

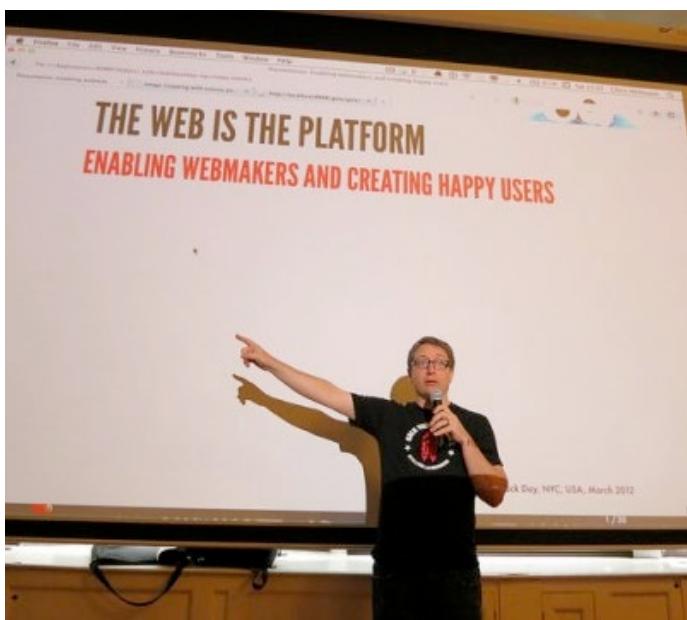
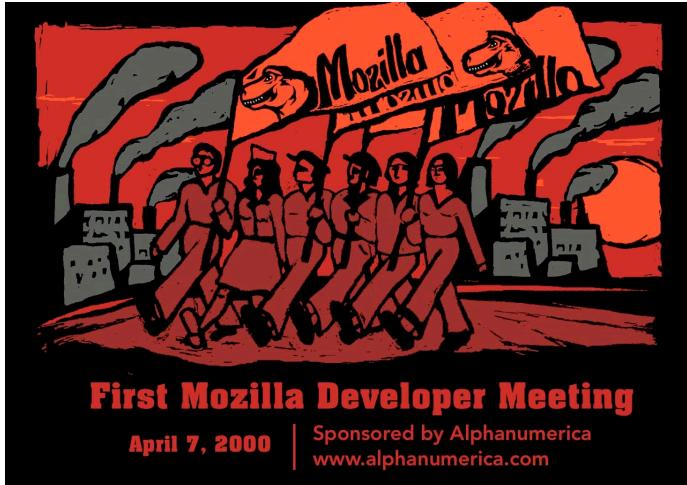
# Strategy & Insights Team

# The App Developer Experience

Larissa Co

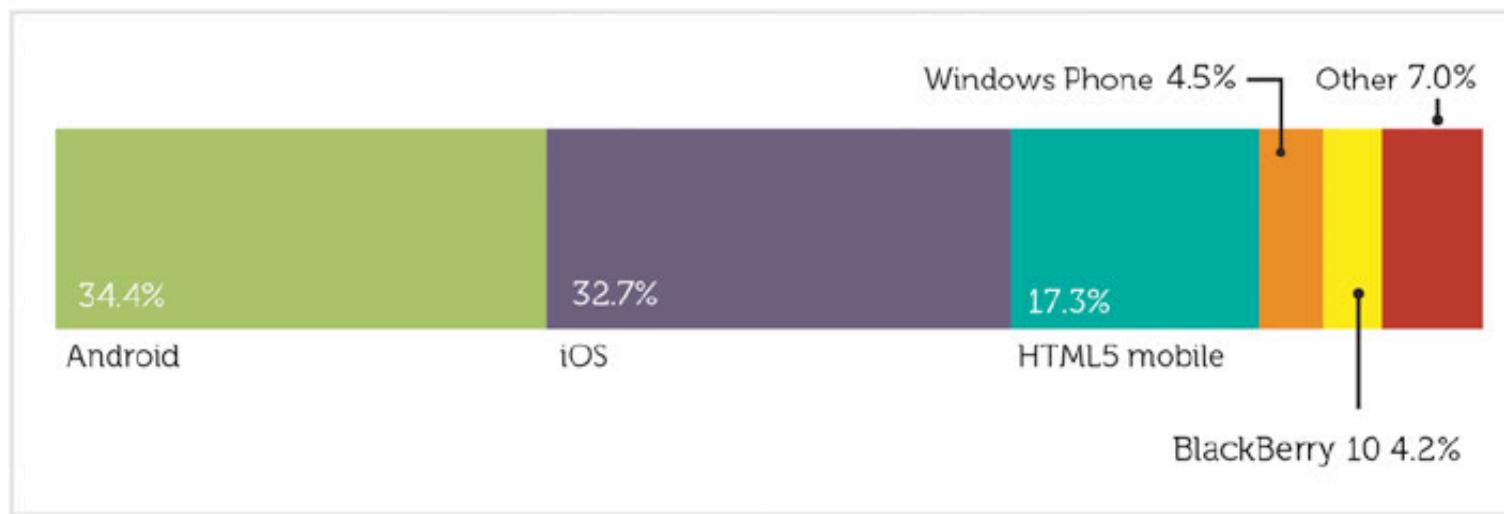
Cori Schauer

# Supporting developers has always been an important part of Mozilla's work



# Now, we want to engage app developers so that we can advance the Web ecosystem on mobile

**The mobile triopoly: 84% of mobile developers use iOS, Android or HTML5 as their main platform**  
% of developers using each platform as their primary platform (n=5,271)



Source: Developer Economics Q3 2013 - State of the Developer Nation  
[www.DeveloperEconomics.com/go](http://www.DeveloperEconomics.com/go) | Licensed under Creative Commons Attribution 3.0 License



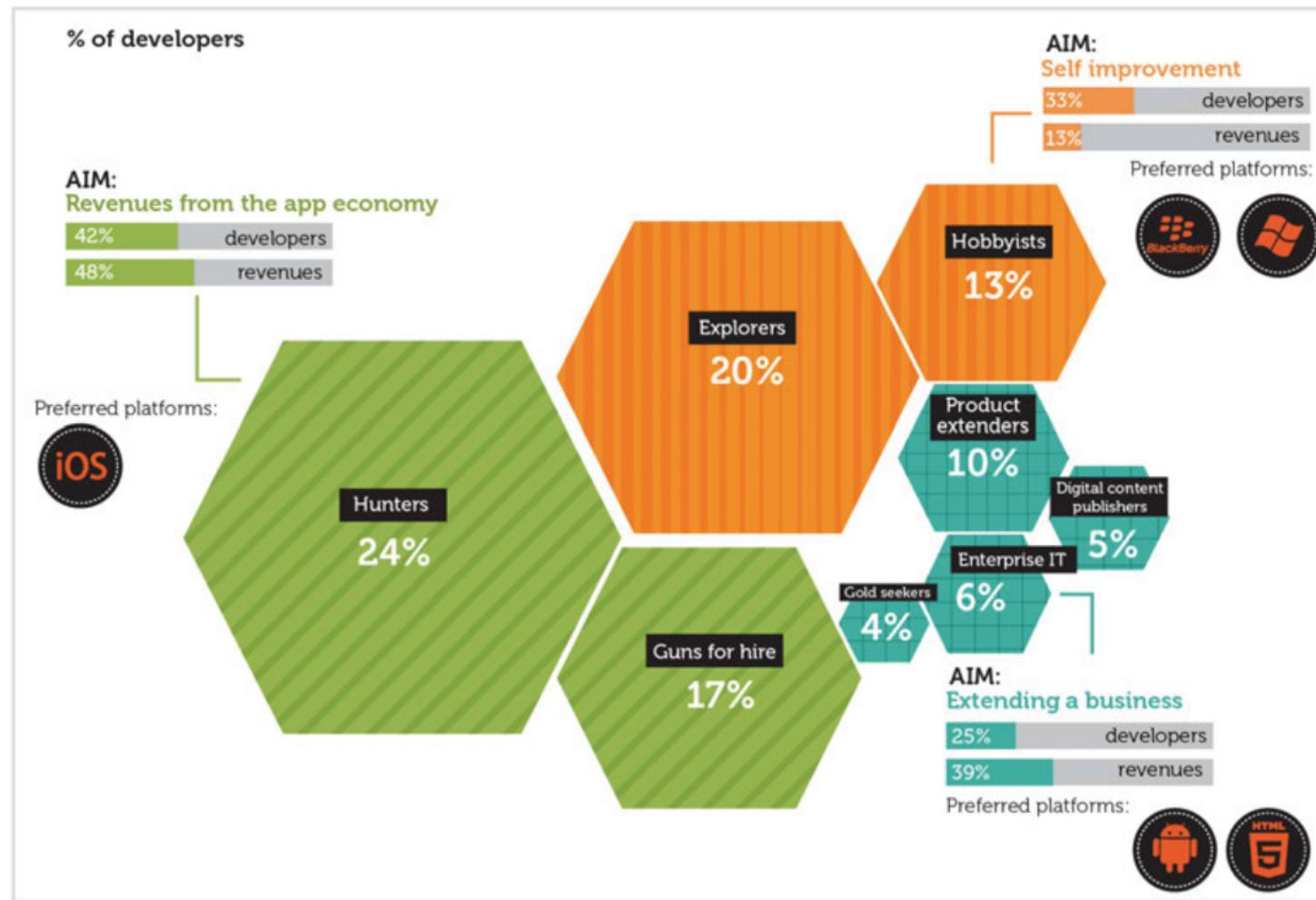
# We already have a sense of what app developers do at different phases of their process



