No. 02
March 2025

testing experience

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Abstracting quality conversations using Lego

Scaling Human Evaluation of AI-Infused Applications

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From the Stage to the Page: Insights You Can't Miss

I am incredibly grateful for the overwhelmingly positive response to the first issue of Testing Experience! Your feedback and encouragement mean the world to us. They keep us motivated to continue this journey, working even harder to bring you fresh topics and insightful authors.

This second edition is even more extensive, packed with great articles covering a wide range of topics. Some of these articles originated as talks at the Agile Testing Days, where they were met with great enthusiasm. We didn't want to keep them from a wider audience, so we're thrilled to share them with you here. I truly hope you enjoy them!

We see that the community is still deeply engaged with the topic of AI. Naturally, this edition touches on that as well, but we also explore other important subjects. So dive in, let yourself be drawn into the stories, and discover new insights. I believe that all of us can learn something from at least one of these articles—if not more! That's why we publish this magazine: to bring you information, experiences, and different perspectives that might enrich your understanding.

As always, after this issue comes the next one! And for that, we need your articles, your stories. If you have something valuable to share, we'd love to hear from you!

A couple of quick notes:

The Call for Papers for the Agile Testing Days is now open! If you have an exciting topic, a compelling story, or a unique project experience to share, we warmly invite you to submit.

The structure of the Agile Testing Days is evolving. Learning, networking, community, social events, and, of course, fun go hand in hand. We're expanding our offerings and introducing new, exciting experiences. Stay tuned—there's a lot to look forward to! We've had some great ideas, and with your help, we're bringing them to life.

Enjoy reading this edition, and I look forward to your feedback!

And don't forget—spread the word!

Impressum

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CONTENT

Scaling Human Evaluation of AI-Infused Applications

Photo by Ryoji Iwata on Unsplash

Author: Tariq King

It seems like everyone in the quality engineering community is talking about AI. After all, advances generative AI have been rapidly transforming our tools, frameworks, platforms, processes, and ways of working. AI-assisted software lifecycle activities are becoming more widespread and generally accepted.

However, while everyone has been busy applying AI to testing, myself and the team at Test IO have been focused on harnessing the collective intelligence of humans to validate and verify several different types of AI systems. Our approach is currently being utilized to test some of the most sophisticated AI models, assistants, co-pilots and agents at scale. This article shares our approach to testing what we refer to as AI-infused applications. It describes the grand challenge with testing these types of applications and then discusses the need for human evaluation. After outlining a number of practical techniques, it provides some lessons learned on how to effectively scale the human evaluation of AI/ML.

AI-Infused Applications (AIIA)

Just as with any application, there are many different ways that an AI-based system can be implemented. The particular method used generally depends on the problem being solved, desired capabilities, and any constraints on its development and operation.

Some common approaches to developing AI systems are:

- **Rules-Based AI.** Encodes domain expertise into conditional (if-then-else) statements, heuristics, or expert systems.
- **Classical Machine Learning.** Training a supervised or unsupervised learning model from scratch using structured datasets and algorithms like random forests, support vector machines, or gradient boosting.
- **Integrating a Pre-Trained Model.** Leverage APIs from providers like OpenAI, Google, Anthropic, or Hugging Face to integrate an AI-powered component into an application with minimal development effort.
- **Retrieval Augmented Generation.** Combine LLMs with a vector search database to fetch relevant information before generating a response.
- **Fine-Tuning a Pre-Trained Model.** Using transfer learning to adapt a pre-trained model to a specialized dataset to improve the performance of specific tasks.
- **Agent or Multi-Agent Based AI.** Build autonomous agents using an LLM backend, goal-setting mechanisms, and tools for action execution, e.g., APIs, databases, browser automation. These types of systems may include reinforcement learning (RL) or emergent behavior to allow multiple AI agents to interaction, collaborate, or compete in an environment.
- **AI-Orchestrated Workflows.** Combine multiple AI components using workflow orchestration tools such as LangChain, Haystack, or Airflow).

Each of these approaches have trade-offs in terms of accuracy, efficiency, cost, interpretability, among others. However, regardless of the approach used, as long as an application leverages AI or ML models or services as part of their logic, we consider it to be an **AI-infused application (AIIA).**

Grand Testing Challenge

The rapid pace of growth in the AI space makes it particularly difficult to keep track of all of the different ways these types of systems can be implemented. However, irrespective of the development method, AI-infused applications present a grand challenge for software testing practitioners primarily due to their highly dynamic nature.

DYNAMISM

AI-infused applications exhibit different levels of dynamism depending on their purpose and capabilities. For example, there are dynamic aspects of **predictive, adaptive,** and **generative** AI systems which make them unpredictable, non-deterministic and, as a result, very difficult to test.

■ **Predictive AI** analyzes historical data to identify patterns and make forecasts about future events or outcomes. These types of systems evolve with data. In other words, the accuracy of predictions depends on continuously updated data and therefore, as new data arrives, retraining or fine-tuning the model helps improve its forecasts. Some predictive systems like stock trading algorithms process real-time data streams, modifying forecasts as conditions change.

■ **Adaptive AI** continuously learns from new experiences and environmental changes to modify its behavior and improve performance over time. Unlike traditional models, it evolves without requiring explicit reprogramming. For example, self-learning chatbots will personalize their responses over time. Systems like these are context aware and dynamically adjust based on real-world conditions. Adaptive AI can autonomously tweak its internal models and strategies to improve accuracy and efficiency over extended use.

■ **Generative AI** creates new content such as text, images, code, and music based on learned patterns from vast datasets. The same user prompts sent to a

model can generate different responses. Generative models can refine outputs based on user feedback, style preferences, leading to evolving content quality. Model knowledge can be augmented with external sources via retrieval augmented generation, making the overall system highly flexible.

Adequately testing AI systems may involve a combination of pre- and post release testing, continuous monitoring, automated pipelines, adversarial testing, and human evaluation. These approaches help address quality challenges with AI systems including **model drift, bias, fairness, uncertainty, output-variability, explainability, hallucinations, and more.**

AI systems evolve dynamically: Predictive improves forecasts, Adaptive learns and adjusts, Generative creates varied content. Testing mitigates bias, drift, and uncertainty.

The Importance of Human Evaluation

While automated testing methods for AI systems help to monitor performance, human evaluation is essential to ensure AI aligns with real-world expectations. Here's why human evaluation is critical and some techniques that can be applied in practice.

WHY IT MATTERS

In classical ML systems, automated accuracy metrics such as F1 scores don't necessarily capture the real-world impact of predictions. Bias and fairness issues often require domain experts to identify potential harms and when it comes to explainability, although some tools provide insights, human judgement is generally needed to interpret them meaningfully. If an AI-infused application is going to interact directly with users, the system must be assessed for user experience and usability.

Adaptive AI systems can potentially start optimizing on the wrong objectives. For example, a common problem with recommendation systems is that they tend to reinforce their own biases. Here's how:

- Recommendation system suggests content based on past user behavior.
- User engages more with that types of content (e.g., specific movie genres, political articles)
- System interprets this as a strong preference, leading it to narrow future recommendations to similar content.
- Over time, diversity in recommendations decreases and users are less likely to be exposed to alternative perspectives.

