and effectiveness. Compete quadrant deal with the compete actions of the organization. This deals with improving productivity and profitability of the organization.

The understanding of the external environment is crucial for planning, goal setting and designing work processes in this quadrant. The strategies are driven by aggressive competition, markets changes, profits and speed. Stakeholders in this quadrant must constantly manage performance through objectives and use iterative mechanisms to quickly initiate or cease initiatives. The goals of the create quadrant are to rapidly create the necessary innovation, adapt to change and acquire the necessary support. The key skills required in this quadrant are identifying trends, differentiating from the competitor, encouraging new ways of thinking, starting new ventures, extrapolating emerging opportunities and promoting innovation. The quadrants of the competing values framework represent tensions that organizations face in creating and managing their strategies. Organizations possess varying degrees of the values represented in the quadrants.

3 METHOD

This research is based on a detailed case study of the Google Android platform. The study of how platform controllers achieve their organizational objectives through their platform strategies and manage strategic tensions in the ecosystems requires a case that provides different perspectives on the mentioned aspects of study to compare and contrast the various values in the competing values framework. The organizational and platform strategy processes of Google and their impact on the ecosystem can be seen as extreme cases (Yin 2009). The studied cases are paradigmatic of some phenomenon of interest (Gerring 2007). To highlight the challenges involved in managing platform strategies, a case study approach of (Gerring 2007;

Yin 2009) was followed with a specific focus of studying organizational and platform strategies of Google and the Android ecosystem.

3.1 Data Collection

The data for the case studies in this research is based on various sources such as documents, website interviews and nonparticipant observations in communities. Secondary data available on the internet is a source of diverse, abundant and rich data material that exceeds the diversity of data that can be collected from direct interviews (Romano et al 2003; Ghazawneh and Henfridsson 2011). The data that were collected represents official press releases from Google related to Android, relevant messages from Android mailing lists that describe issues related to platform strategies and generative mechanisms were identified.

The collected data described various issues related to organizational values and platform strategies and how the stakeholders reacted to the implementation of the various strategies. The study of the field of Platform based ecosystems requires large volumes of data to understand the relationship between the different actors, their actions and the motivations for their actions (Ghazawneh and Henfridsson 2011). The secondary data for this research is representative of the period between January 2009 and January 2013, where some of the key issues described in this research became a cause of major concern with the growth and proliferation of the Android ecosystem. Data from multiple sources can assist in generating various generalizations and help in improving data quality (Soy 1997).

3.2 Data Analysis

This collected data was then analyzed with the help of Romano et al's (2003) methodology for analyzing web based qualitative data. The Romano et al' method is based on a three-step approach to data collection and analysis of Internet-based qualitative data, namely: elicitation, reduction and visualization. In the first step, elicitation, specific terms that are of interest to this research from the framework such as "Android collaboration", "Android innovation", "Android ecosystem control" were fed into popular search engines such as Google and Bing and specialized online search engines such as board tracker and omgili that track discussions in mailing lists and the resulting data was captured in a QDA tool. Online observations on the evolution of the

Android is aimed at collecting relevant data from natural settings, hence non-participant observations in mailing lists and discussion boards discussing Google's Android strategy provided useful data for this research. The elicited data was then saved in a Qualitative Data Analysis (QDA) tool. Once the data was stored in the tool, some of the key themes in the data were identified. This was done with the help of word frequency analysis and a thorough literature review. Word frequency analysis provides a complete list of all the words that occur in the collected data material and the number of times they appear in the text. The analysis of the collected data through word frequency counts helped in deriving inferences about the subjects of importance. The result of the word frequency analysis and literature review was the discovery of some of the key themes in the data such as "licensing", "open handset alliance" and "release cycles".

