



Stack Overflow 2017 User Research

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As Stack Overflow approaches a decade of helping the world's developers learn, share knowledge, and build their careers, understanding the goals and motivations of users is more important than ever in keeping developers engaged.

50 million programmers every month visit Stack Overflow to learn new skills, search for jobs and get answers to programming questions. By understanding the goals these users have and experiences they care about, we can continue to grow Stack Overflow as the most trusted online community for developers.

Stack Overflow's greatest strength is offering free access to questions and answers from the world's greatest technical talent. This has lead to opportunities in developer marketing, technical recruiting, market research, and enterprise knowledge sharing.

The crowd sourcing of Q&A since 2008 has built an amazing community that many developers depend upon to get work done and learn new skills. However, over the years a few weaknesses have surfaced as Stack Overflow's Q&A swells. Some users excel within the Stack Overflow community, but many more lack the motivation required to participate on a regular basis and still others are hesitant to even start participating. Understanding the diverse makeup of Stack Overflow users will prevent the threat of users switching to alternative Q&A platforms.



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Part I

Getting to know Stack Overflow

Stack Overflow Offices, New York City



Economic, Social & Technological Goals

TECHNICAL RECRUITING

Recruiting within technical fields such as programming is booming and tech companies are paying top dollar for the perfect candidates. Stack Overflow has the most active developer community in the world and has the ability to place job openings in front of passive job seekers, an ability job boards alone will never have.

DEVELOPER MARKETING

The very nature of Stack Overflow's Q&A allows for advertising that reaches developers when they're most open to learning about new products while answering their questions and solving their immediate problems.

“Developers come to Stack Overflow to get answers to their coding questions. Whether they’re looking for help related to a work task or a hobby side project, developers on our site are in a problem-solving frame of mind. Advertising to them about a relevant product or solution doesn’t disrupt their workflow.”

— stackoverflowbusiness.com

QUESTION AND ANSWER

The social impact Stack Overflow has had on programming establishes it as one of the most trusted sites in the developer community. Stack Overflow along with the entire Stack Exchange network of sites is built by developers for developers. Continuing to add new communities to the Stack Exchange network is a continuing goal.

ENTERPRISE KNOWLEDGE SHARING

The technology that powers Stack Overflow can be leveraged within other organizations. Developers already know how to use Stack Overflow and allowing private instances speeds up knowledge sharing, employee on-boarding, and empowers teams to find answers to proprietary questions.



Environmental Forces

SUBSTITUTIONS & ALTERNATIVES

Stack Overflow is unique in that it offers free access to some of the world's greatest technical talent. Several potential substitutions exist, yet none combine fast turnaround, industry expertise and high reputation for no cost.

BARGAINING POWER OF BUYERS

Buyers of ad space on Stack Overflow get access to a very targeted, extremely loyal and highly recurring group of users. This allows Stack Overflow to be very selective in who it partners with. These same users also put Stack Overflow in a strong position with buyers of job ad space. Stack Overflow has an advantage over most technical websites in that its visitors can answer the internet's most difficult technical questions.

THREAT OF NEW ENTRANTS

Organizations in the tech industry are often susceptible to new entrants disrupting established business models. The type of user who visits Stack Overflow is also the type of user who is interested in new and emerging technology. This includes question and answer websites such as Quora, Site Point, and even Reddit.

BARGAINING POWER OF USERS

A small subset of Stack Overflow's user base supplies the site with crowd-sourced questions and answers. Stack Overflow is largely dependent on these repeat user interactions and a shift in community preference to another platform would greatly disrupt traffic to Stack Overflow.

EXAMPLE SUBSTITUTES

- Co-workers, Classmates, & Friends
- Documentation, Manuals, & Books
- Blogs, Tutorials, & Forums
- YouTube
- Mentor Services such as Pluralsight
- Online Code Schools such as Egghead
- Meetups & Conferences
- Colleges & Universities

A person is shown in profile, sitting at a desk and working on a laptop. Their hand is resting on their chin in a thoughtful pose. On the desk, there is a black coffee cup with steam rising from it, a smartphone, and a small bowl. The background is a soft, out-of-focus indoor setting. The entire image is overlaid with a semi-transparent gradient that transitions from orange on the left to purple on the right.

