



AN EXECUTIVE'S GUIDE TO SCALING WOOCOMMERCE

A LOOK AT SIX CRITICAL FACTORS FROM THE EXPERIENCE
OF SELLING MILLIONS OF DOLLARS IN LIPSTICK

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INTRODUCTION

Over the past several years we've seen Cyber Monday sales (in millions of U.S. dollars) increase consistently. Digital spend on Cyber Monday in 2015 reached more than \$3 billion¹.

In October 2015, WooThemes announced its own growth – to the tune of 10 million downloads of its flagship product, WooCommerce. WooThemes also announced that WooCommerce now powers nearly 30% of all online stores².

The logical conclusion to these two dynamics is the question raised consistently by store owners and prospects considering using WooCommerce for their own store: Can WooCommerce scale to support serious Cyber Monday traffic?

In this ebook we'll look at the **six critical factors** to consider when scaling WooCommerce sites for Cyber Monday-like traffic. As you'll see, these factors span processes, decisions, and roles involved in creating a highly scalable WooCommerce site.

*Can
WooCommerce
scale to support
serious Cyber
Monday
traffic?*



A hand is shown holding the red handle of a miniature metal shopping cart. The cart has a red basket and is positioned on a wooden surface. The background is a warm, orange-toned image of a person's face, partially visible. The text "CRITICAL FACTOR ONE: UNDERSTANDING YOUR NEEDS" is overlaid in white, bold, sans-serif font on the left side of the image.

CRITICAL FACTOR ONE: UNDERSTANDING YOUR NEEDS

DON'T GET CAUGHT ASKING THE WRONG QUESTIONS

When store owners discuss their online platforms for ecommerce, they often begin the conversation around support for a quantity of SKUs. Almost every conversation begins with the same questions:

“Can WooCommerce support my online needs? I have 15,000 products, many of them with five or more variants. Are any large sites running on WooCommerce?”

If SKU management is indeed the most compelling challenge that an organization has, it should focus there. Yet, questions regarding SKUs are often asked as a proxy for how well WooCommerce can scale, and in that case, these questions are incorrect.

Another proxy question relates to revenue:

“Are there WooCommerce sites that are handling millions of dollars in sales?”

This question, much like the one focused on SKU counts, assumes that high revenue is an excellent indicator of scale.

Sometimes it's true, but it's an unreliable metric because what's missing from the conversation is the per item average sale price. Without that, it's unclear what kind of traffic and scale is happening on a site.



SCALE REQUIRES A DIFFERENT METRIC

When working on sites that need to support high volumes of traffic, like on a Cyber Monday, SKU count won't help you.

Those who consider revenue as a useful metric often forget that the performance cost on an ecommerce site isn't related only to transactions that complete. The reality is that incomplete sales also have a performance cost that needs to be considered.

This is why volume (quantity of items sold per day) also fails as an effective measure of scale. It only looks at completed transactions. But all the partial and abandoned carts still utilize server resources.

Every instance of a customer searching for a product, looking at a list of products, picking one, and looking at a product's details can be cached for better performance.

What is needed is a different metric.



Where customer interactions shift, and have cost, is the moment they put a product into their shopping cart. This is true regardless of whether the customer ultimately makes a purchase or leaves the site.

THE METRIC OF SCALE: ADD TO CARTS PER MINUTE

The most effective way to measure how well a WooCommerce store will scale is to use “Add to Cart” events.

Early in 2015, a fast-growth online cosmetics store approached Crowd Favorite with questions related to scale. They wanted to prepare for expected growth and scale and wondered if WooCommerce would be able to handle the demand.

It was in conversations with this company that we discovered a need for a consistent metric to use as a way to evaluate their preparedness for scale.

And that metric was “add to carts per minute” or ATCPM.

Over the course of several months, every action, every decision, and every discussion circled around this notion – a notion that brought the customer (and their online store), their software development partner (Crowd Favorite), and their host (WP Engine) into a conversation where each could evaluate their own recommendations from a consistent and singular focus.

