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Australian Government

Bureau of Meteorology

MOBILE STRATEGY

1. Executive Summary

1.1. Mobile Vision

General mobile use is growing at the fastest pace we've ever seen. Although there are already many weather apps in market, the Bureau holds the most valuable piece of the product roadmap – its weather data combined with generations of dedicated scientists and meteorologists.

That said, there are countless hurdles to overcome as the mobile channel is created. Challenges with processes, lack of mobile expertise, monetisation goals, technical architecture problems, internal groups that move forward quickly with their product, and others.

And externally, we will continue to see a shifting mobile landscape, new devices in market, and new products from the competition that will require the overall strategy be adjusted. It will be no small feat to implement a mobile strategy and align the organisation to a common agenda.

Vision
We believe the following vision can serve as guiding principles for the Bureau's mobile program:

‣ To provide every Australian with timely, accurate, and relevant weather information and notifications on their mobile device
‣ To retain status as Australia's most authoritative and trusted provider of weather, climate, and severe event forecasting information and services
‣ To surpass the current weather market competition by offering a superior mobile product and superior mobile experience

Goals
This vision can be achieved by adopting the following goals:

‣ Increase customer engagement by publishing Bureau content on mobile and tablet devices
‣ Increase the number and frequency of Bureau mobile and tablet products in the marketplace

- Increase the data and presentation quality of weather applications in the Australian marketplace
- Decrease the time it takes to publish content to multiple devices
- Decrease the time it takes to design and deploy new products, features, and enhancements
- Create profitable program that can become self-sustaining

1.2. Our Objectives

- A mobile product in the marketplace by end of 2013
- The ability to support for more than one platform with a single source of data by 2013
- A mobile app in a major App Store in 2014
- Have an average customer rating of four stars in all available App Stores by 2014
- A revenue generating product in the market by the end of 2014
- A 30% reduction in the time it takes to roll out new features by 2014
- A 40% reduction in costs to publish content to multiple channels by 2015
- The ability to rollout and manage at least three multi-channel products by 2016
- A fully self funded digital program by 2017

1.3. Our Approach

The Bureau is moving quickly to address what customers are requesting in the mobile channel. Evidence of this is in this strategy initiative, and other projects such as the "Water App" that was put into market both quickly and effectively. This app seemed to be a one-off mobile solution – now recognising the importance to develop a greater Mobile Strategy and move forward.

The following are groups of high-level actions found in the Roadmap Options section in the strategy. Each action is meant to kickoff individual workstreams to move forward with the Mobile Program.

Apps
- Establish a Product App Roadmap with defined core feature sets

- Resource, plan, and develop a free application per the Roadmap. This app will recruit customers away from the competition and show that the Bureau has the best, most relevant data

- Resource, plan, and develop a premium application per the Roadmap. This app would provide detailed, specific weather information for users that need it for frequent, industry impacted weather decisions

Publishing

- Review the current data architecture to determine data that can be made easily available vs. data that would be difficult to access

- Determine the technical strategy to have data be made available for both mobile web and mobile app – both short term (perhaps temporary) and long term strategies

- Resource, plan, and execute on the Publishing strategy to make data available for internal web and application use

Services

- We recommend that the Bureau further explore the possibility of developing a services strategy, in additional to the app data necessary via the publishing strategy

1.4. Learnings & Recommendations

We are not be privy to a number of factors that may impact the following challenges. From what we were able to uncover throughout our engagement, these areas are of concern. We designed the Mobile Strategy to address these issues.

1.4.1. Unprepared for Mobile

- We are concerned that the Bureau is not properly prepared to execute a mobile strategy.

- Departments and stakeholders are still very siloed and appear to have conflicting priorities. However stakeholders did show their passion for the Bureau a strong willingness to rally around a shared vision.

- Decisions are still being made by committees and not people. We saw limited evidence of empowered product management, technical or creative direction. These roles are crucial for guiding any mobile strategy.

- We didn't see any evidence of the product, design, or technical infrastructures that we would expect for a mobile strategy. These are necessary components in order to properly execute a modern mobile strategy.

- We believe that the unpreparedness in these areas will severely limit the Bureaus ability to build a profitable mobile program that can both respond to current market needs quickly as well as be competitive in the marketplace.

- Therefore we tailored our original Mobile Strategy report to be more instructive in nature. For both the workshop and the mobile strategy we felt it a requirement to "level set" the stakeholders and include broad overviews for each of these areas.

- At this stage, it is premature to recommend a more in-depth or, overly prescriptive strategy. Instead our hope is to help stakeholders better understand some of the basic necessities of running a modern mobile program and provide depth where needed.

1.4.2. A Lack of Tools

- The Bureau does not have any of the tools in place to create even the simplest of mobile strategies.

- Even the most rudimentary production tools – like CSS frameworks, that increase consistency while reducing time to publish – are not in place. There are no tools in place to support the multi-platform complexity of mobile.

- From our understanding the majority of web content is being manually published. There is no CMS in place, and it appears it will be one year before one is in place. This is of great concern.

- While the Bureau's primary product is data, we saw no evidence of an API making that data available in an industry acceptable way. Like the CMS, it appears it will be a year before basic data is available. This is of critical concern.

- With no CMS and no API in place, it could be at least one year before we can get content to mobile devices, we see this as a critical obstacle to beginning to build a mobile strategy.

1.4.3. The Wrong Focus

▸ We are concerned that the Bureau becomes too easily distracted with ambitious and lofty goals, and is not paying enough attention to the basics.

▸ For example, the goal to earn revenue from mobile apps seems very premature. The weather app marketplace is very competitive and the Bureau hasn't shown they have the resources or tools needed to be competitive with free apps.

▸ There is also a heavy focus on native apps, specially for iOS, which seems overly ambitious without any of the basic tools in place for delivering data to native frameworks.

▸ Creating apps designed specifically for Industry customers are also a popular topic with stakeholders. We do believe that the non-consumer market is the most like source of revenue, however we feel that the basic consumer interest must be served first before we begin to address the more complex and diverse needs of non-consumer markets.

▸ We recommend making the modernisation of the Bureaus web publishing techniques a priority. We need to reduce the time and cost to publish so we can simultaneously publish to desktop, mobile and tablet platforms.

1.4.4. Late to Market

▸ We are concerned that we may be too late in delivering a basic weather app to consumers – the most popular and most commonly purchased. By the time the Bureau is able to deliver even a basic mobile product, we believe the addressable market will have decreased considerably in size, further reducing an already small ROI.

▸ We find when a client is late to market, the best strategy is either a.) leap frog the competition with amazing design and features, or b.) commoditise the industry – driving down cost to customers while increasing value, making it unsustainable for smaller competitors to draw away Bureau customers.

▸ We feel because of the issues listed above, that commoditisation is the best strategy, however this directly conflicts with the mandate to produce a revenue generating strategy. We've attempted to produce a roadmap in the Mobile Strategy document that resolves this over three to five years.

1.4.5. Agility

▸ Unless a new strategy is adopted, we believe it might not be until 2015 that we see a competitive mobile product from the Bureau. By then the market could look much different than it does now, introducing the risk of market shifts during unnecessarily long development cycles.

▸ We are concerned about the Bureaus ability to be agile, establishing the right roles and empowering staff to make decisions quickly. It is simply taking too long to get critical systems, infrastructures and staff in place.

▸ We feel that in order to be competitive, the Bureau must be able to plan, approve, fund, and execute a product, feature or enhancement within three months – producing at least four cycles a year. Ideally we'd like to see each cycle reduced to two months, producing six cycles a year. Most app teams – the Bureaus competition – use one month cycles, producing twelve cycles a year.

1.4.6. ROI Expectations

▸ Due to the aforementioned challenges, as well as the limited addressable market of Australia, we are concerned that it may be impossible to break even or generate a profitable return on investment of a mobile program.

▸ In order to increase the likelihood of a reasonable return on investment, we feel the following areas must be addressed:

  • Provide focus to staff by prioritising fundamental and achievable goals over long term vision. We recommend establishing a single very high level vision or direction that can serve as a general beacon for Bureau staff and stakeholders – currently this is pursuit of revenue, which is a desired outcome not a vision. Then have teams create achievable and timely goals that help support the vision, giving the staff empowerment and focus.

  • Reduce the cost of web publishing by modernising tools. We fully expect that more money will be saved in the first two years by simple modernisation of tools, than would be made from mobile app revenue.

- Increase the Bureau's agility by empowering staff, reducing cycles and eliminating bureaucracy. Harder said than done we know, but from the passion and commitment we saw from Bureau staff, we believe the team is up for the challenge.

- Forgo pursing revenue in the mobile channel until year three or four, after the proper tools and services can be put in place. In the meantime, optimise web publishing to support mobile and tablet, commoditising weather data in Australia and to prevent further attrition of customers.

- Heavily invest in the modernisation of digital technology and tools. Modest investments over the next 24 months can highly reduce costs and increase ROI over the subsequent years.

1.4.7. Actions

These actions are a section by section summary of the actions listed throughout the strategy document.

Market Assessment

✓ Commission a market study focused study on monetisation opportunities. Both this Mobile Strategy, and the strategies we reviewed to inform the Mobile Strategy, have not focused deeply enough to understand the true monetisation potential required for business goals.

✓ Stay connected to the rapidly changing mobile device and platform landscape. Driven by product, these are evolving as fast as any market we have seen. With the speed at which the Bureau can execute a strategy, markets should continually be examined.

Program Planning

✓ Approve a multi-pronged strategy and move forward – continue to keep abreast on changing devices, standards, and market conditions.

✓ Think "disruptive" – with the products already in market The Bureau needs to provide something even better, a more meaningful application experience for the Australian public.

✓ Further discuss an "BOM Everywhere" strategy – providing weather and climate data on anything with a screen.

✓ Make significant investments into data publishing capabilities – data services architecture to serve data to mobile apps, including a way for customers to submit weather data from mobile devices.

✓ Focus on a disruptive free application using the appropriate app class that provides users the highest fidelity experience based on the v1 feature set

✓ Increase internal staff subject matter expertise, regardless of the intent to build the app within the Bureau or commission the build.

✓ Define a v1 balance feature set to be launched in a free product that can be built in a timely manner and in an engaging customer experience, based on the recommendation of this strategy.

✓ Review the defined feature set with an external audience – it is our experience that companies try to do too much too quickly, which results in delayed launches and a poor experience.

✓ Plan a v2 feature set that should replace the first product in market.

✓ Create a Content Proxy that uses data from MetEye and other data sources to efficiently serve necessary content to a mobile app

✓ As mentioned in the Opportunities section, make significant investments into data publishing capabilities – data services architecture to serve data to mobile apps, including a way for customers to submit weather data from mobile devices.

Roadmap Options

✓ All actions are listed in the Approach section.

2. Market Assessment

2.1. Market Overview

Mobile is a market that is still growing in Australia – globally ranked 14th in smartphone subscribers[1] as of Q4:12[2].

Both experts and data suggest that the increased use of mobile devices in our everyday tasks require us to re-imagine nearly everything when creating new mobile UI. We need to consider device processing power, connection speeds, user interface, user experience, and beauty.

Looking specifically at the Bureau's smartphone traffic, bom.gov.au website data reveals a 12% increase in smartphone use from 2011 to 2012, to over 13.8 million smartphone users that are fifteen years and older.

bom.gov.au website data also reveals device users are eager for weather information. About 73% of the audience access weather related information. A similar percentage are also accessing social, game, and mapping applications.

Australian Population

● 0-14 yrs   ● 15-65 yrs   ● 65 +

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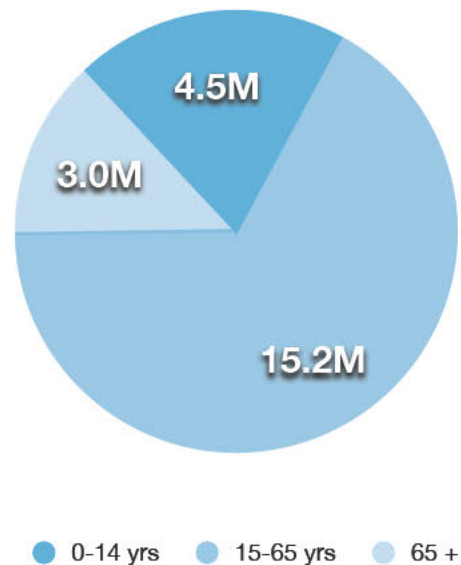
1 Source: World Health Organization

2 http://trends.e-strategyblog.com/2012/12/24/mary-meeker-2013-trends-presentation/6651

Within that percentage, Apple devices account for the majority of access at 70%, whereas Android is a distant second. This is slightly disproportionate to other countries where recent data suggests Android is leading Apple in global market share by single digit percentages.

Australian Smartphone Users

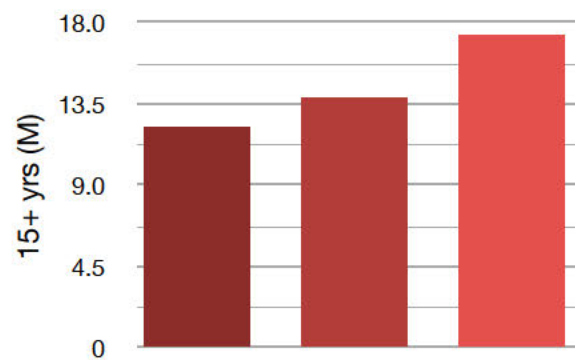In Australia, we would expect the Android market share to increase in 2013. Some Australian consumers will replace their older Apple devices with Androids, and new subscribers are likely to adopt the Android platform at proportions closer to what we see worldwide.

