

# Aardvark Design: Difficulties with Mobile App Deployment

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## Abstract

Aardvark Design is a small mobile application development startup. They have experienced fantastic results over the past few years, but are now starting to feel pressures from competition and customers to deliver the same level of customized, high-quality products within ever shortening timelines. The company's CEO believes their ability to address these new challenges depends on the company's reducing the time it takes to deploy applications once they are designed, developed, and tested. He believes the key to reducing the deployment timeline is related to the firm's information technology (IT) infrastructure. One of the contributing factors to the deployment timeline issue is the lack of available human resources in the local market. In order to address this problem, he is considering the possibility of outsourcing some of the later activities in Aardvark's development process.

**Keywords:** application development, outsourcing, personnel, SaaS, PaaS

### 1. INTRODUCTION

Caleb Sharp, CEO, had just finished reviewing the most recent analysis of customer feedback for his company Aardvark Design. It had been a great

year for Aardvark, a small 18 person mobile application development company. Aardvark had just tripled its revenue in one year and had clients ranging in size from startups to Fortune 500 corporations. Mr. Sharp was looking forward to

another exciting and prosperous year. However, he had concerns regarding whether Aardvark Design could maintain a competitive position in its market as more app (application) development companies entered the market. In his mind, the deciding factor was whether Aardvark Design could continue to meet customers' needs and expectations.

According to the customer feedback report, clients were very satisfied with the design and development services provided. The apps provided a great user experience by being intuitive, entertaining and/or useful (this varied depending on the intended use), and were energy efficient. The one concern noted in the analysis was the time it took to get the product to market. Clients wanted to launch apps as quickly as possible, in order to provide a unique value proposition to their target markets and maintain their competitive positions in their respective industries.

Mr. Sharp knew that Aardvark Design had to reduce the time to market in order to remain competitive. Internally his company was struggling with maintaining the operation of its infrastructure, which was causing costly delays. How could Aardvark Design continue to provide a high-quality product while at the same time reducing the deployment time and efficiently maintaining the operation of its infrastructure?

## 2. THE COMPANY

Aardvark Design was founded in 2012 in Cincinnati, Ohio by three friends (Mr. Sharp was one of the original founders) who saw a need for a mobile application design and development firm that could provide applications that could be used across mediums and industries. Aardvark Design leverages Meteor.js to rapidly serve global brands and cutting edge companies (see Exhibit 3 for a description of the technology used by Aardvark). Clients range from small innovative startups to large corporations. In three years, they grew from a staff of three to eighteen people. Aardvark Design services were in high demand; they were being asked to create productivity tools, online marketplaces, and data analytics apps that could work on both web and mobile platforms.

But this rapid growth presented challenges to the firm. They had an excellent core team of Ruby developers that worked in Node.js, but lacked personnel that had expertise in infrastructure management. Infrastructure included assembling and running the hosting solution, which allowed

for deployment, reliability, and scaling of the apps. Doug Smith, Sales Associate, explained the problem.

"Clients love the creativity our team offers; however they are upset with how long it takes to launch. I have to constantly call our developers and ask for status updates. I don't understand why developers can't simply fix this problem. We need to meet our deadlines. The competition in this industry is intense."

The dynamic between sales and development at Aardvark Design is not unique. You have the sales function of the organization focused on the customer. Their job is to satisfy customers by providing a level of service and value that is superior to that being offered by the competition. Often, this leads to commitments being made that are difficult to deliver. The IT development function of the business is being asked to deliver on commitments that they simply do not have the infrastructure or internal capacities to deliver on. This is leading to conflict between the sales and IT functions of Aardvark Design.

## 3. THE INDUSTRY

When the Apple iPhone and Google's Android were released, a new industry of smartphone application (app) developers was created. Smartphone apps had a high adoption rate and developers quickly started to offer apps in gaming, entertainment, and social networking (See Exhibit 1 for a breakdown of the different types of apps being developed). It is projected that other online services such as banking, shopping, and mobile payments will increasingly be utilized by smartphones. The annual growth rate for the Smartphone App Industry from 2010 to 2015 was 43.3% and it is projected that the annual growth rate from 2015 to 2020 will be 28.3%.

With an increasing number of mobile internet connections and low barriers to entry, the number of developers in this industry has been growing rapidly. This has caused developers to face intense competition. Due to the competition and need to develop and deploy apps quickly, some believe this has led to a steep increase in failure rates among mobile apps and a number of apps being offered for free. Under these conditions, many developers are struggling to make any profit (Kahn, 2015).