This is potentially one of the most important aspects of getting a WooCommerce site to scale – the need to have clarity around a site’s actual needs, and to be able to have a single metric that galvanizes everyone’s focus.

DETERMINING YOUR TARGET ATCPM REQUIRES ANALYSIS

There are several ways you can determine your target goal for add to carts per minute. The first is simply to track what your current volume is and make a prediction about your growth needs. This is what most organizations do. It's an educated guess, and while not perfect, it's a start.

The second approach is to look at historical traffic and purchasing during the last holiday season and extrapolate from that. It's still not scientific if you weren't capturing the correct data last holiday. But again, it's a good starting spot.

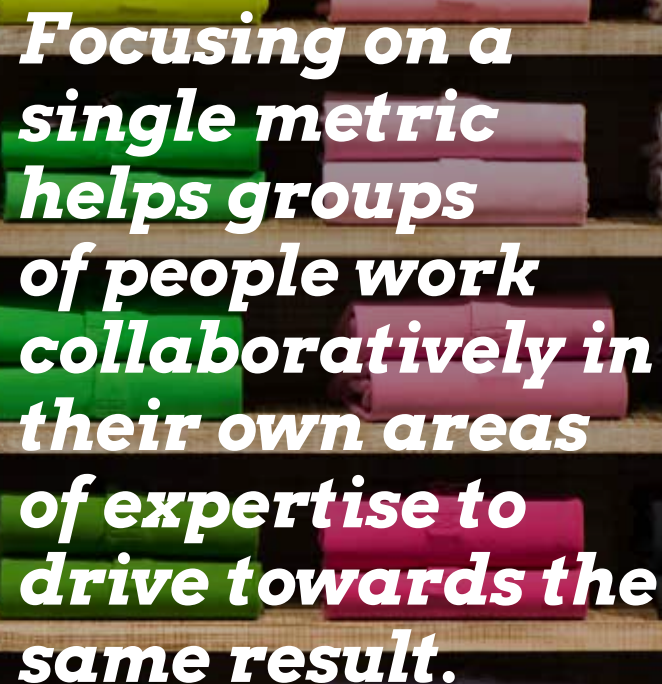
Of course this suggests you should work to calibrate your monitoring so that you know the ATCPM volume on a daily, weekly and monthly basis – both on product launches and normal days.

Another helpful approach, if it's available, is to discuss the metric with organizations that sell similar products.


While normally discussion with a competitor would be inconceivable, discussing dynamics of scale is often one of the areas where successful organizations like to boast.

"We did XX sales yesterday for an all-time record," isn't just a boast, it's a way to understand a minimum baseline for ATCPM.

It's why it's the first of six critical factors – truly understanding a site's needs and being able to leverage a metric that drives every discussion and decision.



Focusing on a single metric helps groups of people work collaboratively in their own areas of expertise to drive towards the same result.

A person with glasses is shown in profile, focused on their work at a desk. They are wearing a dark shirt and a watch. The background is a warm, orange-toned blur, suggesting an office or workshop setting. The overall mood is professional and concentrated.

CRITICAL FACTOR TWO: UNDERSTANDING WOOCOMMERCE

Most discussions on scale jump immediately to hosting and infrastructure. While there's no question that hosting is important, our recommendation is that the second critical factor is the need to deeply understand the selected platform supporting your ecommerce site. In this case it means having a deep understanding of WooCommerce.

While it's true that WooCommerce runs on WordPress and that WordPress is coded in PHP and runs on MySQL, simply hiring a PHP developer will not deliver the scaled performance an organization is looking for.

CONFIGURING WOOCOMMERCE DOESN'T EQUAL UNDERSTANDING IT

In order to scale WooCommerce one needs to understand it. And that requires more than simply configuring a site that has the WooCommerce plugin installed.

What happens when a coupon is created?

There's a lot of power in the WooCommerce solution for coupons. One of the features of the system is to limit how many times a coupon can be used. That results in a query to the database to look to see how many times it's already been used. This, of course, would determine if a person could use it again.

But the "use" data of each coupon was stored in a meta value that would be queried countless times as people tried to make purchases. This is exactly what happened at scale with this particular online cosmetics company.