The tablet market has expanded the fastest over the past year seeing tremendous growth of over 140% globally.3 bom.gov.au website data supports this statistic, revealing that nearly one in three of those fifteen years and older are accessing the Bureau website using a tablet device.

Tablet Growth

2.1.1. Application Purchase

Buying apps is not unfamiliar to Australian app users. Over the past 3 years those willing to make app purchases was consistent at approximately 60%.

This is supported by United States mobile commerce data. In 2011 during the Black Friday holiday shopping (during the Thanksgiving public holiday preceding Christmas), nearly 25% of of commerce was done using a mobile device, an increase of 14% from 2010.4 Although Australian app purchase is not a U.S. Public holiday, it does show that consumer confidence in mobile commerce is increasing rapidly, and app purchase is on the leading edge of this market

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3 http://www.idc.com/getdoc.jsp?containerId=prUS24093213

4 http://trends.e-strategyblog.com/2012/12/24/mary-meeker-2013-trends-presentation/6651

change.Consumers are willing to pay for an app that performs well and provides valuable features. This is also supported by our global observation of mobile app purchases.

In this study, iOS commerce was four times greater than that of Android. Recent security reviews5 have also been released, suggesting Apple ranks much higher than Android in providing a secure device.

Based on these trends, the Bureau will be able to generate mobile revenue provided application development and monetization strategies are well executed. Later in this report we will analyse subscription and app purchase strategies based on market projections, competition, and revenue requirements.

2.2. Addressable Market

2.2.1. Overview

There should be no doubt that the overall Australian mobile market is sizeable. The question is, "How many of these users will our product be able to reach?" This is called the 'Addressable Market' – the portion of the market that is likely to have an interest in a weather product.

The good news is that 73% of all smartphone users have indicated they want news and weather services on their phone, which are a very big slices of the pie. We can use that figure to project the number of smartphone and tablet owners that will want news and weather applications on their device over the next three years.

However, that is only our gross addressable market – the maximum number of users that would download a free application. We see the numbers go down dramatically once we ask customers to pay $0.99 for an application, and even further down as we increase the price.

In the best case scenario, if the Bureau launched one $0.99 product or add-on feature per year and were able to get the entire addressable market with each release, the estimated revenue would be $1,941,304 AUD over three years. Adding Android would increase the value to $2,745,559 AUD.

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5 http://tech.fortune.cnn.com/2013/04/14/apple-enterprise-android-malware/

It is much more likely that the Bureau will capture somewhere between 20-50% of the addressable market. Yet it all depends on the quality of the application, not to mention the promotion and timing of a product launch.

The below table of projections was created exclusively for the Bureau. It uses over a dozen different data points, provided by the Bureau, the Global Health Organisation, various Mobile Market Reports and s47G own market data.

s47G

		2013	2014	2015	2016	3yr Total
Total Population		23,427,446	23,755,430	24,088,006	24,425,238	
2-17 yrs old	10%	2,225,607	2,256,766	2,288,361	2,320,398	6,865,524
18-24 yrs old	13%	3,022,141	3,064,450	3,107,353	3,150,856	9,322,659
25-34 yrs old	18%	4,310,650	4,370,999	4,432,193	4,494,244	13,297,436
35-49 yrs old	29%	6,723,677	6,817,808	6,913,258	7,010,043	20,741,110
50+ yrs old	31%	7,145,371	7,246,406	7,346,842	7,449,698	22,041,946
Devices						
Smartphone Users	67%	17,268,556	19,306,246	21,584,383	24,131,340	65,021,968
Tablet User	40%	10,689,628	13,853,758	17,954,471	23,268,994	55,077,223
Total Devices	-	27,958,184	33,160,004	39,538,853	47,400,334	120,099,191
Apple	**70%**	**19,570,729**	**23,212,003**	**27,677,197**	**33,180,234**	**84,069,434**
News & Weather Apps	73%	14,286,632	16,944,762	20,204,354	24,221,571	61,370,687
Addressable Market						
Free App	76%	10,857,840	12,878,019	15,355,309	18,408,394	46,641,722
$0.99 Price Point	4.6%	652,123	773,455	922,241	1,105,609	2,801,305
Revenue	$0.99	$451,921	$536,004	$639,113	$766,187	$1,941,304
$1.99 Price Point	0.27%	39,167	46,454	55,390	66,403	168,247
Revenue	$1.99	$54,559	$64,710	$77,158	$92,499	$234,367
$2.99 Price Point	0.02%	2,352	2,790	3,327	3,988	10,105
Revenue	$2.99	$4,923	$5,839	$6,963	$8,347	$21,150
$3.99 Price Point	0.001%	141	168	200	240	607
Revenue	$3.99	$395	$468	$558	$669	$1,695
$4.99 Price Point	0.0001%	8	10	12	14	36
Revenue	$4.99	$30	$35	$42	$50	$127
Android	**29%**	**8,107,873**	**9,616,401**	**11,466,267**	**13,746,097**	**34,828,765**
News & Weather Apps	73%	5,918,748	7,019,973	8,370,375	10,034,651	25,424,999
Addressable Market						
Free App	76%	4,498,248	5,335,179	6,361,485	7,626,335	19,322,999
$0.99 Price Point	4.6%	270,165	320,431	382,071	458,038	1,160,540
Revenue	$0.99	$187,224	$222,059	$264,775	$317,420	$804,255
$1.99 Price Point	0.27%	16,226	19,245	22,947	27,510	69,702

		2013	2014	2015	2016	3yr Total
Revenue	$1.99	$22,603	$26,808	$31,965	$38,321	$97,095
$2.99 Price Point	0.02%	975	1,156	1,378	1,652	4,186
Revenue	$2.99	$2,040	$2,419	$2,885	$3,458	$8,762
$3.99 Price Point	0.001%	59	69	83	99	251
Revenue	$3.99	$163	$194	$231	$277	$702
$4.99 Price Point	0.0001%	4	4	5	6	15
Revenue	$4.99	$12	$15	$17	$21	$53

While these numbers are far from being conclusive, they do provide valuable insight into the addressable market size, and help us understand and plan a realistic long term mobile strategy.

2.3. Market Challenges

2.3.1. Overview

There are a great number of challenges that are holding back the mobile market- despite this, the mobile market continues to grow at an exponential rate with consumers.

We've repeatedly observed this disconnect between the real challenges of providing long term mobile products while meeting high consumer expectations of today's market with some of the largest companies in the world. Nine times out of ten this results in a mobile strategy that is far outside the initially allocated time, budget, and resourcing constraints.

Just as Web 2.0 needed early content management systems and Ajax in order to create companies like Facebook, YouTube, Blogger, Wikipedia, and Twitter, mobile still needs similar starting points to reach its full potential. These milestones have yet to be reached in mobile.

Our first recommendation when developing a mobile strategy is to understand the challenges of the mobile market and to focus on developing a very pragmatic approach to addressing them over time.

A Fragmented Marketplace

‣ Currently, the mobile application market is tied to multiple platform-based App Stores. This requires that businesses make multiple versions of their application and support a plethora of mobile devices in order to sell their product.

‣ Supporting multiple devices and marketplaces quickly becomes cost prohibitive for most businesses. This has remained unchanged for nearly a decade.

Unmet Consumer Needs

‣ Due to the rapid growth of smartphones, mobile is currently the number one business consideration in the market today.

‣ Consumer demand for Apple-quality mobile solutions is incredibly high.

‣ The majority of businesses do not have the resources or expertise to define, create, or maintain a mobile solution.

‣ Skilled mobile resources available are extremely limited.

Lack of Tools

‣ The majority of Fortune 500 companies do not have data infrastructure to support a strong long term mobile strategy.

‣ The W3C has an extremely restricted roadmap for HTML5, limiting most businesses mobile strategies to 1-2 years.

High Cost of Support

‣ The high cost of device fragmentation continues to hinder innovation.

‣ Due to the lack of standards in the mobile market HTML5 mobile strategies can quickly increase in cost as additional devices come to market.

‣ The Android platform continues to be fragmented and can be cost-prohibitive to support.

‣ A go-to market mobile strategy costs cost between 0.01% and 0.05% of gross revenues per year.

‣ Limited data is often available to justify appropriate budgets, KPIs, and ROI.

Needs Critical Mass

‣ These problems will continue to limit the available tools and solutions in the marketplace.

▸ The lack of viable cross-platform mobile solutions will continue to hinder efficiency and innovation- reaching critical mass on mobile marketing, advertising, commerce, and payments.

2.4. Best Practices

2.4.1. Overview

Given the steady rise of smartphone use in the mainstream public and the increasing commonality of tablet usage there has been a significant cultural shift toward cross-platform digital media consumption. The reality of this swell has resulted in a highly competitive landscape for weather apps.

This section is an overview of best practices based on market comparison research (on 35 of the top free and paid weather apps in the Apple and Android market, for US and Australia). Included are Insights to Top Market Weather Apps, Comparing and Contrasting Weather Apps, Weather App Design Trends (interface, design, data presentation), and a conclusion of the best practices and research data.

2.4.2. Insights

The "Top Market Apps" are defined categorically by having high ratings and usage reported- listed under "most popular" by the App Store. The data in this comparison research demonstrates that apps in the weather category captivate and enlighten customers, primarily when the product finds and focuses on a particular niche- e.g. current, hyper-local weather information, lifestyle forecasts, radar mapping information, or real-time severe weather alerts.

By further specialising the customer experience through interface and design e.g. simplistic, highly informative, creative, fun, or innovative- apps maintain customer loyalty and receive high ratings in the market.

▸ there are currently 4,900 weather apps in the American market
▸ priced from free to up to $4.99 (for a one-time purchase with in-app purchases)
▸ there are a few very specialised apps in the $10-60 range (marine, radar)

▸ most popular customer apps were paid apps (as reported by Apple App Store)Australian Weather Apps

There are several apps that are used globally for weather: AccuWeather, The Weather Channel, and Weather Underground (and its many related apps). Theyare recommended by LifeHacker as free versions of excellent weather apps for Australian consumers.

In an App Directory category for Best Weather App for iOS, Pocket Weather was named as the one to beat in the Australian Market.

The following shows a sample of features.

Top Features

▸ current weather

▸ high/low temperatures

▸ humidity

▸ precipitation

▸ cloud cover

▸ wind

▸ sun rise/set

▸ hourly forecast

▸ real-time severe weather warning alerts

▸ push notifications

Additional Features

▸ 3,7,10,15 day forecast

▸ animated radar or satellite images

▸ lifestyle forecasts

▸ user-generated content (i.e.photographs, weather reports)

▸ socialisation (Twitter, Facebook, etc.)

2.4.3. Actions

✓ Commission a market study focused study on monetisation opportunities. Both this Mobile Strategy, and the strategies we reviewed to inform the Mobile Strategy, have not focused deeply enough to understand the true monetisation potential required for business goals.

✓ Stay connected to the rapidly changing mobile device and platform landscape. Driven by product, these are evolving as fast as any market we have seen. With the speed at which the Bureau can execute a strategy, markets should continually be examined.

3. Program Planning

3.1. Opportunities

3.1.1. Overview

While there are many discussions about the next evolution of mobile apps and content, little is understood by the market. The market can sense something is coming, but it is not able to articulate what it will be and how to take advantage of it – simply pointing to the bespoke efforts of big names like Google and Facebook.

The market will often conflate different incompatible technologies, leaving businesses poorly prepared to create a realistic mobile strategy based on their own business goals.

This can lead to speculative or unproven strategies, based more on the press than actual business needs. For example, many research firms might recommend mobile web apps one quarter, only to recommend native apps the next.

We recommend employing an evolving mobile strategy, picking an entry point and evolving the strategy to changing devices, standards, and market conditions.

3.1.2. Current Opportunity: Mobile Apps

Currently, the market is focused entirely on the mobile application space in an almost reactive way. Historically, this has been the only viable mobile distribution strategy. Today's mobile apps are an evolution of a ten-year-old strategy made possible by current mobile hardware.
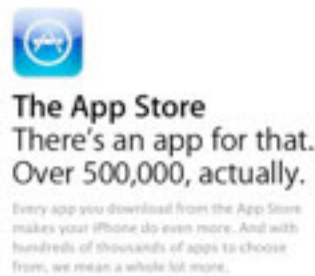
Due to the problem of a fragmented market, many companies are caught off-guard while holding off on developing their mobile app strategy, waiting for more cost efficient option.

This creates a significant opportunity for competitors to enter the mobile app space early and disrupt or acquire customers through marketplaces like the Apple App Store or the Android Market.

This market is expected to reach $183 billion by 2015.

What this means for the Bureau?

This is where the Bureau is now. With a large number of weather apps already in the market, many on the second, or third major version, the Bureau must be able to disrupt the market with a better, more meaningful application experience for the Australian public.