Part II

Understanding Stack Overflow Users



User Interviews

Speaking with Stack Overflow users revealed diverse interactions patterns across different persona types. Users initially interact with Stack Overflow when searching for answers to programming questions, of which nearly 80% create an account on Stack Overflow. Some users then go on to participate in Q&A, earn reputation points, collect badges and more.



ASK

Users frequently mentioned Stack Overflow as their favorite way of continuing to learn new programming languages and techniques.



ANSWER

Developers interviewed even attempt answering questions on Stack Overflow they don't know the answers to as a way of learning new concepts.



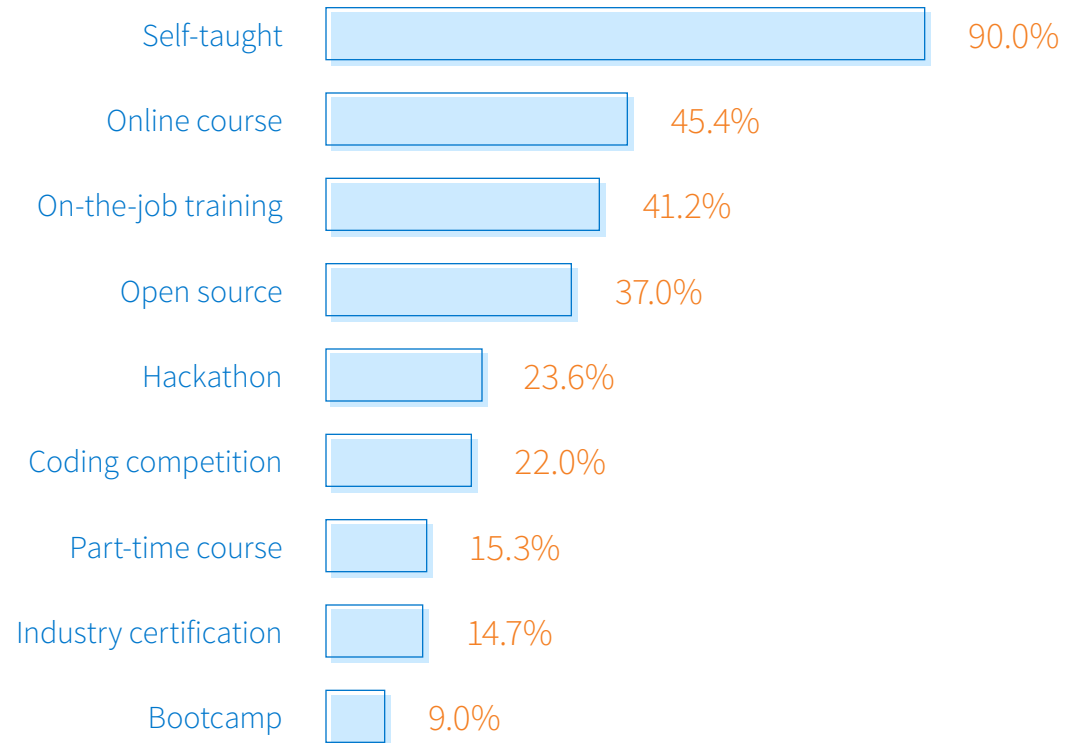
VOTE

Voting on questions and answers along with earning reputation points and badges is a favorite among those who frequent Stack Overflow.