Lastly, AI-generated content is often ambiguous, misleading, or biased, requiring human judgement to assess quality. Automated checks like toxicity filters generally can't fully capture nuances like sarcasm, cultural sensitivities, and ethical concerns.

PRACTICAL TECHNIQUES

- **User-Centric Testing.** Real users provide feedback on how well AI adapts to changing needs and preferences.
- **Fact-Checking Panels.** Subject matter experts verify AI-generated claims for accuracy and credibility.
- **Bias and Harm Assessment.** Diverse human reviewers assess content for potential ethical issues and unintended harm.
- **Human Scoring and Annotation**. Evaluators rate AI outputs on quality criteria such as coherence, creativity, appropriateness, practicality, among others.

Effectively Scaling Human Evaluation of AIIA

Over the past 14 months, the team at Test IO has been diligently focused on human evaluation of AI-infused applications for a variety of large enterprise clients. The AI-infused applications under test range from independent chat and voice bots, to code and cloud assistants integrated into software development environments and cloud platforms. So how do you make human evaluation scalable, structured, and reliable? Here are some of the key lessons we've learned along the way:

ESTABLISH CLEAR EVALUATION CRITERIA.

This involves defining structured rubrics for human reviewers to ensure consistency. Figure 1 shows a sample deliverable including a cross-section of quality criteria.

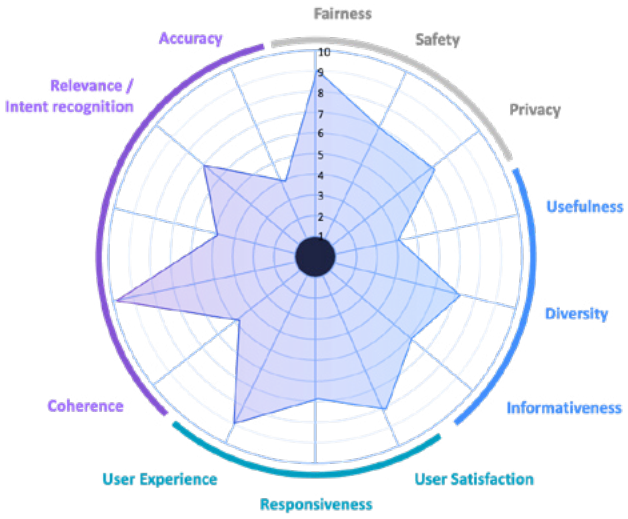


Figure 1: Artifact Showing Quality Criteria and Results of Human Ratings for Testing AI-Infused Apps

LEVERAGE INTERNAL AND EXTERNAL COMMUNITIES.

Diverse human expertise may be crowdsourced internally from your own pool of people, or externally via user testing communities. As shown in Figure 2, we capture a diverse set of perspectives by using the Test IO crowdsourcing platform to run test cycles using internal employees or external freelancers, or a combination of the two.

COMBINE HUMAN AND AI JUDGES.

Automated tools or, for example, another LLM can be used for initial screening, followed by human reviewers for deeper analysis. Not only can this technique be applied to accelerate the evaluation activities, but it also facilitates comparing human versus automated evaluation. The confusion matrix in Figure 3 illustrates the correlation between human ground truths and labels generated by GPT4.

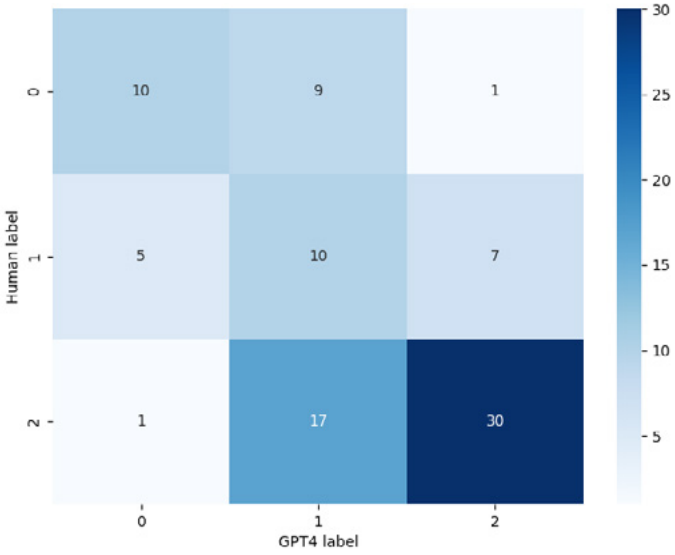


Figure 3: Confusion Matrix of Human Scores versus LLM Scores

Such an artifact can be used to indicate cases where the LLM assigns "irrelevant" to something that the human assigned as highly relevant, and vice-versa.

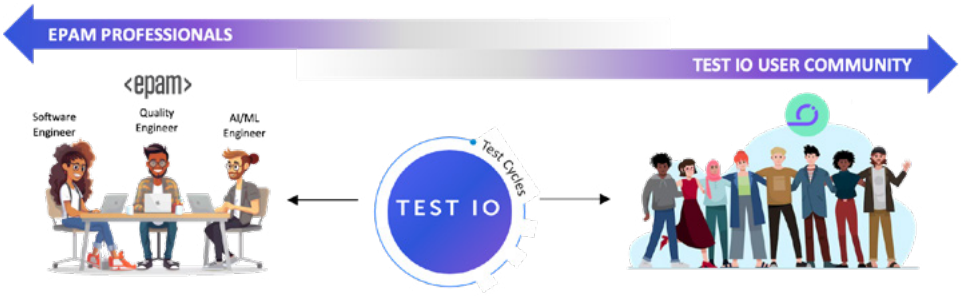


Figure 2: Access to Diverse Set of Human Evaluators including Internal Experts and External Freelancers