Source: Developer Economics 2013 | www.DeveloperEconomics.com | January 2013  
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# As well as the factors that drive their platform choices



Source: Developer Segmentation Q3 2013  
www.DeveloperEconomics.com/Seg13 | All rights reserved

**Vision mobile**

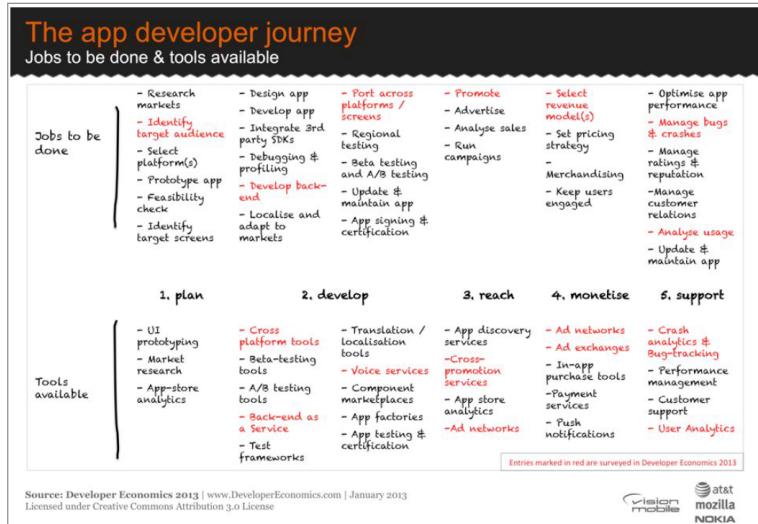
Different teams at Mozilla are now focused on engaging with different types of app developers

## Developer: Categories By Strategies Adopted

Strategies Adopted	Target Platform Selection	Are Sub-Segments Of
Reach many quickly	High Volume Platforms	VC Funded, Media, Opportunists
Reach top-spenders	High Affluence Platforms	Brands, Media, Opportunists
Reach everyone possible with existing apps "Porters"	Cross-OS-Platform	Media, Corporate, Brand, Opportunists, VC Funded, Explorers
Reach across consumer's life	Multi-Screen	Media, Brands, Corporate
Target specific users	Niche sub-segment	Corporate, Brands, Explorers, Hobbyists
Follow a passion	Familiarity	Hobbyists, Explorers, Contractors
Doing well where we are	Current platform(s)	Opportunists, Platform



# The goal of this report is to give teams even more insights to help them support app developers



Market research provides us with the context:

- Key elements and process of the developer journey
- Tasks performed by app developers at each stage (JTBDs)
- Preferences and motivations of different types of app developers

User research provides us with the stories:

- How developers interact with people, tools, resources at each step of the way
- Emotions and cognitive frames that influence decision-making
- How Mozilla can help

## LEARNING

LET THE EXPERTS  
GUIDE ME

MORE EVANGELIST  
EVENTS

CHRISTIAN IS  
THE BEST

WRITE MORE  
BOOKS

MDN IS THE  
BIBLE FOR  
DOCUMENTATION  
ABOUT HTML5,  
JS

HAVE MORE  
DEV EVENTS  
THAT WALK  
THROUGH PROCESS  
OF BUILDING FFOS  
APPS

MORE MOZILLA  
TWEETS ON  
LEARNING OPS  
+TOPICS

PUT MORE  
ON TWITTER

ARTICLES ON  
MOZHACKS ABT  
PERFORMANCE +  
TOOLS ARE  
GREAT

VIDEOS  
MEET UPS  
HTML5 CONFERENCES

## HELP ME RECOVER FROM A CRISIS

HELP WITH  
APPROVALS IN  
STORES

CLEAR + ACCURATE  
FEEDBACK ON HOW  
TO TUNEIN SHOTGUN  
IF REJECTED FROM  
STORE

PAY FOR THE SERVICE

GIVE ME A  
PERSON TO TALK  
TO WHEN I NEED  
HELP DURING RELEASE/  
WORKING WITH NEW  
TECH

A WAY TO  
AUTOMATE REVIEW  
FEEDBACK FOR  
CRITICAL BUG FIXES  
(SUCH AS WHAT TO  
DO IF MY APP IS  
REJECTED)

DISTRIBUTE PRE-RELEASE  
VERSIONS

## INSPIRE ME TO START BUILDING

push technical boundaries

INCENTIVES DEV'S  
WHO'VE ALREADY  
MADE AN APP TO  
TRY + INCORPORATE  
NEW TECH INTO IT  
(ESP. DEVICE APIs)

MAKE SURE THERE'S  
EXCITING TECH  
FOR DEVELOPERS  
TO PLAY WITH +  
COMMUNICATE IT  
WELL

INTEGRATE THE  
WEB BETTER W/  
THE PHONE INSTEAD  
OF CREATING "APPS"  
THAT BEHAVE JUST  
LIKE OTHER PLATFORMS

MAKE SURE USERS  
+ DEV'S  
UNDERSTAND WHY  
FFOS IS DIFFERENT  
(FROM IOS ETC)

## Provocation

HAVE DEV'S WHO  
ARENT THE MOZILLA  
"EXPERTS" EXPLAIN  
TECH TO OTHERS +  
GET THEM EXCITED  
ABOUT IT

INCENTIVIZE  
(THROUGH GAMES,  
CHALLENGES) THE  
USE OF NEW  
TECHNOLOGY

GIVE ME A  
FFOS PHONE

Computer →  
Crashmore  
Simple/  
humble  
interface  
not in my  
way!

## BUILDING OFFER THOUGHTFUL TOOLS THAT SUPPORT MY PROCESS

MOZILLA'S DEV  
TOOLS UI IS  
NOT AS INTUITIVE  
AS CHROME'S  
(SEE LIST OF  
IMPROVEMENTS)

PROVIDE BETTER  
TOOLING FOR  
DEV'S

HAVE A TOOL TO  
COMPARE MY SITE  
ON DIFF SCREEN  
SIZES AT THE  
SAME TIME

CREATE A GOOD  
TOOL FOR ANDROID  
(NATIVE)  
DEVELOPMENT

DIFF BETWEEN  
FIREFOX +  
FIREBUG IS  
CONFUSING

A PROFILER THAT  
HELPS DEBUG  
MEMORY LEAKS

## access

COULD NOT BUY  
A FFOS PHONE  
TO BE ABLE TO  
TRY DEVELOPING  
FOR IT!

RELEASE BETTER  
PHONES!

GIVE ME  
A PHONE

## hacking made easy

MAKE IT EASY  
AND FAST TO  
GO THROUGH  
THE BUILDING  
PHASE

MAKE WORKING  
WITH SIMULATORS  
EASIER

MAKE FFOS  
MORE FRIENDLY

HAVE A CLEAR  
ROADMAP FOR FFOS  
THAT YOU CAN  
COMMUNICATE W/  
DEV'S + STICK TO

## ANTICIPATE ERRORS BEFORE SUBMISSION

INFO ON  
RELEASE BOST  
PRACTICES

CREATE A  
CHECKLIST OF  
HELPFUL THINGS  
APP DEV'S SHOULD  
THINK ABT BEFORE  
UBLISHING THEIR  
APP

CREATE A WAY TO  
GET BOTH LIGHTLY  
AVOIDABLE VERSIONS  
OF MY APP TO  
CAN AUTOMATICALLY

DISTRIBUTE PRE-RELEASE  
VERSIONS

## HELP ME ITERATE MY PROCESS

MORE ARTICLES  
ON TOOLS

MORE TOOL  
REVIEWS

MORE ARTICLES  
ON DEVELOPMENT  
PROCESS

re/love  
all

# Gathering Insights

# We spoke to 12 mobile app developers in two different locations about what they do and why

Bay Area, California



P1



P2



P3



P4

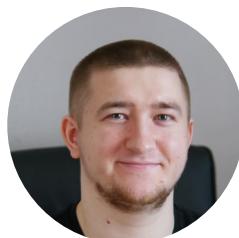


P5



P6

Warsaw, Poland



P7



P8



P9



P10



P11



P12

# Our participants were all porters within different developer segments from past market research<sup>1</sup>

Hobbyists



Explorers



Opportunists



Contractors



VC Funded



Brands  
Media



<sup>1</sup> The only segment we didn't talk to was "Corporate IT", which is not one of our main target markets. "Brands" and "Media" are two different segments, but the participant we interviewed had experience in both. Some participants can be classified under multiple segments based on their professional and personal work, but we only placed them under the segment that we focused on discussing during the interview.

