

The current state of apps on TV and the web on TV, and where it is heading

Including comparisons with the mobile app industry

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By

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Overview

“Forming, Storming, Norming and Performing” – Apps on TV is just starting to happen, as all the players are Forming their technologies and strategies. Storming will happen when a clear leader appears (like Apple did in mobile). Norming will be the phase when users consume apps and engage with their TV in new ways, and revenue starts to flow. And Performing will come later, when the TVs and boxes and browsers and apps really start to Perform like they do today on mobile.

This paper presents a pragmatic set of views on the current landscape, in a thought provoking way, and will consider why apps on TV will be different – but just as successful – as apps on mobile.

The 5 key questions that this paper aims to discuss are;

1. Will apps on TV be the same as apps on mobile?
2. What will it take for apps to be successful on TV?
3. What technologies are needed to deliver apps on TV?
4. What will the role of the companion device be?
5. How will advertising on TV evolve?

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INTRODUCTION

AppCarousel, and our parent company Wmode, have been helping mobile operators to deliver a web-centric and app-centric experience to mobile consumers for over a decade. As such, we have witnessed firsthand how apps and the web have become a reality on smartphones and tablets, and the painful experiences along the way. The web on TV, and apps for TV, is in its infancy, therefore we decided to look at some of the lessons learned from mobile, along with the present state of the TV ecosystem, to draw some parallels and to look ahead to what might happen going forward.

SETTING THE SCENE

Most people use smartphones to access apps on a daily basis for entertainment and utility. With the hundreds of thousands of apps already available in the Apple App Store and in Google Play, the mobile landscape has completely changed and continues to create a growth industry for apps. Every brand, every company, every wannabe has an app and it's fast becoming the primary way that users interact with organizations.

As users demand that their favorite apps work across multiple platforms, the lack of apps for TV means that cable and TV service providers are left playing catch up. And as apps begin to emerge on TV, those in our industry who are scrambling to make the app experience identical to mobile should stop to consider why apps on TV should be very different.

Apps on mobile devices are functional; a person can open a banking app to check a balance, go to YouTube to watch a video and then go to the browser to check a Web page. Those practices won't work on TV. Apps will need to be threaded into the fabric of the viewing experience. For example, apps should be an integral and enhanced part of the TV channel being watched, with those most relevant to the viewing experience showcased first. Apps shouldn't be hidden in the silo of an app store or menu system. If broadcasters get this right, viewers won't even know that they're engaging with apps, and instead will see it as a standard part of the next generation TV experience.

Apps present new opportunities for the broadcasting industry to deliver unique and personalized unicast programming and advertising to users, especially as our industry moves away from a dependence on linear broadcast technologies. As apps evolve and continue to proliferate the TV realm, we will see TV channels, content and advertising delivered inside of apps, which will then provide a return path for interactivity and conversion.

As a result, apps will enable programmers to engage their audiences in entirely new ways, serving as a supplement to conventional shows in order to create a whole new

dimension of engagement. Just as apps have transformed the book and music industries, apps on TV will disintermediate the value chain, enabling local and independent publishers of TV content to reach audiences without depending on a network deal with broadcasters.

More often than not, people are watching TV with a companion device on their laps. Therefore, offering companion apps that complement broadcasts will be key, as will leveraging the companion device as the point of interactivity with the first screen. There is a proven desire among consumers to interact with shows or ads they see on the television screen, and if our industry leverages companion apps on those smart devices, we can deliver a superior user experience while leaving the TV to continue its main purpose of providing leanback entertainment.

We also need to consider where these apps for TV will reside. It's easier in mobile since apps have to run on a smartphone or tablet. In the living room, however, there are a whole host of smart devices including the set top box, the TV itself, the games console, and over-the-top boxes including Apple and Roku. Some systems run Android apps, which need to be optimized for the 10 foot experience, some boxes run proprietary native apps that are hard to develop, and many boxes have non-standard browsers that run HTML5 apps developed for TV. As a result, this fragmentation will serve as a roadblock and cause app developers to pause until a clear winner emerges.

With so much conversation focused on “cord cutters” and “cord shavers” (the new generation of consumers who either discontinue their traditional TV service or trim it back), apps will allow the broadcast industry to remain current and relevant with this new type of audience. In recent years, two other types of consumers have emerged. The “cord ignorer” simply doesn’t watch TV anymore, so reaching that user via companion apps is essential for the broadcasting industry. The “cord absorber” lives for TV programming, and our industry needs to deliver world-class app experiences to these people so that they can get their fix long after the show has aired, whether they are in front of the TV or not.