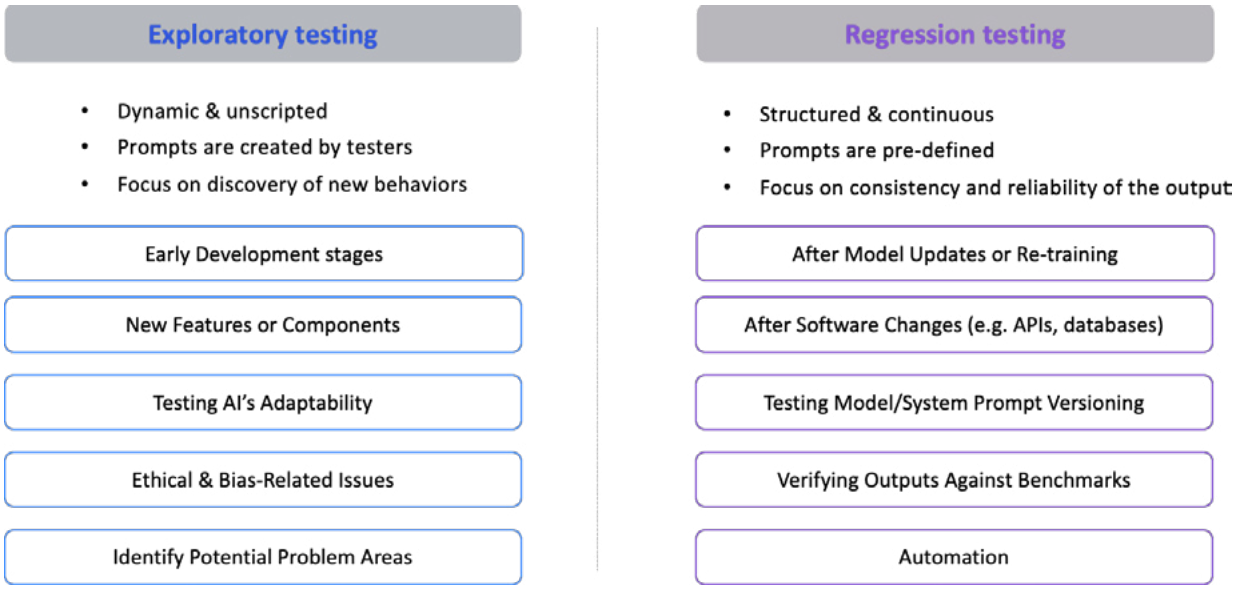


Figure 4: Crowd-Sourced Exploratory Testing and Regression Testing of AIIA

CONTINUOUSLY TEST, INCORPORATE HUMAN FEEDBACK, AND RE-TEST.

Crowd-sourced human evaluation of AI-infused applications is applicable to several dimensions of testing. Test cycles can be exploratory, focusing on the early stages of app development or on new features. When issues are discovered, user feedback can be fed back into the model via approaches like reinforcement learning from human feedback. After the given model is updated or re-trained, test cycles can be executed as a form of regression using humans, automated tools, or a combination of both. Figure 4 provides a side-by-side comparison of these two general modes of conducting AIIA testing at scale using crowd sourcing.

Continuously test, integrate human feedback, and re-test to refine AI models through crowd-sourced evaluation and iterative updates.

Tariq King
Executive Leader | Head | Test IO

CONCLUSION

For now, AI systems are too complex and dynamic to be tested solely through automation. Human evaluation is indispensable for detecting biases, verifying real-world applicability, and ensuring an ethical and engaging user experience. By integrating structured human oversight and deploying it using a scalable outcome-based model, we can look towards a future where AI systems are not only technically robust, but also aligned with societal values and user expectations.

Testing the Limits: Embedded Software in a Cloudy World

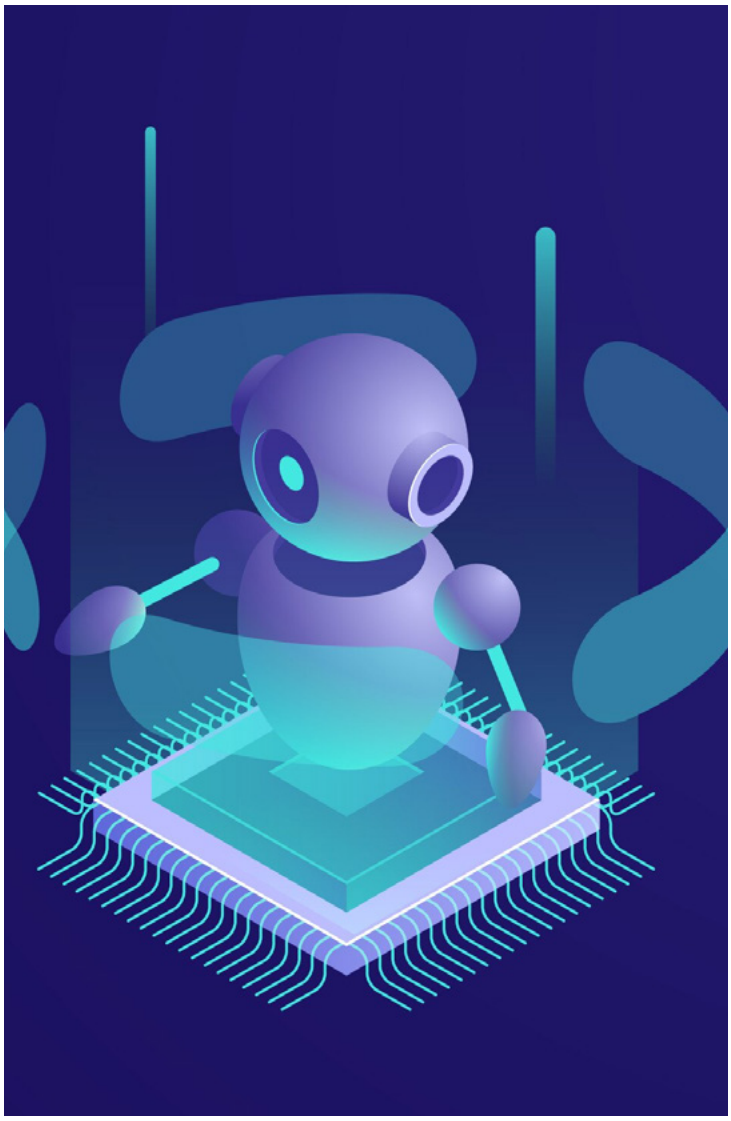
Author: Renato Ruggiero

The rise of hybrid embedded/cloud systems has changed how we develop and test complex applications. These systems combine embedded hardware with cloud-based processing, enabling real-time edge decision-making and leveraging the cloud for resource-intensive tasks. This article explores the challenges and best practices for testing hybrid systems, particularly in the field of AI-driven solutions in the automotive sector.

HYBRID EMBEDDED/CLOUD SYSTEMS

Hybrid embedded/cloud systems are common in the automotive sector, where real-time decisions are critical and cloud-based processing offers scalability. These systems combine an ECU (Electronic Control Unit) with a cloud platform. The ECU handles real-time tasks, such as processing sensor data, while the cloud manages deeper analysis, like AI model retraining.

An example is Adaptive Cruise Control (ACC), in which the ECU uses sensor data to make real-time decisions, such as speed and braking, while the cloud refines AI models to improve decision-making over time. These systems offer many advantages, but integrating the ECU and cloud introduces challenges, especially in testing.



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COMMON CHALLENGES IN TESTING HYBRID EMBEDDED/ CLOUD SYSTEMS

Several challenges arise in testing hybrid embedded/cloud system integration, affecting performance and reliability.

- Network latency: testing how the ECU handles latency and connectivity issues is essential, especially in remote areas where communication with the cloud might be delayed or interrupted.
- Integration complexity: synchronizing the ECU and cloud for timely updates, like AI model downloads, is crucial to avoid disrupting operations.
- Security: To protect sensitive data, secure communication, encryption, and authentication between the ECU and cloud must be tested.
- Scalability: testing must ensure the system can handle growing data loads and connections without degrading performance.
- Data consistency: ensuring accurate data flow from the ECU to the cloud is critical to prevent data corruption or loss.
- End-to-end validation: This testing ensures that business logic across the ECU and cloud works as intended and verifies the entire data flow.

HIL TESTING FOR HYBRID EMBEDDED/CLOUD SYSTEMS

Hardware In the Loop (HIL) testing is vital in developing hybrid embedded/cloud systems, particularly for early defect detection. It is an embedded software testing strategy to simulate real-world use cases related to ECU. The key benefit of HIL is that it allows engineers to test the ECU without an actual vehicle, simulating the real-world environment in which the ECU operates. The HIL setup can simulate vehicle and environmental conditions and the behavior of sensors and actuators in real time. For example, in the ACC system, the ECU can be tested with simulated sensor data (e.g., from cameras, lidars, and radars) over communication protocols like the CAN bus or Ethernet.