# We asked about four different aspects of their development process



Learning



Building



Releasing

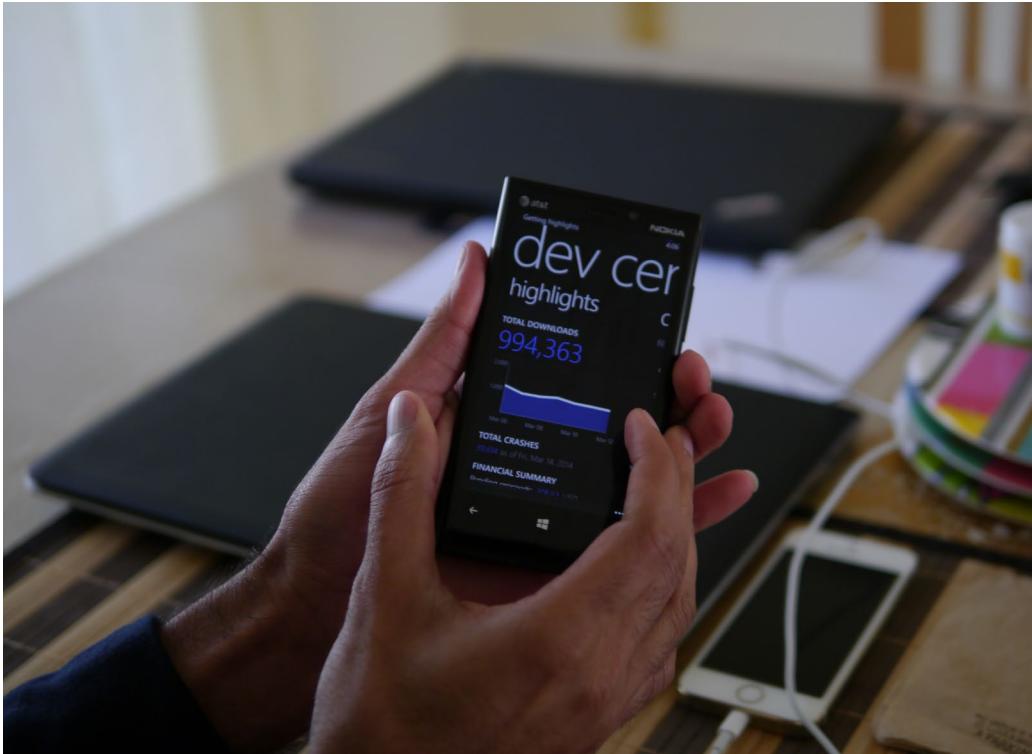


Then What?

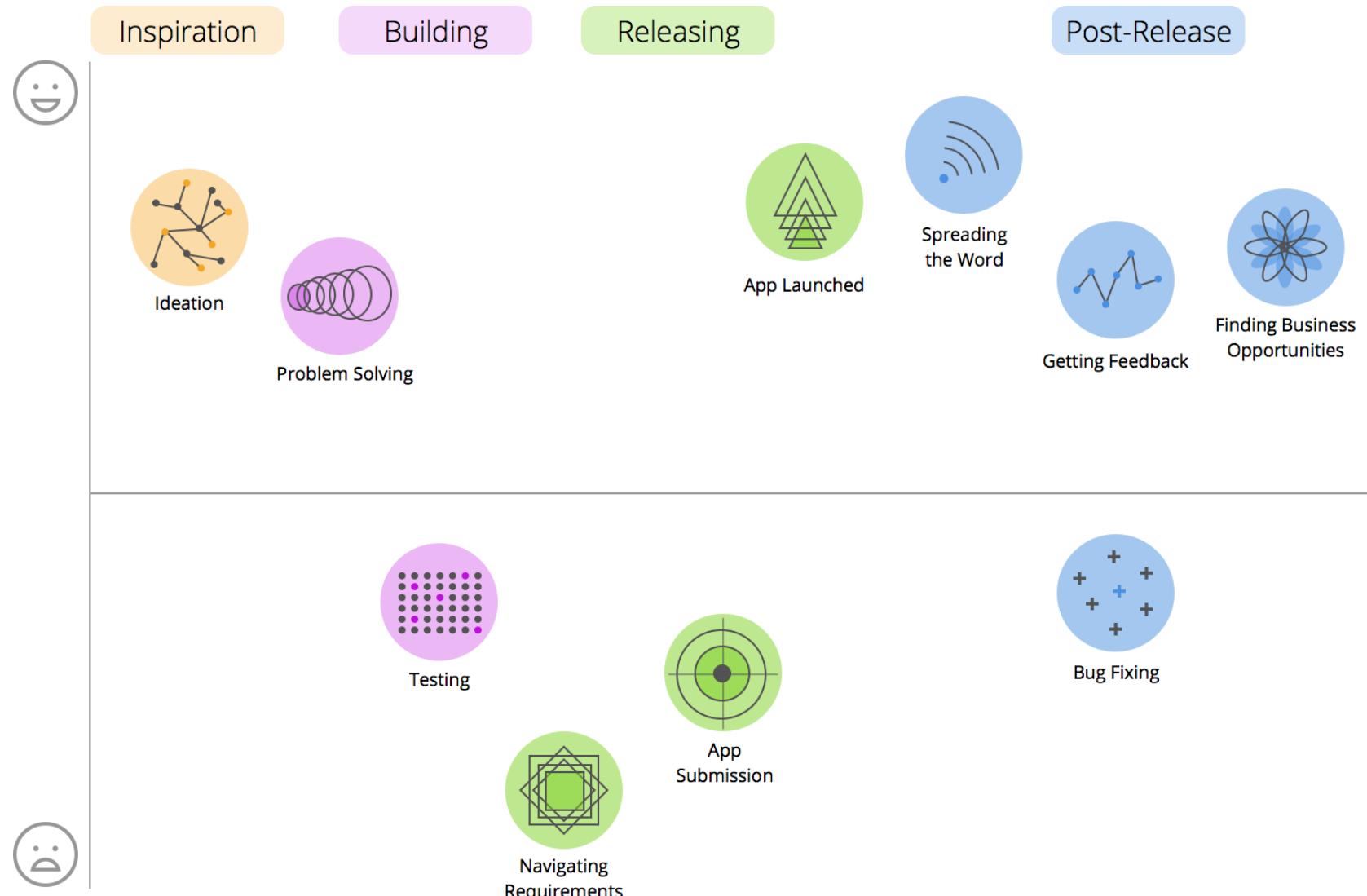
# We talked about stories of their first app, what success means, and how to be successful



*"I really like seeing users use my apps. Especially when I meet complete strangers who tell me: 'you made this app? I use it everyday!'"*



# Ultimately, we created an experience map to help us better understand the app developer journey



# And discovered the following core insights about the app developer experience:

- 1 App developers **learn** in different ways throughout their experience and thus need different kinds of resources at each phase
- 2 The process of **releasing** an app on an app store is an emotional low unlike releasing it on the Web
- 3 By helping developers feel successful **post-release**, Mozilla can inspire them to continue creating for the Web and FirefoxOS
- 4 By emphasizing the Web's rich ecosystem that's everywhere, we can inspire more app developers to **build** for it



Learning throughout the journey

# Developers see Mozilla and Mozillians as trusted sources of information



*“Every time I have to research, I always start with MDN... Because you guys are the bible of Javascript. I will always start with that as a reference.”*

*“One of the two blogs I check every day is Hacks Mozilla because there’s a lot of news there that’s not available on other services.”*



*“There are lots of people working for Mozilla that share information... if they put something, on Twitter for example, I will have to check it because it has to be something interesting.”*

# App developers learn *throughout* their journey using different kinds of resources at each phase

Phase	Mode of Learning	Sample Sources
Inspiration	Ambient Learning for learning's sake or for future inspiration	<a href="#">Hacks Blog</a> , Twitter, developer / platform blogs, mailing lists, meetups & conferences, introductory videos, HackerNews, Reddit, gurus
Building	Practical Learning in order to solve a problem or accomplish a task	<a href="#">MDN</a> , writing code, search, Stack Overflow, specs & documentation, sample code & snippets, Github
Releasing	Experimental Trial & error; Learning through others' and your own past experiences	<a href="#">FirefoxOS developer device</a> , QA & testing, release checklists, code reviews, app submission process, device testing
Post-Release	Observational Learning from feedback and observed patterns	<a href="#">Marketplace</a> , user reviews & feature requests, analytics, bug & crash reports

# Ambient learning: Learning for learning's sake

Developers love to learn about new technology because it inspires them to make more cool things. They create systems for themselves and identify trusted sources that ensure they're always in the loop.



