The Trillion Dollar UX Problem: A Comprehensive Guide to the ROI of UX
“Focus on the user and all else will follow.”

- Rule #1, Google’s “Ten Things” Philosophy
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A trillion dollar issue in e-commerce

35% of money is left on the table because of bad UX in e-commerce.

$5,478,300,000,000

2020 projected global e-commerce sales with good UX.

$1,420,300,000,000

Lost because of bad UX.
Executive Summary: The Trillion Dollar UX Problem

Good user experience (UX) is the difference between category winners and losers. That’s why Facebook, Apple, Google and other world-class companies invest heavily in their UX teams. They know UX is the secret weapon for growth. While they are exceptional examples, the vast majority of companies today do not invest enough in UX. As a result, we found a trillion dollar UX problem in the making- and this is looking at e-commerce alone. This discovery called for a thorough investigation of the true impact of user experience design on the world. Thus, we interviewed more than 60 of the world’s leading UX experts to get their insights into the return on investment (ROI) of UX design.

This report compiles these insights and other leading studies that make the case for investing in UX design. For UX practitioners struggling to prove the value of their work, this guide will serve as a much-welcomed reference. Our findings are divided into two categories to address this: monetary and human impact of the ROI of UX design.

“When we first started using UX design as a business practice, we grew revenues by 895% in the first three months. By making UX a focus in everything we do, we have fostered a highly-engaged user community and internal workforce.”
- Raffaela Rein, founder, The UX School

“UX is impact”
- Austin Knight, senior UX designer, HubSpot
“The impact of UX is crystal clear: the more satisfied your users are, the more likely they are to do whatever it is you are encouraging.”

- Abby Covert, author, How To Make Sense of Any Mess
A Comprehensive Guide to the Monetary ROI of UX Design
This section compiles the most noteworthy monetary insights that make the case for investing in UX design. The financial ROI of UX design can be measured in several ways. We have split them into two categories: positive and negative.

“88% of online consumers are less likely to return to a site after a bad experience.”

- Justin Mifsud, founder, Usability Geek
Not investing in UX

How did we learn that UX design is on its way to becoming a trillion dollar issue?

According to a report\(^1\) from eMarketer, by 2020, e-commerce sales will grow to a global total of about $4.058 trillion. While that is a huge number, research from the Baynard Institute found that conversion rates for e-commerce could be improved by 35% through better checkout flow and design\(^2\). So using that rate, we came to $1.420 trillion for e-commerce alone. In the examples given by the Baymard Institute, small UX design fixes could have saved these companies billions of dollars. 27% of US online shoppers have abandoned an order in the past quarter solely due to a “too long / complicated checkout process” or 35% abandoned their order because they needed to create an account to continue. These and the many reasons given in the report, are avoidable and can be addressed through better UX design practices.

\(^{1}\) [https://www.emarketer.com/Article/Worldwide-Retail-Ecommerce-Sales-Will-Reach-1915-Trillion-This-Year/1014369](https://www.emarketer.com/Article/Worldwide-Retail-Ecommerce-Sales-Will-Reach-1915-Trillion-This-Year/1014369)

\(^{2}\) [https://baymard.com/lists/cart-abandonment-rate](https://baymard.com/lists/cart-abandonment-rate)
Further evidence to support the negative impact of not investing in UX design was provided by Dr Susan Weinschenk\(^3\). With one trillion dollars spent each year globally on software development, she estimates that:

- The number of projects abandoned because they do not meet the original purpose is up to 15%, which equates to $150 billion worldwide.
- The time spent by developers reworking a project with avoidable faults is 50%.
- The cost of fixing an error after development is 100x that of fixing it before development.
- 3 out of the 12 reasons why projects fail are attributed to user experience failures.

\(^3\) https://www.youtube.com/watch?v=O94kYyzqvTc

$150 billion lost due to abandoned projects

Projects abandoned because they do not meet the original purpose.

$1 trillion

Global IT expenditures.

\(^3\) https://www.youtube.com/watch?v=O94kYyzqvTc
Another example of the negative impact of not investing in UX is excluding a customer base, e.g. a number of sites do not tailor their online user experience to enable older people to easily use them. Not only are these older people missing out on satisfying online interactions, but companies are missing out on a huge source of revenue.

“At £320bn a year, the over-50s now account for around 47% of all UK consumer spending.”

- Joseph de Garr Wilkinson, UX & technology talent recruiter, Zalando

“The value of UX is not wasting time and money developing the wrong solution.”