HIL testing supports manual exploratory testing, where engineers create driving scenarios to explore ECU behavior. Automated testing ensures repeatability. This is especially important for testing edge cases and safety-critical functions that are difficult or unsafe to replicate in a vehicle.

HIL systems also simulate various sensors and actuators, like temperature sensors, motors, and switches. The connection between the ECU and the HIL system is typically made using a dedicated harness, ensuring the simulated environment is as accurate as possible.

For hybrid systems, HIL testing is crucial for evaluating the interaction between the ECU and the cloud, validating how data flows between them, and ensuring that critical operations (e.g., AI model deployment) are handled correctly.

TEST LEVELS IN HYBRID SYSTEMS

Referring to the test pyramid, we focus on a high volume of automated unit tests at the base, as they run at the code level, execute faster, and are less expensive. Moving up the pyramid, integration, and system tests become more complex, time-consuming, and costly, with test environments requiring significant effort to create and maintain. When HIL testing comes into play, these same principles apply since it is used at the system level.

UNIT TESTING

Unit testing occurs in parallel for embedded and cloud components, each with different tools. Embedded software, often written in C/C++, can use frameworks like GoogleTest and gMock, while cloud modules, typically written in Python, can use tools like unittest and pytest. These tests can be integrated

into CI pipelines to catch defects early.

INTEGRATION TESTING ENSURES MODULES WORK TOGETHER CORRECTLY.

- Cloud integration testing: integration testing for cloud-based microservices validates interfaces, data flow, service integration, and task orchestration. Assuming the cloud is hosted on AWS, a local test environment with LocalStack and Docker Compose can simulate AWS services locally without deploying to a real cloud platform, enabling effective testing in isolation.

- Embedded integration testing: integration tests for embedded systems typically involve more complex scenarios than unit tests. If the setup requires extensive resource management, Python-based test environments can streamline testing even for C++ libraries. Tools like pybind11 help create Python bindings for C++ code, while litgen automates the binding generation, reducing maintenance effort for evolving APIs.

SYSTEM TESTING

At the system level, we verify that the embedded and cloud systems independently meet their system requirements.

The HIL platform plays a critical role in embedded systems. Hardware and software options range from closed, proprietary solutions to more flexible, open frameworks compatible with open-source tools. The HIL simulator allows testing the ECU under realistic conditions, often using mocked cloud responses to validate embedded system behavior. On the cloud side, black-box testing through REST APIs enables the simulation of workflows and testing of edge cases, including API errors, timeouts, and security checks, without involving
the embedded system.

"System testing verifies embedded and cloud systems independently, using HIL for embedded validation and REST API testing for cloud robustness."

SYSTEM INTEGRATION TESTING

In this phase, we test the fully integrated system in a production-like environment. The HIL system connects to the ECU, allowing us to simulate real-world conditions and interactions between the embedded and cloud systems. We validate critical aspects such as network latency, operation timing and sequencing, data consistency, and security, addressing key integration challenges and ensuring the system functions as intended under realistic conditions.

CONCLUSION

A solid testing strategy for hybrid embedded/cloud systems requires several key principles. First, lower-level testing is essential for early defect detection and a strong foundation for higher-level tests. Isolating test activities, like testing embedded and cloud systems independently, streamlines the process. Automation, mainly through CI pipelines, is crucial for efficient regression testing. Finally, HIL testing at the system level ensures early defect detection and validation in real-world scenarios. By focusing on these principles, we can build a reliable and efficient testing strategy for hybrid systems that provides high performance and reliability.

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Abstracting quality conversations using Lego

Martijn Goossens
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@ Xebia

Author: Martijn Goossens

One of my fondest childhood memories is building a Lego maze with my siblings for the family hamster. Not all my family shared my Lego passion. Yet, on occasion we came together to work on a project when inspiration struck and as a group, we built out our vision. It always started with our abstract thoughts, and with the help of the piles of bricks I had collected over many birthdays, we shaped something real that our pet hamster could use for the brief moments we let it out of

"By abstracting with Lego, teams eliminate ambiguity, foster engagement, and turn ideas into action."

its cage. But when I became an IT specialist, I left behind my Lego building to focus on more tedious working activities.

THE AGE-OLD SKILL MATRIX

One of these less enjoyable activities is filling in skill matrices. For those who don't know: it's usually a two-dimensional table where team members are listed and over the other axis their skills are rated. The team then uses it to identify and address strengths and weaknesses. My pet peeves with it are that it's typically asynchronous, non-collaborative, and not very engaging. Often it is done once, after which the outcome is stored and rarely consulted or even visited. I've always felt there must be a better way to approach this. I constantly have conversations about development and quality, and while each has its value, they are often perceived as dry or tedious. I personally feel the same about the skill matrix.
Still, in many projects, I refer to skill matrices if they are available and use them to identify skill capabilities in teams and adjust my consultancy accordingly. In the best case, a team shows interest in their matrix and knows how to interpret the values of their team mates. I remember one team that used the abstract information in their matrix to upskill junior members and build their proficiency. Their collaboration reminds me of those building sessions with my siblings.

ENTER LEGO

Colorful boxes of Lego litter the Xebia offices. I have always been intrigued by them; why is there Lego in a workplace? Surely, we aren't meant to use these during work hours when we're supposed to be delivering software? I eventually learned some of my colleagues were involved in Lego Serious Play (LSP), where they use the Danish bricks in workshops to engage in professional collaboration.

As my colleague Dave explained, the core concepts of LSP are:

1. Using abstraction of concepts and jargon
2. Everyone works individually on their part before bringing things together
3. The result builds a combined outcome which represents everybody's input as a group model

By abstracting using Lego, a group must have a shared understanding of what each element means. This gets rid of ambiguity and creates a need to discuss meanings as a group. These concepts enhance engagement within a team and create a platform to discuss ideas that are often not acted upon. In most of my consulting, I facilitate engagement and alignment, and even though I'm not certified in LSP, its concepts resonate with what I do. This inspired my skill matrix workshop that was selected by Agile Testing Days last year.

"WHAT'S THAT TELESCOPE THINGY YOU BUILT?"

On the last day of Agile Testing Days 2024, amid another stellar program of workshops and talks, 16 attendees joined the beta-test for my workshop. On the floor was a series of numbers from 1 to 5, and as part of the interactive opening exercise, I posed the group a series of questions. The question that got the strongest response was whether quality encompasses many skills. In fact, most of them

went beyond the '5' to stand near the window to express their off-the-scale response. With this in our collective minds, the main exercise of 'bricking your testing skills' kicked off. I couldn't have imagined all the structures my audience would come up with.

"The passion of the attendees lit up the room as the creative builds showed their various skills"

The basic briefing was: pick a few bricks and a base plate and, by the size of the bricks, show your confidence in 5 skill areas. When envisioning this exercise, I had a mental model of that old 2D skill matrix but for every skill a different color of brick. Only a few of the attendees built in that structure, while most of them dove into the playful mindset to visualize their skills in unexpected ways. The passion of the attendees lit up the room as the creative builds showed their various skills.