*"I've built a Twitter base that is good enough for me... I'm not going anywhere for the knowledge; The knowledge is already finding me. But you have to build it first-- right now, it's tailored for me."*



*"It's very important to keep learning. If you're standing in place, you simply stay behind."*

Mozilla can help developers by:

- Encouraging Mozilla developers to participate (informally) in local community gatherings such as meetup groups and book clubs
- Frequently posting new material on blogs and Twitter, writing more books about Javascript (from the experts)
- Sharing resources that Mozilla developers trust

# Practical learning: Learning in order to build

Developers encounter issues while building their app which prevent them from continuing. They must find practical information and answers that they can immediately apply to the problem at hand.



*"We're a small team; we have to move fast. I wish I had time to master Firefox developer tools but I don't know what benefits it will give me today since I'm already pretty fluent with Chrome developer tools."*

Mozilla can help developers by:

- Hosting creative challenges that incentivize developers to take on new technical challenges such as developing high-performance apps on low-end hardware
- Incorporating features that provide developers with immediate feedback in their developer tools
- Providing small, interactive examples that developers can play with and look at the code for
- Making it easy for developers to switch from one set of developer tools to another

# Experimental learning: Learning to reduce anxiety

Releasing an app comes with many unknowns, such as undiscovered bugs and changing store requirements. Developers rely mostly on experience to anticipate problems during the release.



*"The hardest part is testing a game on various devices, many of which I don't own. I assume it will work, but I don't always know."*

Mozilla can help developers by:

- Documenting or reducing the number of device-specific bugs that might surprise a developer in the field. We can also provide ways for developers to report these bugs or share this knowledge with their peers
- Providing ways for developers to share their experiences with platform or device-specific idiosyncrasies with others
- Developing a side-by-side comparison of what an app looks like on different screen sizes
- Documenting all the different app store requirements in one place
- Creating tools that allow a developer to submit the app to multiple app stores automatically without having to manually refer to different app store requirements

# Observational learning: Learning through feedback

Developers want to improve their app so that they can attract new users and keep existing ones. Once an app is released, they pay attention to user reviews and analytics to get information about bugs and feature requests.



*"That app is my baby... I read comments on the stores, mostly on Google Play because it's easy to communicate with them via G+ or Facebook. So when I heard that someone has a problem with our app, then I find him or her and ask them to explain it to me. I want my app to be the best."*

Mozilla can help developers by:

- Making it easy for developers to get feedback about their app in one place, even if it's in multiple app stores.
- Helping developers get in contact with customers / allowing users to file bugs on apps so that they can improve the app.
- Giving developers ways to connect with their customers who don't speak the same language that they do.

# How can Mozilla help a developer evolve by learning at every stage of the journey?



## Let Mozilla's expertise guide me

*"I don't see Mozilla at a lot of Javascript meetups. The Chrome Evangelism Team does a great job of getting out there and teaching new things... Firefox needs to do that more."*



## Increase my ability to learn by building

*"Learning is time-consuming. We have limited resources, so sometimes I feel that I just don't have enough time... If it's not very important, I have to skip it. It's hard to learn and stay up to date because there are so many things to learn."*



## Be the experience I can learn from

*"For websites, someone has written a Web development checklist for smart things you should check before releasing your app... just good defaults for things. Someone should make a mobile checklist of things to do on mobile."*



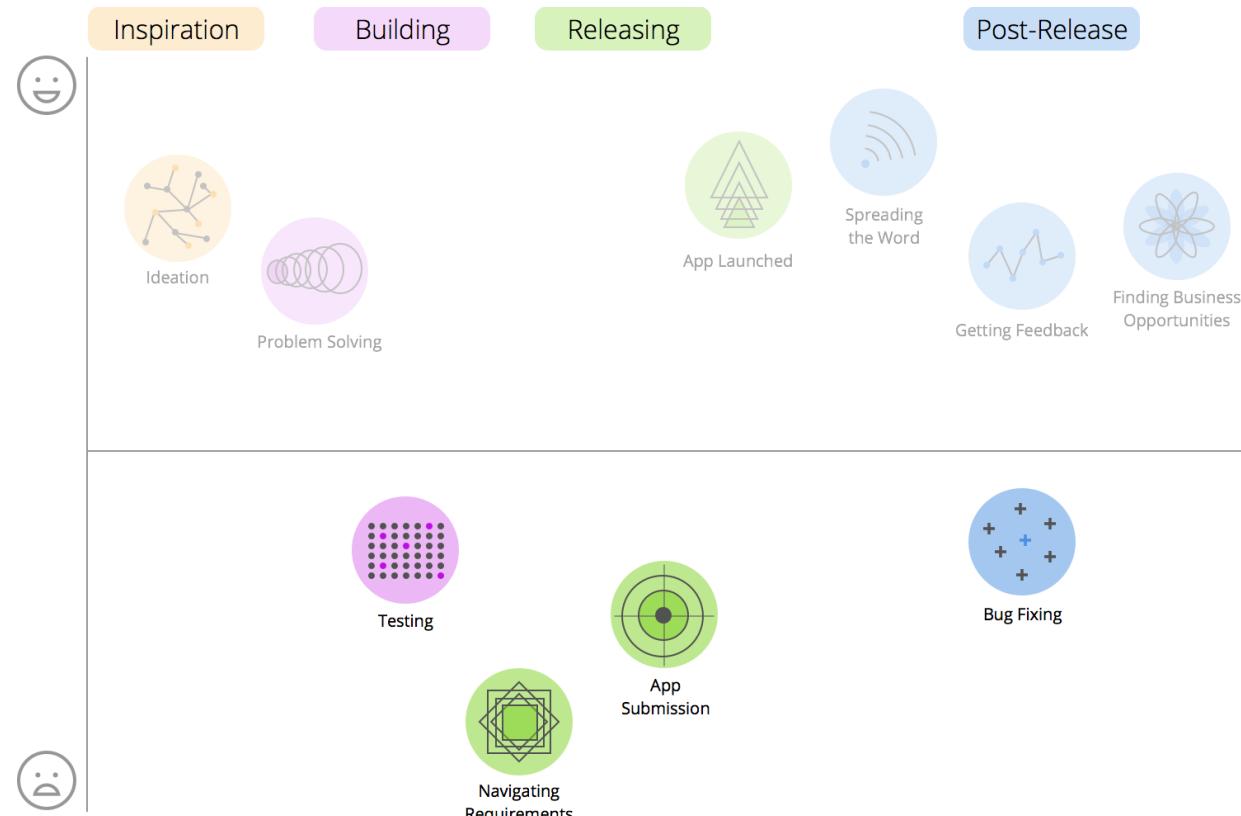
## Deepen my understanding of my customers

*"I like measuring progress and performance and displaying it in one concrete report, but it takes a lot of time to recreate... Mozilla can create a tool to automate the process and make diagrams in a form I can show customers."*



The emotional low of releasing an app

# The process of releasing an app to an app store is a low point for developers



*[Releasing an app] is stressful because I'm worried I didn't get it all right and will break people's experiences"*

# Developers see the release process as a tedious barrier that prevents them from reaching users

## Thinking



*"I'd even consider paying for a priority list only to make sure that my users have the best available content."*



