Common pitfalls in modern QA

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Abstract

Are your software quality efforts constantly struggling to keep up?

It is getting more challenging, especially in these modern times, where our quality processes constantly need to catch up with each sprint. We often require QA tasks to rush to be completed before the sprint ends.

These and many more problems come from various sources, such as harmful practices, archaic best practices, misunderstandings, and issues affecting software development teams.

Psychology plays a big part in these problems. Several cognitive biases affect teams and industries. Some are the man with a hammer syndrome, priming, hindsight bias, the Dunning-Kruger effect, semblance, congruences, the halo effect, and many more.

Those may generate problems such as keeping the teams in infinite cycles updating automations, becoming the bottleneck of the entire team by waiting long periods for their executions to finish, and many more problems.

We will present several examples of organizations suffering from these practices and highlight real-life situations, identifying solutions and recommendations for modern best practices.

We will have endless funny analogies, thought exercises, and riddles that will leave the audience pondering and wondering of how many biases they fall into.

Biography

Leandro is a performance testing advocate with Grafana k6 helping everyone to ramp up their performance practices.

He has over 20 years of experience in IT and over 10 in the performance testing practice, where he served multiple S&P500 customers all over the USA, Mexico, Canada, Brazil, India, Austria, etc.

Author of the popular performance testing blog Señor Performo (www.srperf.com), where he curates a diverse set of learning material for performance testers and engineers.

He is an international public speaker participating in multiple conferences, events, and webinars, with keynotes, workshops, and multiple talks on his belt.

And last, the author of "The Hitchhikers Guide To Load Testing Projects", a fun walkthrough that will guide you through the phases or levels of an IT load testing project. https://amzn.to/37wqpyx

1 Introduction

Do you think QA efforts have been challenging to keep up with instead of getting more accessible and agiler?

You may think that it is the fault of those Agile practices that make your automations constantly break from so many changes. On top of that, you may be the least popular in halting the sprint's release as, again, you need help to keep up with so many things. Especially since the team is giving you testable things on the 7th or 8th day of the sprint.

And you know you are not alone because many more people you know doing QA are struggling with similar issues.

Well, let me tell you that among many other reasons, a predominant one is that you are all human beings. The human condition comes with multiple psychological phenomena that most probably all are falling for.

They are called cognition biases, syndromes, fallacies, and even more picturesque names. And guess what? They affect our everyday lives. Every activity you do is affected by them. Yes, QA is affected by them. And here, you will learn about them. We will provide some examples and even some tips to cope with them.

2 Cognition Biases

2.1 What are they?

You may think your brain, mind, and thoughts are all intelligent, rational, and excellent.

Well, I am sorry to bring this up to you. Most are not. Human beings are fascinating creatures that act in peculiar ways that are everything but rational. Even as now you might think our actions and thoughts are rational, you will see they are not always like that.

All this happens because our brains have evolved, given our past circumstances, in a way that started not to help us be smart but survive.

After that, the brain evolved larger than other animals, demanding more energy. But keeping a balance on energy consumption, in its evolution, it developed several shortcuts to maximize the efficiency in its energy use.

The elements of survival and efficiency make our brain take great shortcuts for the mentioned reasons. But it only sometimes gives rational, intelligent, accurate, or even correct outcomes.

Those are known as cognitive biases.

2.2 It was all survival.

As mentioned, we developed cognitive biases for two reasons that assured our survival.

Our ancestors had to develop multiple reactions to the environment. Otherwise, they would have been eaten.

One example is our ability to see things where they are none. Think of a Rorschach test, the ones with dots randomly splattered on a page. Most will find a shape or meaning in those. Same as finding shapes in clouds or seeing faces in front of many car models. Yes, like the Pixar movies.

Another example is our ability for quick assessments and snap judgments. We may have met someone and already have an idea about them in about two seconds. Same for identifying a weird noise we just

heard coming from behind us. Or even interpreting the cracking in our wood-framed houses as something supernatural.

We have many more situations like those. All wrong behaviors and estimations of our brains. But those were vital in the past. As a few examples, if a striped tiger got nearby in the orange forests with vertical golden plants, it was vital for us to quickly identify the pattern. We had to see the tiger immediately if we did not want to be eaten. Same for the snap judgment that triggered our fight or flight response (most often flight) at the minimum weird noise we heard. It could be the tiger.