- Jeff Humble, lead UX designer, CareerFoundry

4) Research from Saga and the Centre for Economic and Business Research
Failure to invest in UX design is currently creating a billion-dollar loss of revenue, a loss that will become a trillion-dollar issue over the next 3 years in e-commerce alone. This is an internal resource issue as well. Projects take longer to deliver, use more people-power both during and after completion, get stalled by avoidable faults and issues and are more expensive to alter or improve.
“Design-driven businesses have outperformed the S&P by a whopping 228% over the past 10 years. The bottom line, good design = good business.”

- Joanna Ngai, UX designer, Microsoft

5) http://cargocollective.com/joannangai/about
The positive impact of investing in UX design

“Investment in UX is often the difference between businesses that grow and those that sputter.”
- Roman Nurik⁶, designer and design advocate, Google

When we take a look at the numbers, it’s clear that investment in UX design is a financial win for companies of all sizes, and in all industries.

A 2016 design study⁷ of 408 different companies found that the more a company invested in and focused on design, the more sales they saw, the higher their customer retention and customer engagement was, and the faster they moved through their product cycles. All this simply because they kept UX design, and more importantly, the user, at the very core of their business.

Return of Investment

The return of investment in UX design is $100 dollars for every $1 invested.

⁶) http://roman.nurik.net/
The companies with the highest investment in UX, referred to as “Design Unicorns” saw their sales increase by a considerable 75%, while companies who were less invested in UX (who considered themselves simply “design-centric”) still saw their sales increase by 60%.

Experience Dynamics\(^8\) made the case for this back in 2014, when they revealed that the input of a UX designer reduces the amount of time developers have to re-work a product by up to 50%, and reduces development time overall by between 33% and 50% by improving decision-making and helping to prioritize development tasks.

Not only does it make it possible to hire fewer developers, it also means companies which invest in UX design are able to release their products earlier. In terms of innovation, being first to market is paramount.

“The value of UX is not wasting time and money developing the wrong solution.”
- Jeff Humble, lead UX designer, CareerFoundry\(^9\)

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**Time savings**

The input of a UX designer reduces the amount of time developers have to re-work a product.

![Time savings chart](https://www.experiencedynamics.com/blog/2014/07/making-strong-business-case-roi-ux-infographic)


The most obvious financial benefit of having a UX designer on board is the impact the design has on attracting and retaining users. This is why a UX designer is traditionally brought on to a project on day one, and stays with it right until it's with the customer and beyond.

“Happy users are ultimately happy and returning customers.”
- Clive K. Lavery, senior UX person and co-organizer, UX Camp Europe

Satisfied users are the key to any successful project so much so that 70% of projects fail due to lack of user acceptance. This is even more true of mobile businesses. The same Experience Dynamics report stated that one e-commerce site where product pages were specifically optimized for customers using mobile, saw a 30% growth in sales and a 50% decrease in bounce rate. It was found that 86% of users preferred using mobile apps over mobile sites due to their ease of use.

Overall the Future of Design in Startups Survey found that the five biggest benefits for companies who had a UX-focus were:

1. Boost in revenue and conversion
2. Fewer support calls, therefore fewer employees
3. Increased customer satisfaction
4. Reduced development waste
5. Lower risk of the development of a wrong idea

10) https://twitter.com/cklavery
Further research highlights:

- On average, every dollar invested in UX brings 100 dollars in return. That's an ROI of an impressive 9,900 percent.\(^\text{13}\)
- According to a study undertaken by Forrester\(^\text{14}\), companies which invest in the user experience see a lower cost of customer acquisition, lower support costs, increased customer retention and increased market share.
- The same study showed that when compared to their peers, the top 10 companies leading in customer experience outperformed the S&P index with more than triple the returns.

“At one company we redesigned the checkout flow and achieved an increase in conversion by up to 105% (mobile traffic, 85% desktop traffic). Some UX projects have a very direct impact on the bottom line.”
- Tobias Treppmann, Mentor at CareerFoundry\(^\text{15}\)


\(^{15}\) [http://tobystereo.github.io/portfolio/](http://tobystereo.github.io/portfolio/)
As we have seen here, there is an enormous potential for growth that is not being tapped into. Every dollar invested in UX design right can bring a $100 dollar return. That’s because, essentially, happy customers complete transactions, recommend their friends, and return. Put simply, when users value and enjoy an experience or interaction with a product they want to do it again.
“UX can take a good product and multiply its value.”