Love to Learn

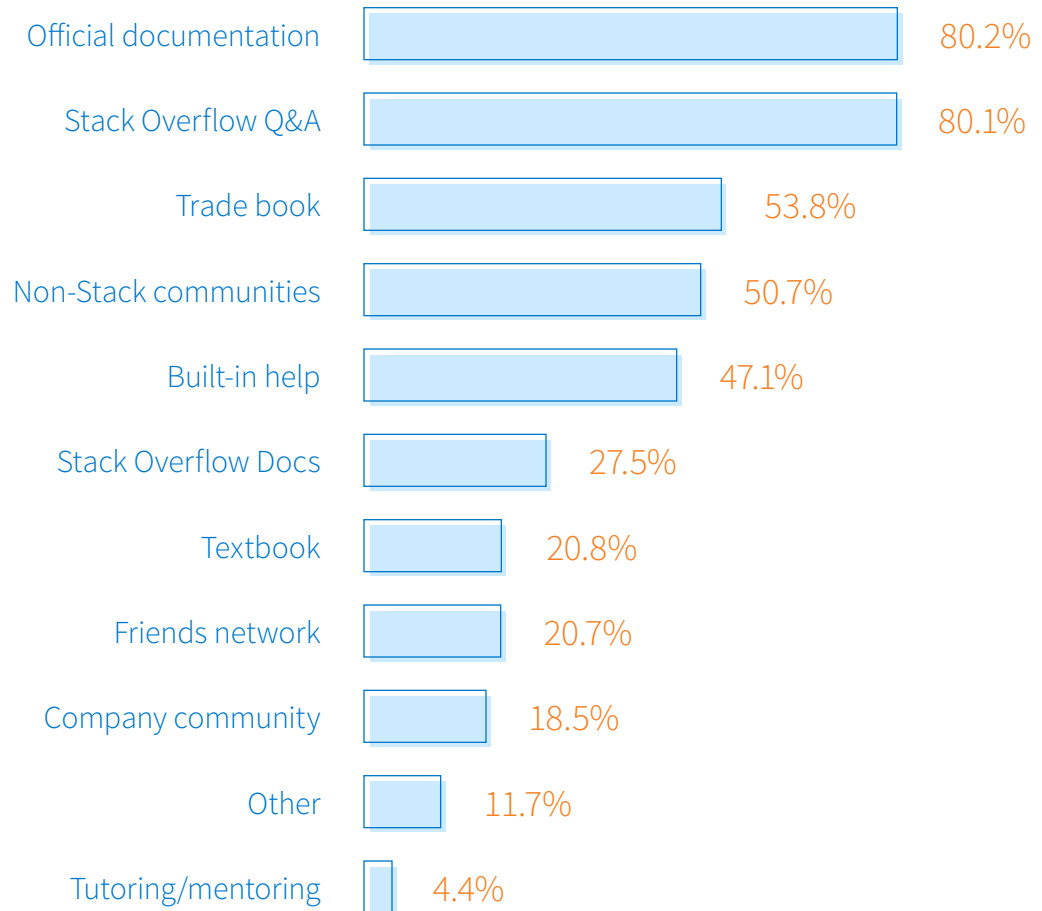
Stack Overflow 2017 developer survey results support conducted user interviews, showing that continuing education is very important to Stack Overflow users. 90% of respondents engage in some form of self teaching and about 45% of respondents reported taking online courses.





Ways to Learn

The survey also supports user interview findings that Stack Overflow is a top source for learning new skills. Fostering an online community where members share ideas and offer critical feedback is essential in attracting new users and preventing existing users from churning.





The Rockstar

BACKGROUND

Steve, 27 years old, aced all of his information science classes in college and did fairly average in the rest. During the middle of his senior year he and a few other classmates kicked around the idea of forming a startup company. Steve attended a few quick pitch competitions, but ultimately realized running a company wasn't for him. He's carefree and lives to have fun. When asked Jobs or Wozniak, he replies: Jobs who?

STACK OVERFLOW PRODUCT GOALS

Steve uses Stack Overflow like a game. He participates as often as possible in his quest for more reputation points and to earn his next Stack Overflow badge, gold of course. He's in the top 0.1% of users and when he's not answering questions he's editing the questions and answers of others for clarity or marking them as duplicates. He only created his account three years ago, but since day one he's made it his goal to double the amount of reputation he has each every year. Though he would deny it, there have been days at work where Steve has spent the entire day answering questions on Stack Overflow.

STACK OVERFLOW EXPERIENCE GOALS

He loves checking his Stack Overflow reputation and does so almost hourly. Steve also enjoys searching for unanswered questions via his favorite tags and aims to be the first person to post answers on newly asked questions. He actively answers several questions per week and often gets side tracked answering questions while waiting for his coffee to brew.