An initial set of codes were then created to structure the data. The elicitation process led to the creation of a large research data set, some of the key concepts relevant to this research were identified such as platform control, agility in release intervals, open handset alliance. These concepts were then investigated in detail. In the second step, reduction, the large data set that was built during the elicitation process was reduced to fit the identified themes. Some of the key concepts identified in the elicitation step such as "licensing", "release process", "app blocking" and "fragmentation" were further investigated. The reduced data was further coded to identify the sequence of events and actors based on the themes that were discovered and evolved from the literature review and investigation of the initial data set. In the visualization step the various organizational objectives and their achievement through platform strategies and information infrastructure mechanisms are identified and summarized the discussion section. The strategies are summarized as four cases. The visualization process also led to the identification of the key factors that drove the organizational strategy in a mobile software ecosystem, which were further expanded upon and analyzed in section 5 of this research.

4 FINDINGS

From the time of release of first Android based phone to today, Google has been able to rapidly scale its platform, user base and other ecosystem components. One of the key drivers of Google's

growth is its ability to manage its strategic initiatives around innovation, collaboration, quality management and using the platform and its ecosystem components as a way to compete in the market place. In the below section, four key cases from the collected data representing the above mentioned strategies are described.

Case I: Platform licensing decisions

Google adopted the Apache licensing scheme during the release of the Android platform to create provide access to the code base for a wide variety of audience. Andy Rubin, the head of the Android project at Google describes the reason for adopting the apache license as

"We built Android to be an open source mobile platform freely available to anyone wishing to use it. In 2008, Android was released under the Apache open source license and we continue to develop and innovate the platform under the same open source license -- it is available to everyone at: <http://source.android.com>. This openness allows device manufacturers to customize Android and enable new user experiences, driving innovation and consumer choice."

Case II: Design of the open handset alliance

The open handset alliance is a networked model of collaborative innovation where Google engages with various stakeholders in the ecosystem. The open handset alliance assists stakeholders such as device manufacturers, content providers, semiconductor companies and operators in adopting the Android platform. Andy Rubin the head of the Android project at Google commented

"Despite all of the very interesting speculation over the last few months, we're not announcing a Gphone. However, we think what we are announcing -- the Open Handset Alliance and Android is more significant and ambitious than a single phone. In fact, through the joint efforts of the members of the Open Handset Alliance, we hope Android will be the foundation for many new phones and will create an entirely new mobile experience for users, with new applications and new capabilities we can't imagine today."

Case III: Managing fragmentation

The flexible licensing scheme of Android allowed for the platform to be modified in many different ways and did not require the modifications to be

contributed back to the creators of the platform. This led to the forking of the project into various derivatives. Chris Roland a commentator on Android describes the issue of fragmentation as

“Fragmentation of a operating system is nothing new one need only look at what has happened with Linux to see a great example of how this can occur. Fedora and Ubuntu are both Linux, they both have a Linux kernel, and are for the most part compatible with each other, but not entirely. Applications designed for one will not easily run on the other unless recompiled. Android is the same, but worse. Not only do developers have to contend with different versions of Android between 2.x, 3.x and now 4.x, but not all Androids of the same major version are the same developers have to contend with OEM customisations and issues as well.”

Case IV: Platform release processes & leveraging ecosystem components

The Android team uses an agile way of product development release. Since its beta release in November 2007, Google has launched over thirty versions of the Android OS. Andy Rubin the head of the Android project describes the agile release strategy as a way to compete in the market

“We were at a feverish place post 1.0. 1.0 felt to me more like an 0.8 - it was pushed out for Christmas. We subsequently got it up to the spec that the industry expected it to be. We saw a rapid release cycle to basically catch up with the industry, and now I feel pretty much caught up. So any new releases aren't going to be catch-up releases, they're going to be releases that are focused on innovation. “

5 DISCUSSION

Based on the findings in the previous section, it can be observed that Google tries to balance conflicting values and organizational interests during the evolution of the Android platform. In the create quadrant one of the key challenges is to facilitate the necessary innovation and adapt to changes in the industry. Organizations have to cultivate strategies that facilitate flow of innovation and new ideas that can help the organizations innovate.