- Sagi Schrieber, co-founder, Hacking UI
UX Design Impact for Humans: So Much More Than Money
“UX provides tools and methods that bring insights about people that help organizations avoid arguments, breakups and flirtations with competing suitors.”

- Per Axbom, co-host, UX Podcast
The impact of UX design also has human “returns” which can be categorized as positive or negative. Here is a comprehensive compilation of the ways UX design impacts human lives.

**Global UX Interest**
Search popularity by region according to Google Trends

1. South Korea
2. India
3. Australia
4. Canada
5. United States
The positive human impact of investing in UX design

“If you want to offer products or services that have value for your customers, you must first make the effort to understand what customers consider valuable.”
- Jan Jursa, author of UX Storytellers 16

Traditionally- MRI scans are a traumatic experience for children and adults- patients who are usually already in a state of distress or discomfort. This is because MRIs were developed with the results of the scan in mind, not the user’s experience being inside or interacting with the machine. The value to the user in this instance is not only the result of the scan, but the experience as a whole.

As Jennifer Aldrich, UX & content strategist at InVision 17 and a blogger at User Experience Rocks, explains, the UX of medical equipment has an enormous impact on patients and their families’ lives. It can also have a massive impact on health.

“5 years ago my daughter temporarily lost her vision - it was one of the most terrifying experiences of my life. She was rushed to the ER and they did a CT scan. The results came back showing an abnormality on the right side of her skull so they immediately sent her to radiology to have an MRI, where she had a massive panic attack. They tried to sedate her, but she had an adverse reaction to the medication.”

The work of Doug Deitz of GE Healthcare 18 addresses this very issue. Deitz had created a design for an award-winning MRI scanner. However after realizing that many of his patients were terrified of having MRIs, he decided it was time to change the design to better accommodate their needs and reduce the natural fear that comes with medical procedures.

He went away and studied the human-centered approach to design and innovation. By observing and talking to users of existing products and services, he was able to better understand his patients’ fears and redesign the MRI scanner to meet not just his own medical purposes but also the needs of his patients. He improved the UX of MRI’s for children so drastically that they now ask to have them done again.

16) https://about.me/jan.jursa
17) https://www.invisionapp.com/
18) http://t.yesware.com/
The impact that focusing on UX can have on the lives of people interacting with a product can be profound. In the case of these children, what was valuable to them, and their parents, was making the experience of having an MRI a delightful rather than terrifying one.

The positive effects of UX design on human life are now being seen in our towns and cities. Anthony Lyons, city manager of Gainesville, Florida, made it his mission to make the city the best place to live and work, and he planned to achieve this using human-centered design. This strategy was applied to a range of architectural and public policy decisions.

“It made sense to create opportunities for Gainesville residents to invest in their own local future - to be able to envision and implement their own dreams of how they want to be part of the city and have a role in building it as business owners, whether this is as restaurant owners or technology companies,” says Kate Lydon, public sector portfolio director at IDEO, San Francisco.

“The impact of UX is apparent, and most important, where it has a positive effect on the product’s audience and customers.”

- Luke Chambers, founder, UX Mastery
The negative human impact of not investing in UX design

“The best way to explain the impact of good design is to look at the outcomes of bad design, that customers have to live with for years and years. Low customer satisfaction, additional development efforts, increase in customer support efforts are typical indicators of poorly done designs.”
- Arun Yashwant, CareerFoundry Mentor

There are numerous examples of bad user experiences negatively impacting human life. How Bad UX Killed Jenny by Jonathan Shariat shows how this led to the death of a patient, as her nurses were unable to easily operate an interface that informed the patient’s treatment. In another case an ebola patient was sent home accidentally, and in another a pilot accidentally plotted the wrong course for his flight.

“What we must validate is if our target users need or want our products.”
- Professor Jaime Levy, UX strategist and author

20) http://www.arunyashwant.com/
21) https://medium.com/tragic-design/how-bad-ux-killed-jenny-ef915419879e#.qdiitpk9
23) http://blog.martindoms.com/2011/01/24/poor-ui-design-can-kill/
A larger scale example of when the UX design of an interface had a negative human impact was The Three Mile Island accident\(^\text{24}\). This was a partial nuclear meltdown that happened in a reactor at the Three Mile Island Nuclear Generating Station in Pennsylvania, USA.

