

Hidden champions of the app economy

October 2013

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Cross Platform App Development Tool Benchmarking 2013

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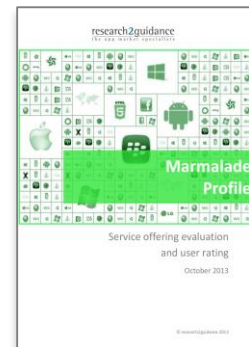
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1. KEY TAKEAWAYS

Over the course of the last five years, multi-app and multi-platform app publishing have become common for traditional enterprises and pure app publishers. After having published their first apps on iOS and Android, developers have become increasingly aware of second-tier platforms like BlackBerry and Windows Phone. The result has been an increase in complexity, as well as development & maintenance costs.

With mobile app user penetration reaching mass-market size, small businesses like hotels, restaurants and copy shops now also want to have their own apps to complement company websites. Often, these small businesses lack the funds, time and technical know-how to develop native apps from scratch.

Thus, an ideal environment has been created for app development tools that support multi-app and multi-platform publishing for simple and complex apps.

Dozens of cross-platform tools (CP Tools) have been launched over the past few years. More than 90 CP Tools were identified for the purpose of this benchmarking report.

CP Tools fall into 5 categories: App factories, Web App Toolkits, Cross-Platform Integrated Development Environments (CP IDE), CP IDE for enterprise, CP compilers and CP Cloud services.

The complexity of these tools varies significantly: App factories address users without coding skills. They provide a “drag & drop” environment where apps can be developed within days. Only 12% of app factory users rate the complexity of their tool high or very high. IDEs for enterprises are seen as the most complex tools by their users. 38% rate the tool complexity high or very high. These tools need development skills and the average project duration is counted in months rather than weeks or days.

The increasing number of CP Tools has made it difficult for new solutions to become known amongst the app developer and publisher community. As a result, only 11 CP Tools are known by more than 20% of the app community.

For the majority of developers using CP Tools, these environments have become their primary development platform. 63% of CP Tool users develop more than 50% of their apps using a CP Tool.

CP Tools are mainly used for “dual” platform publishing, rather than “multi” platform publishing. Most developers use CP Tools to publish on iOS and Android.

Saving time is one of the main benefits of CP Tools. Up to 75% of CP Tool users (CP IDE for Enterprises) have indicated that they reduce app development time by more than 40%.

Realized time saving increased with the number of platforms being targeted (peak 5-6 platforms).

Overall, CP Tools are rated well by developers. A high rating has been indicated for platform coverage (83%) availability of pre-installed apps (57%), API cloud service (52%), access to device hardware features (64%) and support (63%). The overall cost-performance of CP Tools is rated by 85% of the users as high or very high.

App performance is seen as the main weakness of CP Tools. 50% of all users rate the performance of the apps that are being developed by CP Tools considerably lower than their native counterparts.

The CP Tool benchmarking shows a high user satisfaction with these tools. Despite this positive feedback, less than 5% of all apps available in today's leading apps stores are being developed with the help of CP Tools.

CP Tools vendors must increase awareness among "non-users" if they want to gain significantly more reach. Additionally, CP Tools vendors have to find ways to keep up with the speed of updates and new SDKs bringing increased functionality to traditional and challenger platforms. Increasingly, these updates are being sent half-yearly and sometimes even quarterly to device users. Additionally, there is now demand for app publishing beyond mobile devices (esp. TV, in-Car devices, desktop PCs).

The benchmarking results recommend to developers that before starting the next app project it makes sense to check if one of the existing CP Tools fits with the project requirement.

With the overall positive user feedback CP Tools received and the low awareness they have in the app market, they are really hidden champions of the app economy.

This report also aims to give an overview of the cross-platform tool market and to help developers and enterprises to narrow down the available tools and find those that fit their app project best.

Please see our detailed benchmarking reports for ratings of specific CP Tools.

2. BENCHMARKING METHODOLOGY

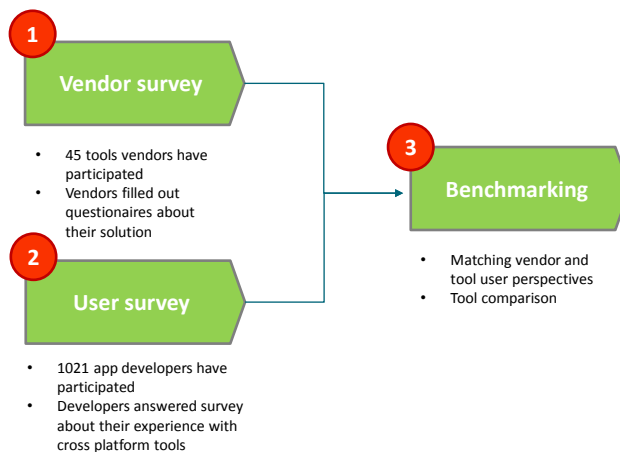
This benchmarking of cross-platform development tools is based on two research projects conducted between May and August 2013.

The vendor analysis examines the tool features, USPs¹ of the solutions, penetration and the service offering of the vendors. Research2guidance invited 90 cross-platform tool vendors to provide company and tool information with the help of an online survey. More than 50% of invited vendors participated, making it the largest cross-platform tool survey to date. Survey results have been enriched with expert interviews and secondary research.

Chart 1: Benchmarking methodology

The benchmarking matches the tool vendors view with the reality of the users

Benchmarking process



Source: Global Cross Platform Tool Benchmarking 2013
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User awareness and performance rating is based on a global app developer and publisher online survey. The online survey received over 1,000 responses.

Tool vendor offerings and user ratings are matched in the benchmarking, indicating gaps between vendors and user perception of today's leading cross-platform app development tools.

Participants come mainly from the US (15%), Canada (11%), India (11%), Germany (10%) and UK (6%).

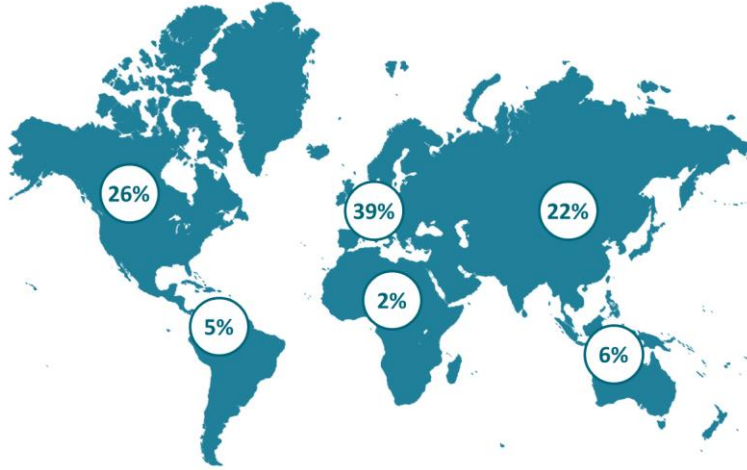
¹ USP: Unique Selling Proposition

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Chart 2: Geographical overview of cross-platform tool users

Tool users are spread around the globe

Geographical distribution of participating developers



Source: Global Cross Platform Tool Benchmarking 2013
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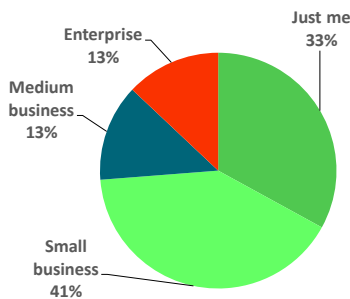
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Tool user survey participants range from individual app developers to IT managers of multi-national corporations.

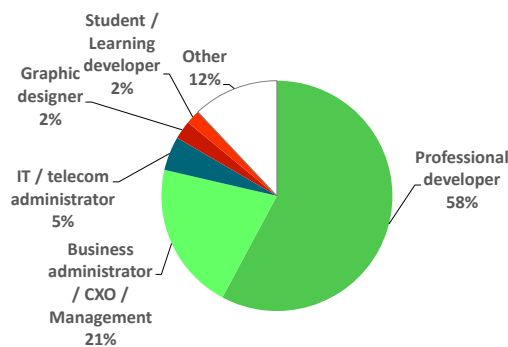
Chart 3: Background of cross-platform tool users

The cross-platform rating audience ranges from individual developers to IT managers of multi-national corporations

User survey participants by company size



User survey participants by position in the company



n=888

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3. CROSS PLATFORM TOOL LANDSCAPE

There are a multitude of reasons why tools that allow developers to publish their apps on multiple platforms have increased in number so rapidly.

For one, companies are making more apps. Most mobile app publishing companies have passed the stage of trial-and-error with limited effort. Over the last five years, multi-app and multi-platform app publishing have become the norm for multi-national companies. Increasing complexity and development and maintenance costs have been the consequences.

But skilled labor has not caught up with demand. For companies, finding developers for iOS, Android and other mobile native SDKs has become a challenge. On the other hand, there are millions of developers familiar with traditional web development skills like Java, HTML and CSS.

As mobile app user penetration reaches mass market size, all corners of the economy are finding it necessary to offer their own apps. Small businesses like hotels, restaurants and copy shops want to increase their mobile reach but lack the funds, time and capabilities to develop native apps from scratch.



About Telerik Kendo UI:

Telerik Kendo UI is everything you need to build HTML5 sites and mobile apps. Enjoy seamless coding with its completely integrated package including a JQuery-based toolset of rich UI widgets, powerful data source, dynamic data visualizations, and ultra-fast micro-templates. This leading edge framework delivers everything in a unified package, backed by industry-leading professional support. Kendo UI is one of the many Telerik brands making software development easier and more enjoyable.

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Cross Platform App Development Tool Benchmarking 2013

Based on these market developments, cross platform app development tool vendors have come up with services that target increasing market needs.

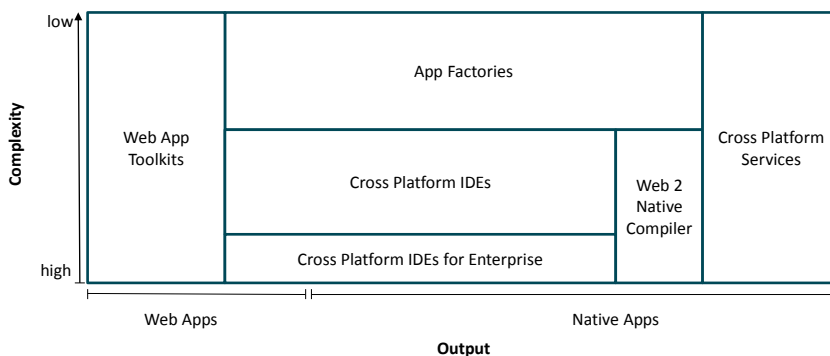
1. Efficiency tools for native app development: Tools that offer an app development platform that produce native apps for multiple mobile platforms on the basis of a single code. Some of these tools put a greater emphasis on the needs for company database integration and the overall app portfolio management within an enterprise. Others concentrate on a specific app category (mainly games). All of them offer features that help to increase the development speed of a single app and deploy and support the compilation of the single source code into various native codes.
2. Efficiency tools for web app development: These tools help developers create web apps that aim to match the performance of native apps. Web apps are also multi-platform in the sense that they run on multiple devices (e.g. iPhone, Samsung Galaxy, BlackBerry and Lumia devices, as well as mobile browsers) but they don't integrate with the native SDK of the platform. Vendors of these tools try to leverage their company's skills in web development and hitch their wagon to the shooting star that is HTML5.
3. Mass market tools for "non-developers": Tools that allow anyone to create either a native or a web app within days and at minimal costs.

The growing market need has caused an increase in complexity in the cross platform app development landscape. Our research counted almost 100 tools that fall into one of the following 6 categories.

Chart 4: Categories of cross-platform app development tools

Today's mobile cross platform app development tools fall into 6 categories

Cross platform app development tool landscape



Source: Global Cross Platform Tool Benchmarking 2013
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Web app toolkits: Tools that support the development process of web apps and mobile webpages. The development process is accelerated by pre-installed design templates, access to coding libraries, defined APIs, automatic testing, prototyping and multi-screen adaptation. The needed development skills range from advanced to limited. Developers can use classical web development language.