"It has also become increasingly difficult for app developers to differentiate their products and market them as superior to others. Functionality and aesthetics are increasingly important bases of competition, and apps are expected to be updated and enhanced regularly." Apps have to offer more functions and be creatively designed in order to stand out. At the same time, they must be produced at low costs in order to be offered at a reasonable price to clients who are facing the competitive market pressures. Therefore, developers must manage costs to be able to boost their market share and revenue.

In the app development world, it's all about the survival of the fastest. "If you're not first, you're last," said Sharp during a recent executive meeting he held to discuss the issues they were having at Aardvark Design.

There is intense pressure on the team at Aardvark Design to increase efficiencies and reduce the time to market of newly developed products. Aardvark Design is facing threats from startups as well as existing competitors who are finding ways to speed up their processes and get the finished products to customers quicker than in the past.

By narrowing the scope of services provided, some competitors have become very efficient and quick in the design, testing, and deployment of new applications. If Aardvark Design wishes to continue to provide the same scope of offerings they must find a way to speed up their internal capabilities. An alternative would be to also narrow the scope of offerings and focus on getting quicker at a few key segments.

#### **4. THE APPLICATION DEVELOPMENT PROCESS AND INFRASTRUCTURE**

Before Aardvark begins any new development, the sales rep meets with the client to identify their needs and define the project scope (see Exhibit 2 for a graphic and outline of the development process). During this planning and analysis stage of the process, requirements were set so developers can then begin to develop a prototype. These requirements include any data input formats, processing requirements, and the output screens desired. The price of the service depends on the number of user interfaces to be developed and the complexity of any processing that must be coded. An additional factor would be the development and maintenance of any persistent data that would need to be tracked and stored by the company for the users of the product.

Next, a prototype of the application based on the "Minimum Viable Product" (MVP) is constructed. This represents the basic user interfaces that would be seen by a user of the application. This version of the app may, or may not include actual processing code; but should "look and feel" like the ultimate finished app.

Once constructed this prototype is tested. This "alpha" version of the product is released to a User Acceptance Testing (UAT) group. This group tests the UX (user experience) design and the features and functionality of the app on multiple devices (Apple's iOS v Android). This group then documents their feedback on the application for the design team. This feedback is used to make changes to the application (and the activity is repeated) until it decided that the application meets a minimum level of design quality.

After the changes are made and the app is ready to be released to the masses, it's time to deploy. Using Meteor, Aardvark Design developers are able to use one set of code that will create desktop, web, iOS and Android apps. This drastically speeds up the development process. However, there is a bottleneck when they get to deployment. Once an app is developed, it takes Aardvark Design several days to deploy it.

Their development staff simply does not have the expertise or the capacity needed to manage their infrastructure. This is creating the bottleneck in their process and resulting in unhappy customers. Infrastructures were important for deploying (and later scaling) completed applications. This "provisioning" activity was not being performed well. Aardvark Design made beautiful applications for their customers but without a proper infrastructure and provisioning process in place, the value of the fast development process was in jeopardy.

Aardvark Design developer Kelly Miller has repeatedly voiced her concerns in staff meetings. Miller stated, "I have explained to our HR (human resources) Manager and company leadership that we need to hire more developers with infrastructure experience and I get the same old runaround. The HR Manager tells me that they are posting for positions, but they can't find the 'right' candidate and that there is a shortage of talent in the area. I don't understand why it takes so long to fill a position, what does the HR Manager do all day?"

## 5. THE IT HUMAN RESOURCE MARKET

In today's marketplace it is very difficult to find and hire quality IT professionals. Top talent are not looking at traditional job postings for jobs, they are looking for challenges. Many firms now host "hack-a-thons" in order to attract talent. This type of event gives the IT professional a competitive area to show off their skills. It is a highly effective tool to attract talent and large firms like Facebook, Yelp, and ESPN are hosting these "hack-a-thons" (Jamey, 2015).

In 2013 a survey of 2,600 Linux IT professionals were asked about the incentives they have to stay in their current jobs (Schiff, 2013). The top three incentives were money (74%), better work/life balance (61%), and flexible work schedule (47%). Top IT recruiters and executives were asked for suggestions on how to keep top IT talent and they said:

- Include IT in decisions
- Don't micromanage
- Offer flexible work hours
- Invest in training
- Provide access to new technologies
- Give praise and acknowledge contributions
- Offer free stuff
- Provide a competitive compensation package

Aardvark's HR Manager, Sheila Robinson, was well aware of these facts and was convinced that the market for good IT talent in Aardvark's region was even more difficult than the averages suggest. It seemed that whenever she had finally found a potential new hire for Aardvark, the candidate quickly received multiple offers from competing firms at salaries much higher than she could offer (and at firms that had much more opportunity for advancement for IT personnel). She knew that hiring and retaining good quality IT staff was a continuing challenge, especially given Aardvark's relative size.