For the successful evolution of a platform, it must balance the introduction of new artifacts, processes, and actors but in the same time offering the flexibility to support scaling and further evolution of the platform (Tilson, Sorensen and

Lyytinen 2011). As seen in case 1 in the findings section, the open licensing adopted by Google for its Android platform enables users access to the code base enabling them to modify and change the platform in new innovate ways, it also allowed commercial use of the platform as the licensing scheme allowed for the modification of the platform without having to commit the changes back to the platform controllers. One of the challenges in the create quadrant is the bootstrap problem. A platform's value is realized when a large number of users use a platform, hence platform controllers have to find ways to attract early users to use the platform. This can be difficult as platform controllers have to often address the needs of these early users before having a complete design of their platform (Hanseth and lyytenen 2010). The flexible licensing, killer apps and tools such as the SDK allowed for early users to understand the technical architecture and implement the necessary changes to adopt the platform and make it useful. As seen in case 3 in the findings section, the challenges of the control quadrant have to do with the quality aspects of the strategy. Complimenters of a platform need to be governed in a way where both platform controllers and complimenters create and extract value from the platform. The openness aspects of the create quadrant helped bootstrap the platform by attracting early users but also lead to the forking and fragmentation of the platform and its ecosystem. End users and competing organizations fork the platform and thereby split the platform resources and its ecosystem. To control the platform effectively, the platform owner constructs new platform designs, secures platform control through agreement , increases knowledge heterogeneity through distribution channels, and counteracts foreign boundary resources designed to infringe on the platform (Ghazawneh and Henfridsson 2010). Forks of the Android platform do not receive the latest updates of the platform released by Google, which might lead to critical security and quality issues. Due to the emergence of dozens of forked versions of the Android platform, the creation of an additional clause in the Android SDK's terms of service enabled Google to control and act on third parties that fork the platform. Due to the phenomenon of increasing returns, the more a standard is diffused, the greater its value.

A platform standard can also be used as a strategic tool to decide whether a particular product is compatible with competitor's products (Katz and Shapiro 1995). Forking can create incompatible versions and could hamper the long term

sustainability and quality of the platform and its ecosystem (Krogh and Spaeth 2007). Google created the Android compatibility definition document, which details the software and hardware requirements to comply to the specifications of a compatible Android device.

Once a complimenter or a competitor creates an Android compatible product they will have to use the compatibility test suite as an aid to compatibility during the development process. Organizations such as Google have to thus balance their quest for platform growth with enforcing quality and standardization in the ecosystem. Companies that are part of an industry segment are encapsulated in an ecosystem of suppliers, customers, partners, competitors, suppliers of substitute products or services and potential new entrants that can challenge the status quo (Popp and Meyer 2010). Hence collaborating with various stakeholders is a key organizational value that determines the success of a platform controller. The values of the collaborate quadrant are determined by actions such as fostering collective effort, building cohesion and teamwork and managing conflicts in the ecosystem. The collaboration is driven by a shared aims, values and expertise. One of the key challenges of a mobile platform is the challenge of install base cultivation. A rapid establishment of a large installed base can help companies become the platform standard of choice (Besen and Farrell 1994). Rival firms seek to exceed consumers' expectations as the size of the installed base determines the choice of platform standard, hence industries with network effects witness an intense early competition as a quick early lead can determine the outcome of the race and the ones that follow the platform leader eventually end up becoming obsolete.