Examples: Kendo UI, JQuery Mobile, KonyOne Studio, Netbiscuits, MoSync Reload, Sencha Touch

App factories: “Drag and drop” app development environment that allows “non-developers” to develop a mobile native or web app in a few hours or days. Native apps are compiled to run on all major mobile platforms and app stores.


Examples: AppMachine, AppMakr, Conduit Mobile, iGenApps, Mobile Roadie, ShoutEm

Cross platform integrated development environment (IDE): Tools that allow multi-app/multi-platform app development. Most tools concentrate their output on native apps but some also create web apps. These tools use their own SDK to develop a single code faster and compile it to meet native requirements. Some tools specialize in certain genres (mainly games) and/ or fewer platforms to get better results while others aim to cover as many operating systems as possible, with a trade off in app quality.

Examples: Marmalade, Xamarin, Titanium, PhoneGap, Monocross, Corona SDK, Adobe Air, V-Play (games), Unity (games)

Cross platform integrated development environment for enterprises: Tools that focus on the needs of enterprises by providing more pre-installed APIs to standard ERP, CRM and shop systems. Tools also support the workflow of app development and deployment in an enterprise environment. Some of these tools are part of a broader suite that also allows for device and app management, as well as analytics.

Sponsor**apiOmat**



apiOmat is a German Backend as a Service provider, allowing the development of backends for mobile, tablet, and web applications.

apiOmat eliminates the hassle of dealing with cross-platform issues, synchronizing data with external services, hosting and scalability.

The development process for backends has been made much easier, faster, and more cost efficient than self-made backends. Specialized and expensive backend development know-how is no longer needed. The costs savings are up to 30% per app.

The modular integration layer as well as individual data modeling and the possibility to write server side code leaves the app developers with full flexibility.

apiOmat is offering a public cloud solution hosted in Germany with German quality SLAs and data privacy. Furthermore apiOmat can be applied as on premise or private cloud solution for enterprise customers. In the field of enterprise business apiOmat offers modular integration of enterprise applications and data. Enterprise solutions will be fully managed by the Apinauten GmbH.

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Cross Platform App Development Tool Benchmarking 2013

Examples: Any Presence, Service2Media, Corona Enterprise, Rhomobile, Point Sync, AppConKit, Appscend

Cross platform compiler: Tools that concentrate on translating a single source code into native applications. These tools bridge the requirements of the native device APIs with the chosen programming language of the single source code. Some CP IDEs (mentioned above) make use of these compilers so that they do not have to create their own solution.

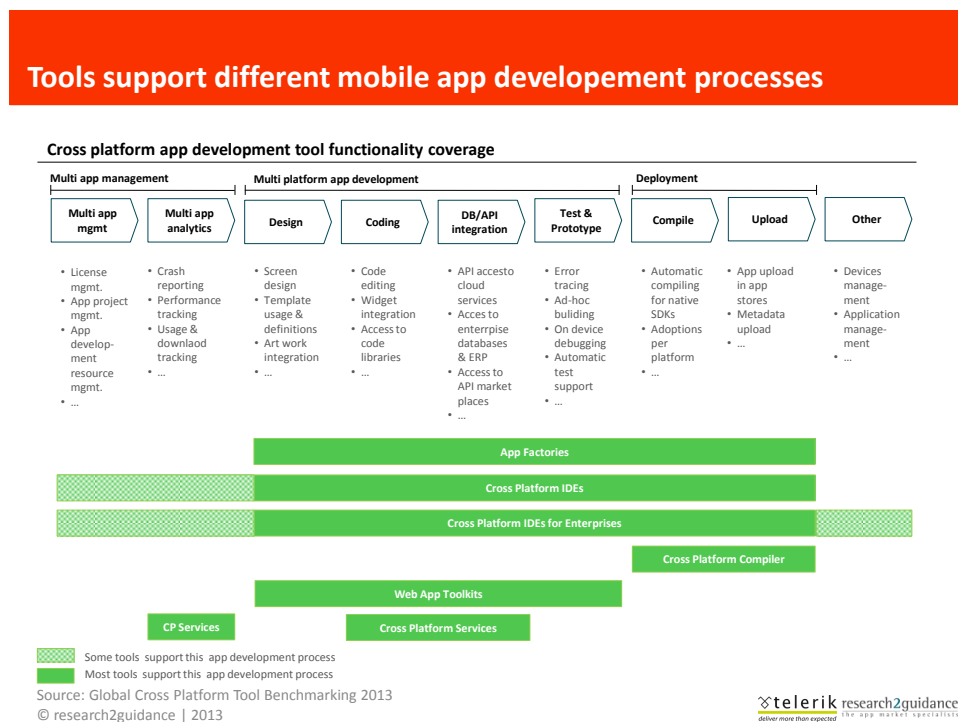
Examples: PhoneGap Build, Cocoon (Games), Alchemo

Cross platform services: Mainly cloud API services that enable easy integration of in-app purchases, push notifications and in-app advertisements (to name a few) into apps being developed for multiple mobile platforms.

Examples: apiOmat, appMobi, Icenium Everlive, appery.io

The majority of the tools in the market claim to support the main app development and deployment process.

Chart 5: Tool support for app development process



This includes design and coding support. CP Tools offer integration of existing artwork but also provide a variety of design templates for specific app categories. Most of the CP IDEs provide access to code libraries that allow reuse of existing code. API integration for e.g. SMS or in-app purchase is also a common feature of CP Tools on the market.

The majority of CP Tools also support the test phase by e.g. error tracing or automatic prototyping. The level of sophistication of development support features increases from App Factories to IDEs.

Most of the CP-Tools have their own integrated compiler and uploading service but there are also CP-Tools that make use of an existing compiler tool (e.g. Phone Build).

CP IDEs sometimes go beyond pure app development support by including also other features (e.g. device management) or multi app management (e.g. licence management, app project management).

By providing certain elements of an app like in-app purchase and app analytics that run on iOS, Android, WP, etc., CP Service providers also support the app development process but their services and components are always only a part of the final app.

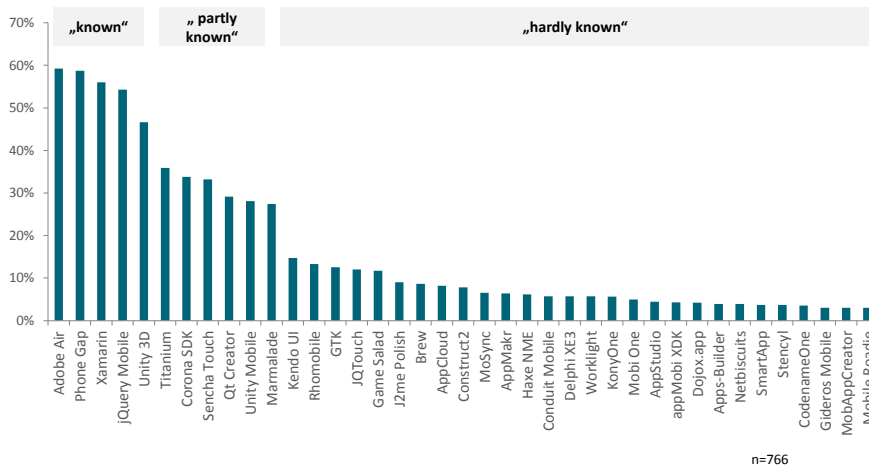
4. CROSS PLATFORM TOOL AWARENESS AND USAGE

The increasing number of CP Tools has made it difficult for new solutions to raise awareness among the app developer and publisher community. As a result, only 11 CP Tools out of over 90 are known by more than 20% of the app community.

Chart 6: Awareness level for CP Tools

Only 11 CP tools are known by more than 20% of app developers

Awareness of cross-platform tools in the app economy



Source: Global Cross Platform Tool Benchmarking 2013
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Adobe Air, Phone Gap, Xamarin, JQuery and Unity are among the few CP tools known by the majority of app developers and publishers. Another six tools are known by around 30% of the app developer community. The great majority of CP Tools, however, are “hardly known” or “unknown” (due to extremely low awareness, more than 50 tools included in the survey aren’t shown in the figure above). These tools face a major challenge in raising awareness.

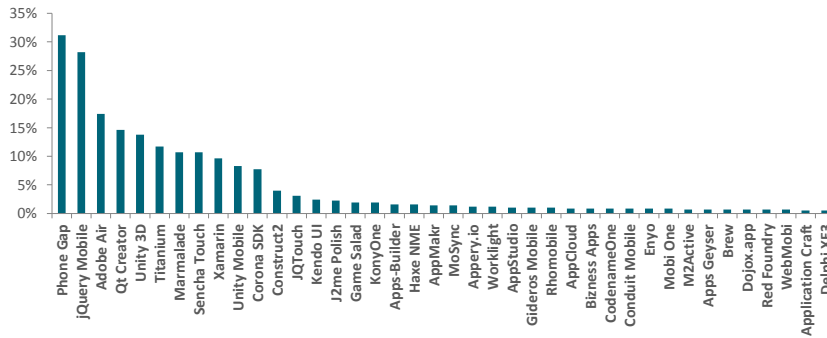
Among the developers that make use of CP Tools, Phone Gap and JQuery are the most used. These tools have been able to convert their high market awareness into actual users. Others, like Adobe Air and Xamarin, still haven’t been able to unlock the potential of their brand awareness.

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Chart 7: Usage distribution of CP Tools

Phone Gap and jQuery Mobile are the most used CP tools

Usage distribution amongst CP Tool users



n=801

Source: Global Cross Platform Tool Benchmarking 2013
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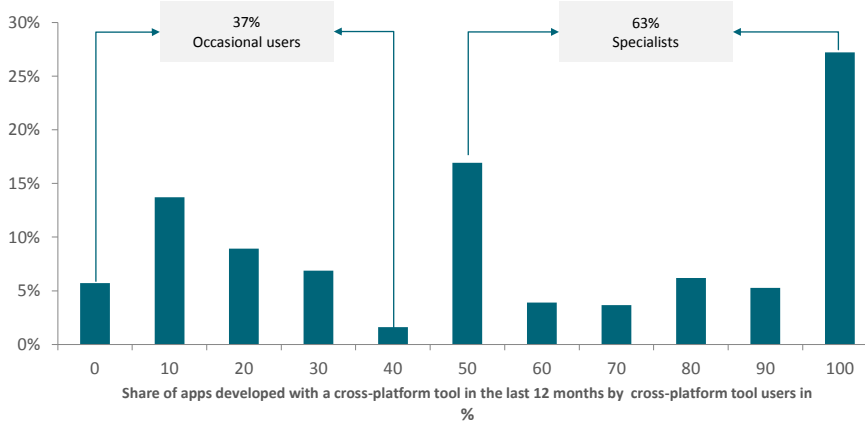
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Once developers have begun using a CP Tool, the majority use it as their main development platform. 63 % of CP Tool users develop more than 50% of their apps using a CP Tool.

Chart 8: Intensity of CP Tool usage in app development

63% of CP tool users develop the majority of their apps with CP tools

Intensity of cross-platform tool usage in app development



n=437

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On the one hand, this is good news for CP Tool vendors, as this number indicates that users are happy with their tools (see also the later chapter on user ratings). On the other hand most CP Tools are widely unknown among app developers. This shows the enormous

challenge CP Tool vendors face to raise the awareness and usage conversion for their tools to explore the full potential of the market.

Not surprisingly, the majority of apps developed and published with the help of a CP Tool are for iOS and Android, with BlackBerry and Windows following (significantly far) behind. Other mobile platforms like Bada, Ubuntu or LG Proprietary play a very insignificant role in the CP tool landscape.

CP Tools are mainly used for dual-platform publishing, rather than multi-platform publishing. One explanation for this lack of true “multi” platform publishing could be that the features which shorten app development time and improve app quality are more important for developers than the compilation functionality of CP Tools.

Smartface App Studio

Sponsor



Smartface
App
Studio

Smartface App Studio from Mobinex, is a cross-platform and cross-channel application development environment for building native solutions, which is equipped with state-of-the-art development features, and it is a proven solution to cope with challenges like

fragmentation, device diversity and rapid development in the market.