Overall, apps in the TV environment present unparalleled opportunities. However, unlike in mobile, at AppCarousel we don’t see hundreds of thousands of apps or app developers. We see apps as an essential extension to the brand of every programmer, broadcaster, publisher, and cable operator. Apps will allow them to deliver content in totally new ways, and will enable them to engage with their users. Apps will also present new opportunities for monetization via merchandizing and premium content, and as part of IPTV, will offer up whole new technical paradigms for service delivery and unicast programming.

PARALLELS: MOBILE TO TV

Let’s look at why “apps” and “web” live side by side on mobile. When IP (as in Internet Protocol) first came to mobile a decade ago, regular websites could not be displayed on mobile devices because of the lack of processing power, small screen size, and slow

network speeds. Coupled with 2G data network speeds, expensive data plans, and sluggish hardware, mobile web simply couldn't compare to broadband connected desktop computers. In addition, mobile operators wanted to control the browsing experience via "walled gardens" rather than the open web. As a result, a mobile-optimized version of the web was developed and adopted as an industry standard, called WAP (Wireless Application Protocol). Unfortunately the user experience of WAP was never good enough relative to browsing on a desktop, and even today there are notable differences in features and functionality between desktop websites and mobile websites. The stage was set for Apple to capitalize on these weaknesses by rolling out richer experiences with iOS and the iPhone.

Apple provided three essential ingredients to spur the app ecosystem: a standard app development platform on a single mass market device, a mass distribution channel through the App Store, and a path to monetization. In effect, developers were given standardized platforms to build apps against with the opportunity to distribute en masse without having to worry about which carrier the phone and app was running on. At the same time, mobile browsing standards were improving with the introduction of browsers such as Safari and Chrome that could finally provide adequate support for HTML5 and CSS3. This in turn allowed for mobile web pages to flourish.

Today, in mobile, apps and web live side by side; apps are controlled environments for specific purposes, and almost all phones also have a fully open web browser. Hybrid solutions that leverage web development to deploy across multiple native environments have yielded significant efficiencies. Most notably the Apache Cordova project, formerly known as PhoneGap, has allowed applications built in HTML, CSS, and Javascript to be packaged for numerous cross platform operating systems. Both apps and web allow the content provider to monetize via payments or ads, with or without the intervention of app stores or carriers. In mobile today, the edges between apps and the web are blurring; many mobile web pages look and feel like apps, and many apps are nothing more than web pages. The line is blurred so much so that there are heated debates within organizations as to whether they focus on apps or optimized web pages, or a combination of the two, and it often comes down to aspects such as futureproofing, cost of development and support, features and functionality, security, and scalability across device types.

Of course much of this mobile adoption has been helped by having larger screens and faster wireless networks. Now, if we compare that to TV, we would argue that the industry is not being held back by screen size or network speeds; screens are large and homes have high-speed internet. Recall the three essential ingredients that Apple provided to catalyze the smartphone era: platform standardization, mass distribution, and monetization solutions. We propose that it is these three elements that are holding TV back. Let's discuss each in turn.

- **Platform Standardization for TV:** Significant fragmentation issues exist for anyone looking to develop apps or web for TV. Multiple screen sizes and resolutions,

varying user inputs, a wide array of hardware capabilities and performance limitations, many different middleware environments, a variety of network technologies, patchy plugin support, several deployment options, browser variants, and a large number of platform players in any market make for not just fragmented development, but fragmented audiences and fragmented user experiences. Even in mobile Android is suffering from some of these symptoms, but at least Android's market share is big enough that the problems are being overcome. The same cannot be said today in TV. There have been numerous attempts at standardization, such as the Smart TV Alliance, but none have yet gained enough traction to instill confidence and efficiencies for the lion's share of content producers. The promise of "write once, run anywhere" has still not been fulfilled.