As seen in case 2 in the findings section, Google created a collaborative model of innovation through the open handset alliance, where complimenters in the ecosystem could work with Google in shaping the Android platform. The networked model of innovation enabled various stakeholders such as device manufacturers, content creators and others to provide inputs to the innovation process and build a platform for shared vision and innovation, which assists in the deployment of Android on various devices contributing to the build up of a rapid install base. Stakeholders could customize new releases of the platform to suite their needs and collaborating in the design and development process enables an easier adoption of the platform and assists in planning ahead. When information infrastructures such as Android grow in the creation phase due to

bootstrapping and aspects such as openness, the platform controllers have to deal with unforeseen and diverse demands and manage these demands in the design and technical architecture of the platform. This is defined as the adaptability problem of information infrastructures (Hanseth and Lyytinen 2010). The open handset alliance acts as a forum to evolve complex relationships with the various stakeholders, who are some times direct competitors. The adaptations that a platform undergoes through a series of negotiations in forums like the open handset alliance are determined by socio-technical motivations and can be understood by analyzing the significant changes that a platform undergoes, which are often infrequent, discontinuous, and intentional (Tilson, Sorensen and Lyytinen 2011). Keystones or platform controllers like Google have to balance two key activities to be successful, the first is to create value within the ecosystem and the second is to share the value with other participants in the ecosystem. Unless a keystone finds a way of doing this efficiently, it will fail to attract or retain members (Iyer et al 2006). Hence the open handset alliance helps cultivate install base by acting as a forum for creation of new innovation and facilitation of Android compatibility and drives platform standardization through ensuring a consistent experience for developers, manufacturers and consumers.

The core competence required by an organization in the compete quadrant is product differentiation through rapid innovation, agility and lockin mechanisms. Innovation in a platform ecosystem is characterized by simultaneous competition and cooperation (Walley 2007), where the relationships between the members are actively shaped by the stakeholders. In such ecosystems, the competitive position of a firm participating in the ecosystem is measured through its relationships to other participants in the ecosystem (Selander, Henfridsson and Svahn 2010). As seen in case 4 in the findings section, while Google and Apple directly compete against each other through their platforms, they collaborate and leverage each others platform for their ecosystem components. Apple uses Google maps as its maps and navigation system but Google released a version of its maps app with diminished capabilities for the iOS version thereby creating a locking in end users to the Android platform.

The existence of strong network effects and increasing returns promotes a single or a small set of platform standards being adopted in an industry (Bekkers and Martinelli 2010). Hence agility through short release cycles to gain market share by

a rapid buildup of install base is key to becoming the dominant design. Google uses short release intervals to introduce new innovations in the platform, while most of these releases are backward compatible some versions are not and this leads to fragmentation of the platform. Hence balancing competing organizational values of collaboration which is enacted through sharing and networked innovation with the organizational value of competition which is enabled through agile innovation and lockin's is crucial for platform controllers in becoming the dominant design.

6 CONCLUSIONS

The goal of this research was to analyze how organizations such as Google achieve their objectives through the enactment of platform strategies and manage strategic tensions in the ecosystem. Based on the discussions in the previous section, it is evident that in order to deal with the changes in the industry and counter market forces, organizations such as Google have to balance radical new innovation with incremental sustaining innovation through managing change that is new, innovative, unique, and transformational with small incremental change that drives efficiency, predictability, and continuity through their open innovation strategy. This can help platform controllers become the dominant design, but to sustain their position, platform controllers have to also balance their short term need for speed and agility with a long term focus on developing their ecosystem by controlling the pace of innovation.

Hence being dynamic and balancing the various organizational values over time can yield desirable results. The strength of the platform lies in the diversity of the stakeholders participating in its ecosystem, when engaging in an ecosystem the organizational value collaboration takes greater importance. Platform controllers have to constantly shape their relationship with the various stakeholders to be successful and shape it in a way that everyone in the ecosystem benefits from the platform. More research is needed to corroborate many of the findings in this research. One of the caveats is that the analysis is restricted to the Android ecosystem.

While this restriction has assisted in improving our understanding of how platform controllers deal with competing organizational values through their platform strategies, we would require more cases where the findings can be tested. A task for future

research would be to conduct longitudinal studies on various mobile and non-mobile software platforms and analyze platform controllers balance their organizational values over the lifecycle of a platform.

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