Among many other great features, this all-in-one approach stands out with its life-saving design editor: What You See Is What You Get!

In addition to that, by means of its rule-based multi-resolution development features, the design prepared on the development environment is exactly displayed on whatever device you choose.

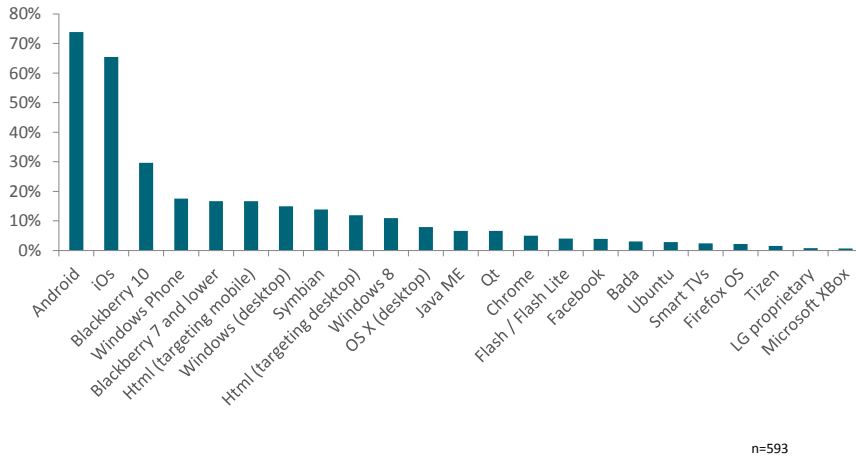
You can also use entire functionality of coding with JavaScript to develop fully native apps, supported by emulation and run-time debugging options on the device.

Integrated partner eco-system and ready to use features like authentication, QR Code, capturing and animation components bring rapid development concept to life, not just a bare promise.

Chart 9: Targeted OS by CP Tool users

CP tools are mainly used to develop Android and iOS apps

Targeted OS when developing apps with cross-platform tools



n=593

Source: Global Cross Platform Tool Benchmarking 2013
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CP Tools are mainly used to develop games; 35% of CP Tool users have published a game. In fact, some of the most popular games offered on iOS and Android (Cut the Rope, World at War: Zombies) are showcased on CP tool vendors' sites. At first glance, the high prevalence of games developed with CP Tools does not seem so surprising, given that games represent the largest category in app stores. But since games require the highest standards for user interface design, animation, device API integration and overall performance, their high prevalence on CP Tool platforms indicates that these tools could easily be used for other app categories.

After games, the most popular app categories developed using CP Tools are Utilities (22%), Business (21%), Education (20%) and Entertainment (19%).

5. SCOPE OF SERVICE/OFFERING

Cross Platform Tools try to reduce complexity in the app development process and make things quick and easy for developers. But CP Tool vendors are continually challenged by frequent updates to mobile operation systems and interfaces (e.g. redesign of BlackBerry OS and the endless parade of Android OS updates), as well as new operating systems (e.g. Ubuntu), expanding and contracting screens (e.g. the Galaxy Note and the mini table), increasing demand to mobilize existing company processes and databases (e.g. ERP systems from SAP or Oracle) and so on.

Because the business mandate of CP Tools is to reduce complexity, some (like app factories) go so far as to create “drag and drop” interfaces for those with zero development skills.

The vast majority of these tools support the creation of apps that run on iOS and Android devices, but the process they use to get developers to the publishing stage could not be more diverse.

This chapter presents and compares characteristics of up to 45 cross-platform tools based on the CP Tool vendor information.² The comparison includes:

- Optimization for particular device classes
- Platform / OS support
- Target groups by:
 - Industry
 - Company size
 - User type / profession
- Tool complexity in terms of:
 - Time needed to familiarize with the tool
 - Average app development time
- Available support options and languages
- Number of accessible device hardware features
- Number of accessible pre-installed applications
- Access to integrated APIs

² The shown information has been submitted by representatives of the particular cross-platform tool vendors. Please note: Not every participating vendor has disclosed all requested information. If information about some characteristics of particular tools is missing, it has not been provided by their vendors.

The following tables will allow an easy comparison of CP Tools. By matching tool features and services displayed in the tables with one's own objectives and requirements, it should be possible to narrow down CP Tool options.

5.1. CROSS PLATFORM TOOL OPTIMIZATION FOR PARTICULAR DEVICE CLASSES

Most CP Tools concentrate on supporting app development for smartphones and tablets. Only few address the specific needs of desktop PCs, TV-sets, game consoles, in-car devices or feature phones.

This is not a surprise as CP Tools emerged during a time when the smartphone OS landscape was fracturing and hype around mobile apps had reached a fever pitch.

But as soon as car drivers, TV viewers, console gamers and PC users demand access to apps, publishers will want to also get their app in front of these target groups by using CP Tools.

First vendors have reacted and allow app publishing for these devices (e.g. Eqela, DaVinci).

CP IDEs cover the broad spectrum of devices. App Factories and enterprise offerings concentrate their resources on smartphone and tablets.

Cross Platform App Development Tool Benchmarking 2013

Table 1: Device class optimization of CP Tools

	Smart-phones	Tablets	Desktop / PC	Smart TVs	In-car devices	Feature phones	Game consoles
Web app toolkits							
Appery.io	■	■					
App Studio	■	■					
DaVinci Suite	■	■	■	■	■		
Genero	■	■	■				
Kendo UI	■	■	■				
Magmito	■	■				■	
Weever Apps	■	■	■	■			
CP IDEs							
Codename One	■	■					
Corona SDK	■	■					
Embarcadero RAD Studio XE5	■	■	■				
Eqela	■	■	■	■	■		■
GeneXus	■	■	■				
J2ME polish	■					■	
LiveCode	■	■	■				
Marmalade	■	■	■	■			
Smartface App Studio	■	■					
TotalCross	■	■	■				
V-Play	■	■	■				
WebMobi	■	■					
Xamarin	■	■	■	■	■		
CP IDEs (Enterprise)							
AnyPresence	■	■	■				
AppConkit	■	■					
Appscend	■	■					
Gideros	■	■					
Service2Media M2Active*	■	■					
App factories							
AppEasy	■	■	■				
Conduit Mobile	■	■					
iGenApps	■	■					
Joshfire Factory	■	■	■	■			
MobAppCreator	■	■					
MobiCart	■	■					
Mobile Roadie	■	■					
Pajap	■	■					
Red Foundry	■	■					
Saasmob SmartApp	■	■					
Spot Specific	■	■	■				
ViziApps	■	■					

5.2. PLATFORM SUPPORT

According to the mantra “develop once, publish everywhere”, the benefit of cross-platform tools increases with the number of platforms they support. Whether the desired platforms are supported is a main criterion for or against the selection of a particular cross-platform tool. The following table shows which mobile and stationary OS are supported today and will be supported in the next 12 months.

Since iOS and Android are the most successful mobile platforms today, they are (or will soon be) included in nearly every solution. In third place is HTML (targeting mobile): 20 out of 45 cross-platform tools support the W3C standards³ today, while three solutions plan to support them in the near future.

Windows Phone, BlackBerry 7 and lower as well as the new Blackberry 10 are almost neck-in-neck in terms of platform coverage by cross-platform tools. Today, these operating systems are supported by about one third of the observed cross-platform tools. Windows Phone and the BlackBerry 10 platforms are planned to be included in many of the cross-platform solutions in the near future

- Windows Phone will be supported by 33 out of the 45 solutions (at release date, it is supported by 16).
- Windows 8 will be supported by 29 solutions (at release date, it is supported by 14).
- BlackBerry 10 will be supported by 22 solutions (at date of release, it is supported by 13).

On average, each CP Tool displayed supports 5-6 platforms at publishing date and plans to adopt 1-5 additional platforms in the next year.

CP IDEs for enterprise solutions tend to concentrate their app development support on the major platforms Android and iOS today. Other CP IDEs differ a lot in their coverage of supported mobile and “non-mobile” platforms. Three of them even claim to support app development for TV screens.

³ The W3C (World Wide Web Consortium): international standards organization for the World Wide Web

5.3. INDUSTRY FOCUS AND TARGET GROUPS OF CP TOOLS

The majority of observed CP Tools do not focus on particular industries. However, some tools specialize in creating apps for pre-defined use-cases. CP Tools with focus on industries specialize mostly in “News and Media”, “Games” and “Retail”. The depth and quality of industry specific resources provided by the CP Tools varies significantly. In general, if a CP Tool claims to offer an industry-specific solution, it offers industry-specific design templates, code libraries and (for more advanced solutions) access to most frequently used industry databases.

Cross Platform App Development Tool Benchmarking 2013

Table 3: Industry focus of CP Tools

	General	Utilities	Games	Retail	Hotels/ gastronomy	News/ Media	Sports	Medical/ health	IT	Financial	Education	Automotives	Heavy Industries	Aerospace/ defense	Government	Enterprise apps
Web app toolkits																
Appery.io	■															
App Studio						■		■		■						
DaVinci Suite				■		■		■						■		
Genero				■		■		■		■	■			■	■	
Kendo UI	■															
Magmito	■															
Weever Apps	■															■
CP IDEs																
AIR	■		■													
Codename One	■															
Corona SDK		■	■			■										
Embarcadero RAD Studio XE5	■															
Eqela	■															
GeneXus	■															
J2ME polish	■															
LiveCode	■										■					
Marmalade			■			■										
MoSync																■
PhoneGap	■															
Smartface App Studio				■		■				■						
TotalCross	■															
Unity			■													
V-Play			■													
WebMobi				■				■								
Xamarin	■															
CP IDEs (Enterprise)																
AnyPresence	■	■				■		■	■						■	■
AppConkit																■
Appscend	■															
Gideros			■													
Service2Media M2Active	■					■				■						■
App factories																
AppEasy		■	■	■												
AppMachine	■															
Conduit Mobile				■	■	■										
iGenApps	■															
Joshfire Factory				■	■	■										
MobAppCreator	■															
MobiCart				■												
Mobile Roadie						■	■									
Pajap					■	■										
Red Foundry	■															
Saasmob SmartApp	■															
ShoutEm				■												
Spot Specific						■								■		
ViziApps	■															

App Factories mainly target small and medium-sized companies. CP IDEs also include enterprises in their preferred customer list. Overall, medium businesses are targeted by all CP Tools, followed by small businesses (90%) and enterprises (80%). Consumers/private users are targeted by only 17%.

Targeted user types most frequently include professional developers (85%) and graphic designers (70%), followed by business administrators (50%). About 40% of the observed CP Tools are suited for non-developers. Not surprisingly, almost every App Factory vendor claims that their tools can be used even without development skills. Web App Toolkits are also addressing non-developers but to a lesser extent.

Cross Platform App Development Tool Benchmarking 2013

Table 4: Targeted company size and user type by CP Tools

	Targeted Company Size				Targeted Profession							
	Consumers	Small	Medium	Enterprise	Professional Developer	Novice Developers	IT / Telco Administrator	Business Administrator / CXO / Management	Graphic Designers	Web developers / web publishers	Non-Developers / Anyone	Other targeted professions
Web app toolkits												
Appery.io												
App Studio												
DaVinci Suite												
Genero												
Kendo UI												
Magmito												
Weever Apps												
CP IDEs												
AIR												
Codename One												
Corona SDK												
Embarcadero RAD Studio XE5												
Eqela												
GeneXus												Analysts
J2ME polish												
LiveCode												
Marmalade												
MoSync												
PhoneGap												
Smartface App Studio												
TotalCross												
Unity												Non-profits, gov.
V-Play												
WebMobi												
Xamarin												
CP IDEs (Enterprise)												
AnyPresence												
AppConkit												
Appscend												
Gideros												
Service2Media M2Active												
App factories												
AppEasy												
AppMachine												
Conduit Mobile												
iGenApps												Groups, Bands
Joshfire Factory												
MobAppCreator												
MobiCart												
Mobile Roadie												
Pajap												
Red Foundry												
Saasmob SmartApp												
ShoutEm												
Spot Specific												
ViziApps												

5.4. TOOL COMPLEXITY

The complexity of solutions can be estimated by the time needed to get familiar with a tool and to develop an app. The majority of the tool vendors claim that it takes days up to weeks, which suggests a short learning curve for most CP Tools. Only in four cases is the time-to-familiarize stated to take months (GeneXus, J2ME Polish, TotalCross and Unity).