- **Distribution for TV:** Following the need for standardization, distribution needs to be addressed. Compared to mobile, televisions have multiple sources and inputs, and each input has a specific purpose with its own type of content, so the channels for distribution for televisions is significantly more complex than mobile. Do the apps live on your TV, your game console, in the web browser, or on your television service provider's Set Top Box? Do you get apps from a store, the middleware UI, or a web portal? Does the developer distribute via the Smart TV manufacturer, or the Set Top Box manufacturer, or the cable operator, or Apple TV, or does the developer try to go over the top (OTT) direct to the consumer? Will multiscreen content stores and management ecosystems like Google Play take hold? Without clear answers for developers and consumers, the distribution of web and app content on television sets remains a hindrance.
- **Monetization for TV:** The key business drivers of content in the television industry have historically been user subscriptions and advertising. For web content and apps on TV today, this remains true. OTT video providers such as Netflix, Amazon, and VUDU have built businesses around user subscriptions. Others like Crackle and YouTube have forgone collecting user fees and rely on advertisers to subsidize the delivery of their programming. However, most of these services are for multiple screens on a wider variety of connected devices. While integrating payment and advertising solutions into mobile and desktop products has become straightforward, doing the same for the fragmented TV ecosystem introduces more hurdles. In reality, the only web content being monetized purely on televisions may be IPTV, and even that content is being shifted to other more portable devices. It remains to be seen whether TV remains a standalone screen to monetize or if it will simply be a driver for a multiscreen future.

Following on from those three key limiting factors, there are still a myriad of other factors that are holding back "apps on TV" and "the web on TV" and why the ecosystem hasn't yet matured like it has on mobile. It is worth discussing each of these in some detail.

THE PAY TV BUSINESS

Having built lucrative television service businesses for decades, Pay TV providers are incentivized to maintain a walled garden environment for as long as possible. If users can get the content they want from other sources, in the same or more formats, and for a lower price, they will find reasons to disconnect from their television subscription. A fully featured open browser, or availability of thousands of apps, creates OTT opportunities, which take users away from the traditional TV service on which Pay TV providers have based their businesses. This is considerably more threatening if the TV service provider does not have a substantial broadband internet business in parallel. If a TV provider acts as the Internet Service Provider, they remain able to monetize the bandwidth served to customers that consume primarily third-party OTT content.

MULTISCREEN BEHAVIORS

Could TV become the proverbial “second screen”? A user that is mobile, and who engages with the smartphone as the device of choice, may only use the TV as a second screen to that smartphone or as a way of more easily accessing and displaying their content. In that sense, the TV is the “companion device”. However for a user that consumes much more content via the regular TV, the smartphone is viewed as the “companion device” in that it provides opportunities to augment the TV experience while the user is on the sofa. If mobile is used synchronously with the television, it is a more interactive personal experience, offering the ability to get more information on programs and ads. Asynchronously, i.e. when away from the sofa, it offers audiences the ability to get “TV Everywhere” along with complementary content and functionality. “Companion devices”, “companion apps” and “second screen” are industry buzzwords that have the promise to turn into extremely compelling new ways for users to interact with their entertainment devices.

A MARKET LEADER IS YET TO EMERGE

It’s all about “supply and demand” or more like “chicken and egg”. Creators of apps will only make them available on platforms that have mass reach, and creators of websites will only optimize them for browsers that have mass adoption. This is what happened in mobile. When the iPhone took off, and Apple opened up the App Store, it fueled tens of thousands of developers to make their apps available on iOS, likewise with Google’s Android. Today in TV, developers struggle to decide whether to build native apps, websites, or web apps, and they struggle to decide which platforms to target. They have limited resources and need to budget. Many brands are therefore focusing on the largest market, perfecting their mobile strategy before optimizing for a nascent TV app market. This is because, right now, there is no clear leader that instills the confidence necessary for an ecosystem to really take off. Samsung is arguably the leading smart TV manufacturer, and they can give us insight into the challenges and opportunities.

Samsung has a Smart TV developer program that supports web technologies. Apps utilizing HTML, CSS, JS, and/or Flash are submitted to Samsung for testing, approval and inclusion in their app store. Additional Samsung-specific APIs are provided to support further functionality such as companion device / companion app to TV communication, access to TV storage, and gesture support. Once an app is fully developed with the Samsung extensions it will create a great experience but will only function on the Samsung device. Samsung has also launched Ad Hub, a program to help developers monetize via ads. The number of apps in the store is in the thousands, but even then, the sheer quantity of apps has not reached critical mass from a consumer perspective. Samsung has gone steps further in creating “smart hub” experiences that tie different content types to better organize the presentation to users. After all these efforts, Samsung still isn’t the runaway winner because they have struggled to provide those three key ingredients discussed earlier to spur on the app ecosystem, those being:

- **Platform standardization:** Samsung only has a quarter of the Smart TV market, then there are non smart TVs, set top boxes, IPTV boxes, games consoles and PVRs, so Samsung is far from being the runaway leader in a fragmented living room.
- **Distribution:** Samsung’s app focus has been on their Smart TVs, and it is not yet clear whether consumers want to run apps on TV, especially when sitting in the living room with other members of the family. Apps that take over the TV detract from the purpose that the TV was probably purchased for, so the distribution opportunities for developers are limited on Smart TV
- **Monetization:** Nobody wants to get their credit card out to pay for an app on TV, or to open yet another account for buying apps, so until Samsung does deals with operators to enable billing of apps onto the cable bill, the opportunities for monetization will be limited.