*"Being on multiple platforms gives me a better chance of being picked up."*

## Saying



*"Submitting an app is like doing your taxes."*



*"Releasing is a necessary evil. It's nerve-wracking, but I have to do it."*

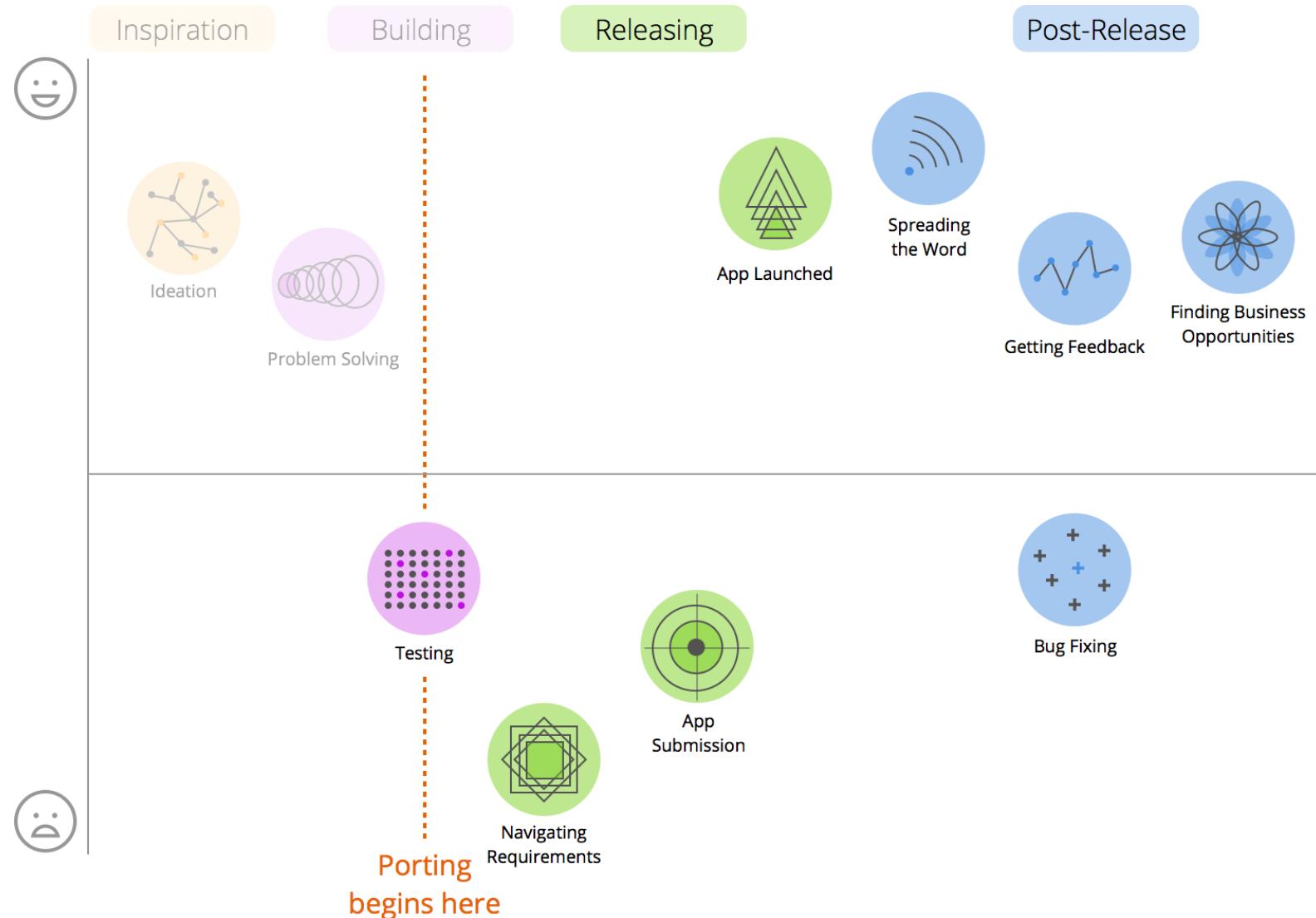
## Feeling

- **Anxiety** about whether the app will be submitted and whether it'll break anything
- **Frustration** at meeting the variety of requirements each store has
- **Relief** when the app is accepted into the app store

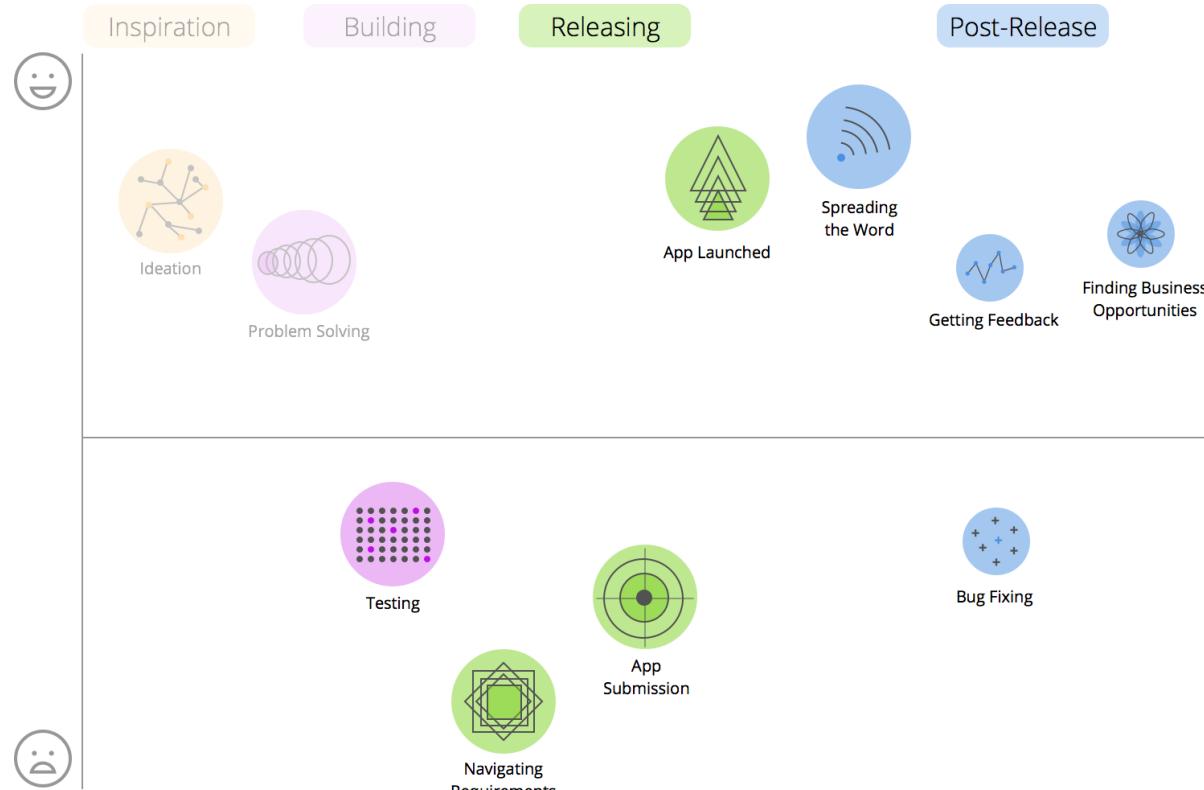
## Doing

- Using cross-platform porting tools
- Rewriting parts of the app to make it more performant on lower-end devices
- Per store: taking different-sized screenshots and writing descriptions
- Submitting their app on multiple platforms

# Unfortunately, the release process is also where many app developers first engage with FirefoxOS



# A great release experience is critical because FirefoxOS still lacks developer value post-release



*"As far as I know, too few people use [FirefoxOS]. And [the company] prefers us to focus on other platforms."*

# Whereas other platforms<sup>1</sup> offset a stressful release experience through post-release incentives

	Stressful release process	Post-release incentives
iOS	<ul style="list-style-type: none"><li>• XCode is painful to use for packaging apps</li><li>• Long app approval process</li><li>• Difficult to revert to an older version if the new version is unstable</li></ul>	<ul style="list-style-type: none"><li>• Prestige of being in the Apple store</li><li>• Revenue potential</li></ul>
Android	<ul style="list-style-type: none"><li>• Device fragmentation makes testing very difficult</li><li>• Setting up the SDK takes a long time</li><li>• Different Android stores have different submission requirements</li></ul>	<ul style="list-style-type: none"><li>• Powerful developer ecosystem (e.g versioning, analytics dashboard, payments, ads)</li><li>• Large # of users on the platform</li></ul>

<sup>1</sup> We didn't talk with enough developers who had experience releasing apps to other app stores (besides iOS and Android), so we didn't include these platforms here.

# The good news: The Web already has a model that addresses issues with the app release process

Developers hate	The Web offers
The long app approval process	<b>Control:</b> Developers don't have to wait before the Web app is updated
Device fragmentation (because they have to test on multiple devices)	<b>Standardization:</b> The Web (almost always) works on all devices
Having to learn and use each platform's tools to release the app	<b>Flexibility:</b> Developers are free to choose the tools that they like
Being constrained by the app store's policies for releasing an app, displaying it in the app store, monetization, etc.	<b>Freedom:</b> The Web has no restrictions (except legal ones) for how a developer can release an app



*“[The Web] is awesome. It provides flexibility... You can do whatever you want and nobody stops you from that.”*

# How can Mozilla enable developers to get great products to their users sooner?



## Help me recover from a crisis

*"We made a small mistake and we had to take the app out of the [Apple] store but it was difficult. We even tried calling Cupertino. You pay for a developer subscription but there's no one to help you. Apple on the outside is great, very beautiful, but on the inside, it's very poor."*