A developer without deep understanding of, and an inability to trace, the code would simply be left with, "the site is running slow." They might, if they figured out that coupons were the issue, turn off the coupon.

The Right Result

The right result, however, might include several different approaches – both business and technical.

From the business perspective, creating multiple coupons may help offset the query load for a specific record check. From the technical perspective, it makes more sense to store data in a separate table and/or change the nature of the query to store its result in a transient.

The same kind of challenges arise with session data and session management (until the recent release of WooCommerce 2.5³).

Prior to the recent release, a custom solution might have been needed for scale. Unfortunately, many developers who notice a site is slow misunderstand why it's slow and simply want more computing resources (RAM, etc.).

THE LACK OF UNDERSTANDING DRIVES COSTS HIGHER

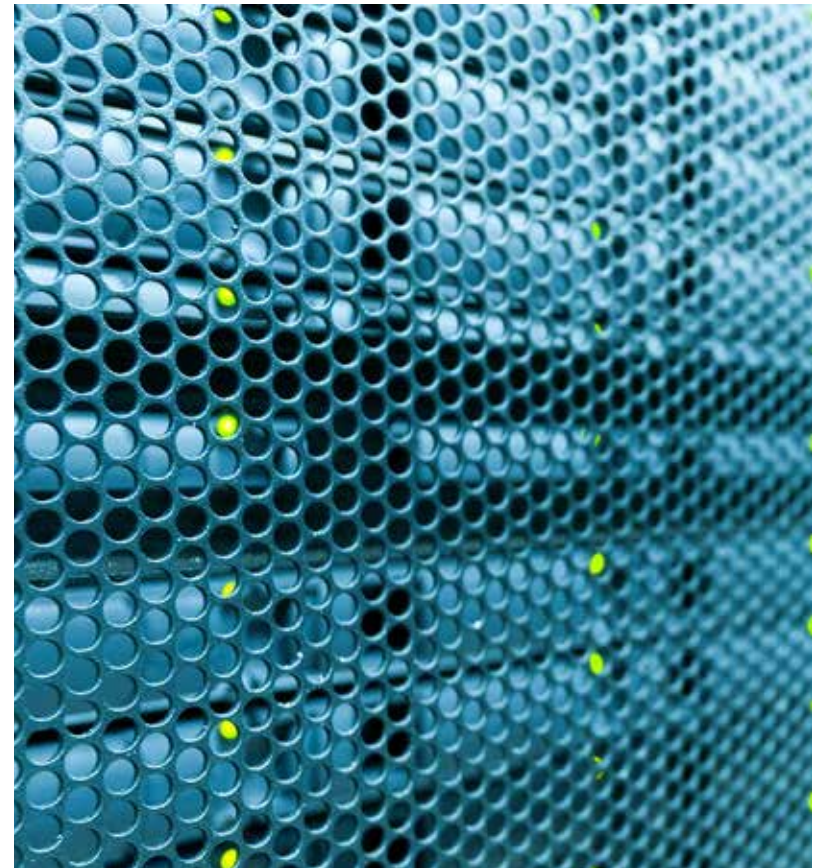
It's common for a developer to make a request to add more RAM, to add greater amounts of disk, or to spin up additional servers. It's an approach to scale that moves away from the code and towards development operations (devops).

The result is that costs increase at a faster pace than performance improves – because the core issue isn't being resolved.

This is a notoriously poor trade-off for organizations that may not understand the technical details well enough to know that they're overspending, or spending in the wrong areas.

Additionally, site owners who don't have internal technical teams that deeply understand WooCommerce should collaborate with development organizations that have the understanding and can work alongside the organization like a trusted partner.

None of this is possible if the extent of a developer's experience is configuring the settings of a WooCommerce site.



It's critical that the customers of sites who want to see a WooCommerce site scale work with established hosts like WP Engine' that understand what it means to apply the right resources at the right time.