3.1.3. Future Opportunity: Near-Ubiquitous Experience

The number of devices currently connected to the Internet is over 5 billion. Several different technologies (LTE, IPv6, HTML5, etc) will merge to enable what we call Near-Ubiquitous Experiences (NUE) across a multitude of devices- from phones, to cars, to environmental advertising.

In this model, the business logic lives in The Cloud and there are many clients – both native and web-based – that can start, resume, and complete transactions.

We think of this stage as "Cloud Computing" meets Near-Field Communication (NFC). Cloud-based services – which is the best indicator of the potential market size – claimed $68.3 billion in revenue in 2010 and is expected to reach $148.8 billion by 2014.

Today HTML5 is being viewed as the primary framework of this stage. Although, the lack of standards being defined by the W3C and other standards bodies is currently holding it back and making it more costly than native mobile apps.

This may change, but we believe it is more likely that we won't see a mobile friendly framework until we are closer to HTML6 being defined.

Alternately, if the mobile platforms create a more open mobile standards process, we could see industry-led standards. Though as long as Apple and Google are the primary mobile platform providers we do not think this is likely to happen soon.

What this means for the Bureau?

We see a significant opportunity for the Bureau to take advantage of this next stage. Being able to present highly relevant weather and climate data on a variety of screens and platforms around Australian will be a big win for customers. The Bureau will have a ubiquitous presence in customers' lives, simply being anywhere people are.

In order to prepare for this next shift, the Bureau will need to make significant investments into their data publishing capabilities.

3.1.4. Future Opportunity: Linked Data

Tim Berners-Lee – father of the World Wide Web – described "Linked Data" as a "new form of Web content that is meaningful to computers will unleash a revolution of new possibilities" in 2001. The concept is, data will increasingly come from multiple sources and be in multiple formats. We need a way to bring data together dynamically to create new contextual experiences on demand. However, these concepts are still stuck in academia.

Multiple data systems need a common language in order to work with the coming age of near-ubiquitous experiences and devices.

To date, this market need is completely under-served and therefore no one knows its market size or potential. However,

s47G   has worked with companies like s47G   and others and observed first-hand the value that Linked Data solutions can bring to customers.
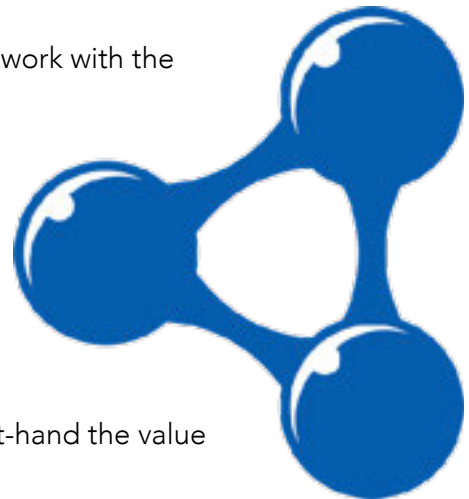
What this means for the Bureau?

Currently the Bureau is fortunate enough to be in content publishing – creating weather forecasts and pushing them out to various outlets. But as the industry shifts more toward a Linked Data model, we will likely see a future where many devices can become meteorological sensors, with the ability to transmit data back to the Bureau.

The opportunity presents itself for the Bureau to prepare for this transition by further investing into its data services architecture, developing a true linked data system.

3.1.5. Actions

✓ Approve a multi-pronged strategy and move forward – continue to keep abreast on changing devices, standards, and market conditions.

✓ Think "disruptive" – with the products already in market. The Bureau needs to provide something even better, a more meaningful application experience for the Australian public.

✓ Approve an "everywhere" approach – provide weather and climate data on a variety of screens and platforms around Australia

✓ Make significant investments into data publishing capabilities – data services architecture to serve data to mobile apps, including a way for customers to submit weather data from mobile devices.

3.2. Apps Assessment

3.2.1. Overview

There are many ways to deliver content to mobile devices. We tend to call of them "Apps" but there are subtle differences that are important to understand and consider when building a mobile program.

To make matters more confusing, we hear of technologies like HTML5 or techniques like Responsive Web Design that appear, at least on the surface, as simple solutions to big mobile problems.

For most organisations a mobile strategy is typically defined by how you intend to use mobile devices to create two-way dialogue with your customer. However the Bureau's role for mobile customers, at least initially, is simple to publish weather data to Australian's.

This gives us a lot more options to choose from, allowing us to explore each of the different types of apps to find the right strategy.

In this section we will define each of the different types of apps. More detail and the advantages and disadvantages of each can be found in the Appendix.

3.2.2. Mobile Websites vs. Mobile Web Apps

There are distinct differences between a Mobile Website and a Mobile Web App, sometimes referred to as a HTML5 Mobile App. These differences are important to note as not all mobile technologies and solutions are equal.

A mobile website is a website designed specifically for mobile devices, not to be confused with viewing a site made for desktop browsers on a mobile browser. Mobile websites are characterised by their simple "drill-down" architecture, or the simple presentation of navigation links that take you to a page a level deeper.

Different than a Mobile Website, Mobile web applications are mobile applications that do not need to be installed or compiled on the target device. Using HTML5, CSS, and JavaScript, they are able to provide an application-like experience to the end user while running in any mobile web browser. By "application-like" experience, we mean that they do not use the drill-down or page metaphors in which a click equals a refresh of the content in view. Web applications allow users to interact with content in real time, where a click or touch performs an action within the current view.

However the app will be limited to the capabilities of the onboard browser of the planned devices. There are four classes of devices it is possible to support, these are further define in the Appendix
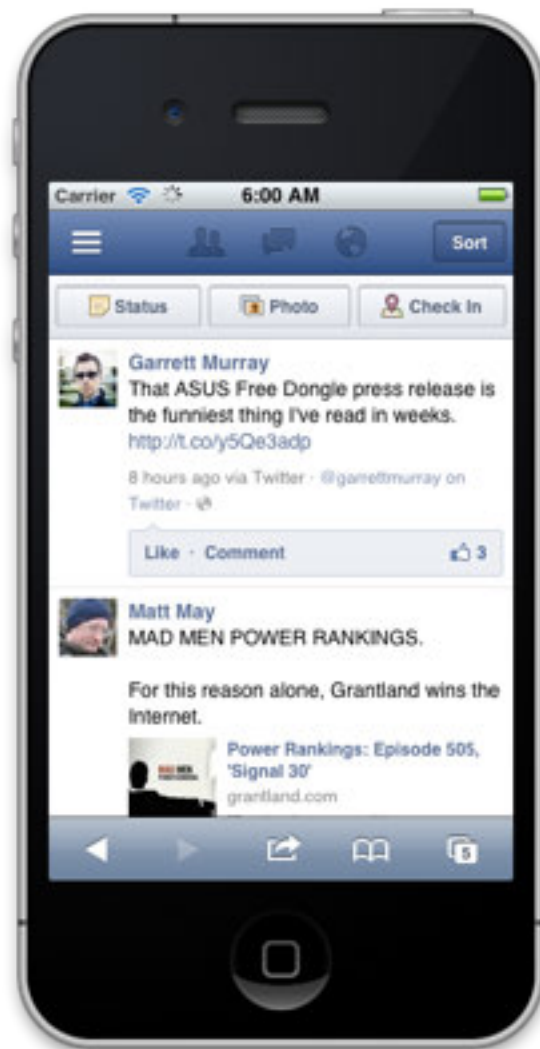
3.2.3. Native Apps

Native applications are apps that are downloaded and installed on the device – a process called on-boarding or provisioning. Once installed, the app can be launched from the users home screen – called a springboard.

Native apps provide focus around brand, topic, or content. It is a purely curated area of focus for the user. They also provide the most flexibility in both design and development, as long as it is compatible with the platform guidelines.

Native vs. HTML5

One of the key questions most companies are asking themselves when it comes to their mobile strategy is around Native vs. HTML5. They are two of the hottest technologies in mobile, with a fair amount of overlap.

The general rule of thumb is if you're creating an app that relies on native functionality such as the accelerometer or camera, then you should go down the native path, however HTML5 can still provide a lot of the same functionality, with the added benefit of cross-device compatibility.

HTML5 has some limitations on things like speed and access to certain phone features, however an advantage is that HTML5 apps are searchable by standard web crawlers such as Google, so consumers will still find results in standard search engine queries.

Ongoing maintenance of your application is also a key consideration – how are you planning to support the application going forward? Will your current development or product team be able to make updates to your app, or will you need to bring in a specialist developer?
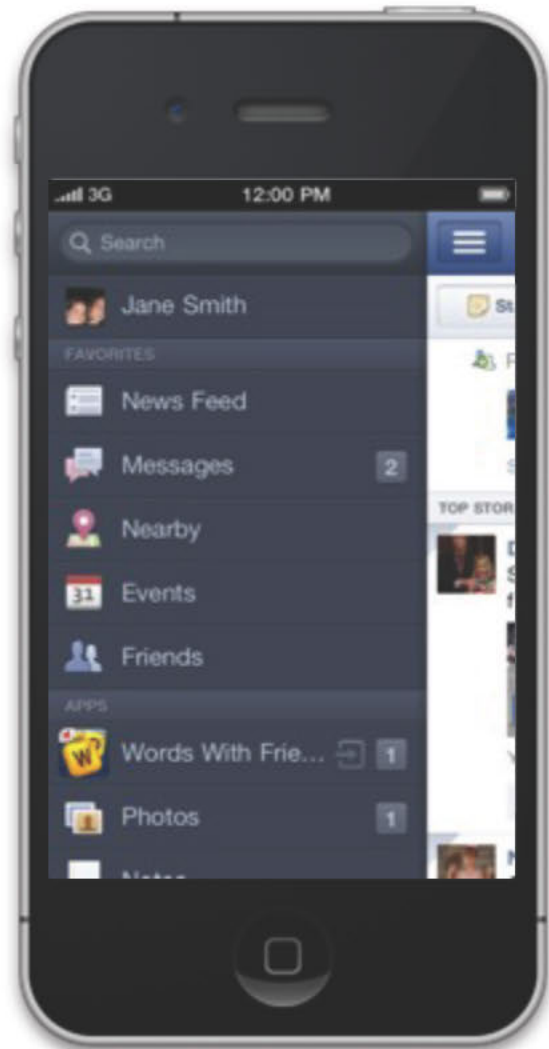
According to s47G research, it's not a question of "either/or" when it comes to a choice between apps vs. the HTML5, but both.

Native Apps offer a superior user experience as well as a new marketplace to introduce your brand to new customers. However supporting multiple native frameworks can be costly.

Having an HTML5 mobile strategy ensures that your site is visible to users regardless of device, but the experience is limited to the lowest common denominator of device support – a low end Android device.

3.2.4. Actions

- ✓ Focus on a disruptive free application using the appropriate app class that provides users the highest fidelity experience based on the v1 feature set.
- ✓ Increase internal staff subject matter expertise, regardless of the intent to build the app within the Bureau or commission the build.

3.3. App Features

3.3.1. Overview

Features are the core of a mobile strategy, defined as "a distinctive attribute or aspect of something." Features are the tiny details that will draw users and determine how they interact with data. In some cases, a key feature may simply be the design aesthetic used in the application.

Features are subjective, being as unique as the person using them or the person requesting them to be in your app. They can fall anywhere along the spectrum – high priority, high impact, and "me too" copycat features. For better of for worse, they are the details that help define your mobile strategy and how it will be remembered.

We've found that properly defining and managing product features is a critical component of a mobile strategy. With good feature management we can define priorities, vision, and provide focus – in other words, what to do and what not to do.