## Make my desire to scale effortless

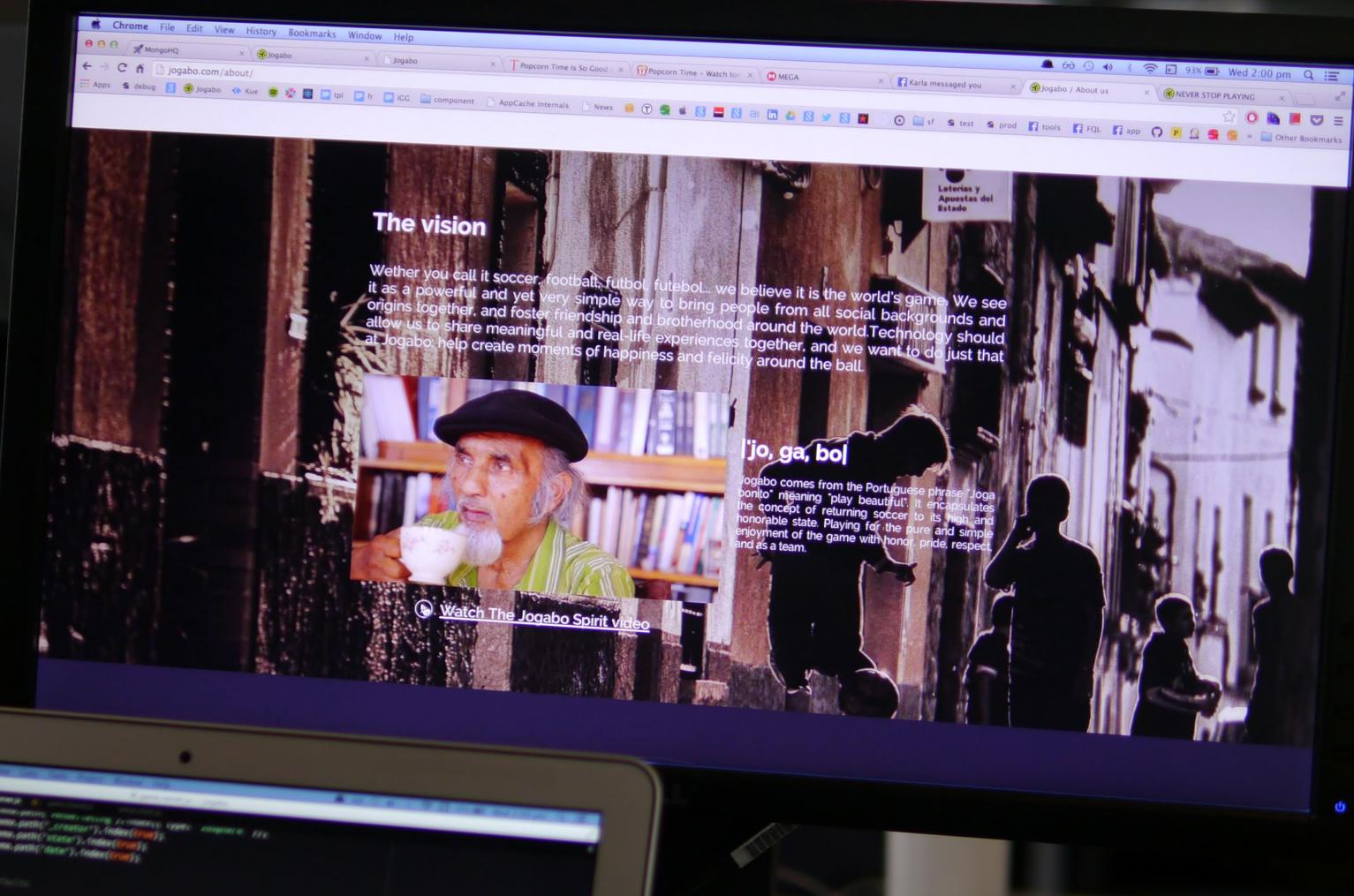
*"When you deploy to different marketplaces, it takes so much time. You have to fill out the same information, every single platform wants multiple images... they're not even standard. It's arbitrary, the sizes they pick. It's just because it fits the design that the designer picked that size."*



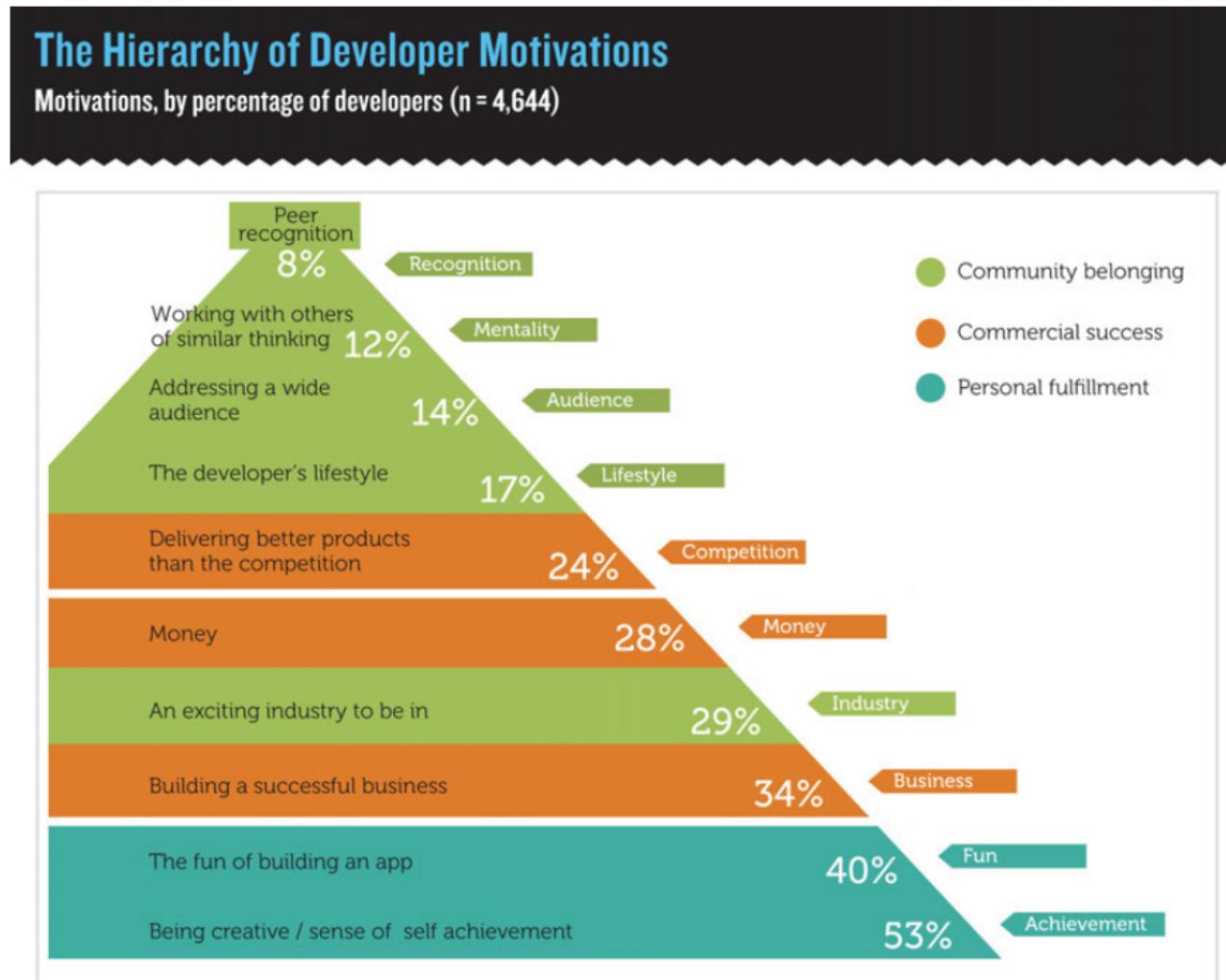
## Allow me to set the pace that's best for my app

*"After experiencing both approaches, I decided to stay with the self-hosted app because it gives me more control over updates."*

# Celebrating developer success



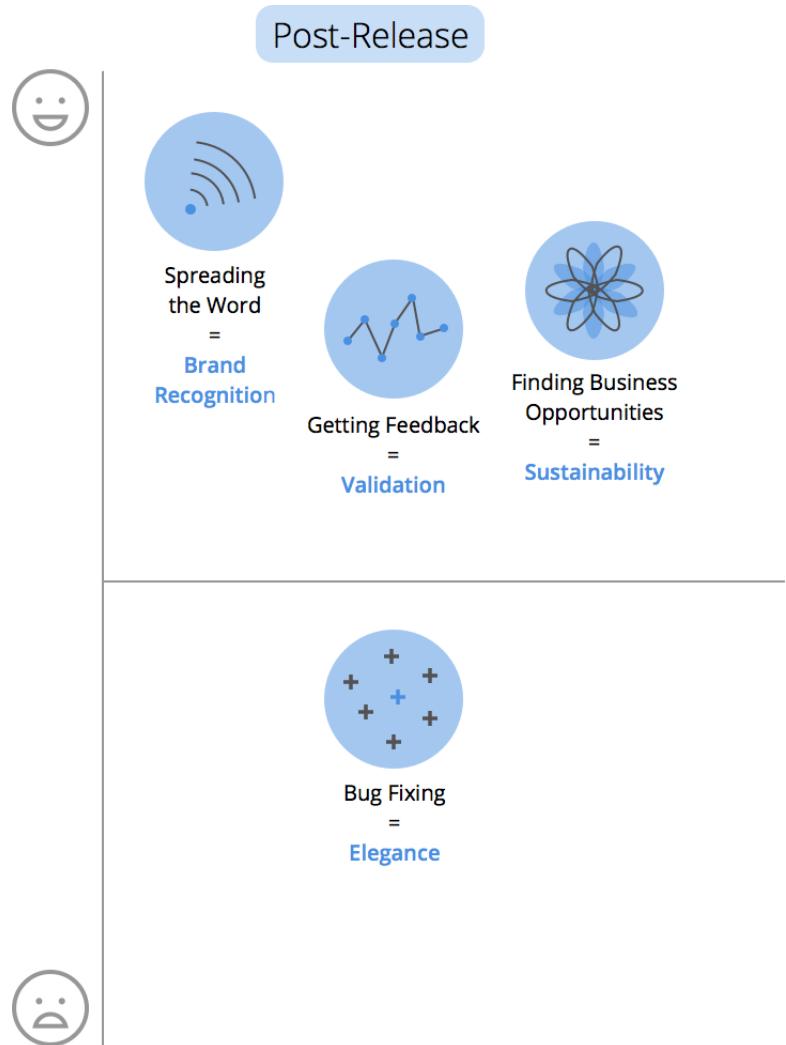
# Developers endure the release process because of their ambition to launch a “successful” app