"I don't ask the questions on Stack, I answer the questions."

— Steve, Software Engineer

STACK OVERFLOW USER STATS

Reputation: 96,984
Member for: 4 years 7 months
Questions Asked: 11
Questions Answered: 3,291
Votes Cast: 5,117



The Dabbler

BACKGROUND

Travis, 36 years old, works as a full stack web developer for Northwestern Mutual Life Insurance Company in Milwaukee, WI. He primarily codes in C# along with writing SQL and is entrenched in Microsoft's .Net environment. He is often under pressure to meet product launch deadlines and keep his team on, or even, under their estimated story points. Travis has been married for seven years, has three children, and two cats.

STACK OVERFLOW PRODUCT GOALS

Travis uses Stack Overflow to get work done. He uses the website daily to search for answers and when he finds an answer that's useful he tries to remember to come back later and upvote it, but he usually forgets. Most of his posts and reputation points are from when he initially created his Stack Overflow account. When searching for answers on Stack Overflow he usually skips those which are not marked as the accepted answer since he doesn't have time to experiment with untested solutions.

STACK OVERFLOW EXPERIENCE GOALS

Travis loves that other users post questions, but he only posts questions after spending several hours attempting solutions on his own or with his team. He also rarely posts answers, typically only doing so when he's having a very light work week; which doesn't happen often. He feels it takes too long to put together an answer that will be accepted or voted on and feels if you're not first to post an answer then you might as well not post one at all. He doesn't mind upvoting questions and answers, but usually only does so on posts he has come across while looking for answers.



"Stack Overflow is like having a team of developers at my computer that pretty much know the answer to any question I could ask."

— Travis, Web Developer

STACK OVERFLOW USER STATS

Reputation: 3,162
Member for: 6 years 2 months
Questions Asked: 6
Questions Answered: 27
Votes Cast: 413



The Lurker

BACKGROUND

Amy, 23 years old, is wrapping up her final year as a Computer Science student at the University of Wisconsin-Madison with a minor in math. For the past two years she has been an intern at Ravensoft where she programs in C++ building advanced physics engines for video games. She lives by herself in a studio apartment just off campus so she can walk to classes and take the bus to work.

STACK OVERFLOW PRODUCT GOALS

Amy has used Stack Overflow to get answers to her programming questions ever since she started writing code and she has even made a Stack Overflow account. Though she's always had the intention of posting her own questions and answers, Amy has yet to post anything. Just when she thinks she's about to make her first post she gets a little nervous and intimidated by the community and its combined knowledge. This hesitation to ask a question or post an answer on Stack Overflow prevents Amy from acquiring reputation points which she needs to unlock permissions on the site which would allow her to contribute to Stack Overflow beyond posting questions and answers.

STACK OVERFLOW EXPERIENCE GOALS

Though she hasn't made a single post to date, she couldn't live without Stack Overflow's answers. She finds the site easy to navigate and her favorite feature are accepted answers and upvotes. When choosing between which answer to implement first she usually goes by which one has the most votes.



“Whenever I think about asking a question on Stack Overflow I think about how my question might not come out right or that it might have already been asked by someone else and asking it again might get everyone all ‘internet angry’ at me”

— Amy, Developer Intern & Student

STACK OVERFLOW USER STATS

Reputation: 1
Member for: 4 years 9 months
Questions Asked: 0
Questions Answered: 0
Votes Cast: 0



Part III

Identifying Areas of Improvement



Increasing Participation

FEW GO BEYOND LOOKING UP ANSWERS

Most users never actively participate with the Stack Overflow community, for them, Stack Overflow is a bank of answers to their programming questions. Of the 8 million users who have registered, only 23.1% have asked more than one question and only 1.6% have asked more than 5 questions.

WHY?

Many users feel there are no more questions left to ask; anything you would ever want to know is already on Stack Overflow.

Stack Overflow's reputation and permission system fosters a site environment that can sometimes feel unwelcoming to new and/or low-reputation users.