It was all survival.

As our brains evolved, those behaviors had to be optimized as our brains' evolution made them grow, and their energy consumption increased.

Human brains had to optimize those paths and shortcuts. Otherwise, our already enormous energy consumption would be even greater. Imagine having to eat even more time during the day to keep your hungry brain fed. We would have been easier prey. Not to mention we would need more lunch breaks.

2.3 Some of the biases.

Several psychologists and scientists have recently identified these biases through research, experiments, and notes. The actual list is long, and the names are varied and even colorful.

Here I will list some of the ones I like the most and their flamboyant names.

2.3.1 The “Man with a Hammer” Syndrome[1]

If all you have is a hammer, everything looks like a nail.

Where I come from, the phrase goes like this—Who learned to hammer well sees nails everywhere.

Also known as the "Law of the instrument" or as Maslow's Hammer (yeah, the Maslow that you probably thought of) is a cognitive bias involving an over-reliance on a familiar tool. Abraham Maslow wrote in 1966, "If the only tool you have is a hammer, treating everything as if it were a nail is tempting.

This is a psychological effect that I have suffered several times over my life, and why I am starting with this one. It is effortless to fall for it.

It does not apply only to tools, but processes, knowledge, perspectives, and many more "tools." The hammer may be an excellent tool for some things, but a dangerous one if the task at hand is to brush your teeth. Just think about it. How many things you may be trying to do with the wrong tool?

2.3.2 Halo Effect[2]

It is also known as the Halo Error.

Have you ever met someone who was great at something? Let's think of Michael Jordan, the basketball player. He was fantastic at playing basketball.

But departing from that bit of information, some may think (even he) that he would be great at baseball.

But it doesn't only have positive effects. We may know the phrase, "Who keeps company with the wolf will learn to howl." If someone has some bad traits or is surrounded by wrong impressions, we may infer that the judged thing or person is terrible with others.

This is a common misconception about people, places, circumstances, and many more things. When we have some information about the subject, we generalize that into other areas of the subject, whether it is a person, place, or others.

2.3.3 Sunk cost fallacy.

Almost related to the Loss aversion fallacy, this one delves into how we handle loss in our minds.

Have you ever continued to be invested in something when you knew you should have quitted long ago just because of what you already invested?

This is true for relationships, where people may know their partner is not a good choice but stay there because they already invested much in the relationship. Or how about that handwork you patched even as it already looked horrible, but you kept toying around it?

I experienced that with some programming code so messed up that starting from scratch was the best choice, but I stuck with it. You have no idea how many headaches I had because of that.

Humans tend to think that past costs, investments, or events influence our future actions. Having coin-flipped tails 9 times doesn't make it more probable to get heads on the 10th try. It is always 50-50.

2.3.4 Dunning-Kruger effect

Do you think riding a bicycle is easy? Do you consider yourself a good cyclist?

You may be surprised (if you have yet to become a connoisseur) by how deep that cycling world can go. It is profound. You need several skills to be a pro, which many underestimate from their limited perspective. And this effect often happens in multiple areas: knowledge, understanding, skills, experience, etc.

This effect was named after a study by David Dunning and Justin Kruger. This effect describes how people with some understanding of a given topic tend to overestimate their understanding or skill in each topic. But as the knowledge deepens or grows, people often realize how little they know or how unskilled they are.

The craziest part is that the true experts know how big the topic is, making them underestimate their expertise. Even at points where they are pushed towards another psychological effect, the imposter syndrome. Everything is connected.

2.3.5 Groupthink

Have you been in a meeting at work where the boss says something evidently wrong, but you don't correct the boss as no one else is raising concerns? Even worse, everyone seems to be nodding. To make things worse, you start nodding as well.

In the example above, you were aware of the error. But in many environments and examples, you may need to be made aware and take everyone else's knowledge for granted.

We evolved into social creatures who would have died if we were expelled from our group; hence, we care for that pertinence instinctively, even when we may agree with evidently wrong statements if we want to be part of a community.

3 QA and biases

A common thought is that in their efforts to objectively test and prevent defects, QA practices are one of the most bias-proof areas in IT. And that is a biased opinion that is far from the truth.

QA processes, tasks, tools, methods, and many other sides of QA are designed, planned, executed, and reported by humans. We have criticized poor humans for being full of biases and problems. They inherit all those to the QA processes, tasks, reports, and everything surrounding the discipline.

Don't believe me? Here are some real-life examples of cognitive biases hurting our QA processes. Just a few because this could be a long one if I went crazy with it.

3.1 Man with a QA hammer

We may have encountered this problem in several organizations. Especially around automation tools, or in other words, hammers.

In this case, a close relative discovered how to automate with Selenium. Selenium is fine, but this relative was super excited about its possibilities. He started using it everywhere. He went everywhere, happily automating processes, not being a tester or an IT person.

Then he had a genuine QA need to validate if migrated data from other databases arrived right in the target system.

Given he had learned Selenium so well, he started automating validations through the front end. Quickly discovered that validating one record at a time through the front end was slow, required a lot of computer power, and quickly broke with any difference in the flow. We quickly estimated that validating some million records would take days of nonstop running.

Why obsess about using the Selenium hammer if he could use the SQL screwdriver? Just query for the migrated data on the source and target environments and add a comparison on both outputs. A process executed in a few minutes, if not seconds. Something seriously related to the automation pyramid.

3.2 Loss aversion of automations

We have seen this one everywhere; you probably have suffered from it. How easily can you or your team stop supporting or even delete old automations?

We all have become part of teams with hundreds and even thousands of automations, and we cannot eliminate any of them. We may not even know what they were for, who created them, or why we have them, but we keep supporting them every time they break. We diligently fix them.

This may have a sentimental facet as we worked hard to create those automations, even if that was 5 years ago. Or our management may feel that they have paid so much for them that it would be unjustifiable to file them as old or, even worse, to delete them!

As Elsa the ice princess told us in that catchy song, we must "Let it go!"

João Proença, a master in cognitive biases in QA, recommended me a heuristic for when you are falling for this one. Imagine all your automated tests were suddenly deleted to know which ones you should stop supporting or could even delete. Think of which ones you would re-create right away. The rest, you can stop thinking about them.

3.3 The tool with a halo effect

One tool to rule them all. Or at least this is the dream of many managers when requested to procure tooling for their org. No matter how expensive, complex, or heavy it may be.

This is a common pitfall when we talk about tools. Many tools are fantastic for some things. But vendors tend to add features and functionalities to those tools until they are almost a huge test-everything suite.

The conception of the thing that the tool is good at (and it may be excellent at it) may give the impression that it is an excellent tool for everything, given the other functionalities it has. But often, that is different.

This may be confused with the man with a hammer fallacy. Let me differ on it as we use only one function of the tool for many things. The tool has other modules, functions, or features in other areas than the one

it is good at. Again, it is usual that because that tool is very good at one thing, we might think it is fantastic in the other functions it has.

3.4 Confirmation in my machine bias

This one is a true classic. How many times have you heard, "It runs OK in my machine," after you report a bug? I mean, that is almost a cliché statement nowadays.

In their interest in finishing and delivering software, developers may close themselves to other perspectives. Or in other words, they close themselves to considering other environments. This lack of consideration of other data points might make them blind to other environments' configurations or requirements. In this situation, the QA specialist may be biased as well.

Often developers need to consider elements that may be missing when they are testing a report of a defect right away without considering the possible reasons why they might be seeing that defect. They are not interested in fixing or diagnosing bugs, just detecting and reporting them.

Both sides are so interested in their truths that they are blind to the rest of the information. We know how much cat-mouse chasing this brings, and usually, solutions take time to come. The trustworthy source of the problem is usually detected after a lot of chasing.

3.5 Many more biased defects!

As you can see from the examples, QA endeavors are plagued by biases. These were just a few examples, but there are many more. Wrong assumptions, hunches, anchoring when proven wrong, and much more happens on teams delivering software that passes through a QA process.

The list is long, and most of the time, the teams are unaware that they are falling for those biases.

Now you may wonder how we can avoid falling so much for these effects. Well, let's go over some tips.

4 How to avoid falling for biases?

Well, this is awkward. You may be unable to avoid falling for cognitive biases in your QA efforts. As mentioned, those biases are part of the human condition, and anyone 100% free of them may not be human. I mean, even AI falls for biases!