Source: Developer Segmentation Q3 2013  
[www.DeveloperEconomics.com/Seg13](http://www.DeveloperEconomics.com/Seg13) | All rights reserved



# Post-release, developers will continue maintaining an app because they want to fuel its success



*"I feel proud. When I saw the icon for my app [on a FirefoxOS billboard in Warsaw], it was very cool, motivating."*

# Developers may adopt a platform for different reasons, but...

## Developer: Segments By Motivation

*Developers create relevant content if incentives align with motivations*

Segment	Size	Motivations	Evidence For Platform Adoption
Hobbyists	13%	Fun, Recognition, Learning	Reach, Low barriers
Explorers	20%	Ancillary income, Experience	Reach, Social proof
Opportunists	24%	Revenue from apps	Reach, Engagement, Affluence
Contractors	17%	Projects utilizing existing skills	Familiarity, Developer interest
Brands	10%	Engagement with primary products	Reach, Engagement
Media	5%	Content Consumption	Reach, Engagement
VC Funded	4%	(Representation of) Growth	Reach
Corp IT	6%	Productivity	ROI
Platform	<1%	Ship in the box	Reach



*"You have to go where your customers are... If you had 10% market share, I would definitely consider developing an app for FirefoxOS."*

# By making developers feel successful, Mozilla can inspire them to continue creating for FirefoxOS

## What personal success means to an app developer

### Brand recognition

App developers want the world to know about and use their app so they spread the word on multiple channels.

### Validation

App developers want to know how users feel about their app so they pay attention to customer feedback, downloads, money, app analytics etc.

### Elegance

The desire to create a polished, performant, brilliant app drives a developer to fix bugs or rewrite the app.

### Sustainability

Developers are passionate about what they do. By seeking opportunities to sustain themselves, they can continue to build awesome apps.

# How can Mozilla show developers that we are invested in their personal success?



## Amplify my presence

*"You can buy your way into getting to be a top app in the app store. Some awesome apps aren't getting discovered... Most mobile developers are not getting a fair shot. There's no way to get you stuff out there if you have no money to market it."*



## Develop me

*"[My game was successful] because I got to go to MWC and show my game in the FirefoxOS booth. I was able to showcase my brand. It was great to be there and to learn from others that I respect and find out that they respect me too"*



## Make our relationship personal

*"Having a person to talk to [would be helpful]... I want to have a relationship with the company, person-to-person so that when you ask a question, you get important information from a trusted source. Then you have a reason to do something, to add new technology. It's not this faceless things. Understanding what's going on has its advantages."*

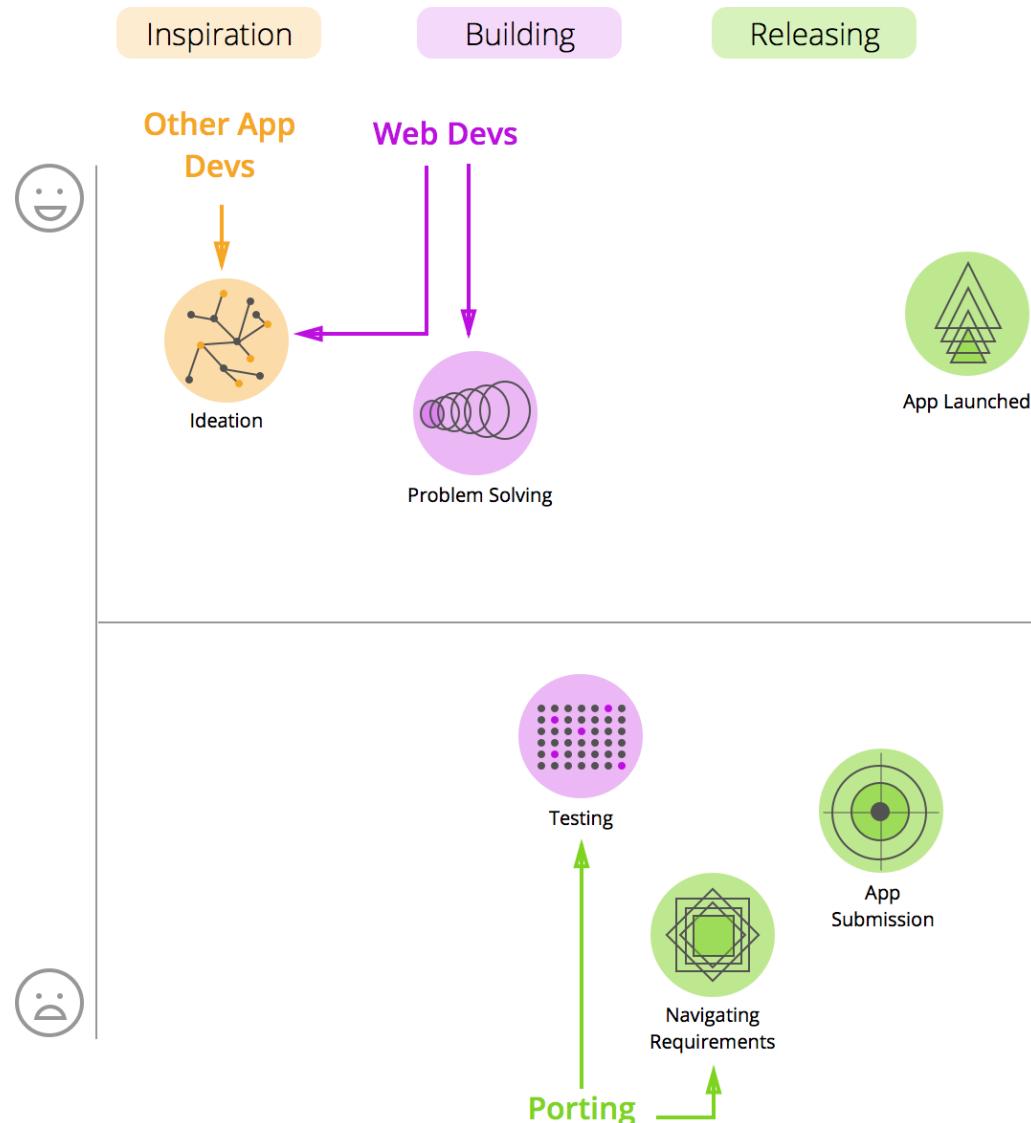
A close-up photograph of a man with dark skin and short hair, wearing a purple hoodie with a white graphic on the chest. He is looking upwards and slightly to his left with a thoughtful expression. In the background, there is a blue poster or banner with the text "Engineered For Heroes" in white and "oracle.com/ir" in red. A small Iron Man hand is visible at the top right of the poster.

Engineered For Heroes

oracle.com/ir

Inspiring app developers to build

# How can Mozilla activate developers who aren't even building mobile Web apps yet?



# FirefoxOS gives native speakers of the Web a platform where they are finally first-class citizens



*"I like that it's written in Javascript, HTML, CSS-- things that I already know. Theoretically speaking, I should be able to write an app if I manage to buy the phone or get it from the company."*

*"[On porting an existing Android app to FirefoxOS] I was able to remove a lot of code that was necessary to maintain old Android versions and to use new APIs and CSS animations without any prefixes. So I was able to make the code leaner. Thanks to which the app worked better than when I released it right away with the old code."*



# Our products and messages need to amplify what Web developers already love about the Web

## Everywhere



*"I intend to keep developing for the Web because it makes me a more universal developer. The language is everywhere: phones, TVs, browser, watches... I can't afford to ignore it"*

## A Force Multiplier



*"You only need to know one [language] and package it differently. It's good for a company because you can stay small."*

## Open for Participation



*"The Web, by its nature, is open. Other models have gatekeepers... they could control the content. The Web is the closest thing we have to a meritocracy and egalitarian system"*

## A Rich, Evolving Ecosystem



*"We have this great community because Javascript is so popular and it's open. You don't find that in other platforms, not in that extent... there is nothing as rich as the Web."*

## Faster to Launch



*"The Web is faster. The language is easier to learn, it's not compiled, and the desktop and mobile versions of an app for the Web are the same"*

# While invite, not overwhelm newcomers with the open and diverse platform that the Web offers



## Give me a starting point

*"There are set APIs for Windows, iOS. There are a gazillion Javascript frameworks out there. How do you figure out what to use? The Web has a constant learning curve."*