50 million



monthly
visitors

8 million



registered
users

23.1%



asked > one
question

1.6%



asked > five
questions



The Need for New Questions



USERS COME FOR STACK'S ANSWERS

Everyone loves Stack Overflow for its answers, but not so many people love posting questions. A decline in users posting questions leads to fewer answer posts.



Q&A DRIVES STACK OVERFLOW TRAFFIC

Q&A is a major driver of traffic to Stack Overflow and user interviews have shown that Q&A is by far the leading feature users interact with on Stack Overflow. Without new questions, traffic doesn't grow.



Q&A PROMOTES DEVELOPER EDUCATION

As new programming languages and techniques come about developers are going to continue to need help learning them. Getting that content on Stack Overflow starts with users posting new questions.



Task Analysis: Finding an Answer

This task analysis is an observation of Stack Overflow user Justin Valerius (1686485/tymejv) in his office as he was searching for an answer to a programming question using Google. He was at his computer in his office and the search to find what he needed took about three minutes.

Of the four links Justin opened, all of them were from Stack Overflow. Interestingly, his first search led to him immediately going past the first page of Google. Had mentioned that he usually never goes past the third page of Google results and will usually attempt about four searches before stopping to try again later.

When asked why he chose not to post a question after failed search attempts he said he never thought of it; he's grown accustomed to finding answers and answering questions on Stack Overflow, not posting questions.

- ▼ Focuses Browser
- ▼ Opens new tab
- ▼ Focuses search input
- ▼ Adds keywords
- ▼ Submits query
- ▼ Scans results
- ▼ Goes to second results page
- ▼ Scans results
- ▼ Opens fifth link
- ▼ Scans page for answer
- ▼ Goes back to search results
- ▼ Scans results
- ▼ Opens second link
- ▼ Scans page for answer
- ▼ Goes back to search results
- ▼ Focuses search input
- ▼ Adds new keywords
- ▼ Submits query
- ▼ Scans results
- ▼ Opens first link
- ▼ Scans page for answer
- ▼ Starts implementing answer
- ▼ Deletes code
- ▼ Focuses Browser
- ▼ Goes back to search results
- ▼ Opens fourth link
- ▼ Scans page for answer
- ▼ Implements answer
- ▼ Task Complete



Task Analysis: Posting a Question

This task analysis is an observation of Stack Overflow user Daniel Hopkins (1556005/daniel) in his office as he was preparing to post a question on Stack Overflow. He was at his computer in his office and the post took about nine minutes. He did not complete the post because he didn't like how he worded it and thought if he kept looking he could find the answer online.

"I can't word it right, [the Stack Overflow community] will just get pissed at me if I post this."

— Daniel Hopkins, Web Developer at AccuLynx

Daniel has only made eleven posts since 2012 and during user interviews remarked that he doesn't post questions more frequently because he doesn't "want everyone getting all internet angry" at him, referring to Stack Overflow users.



- ▼ Focuses Browser
- ▼ Opens new tab
- ▼ Navigates to stackoverflow.com
- ▼ Clicks "Ask Question" button
- ▼ Clicks "proceed" link
- ▼ Page refreshes
- ▼ Scans page
- ▼ Checks "thanks" checkbox
- ▼ Clicks "proceed" link
- ▼ Enters post title
- ▼ Scrolls tool tip and search results out of view
- ▼ Enters tags
- ▼ Focuses question body textarea
- ▼ Spends several minutes wording question
- ▼ Abandons post because he "can't word it right"

The background image is a photograph of a stone path leading through a series of wooden frames, creating a tunnel effect. A lantern is visible in the distance. The image is overlaid with a gradient from orange on the left to purple on the right.