3.3.2. Measurements

The first step in feature management is organising them for s47G ▒▒▒▒▒▒▒▒ . Our approach was to s47G ▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒

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▒▒▒▒▒▒▒▒▒▒▒▒ to identify key features that should be included in the Bureau's mobile strategy. We evaluated each feature categorically by:

Priority

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Revenue & Premium Features

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User Value

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Business Value

We gave one of the following scores to each feature based the business value based on the April 2013 Mobile Workshop and additional conversations with Bureau staff. We s47G ███████████████████████████████████████ ████████████████████████████

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Complexity
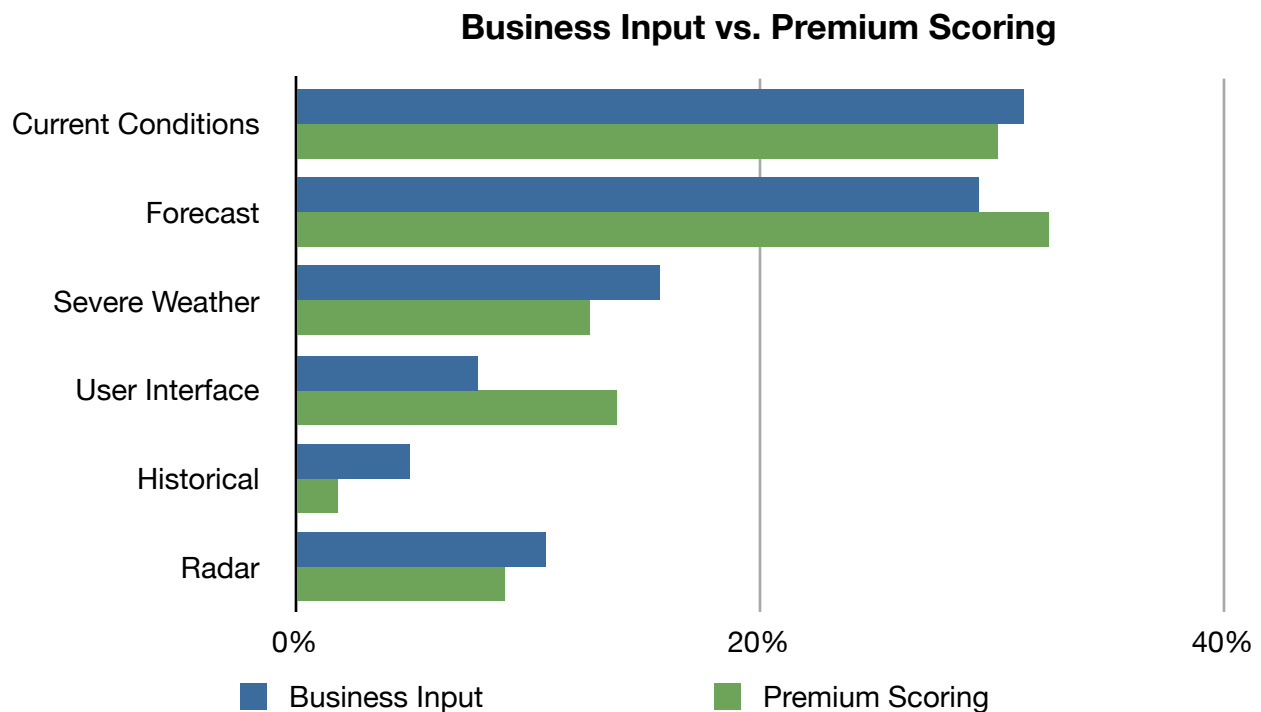
We gave one of the following scores to each feature based on the complexity to deliver according to the April 2013 Mobile Workshop and s47G ████████ experience designing and building mobile applications for similar sized organisations [to the Bureau].

We use s47G ██████████████████████████████ y. Generally speaking the s47G █████████
██████████████████████████. However if a feature has s47G ██████████████████
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3.3.3. Feature Priority

Business Input vs. Premium Scoring

After scoring the features using this criteria, we found an interesting insight common to mobile strategies – many features that were thought to be important by the business scored less important to users. In other words, we are spending a good deal of time looking at solutions to problems we don't yet have, or ones that may not exist.

For example, when we look at features being evaluated based on Business Input, we see that the highest scoring were related to Current Conditions, Forecast, and Severe Weather. By using this scoring alone, it could be easy to assume this is where we should focus our strategy.

However, once we scored the features based on market research and user value, we see a different picture. Both Forecast and User Interface score much stronger than Business Input predicted, with Current Conditions and Severe Weather validated important as well.

The biggest scoring variances between the business and user were the features pertaining to Radar and Historical information, which were repeatedly mentioned in the Bureau provided research and the April 2013 Mobile Workshop. Radar can provide a user value, but its score shows that users find it less valuable than the business anticipated. Historical information results swayed in this direction even more.

This is a very common problem with mobile strategies of this type. With many areas of complexity, the lists of desired features can become quite long, while subjectivity or internal priorities can trump actual priorities. Though this scoring is not scientific, without a quantitative scoring formula to give clarity to the strategy, perception can become reality resulting in the investment of valuable time and resources in the wrong strategy or channels.

This is a good example of how a product can easily fall into the trap of failing to meet market expectations, simply by focusing on the wrong priorities.

3.3.4. Minimum Viable Product

By using our feature analysis data, we are able to recommend the Minimum Viable Product (MVP), defined as the core feature set which meets customer expectations. Additional features can be included and should be considered to round out a product offering, but without these core features, the product would likely fail to resonate with the target audience.

We recommend the mobile strategy include a MVP that includes a well designed, beautifully executed core feature set that will serve as a foundation for future enhancements. An established roadmap will incrementally add more features over the lifespan of the product.

Listed here are Core Features that should be considered as the base feature set for the MVP. They are not ranked in order of importance, but one can see a groupings of Current Conditions, Forecast, Severe Weather, and User Interface.

Core Features

- Current Location Conditions – Display the current weather conditions and forecast for the users current location.
- Current Temperature – Display the current temperature for location in view.
- Perceived Temperature – Display the perceived or "feels like" temperature in addition to the actual temperature, for the location in view.
- UV Index – Display the UV Index for the location in view.
- Wind Speed information – Display the windspeed information for the current location.
- Chance of Rain – Display the chance of precipitation for the location in view.

- Expected Rainfall – Provide the user with forecasted Rainfall information for the location in view.
- Daily High Temperature – Allow the user to view the forecasted high temperature for each of the days in view.
- Daily Low Temperature – Allow the user to view the forecasted low temperature for the location and days in view.
- Time of daily high expected – Provide the user with the time and temperature of the expected daily high.
- Time of daily low expected – Provide the user with the time and temperature of the expected overnight low.
- Sunrise/sunset times – Provide the user daily sunrise/sunset times.
- Daily Synopsis – Provide the user a synopsis outlook for the next current and next day based for the location in view.
- Forecasts - 1hr increment for the next 12 hours – Provide the user an hourly forecast for the next 12 hours for the location in view.
- Forecasts - daily increments for next 7 days – Provide the user a daily forecast for the next 7 days for the location in view.
- Severe Weather Alerts – Provide the user with a push notification to their device in the case of a severe weather warning.
- Flood Warning Information – Provide a push notification and display general (not location specific) flood warning information to the user.
- Hail Warning Information – Provide a push notification and display general (not location specific) hail information to the user.
- Heatwave Conditions Warning Information – Provide a push notification and display general (not location specific) heatwave warning information to the user.
- Thunderstorm Warning Information   – Provide a push notification and display general (not location specific) thunderstorm warning information (thunder and lightning) to the user.
- Fire Danger Warning Information – Provide a push notification and display general (not location specific) fire danger information to the user.
- National and state radar – Provide the user with national and state radar.

- Clean Interface – Provide the user with a simple, sleek and elegant interface that does not overwhelm the user with weather information.
- Excellent Performance – Provide the user with an experience that loads quickly, is responsive to the touch and isn't prone to crashing.
- Multiple Locations – Allow the user to add multiple locations for the ability to monitor weather in other areas..
- Swipe Navigation – Allow the users to be able to swipe between multiple locations in order to quickly see the current weather conditions and forecast.
- Forecast Icons – Display a visual indication of the current weather conditions for the location in view.

3.3.5. Revenue opportunity

The feature data revealed that when looking at features with monetisation potential, premium products and core customer needs were often conflated.

For example, when looking at the top twenty features of a premium app, 30% would be unique to that app. This is a substantial variance, but with as much as 70% of the app's features meeting both free and premium criteria, it is difficult to determine a clear product roadmap where free features don't cannibalise a premium product offering

Feature Monetisation

Legend:
- Both Audiences will pay
- One audience will pay
- Expected for free
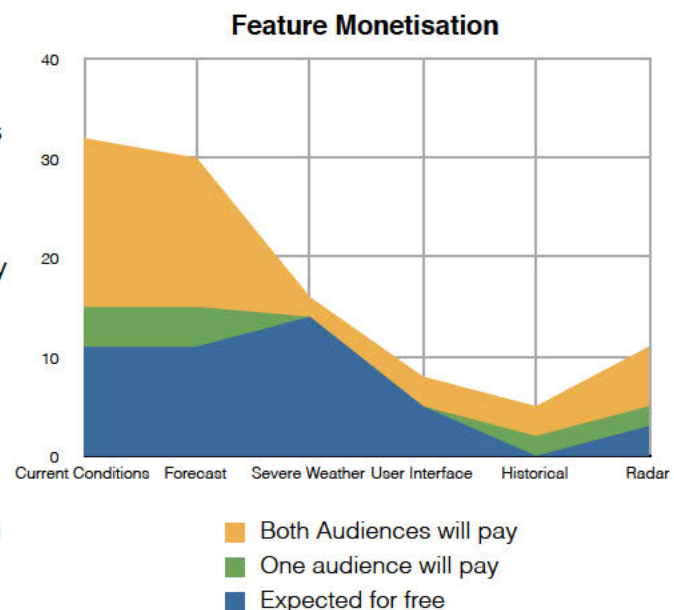
Custom push notifications received the highest ranking by a wide margin, and should be the focus of a premium offering.

Other features such as Forecast and Current Conditions- scored having a proportionate number of features in both the free and premium category. These are also a candidate for a premium

app that would allow sophisticated data to weather-hungry users in the public or industry audiences.

Potential Premium Features

▸ Custom Push Notifications – Provide the user a method of defining custom push notifications based on weather conditions that they specify.

▸ Wellness report – Provide the user with an observed weather update based on selected locations outside of their current location.

▸ UV Forecast – Provide the user with forecasted UV Index for the location in view.

▸ Recent Rainfall – Display the amount of rainfall for the current location over a set period of time.

▸ Rainfall intensity – Display rainfall intensity information for the current location.

▸ Soil temperature information – Display the soil information for the current location.

▸ High definition radar – Provide the user with high definition radar.

▸ Severe Thunderstorm cell based maps – Provide the user with severe thunderstorm cell maps.

▸ Water Availability / Usage – Display water availability information for the current location.

▸ Seasonal Outlooks – Provide the user seasonal outlook information based on their region based on location.

▸ Marine Forecast – Provide the user with forecasted Marine information for the location in view.

▸ Swell Forecast – Provide the user with swell information based on selected location.

▸ Tide Tables – Provide the user with tidal information based on selected location.

▸ Heat Maps – Display Heat Maps for the location in view.

▸ Additional Warning Information   – Provide a push notification and display general (not location specific) for other warnings such as tsunami, pollen, dangerous seas, tropical cyclone, etc.

▸ Unlimited favourite locations – Allow user to add an unlimited number of locations for the ability to monitor weather in other areas.

▸ No Advertising – Allow user to turn off advertising.

Premium Offering Recommendation

When looking at the premium features, many of these fall into the category of the power public user, the industry user, or both.

Because the Bureau has the most sophisticated forecast and notification system in Australia, and perhaps the world, there is no doubt a premium offering could generate revenue. It is unknown at this time as to how much revenue could be generated.

When considering the addressable market defined in this strategy and the current choices already in market by competition, it is unlikely that apps alone could generate enough revenue to sustain the mobile channel for the Bureau.

It would be advisable to perform additional research (and review of existing audience research) to maximise the mobile channel's monetisation potential.

3.3.6. Actions

✓ Define a v1 balance feature set to be launched in a free product that can be built in a timely manner and in an engaging customer experience, based on the recommendation of this strategy.

✓ Review the defined feature set with an external audience – it is our experience that companies try to do too much too quickly, which results in delayed launches and a poor experience.

✓ Plan a v2 feature set that should replace the first product in market.

3.4. Data Solutions

3.4.1. Overview

Any mobile solution will require data. The better the data, the more features the solution can provide. Though the Bureau currently delivers large amounts of data to its traditional clients, this section will explain options to deliver that data to mobile clients, something the Bureau is not currently equipped to do.

This strategy takes the position that the Bureau should provide a mobile data solution in year one with whatever data can be made available, while concurrently creating a RESTful web service to enable more robust solutions in the future. There are a number of data solutions available to us in the first 12-18 months while a data service is being developed, that should focus on the most valuable bom.gov.au pages and recommended mobile features from this strategy. And how we collect data will ultimately determine the course of the strategy, therefore we present four data solutions for consideration and discussion.

3.4.2. Responsive Web Design

In this scenario we would develop CSS Media Queries to alter the presentation of the experience based on the customers device and/or orientation. Under the hood, we use the same markup, but separate out the presentation CSS by device or device class.
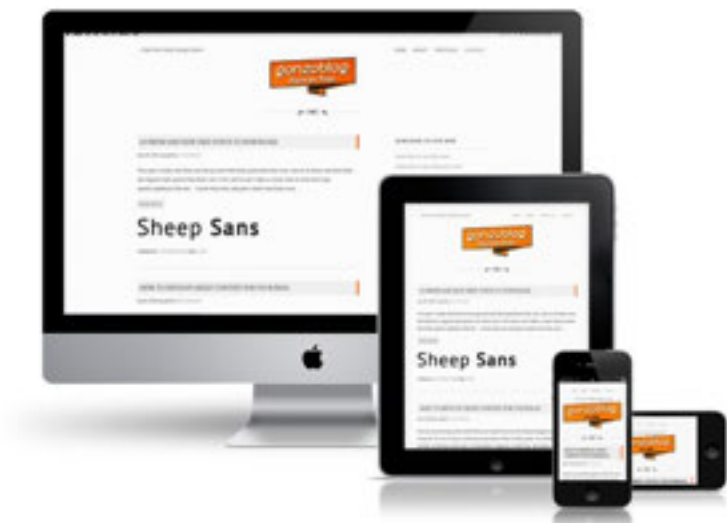
Advantages

▸ Very minimal changes to the markup

▸ Can be done without the support of a dev team

▸ Can be implemented quickly

Disadvantages

▸ Not optimised for the mobile context, e.g. the tablet experience may be lacking

▸ Would require a media query for each screen size and orientation (typically between 8-9 media queries)

▸ Limited tablet support

▸ No native app support

Platforms Supported

▸ Extensive – Responsive Mobile Website on WebKit browsers only

3.4.3. A Content Proxy

In this scenario, we would deploy a content proxy, or web service that translates data between differing systems, or in other words creates a mobile API where one doesn't exist.