App development time obviously depends on the complexity of the apps in question, but the time claimed by vendors is often short (sometimes days). This indicates that CP Tool vendors expect that their tools are mainly being used to develop simple apps, but it also indicates that vendors assume their customers' primary concern is speed. This is especially true with App Factories, which claim to be able to shrink learning and development time to a matter of days.

Please also read the chapter on user ratings to find out how long app developers really need to complete apps using CP Tools.

Cross Platform App Development Tool Benchmarking 2013

Table 5: Tool complexity in terms of time-to-familiarize and average app development time

	Time-to-learn			Average app development time	
	Days	Weeks	Months	Days	Weeks
Web app toolkits					
Appery.io	■			■	
App Studio	■			■	
DaVinci Suite		■		■	
Genero		■			■
Kendo UI	■				■
Magmito	■			■	
Weever Apps	■			■	
CP IDEs					
Codename One	■			■	
Corona SDK	■			■	
Embarcadero RAD Studio XE5	■			■	
Eqela		■		■	
GeneXus			■	■	
J2ME polish			■		■
LiveCode		■		■	
Marmalade		■			■
MoSync		■		■	
Smartface App Studio	■				■
TotalCross			■	■	
Unity			■	■	
V-Play		■		■	
WebMobi	■				■
Xamarin		■		■	
CP IDEs (Enterprise)					
AnyPresence		■		■	
AppConkit		■		■	
Appscend	■			■	
Gideros		■		■	
Service2Media M2Active		■			■
App factories					
AppEasy		■		■	
AppMachine	■			■	
Conduit Mobile	■			■	
iGenApps	■			■	
Joshfire Factory	■			■	
MobAppCreator	■			■	
MobiCart	■			■	
Mobile Roadie	■			■	
Pajap	■			■	
Red Foundry	■			■	
Saasmob SmartApp	■			■	
ShoutEm	■			■	
Spot Specific	■			■	
ViziApps	■			■	

5.5. SUPPORT OPTIONS

CP Tool vendors offer a broad range of support options, ranging from online community support to “On Site” services. For 32 out of the 43⁴ displayed CP Tools, the user can choose between three or more support channels. In 17 out of 43 cases, more than five different support channels are available.

The most common support channels are online community support and time-delayed online support. In all cases, support services are available in English but some vendors of CP Tools offer their support services in additional languages. For a few tools, support is offered in a number of widely-spoken languages.

App Factories concentrate more on online support channels, whereas more complex solutions allow “on-site” training and project support.

⁴ Support services information has been disclosed by vendors of 43 CP Tools as displayed in Table 6.

Cross Platform App Development Tool Benchmarking 2013

Table 6: Available support services and languages of support services for CP Tools

	On-site project support	On-site training/tutorials	Personal phone contact	Real time online support	Time-delayed online support	Online community	Others	Support available in languages:
Web app toolkits								
Appery.io								
App Studio								
DaVinci Suite								
Genero								
jQuery								
Kendo UI							*	
Magmito							FAQs, video	
Weever Apps								
CP IDEs								
AIR								
Codename One								
Corona SDK								
Embarcadero RAD							Partners	
Eqela								
GeneXus								
J2ME polish								
LiveCode								
Marmalade								
PhoneGap								
Smartface App Studio								
TotalCross								
Unity 3D							Online tutorials	
V-Play								
WebMobi								
Xamarin								
CP IDEs (Enterprise)								
AnyPresence								
AppConkit								
Appscend							Documentation	
Gideros								
Service2Media M2Active							Team	
App factories								
AppEasy								
Conduit Mobile								
iGenApps								
Joshfire Factory								
MobAppCreator								
MobiCart								
Mobile Roadie								
Pajap								
Red Foundry							Online training	
Saasmob SmartApp								
ShoutEm								
Spot Specific								
ViziApps								

*Phone support: Enterprise customers

5.6. ACCESS TO DEVICE HARDWARE FEATURES

The usability of an app is closely related to accessible device-specific hardware features⁵. The following table shows how many hardware features can be accessed per platform. For the two largest platforms, Android and iOS, coverage is very high among CP Tools. Hardware access for all other platforms is less common and manifold.

Tools differ significantly in their breadth of hardware API coverage. The fact that smartphone vendors are constantly updating their hardware components makes it hard for CP Tool vendors to keep up with the rate of innovation. Therefore, only a few of CP Tools offer full hardware API coverage for more than three or four platforms.

On average, a CP Tool allows access to 6-7 hardware features.

There is a clear ranking of accessible hardware components amongst CP Tools. The most supported components and features include the speaker (61%), landscape orientation (60%) and multi-touch (56%).

The least supported hardware APIs are: accelerometer (44%), compass (40%) and NFC (30%).

⁵ List of hardware APIs: accelerometer, camera, compass, GPS, landscape orientation, microphone, multi-touch, NFC, speaker and vibration

Cross Platform App Development Tool Benchmarking 2013

Table 7: Amount of accessible device hardware features per platform

	mobile OS														desktop OS			other		
	iOS	Android	Windows Phone	Windows 8	BlackBerry 10	Symbian	Windows RT	LG	Qt	HTML5	HTML5	Windows	X	Chrome	Firefox	Facebook	Smart TVs			
Web app toolkits																				
Appery.io	10	10	10	10	10												4			
App Studio	2	2															1 1			
DaVinci Suite	10	10						10						10	10	10	10			
Genero										10				10	10	10	10			
Kendo UI	10	10	10	10	10	10								10		4	4			
Magmito	3	3	3	3	3	3	2	2	1	3	2			2	2	3	2			
Weever Apps	7	7		7		7											7			
CP IDEs																				
Codename One	8	8	6		7	7	7	7			7									
Corona SDK	9	9																		
Embarcadero RAD Studio XE5	10	10		10											10					
Eqela	10	10	10	10	10	10	10		10		10	10	10	10	10	10	10			
GeneXus	10	10		10	10									10						
J2ME polish		10			10															
LiveCode	9	9												3		3	3			
Marmalade	9	9	4			6									5	4				
PhoneGap	12	12	12	12	10		8	9												
Smartface App Studio	11	10																		
TotalCross	5	5			5										5					
V-Play	4	4		4			4								2					
WebMobi	10	10	10								4	2				2				
Xamarin	10	10	10	10																
CP IDEs (Enterprise)																				
AnyPresence	10	10													2					
AppConkit	12	12																		
Appscend	10	10																		
Gideros	8	8																		
Service2Media M2Active	7	7	6		6	6														
App factories																				
AppEasy	9	9													4					
Conduit Mobile	7	7	5												5					
iGenApps	3	3																		
Joshfire Factory	11	11		10		10								4	4		4			
MobiCart	4	4													3					
Mobile Roadie	3	3																		
Pajap		3																		
Red Foundry	9	10																		
Saasmob SmartApp	5	5	5		5	5	5													
ShoutEm	10	10													10					
Spot Specific	8	8																		
ViziApps	10	10															10			

5.7. ACCESS TO PRE-INSTALLED APPLICATIONS

Pre-installed applications, such as calendars or address books, are often integrated into apps developed using a CP Tool⁶. The following table illustrates the number of pre-installed applications per CP Tool and supported platform. Similar to the access of hardware APIs, the accessibility of pre-installed applications varies.

The most common pre-installed apps include: file system IO (47%), maps (45%) and in-app email (45%).

The least common pre-installed apps include: calendar (34%), MMS (30%) and speech recognition (26%).

⁶ Pre-installed apps on the operating system includes Calendar, contacts, file system IO, image library, in-app email, maps, MMS, phone, SMS and speech recognition.

Cross Platform App Development Tool Benchmarking 2013

Table 8: Number of accessible pre-installed applications per platform

	mobile OS													desktop OS			other		
	iOS	Android	Windows 7	Windows 8	BlackBerry 10	Symbian	Windows Phone	Android TV	Android Wear	Android Auto	Android TV	Android Wear	Android Auto	Windows	Mac OS X	Linux	Chrome OS	Facebook	Smart TVs
Web app toolkits																			
App Studio	1	1																	
DaVinci Suite	10	10					10						10	10	10	10	10	10	
Kendo UI	10	10	10	10	10	10											2		
Weever Apps	10	10		10		10		10					10						
CP IDEs																			
Codename One	10	10	10		10	10	10	10		10									
Corona SDK	9	9																	
Embarcadero RAD Studio XES	10	10		10											10	10			
Eqela	10	10	10	10	10	10	10	10	10	10		10	10	10	10	10	10	10	10
GeneXus	10	10		10															
J2ME polish		10			10				10										
LiveCode	8	7									2		2	2					
Marmalade	5	6	1			1							1	1					
Smartface App Studio	8	8																	
TotalCross	4	4			4										3				
V-Play	2	2		2			2				2	2			2	2			
Xamarin	10	10	10	10															
CP IDEs (Enterprise)																			
AnyPresence	5	5											1						
AppConkit	9	8																	
Appscend	8	9																	
Gideros	3	3																	
Service2Media M2Active	6	6	6		6	6													
App factories																			
AppEasy	2	2												2					
Conduit Mobile	6	6	6																
iGenApps	5	5																	
Joshfire Factory	8	9		6		6						5	3				3		
MobiCart	6	5										3							
Mobile Roadie	5	5																	
Pajap	4																		
Red Foundry	10	10																	
Saasmob SmartApp	5	5	4		5	5	5												
Spot Specific	7	7																	
ViziApps	10	10										10							
WebMobi	10	10	10																

5.8. API INTEGRATION

The integration of APIs allows developers to make use of cloud services, connect with a backend and monetize their apps. API services also ease the integration of communication features (e.g. SMS). They offer connection to commerce features (e.g. operator billing) and monitoring services (e.g. remote home monitoring). The cross-platform usage of core app features like push notification, points of interest databases and in-app advertisement is also supported by a large number of CP Tools.

Cross Platform App Development Tool Benchmarking 2013

The following table shows the integration of various APIs into the CP Tools. Most common is the integration of social networking services, location-based services, app analytics and in-app advertising. Remote monitoring APIs remain a niche product and are integrated only by a minority of CP Tools.

Table 9: Integrated APIs per platform

	Communication			Commerce							Monitoring					
	VOIP	SMS	MMS	Social network access (e.g. Facebook)	Advertising in apps (e.g. Inmobi)	Billing (e.g. credit card or operator billing)	Mobile payment (e.g. Paypal)/ In-app payment/ In-app purchase	Access to enterprise software (SAP, Oracle, etc.)	Access to commerce platforms (e.g. Magento)	Location based services (maps, routes, traffic)	App analytics (e.g. Distimo)	Text-to-speech transformation	mHealth monitoring	Remote monitoring: home energy	Remote monitoring: entertainment	Remote monitoring: home security
Web app toolkits																
Appery.io																
App Studio																
DaVinci Suite																
Magmito																
Weever Apps																
CP IDEs																
Codename One																
Corona SDK																
Embarcadero RAD Studio XE5																
GeneXus																
J2ME polish																
LiveCode																
Marmalade																
Smartface App Studio																
V-Play																
WebMobi																
Xamarin																
CP IDEs (Enterprise)																
AnyPresence*																
AppConkit																
Appscend																
Gideros																
Service2Media M2Active																
App factories																
AppEasy																
Conduit Mobile																
iGenApps																
MobAppCreator**																
MobiCart																
Mobile Roadie																
Pajap																
Red Foundry																
Saasmob SmartApp																
Spot Specific																
ViziApps																

*IVR

**Video, Radio

6. CROSS PLATFORM TOOL USER RATING

As shown in the previous chapters, CP tools offer a broad range of features and services. This chapter examines how users of CP Tools rate these features and services. The user rating takes into account the following factors:

- CP Tool complexity
- Realized time savings when using CP Tools
- Platform support
- Accessible pre-installed applications
- Accessible device hardware features
- Integration of cloud API services into CP Tools
- Result quality (app quality)
- Support services
- Cost-performance

The user rating is based on the contribution of more than 1,000 app developers and publishers that have used any of the tools.