Part IV

Finding the Magical Happy Path

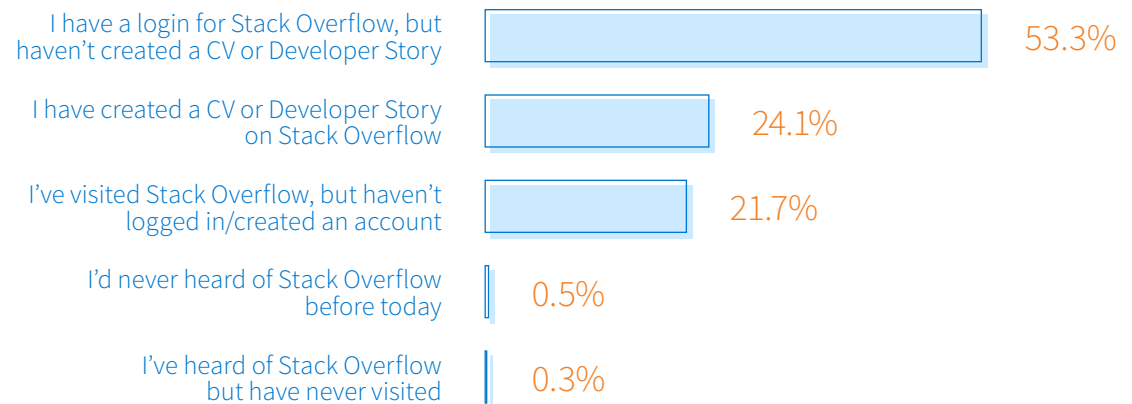


The Happy Path

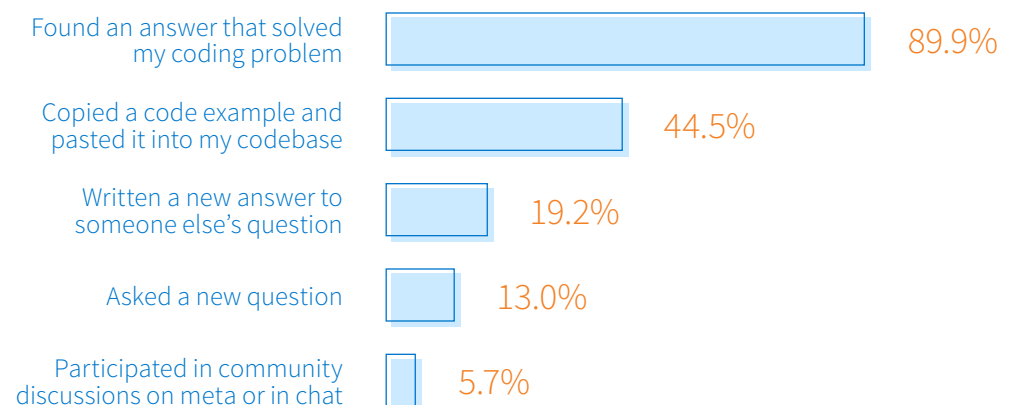
Assuming technology can solve all of our problems and where it fails we can use magic, the happy path takes our users from problem to solution without the messy implementation details.

It's important to keep in mind users engage with Stack Overflow in different ways, to different degrees and with different product offerings.

How Are Survey Respondents Engaging on Stack Overflow?



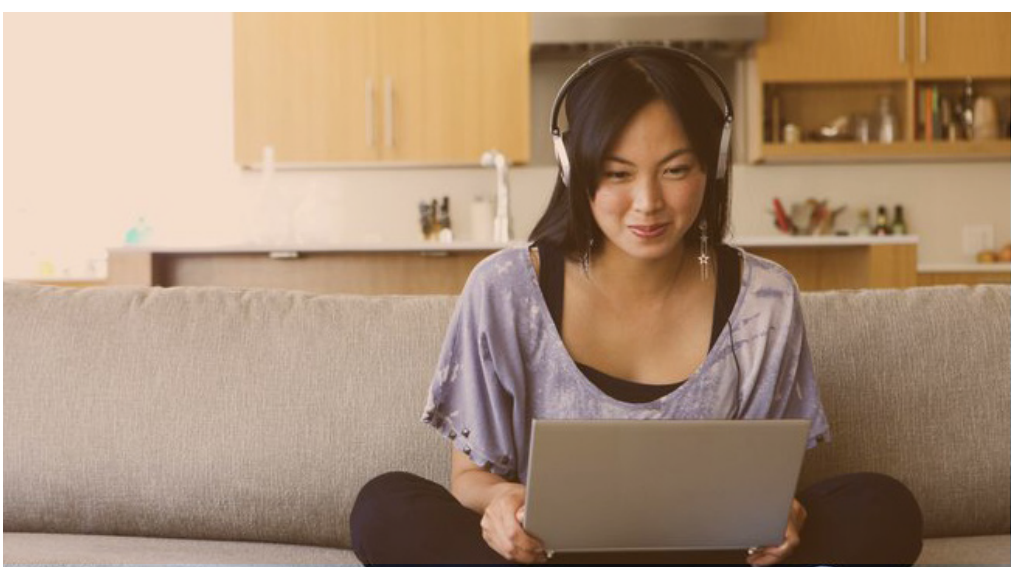
How Often Do Stack Overflow Users Find What They Need?