CRITICAL FACTOR THREE: PROACTIVE LOAD TESTING

The difference between a normal WooCommerce site and a site that has to scale to support Cyber Monday is vast. The common mistake made when preparing for high volumes of traffic is making assumptions.

DON'T MAKE THESE THREE INCORRECT ASSUMPTIONS

1. THE TRAFFIC WILL COME IN EVENLY OVER THE DAY.

When people talk about scale, they talk in large numbers. “We expect 50,000 orders,” or “We may see 500,000 visitors in a day.” But it means nothing if it isn’t evenly distributed over time.

The reality is that traffic rarely comes in a nice and evenly distributed pattern.

And that means you might need to test for a 30% load of the day’s traffic in a single hour.

2. THE CHALLENGE FOR PERFORMANCE IS RELATED TO THE SHOPPING CART.

It isn’t rare to hear people talk about an ecommerce site with the assumption that the real performance area of the site is the cart or the checkout form.

This works off of the assumption that the rest of the site can be cached. But what’s missed is that there are other, equally less cacheable locations on the site that are heavily visited (especially when overall site performance struggles). It’s the “My Account” area.

3. CUSTOMERS WILL MAKE A SINGLE PURCHASE AND DEPART.

Most visitors who make a purchase move from the cart to the checkout area and from there to the final thank you page. From there they may depart. But it’s not always the case.

WooCommerce can present additional products to consider, or a link to “keep shopping.” Once a logged in user clicks on that link, they’re back to pages that could have been cached but now aren’t because they’re still logged in (from their previous purchase). This needs to be considered (and changes may need to be made).

The point of these three assumptions isn’t to suggest they’re the only assumptions possible, or that they’re assumptions every site makes. Instead, it’s simply to highlight that when it comes to scaling a high performance WooCommerce site assumptions are never helpful to planning.

It’s why load testing is so critical and can’t be left until the last minute.

LOAD TESTING MUST NOT BE AN AFTERTHOUGHT

Regardless of what testing solution you used for load testing a WooCommerce site, a common mistake is to only focus on the performance of the site itself.

Monitoring sessions, caching, querying, and slow performance are all critical. But equally important is the need to configure your hosting to match the kind of demand you expect.

Load testing must be strategic and well thought out. Here are five considerations for every organization looking to scale WooCommerce.

1. BUILD TEST CASES THAT MIRROR USER NAVIGATION

It doesn't help to create a single test case that has a user navigate a perfect path to a product and then purchase it perfectly. Customers aren't perfect, after all. They browse, navigate to details, back up, navigate to other category listings and then drill into a product, before moving to a similar product and then going back to add something to their cart. Make sure your test cases are realistic.

2. MAKE SURE YOUR HOSTING PROVIDER KNOWS OF YOUR TESTING

Some hosts protect against high traffic as they might consider it the beginning of a denial of service attack. This results in skewed data at best and no data at worst. Working with your hosting provider ensures that they can manage any exceptions needed for your load testing tool.

3. CREATE AN ENVIRONMENT THAT MATCHES PRODUCTION

Some hosts don't support testing. Others support it but have you work on your existing site (after hours). Instead, configure a duplicate environment with the same number of servers to ensure your testing numbers are legitimate.

4. DON'T SIMPLY TEST THE FRONT END OF YOUR SITE

It's easy to focus on the front end of your site (the highly cacheable catalog of products) when load testing. Unfortunately, this won't mirror reality, as site administrators, customer service, order processors and executives may also be logging into the backend of the site to get access to data. Make sure to create tests that simulate this behavior.

5. MAKE SURE THE TESTS ARE ACTUALLY WORKING

On non-WooCommerce sites, load testing a site is relatively easy as there are no logged in users. But for an ecommerce site, users will likely log in for a purchase (to re-use their shipping or credit card details). If you record a script with dynamic data (session data) and it's not managed correctly, running the script can result in things looking ok but without the orders you expected.

Make sure you close the loop on your tests to verify that your scripts are actually working.

CRITICAL FACTOR FOUR: YOUR HOSTING PARTNER

It's possible that you decide to host your own ecommerce site. It's possible because you have existing expertise when it comes to PCI compliance, your own devops team, and the hardware and the software to monitor and manage your own scale. If that's the case, you won't have a hosting partner.

Of course many companies don't necessarily have all of the above and attempt to host their own solution anyway. In that case, guidance for scaling results in a lot of technical suggestions.

MAKE SURE YOU HAVE A PLAN FOR FAILURE

If you plan to host your own infrastructure, a single environment won't suffice. Traffic to that infrastructure, especially on days like Cyber Monday, can overload your servers and bring everything to a crawl.

It's critical to consider and plan for failure. Most organizations use warm or cold failovers where servers wait in another location but may need backups restored (warm) or the complete software environment deployed (cold).

If the focus is on minimizing downtime, hot standbys are an option – where environments have been consistently synchronized with the active solution and will immediately accept traffic if the main environment becomes unavailable.

***These solutions are neither simple
nor inexpensive.***



LEVERAGE LOAD BALANCING, CONTENT DELIVERY NETWORKS (CDN) AND MORE

Expertise Needed

- ☐ Payment gateways
- ☐ PCI compliance
- ☐ Network redundancy
- ☐ Hardware for a failover solution
- ☐ CDNs
- ☐ Load balancers
- ☐ Varnish cache

As you consider the list of expertise needed, the question should become clear: Why not look for a hosting partner to help mitigate the risks of hosting a high performance ecommerce site on your own?

When companies consider this option, most of the questions about WooCommerce and scaling are often asked in exactly the same manner.

1. CAN WORDPRESS AND WOOCOMMERCE REALLY HANDLE THIS TRAFFIC?
2. IS MY HOST THE RIGHT HOST TO HOST THIS KIND OF SITE?

In early 2015, the online cosmetics store approached Crowd Favorite and asked the same two questions:

1. CAN WOOCOMMERCE SCALE TO MEET HIGH TRAFFIC DEMANDS?
2. IS WP ENGINE THE RIGHT PLACE TO HOST SUCH A SITE?

Our answers to both questions were direct and without caveats: **"Yes!"**

The same cannot be said for every hosting provider that offers WordPress as one of the applications available on their infrastructure.

HOSTING WOOCOMMERCE AND WORDPRESS AREN'T THE SAME THING

Almost every shared hosting, virtual private server hosting and managed WordPress hosting company offers WordPress.

Some of them, when discussing performance, suggest using a caching plugin. That's the extent of their support for performance, and that's not good.

Others have their own custom approach to performance.

Every request for a webpage, from the data queries to externalized calls, can mean a slow down in performance. This can have significant consequence in regard to site revenue⁵.

To deal with this, many managed service providers who specialize in WordPress hosting use Varnish.

Copies of the most requested pages (after the queries have run, after the externalized calls have been made) can be stored so new guests are given cached versions of the page.

The aggressive nature of configuring Varnish can result in the need for exclusion rules in the Varnish configuration files. This enhances speed for most sites. But ecommerce sites that expect high traffic loads aren't "most sites."

The cart page, for example, shouldn't be cached if a user has added something to their cart, so users, after adding an item to their cart, can then be taken to their cart and see the item. But if no cart has been created for the user (who is simply browsing), the cart page should be cached.

If your host doesn't have a simple way to create these exclusions, they're likely a poor partner for high performance ecommerce sites.

If they don't understand what you're asking, it's time to find a new partner.

It's critical to work with a host that understands the need for these kinds of exclusion rules.



THE RIGHT HOSTING PROVIDER IS A PARTNER IN SCALING

Varnish support is simply the beginning, not the ultimate destination. As mentioned already, load testing is critical and not every hosting provider will be a partner in the effort. Here are three criteria that help determine if your host is a partner.

1. DOES YOUR HOST HAVE STAFF TO PARTICIPATE IN MONITORING YOUR TEST?

When a site owner or development partner is load testing in a sandbox, what is your host doing? Are they waiting to hear that there was a problem? Or are they actively engaged in the test? Are they monitoring the servers to see what is happening so that they can participate in a post-mortem of the test?