## 6. ALTERNATIVES

### Outsourcing vs. Insourcing

The decision whether to outsource an activity depends on many factors. Aardvark Design's service on the deployment stage of the development process is lacking in the current marketplace. Responsiveness to clients and service differentiation is seen by Caleb as one of the company's key strategies. He knows that if

Aardvark Design cannot lure the right talent in he door then they should outsource the deployment of the apps. Design is their core competency and having control over the end-to-end development process is appealing to manage quality, but they have been lagging when it comes to provisioning and rolling out the app.

Aardvark Design's company culture is a factor in determining whether to outsource or insource. Caleb knows he needs to figure out why Aardvark Design is considering the decision to outsource (or insource by building this competence). As a startup, Caleb realizes that how he makes these decisions may be as important as the actual choice. This decision may establish Aardvark Design's attitude and behavior toward decision making. Are they "Cultural Aggressives", "Cultural Moderates", or "Cultural Conservatives"? Cultural Aggressives make decisions out of hope. They look towards outsourcing as a partnership and an external source of expertise. Cultural Moderates make decisions out of fear, they are driven by parity and look to outsourcing as a utility. Finally, Cultural Conservatives make decisions out of pain, they are driven by force, and view outsourcing partnerships as not being trustworthy (Karamouzis, 2007).

Caleb asked an intern working for the company to search online for "best practices" for evaluating outsourcing. Based on the intern's report, Caleb created what he thought was a simple and effective approach:

First, determine the context and purpose of the function being considered for outsourcing or insourcing. Caleb thought the best thing to do this would be to compile a "task force" with a representative from each area involved (sales, development, and deployment) to research the situation and to determine the objective criteria that they should use to make their decision.

Second, he felt a formal "Analysis of Options" should be performed. The team should identify potential options and then determine how each option would affect their presence in the marketplace. The overarching goal being to increase the speed to deliver apps to customers.

Third, Caleb thought that the task force should reach consensus and create a recommendation. The task force would create a business case around the option that they determined would best solve the problem and then present this to the executive committee.

Lastly, upon review, modification, and approval of the option by the executive team the task force would then begin the process by developing an action plan. This should include detailed steps for either selecting a vendor or building the in-house capability.

Based on all the research he saw, Caleb knew that cost would be a critical factor in the decision to outsource or keep the development in house. Is there an advantage for Aardvark Design to outsource deployment and support to someone who may be able to do it at a lower cost than Aardvark Design? The other primary consideration seemed to be control. Could Aardvark Design compete with those firms who design, develop, and roll out their apps in-house? If Aardvark were to invest in bringing in IT talent and retaining that talent, could they possibly develop a competitive advantage?

## 7. THE DECISION

Caleb knew that something needed to be done. In order to remain competitive, his company needed the ability to deploy apps in hours, not days. Should he look to hire a new operations team? By hiring new staff, it would allow the company to maintain control over their processes in-house. However, the cost and amount of time it was taking to fill those positions was a concern. He knew his team was expert at designing and developing apps, but not so much in provisioning, deployment, and scaling them.

Should he look to outsource to a Platform as a Service (PaaS)? Outsourcing could be expensive and they still may not meet customer demand if they select a vendor that is unreliable or doesn't have the right expertise in Meteor and Node.js. Sharp's last words before heading back to his office to start thinking about the road ahead were, "We need to focus on what we're best at – app development. That's how we will win. But we can't stay on top without an operations staff or a strategic outsourced partner we can trust to host and scale our applications."

## 7. DISCUSSION QUESTIONS

1. Caleb believes the main issue is his company's ability to manage its infrastructure. Do you agree? What is meant by infrastructure? How does the organization's infrastructure impact the deployment of the apps?
2. How should organizations determine whether an activity should be performed in-house or outsourced to a service provider? What criteria should be considered when evaluating the outsourcing decision?
3. How should an organization select a service provider?
4. What criteria should be used to select a service provider?
5. What are the advantages and disadvantages of outsourcing?