Journey Map

Amy's journey map represents every interaction she has leading up to, during, and after posting a question on Stack Overflow. Mapping her experiences and pain points along with areas for improvement at such high detail allows for visibility into the moments where she might abandon her task. This opens the possibility of addressing each issue independently of the others while keeping their context within her overall goal.



Preparation

1

- 7:58am**
person to person
OFFICE ACTIVITIES
Get coffee.
Eat breakfast.
Mingle.
- 8:27am**
person to computer
OPEN
Chat: Slack.
Code editor: Visual Studio.
Mock-up: Sketch App.
Web browser: Chrome.
- 8:29am**
LOGIN
VPN: SoftLayer.
E-mail: Gmail.
Calendar: Google Calendar.
Code repository: GitHub.
Project management: JIRA.
- 8:37am**
REVIEW
Yesterday's tasks.
Today's tasks.
- 9:06am**
COORDINATE
Today's tasks with team.

Code

2

- 9:27am**
SETUP
Pull code from repository and open the project.
- 9:31am**
SEARCH
Search the project for the code which is causing the bug.
- 9:34am**
ATTEMPT FIX
Try to fix the bug and run the project, bug still exists.

PAIN POINT
Failed attempts cause frustration.

Investigate

3

- 10:21am**
RESEARCH
Browse official documentation for possible fix.
- 10:34am**
GOOGLE THE ERROR
Search Google with keywords related to the bug or error.
- 10:34am**
SCAN SEARCH RESULTS
Look through search results for relevant and likely matches.
- 10:34am**
OPEN LINK
Click link and open page.
- 10:34am**
SCAN PAGE
Skim page for answers.
- 10:35am**
IMPLEMENT ANSWER
Test new solution in project.
- 10:49am**
CONVERSE
Talk to co-workers and ask if they have encountered this bug or similar bugs in the past.
- 10:57am**
CONTEMPLATE
Ponder posting first question on Stack Overflow.

PAIN POINT
Documentation is often hard to navigate or nonexistent.

PAIN POINT
Picking the right keywords can be challenging.

PAIN POINT
Search result titles & descriptions can be inaccurate or misleading.

PAIN POINT
May not contain a valid solution.

PAIN POINT
Solution does not work.

PAIN POINT
Finding a co-worker best suited to help can often be difficult.

ROOM FOR IMPROVEMENT
Anxiety about question posting process and how the community might react to the question.

Open Stack

4

- 11:02am**
VISIT
Navigate to Stack Overflow and click the "Ask Question" button.
- 11:02am**
SEARCH
Do one last search on Stack Overflow for a possible answer.
- 11:21am**
TIPS
Read brief list of bullet points on writing a good question.
- 11:21am**
CONFIRM
Checkbox confirming you have read the tips.
- 11:21am**
PROCEED
Click proceed button and start composing question.

PAIN POINT
Performing another search after previously attempting several failed searches can be frustrating.

ROOM FOR IMPROVEMENT
List of rules, what not to do and what could go wrong can add to anxiety.

ROOM FOR IMPROVEMENT
Feels a bit like accepting terms and services.

Compose

5

- 11:21am**
ADD TITLE
Add a succinct, descriptive and keyword rich title.
- 11:23am**
TITLE TIP
Read and dismiss tool tip about posts with similar titles.
- 11:23am**
DUPLICATES
Scan list of possible duplicate posts.
- 11:24am**
ADD BODY
Add question, along with code sample and/or images.
- 11:39am**
PREVIEW BODY
Review how post will actually appear when published live.
- 11:39am**
ADD TAGS
Categorize post by adding up to five keywords.