Due to a combination of human factors and poor design, problems were encountered with the reactor control system’s user interface. Despite a valve being stuck open, engineers interpreted the light on the control panel to mean it was closed. This meant that engineers did not realize there was a problem for several, crucial hours.

Due to bad user interface design, high levels of radioactive gas were released into the environment, causing a suspected increase in incidents of cancer in the local population, as well as increased rates of “death and disease” amongst local livestock and animals.

We have seen in this section the effect that having a user-centric process can have in industries not typically associated with UX design; healthcare, transport and nuclear energy.

\(^{24}\) [https://en.wikipedia.org/wiki/Three_Mile_Island_accident](https://en.wikipedia.org/wiki/Three_Mile_Island_accident)
As these examples have made clear: small user-focused design changes can have significant impact on the lives of individuals and communities. This is why the human ROI of UX should always be considered and should never be an afterthought.
“How do I explain what I do at a party? The short version is that I say I humanize technology.”

- Fred Beecher, director of UX, The Nerdery
Learnings from UX-Centric Companies
“Google teams design the product based on what people (some call them users) really need to know.”

- Tomer Sharon, head of UX, WeWork, formerly of Google
We’ve seen the stark difference that having a UX team, or not, has had on the examples in the previous two sections. But when we think of companies that are truly UX-led, who are the main players?

In this segment you’ll learn about the leading companies who have put their success down to a user-centric approach. Irrespective of the industry, it’s clear that investment in a solid UX strategy has seen these giants grow at a lightning rate - putting the user front and center of every decision made.

“It’s a competitive differentiator.”
- Marieke McCloskey, director research and product, User Testing

25) http://rosenfeldmedia.com/books/why-we-fail/
Airbnb

Airbnb was created to make the experience of finding somewhere to stay a delightful one for the user - both guest and host. It’s intuitive, beautifully-designed, and user-centric from start to finish.

The whole UX of Airbnb is based around trust. The profile images, Facebook verification, reviews and passport upload system builds trust between those looking to rent out their places and those looking for a place to stay. Having that stamp of authority from Airbnb on the transaction creates a safety net for travellers and hosts.

It isn’t just the online experience that is seamless. The transfer from online to offline is also without any friction. The promise might be made on a website, but it is fulfilled in the real world.

So successful has Airbnb’s UX strategy been that Airbnb’s Joe Gebbia credits UX with taking the company to $30 billion.25

“Amazon UX = pure customer centricity.”
- Paul Rouke, founder and CEO, PRWD

25) http://www.forbes.com/sites/forbestechcouncil/2015/11/19/good-ux-is-good-business-how-to-reap-its-benefits/#6e89a02e3c53
HubSpot

In a recent major iteration of HubSpot.com, the company decided to re-think the user experience on the site, starting from the ground level with user feedback. They tested entirely new conversion flows, copy messaging, and even visual treatments. As part of the process they pushed countless experiments live and iterated with each piece of feedback, putting the user in control.

From start to finish, the whole project took 3 months with a team of 3 designers in total (one for UX, and two for Visual Design). The approach was above all lean, and the project moved through each stage at lightning speed.

What was the result? In the end, the conversion rate doubled (tripled, even, in some areas). As HubSpot.com receives upwards of 10 million visitors per month, we can therefore deduce what impact this had on revenue.

“UX is impact.”
Austin Knight, senior UX designer, HubSpot  

Google

The fantastic user experience with Google is well-documented. Whether it’s when using the search bar that made the company so famous, or Google Docs, Google Mail or Google Maps, it’s clear that Google’s UX strategy is at the forefront of everything they do. And it’s paid off.

“Google teams design the product based on what people (some call them users) really need to know.”
- Former Google employee, and head of UX at WeWork, Tomer Sharon

27) https://twitter.com/tsharon
Google’s UX strategy is split into five phases: Unpack, Sketch, Decide, Prototype, Test. This process provides numerous opportunities for iterations to be made before implementation begins. I.e., before huge investment is made in development. As previous examples have already demonstrated, making changes later down the line is not only much more expensive, it takes a lot more time.

“Looking at companies with great design like Google, Apple, Airbnb etc., it’s obvious that without great design, they wouldn’t be at where they are right now.”
- Taylor Ling, design expert, Google.

When thinking about and working towards understanding user behaviour, Google uses the HEART framework. Google noted that it was no easy task measuring user experience on a large scale (when done automatically) if there was no framework in place. They therefore created the HEART framework to solve this problem. HEART is an anagram for Happiness, Engagement, Adoption, Retention and Task Success. The idea behind the framework was to be able to deliver metrics about the user that allow an organization or team to measure the user experience on a large scale to inform decision-making during product development.