These colorful creations were a stark contrast to the dull two-dimensional skill matrix I know. With this brickful abstraction method, someone built a telescope to represent observability. Everyone understood when another participant demonstrated not having unit testing skills by putting a brick below the base plate. I thought it was better than any text you could put in a skill matrix, and we were doing it together, understanding each other as we were building.

Ultimately, I hope to facilitate this workshop in organizations where we can join all the individual skill visualizations into one team structure that is then showcased and updated as their central source of truth. Just like building hamster mazes with my siblings, building Lego skill matrices with team members draws out collaborative creativity and allows us to have fun at the same time.

TO BRICK-FINITY AND BEYOND

Even though we're IT professionals now doesn't mean there is no time for play. While I was inspired to use Lego as a workshop vehicle for the skill matrix activity, the abstraction can work with any medium and so many work topics. It might also feel natural to us in engineering as we apply abstraction to many things in software as well. Let's use that to our advantage in IT conversations too and find better ways to collaborate. I promise that it'll make some of those repetitive and tedious topics we encounter as professionals easier to discuss. If you find yourself having cumbersome conversations about testing, engineering or quality, feel free to look me up and I'll gladly help you bring back the fun to your work.

Photo by Ken Suarez on Unsplash

Beyond Scripting: Building Test Automation That Scales

Author: Arkadiusz Frankowski

When reviewing test automation code, I often encounter what could be called the "monolithic test" - a massive sequence of steps captured in code that happens to make the software do something.

While such scripts might work initially, they quickly become unmaintainable as test suites grow. This isn't automation - it's documentation of manual steps in code form.

Photo by charlesdeluvio on Unsplash

THE PROBLEM WITH MONOLITHS

Think about how cities evolve. Early settlements often feature massive, multi-purpose buildings that try to serve every need at once. These structures, while initially practical, become increasingly problematic as the community grows. The same holds true for monolithic test scripts. They try to do everything in one place - setup, execution, verification, cleanup - all intertwined in a way that makes changes difficult and maintenance costly.

BREAKING DOWN THE WALLS

The first step in transforming monolithic tests into maintainable automation is understanding that not every action needs to live in the same space. Just as modern cities separate functions into distinct zones and buildings, our test automation needs clear separation of concerns. This isn't about making the code prettier - it's about making it sustainable.

When we break down our monolithic tests into focused components, we gain the ability to modify one aspect without touching others. This modularity becomes increasingly valuable as our test suite grows. A change in the login process, for instance, should require updates in only one place, not in hundreds of test scripts.

BUILDING REUSABLE INFRASTRUCTURE

Modern cities thrive on shared infrastructure - power grids, water systems, transportation networks. Similarly, effective test automation needs common components that all tests can use. Instead of copying and pasting the same login code across hundreds of tests, we create a single, reliable implementation that can be shared.

This standardization goes beyond simple code reuse. It establishes patterns and practices that make our tests more reliable and easier to maintain. When every test uses the same proven approach forcommon operations, we reduce errors and simplify maintenance.

ADAPTING TO CHANGE

Cities must accommodate growth and change while maintaining essential services. Some neighborhoods might be residential, others commercial, but all need access to the same basic infrastructure. Our test automation framework faces similar challenges. Different types of tests - UI, API, performance - need different approaches but should share common underlying structures and principles.

This adaptability comes from thoughtful design. By creating flexible, extensible components, we can handle variations in test scenarios without duplicating code or compromising maintainability. The key is building systems that embrace change rather than resist it.

MANAGING GROWING COMPLEXITY

As test suites grow, they need systems for managing complexity. Just as cities develop zoning laws and building codes, test automation needs patterns and practices for controlling how components interact. This might mean implementing design patterns like factories for creating test components, or establishing standards for how different parts of the system communicate.

These management systems aren't bureaucratic overhead - they're essential tools for maintaining order and efficiency as our test suite grows. They help new team members understand how to work within the system and ensure that additions to the test suite maintain its structural integrity.

THE TRANSFORMATION

The shift from scripting to systematic test automation requires a fundamental change in thinking. Instead of asking "How do I automate this test case?" we should ask "How do I build a system that makes automating this type of test easy?" This perspective changes how we approach every aspect of test automation.

When we design for scalability from the start, we create systems that grow gracefully. New tests become easier to write because they can build on existing infrastructure. Maintenance becomes simpler because changes are localized. The entire system becomes more reliable because it's built on proven, tested components.

LOOKING FORWARD

The next time you're tempted to write a long test script, pause and think about the future. How will this code look with ten times as many tests? How easily can it adapt to changes in the application? How quickly can new team members understand and work with it?

Creating sustainable test automation isn't about writing more code - it's about writing smarter code It's about building systems that scale with your needs and adapt to change. While this approach might require more upfront thought and planning, it pays dividends in reduced maintenance costs, faster test development, and more reliable test execution.

Remember, great test automation systems evolve through careful design and thoughtful architecture. Take the time to build strong foundations, and your test suite will serve you well as it grows.

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Wrongfully Addressed

Author: João Proença & Sanne Visser

Twenty years ago, long before the authors ever crossed paths, two young tech nerds were about to take a first step that would lead to thousands of wrongfully sent emails.

You see, in the latter half of 2004, Google came out with the Beta program for Gmail. Folks were sharing invites among their friends and we were both on the lookout. At the time we were ready to leave our embarrassing teenage email aliases behind, so as soon as we got gmail, we successfully claimed the simplest 'adult' email handles - firstname.lastname@gmail.com! We know our first and last names are fairly common within our cultures so we were thrilled when these gmail addresses were available and happy to claim them. Little did we know the trouble that was about to follow.

MISTAKEN IDENTITY

Let's go even further back to a story that happened in the late 90s. João and his family were in for an unpleasant surprise when they tried to board their flight. "Sir, you'll need to take another flight in 8 hours. This one has more reservations than seats," the attendant explained. Naturally, João's father protested, "That's overbooking. We want a refund!". But the flight attendant remained adamant. "No, sir. It's not overbooking. It's just more reservations than seats," they unhelpfully clarified the situation. After some back-and-forth, the family decides to leave, planning to deal with the airline and request a refund at a later time. However, for months, the airline stubbornly refused to acknowledge that they had overbooked the flight.

Then, out of the blue, the airline called: "We have orders to refund Mister João Proença immediately!"

"That's my 17-year-old son. I made the reservation," João's father replied, confused.

"Sorry, sir. The orders are clear. Only João Proença can be reimbursed."

Bewildered but realizing there was no other option, João's father reluctantly agreed. They had João deposit the check and transfer the money to his father, finally resolving the absurd situation. They had no idea why that happened, but the money was back so they put it out of their minds.

Later they realized this had likely been a mix up based on João's name. You see, at the time, there was a very well-known individual in the country, also called João Proença, who was the president of the largest conglomerate of worker unions in the country - the kind of powerful political figure you don't want to mess with in an overbooking dispute. That explained it all: somewhere within the airline someone saw João's name and escalated they might be heading to a nightmare - better refund them immediately!