BUSINESS MODEL COMPLEXITY

When it comes to monetization, TV is a very different world compared to mobile. Mobile began as a way to make calls while out and about, followed by text messaging. For this, users paid their wireless carrier a monthly fee, often getting the hardware free with a contractual commitment. Only fairly recently has mobile matured into a way of consuming and paying for rich media and content. These days mobile phone users have two ongoing relationships; one with their wireless carrier for paying the network service bill, and one with their operating system provider (e.g. an Apple user typically has an account with iTunes for buying music, apps, and videos). On the surface, there are numerous similarities, but there are key differences compared to the TV industry. In TV, advertising can completely subsidize an entire service, users buy much of their own hardware, and content and network are delivered via the same provider. TV service providers could now feasibly turn their entire service into an app and go OTT. Alternatively, due to their precious ongoing relationship with each subscriber they could become a central billing convenience for other OTT services. Each MSO will have to determine where their strengths lie in order to determine the optimal model, either

moving towards becoming a “dumb pipe” delivering capacity to serve the content of others or creating valuable new services that leverage the intelligence of their network and their unique and premium content together.

WEB CONTENT WAS NOT BUILT FOR TV

Most of today’s web and app experiences aren’t ready for primetime. Many web-based TV solutions have some element of walled garden rather than a fully open web experience, either for commercial or technical reasons. This poses challenges for apps and the web on TV, which have historically been designed for open mobile and desktop browsing. Developers also have to make “leanback” versions of their solutions, which are optimized for the D-Pad remote, laid out for the big screen far away from the user, and sensitive to the fact that the user wants to get to the entertainment with limited navigation and clicks. With only handfuls of web sites designed for television screens, which only work across select TV browsers, web content remains a far cry from the vast amount optimized for mobile or even tablets. The path to TV from desktop and mobile is rife with hurdles.

However there are some industry giants taking bold steps to create the canvas of the future. For example ARRIS has made the decision to go with an HTML5-based platform for its Whole Home Solution (Media Gateway and Media Players) which enables industry-standard HTML-based apps to run on the ARRIS hardware, and enables Multiple System Operators (MSOs) or developers to create whatever apps or web-based ads that they want for a particular use case. This approach means that no executable apps are downloaded to the box, which in turn means no malicious code from third parties. If we look at how users use PCs today, much of their interactions are via the browser (whether it’s webmail or banking or CRM or shopping) rather than via installed software, and if TV plays out the same way, a web-based approach will make sense.

Others are building on top of web technologies, as Samsung has done with their SDK. The Apache Cordova project is allowing developers to port their web applications to Google TV, but is scant in the way of other television- related platforms. Myriad takes this a level further. They have identified that TV users are demanding and expecting to be able to run the apps that they are familiar with, even if the TV platform is proprietary, so they have developed Alien Vue, which is a way of running Android apps on non-Android hardware. Until browsers are industry-standard and fully featured, and until cross-platform apps are ubiquitous, opportunities will exist for solutions to plug the gaps.

POOR BROWSING EXPERIENCES

As with mobile in those early days, regular web browsing was a poor experience, and to a large extent still is on TV today. There are a plethora of different browsers available for televisions, including solutions from Opera, Espial, ACCESS, Google, and Microsoft. Each has potentially different rendering engines, standards implementation, and plugin

support. Processor power and available memory are often limiting factors. This is fuelling the rise of custom solutions, whether they are apps optimized for the device, optimized web pages, or cloud-based client-server browsing solutions where much of the processing and interaction is handled in the cloud, leaving the device to handle only the presentation layer. This browser-in-the-cloud concept has been executed in mobile for years by Opera with their Opera Mini browser, especially for low performance feature phones. A similar approach has been adopted in the TV industry by ActiveVideo Networks with their CloudTV products.