This approach ensures that every product that Google develops has to adhere to these user-specific categories. In following this framework Google is putting the user front and centre of everything it creates. The results speak for themselves.

“Focus on the user, and all else will follow.”
- Google.com

28) https://developers.google.com/experts/people/taylor-ling
29) https://www.interaction-design.org/literature/article/google-s-heart-framework-for-measuring-ux
Amazon

The retail giant which began as a bookseller has always kept its users at the front and center of everything it does. Jeff Bezos, founder of the company, invested 100 times more into customer experience than advertising in the first year of Amazon launching.  

Amazon is known for its ‘reactive design’, that is it reacts swiftly to a customer’s engagement by applying personalized attention to increase that user’s overall feeling of satisfaction. This reactive experience design is a powerful way to increase customer engagement throughout.

Apple

“The best example is the largest company in the world (by market capitalization), Apple. Read their statements carefully, and observe yourself while using their products: though they’re not perfect, they take UX seriously.”  
- Stefan Freimark, creative director (UX) at Interactive Tools

Apple’s user experience is focused on a strong immersion experience: turning customers into fans of the brand. Apple customers aren’t just users, they preach about its products. To convert a customer from a user into a defender of the experience, you need strong immersion design.

“Nokia had good design but did not invest to the radical extent that Apple (and Google) did (in UX design) and so Nokia went from the biggest mobile phone manufacturer to essentially extinct in a matter of years.”
- Victor Lombardi, author of Why We Fail

31) http://www.interactive-tools.de/
32) https://www.forbes.com/sites/sungardas/2014/03/21/three-kinds-of-user-experience-design-fuel-amazon-google-apple/#604ef4181f9
33) http://rosenfeldmedia.com/books/why-we-fail/
In this segment we saw how leading companies like Airbnb, Google and HubSpot credit their rapid growth and expansion to a user-centric approach. UX design enables smoother in-house processes between teams, and ensures a product that fulfills their user’s direct goals and needs. The combination of these approaches increases growth, customer conversion and retention and crucially ensures no money is wasted developing the wrong product or idea - a saving that, as we have seen, goes into the billions.
“Projects with personas have an ROI of up to 4x more than projects without them”
(Source: Forrester)
- Sara Kremer, senior user experience architect, Eventbrite
Conclusion:
What Did We Learn?
“Care for happy customers, and the money will follow.”

- Stefan Freimark, creative director (UX), Interactive Tools
Conclusion: What Did We Learn?

We learned that the world we live in is not built for the user. More often than not, products are built simply with the goals of the business in mind, forgetting the user’s own goals and needs. So much so, that in e-commerce alone failure to invest is creating a billion-dollar loss of revenue, a loss that will become a trillion-dollar issue over the next 3 years.

Even small investment in UX design led to massive financial returns for businesses: invest $1 in UX and it is possible to see a return of $100 dollars (or more). In addition to the significant increases in both revenue and conversion for the companies mentioned, there are also enormous savings to be had: UX-centric organizations need fewer support calls, have increased customer satisfaction, reduced development waste, and lower risk of developing the wrong idea.

The human impact of UX design can be a matter of life and death. Badly designed interfaces can be the cause of large-scale disasters, like the Three Mile Plant accident, as well as life or death situations for individuals. We learned that UX design is not limited to business alone: industries such as healthcare, transport and nuclear energy benefit hugely from keeping their interfaces designed for those who use them.

We invite you to join us in working towards transforming the world into a more user-centric place - as we have seen, the results speak for themselves.

Find out more about the work we do:

c theux.school

“What we must validate is if our target users need or want our products.”
- Professor Jaime Levy, UX strategist and author

34) http://www.forbes.com/sites/forbestechcouncil/2015/11/19/good-ux-is-good-business-how-to-reap-its-benefits/#440e8c8f3c53
35) https://twitter.com/JaimeRLevy
“It’s got to be usable or the product will crash and burn straight away.”

- Cory Lebson, author, UX Careers Handbook
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We’d like to thank the following industry experts for their insights, help and contributions to this white paper.

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Tomer Sharon, head of UX, WeWork
Victor Lombardi, author, Why We Fail
Zayera Khan, CareerFoundry UX design Mentor
“The world is not made for the user, which will cost businesses trillions of dollars.”

- Raffaela Rein, founder, The UX School