## Make beautiful things easy

*"Developing for the Web is hard to do. It's hard to make it look good on everything. I'm not a great visual designer, so I have a difficult time getting it right across all devices."*



## Help users find me

*"On the Web, still the biggest problem is finding about content even though its open. It feels like it's missing curated spaces. There's no go-to place for apps... You can only rely on your users to do the job or pour money into lots of marketing."*

# How can Mozilla inspire developers to start building for the mobile Web?



## Push technical boundaries

*"I didn't see the value in making just another Web app, when we could try to do something that wouldn't be possible otherwise or something that would work especially well [on FirefoxOS]... Mozilla should make sure there's exciting technology to work with and communicate it well to developers."*



## Make early hacking easy

*"When the documentation on FirefoxOS was being developed, I had to search for many APIs and I found them in examples made available by Mozilla in Github.... it wasn't available as text for me to read easily. I had to dig through it."*



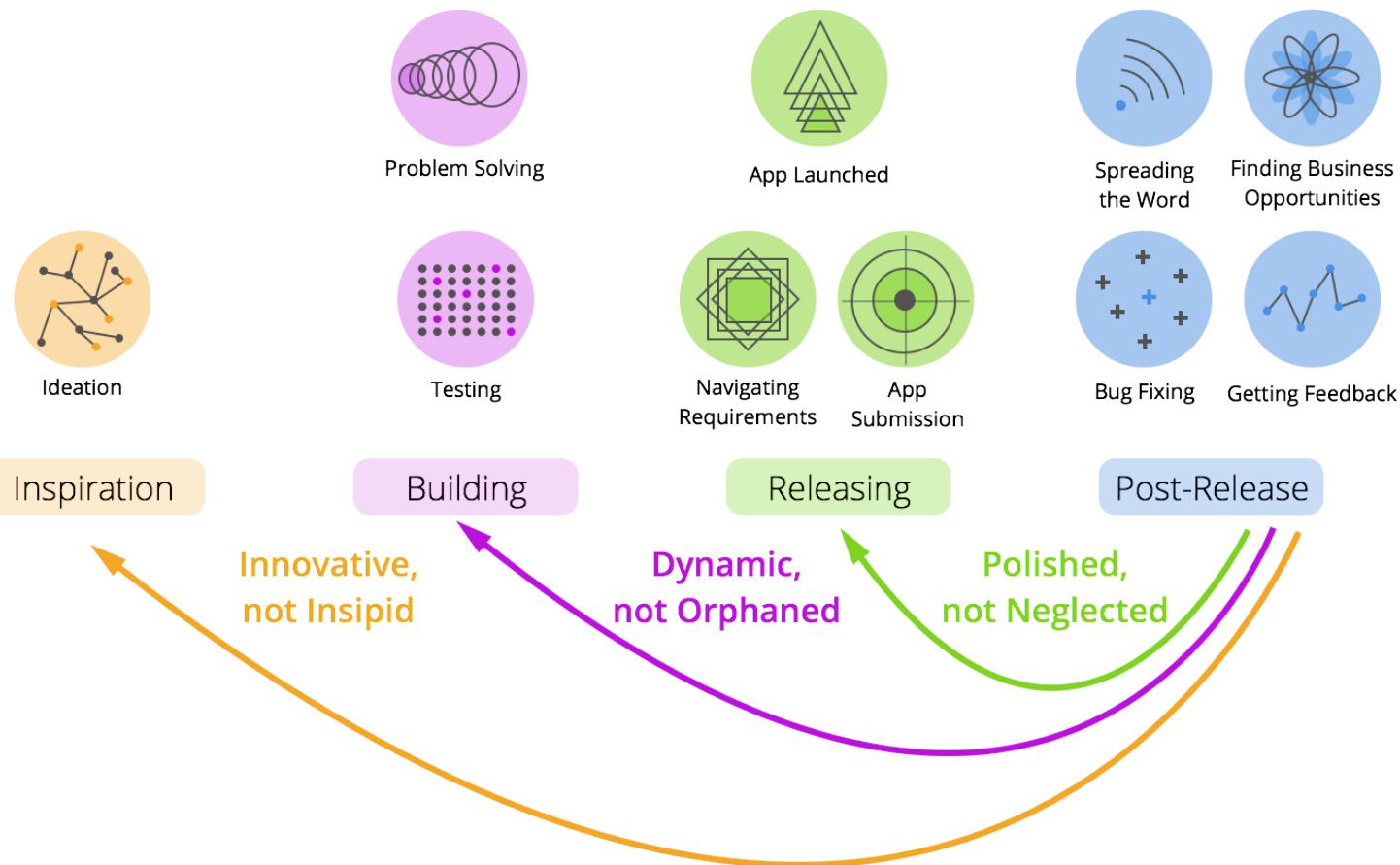
## Provide a platform where I can show my craft with pride

*"[When I first saw the beta version of FirefoxOS on a Samsung Galaxy SII], it was WOW. We saw the source code of the phone app. That's something new for us. The entire system made in HTML-- It's great!...Then, I saw the first native device with Firefox [on a Geeksphone]. To be honest, there were no wow... it's a really poor device, but of course it was only a developer device."*

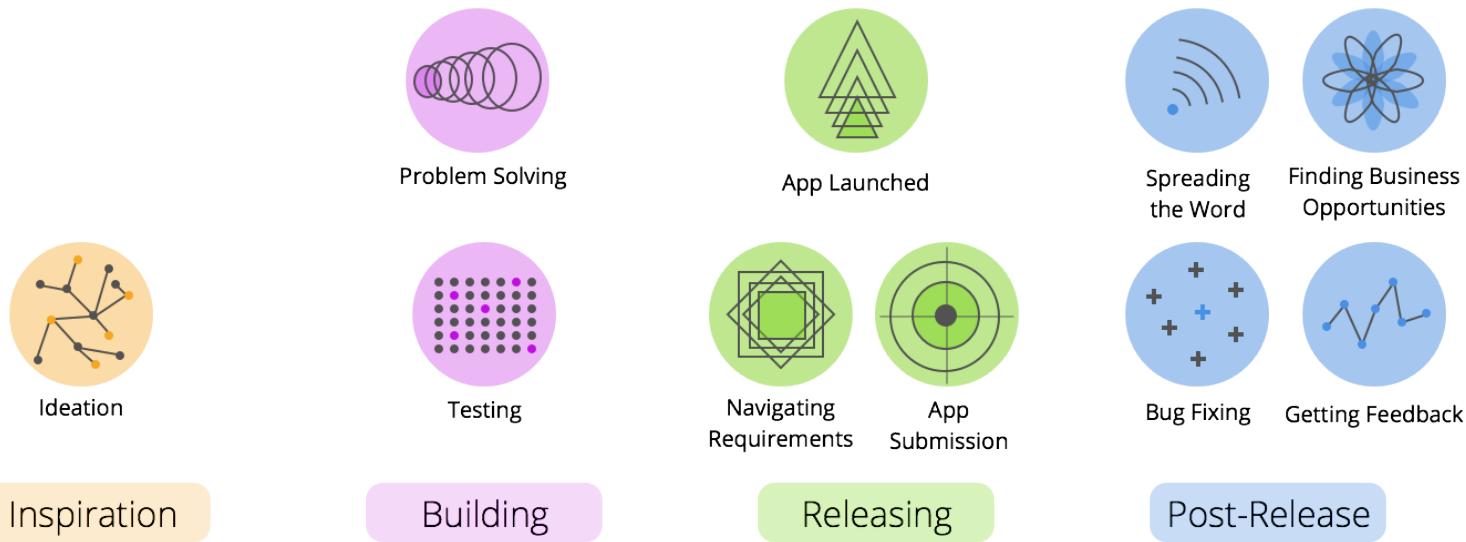


Tying it all together

# The Web apps ecosystem depends on a constantly renewing developer journey to continue thriving



# By supporting the developer's craft at every stage, Mozilla can keep them excited about the Web



Help me  
evolve through  
learning

Inspire me to  
start building

Enable me  
to get great  
products to  
my users  
sooner

Invest in my  
personal  
success

# Ultimately, app developers want to see the Web succeed too!



*"The Web is going in the right direction. In the future, you won't have to differentiate... because all apps will be Web and native at the same time, independent of Internet access."*

*"I'm betting 100% on HTML5... it's a shame that Google and Apple have this war on native. They should be throwing their effort to support the Web"*



*"Everyone has a browser in their pocket... Eventually, Web apps will be really good on every platform. It's not a matter of if, but when."*

# Let's give developers an experience where they can help build up the mobile Web ecosystem with us

- 1 Learn more about the participants that we spoke with from our Participant Bios
- 2 Let the artifacts that we'll share soon (the experience map, design principles, etc.) surface in your discussions and guide your decisions
- 3 Share. Discuss. Percolate thoughts. Come up with brilliant ideas that will help app developers!



Thank you!

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