And now a decade later João has his new gmail address, and our Union Leader is still in politics. You wouldn't think that folks might accidentally send him emails meant for our politician João? They sure did! Emails about mass layoffs happening in a city council, or meetings that were due to take place

about important matters - the kind of sensitive information you don't want to see leaked before it's time!

Photo by engin akyurt on Unsplash

Humorous Mistakes

Misdirected emails can cause a range of reactions, from panic to amusement. Sanne once received an urgent message titled "WHERE ARE YOU?" that initially caused alarm before she realized it was another case of mistaken identity. In a lighter instance, she gained access to a cute little document, full with pictures of turtles. Occasionally, just for fun, she adds more turtles and apparently no one has complained. Notably none of the 36 other people that she shares the turtle document with has ever seemed to notice.

FROM BILLS TO BARGAINS

The biggest category of misdirected emails are receipts, quotations and bills. Notably, Sanne received bills for a housing project in Zeewolde, where she's mistakenly listed as an owner. This mix-up has inadvertently provided her with detailed pricing information for various aspects of home construction in the Netherlands. Similarly, João discovered an unexpected advantage when he received his namesake's phone bill who in a happy coincidence was with the same provider, using the information from his namesake's bill to negotiate better rates for his own service.

MATCHES IN YOUR AREA

The other common 'spam' that can be problematic as well as entertaining are dating sites. Most of these services start offering you dates in your area well before you ever confirm your account. And when some of our namesakes hit the dating scene we get many concurrent sign-ups to the Tinder equivalents of the world. Sanne and João are both blessed that their partners trust them implicitly because their inboxes imply we are people who are in the dating mood every week.

Not confirming the account usually makes it go away in a couple of days but one João in France was determined to find love, he signed up to dozens. A couple of months later, he signed up to the (roughly translated) House of Celibacy. It was when his catholic priest started emailing that a response felt necessary. The Father responded that he would respect João's wishes but as his daughter was baptized there and his wife was still in touch he wanted to assure him he would always be welcome back. One more sincere return email assuring the Father that he wasn't losing a member of his flock but talking to someone who had never been a member, the father apologized and stopped emailing.

Photo by Brian JTromp on Unsplash

THE QUESTION: TO RESPOND OR NOT?

We often face the dilemma of whether to respond to misdirected emails. We generally ignore or unsubscribe from standard company mailings, but respond to personal and important messages. We notify companies about sensitive information sent in error, such as prescriptions or salary statements, though usually just once. Sanne occasionally enjoys responding creatively to product review requests, like "Hair today, gone tomorrow - 5 Stars" for a waxing service.

THE STATS

When João data mined his email account, the stats that came back were alarming. He receives on average one email per day intended for someone else! There are at least 16 identifiable individuals that he's getting emails by mistake. He knows this because of the kind of data in those emails: tax IDs, social security numbers, invoices, pay slips, health records, you name it! And it's pretty clear that a lot of that is protected by regulations like GDPR and he definitely shouldn't be getting access to it.

SO DO WE THINK THIS HAPPENS?

A major reason for this issue is the opt-out nature of online services, rather than an opt-in system. However, we've also identified a few other contributing factors. The first is autocomplete. When someone is quickly typing an email on their mobile device, they may not notice that the recipient field is automatically filled with "@gmail.com" instead of the correct domain, such as "@yourcompany.com."

Another factor is digital literacy. Many people use online services like social media but don't fully understand how email addresses work. They may mistakenly believe that João or Sanne's email addresses are theirs.

Finally, there's what we call the "clueless operator effect." Many digital systems require an email address when onboarding a new customer, but some operators might not realize that the person doesn't have one. As a result, they often default to a simple format like firstname.lastname@gmail.com!

All of these problems stem from a major one: the industry hasn't figured out online identity well. Ten years ago an "identity war" was raging between a lot of the big players like Meta, Apple and Google, all trying to build the de facto source of identity that we would all use to register in all online services. But nothing came out of that war and we're still left to have email addresses as a key source of that identity.

It's getting even worse with the exploding advances of AI where deep-fake technology and LLM-driven bots can make impersonation much more sophisticated. It suggests we will have to find a better solution for the whole online identity challenge.

From problem to solutions

While the big solutions are beyond our control, we'd like to mention them. The ideal solution would be an online identity not tied to our names or email addresses—one we can manage and revoke when misused.

Another critical need is a platform to report GDPR breaches. Right now, hospitals, pharmacies, doctors, payroll agencies, and debt collectors face no consequences for misusing our email addresses and sending us sensitive information.

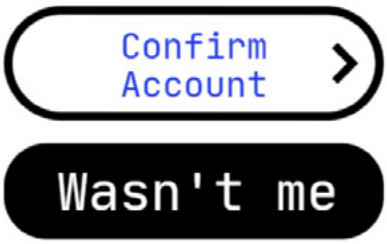
What can we do? As software testers, we have more influence than you might think over the key issues in products, processes, and people that contribute to these problems.

ONBOARDING AND OFFBOARDING CUSTOMERS

Please review your onboarding and offboarding procedures. When we contact companies, especially banks and debt collectors, to dispute claims of nonpayment, customer service often cannot distinguish if we are the ones fraudulently calling or if it's our namesakes. As a result, they usually refuse to take action. Even more frustrating is when the call center requires an account number or phone number to contact them—something we, as non-customers, don't have—making it impossible to reach them. How would your customer service handle a call from Sanne or João? Do you have a process to flag emails that were sent to the wrong recipient?

UNSUBSCRIBE

Give us the 'unsubscribe' option by including an unsubscribe thread in all your mailing headers, not just as a button in the email. Also consider a negative response option to account confirmation, next to confirm put 'This wasn't me', so we can let your company know they've emailed the wrong person.



PERSONA'S

Then most directly you as fellow quality professionals can use our examples as a testing persona. Add these scenarios to your testing and especially consider the harm that might be caused when communications end up at the wrong recipient.

For example, when Sanne wrongly received notice that she could come and pick her chair from the store, that pick-up message unnecessarily included Sanne's phone number and address, which is not needed for a store pickup message. This likely resulted from reusing a delivery email template without considering the risks of sharing too much information. Are you including unnecessary information in your emails?

RISK

Now, we have purposely stuck to the mostly funny and accidental side of these mix-ups. Of course there's the nefarious side as well, which is why we have needed to ramp up our security and don't use our GMails for a lot of services anymore, such as paypal, banking and password managers.

While the mix-ups and misdirected emails we've shared may seem humorous or frustrating, they reveal a deeper issue with our current online identity systems. The risks of personal information being wrongfully shared or misused are very real, and as technology evolves, these problems could only become more complex. We urge both individuals and organizations to take a closer look at their practices—whether it's improving onboarding and offboarding procedures, adding better safeguards for email communications, or addressing the flaws in current identity management systems. As software professionals, we have the power to influence change and reduce these risks. Let's work together to ensure that our digital identities are better protected and that our personal information stays where it belongs.

João Proença
Expert Quality Engineer @Ada Health

Sanne Visser
Agile Test Coach @Bartosz ICT

Have you lost your mind(set)?