ROOM FOR IMPROVEMENT
Validation criteria only appear when title is invalid

ROOM FOR IMPROVEMENT
Usage of tool tip pattern is an inconsistent pattern not commonly found on other Stack pages.

ROOM FOR IMPROVEMENT
List abruptly appears and shifts interface which could be unexpected for first time users.

ROOM FOR IMPROVEMENT
As body content grows body preview get pushed out of view prohibiting side-by-side comparison.

ROOM FOR IMPROVEMENT
No explanation on what tags do or why they're useful.

Implement

6

- 11:39am**
WAIT
Wait for an answer to post.
- 11:41am**
NOTIFICATIONS
Receive emails when new posts are created on the question.
- 11:44am**
TEST
Test new solution in project.
- 11:52am**
ACCEPT
Mark correct solution as accepted and up vote.
- 11:53am**
CONTINUE CODING

PAIN POINT
Waiting for answers can be frustrating.

PAIN POINT
Solution does not work.



Scenario: The Reluctant Poster

VISION STATEMENT

Prompting an existing Stack Overflow user to post a question upon successive page loads of similar posts will elicit the attention of users who don't frequently post questions but often search Stack Overflow for answers.

NARRATIVE

1. Travis is at his computer working in a very old part of the code base written in a language he doesn't regularly use.
2. He encounters an error when attempting to run his program, but doesn't know how to fix it.
3. He searches the official documentation but what he's looking for has been deprecated years ago, and he can not find an answer to his question.
4. He searches Google and several similar questions appear across different websites, including Stack Overflow, but none of them fit his exact problem.
5. After viewing several similar questions on Stack Overflow he is presented with a message asking if he'd like to post a new question.
6. Travis clicks yes and is taken to the new question page.
7. He fills out the form and posts his question.
8. Soon after posting his question he receives an email that members from the Stack Overflow community have posted possible answers.
9. He reviews the answers, one of which is correct.
10. Travis marks the correct solution as the accepted answer.



Scenario: The First Question

VISION STATEMENT

Branching Stack Overflow's question posting process for those asking a question for the first time might introduce and entice participation by new and/or low reputation users with the site's existing community. This alternate workflow will offer a more wizard-like experience that helps new user visualize their first post and how it will be received by the Stack Overflow community.

NARRATIVE

1. Amy is at her computer working on a new project in a new programming language she is not fully familiar with.
2. She encounters a syntax error when attempting to run her program and does not know how to fix it.
3. She looks up the function she is trying to use in the official documentation, but cannot find an answer.
4. She searches Google and several similar questions appear, but none of them fit her specific problem.
5. After looking through several answers and attempting to implement each of them in her own program, she decides she wants to ask her very first question on Stack Overflow.
6. Amy creates an account on Stack Overflow.
7. She nervously starts the process of asking her first question. Each requirement, such as post title, body and tags, is explained in greater detail along with a one to one preview of what her post will look like.
8. Soon after posting her question Amy receives an email that members from the Stack Overflow community have posted possible answers.
9. She reviews the answers, one of which is correct.
10. She marks the correct solution as the accepted answer.



Going Forward

There's no question that Stack Overflow users love Stack Overflow. By continuing to put users first, they will be motivated to interact with Q&A on a more regular basis. These interactions will provide a deeper, more meaningful experience, leading to increased site traffic and a healthier online community. Every Stack Overflow experience should...



REMIND USERS

While in the tussle of searching for an answer, many users don't think to post a question on Stack Overflow or they feel their question must already be on Stack Overflow.



GUIDE USERS

New users can be unsure about the process of posting for the first time on Stack Overflow or they can be nervous about how the community will react to their first post.



EDUCATE USERS

Every user experience must align itself with knowledge gained as the end result. Stack Overflow users never stop learning and our solutions should never stop teaching.

"Using Stack is like having a team of developers by my side."

— Daniel Hopkins, Web Developer at AccuLynx
— Echoed by developers around the world