This solution is a standalone piece of technology that would coexist with other sites. Mobile requests would be rerouted to the content proxy and deliver the appropriate experience based on their user agent.

This provides a reliable end point to which the Bureau can develop mobile experiences – historically, the most expensive part of mobile development. All layout, caching, and content transformations are handled on the content proxy, not the parent web application server.

Proposed Content Proxy Architecture
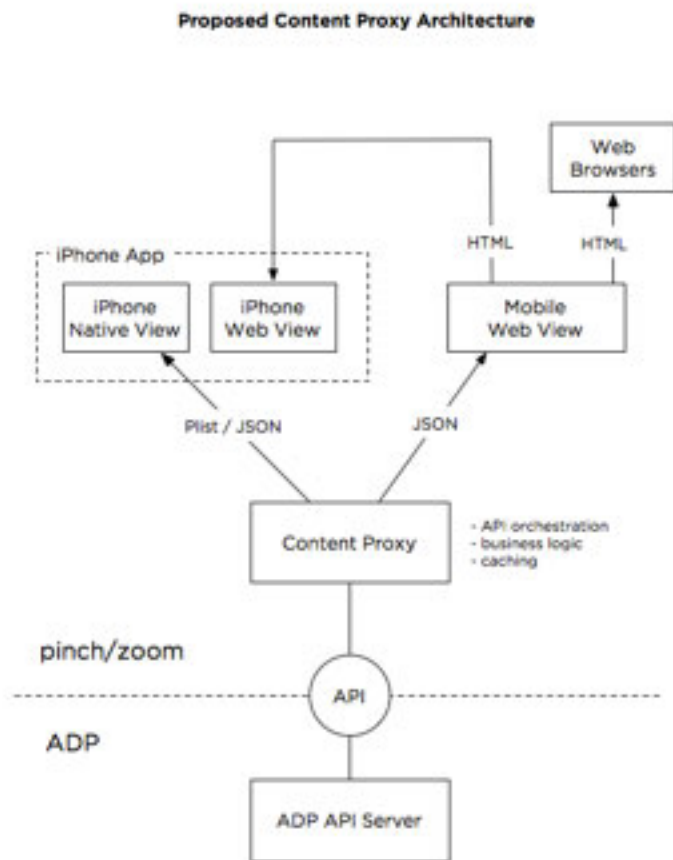
For lower priority sites/pages, we may need a screen scraping service, but unlike the market solutions, we would avoid doing DOM-level transformations.

We've found Proxy-based adaptation to be an extremely effective method of dealing with older data in the mobile context.

Advantages

▸ Optimised user experience based on the requesting device

▸ Supports many platforms (known and unknown)

▸ Reduces network latency

▸ pinch/zoom has already built it

Disadvantages

▸ An unknown level of effort would be required to get data from the Bureau

3.4.4. Screen-scraping Services

In this scenario, the Bureau would engage a mobile screen-scraping vendor like Mobify, UsableNet, Digby or Branding Brand to scrape the data of the web properties and transform them into mobile websites (not mobile web apps).

This works by creating scraping rules that map to the rendered DOM of your website. Then transforming the content to a mobile friendly template. In other words, this is like an automated cut and paste of your content into new templates.

Unfortunately, any changes to your website will impact your mobile sites and could break the scraping rules that provide the data. This would require the Bureau to pay the screen scraping service company to modify templates each time a code push occurs. This will be both problematic and costly to the Bureau, requiring a complex change control process, multiplied by the number of sites using the scraping service.

While this provides a fast mobile-friendly version of your site, we believe it does not meet customer expectations of how a mobile experience should work.

We do not recommend this solution as we believe there are many unforeseen costs associated with this approach that the Bureau isn't considering. However, we would need to do a deeper evaluation of each of the screen scraping services in order to make a fully informed recommendation.

Advantages

▸ No infrastructure or additional technology is required

▸ Can be turned around very quickly.

Disadvantages

▸ Very costly, base cost will be multiplied by each site

▸ When the site is updated, the scraping rules will break

▸ Does not support multiple applications, only creates a simple mobile website

3.4.5. Linked Data System

Linked Data is a method of publishing structured data so that it can be interlinked and become more useful. It builds upon standard Web technologies such as HTTP and URIs. Rather than using them to serve web pages for human readers, it extends them to share information in a way that can be read automatically by computers. This also enables data from different sources to be connected and queried.
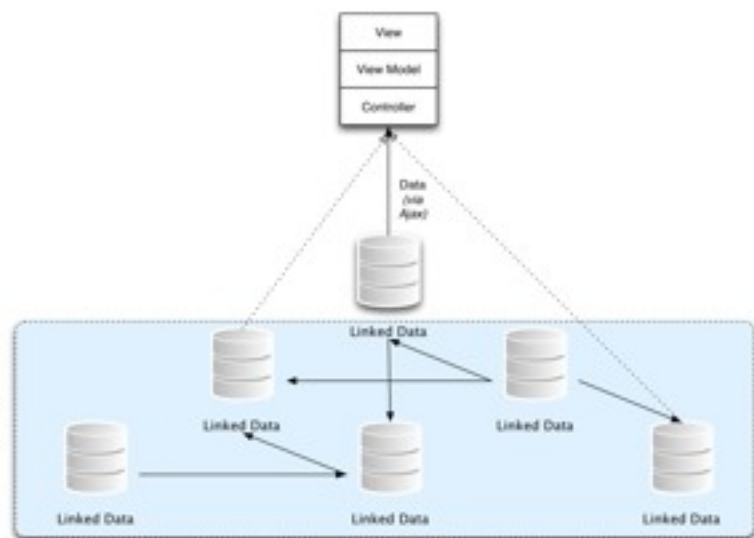
Another way to think of it, a Linked Data System takes data from multiple places and creates experiences at the moment of request, depending on the client or context. A content proxy strategy is the baby brother to this more robust solution.

This approach is especially valuable when thinking of creating the contextual experiences that today's mobile consumer are demanding.

For the Bureau, who is already dealing with multiple data source inputs, a Linked Data System would enable direct hooks into the host data sources, but also transform and output data to

external systems or platforms. For example websites, mobile web apps, native apps, Facebook apps, etc.

How it Works

A Linked Data System would support multiple tenants in a consistent fashion (as opposed to different code being used for different properties). The system serves two primary functions.

Serve a Mobile User Interface

▸ Accept the incoming request

▸ Extract and validate the property domain

▸ Detect the device profile of the requesting user agent

▸ Retrieve the appropriate application configuration from the datastore

▸ Adapt the content based on the detected device profile

▸ Render the user interface

Handle API requests

▸ Accept the incoming request

▸ Validate that the API caller is authorised

▸ Extract the request parameters and map the call to the appropriately defined resource and method handler

▸ Retrieve data cached in the datastore and/or execute procedural logic

▸ Send data back to client with appropriate content type

For the API serving, the infrastructure will get more complex over time. This is the boundary between the mobile application's API (its user interface) and the plumbing that connects it to myriad data sources and procedural logic. This is where we connect with notification systems such as Web hooks, job queues, PubSubHub hubs for aggregating feeds and more.

Advantages

▸ Optimised user experience based on the requesting device

▸ Supports many platforms (known and unknown)

▸ Reduces network latency

Disadvantages

▸ An unknown level of effort would be required to build to the Bureau's specifications

Platforms Supported

▸ All platforms– HTML5 Mobile Sites, HTML5 Mobile Apps, iPhone, Android, iPad, etc.

3.4.6. Actions

✓ Create a Content Proxy that uses data from MetEye and other data sources to efficiently serve necessary content to a mobile app.

✓ As mentioned in a Opportunities section, make significant investments into data publishing capabilities – data services architecture to serve data to mobile apps, including a way for customers to submit weather data from mobile devices.

3.5. Program Components

3.5.1. Overview

Mobile projects are inherently complex and are often prone to unforeseen problems. Together with the challenges of supporting multiple screen sizes, platforms, and deployment requirements, it is not uncommon for a mobile project to take far more resources than similar sized web projects. Therefore, the best mobile strategy will minimise as much risk as possible.

There are four types of enabling components to a mobile strategy, the building blocks so to speak, that are required to execute any roadmap.

▸ Guidelines – Standard operating procedures and guidelines to ensure that users receive a consistent experience across all digital platforms.

▸ Frameworks – The specific tools we employ to ensure that we are using consistent technology with all markets and vendors- it supports both the customer experience guidelines as well as the long term mobile roadmap.

▸ APIs – The technology and documentation that is required to deliver the customer experience across multiple digital platforms.

▸ Process & Templates – The methods we will need to employ to ensure project sponsors, vendors, and stakeholders are meeting both organisation and platform guidelines for successful market deployment from the start.

The following is a comprehensive list of the necessary components for a mobile roadmap.

3.5.2. Guidelines

Standard operating procedures and guidelines to ensure users receive a consistent experience across all digital platforms.

Business Case

Given the limited experience the Bureau has had deploying mobile applications, the guidelines necessary to support the mobile roadmap are lacking. Guidelines are required for everything from app deployment strategy, design, market specific device support plans, usability testing, accessibility, etc.

Return on Investment

Developing a set of mobile guidelines will ensure that all mobile projects conform to the mobile roadmap, where each mobile project contributes to the other. These guidelines will reduce the long term costs associated with each mobile project.

Example Guideline Components

▸ Mobile Strategy – We need to develop both a UI and development strategy for how users are going to engage with the Bureau with mobile and tablet devices. For example, will there be one "BOM App" or "many BOM Apps"?

▸ Mobile Requirements – We need a consistent process for gathering mobile/tablet requirements from business units/owners, since it will deeply impact the business, the user experience as well as the technology needed to support it.

▸ Device Plans – A document that defines the minimum devices that need to be supported in order to properly plan requirements.

▸ Mobile Design Language – Creating a Mobile Design Language will not only ensure that all Bureau applications are visually consistent with other Bureau products, but reduce the time and cost to deliver multiple mobile products.

▸ Interaction Guidelines – A document that provides the interaction and gesture guidelines for mobile and tablet experiences.

- App Blueprints – A document that defines a variety of mobile and tablet application types, with example time, cost, and user benefits.

- Mobile App Vendor Guidelines – Produce a list of certified mobile vendors to provide services for the Bureau based on roadmap criteria.

- Deployment Process – Produce an app preflight, quality assurance, and deployment plan that markets should adhere to in order to maintain App Store and customer experience consistency.

- Mobile Accessibility Guidelines – Develop global mobile accessibility best practices to ensure that all mobile products confirm for local laws.

- Mobile Usability Testing Guidelines – A document capturing the process and best practices for mobile usability testing that has unique lab and deliverable requirements.

- Mobile Pattern Library – Document the common mobile user experience patterns that adheres to App Store acceptance guidelines and policies as well as the Bureau's own patterns.

3.5.3. Frameworks

The specific tools we employ to ensure that we are using consistent technology with all markets and vendors that supports both the user experience guidelines as well as the long term mobile roadmap.

Business Case

As more mobile and tablet applications are sponsored, reliable frameworks are required to provide a consistent customer experience across multiple projects and platforms. These reusable frameworks ensure that the mobile customer experience guidelines and best practices are consistent from project to project, while reducing complexity, time to market, and costs.

Return on Investment

The costs associated with supporting a variety of different technology frameworks will be compounded with each added device or platform the Bureau supports. Using an agreed set of frameworks that supports the guidelines and roadmap will reduce costs associated with each project.

Example Framework Components

▸ Prototype Framework – A framework to rapidly produce mobile/tablet prototypes to use for business validation and user testing, which is also very useful for creating/defining engineering end points.

▸ Container Framework – Produce a native container framework that supports journeys for mobile/tablet devices using a single container.

▸ Responsive Design Framework – Create, select, or customise an approved HTML5 library to serve as a starting point for mobile/tablet applications.

▸ Javascript Framework – Create, select, or customise an approved Javascript framework that will serve as the shared library for all HTML5-based mobile projects.

▸ CMS – Evaluate and recommend a CMS solution that can produce non-secure content for mobile and tablet apps.

3.5.4. API

The technology and documentation that is required to deliver the user experience across multiple digital platforms.

Business Case

To easily support multiple mobile and tablet applications a RESTful web services roadmap, documentation, and requirements are required. Understanding what user data can be accessed is the primary requirement for all mobile and tablet initiatives. Until this roadmap is defined it will be impossible to set appropriate expectations on timeline and cost for the business.

Return on Investment

Having a fully documented API to support mobile applications will greatly reduce the costs of mobile and tablet projects by having a consistent end point for development. As common user experiences are solved they can be reused across multiple projects.

Example API Components

▸ Web Services Roadmap – Document the requirements and roadmap of a JSON or RESTful Web Services to enable mobile/tablet solutions.

▸ Alerts Engine – Document the requirements of an API to deliver alerts to the customer.

- Data Visualisation Engine – Document the requirements of an API to deliver or create data visualisations to the application interface.

- Authentication Gateway – Document the requirements of how customers will authenticate themselves across multiple mobile/tablet applications.

- Mobile Analytics Solution – Review existing analytics solutions and evaluate their ability to support both an HTML5 and native app strategy.

3.5.5. Process and Templates

The methods we will need to employ to ensure that project sponsors, vendors, and stakeholders are meeting both Bureau and platform guidelines for successful market deployment from the start.

Business Case

Developing a process for defining mobile and tablet projects, and templates for documenting the outcomes is a crucial step to ensure that each mobile project contributes to the success of the overall mobile roadmap.

Given that the Bureau is unaccustomed to the complexities of mobile and tablet application development, creating processes and templates for sponsoring and kicking off projects will better align the business, design, and technology requirements for a more consistent customer experience across all markets.

Return on Investment

By having a codified process with supporting templates, the Bureau can ensure that each mobile project contributes to the overall mobile roadmap, producing greater consistency, efficiency, and effectiveness across multiple markets and with multiple vendors.

Example Process & Template Components

- Mobile Project Brief Template – A document to capture the high level requirements for a mobile/tablet project.

- Journey Framework – A template used to document mobile/tablet journeys.

- Screen Description Diagrams – A document used to prioritise features and requirements for a mobile/tablet application.

- Wireframe Templates – A template to rapidly produce wireframes for mobile/tablet based on approved assets and patterns.
- Design Templates – A template to rapidly produce mobile designs for mobile/tablet based on approved assets and patterns.

3.5.6. Actions

✓ These actions will be shared in the Roadmap Options section, summarised in the Executive Summary.

4. Roadmap Options

4.1. Apps

4.1.1. Overview

The first strategy is the most obvious one in today's marketplace – Apps. Mobile Apps, loaded on the device, provide a meaningful point of presence for users. Simply tapping to open it, they extract the information they want, and close it. The transaction is quick and simple.

The single biggest advantage that Apps provide the Bureau are push notifications, being able to send weather alerts out to users based on their location or preferences. An app of some kind is required as push notifications cannot be delivered through any other technology (e.g. HTML5).

Weather applications are a unique utility in the mobile application space. Being a pre-built utility on most smartphones, consumers tend to pay for simplicity (e.g. Solar) and for detail (e.g. Dark Skies) over the pre-installed weather option.

As far as we can tell, location-based relevancy isn't a high demand feature in the global app marketplace, but a highly requested feature in the customer research for the Australian market, likely due to the impact severe weather has on many Australians.

In order to meet this market need, any Bureau weather app must compete directly in App Store rankings in order to be seen by users and then downloaded. The competition may not have as relevant of data as the Bureau can provide, but they have hundreds, even thousands of ratings and reviews to reinforce the user's decision on which app to download.

In the consumer marketplace, if an application is free, then users will download them [multiple applications], trying each one once or twice before making a decision on which to use on a regular basis. If an application costs money, the user will review the application based on its

ratings, reviews, icon, and screenshots. The higher the price point of the app, the more the user will be more discerning.

In other marketplaces affected by weather, such as labour, industry, transportation, aviation, government, or education, the app acquisition model is largely the same as consumer. Apps are downloaded through an App Store. For larger organisations they may maintain an internal App Marketplace, or do automatic asset provisioning. However this model isn't widely commonplace yet as many larger organisations are still switching from Blackberry infrastructure to an iOS or Android infrastructure.

In order to produce revenue from mobile applications, the Bureau must compete with similar weather applications on merits other than just data relevancy. Elements like application speed, design, innovation- must all be catered to in order to gain a large share of the addressable market. Only then will a viable revenue strategy around mobile applications become possible.

4.1.2. The Business Case

The strongest business case for mobile applications is the ability to provide users push notifications based on their location or location preferences. Together with the relevancy and accuracy of the Bureau data, we feel that push notifications would certainly be the "killer" feature of any Bureau app.

However, push notifications are not considered a premium feature by the public, and we do not believe that consumers are willing to pay for push notifications. Consumers think of push notifications as a feature of the application, and not a product unto itself. Therefore, we do not consider a premium push notification service as a viable product for the consumer market.

Industry users on the other hand are highly likely to pay for a push notification service, as the value and return on investment can easily be calculated and justified. Although, if a consumer application is providing push notifications for free, then why would the industry user pay for push notifications? The Bureau would have to provide other features specific to the industry market that differentiate an industry app from the consumer app.

Therefore we recommend building two mobile applications:

Free Application

The first being a very simple and elegant weather report utility that allows the user to add up to five locations in addition to their current location, receiving push notifications and forecast information for each of the locations they follow. This would largely be designed to be a replacement of their current default weather application, meant to be more relevant to the Australian market.

This application would be free and offer a few in-app upgrades (e.g. multiple locations, more detail, etc.) with its core focus would on simplicity- quick and easy weather on the go.

Premium Application

The second application would be a more robust premium weather application, providing custom push notifications, current weather conditions on unlimited locations, more detailed forecast data, high definition radar, and other premium features. While this application wouldn't be explicitly labeled industry, further research and analysis could tailor it to industry needs without losing a consumer focus.

This application would cost anywhere from $1.99 to $4.99 and offer either in-app upgrades or a premium push notification service tailored to the needs of its power users.

Both applications are necessary. The free app is designed to recruit customers away from the competition and show that the Bureau has the best, most relevant data to Australians. It is a necessary footprint on Australians phones- to provide them important alerts that concern their safety and illustrates the Bureau's goodwill toward Australian citizens.

The premium app borrows from the goodwill and trust earned by the free app to increase the perceived value of the Bureau's data to those who need it most. In other words, the free app serves as a demonstration of the premium app, designed to recruit customers willing to pay for weather and climate information.

4.1.3. Free Example: Yahoo! Weather

An example of a high-quality, informative app with simple design is Yahoo! Weather. On the primary screen one can view a Flickr photograph of the location, hour, photograph of current location, current temp, "feels like" temperature, and cloud cover. Almost the entire app can be navigated in one gesture- scrolling down into the app (upwards gesture on screen) first to reveal an elegant presentation of the weekly forecast with additional details like cloud cover, weather description, and humidity. Next, a map of current location area is shown which can be touched to expand upon to reveal radar and colour coded temperature and wind conditions. Further scrolling reveals more details on precipitation (chance of rain), wind and pressure, and sun and moon information. The upper right hand corner presents a navigation button allowing the user to add more locations. Swiping is used to switch between locations.
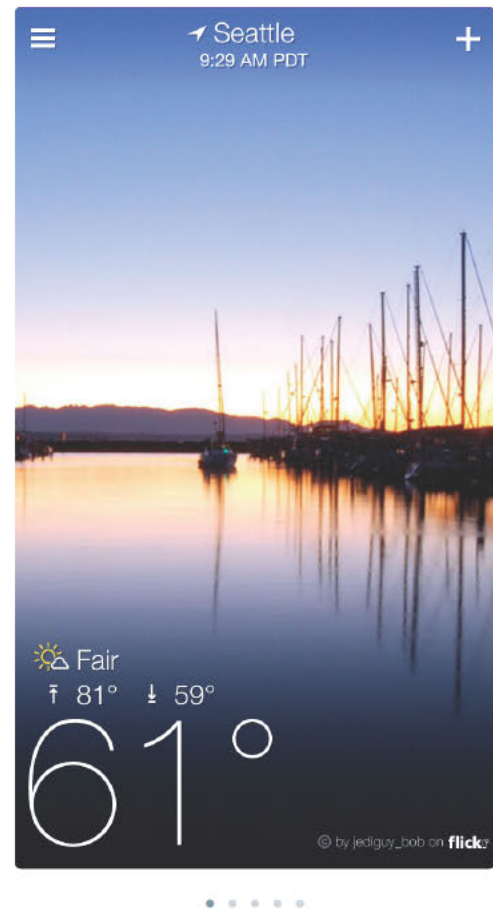
4.1.4. Premium Example: Clear Day

Using beautiful animated real pictures, Weather HD provides a concise, accurate snapshot of the weather and data on the the home screen. Using simple, clear text formatting and buttons to navigate the app for more information. Radar maps, forecast, and multiple city "quick views" are easily found. Sharing capabilities through Twitter and Facebook are easily accessible. This is one of the more beautiful innovative and simple premium apps on the market.
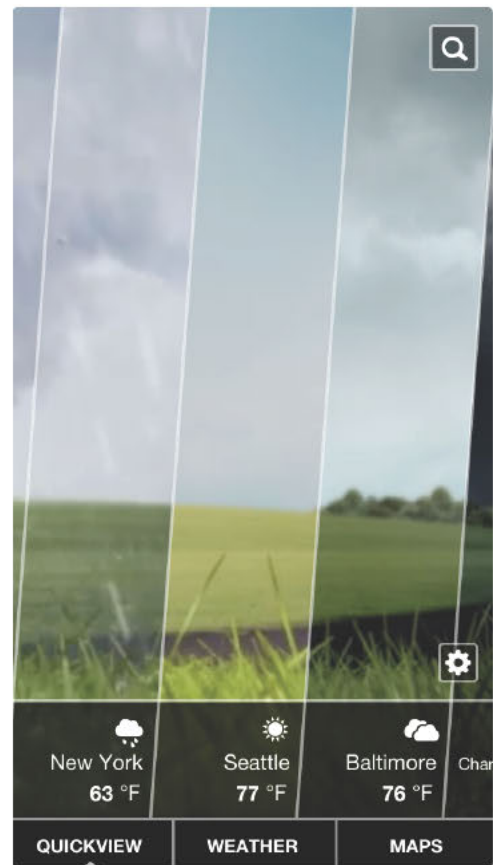
4.1.5. Risks

Lack of Resources

The greatest risk to a mobile app strategy is the lack of experience and resources (e.g. native application development, mobile designer, etc) within the Bureau.

In order to compete with other weather applications and be viable in the marketplace, the Bureau will need to use an agency or external resources to get a mobile program started quickly, while organising a full-time support team to prepare for on additional features, updates, etc. Typically, the headcount of a mobile team of this size is two to four full-time employees in the first year.

Multiple Apps

Building two apps simultaneously can be risky and it isn't typically recommended. We recommend staggering the development by several months, focusing primarily on the free app.

Multiple Platforms

Supporting multiple platforms is a significant challenge. It can dramatically increase the cost of a mobile program and require a far larger team. However any profitable mobile application strategy requires support for multiple platforms, once the platform becomes viable.

We recommend starting with iOS support, which is the most cost effective. We predict that Android will become a viable platform in Australia within the next 24 months and it will ultimately need to be supported.

4.1.6. Components

The components required for this strategy would be the following:

▸ Guidelines

- Mobile Strategy

- Mobile Requirements

- Device Plans

- Mobile Design Language

▸ Frameworks

- Prototype Framework

▸ APIs

- JSON Data Service

▸ Process & Templates

- Mobile Project Brief Template

- Journey Framework

- Screen Description Diagrams

- Wireframe Templates

- Design Templates

4.1.7. Actions

✓ Establish a Product App Roadmap with defined core feature sets

✓ Resource, plan, and develop a free application per the Roadmap. This app will recruit customers away from the competition and show that the Bureau has the best, most relevant data

✓ Resource, plan, and develop a premium application per the Roadmap. This app would provided detailed, specific weather information to users that need it for frequent, financial-impacted weather decisions, e.g. Industry

4.2. Publishing

4.2.1. Overview

The second strategy focuses on how the Bureau publishes content, aiming to reduce the complexity of publishing to the web, while simultaneously increasing support for mobile devices, potentially saving the Bureau hundreds of thousands of dollars per year.

Currently, the Bureau publishes content to the Web using data driven tools. By adopting a modern publishing process – using a web standard HTML5 framework, responsive web design techniques, powered by a content management system – the Bureau will be able to publish content once and distribute to a number of mobile, tablet, and other digital devices far easier and faster than the publishing process being used today.

The downside is that HTML5 mobile apps do not have a viable application marketplace, meaning distributing and earning revenue from HTML5 mobile apps is not as simple as publishing an app to a few App Stores.

However HTML5 is perfectly suited for a free consumer mobile application. The Bureau could offer an HTML mobile app through any web browser on any platform. And with the addition of a simple native WebKit container like PhoneGap, the Bureau could also distribute an HTML5 application to the mobile App Stores, delivering push notifications to consumers.

With a more streamlined publishing process in place, a premium software-as-a-service also could be introduced for industry customers. A web service would provide customers a simple point of presence to handle management of settings, all credentials, multi user access, and billing.

In this strategy all application logic lives in the cloud, therefore complex applications do not need to be created to cater to the needs of multiple audiences. A single container app could be deployed for both consumers and industry customers, reducing the cost and complexity of managing multiple native applications.

4.2.2. The Business Case

The strongest business case for a publishing strategy is the reduced cost to publish. Data can be published faster, more consistently, and with greater ease than current methods. Reducing the time and cost to publish to web, mobile, and tablet devices could be greater than the profit earned through a native application strategy.

Given that weather applications do not require complex interactivity or data back and forth, the costs to design, build, and maintain an HTML5 mobile application can be far less than that of a similar native application.

Furthermore, a web publishing strategy uses the Bureau's existing resources more efficiently, reducing overhead of the learning curve and engaging external consultants.

5.   HTML5 Example: Forecast.io

Truly cross-platform, this app is not technically an app, but an HTML5 mobile ready site. The design is flat and simple, using neutral colours and plain icons to show clouds or sun, with very little animation to tax a mobile device. One can see the current temp the next hour and 24 hours tapping on the temperature for weather data for the day: wind, humidity, visibility, pressure, and a "feels like" ("temperature is falling") message. To view weekly forecasting a tap anywhere else on the screen, and then again to reveal hourly detailed data for any of the days of the week. Beautiful, simple maps show radar animation, and a "time machine" feature will soon be added.
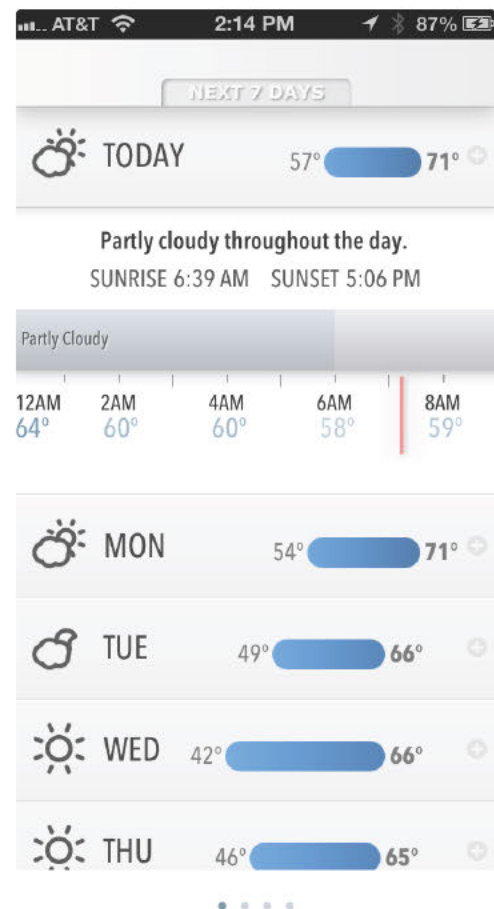
5.1.1. Risks

CMS

The greatest risk to a publishing strategy is the lack of a content management system (CMS). The level of effort

required to evaluate and deploy a CMS within the organisation as well as pilot a mobile program would be significant.

To mitigate this risk, a data proxy or content adaptation service could be used instead of a CMS, to enable a mobile publishing pilot while a search for a CMS can take place.

UI

Another risk is the lack of a standard mobile user interface for HTML5 mobile applications. Any HTML5 mobile app deployed with a native container will still need to meet Apple's certification guidelines. This means that an HTML5 mobile app must meet Apple's stringent Human Interface Guidelines.

5.1.2. Components

The components required for this strategy would be the following:

▸ Guidelines

- Mobile Strategy
- Mobile Requirements
- Device Plans
- Mobile Design Language

▸ Frameworks

- Prototype Framework
- Container Framework
- Responsive Design Framework
- Javascript Framework
- CMS

▸ APIs

- JSON Data Service

▸ Process & Templates

- Mobile Project Brief Template
- Journey Framework
- Screen Description Diagrams

- Wireframe Templates
- Design Templates

5.1.3. Actions

✓ Review the current data architecture to determine data that can be made easily available vs. data that would be difficult to access

✓ Determine the technical strategy to have data be made available for both mobile web and mobile app – both short term (perhaps temporary) and long term strategies

✓ Resource, plan, and execute on the Publishing strategy to make data available for internal web and application use

5.2. Services

5.2.1. Overview

The third strategy focuses on producing premium digital weather services, with focus on the Bureau's efforts of making data available for a fee.

Producing native applications, or even retooling the Bureau's publishing strategy may simply be too costly of an investment with not enough of a return. Therefore, instead of entering the consumer marketplace, the Bureau should consider simply making data available through a web service to those willing to pay for quality weather information.

A digital weather service can take many shapes – it could be to provide raw weather data to competing applications, to partner with operators to provide weather alerts to subscriber, or to provide a rudimentary software-as-a-service solution for industry, similar to what is described above in the publishing strategy.

The substance of this strategy is that there is potentially more revenue to be made from licensing the Bureau's weather data, than could be gained from entering consumer or industry markets on its own.

The focus on a premium digital weather service is an extremely prudent strategy, as it is a mandatory component to any other strategy. Both the native application and publishing strategy would require a web service in order to be competitive.

Starting with a digital services strategy would establish an incredibly strong platform for the Bureau. Any application that the Bureau wishes to create in the future would be based on this platform.

The key to this strategy is empowering external entities to create weather applications using the Bureau's data. With the proper licensing, co-branding, and developer tools, the Bureau could have dozens of Bureau-powered weather applications in the market, rather than just one or two. The cost to the Bureau would be nominal, but the market reach extensive.

Furthermore, as developers create Bureau-powered applications, the Bureau can recruit the best developers to work for the Bureau directly, solving two big problems in one step – acquiring both talent and code using the Bureau's data for less than the cost of developing an app internally and from scratch.

5.2.2. Risks

API
The greatest risk to a services strategy is the lack of a RESTful API. The level of effort required to deploy an API and services and billing model within the organisation would be significant.

Lack of Resources
In addition to the lack of an API, it is uncertain if the Bureau has resources that understand the technical architecture and software-as-a-service model well enough to successfully lead the Bureau toward a positive outcome.

5.2.3. Recommendation

A services-only strategy does not meet the criteria from the business requirements or customer research we gathered, therefore we do not consider a services-only strategy to be a viable stand-alone option.

5.2.4. Actions

✓   We recommend that the Bureau further explore the possibility of developing a services strategy, in additional to the app data necessary via the publishing strategy.

5.3. Roadmap

5.3.1. Overview

With both the App strategy and the Publishing strategy achieving identical scores, we recommend the best strategy for the Bureau is to move forward with both – starting with reducing the time and effort being invested into web publishing and then moving to apps.

Although the Services strategy scored lower due to this being a new model for the Bureau, we also recommend the Bureau develop a services strategy to eventually offer fee-based data to the public or industry segments. This would require refined, modern data feeds with the flexibility for the customer to customise content based on their need. As mobile technology is rapidly changing, and as development tools become increasingly available to the market, the data services product will require a dedicated team to evolve for the ever-changing need. That said the Bureau is truly a data company, capturing some of the most accurate weather data of any country, and this is thought to be a very valuable, long-term revenue generator in the years to come.

Using this roadmap, by end of Year Two, the Bureau would have the following:

▸ a free public offering, both on the web and natively

▸ a premium option, available to the public and industry for those who want more than the free, minimum viable product

▸ an option that provides customised alerts to multiple industry users

▸ the foundation of a services strategy

▸ a great number of evolved program components to expedite the design and development of future products

5.3.2. Year One

Program Components 1.0

✓ Begin building version 1.0 of core components necessary to Year One of the Road Map.

✓ Establish user interface design language, elements and style guide

Publishing Strategy 1.0: Responsive Web Design

✓ Offer basic functionality of current market apps– location based conditions, multi-day forecast, multiple locations – using responsive web approach

✓ Available on any modern smartphone

✓ Deploy a CMS and/or publishing system

✓ Begin publishing pages using a cross platform framework

✓ Use responsive web techniques to reflow content to desktop, tablet and phone

✓ Promote/surface high-value web products that would benefit from a responsive strategy

Services Strategy 1.0: Invest in Data Architecture

✓ Build a simple JSON data service required for native applications

✓ Develop a content proxy to support data service for App strategy

App Strategy 1.0: Free Weather App with Alerts

✓ Design, develop and deploy an iPhone only application

✓ Leverage brand recognition to displace competition

✓ Offer basic functionality of current market apps – location based conditions, multi-day forecast, multiple locations

✓ Attempt to earn a maximum amount of iOS market share

✓ Alerts for severe weather – wind, thunderstorms, fire, flood

✓ Provide a beautiful interface design

✓ Establish a page stack and native direction that will carry forward to support the roadmap

5.3.3. Year Two

App Strategy 1.5: Premium App

✓ Provide a premium app, or paid in-app upgrades, e.g. customisable alerts

- ✓ Include additional features that add depth and breadth

- ✓ Upgrade to a Plus app to support both mobile and tablet

- ✓ Conduct additional research on how to serve all the industry markets

- ✓ Use the same code base as future industry apps

Program Components 2.0
- ✓ Begin building version 2.0 of core components necessary to Year Two of the Road Map.

Publishing Strategy 2.0: Reduce Web Pages
- ✓ Begin to sunset un-used web services

- ✓ Begin to replace web products with program outputs with more appropriate mobile solutions

- ✓ Reallocate redundant web expenditures toward the mobile program

App Strategy 2.0: Free, Premium & Industry Apps
- ✓ Employ a build it once, use everyone approach

- ✓ Begin to deploying industry specific apps based on the Free & Premium code base

- ✓ Add Android support

5.3.4. Year Three

Services Strategy 2.0: Data Pilot
- ✓ Build service that is able to offer JSON data feeds

- ✓ Establish monetization tiers and weights for services strategy

- ✓ Develop a billing system

- ✓ Continue to make more data available to the web service

- ✓ Begin running a pilot program of a data services pilot

Program Components 3.0
- ✓ Begin building version 3.0 of core components necessary to Year Three of the Road Map.

App Strategy 3.0: Disruptive Apps
- ✓ Begin empowering public to become meteorologists through mobile apps

- ✓ Begin establishing the Bureau as world renowned experts and leaders in weather

- ✓ Begin migrating Bureau mobile brand from current to future state

6. Market Research

6.1. App Reviews

Reviews of the Australian competitors conclude that apps using extremely localised data (provided by the Bureau) for current conditions, now-casts and multi-day forecasts, radar, and especially weather warnings are preferred to other outside apps using data that varies- resulting in inaccurate forecasting.

6.1.1. App: Pocket Weather

▸ Priced at $1.99

Highlighted features include:

▸ hourly temperature updates for four territories

▸ push warnings for BOM weather alerts

▸ Tide data available offline

▸ Australian rain radars

▸ satellite maps and synoptic charts

▸ forecast data on app badge

▸ localised information: pressure humidity, forecasted UV, live UV, dew point, rainfall, wind, sunrise/ sunset

▸ "follow me" location

Other positive notes include:

▸ hourly forecasts (ranging out to six days)

▸ detailed knowledge of localised weather

▸ straightforward and simple interface

▸ localised forecast data

▸ short-term forecasting (for the day/ hourly breakdown)

- accuracy with data from BOM

- UV conditions, sunrise/ sunset, wind conditions, weather warnings

6.1.2. App: Weather Zone Plus

Weather Zone Plus is another app using BOM data. The reviews stated:

- more detail for each day with hourly and three-hour predictions

- weekly forecast is not easily visible

- rain radar is not as detailed as Pocket Weather radar

- too many banner adverts on the free version

6.1.3. App: The Weather Channel

- does not use bureau data

- forecasts can vary

- don't have access to the many of regional Aus forecasts

- no BOM weather warnings

- cluttered interface

- banner adverts

- lack of access to Australian rain radar

- good travel app- but Australians want a better regional app for home

6.2. Design Insights

6.2.1. Simple Presentation

Consumers will find weather apps falling into a two main categories. Densely designed for maximum weather information or very minimal with a few points of information, allowing the user to decide how much data to receive by electing to drill down into the app.

However, the highest rated, best reviewed apps are designed so that relevant weather information is on the first screen without being overloaded, so as not to overwhelm the

customer- an example of provided relevant data includes: current temp, precipitation, wind, and brief forecast. The app will use a combination of simple design, yet available detail data for consumers to discover. How does the customer justifying paying for the app when there are great free apps? The difference is in interface, design, data presentation, and accuracy.

An example of a high-quality, informative app with simple design is Yahoo! Weather. On the primary screen one can view a flickr photograph of the location, hour, photograph of current location, current temp, "feels like" temperature, and cloud cover. Almost the entire app can be navigated in one gesture- scrolling down into the app (upwards gesture on screen): first to reveal an elegant presentation of the weekly forecast, and details like cloud cover, weather description, and humidity. Next, a map of current location area is shown which can be touched to expand upon to reveal radar and colour coded temperature and wind conditions. Further scrolling reveals more details on precipitation (chance of rain), wind and pressure, and sun and moon information. The upper right hand corner presents a navigation button allowing the user to add more locations. Swiping is used to switch between locations.

Another app falling into the simple yet informative category, Weather Puppy (a lifestyle app for charity, dog-lovers) also uses a simple interface to provide the customer with a lot of information, but simply, using a few gestures to drill further into the app to reveal more detailed reports. A touch on the temperature reveals precipitation, pressure humidity, wind, visibility sun rise/ set information. Swiping down on the temperature reveals an hourly forecast. Touching on days of the week in 7-day forecast reveal more weather information about the day.

6.2.2. Interface, Design, and Data Presentation Trends

The trend in app design overall has been towards a simpler design with flat interfaces- this includes weather apps. It is a design solution to a problem. The apps rated as most valuable (customer willing to pay) and successful (highest ratings and most reviews) apps appear to be apps moving towards a fully digital design. Easy to use, intuitive, lacking in visual metaphors that tend to look cluttered on a mobile device- clarity and creative data visualisation in the UI, and UX design is the trend in weather apps.