2. DOES YOUR HOST TEST THEIR INFRASTRUCTURE WHILE YOU'RE TESTING PERFORMANCE?

While the tests are running, is your host making tweaks and changes to their own infrastructure to determine if changes may be a better fit for the site? While Crowd Favorite ran tests for our cosmetics client, WP Engine tested more than 10 different tweaks to see which might help overall performance.

3. DOES YOUR HOST HAVE STAFF MONITORING PRODUCTION IN REAL TIME?

Another simple way to tell whether the host you're working with is a partner is to determine what their support staff are doing while your promotion is running. In the case of Cyber Monday, most companies will have staff paying attention. But what if your promotion isn't on that day? Are they paying attention on your high traffic days?

What is your host doing?



CRITICAL FACTOR FIVE: CONSISTENT EXPERIMENTATION

If you were launching a new product, you wouldn't do it without any kind of market research. Yet that is what happens with most ecommerce sites. A simple and single hypothesis is the driver behind the launch of an ecommerce site where the hope is that the site will perform well under high demand.

While nice to have, hope is not a strategy.

BRAINSTORMING AND HYPOTHESIS TESTING IS CRITICAL

When working with WP Engine and our cosmetics client, for example, Crowd Favorite suggested that traffic to the “My Account” section of the site was slowing down the overall performance. Observations during testing and in the live environment suggested this was true.

Sometimes the solution for scaling performance comes from outside the site itself. In this case, a brainstorm meeting resulted in a suggestion to change how announcements were made for product launches on this particular site. Instead of a mass email, the emails were sent in batches.

To succeed – to scale a WooCommerce site to the thousands of “add to cart” events a minute – one must embrace a consistent strategy of experimentation. This is what will enable the host, the development partner and the site owner to brainstorm and test several hypotheses.

***Embrace
experimentation***



FIVE QUESTIONS WERE ASKED OF EVERY IDEA

Before moving forward with any idea, we asked these five questions:

1. How will this affect traffic to the entire site?
2. How will this affect traffic to a specific page?
3. How will this affect traffic to the My Accounts page?
4. How will this affect the site's cache (stored pages)?
5. How can a test verify our ideas or assumptions?

The final question is critical to the overall notion of experimentation.





CRITICAL FACTOR SIX: A TEAM IS CRITICAL

To truly optimize the performance and scalability of a WooCommerce website, a site owner needs to optimize:

THE WEB SERVER INFRASTRUCTURE

Whether you host the site yourself or work with a hosting partner, the reality is that you'll need several servers working together, in tight collaboration, to deliver the performance you'll want.

THE DATABASE INFRASTRUCTURE

When sites get large, and requests are high, you need to know how to vertically and horizontally partition data for your needs. Using solutions like HyperDB may also help.

THE APPLICATION LAYER (WORDPRESS/WOOCOMMERCE)

As mentioned above, you need to know WordPress and WooCommerce to know where and how to change parts of the system to perform inline with your expectations.

NO ONE SINGLE PERSON CAN DO THIS BY THEMSELVES

The point of this list? That it can't be done by a single person by themselves.

You need a team of stakeholders, regardless of whether they all work for the same company, to create a highly scalable WooCommerce site.

The online cosmetics company's team approached Crowd Favorite with a single, experienced WooCommerce developer on staff. Augmenting their internal resources with staff at Crowd Favorite, and partnering with WP Engine for infrastructure support, we were able to help this client reach 2,000 ATCPM.

The site scaled from doing \$1 million a month in lipstick sales to doing more than that in a single day on Cyber Monday, because they knew how to scale their WooCommerce site.



\$1 million a month to more than \$1 million in a single day.

The background of the image features several thick, red and gold-colored cables or hoses, possibly for industrial or medical use, arranged in a crisscross pattern. The entire scene is set against a solid, vibrant orange background. The text is overlaid on the left side of the image.

***Are you ready for
Cyber Monday
traffic?***

CONCLUSION

The thing about lipstick is that it isn't expensive. You can buy a single item for \$6. That's saying something when you have a Cyber Monday event that does more than \$1 million in sales in a single day.