6.1. CP TOOL COMPLEXITY

To evaluate the complexity of CP Tools, the necessary *time to familiarize*, as well as the *average app development time* when using CP Tools have been used as indicators.

One of the key selling points of CP Tools is their simplicity. Re-usage of existing web development skills, drag & drop handling and good documentation should allow familiarization time of just a few days according to the majority of CP Tool vendors across all tool categories.

But the truth is that CP Tool vendors consistently underestimate the time necessary to learn how to handle their tools. This especially applies to CP IDEs with a focus on enterprise applications, as well as app factories.

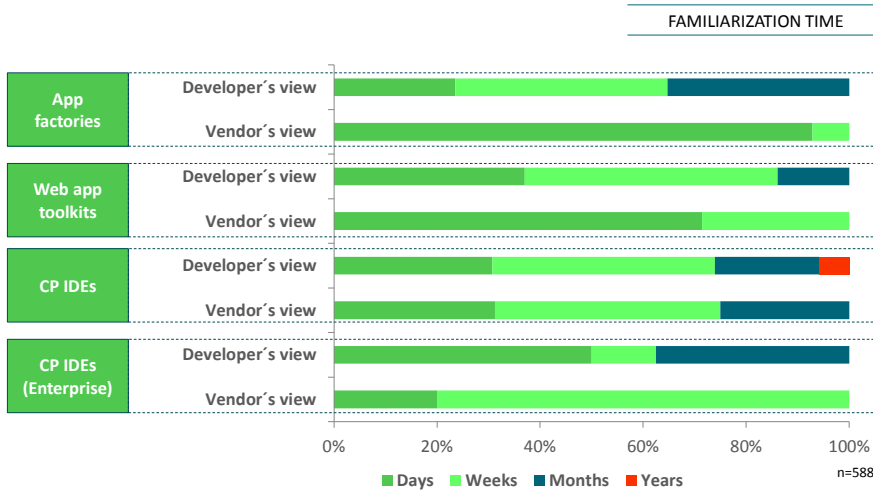
This might not be a major concern when it comes to tools that are mainly used in complex projects like integrated enterprise apps (e.g. sales force performance monitoring apps that allow access to CRM databases). Nonetheless, App Factories must improve the correlation between estimated and actual time to develop. If, for example, a hotel manager has to study the tool for months to build a simple hotel reservation app, he is (much) less likely to finish building his app.

Cross Platform App Development Tool Benchmarking 2013

Chart 10: Familiarization time with CP Tools

Vendors of App Factories and Enterprise CP Tools underestimate the familiarization time for their tools

Familiarization time with CP Tools by tool class – vendor’s view vs. developer’s view



Source: Global Cross Platform Tool Benchmarking 2013
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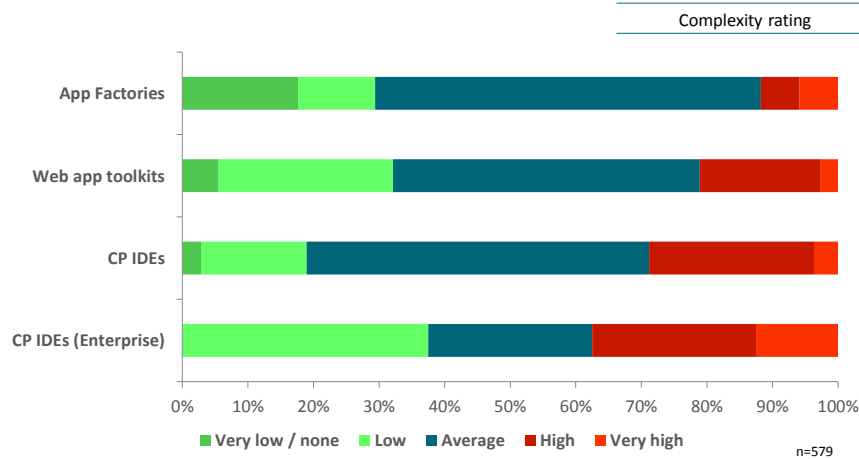
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According to our survey, CP IDE Tools take the most time to master.

Chart 11: Complexity rating of CP Tools

38% of CP IDE (Enterprise) users rate the complexity of the tool high or very high

Complexity rating by CP Tool users (per tool class)



Source: Global Cross Platform Tool Benchmarking 2013
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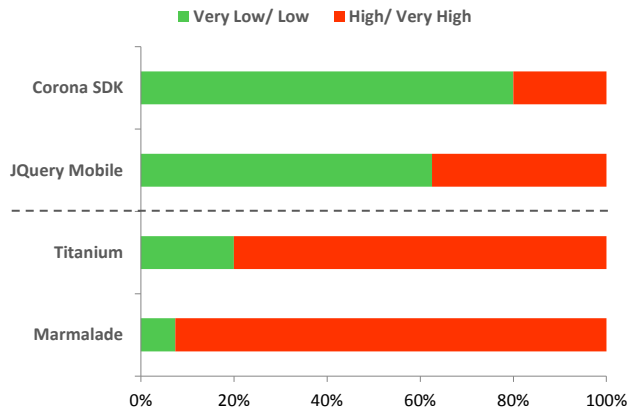
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Corona SDK and JQuery Mobile have been rated to be CP Tools of lowest complexity, Titanium and Marmalade have been rated to be of highest complexity in the benchmarking.

Chart 12: Tools with highest and lowest complexity ratings

Corona and JQuery Mobile have been rated to be of lowest complexity, Titanium and Marmalade have been rated to be of highest complexity

Tools with lowest complexity ratings vs tools with highest complexity ratings in the benchmark



Source: Global Cross Platform Tool Benchmarking 2013
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Find more benchmarks on tool level in [Detailed Cross Platform Tool Benchmarking 2013 Report](#).

CP IDE Tools for enterprises are rated the most complex tools. Overall, 38% of their users rate these tools to be complex or very complex. Despite long tool-familiarization time amongst its users, App Factories gets the lowest complexity rating.

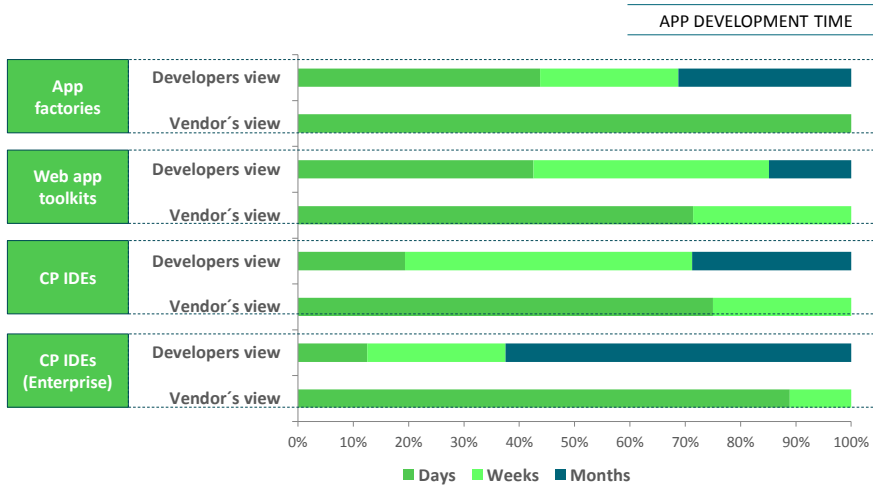
App projects vary in size and necessary development time. However, vendors generally underestimate the duration of app projects created using their tools across all tool categories. The reason for this discrepancy could be that app developers who use CP Tools end up completing more complex apps than expected by the vendors or the vendors' statements are more marketing strategy than honest promises. It is also possible that clients' app project objectives change as they begin to work.

On the other hand, developers confirm that an app-turnaround of just a few days is possible. Between 10% and 50% of CP Tool users claim to need only a few days for their app projects.

Chart 13: App development time with CP Tools

Vendors underestimate complexity of their client's app projects across all tool categories

Average app development time by tool class – vendor's vs. developer's view



Source: Global Cross Platform Tool Benchmarking 2013
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6.2. REALIZED TIME SAVINGS

The majority of users say that CP Tools have saved them time compared to native app development. Almost 45% of the users estimate time-savings of 50% and more. (This applies to all CP Tool categories.)

Comments of CP Tool users underline the positive benchmarking results on time savings:

“As many times as fast as native.”

“I support 5 app stores from a single code base, and cross platform issues are extremely rare.”

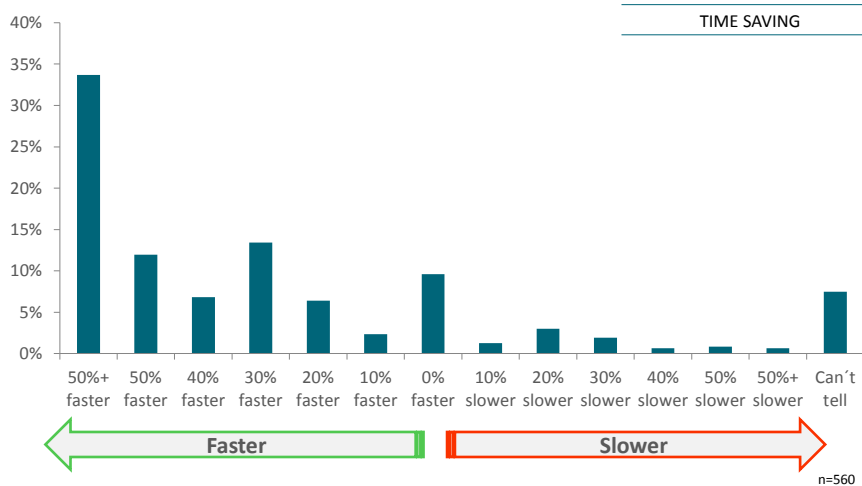
“By having only one code base and deploying to 3-4 native platform (I'm able to) save a lot of time.”

“I can create my app (in a single) day.”

Chart 14: Realized time savings with CP Tools

The majority of CP Tool developers realize significant time savings

Realized time savings with cross-platform tools compared to pure native development.



Source: Global Cross Platform Tool Benchmarking 2013
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Time saving increases with the number of platforms targeted. This effect occurs especially when a CP Tool targets three or more platforms (instead of one or two). The reason is quite simple: creating a master app takes time, porting to multiple platforms takes less time with CP Tools. The creation of the blue print source code takes sometime longer than building apps with a native SDK.

CP Tool users:

“Slow at first but when it comes to deploying to other platforms there is nothing quicker.”

“Master version development is not any faster, but time is saved when versions for different platforms are done. Compared to earlier porting projects which took around 2-3 weeks, this takes 2-3 days.”

“For deploying to iOS and Android alone, probably around 40% faster. This increases as we choose to target more platforms.”

“Effort of optimisation across platforms is approximately the same as total native development effort for 2 platforms. For more than 2 platforms there is a saving.”

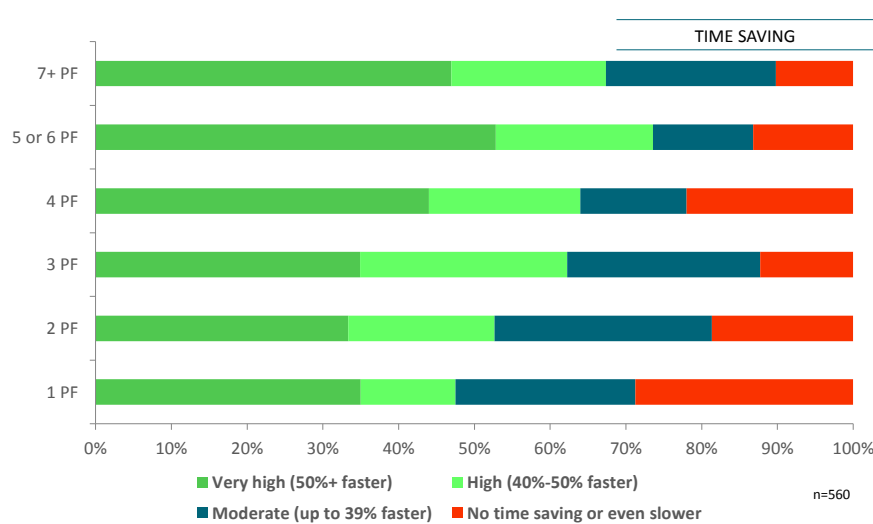
“First port about the same, second 60% faster, i.e. totally 20-30% faster, third (Windows Phone in my case) over 60% faster again.”