A SIDE NOTE ON GAMING

With the dramatic rise in gaming consoles in living rooms, their added functionality from internet connectivity, the broadening of their remit beyond games into video and browsing, their expansion into accepting payments, and their ability to become a social hub for Massively Multiplayer Online Games (MMOG), it could be argued that game consoles are already the set top boxes of the future. In fact, MSOs like Telus are betting on that, as they deploy the Microsoft Xbox 360 as a set top box option for their service. The Sony PlayStation 3 offers many OTT content options, a large online gaming community, and recently began offering apps through its store. The most direct effort at TV may be from Nintendo in the Wii U console, which offers the TVii product that combines the media information from streaming, linear, and broadcast programming sources to give the users a destination for discovering content. Based on viewing history, the TVii then surfaces information like sports scores, cast profiles, and social commentary.

Game consoles are now also becoming an important device for browsing. If you look at the Xbox 360, that device now has Internet Explorer. The PlayStation 3 has an Opera browser and the Wii U has a WebKit-based browser. With more TV browsers in more places, it's truly only a matter of time before web apps and TV optimized web pages start appearing in large numbers.

This brings us all the way back to where we started, which is fragmentation and no clear winner. If you ask developers, they will say that while they love the mass market reach of gaming consoles, they are yet another platform to develop for, with yet another payment system and business model, and they aren't sure that those consoles are the best way to reach TV audiences.

LOOKING FORWARD

At AppCarousel, we have seen a complex fragmented mobile world shake out into a few key standards and a few successful approaches, and we are starting to see similar dynamics in the TV space. But until that shakeout happens, users will continue to be confused by which parts of their TV solution need to be smart, where to browse and run

their apps, how to pay for premium content, and where to place their money - and their bets - on home entertainment of the future. Pressure from cord cutting (where Pay TV subscribers look to reduce their bills by closing their TV service accounts) is becoming a reality as users seek out more OTT services. Cable MSOs are innovating to remain relevant by delivering controlled OTT services of their own, as well as by embracing the users' desire for companion device experiences by delivering TV Everywhere solutions. The high cost of content increases the level of friction between all MVPDs (Multichannel Video Programming Distributors), which will mean that creative models of monetization will need to emerge. Meanwhile TV advertisers are seeing their users move away from traditional TV, and therefore not paying attention to 30-second spots, so they are seeking out advertising solutions that reach those users via apps, the web, and on those companion devices.

In terms of the evolution of web and apps on TV, we are definitely past the Forming stage, and we would argue that we have entered the Storming phase where battle lines are being drawn and where lots of money is being spent to carve out market share and viable solutions. Nobody would claim that we have entered the Norming phase yet, we predict that's 3 years away. Can MSOs get there? It comes back to those three factors:

- **Standardization:** As most subscribers need a cable connection (even if it's just for internet rather than TV), and as that cable connection needs a termination device provided by the MSO, and as the MSOs have always been at the forefront of standards, MSOs have every opportunity to standardize the hardware in the living room (just as mobile operators have driven the adoption of Apple and Android devices).
- **Distribution:** Most subscribers have a relationship with an MSO, MSOs can reach almost every home, and MSOs have huge power with the content providers and therefore the app developers, so when you look across the value chain the MSOs have the biggest opportunity for widespread distribution of apps as the next emerging form of content.
- **Monetization:** Most subscribers have a direct billing relationship with an MSO, for Pay TV, telephony and internet. So MSOs are ideally placed to start selling apps and the content within them, placing those charges directly onto the cable bill.

Therefore MSOs are in the ideal place to take advantage of the new app economy, if they drive towards a standardized world that developers will embrace, while offering unparalleled reach, and easy monetization via the cable bill.

Therein lies the opportunity for our entire industry. AppCarousel went through it in mobile, and helped so many companies to navigate their way through those choppy waters, and it is now doing the same all over again in TV.

Abbreviations and Acronyms

IP	Internet Protocol
2G	Second generation mobile technologies that gave users very basic IP access and slow speeds
WAP	Wireless Application Protocol, the early form of mobile internet
iOS	Apple's mobile operating system
HTML5	The latest standard in web programming
CSS3	cascading Style Sheets, a programming language for web page layout
OTT	Over the top
MSO	Multiple System Operator, often referred to as cable operator
SDK	Software Development Kit
MMOG	Massively Multiplayer Online Games
MVPD	Multichannel Video Programming Distributor