So, is everything lost? Not so much.

Below are some tips to avoid falling so much for cognitive biases. And some others that will help you recover or mitigate their impacts in your QA efforts.

4.1 Recognition

We are all human beings. Well, most of us. And as stated earlier, we are bound to these biases. That is just our nature. We have it and cannot remove those mental patterns from our brains.

And believe it or not, if we do not recognize that we are constantly falling, we fall for a cognitive bias that will get us into even more trouble.

Don't worry. This may feel weird to admit that one is flawed. But it is OK, trust me. No one is perfect. You are not expected to be. You constantly fall for cognitive biases and will continue to do it. If you do not recognize that, you may be in denial or unable to see it when you fall for it.

4.2 Know the menu

The second step is to be aware of the many tricks our mind falls for. In this case, ignorance is not bliss. You do not need to be an expert on them, but at the very least, you must be aware of them.

Like the menu of your favorite restaurant, you may not know what is in the ingredient list of each dish, but at the very least, you know what each one is.

It would be best if you aimed at knowing them even with all their somewhat scientific and even flamboyant names. Learning them is a fun experience, and I guarantee you will be entertained and slightly scandalized.

4.3 Shameless teams

A big blocker for recognizing biases or fixing their outcomes is a shame. That will cause the team to go into Groupthink and herd mentalities. Ironically one bias takes you to many others.

At this point, everyone on the team should feel safe presenting a different perspective and even pointing out when someone may fall for a bias. No shame. Remember, we all have biases. Everyone in the team is human and can fall from them. Teams must be safe families that allow pointing mistakes without making them personal. The focus must be on finding a solution rather than a faulty human in the team.

This is a two-way avenue. The person pointing out the problem must feel safe doing it. But at the same time, the person receiving it must feel safe to admit it and work on it. No victims nor executors, just safe environments full of team members who understand we all err and that it is more productive to find a solution.

4.4 The outlander

Sometimes we need to see the forest for the trees. We may be so close to the problem, so deep in our biases, and even the whole team may be unaware of them. What can you do if no one feels they can tell the emperor that there are no new clothes and he's naked?

Bring a fresh perspective. Someone outside of the team, the division, and even the organization. By this, I do not necessarily mean a consultant. You only need someone from the outside or even with a different perspective. This could be your grandma, a foreigner, and, as mentioned, someone from another team, division, or background. You never know what people with fresh perspectives will be able to see.

Now, some consultants and organizations specialize in providing that feedback. They provide feedback that indicates which biases you are falling for. Always consider bringing external experts who may be used to catching errors in processes and conceptions.

4.5 Keep looking

You will keep falling for biases even if you accept that you are vulnerable, know the possible vulnerabilities, and team up to identify them, even if you bring external contributors. This is the sad truth.

But this doesn't mean you should give up and stop trying to avoid or fix the outcomes of these biases. Quite the opposite, you must stay vigilant and remember that you may fall to cognitive biases every new day. Most probably, you will fall for them again and again.

Keep accepting that you are human and vulnerable to cognitive biases.

Keep identifying new ones as scientists continuously discover new ones.

Keep making it safe for the whole team or org to point out and be given indications of biases.

Keep bringing external perspectives to indicate if you may be falling for biases.

And remember to keep talking to your organization and team to establish conversations that open everyone to these recommendations.

5 Closing

We are all humans that will keep failing for biases. Denying it is a biased idea. Ignoring them is another type of bias. Making it unsafe or forcing Groupthink is biased. And closing to external perspectives is yet another bias. And sticking to cognitive biases will only bring more biases and unwanted outcomes.

Stay vigilant for our human behaviors and love each other!

Adios and gracias!

Footnotes

1. Man with a hammer – AKA Law of instrument https://en.wikipedia.org/wiki/Law_of_the_instrument
2. Halo effect - https://en.wikipedia.org/wiki/Halo_effect
3. Sunk Cost fallacy – Economies definition https://en.wikipedia.org/wiki/Sunk_cost
4. Dunning-Kruger - https://en.wikipedia.org/wiki/Dunning%E2%80%93Kruger_effect
5. Groupthink - https://en.wikipedia.org/wiki/Groupthink

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