## 6. REFERENCES

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Exhibit 1: Application Products and Services Segmentation (2015)

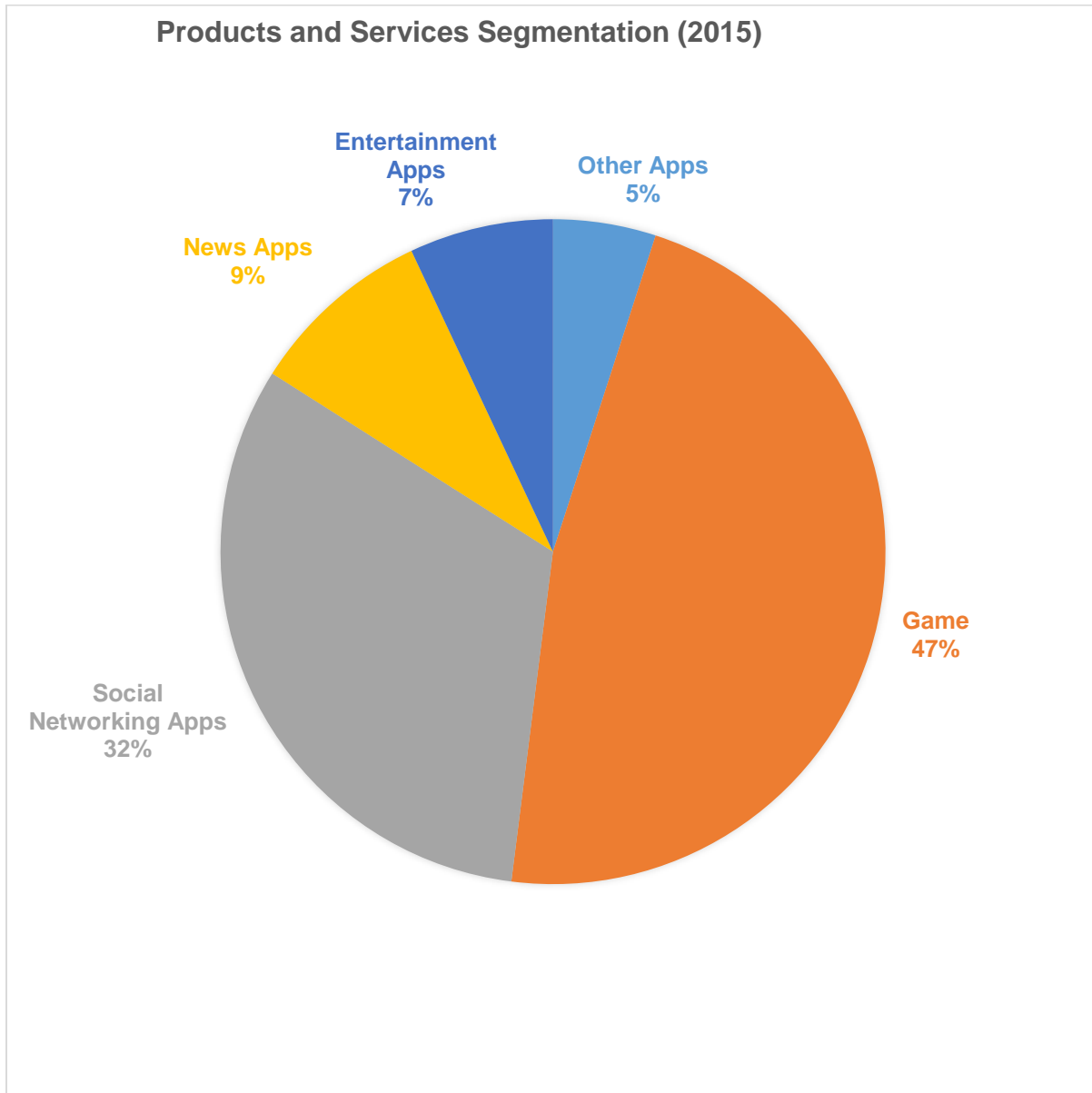
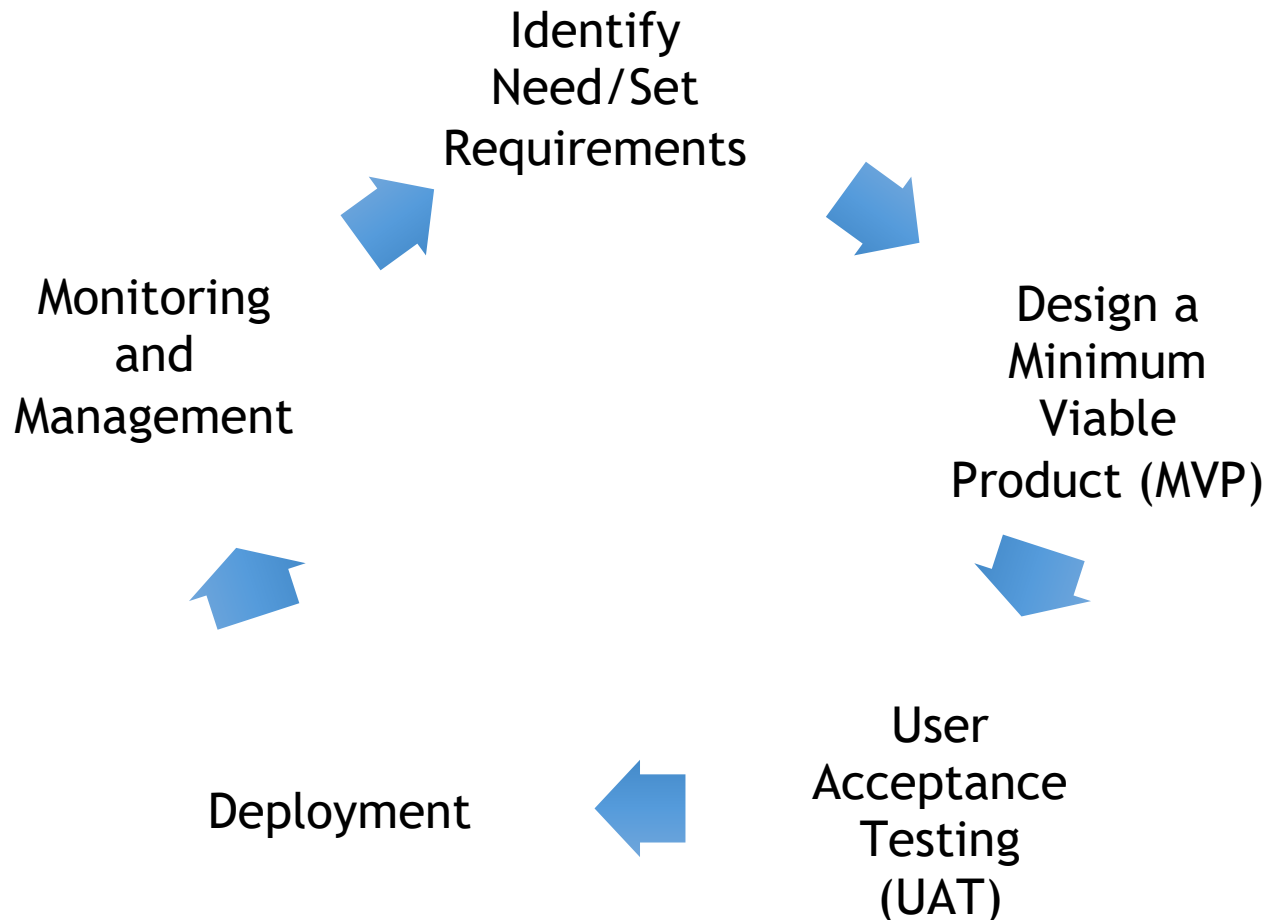