This particular site weathered the demand and pressure of high concurrent traffic but not by chance or hope. Instead, it scaled appropriately because of a plan with a lot of support and preparation.

That's what we've tried to describe in this document – because it's not something only available to lipstick vendors. It's available to anyone who needs to scale a WooCommerce site.

But the playbook for scaling a WooCommerce site isn't just about technology. It's about bringing the right people to the problem. It's about having the right processes in place. It's about knowing and understanding the technology well enough to know what changes to make. And it's about doing all of it with a plan.



Key Takeaways

1. Determine the right measuring metric, like add to carts per minute (ATCPM)
2. Evaluate your WooCommerce needs from a business perspective
3. Make technical changes to WooCommerce to match those needs
4. Design test cases that mirror reality, including employee use
5. Run tests on mirrors of production for realistic results
6. Test hardware and network configurations during load tests
7. Involve your host in your testing efforts
8. Involve your host in supporting your high demand days
9. Experiment often, creating tests to evaluate your hypotheses
10. Find companies to help as partners rather than vendors



ABOUT THE AUTHOR: CHRIS LEMA

Chris Lema is the Chief Technology Officer (CTO) of Crowd Favorite. With over 20 years of software management experience, Chris has served as a pivotal member of corporate management, software development, and product teams.

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ABOUT CROWD FAVORITE

Crowd Favorite is a full-scale services firm building digital solutions for enterprise-level companies around the world.

Our network of multinational offices allows us to offer the efficiency and craftsmanship of small teams with the scalability and horsepower of larger consultancies.

@crowdfavorite

<http://crowdfavorite.com>

ABOUT WP ENGINE

WP Engine powers amazing digital experiences for websites and applications built on WordPress. The company's premium managed hosting platform provides the performance, reliability and security required by the biggest brands in the world, while remaining affordable and intuitive enough for smaller businesses and individuals. Companies of all sizes rely on WP Engine's award-winning customer service team to quickly solve technical problems and create a world-class customer experience. Founded in 2010, WP Engine is headquartered in Austin, Texas and has offices in San Francisco, California, San Antonio, Texas, and London, England.

@wpengine

www.wpengine.com



END NOTES

1. comScore shows a 21% increase in spending from 2014 to 2015, with more than 50% growth in mobile purchases.
<http://www.comscore.com/Insights/Press-Releases/2015/12/Cyber-Monday-Surpasses-3-Billion-in-Total-Digital-Sales-to-Rank-as-Heaviest-US-Online-Spending-Day-in-History>
2. The announcement shows 30% (<https://www.woothemes.com/2015/10/woocommerce-10m-30-percent/>) and BuiltWith (the source) shows 29% at the time of this publication (<http://trends.builtwith.com/shop>).
3. <https://www.woothemes.com/2016/01/woocommerce-25-dashing-dolphin/>
4. <http://wpengine.com/enterprise/>
5. <http://www.fastcompany.com/1825005/how-one-second-could-cost-amazon-16-billion-sales>

A festive holiday-themed collage. In the top right, a gift is wrapped in gold paper with a large gold bow. Below it, a green Christmas stocking is visible. To the right, a hand holds a tablet, and a credit card with a signature is placed nearby. The bottom features more wrapped gifts, including one in silver paper with a silver bow. The overall color palette is warm, with gold, green, and brown tones.

***Want to learn
more?***

FREE WEBINAR FROM WP ENGINE

MYTHS, MISTAKES & MANAGEMENT OF WOOCOMMERCE AT SCALE

Hear examples from the WooCommerce trenches!

- Myths associated with scaling WooCommerce
- Common mistakes to avoid and how to think about ecommerce so you don't make those mistakes
- How to pick a development partner
- How to pick a hosting partner (and why it matters)

SPEAKER LINEUP:**Chris Lema**

CTO & Chief Strategist, Crowd Favorite

Jason Jaynes

Vice President, Product, WP Engine

wpeng.in/woocomm-webinar

***What to do?
What not to do?
Find out from the
experts.***





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