Image by freepik

Author: Linda van de Vooren

Imagine we're a couple thousand years in the past. You're out hunting for your next meal, you're hungry, cold, and you've been hunting for many hours. Suddenly you hear a rustling in the bush next to you. It sounds big. You feel a shiver go down your spine. Your adrenaline spikes. You must decide: is this going to kill me or will I have dinner? The wrong decision will kill you.

Evolution is going slower than our technological development is. In our current society we still function with this mechanism, but it doesn't aid us like it used to as hunter gatherers.

To understand how this response process could happen, let's dive into some of the main functions of our brain.

AMYGDALA

The amygdala is primarily responsible for emotional responses, specifically anxiety, fear, and rage. It triggers the 'fight or flight' response. It can only react and not reason.

HIPPOCAMPUS

After the amygdala creates the emotional response, the hippocampus encodes the context of it. The people, situations, location and the things involved.

HYPOTHALAMUS

This produces hormones, who in their turn control things like heart rate, body temperature, hunger and mood. This is why you get hot when you're angry.

THALAMUS

This is the data maintainer. The bookcase of the brain. It chooses how we respond to something. If the amygdala reacts to something, the thalamus grabs the appropriate response/book and opens it for you.

PREFRONTAL LOBE

The control room of the brain. Look at this as the executive control chamber. This is where you can reason, debate with yourself, and make a different, conscious choice.

INHIBITORY NEURONS

These are the 'don't do it'-juices of your brain. The herbal tea for your brain. This is what happens when you start to do something and then change your mind. This is why we don't act on our intrusive thoughts*.

Imagine you're testing something, and suddenly some behaviour or button jumps into attention. What's going on there, is that a bug? Do you not understand the intended behaviour of the application? You know this isn't a case of 'will this kill me or can I feed my family'. What do you do? Do you give into your hunch and investigate? Or do you think 'ah, I'm probably imagining things.' Or worse: 'I'm probably me, this software is working great!'

Your mindset (stimulus + response) plays a large part in how effective you are as a tester.

We can use our conscience to make a different choice. There are four ingredients that guide us in our decision making and reasoning.

AWARENESS

If you are not aware of what you're thinking or what you are reacting to, then you cannot use your reasoning skills to do anything about it.

FREE WILL

Without free will to make a different choice, you literally can't.

> "These are the 'don't do it'-juices of your brain—the herbal tea for your brain. Your mindset (stimulus + response) plays a large part in how effective you are as a tester."

CREATIVE IMAGINATION

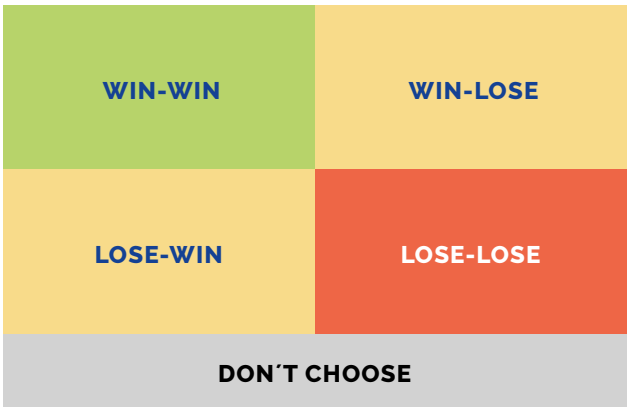
We use our creative imagination to imagine other options and other perspectives. These will lead to the option to make a different choice that might help you in your situation or reaction.

CONSCIENCE

Without our conscience we would make unhinged choices that would possibly (probably?) harm ourselves and others around us.

Using these four ingredients we can shape and create a win-win situation. You can imagine endless possibilities where your actions have positive effects, while choosing a win-win seems like a logical thing to do, very often people don't actually do that.

People sometimes make a decision that isn't good for them but that will benefit the other person (lose-win). They choose something that's good for them but not for the other (win-lose). Perhaps they make a choice that isn't beneficial for anyone (lose-lose). The fifth option: not choosing.



We have a responsibility to choose our responses. Or, when your response or mindset is off, to make a change. Your current mindset is heavily reliant on your current responses.

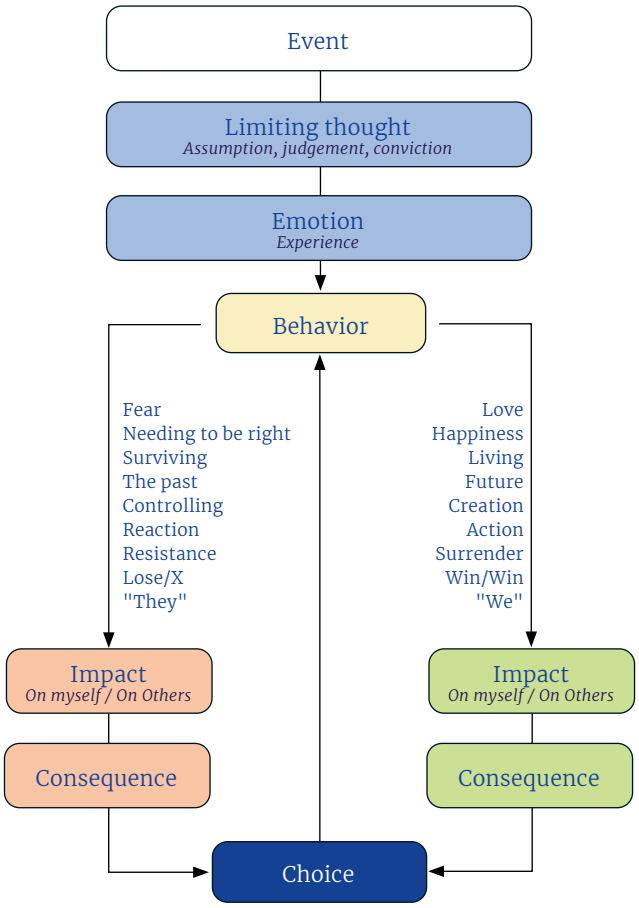
This doesn't only work for yourself; you can also use it to 'manipuhelp' others. Wilfully changing your reaction or manipulating others feels like something malicious. This is where your conscience comes into play. Make the right choice (for the right reasons) and it will not be malicious. If you change someone's mindset there is one very important

*An intrusive thought is something that you might think of in a split second that you 'shouldn't' do. A common thing I have is pushing buttons I know I shouldn't, and I (usually) don't. But I think of it (a lot).

thing to remember, manipulation for evil is a classic win-lose or lose-lose situation. That is why I like the term 'manipuhelping' when I use it for positive!

How do you do that though? How do you get yourself or someone else out of one response or mindset and into another one?

To explain this, I will use this model.



EVENT

An event happens. This is something that happens outside of yourself, that you have no control over.

LIMITING THOUGHT

This is an assumption about yourself or the situation that you immediately jump to. This is your amygdala reacting and your hippocampus, hypothalamus, and thalamus providing you with information about what it thinks you should do RIGHT NOW.

EMOTION

This is where your thalamus has found the 'right' book and starts to exhibit that emotion, it adds to the experience.

BEHAVIOUR

This is where you start acting like your emotion. You might cry, laugh, run, or help. Whatever book the thalamus has chosen, you will start exhibiting this behaviour. Your behaviour can go in either of two categories: a victim state or a responsible state. When you get victim behaviour, you might choose a book from your thalamus library that does not help you (win-lose). When you get responsible behaviour, you probably are using a win-win book.