Exhibit 2: Application Development Process

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- Aardvark Design team meets with clients to identify the need and define the scope of the project
- Requirements for a prototype are determined and defined
- Prototype is developed and tested to determine if the Minimum Viable Product (MVP) has been achieved.
- Alpha version of prototype is released to a User Acceptance Testing Group (UAT) for functionality testing on multiple devices.
- UAT feedback is submitted to the design team and any necessary modifications are implemented.
- Deployment of the finished product

Exhibit 3: Glossary of technology terms.

Meteor.js is a complete platform for developing software in pure JavaScript that is used to create mobile and web apps quickly.

Ruby is a popular programming language that has been in existence since 1995. It is a framework used for quickly creating web applications. Ruby became extremely popular because of Ruby on Rails. Ruby on Rails is a tool that provides structure for all of the code written and simplifies common repetitive tasks, making it easy to write web applications fast.

Node.js is a platform built on Chrome's JavaScript runtime used for developing server side JavaScript applications. It is useful for data-intensive real-time applications that run across distributed devices. Node.js is growing in popularity getting more than two million downloads per month, worldwide.

Minimum viable product (MVP) is the set of features and functions that must be included in an app to satisfy the primary purpose of the application.

UX, UXD, XD (user experience or user experience design) focuses on the interaction between a human user of app and the application interface. It focuses on the pleasure, happiness, satisfaction, and usability of the interaction.

Platform as a Service (PaaS)