Although, with the abundance of weather apps on the market- much to the consumers' benefit, one will find many different perspectives in design.

6.2.3. Navigation

Reminiscent of the productivity app Clear. Weather cube is gesturally based in its navigation. Using multi-touch in lieu of scrolling- pinching, swiping, and tapping to see more or less information. It has a very modern appeal, using an entirely digital, flat design. Though, like a Rubix's Cube one can turn the entire cube in the app and find more information, tapping squares for details. Reminiscent of the productivity app Clear.

Living Earth allows the user to spin the globe around to discover different areas climate and weather information.

The Weather Channel uses buttons as a navigation metaphor giving it more of a traditional web-page feel. Provided is a menu to which customers can turn for navigation. And tiles along the bottom of the screen to visit more information (pollen), videos, and radar. The hourly forecast buttons are ever present at the top of the app.

Weather Channel, Earth 3D, Clear Day/ Weather HD (uses buttons, splitting half the button indicators between very simple icons and plain typeface).

6.2.4. Dynamic and Static Design

Live radar maps are usually presented with a "play" button to begin radar mapping animation for cloud, temperature, and other weather revelations. Furthermore, the market research shows that animation can be used in very creative ways- to give a certain richness to overall app experience and appearance of the app.

Parallax effects, the use of slow moving background visuals have been used in Clear Day (formerly Weather HD)- as richly coloured, "real-life" animated image of clouds, or dew on the earth to make a very simple app quite beautiful. This effect is also very subtly in use in the Yahoo! Weather app when swiping to change cities, and the blurring of the background as one chooses other weather information.

Thoughtful, yet subtle details such as these help to give a "weight" to the app that is meaningful to customers and creates a sense of value in the app and data presented.

6.2.5. Animation & Colour

Using animation to reveal a selected or pressed state button, or bending and stretching buttons (see Haze example below). Ambient glowing, jiggling or undulation in icons or "buttons" to indicate action (Solar, Good Weather, Climate Clock).

Also included in the examples are context dependent colours: i.e. blue or navy for night or cooler temperatures, orange or yellow or red for day or warmer temperatures (Solar, Skye, Weather Pup, radar).

6.2.6. Lifestyle & Social Sharing

There are customisable apps that can be suited to your lifestyle and activities. Certain apps provide the option for a tailor made set of conditions for various activities.

Socialisation is a large part of the app experience. The ability to stay connected with friends and share current conditions seems to be an important feature to digitally native consumers.

▸ Takeweather is an app wherein users take photos of their current conditions.
▸ Weather HD Tweets includes a map and location of tweets about weather around the country. Earth 3D allows a live tweet of reported conditions to Twitter.
▸ AccuWeather gives users the option of setting their perfect conditions (temperature, wind, rain, etc.) and entitle the set for "Fishing" or "Golfing", or "DIY Projects". The Weather Channel provides points of interest for activities (see below, like parks, golf courses, lakes).Weather Quickie is a comparison to weather from the day before.
▸ Swackett uses avatars, "peeps" to demonstrate appropriate clothing options for the day. The app includes other useful information but uses the "peep" avatar to convey quickly to the user what the weather will be like.

6.2.7. Overall Impressions

The consumer is clearly the winner in this market flooded with options- they benefit from innovations in what appears to be one of the most competitive markets in the app industry.

According to the consumer purchase data and innovation trends in an internal review- it should be noted that the "Top Apps" ratings, based on:

▸ innovation

▸ design quality

▸ data quality

Only three percent of the apps rated received perfect scores across the board. Over 54% of the cream that rose to the top were paid apps, less than 50% were free apps.

People are willing to pay for quality apps. The apps focused on thoughtful and useful interface, design, data presentation were in the top tier for customer ratings and purchase. To the users, a focus on these aspects of the app design and experience translates to high quality and simplicity of use- and these apps win out in the crowded weather-app landscape.

7. App Descriptions

7.1. Mobile Websites

A mobile website is a website designed specifically for mobile devices, not to be confused with viewing a site made for desktop browsers on a mobile browser. Mobile websites are characterised by their simple "drill-down" architecture, or the simple presentation of navigation links that take you to a page a level deeper.

Mobile websites often have a simple design and are typically informational in nature, offering few—if any—of the interactive elements you might expect from a desktop site. Mobile websites have made up the majority of what we consider the mobile web for the past decade, starting with the early WML-based sites (not much more than a list of links) and moving to today's websites, with a richer experience that more closely resembles the visual aesthetic users have come to expect with web content.

Advantages

‣ They are easy to create, maintain, and publish.
‣ They can use all the same tools and techniques you might already use for desktop sites.
‣ Nearly all mobile devices can view mobile websites.

Disadvantages

‣ They can be difficult to support across multiple devices.
‣ With now CMS in place they can create a significant content redundancy
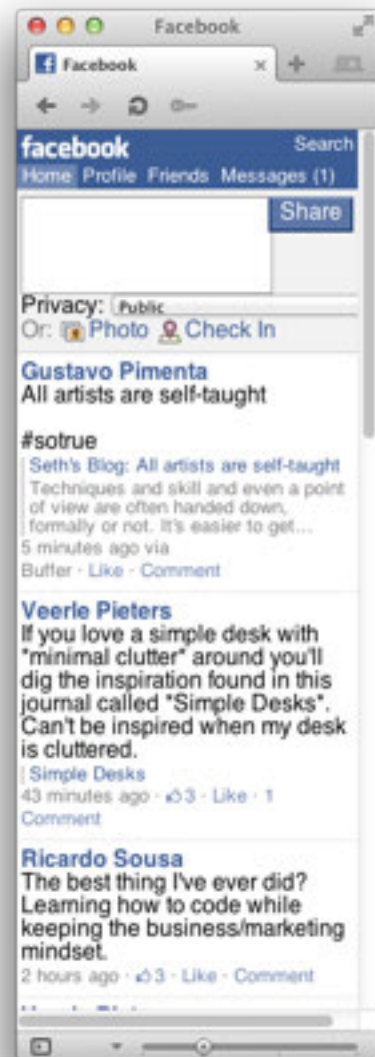
- They offer users a limited experience.
- Most mobile websites are simply desktop content reformatted for mobile devices.
- They can load pages slowly, due to network latency.

7.2. Responsive Mobile Websites

A responsive mobile website is an experience that is built for multiple device contexts, but with a single source of content. Under very specific circumstances the user experience of this approach can be equal to a Class 1 Mobile App, which we will come back to.

Advantages
- Support mobile devices from a single code base
- Based in web standards
- Increases accessibility and SEO.
- Data integration is very simple.

Disadvantages
- Does not address the users context.
- Most websites are not designed to be "responsive" and need to be refactored from scratch.

7.3. Mobile Web Apps
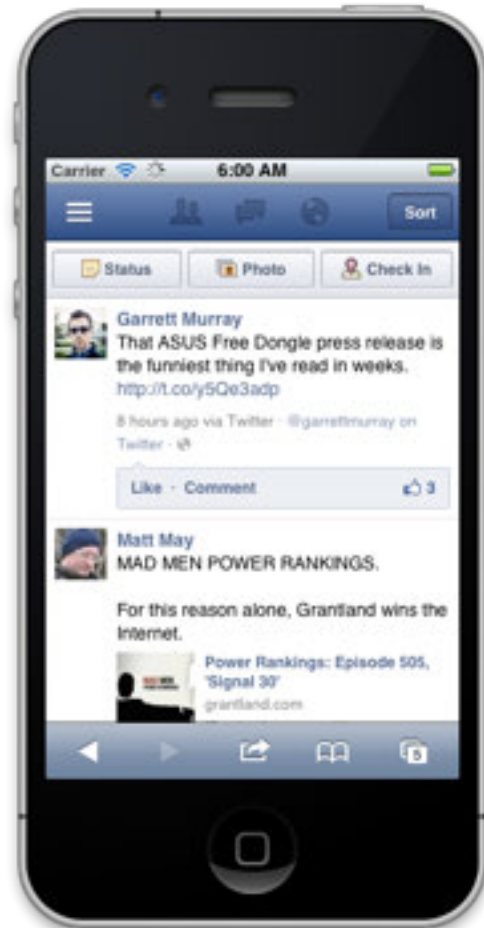
7.3.1. Class 1 Mobile Web App

A Class 1 Mobile Web App uses the latest innovations and capabilities present only in the iPhone, iPad and late model Android devices (3GS and higher, iPod touch 4th Gen and higher, iPad 1 and higher, most 2013 Android devices).

Advantages

▸ Best possible mobile experience

▸ Complex user interfaces, animations is possible.

▸ Access to device features is possible.

▸ The user experience can be very close, and in some cases on par with native iPhone apps.

▸ Fixed headers and footers are possible.

Disadvantages

▸ Class 1 Mobile Apps does not have backward compatibility and does not support other platforms.

▸ Complex Javascript is required for data integration and is difficult to debug.

7.3.2. Class 2 Mobile Web App

A Class 2 Mobile Web App supports high end WebKit browsers with devices that have at least 1Ghz processors (all iOS devices and most 2012 model Androids).

Advantages

▸ Complex user interfaces are possible.

▸ Support the majority of high end smartphones on the marketplace.

- Has limited backward compatibility.

Disadvantages

- Use of animations are processor and battery intensive.
- Cannot use fixed footers and headers
- Complex Javascript can be required for data integration and is difficult to debug.

7.3.3. Class 3 Mobile Web App

A Class 3 Mobile Web App has the highest degree of smartphone device compatibility, provides for high quality user experience, as well as supporting higher and lower classes (supports all iOS devices, all Android devices, BlackBerry Torch and higher).

Advantages

- Supports the majority of devices, but not all.
- Provides a quality user experience on more capable browsers, and degrades to lessor devices.
- Is easier to support with complex data integrations.

Disadvantages

- Cannot support fixed header or footer.
- Cannot support animations or screen transitions.
- Limited Javascript support.

7.3.4. Class 4 Mobile Web App

A Class 4 Mobile App is designed with compatibility in mind, seeking to have the best possible user experience across the widest number of devices. This is the best approach for supporting Windows phones or BlackBerry devices other than the Torch.

Advantages

- Support the largest number of handsets
- Is simple to design and develop
- Is simple to deploy

Disadvantages

▸ Requires significant QA time

7.4. Native Apps

Native apps are built using solely Software Development Kits (SDKs), which for iOS is Objective C and for Android is Java. These SDKs are incompatible from each other, meaning that supporting multiple platforms often requires additional development effort. However there are a number of solutions to reduce the pain in cross-platform support.

The biggest advantage of native applications is the ability to sell the application via each of the platform App Store. However the ability to send push notifications to the device when the application isn't open, is probably the most important feature to the Bureau mobile strategy.

However creating a native application requires a RESTful data service in order to be able to fetch data into the application quickly. Something the Bureau doesn't currently have.
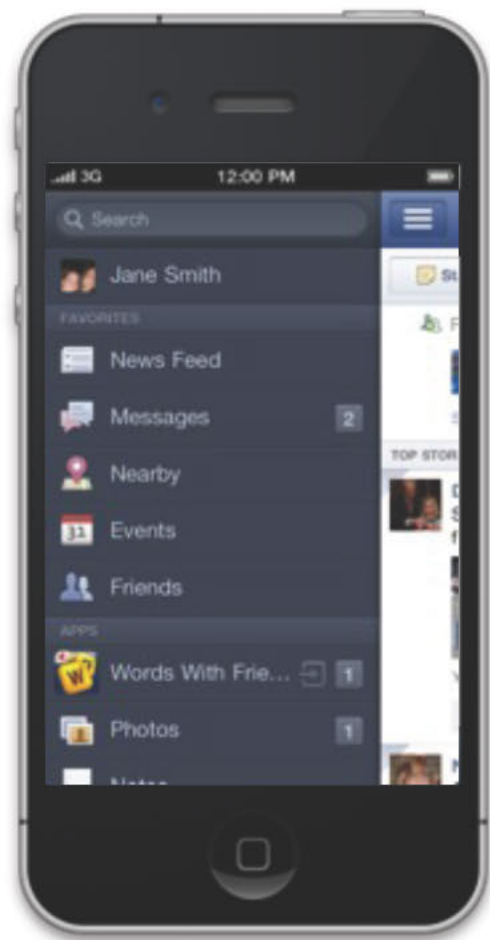
But one of the biggest tricks that native developers keep in their sleeve is embedded WebKit views – similar to an IFRAME – to embed web content within a native app. Over half the applications in the App Store employ this technique in one way or another.

Adobe's PhoneGap employs this trick on a broad scale providing no native elements on screen, allowing you to use web content as your entire interface. But there are many methods in-between PhoneGap and a full native application that can be employed.

At any rate, a native application requires resources that understand how to build and deploy native apps, as well as a RESTful data service to power it. None of which the Bureau currently has in place.

Advantages

▸ Best possible customer experience

▸ Probably the best experience for the audience, but this would need to be confirmed

▸ Takes advantage of Apple App Store marketplace (a new SEO)

▸ A strong reference design can lower overall costs for other platforms

▸ It could possibly be the least development effort

Disadvantages

▸ Limited to iOS devices

▸ Unknown level of effort to produce

▸ Requires in-house staff to manage after the product it is complete