“When you need to support multiple platforms (4 platforms in my case), it's faster than doing each individually.”

Chart 15: Time savings with CP Tools by number of targeted platforms

Time savings increase with the number of targeted platforms

Realized time savings by number of targeted platforms (PF) with CP Tools



Amongst all tool classes, CP IDEs with a focus on enterprise applications seems to accelerate app development the most. Users mention that CP IDEs offer pre-configured enterprise backend solutions for standard ERP and CRM software, saving time users would have spent developing these solutions on their own.

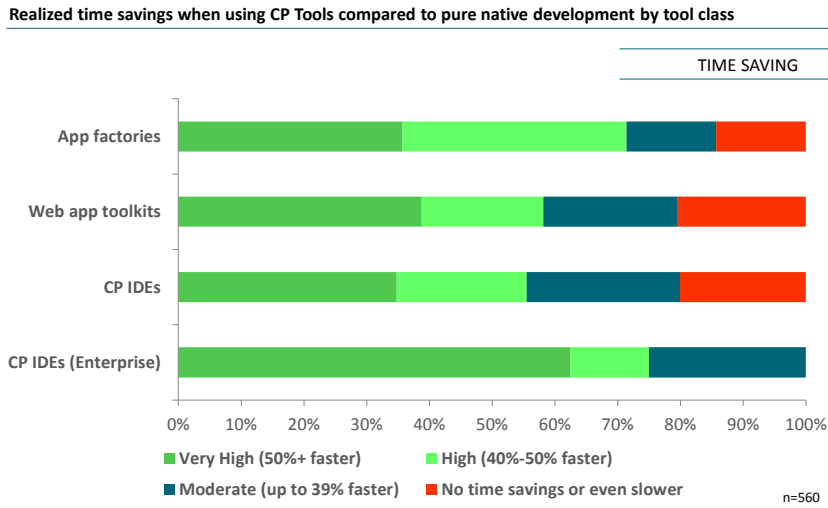
CP IDE Tool users: *“Especially a time saver on backend integration, and develop-deploy-test cycles internally and with customers.”*

All other CP Tools also had a positive net effect on time saving balance. However, not every developer can realize time savings. In case of app factories, time is saved because of simple drag-and-drop interfaces and very little need for coding-supported customization. However, CP IDEs which focus on enterprise solutions tend to offer tools with a high degree of complexity and this could offset time savings from automatized multi-platform publishing.

Cross Platform App Development Tool Benchmarking 2013

Chart 16: Time savings with CP Tools by CP Tool category

Time savings are being realized across all CP Tool categories



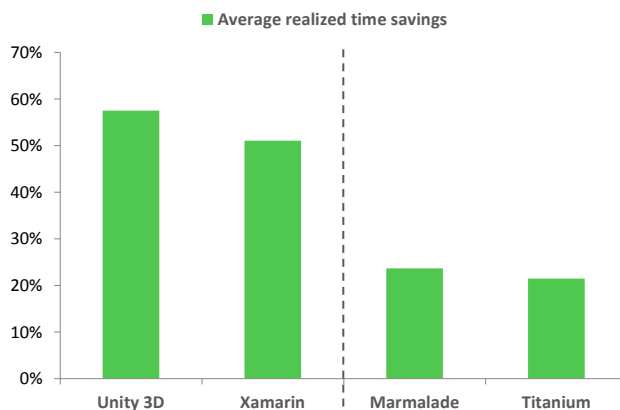
Source: Global Cross Platform Tool Benchmarking 2013
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In the benchmarking, users of Unity 3D and Xamarin could realize the highest time-savings. In contrast, the lowest time savings have been realized by Marmalade and Titanium users.

Unity 3D and Xamarin users have realized highest time-savings in the benchmarking, Marmalade and Titanium users have realized lowest

Tools with highest and lowest time-savings per user on average



Source: Global Cross Platform Tool Benchmarking 2013
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Read our *Tool Profile Report* on [Xamarin](#), [Corona SDK](#), [Marmalade](#) and [Unity 3D](#) for more info.

CP Tools included in the benchmarking survey support 5-6 platforms (on average) and have plans to add 1-2 more platforms over the course of the next twelve months. Web App

Cross Platform App Development Tool Benchmarking 2013

Toolkits average nine supported platforms/browsers while CP IDEs average 6-7 supported platforms. CP IDEs, with a focus on enterprise apps, support an average of two and a half platforms and app factories support an average of three platforms.

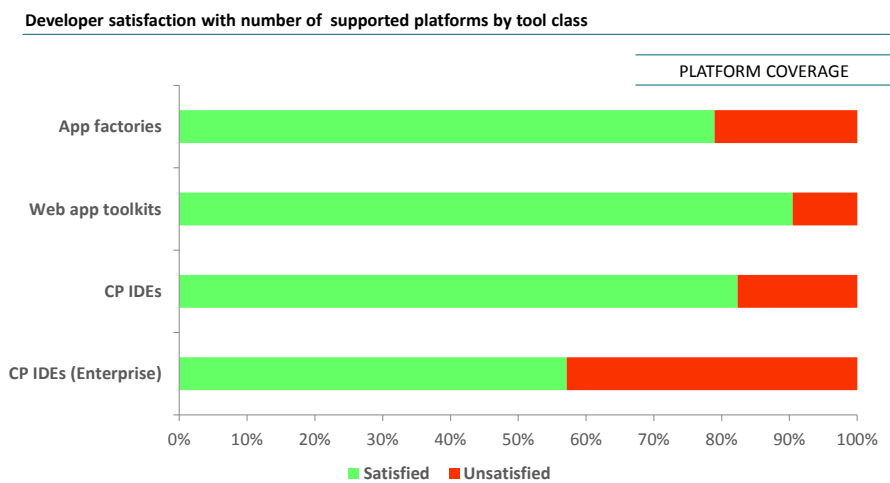
CP Tool users are generally satisfied with the platform coverage of their tools. Satisfaction levels ranged from 57% for CP IDEs for Enterprises to 90% for Web App Toolkits.

The user rating for platform coverage indicates that CP IDE Tool vendors are in need of adding platform support. Currently, these vendors cater primarily to iOS and Android developers.

Developers specifically asked for coverage of Windows Phone / 8 and, to a lesser extent, Blackberry. *“Windows 8 support is missing.”*, *“We need also Windows Phone.”* or *“Waiting for Windows Phone 8 support,”* are just a few of the responses.

Chart 17: Platform support satisfaction of CP Tool users

Vast majority of developers are satisfied with number of supported platforms



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Top 3 “platform support”: The tools with the highest platform support satisfaction are Marmalade, Unity 3D and JQuery Mobile.

6.3. ACCESSIBLE PRE-INSTALLED APPLICATIONS

Access to pre-installed apps like calendars and address books are must-have features on many mobile apps.

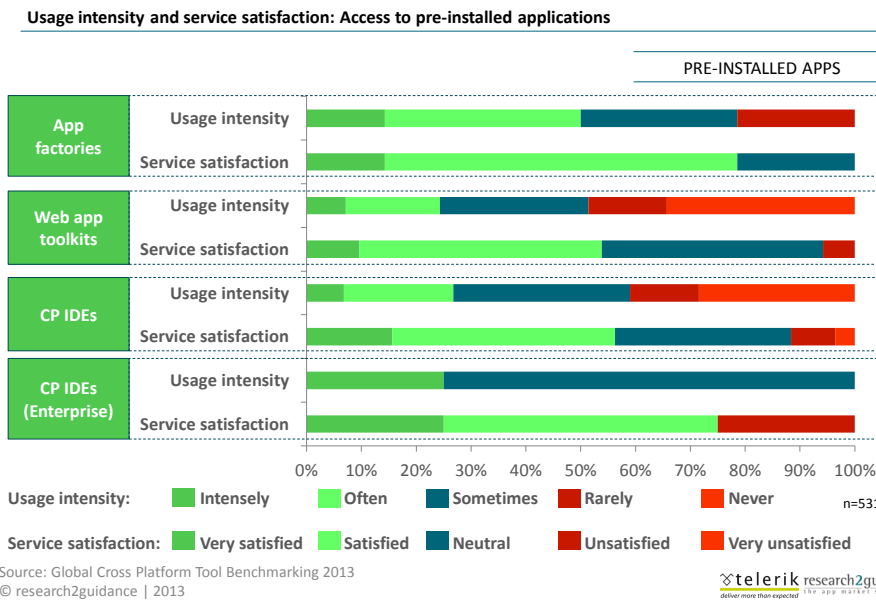
Cross Platform App Development Tool Benchmarking 2013

34% of CP Tool users regard access to pre-installed applications as critical. Only 17% state that they are not relevant. Across all CP Tool classes the usage of pre-installed apps is rather low; it is used in greatest frequency by app factories and CP IDEs focusing on enterprise applications.

On the other hand, satisfaction level with the service CP Tools are offering in that area across all CP Tool classes is high. App factory users rate this feature the highest.

Chart 18: Access to pre-installed applications - usage intensity and service satisfaction

Developers don't use pre-installed apps often, but are largely satisfied when they do



Top 3 “usage intensity”: The tools with the highest usage of pre-installed apps are Titanium, PhoneGap and Xamarin.

Top 3 “service satisfaction”: The tools with the highest user satisfaction for the access to pre-installed apps are Xamarin, AIR and Corona SDK.

6.4. ACCESSIBLE DEVICE HARDWARE FEATURES

Many applications make use of device-specific hardware features, such as accelerometer, speaker, microphone or hard buttons.

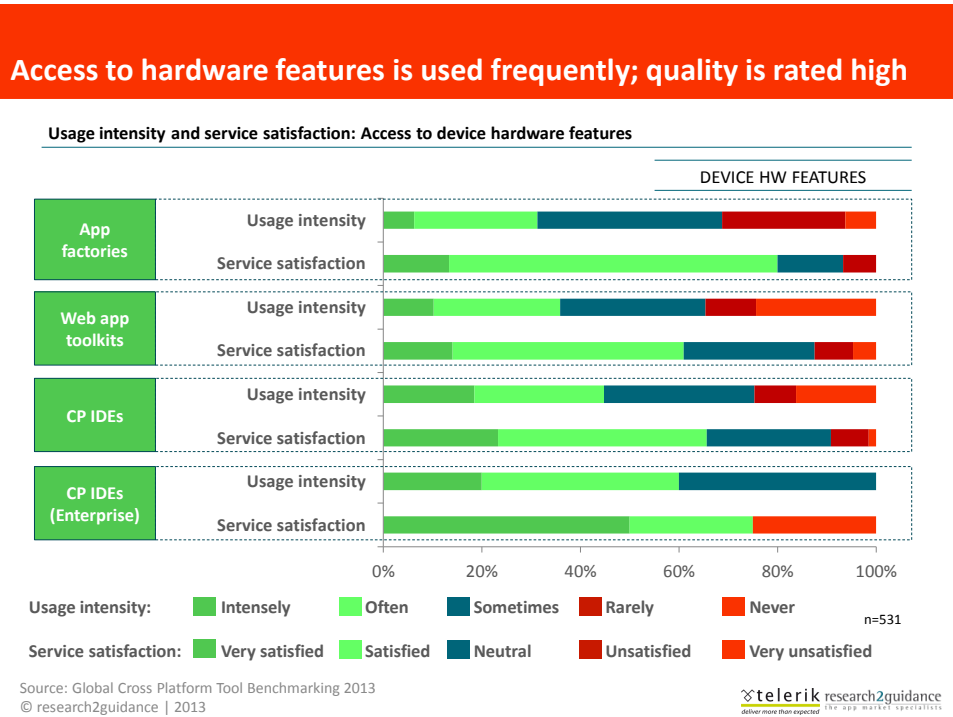
58% of CP Tool users say that the accessibility of device hardware features critically affects their decision to use a specific CP Tool. Only 7% of participants regard this feature as irrelevant.

Cross Platform App Development Tool Benchmarking 2013

The option to access various hardware features is used more frequently by CP Tool users than the option to access pre-installed applications (see above). Usage intensity is highest among CP IDE Tools for enterprise users, with 60% saying they use this feature often or very often.

Satisfaction with the quality of this feature is rated highly across all CP Tool classes.

Chart 19: Access to device hardware features - usage intensity and service satisfaction



Top 3 “usage intensity”: The tools with the highest usage of hardware features are Unity 3D, PhoneGap and Air.

Top 3 on “service satisfaction”: The tools with the highest user satisfaction for the access to hardware features are Air, Unity 3D and Xamarin.

6.5. INTEGRATION OF CLOUD API SERVICES IN CP TOOLS

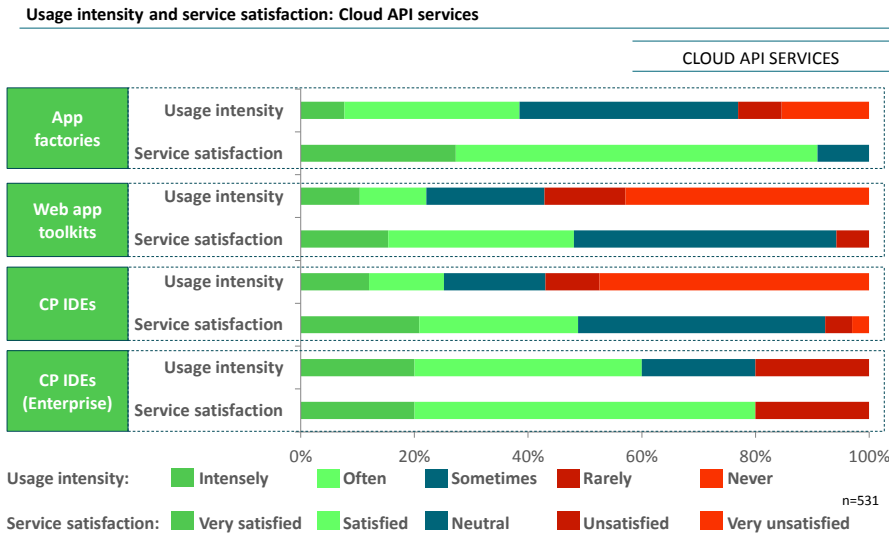
The availability of cloud API services, such as push notification and SMS, is less important to developers. Only 28% regard integration of cloud APIs services as a critical element of CP Tools and 18% rate these services to be irrelevant. Consequently, the majority of participants rarely or never used any cloud API services of CP Tools.

The usage intensity amongst CP IDE Enterprise Tools was highest, with 60% using API service often or very often.

Satisfaction level with API services is comparable to satisfaction level with hardware features and pre-installed apps.

Chart 20: Integrated Cloud API services - usage intensity and service satisfaction

The majority of app developers rarely or never use cloud API services of CP Tools.



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Top 3 “usage intensity”: The tools with the highest usage of APIs are Corona SDK, PhoneGap and AIR.

Top 3 “service satisfaction”: The tools with the highest user satisfaction for the access to APIs are Unity 3D, Air and Xamarin.

6.6. RESULT QUALITY (APP QUALITY)

For the purpose of this benchmarking analysis, the app quality is determined by app performance (response time), usability, graphic design, security and generated app revenues (access to revenue sources, possibility to bill, and customer segments reached). For benchmarking purposes, apps designed using CP Tools are compared to native apps.

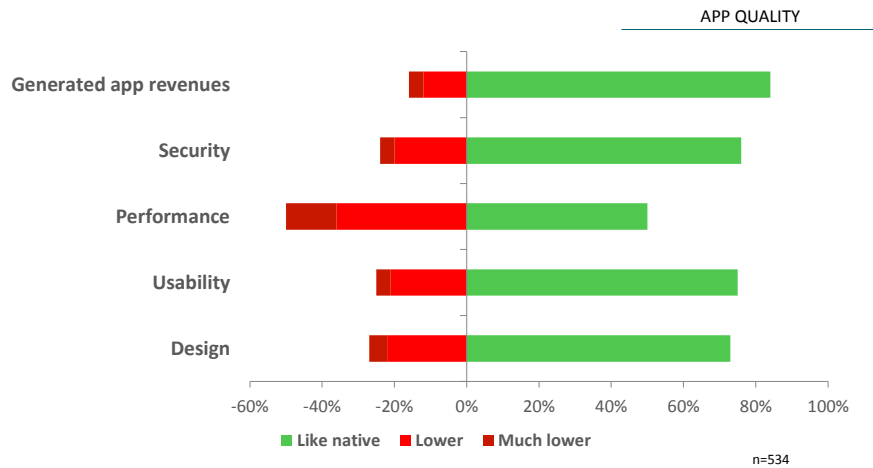
Overall the quality of CP Tool apps is high. “Design” and “usability” of CP apps are rated to be native-like in 73% and 75% of cases, respectively. For 84% of CP Tool users the revenue potential of CP apps is as high as or even higher than that of purely native-developed apps.

The major challenge for CP apps is improving their performance. 50% rate the performance of CP apps “lower” or even “much lower” compared to their OS-specific native counterparts.

Chart 21: CP app quality rating

Performance is the no. one weakness of cross-platform apps

Quality rating of cross-platform apps vs. pure native apps



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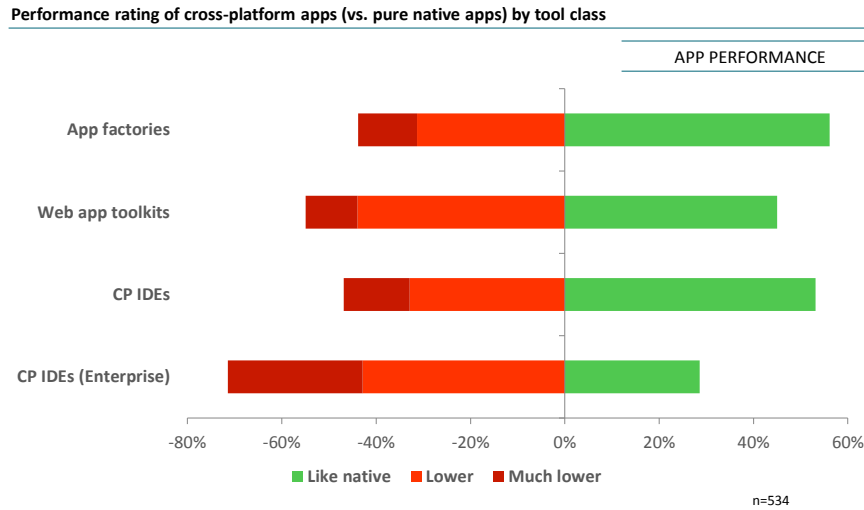
There are a lot of high-end apps (e.g. games featuring extensive animation, 3D graphics and high-speed gameplay) that have been developed using CP Tools. In addition, some CP Tools even concentrate on these games. Examples include “Deus Ex: The Fall” and “Temple Run2” (Unity 3D), “Doodle Jump” and “Need for Speed Shift” (Marmalade).

Nevertheless, CP app performance is still seen as the number one quality issue of apps created using these tools.

There are differences in satisfaction between CP Tool classes. 55% of web app toolkit and 71% of CP IDE Tools for enterprise users rate the performance of their apps as “not native-like” while 56% of app factory users and 53% of users of CP IDEs rate the performance of their CP Tool by saying that their apps are indistinguishable from native apps. Part of the explanation for this interesting result is that the complexity and performance requirements of apps vary between tool classes.

Chart 22: CP app performance rating by CP Tool category

Performance of apps developed by CP IDEs for Enterprise has been rated lowest



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Top 3 “app quality”: The tools with the highest app quality are Xamarin, Unity 3D and Marmalade.

6.7. USAGE AND SATISFACTION WITH THE USER SUPPORT

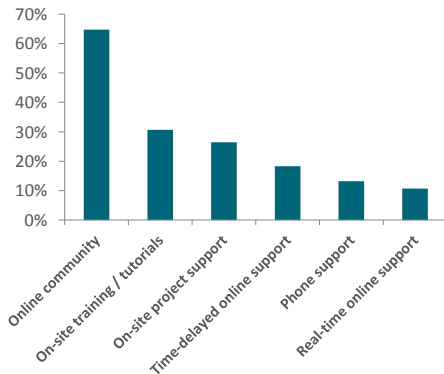
Many CP Tools are of advanced complexity; therefore, comprehensive developer support might be needed. Many CP Tool users reported using multiple support channels. On average, each developer used 1-2 support channels. 47% of CP Tool users used more than one support channel. The most frequently used support channels are online communities, followed by on-site project support and training.

Overall, user satisfaction with the offered support quality, across all CP Tool classes (59% good and very good), is high.

Chart 23: Support channel usage and support satisfaction

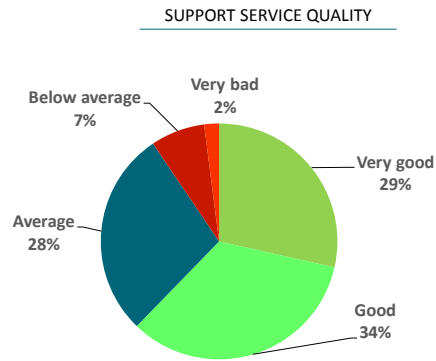
Most developers use online community support and give positive feedback regarding the quality of support

Usage intensity of vendor-side support options



n=476

Quality rating of vendor support



n=445

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In summary, CP Tool users provide a positive feedback for CP Tool Support.

Top 3 “support services quality”: The tools with the highest support services quality are Xamarin, Unity 3D and AIR.

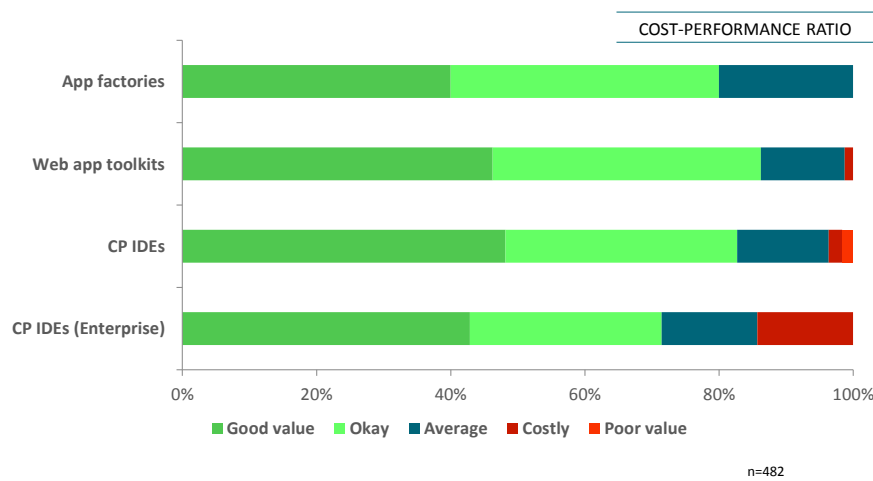
6.8. COST-PERFORMANCE RATIO

As a result, for 72 % of CP Tool users, the cost-performance ratio of CP Tools is positive. This applies to all tool categories with little deviation.

Chart 24: Cost-performance ratio rating of CP Tools

Across all tool classes 72% or more of users say the cost-performance ratio of CP Tools is “good value” or “okay”

Cost-performance rating of cross-platform tools by tool class



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Top 3 “cost-performance ratio”: The tools with the highest cost-performance ratio are Marmalade, Unity 3D and JQuery Mobile

The positive user feedback should be great news for CP Tool vendors and app developers. It is also a challenge for the vendors to learn how to leverage their positive ratings to gain more market share.

The next chapter focuses on today’s “non-users” and their preferences.

7. THE “NON-CROSS PLATFORM TOOL” USER PERSPECTIVE

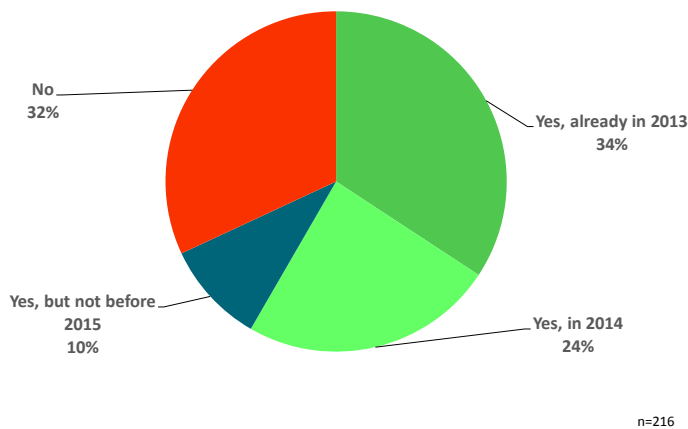
The term “non-users” refers to app developers that did not use a CP Tool in the past. They might have heard or not heard about tools that support multi-platform app development. In any case it is most critical for CP Tool vendors to understand “non-users” readiness to make use of CP Tools and their preferred selection criteria.

Within the benchmarking panel, the majority of developers and publishers plan to use CP Tools within the next two years. This positive outlook (for CP Tool vendors) might be influenced by the fact that developers that participated in the survey had a higher interest in the topic than the normal app developer, but it clearly shows that there is a major interest in the market for CP Tools.

Chart 25: Readiness to use CP Tools among non-users

The majority of app developers consider making use of CP Tools in the next years

Readiness-to-use of cross-platform tools among non-users



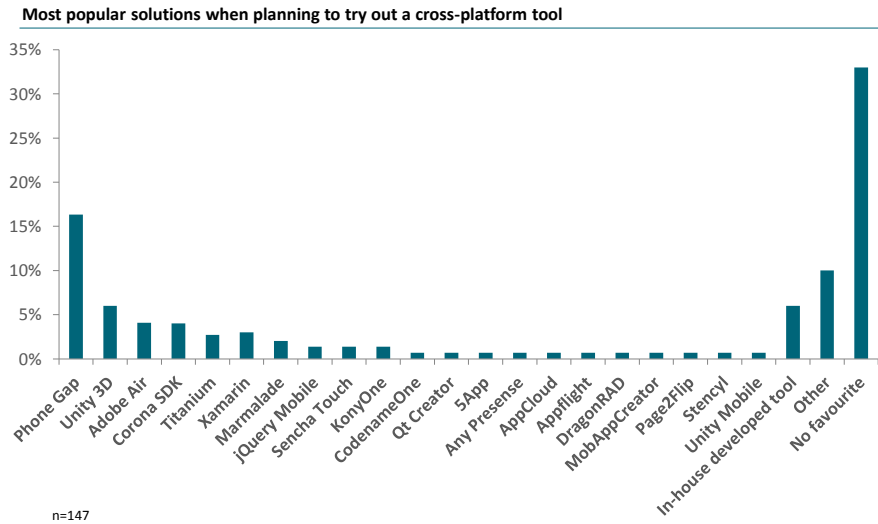
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Amongst “non-users” who plan to use a CP Tool in the next few years, Phone Gap is the most popular CP Tool on the market. The results shown in the graph below also indicate that only a minority have a favourite while most of the “potential users” have no clear preference yet. Even though the interest in CP Tools is high, CP Tool vendors still have a lot of work to do in order to raise brand awareness and educate the market on their distinct advantages.

Chart 26: CP Tool preferences among non-users

Phone Gap is by far the most popular CP Tool among potential users



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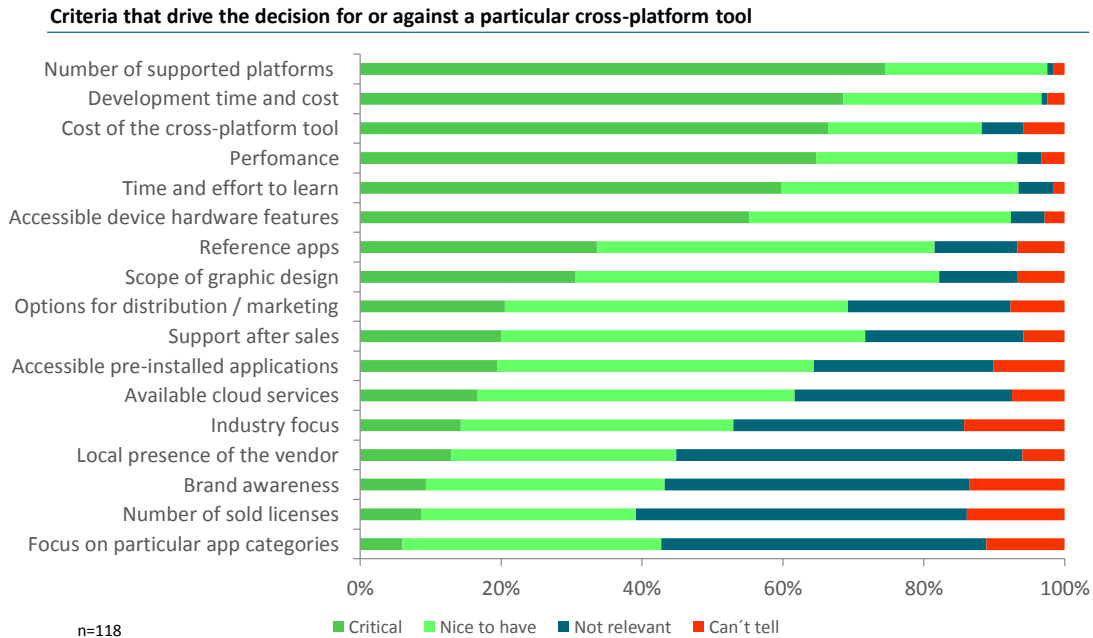
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The list of selection criteria for “non-users” of CP Tools shows a Top Six. This Top Six includes the number of supported platforms (critical for 75% of “non-users”), development time (72%), costs (65%), performance of the app (63%), time and effort to learn (60%) and accessible hardware features (50%).

Provided references and availability of graphical design features are of medium importance. All other listed selection criteria play a minor role.

Chart 27: Decision driving criteria for CP Tools

Number of supported platforms and efficiency gains are the most important selection criteria for CP Tools



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Looking at the way CP Tool vendors currently market their solutions, it has become clear that vendors must address the concerns of “potential users” more. Most of the vendors emphasize the number of licenses (developers using their tools) as well as the number of apps published using their tools. The majority of CP Tool vendors also advertise overall tool features and sometimes the number and kind of platforms served. They could improve how they address information needs in regards to reduced development cost and time, tool costs and performance of resulting apps.

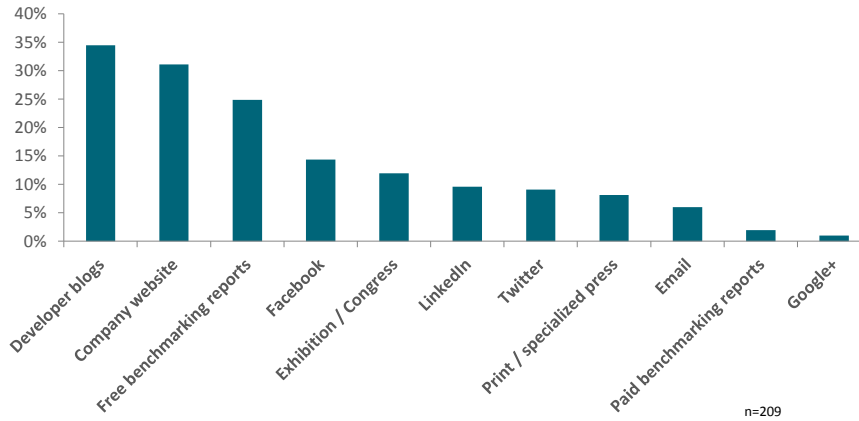
CP Tool vendors have a good chance of successfully engaging with “non-users” via their web presence. Companies’ websites are one of the most used channels for “non-users” to get information about CP tools.

Free benchmarking reports are also a source of information that novices value more than others.

Chart 28: Preferred information channels about CP Tools among non-users

Developer blogs are the preferred source of information about CP Tools for “non users”

Preferred channels for getting informed about CP Tools



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Social media channels (Facebook, LinkedIn, Twitter, Google+) are not seen as relevant channels for CP Tool information.

8. OUTLOOK

The app economy's explosive growth shows no signs of slowing down. It will be fuelled by hundred thousands of app developers who want to bring their ideas to the mobile space and entertain, sell, inform and reach the billions of people who own smartphones. The monetization of this space has arguably just begun.

Although the feedback from the users of CP Tools is generally positive and the tools are becoming more and more sophisticated, the market is still a niche.

Currently there are two million apps available via the major apps stores. Less than 5% of those apps have been developed with the help of a CP Tool.

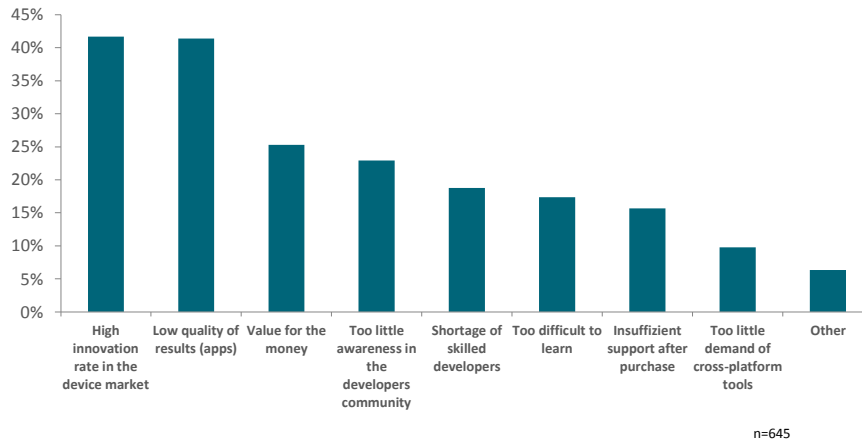
CP Tool vendors have to overcome significant market barriers to get a higher share in the app economy.

The main barrier also refers to the *raison d'être* of CP Tools: Reducing the complexity for app developers who do not have time to master the intricacies of multiple platforms. But even those who expand their range of supported platforms must also contend with the breath-taking speed of platform updates. With Apple, Google, Microsoft and BlackBerry (to name only the main mobile platforms) rolling out new versions of their SDKs and operating systems (packed with new features and style guidelines) every six months on average, CP Tool vendors are constantly playing catch-up.

Chart 29: Major barriers and risks for the success of CP Tools - user perspective

High platform innovation rate and low app quality are the main barriers for CP Tools in the near future

Major barriers and risks for the success of cross-platform tools



n=645

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The speed of innovation will only increase in the future, when new “app devices” like in-car consoles, connected TVs and wearable devices (like glasses and watches) are targeted by app developers. It is most likely that we will see further fragmentation of the CP Tool market. Next to the “one fits all” solutions that serve all native app platforms, more and more specialists CP Tools will concentrate on a certain app category or platform range.

Another major barrier to overcome is to convince the developers that high class apps can be developed with the help of a CP Tool.

A product manager at Marmalade states: *“We have to change the developers’ belief that if they have to build a high performance app, they have to do it native”*

This is a major challenge because CP Tool vendors sell their solutions to third party app developers who must convince their customers that CP Tools will be able to produce a competitive app. What this means for CP Tool vendors in the future is expressed by a developer who participated in the benchmarking:

Developer: *“Even if I know what Cross Platform Tools are capable of doing, my clients don’t know. I would love to get some help in selling projects using these tools”*

In essence: CP Tool vendors have to successfully manage high innovation speed, raise awareness and educate the market about their benefits.

The overall feedback from developers using CP Tools is positive; it’s now up to the CP Tool vendors to let the app economy know about it.

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