IMPACT

What you do has an impact on yourself and on others. This will cause reactions all around, as a new event.

CONSEQUENCE

The consequence is that your reaction to an event has caused a chain reaction of other events. This is normal, you can't stop this. It's important to understand that this always happens continuously.

CHOICE

At this point you can make a different choice. You can't influence the event; you can't change your limiting thought or the accompanying emotion. However, you can choose different behaviour!

So, how do you get someone out of an (usually overreacting) amygdala response? One small trick is to ask a simple question that calls to your memory, like 'What did you have for dinner three nights ago?'. Answering this question uses a different part of your brain and will make the knee-jerk reaction go away. If you have more time, you could also do a physical activity, like a walk or workout.

When you think that there are no bugs in the system, you're likely to not find any. When you think that all the bugs are just you making mistakes, bugs aren't

researched or fixed. In both cases the quality of your application will dwindle. Challenge yourself to make a different choice. Adapt your behaviour to get back into the right mindset of finding bugs and establishing quality.

What happens when others change your mindset? External influences are always going to influence your mindset, the trick is to be aware of it. It's sometimes referred to as 'influencing' or 'marketing'. It's inevitable. If you're aware of this influence, you can choose to act different when you get caught in a negative spiral or responses that don't seem right. You don't buy literally everything you see an ad for, right? You're making a choice to not do that, despite the manipulations.

Given that you are always being influenced, your behaviour also always influences others. This is not something you can prevent. What you can do is ensure that people are influenced in a way that benefits both you and them. This is not easy, but with some knowledge of how your brain is trying to help you, you can work with it and make a different choice.

I created a mindset manifesto! The way the agile manifesto is written is a beautiful way to highlight what is more important over something else that might be less helpful, but that will happen.

In our interactions with others, and the choices that we can freely make,
we value emotional control over emotional weakness,
we value positive thinking over negative thinking,
we value a growth mindset over a fixed mindset,
we value appreciation over expectation,
we value small adjustments over big changes.

The ability to change someone's mindset comes with the responsibility to do the right thing.

Image by freepik

"You can't change the event or emotion, but you can choose different behavior. Challenge yourself to shift your mindset—adapt to find bugs and improve quality."

Linda van de Vooren
Quality Consultant @ Bartosz ICT

What's left for a Tester when Team owns Quality

Author: Liza Nikolaevich

FIND YOUR SPOT IN PELOTON

In professional cycling, a Tour de France team doesn't rely on a single superstar. Instead, the entire team, from the cyclists to mechanics, works together to maximize their chances of success. Every person there, no matter their role, plays a part in pushing the team forward.
Similarly, in a team that owns quality, testing isn't the responsibility of one individual, it's no longer limited to a single tester or a QA department. It's a shared effort. It becomes everyone's job — developers, product managers, and even designers take part in building a top-quality product. Okay, but if testing becomes everyone's job, what's left for a tester?

Before we dive in, you might be wondering — what does cycling have to do with testing? Great question, thank you for asking! Honestly, absolutely nothing, apart from being two of my greatest passions. So, don't be surprised if you come across yet another analogy between the Tour de France and testing (there will be plenty!).

As a tester, your role may shift throughout the development cycle, but your goal remains the same: to step into whichever role best supports the team in achieving their goals. You're the team's jack of all trades, wearing many hats — or helmets, if you prefer.

THE COACH'S MINDSET - FASTER, HIGHER, STRONGER

Let's explore the different "helmets" you can wear as a tester in a team that owns quality. One of the most important is the Coach's helmet, where your

role is to support and guide the team on their journey to quality. You may not be riding the bike yourself, but you're in the support car, offering guidance, strategy, and tactical advice throughout the race.

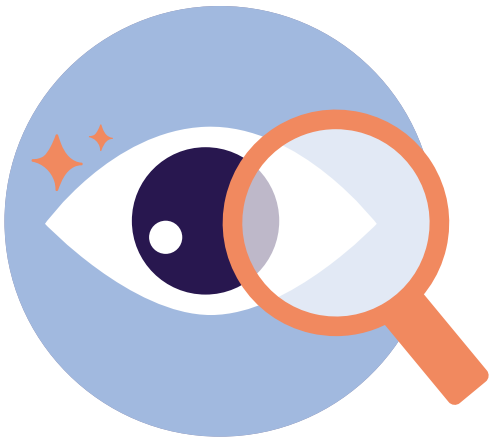
Have you ever heard the story of how Dave Brailsford transformed British cycling? When he took over in 2003, the team had never won the Tour de France. His strategy was simple: improve everything by 1%. Small changes, like testing recovery gels and teaching hand-washing techniques, led to big results. These tiny improvements contributed to the team achieving their first Tour de France victory, along with many other remarkable achievements. This approach, known as the "power of tiny gains", is a key principle in James Clear's book "Atomic Habits".

The same mindset applies to coaching in a testing team. At its core, coaching is all about encouraging continuous improvement. Each Coach's initiative, whether it's fostering a culture of defect prevention or advocating for quality, aims at the same goal: elevating the team's approach to quality to the next level and making things better than they were yesterday.

These are 3 steps to get started with improvements:

OBSERVE

The philosophy of tiny gains is built on identifying small areas for improvement. Start by observing the current state of things — how the team collaborates together, handles releases, and approaches testing. Engage with people, ask questions, and stay curious, avoiding immediate judgments. The goal is to spot even the smallest opportunities and spark ideas that can make a real difference.



"Improve everything by 1%. Small changes, like testing recovery gels and teaching hand-washing techniques, led to big results"

HELP YOUR TEAM GAIN A MINDSET OF CONTINUOUS IMPROVEMENT

You need to help your team develop a mindset of continuous improvement, this is what creates a culture of learning and flexibility. Instead of just sticking to what already works, it encourages small changes that improve both the product and the way the team works. Not only does this make ideas more easily received, but it also invites the team to suggest their own improvements. When everyone feels encouraged to share ideas, the whole team takes ownership of the process and outcomes.

EXPERIMENT TOGETHER

The thing about improvements is that they don't always come with guaranteed outcomes, they are more of an exploration. You won't always know the best approach right away, so it's all about trying out different ideas and learning through trial and error. The key is to not be afraid to experiment together and find what works best for your team.

Take a moment to think of one small change you could make today — what would your 1 percent improvement be? It doesn't have to be huge, but it's

a step in the right direction. Start small and watch how those little improvements add up.

THE HIDDEN HERO

In the Tour de France, there's a rider who rarely gets their moment in the spotlight but without whom victory is impossible — the Domestique. They're the ultimate team player, putting their own ambitions aside to fulfill one mission: support the lead rider. Whether it's pacing the group, shielding teammates from the wind, or giving up their bike in an emergency, their contributions may not always be seen by the crowd, but they're essential for the team to reach its goal.

Now, think of a tester in a team that owns quality. They are no longer quality gatekeepers giving the final green light. Their role has evolved into something deeper — ensuring the team can stay focused on what matters most by identifying and removing obstacles along the way. Imagine a tester looking into processes no one else had time to address — replacing outdated tools, revisiting inefficient procedures, or even speeding up automated tests. