IS NOW THE TIME TO ENTER THE APPLE macOS MARKET?

codeweavers

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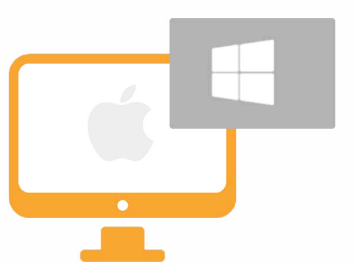


Windows software development companies looking to increase profitability in a measured, predictable way should strongly consider the Apple marketplace. It represents a lucrative and expanding group of buyers who are strongly loyal to the brand and are inclined to spend money on Mac-compatible solutions.

If you do choose to evaluate this market, you'll want to know more about "porting." Porting is the process of taking a Windows-compatible application and adapting it so that it can run on macOS, the Apple operating system.

Sometimes, all you'll need is a porting tool to convert your application and run it on a Mac. Software emulation tools let you conduct affordable and rapid testing and they require minimal investment. They enable your company to reuse existing code, often avoiding an application rewrite.

Keep in mind that not all applications are suitable for porting - for example, a title that requires hardware that doesn't work on Apple hardware would not make sense. But if your program can be ported, there's a best-practiced based method for completing the transition that involves three steps:

1. **Professional Assessment**
2. **Software Development**
3. **Packaging**

Each of these steps is important because they identify what it really takes to run your software product successfully on an Apple computer. The following White Paper describes the Mac market opportunity and why it warrants careful consideration by Windows software developers. It discusses when an application can be ported, and if so, the tools and services available to help firms make a smooth migration.

It outlines the costs and work effort required to create a macOS-compatible solution, as well as some of the potential pitfalls you'll want to be aware of. It details how porting can serve your business and it highlights new and innovative technologies and services available to assist developers who decide to make the transition.

The more informed you are prior to starting a project, the better chance you'll have for long term success.

2. The Mac Market Opportunity

Most executives at Windows software development companies are hunting viable ways to grow their businesses, increase profitability, and capitalize on market trends that have momentum. As you evaluate different paths to take, there's one market that has unique, compelling characteristics, leverages your existing product(s), and warrants close consideration.

Knowing the "right" time to invest in a new market can be a real challenge, especially for smaller firms.

Any investment you make will inevitably require you to put up cash from your own pocket. Prior to making an outlay and to the best of your ability, you want to know that these investments have a high probability of success.
Over the years, the Apple marketplace has shown itself to be lucrative and accessible by small software development companies. It represents a group of buyers that are highly loyal to the brand, have higher disposable incomes, and are increasing in numbers around the globe. Offering a Mac-compatible software application is really the only barrier to entry. Meet this requirement, and your firm gets the opportunity to access a prime group of potential customers.

In its list of companies with the world's most valuable brands, Forbes Magazine ranked Apple first with a brand value of $154.1 Billion and brand revenue of $233.7 Billion.[1] According to Wikipedia, "Apple's iOS and macOS combined, have over 1 billion users." [2] Market research firm, Brand Keys, publishes the "Customer Loyalty Engagement Index" that examines customers' relationships with 740 brands in 83 categories. They claim that:

"The Brand Keys data paints a detailed picture of the category drivers that engage customers, engender loyalty and drive real profits. These drivers not only define how the consumer will view the category, compare offerings, and, ultimately, buy, but also identify the expectations the consumer holds for each driver. The brand whose drivers come closest to meeting (or even exceeding) those of the category ideal is always the one whose customers demonstrate the highest levels of engagement and loyalty over the next 12 to 18 months." [3]

In both 2016 and 2017, Apple won Brand Keys Customer Loyalty Engagement Index in the laptop, tablet, and smartphone categories.

Right now, the Mac market is estimated to be roughly 12 percent of the total computer market. The Mac market is growing– albeit slowly– whereas the Windows market appears to be shrinking and losing ground to both MacBooks and Chromebooks. In addition, the demographics for Mac users imply that they spend more money on software than either their Windows or Chrome counterparts.

3. An Introduction to Porting

If you're considering transitioning your Windows application to the Mac market, you have a lot of choices. You can rewrite your application from the ground up, or if you've written your application in a cross platform toolkit you will just need to rebuild it and repackage it, or in extreme cases you can even create a facsimile of a macOS version by encouraging your customers to use a Virtual Machine solution to run your application. Generally, though, porting refers to the concept of using as much of your existing code base as you can, and only developing new code in limited and specific areas.

The ideal result in porting an application is that you invest a modest amount of effort, reuse a substantial amount of your existing technology, and end up with a polished product for macOS. Of course, depending on your application, this can quickly become challenging for many reasons, such as:

- You depend on third party tools that don't exist on the Mac (like .NET, or third party libraries provided only in binary form).
- Your application is heavily dependent on specific Windows APIs such as the Win32 API or interfaces like DirectX or DirectAudio.
- You depend heavily on Windows only tools like Visual Studio

When you hit one of these challenges, you can either rewrite it or add a software layer that quickly translates back and forth between the application and the operating system. Rewriting code generally gives the best result, but can be time consuming and expensive, and can introduce unwanted bugs. Using a compatibility layer is less expensive but can result in performance degradation-- usually caused by latency from additional processes incurred during translation.

Regardless of whether you rewrite large portions of your code or use a compatibility layer, porting enables Windows developers to reuse existing code on the Mac platform, at a cost that is significantly less than rewriting the application from scratch.

1 Retrieved on 5.17.17 from: https://www.forbes.com/powerful-brands/list/
2 Retrieved on 5.17.17 from: https://en.wikipedia.org/wiki/Usage_share_of_operating_systems
3 Retrieved on 5.17.17 from: http://brandkeys.com/portfolio/customer-loyalty- engagement-index/

What Steps are Involved in the Porting Process?

A best practice-based porting process involves three steps:

1. **Professional Assessment**
2. **Software Development**
3. **Packaging**

The Professional Assessment

The goal of the assessment phase is to understand the scope of the effort required to port the software. If you plan to rewrite portions of the code, you will likely need to engage key members of your development staff, although there are a range of consultants that will help with this work.

For a traditional source code port, this phase will be an entirely cerebral exercise. The team will need to study your Windows product, understand it's technical underpinnings, and understand it's dependencies. They will need to:

- Understand what code can be reused, and what needs to be replaced
- Learn what Windows only dependencies exist, and how to mitigate or replace them
- Understand how to package the overall result as a macOS product

If you use a compatibility layer, such as that provided by CrossOver, the essential work is similar, except that you can also use CrossOver as a tool to assess the expected result. With CrossOver, an additional step will therefore be to:

- Test your application by running the existing Windows code on macOS and looking for specific bugs or issues that impact the installation, configuration, and/or performance of the product running on a Mac.

At the end of the assessment, you should receive:

A detailed report which components can be reused, and which will need to be rewritten

A list of any third party components that cannot be distributed to non-Windows based devices and viable substitutes.

A time estimate to do the work.

A price tag associated with the work.

If you use CrossOver as part of your strategy, you can also expect to receive:

1. A list of bugs and issues discovered while running your Windows application on macOS
2. A "proof-of-concept" of the application running on macOS that you can use for testing
3. A set of time estimates and costs required to resolve any limitations in CrossOver

This sort of assessment can usually be done in three to four weeks, depending on a range of variables. For an internal port, you will need to lean on key staff; if you engage an outside company to do this assessment, there will be associated fees. Understand, however, that the goal of the assessment is to protect your company from being hit by high, unexpected costs, and to keep you from having to make a large financial investment before you know if a port is a smart option.

Software Development

The software development phase will be the meat of your project. The actual work performed during this phase will vary a great deal, and will depend on the specifics of your product and your plan. You may hand your source code to a third party consultant for them to port; you may have an internal team working to migrate your code, or you may have given a copy of your binary to a company like CodeWeavers to have use a tool like CrossOver to accomplish the port.

For most ISVs, an important goal during this phase will be to perform the port in a maintainable way. You want the ability to continue to develop your Windows product and have those improvements flow into the macOS product. You also want to work carefully with the QA process to make sure that all changes are tested for both the Windows and macOS platform.

Packaging

The final phase of the porting process is packaging the Windows application into a single installable product. Apple charges a fee of $100.00 (USD) for a software key to insure your application can be safely and securely distributed to Mac users.

If you are working with a consultant, make sure that you can incorporate future software updates when you want to, without incurring additional fees.

How Much Does Porting Cost?

Traditional porting strategies tend to carry high price tags. You may have an internal team dedicated for a year or more on the project, or you may hire an outside consultant to perform the port. These costs can range from tens of thousands of dollars, to hundreds of thousands of dollars. With all ports, there are often hidden costs, in that the time staff spend working on the port is often not directly computed. It's also important to calculate ongoing costs; so if your port is completed for one price, you want to make sure that incremental updates are available for some reasonable amount of effort or costs. With CrossOver, assessments can range in price from $3,000 - $5,000. Development costs vary depending on the amount of work but average $10,000 to $30,000. Packaging is a recurring cost that can run just under $1,000 per month, or up to $10,000 per month. The recurring fees are for ongoing services such as licensing and support.

What are the Potential Pitfalls of Porting?

If your software application is dependent on Windows components that cannot be used on other platforms, this may create problems. Products that use non-standard APIs can require more technical adaptation and therefore are more expensive to port. Applications that are constantly under development often bump into limits that prevent commercial porting.

Some companies attempt to get Mac customers to install a Windows license on their computers (either as Bootcamp or as a virtual machine). This approach is problematic because many end users are using the Mac platform to get away from Windows. Requiring them to buy Windows and potentially more expensive hardware -- larger hard drive or a faster processor -- is a step they're probably not interested in taking.

When developers decide not to port their software applications, the reason is usually cost. Either the actual price to port the software is greater than what they perceive the customer demand to be, or companies have not yet budgeted any funds for this type of project.

How can Porting Help my Business?

If porting is an option for your software solution, there are some compelling business benefits. First, it's a quicker and less expensive way to test the Mac market without having to fully invest in a complete source code rewrite. There are software tools available to help developers conduct technical testing very quickly. There are also consulting firms that can help your company assess the amount of development required to make a porting transition.

If you can use existing source code, make minor changes, and access a whole new market, that's a high value opportunity. If your product is already successful with Windows customers, the Mac experience should be nearly the same giving you a measurable advantage.

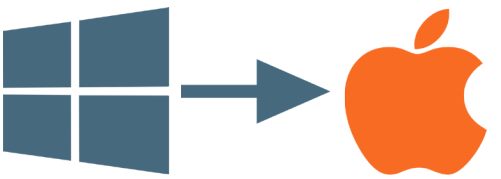
Most game and application developers targeting the desktop/laptop market, prefer to create Windows OS-compatible products. The sheer size of the marketplace makes this approach understandable. But because the Mac market is smaller, there are fewer competitors.

4. Innovative Technologies and Services are Changing the Game for Windows Developers

Through a combination of cross-platform compatibility tools and consulting services, Windows developers now have cost effective and efficient ways to enter the Mac market. These tools enable your firm to quickly test a productivity, utility, game, or design software application and see how it operates on a Mac.

These emulation software solutions don't require source code changes nor do they require you to install the Windows operating system. They create a "custom layer" between your program and the Mac, enabling it to run properly. You won't have to dual boot or use a virtual machine. They let you switch back and forth between both Mac and Windows environments effortlessly.

Customizing these tools takes some time to complete -- four to six weeks -- but the end result is a ported application with little additional overhead (disk space or processor) and Mac performance that meets, and sometimes exceeds, what you see on Windows. By not requiring source code changes, developers don't have to maintain two code bases.



Once the primary software development has been completed, it's critical to test the application on a variety of hardware and operating system versions, to insure stability across the most common platform configurations. It's recommended that the consulting firm and the developer conduct separate testing and quality checks.

5. Summary

The macOS market is lucrative, growing, and filled with brand loyal buyers. Companies with Windows-compatible applications, should strongly consider porting those programs to the Apple environment. The porting process is manageable and well defined. There are a variety of tools and consulting services available to help your firm change its product(s) in an affordable and timely way.

6. Cost Effective, Experienced Windows-to-Mac Porting - CodeWeavers and CrossOver

CodeWeavers has been developing virtualization software for twenty-one years, and has been actively helping companies port their applications for the past ten years. To date, the company has worked with more than ninety companies successfully transitioning their Windows programs to the Mac and Linux platforms.

CrossOver, CodeWeaver's porting technology, enables firms to efficiently and economically transition a Windows solution so that it runs effectively on macOS. No source code changes are required so you won't be maintaining two different programs. For those engineers who are technically savvy and prefer to administer the migration process themselves, CodeWeavers offers a free trial of CrossOver [8] available here: https://www.codeweavers.com/products/crossover-mac/download

As you test your application on the Mac, it's not uncommon to find certain functions or features that don't work properly. If your team needs assistance, CodeWeavers offers different consulting packages to help assess portability, modify applications so that they run under CrossOver in a commercially acceptable way, and investigate macOS licensing issues. They also provide services to launch your newly Mac-compatible product, market and promote it.

To find out more about how your business can port Windows software to the Mac, Linux or Android marketplace with CodeWeavers, contact James Ramey at jramey@codeweavers.com.

8 If you do choose to purchase CrossOver, know that you're indirectly supporting the Wine Project (https://www.winehq.org). Every improvement we make to Wine is contributed to the Wine Project, making the computing world more open and compatible for everyone.

Codeweavers' Corportate Story:
Driving Changing in the Computing World..

In the Beginning...
In 1996, Jeremy White started CodeWeavers to do general-purpose business software development. Then, a year later, everything changed. Jeremy ran across this technology called Wine.

A New Mission...
The more Jeremy looked at Wine, the cooler he thought it was. Because if it realized its potential, Wine could free the PC computing desktop from the shackles of Microsoft Windows. There would be plurality in the desktop world. There would be choice. There would be innovation.

With that, Jeremy completely re-oriented CodeWeavers around Wine. Our mission became: Transforming Unix into a Windows®-compatible operating system.

First Services, then Products...
CodeWeavers' initial business was to help companies port their Windows applications to the Linux desktop. In 2001, CodeWeavers also became a product company, with the first release of our award-winning CrossOver compatibility software for Linux. We've been selling both products and services ever since.

Our Continuing Mission...
With the announcement of Apple's move to the Intel platform in 2007, CodeWeavers released CrossOver Mac. This also broadened the company's range of services into Mac ports as well. To date, we've done Mac ports for a wide range of consumer applications, as well as some very well-known game titles. We are now doing Android ports as well. Our mission remains the same: bringing Windows compatibility to Unix-based operating systems, without saddling our customers with the need to run Windows.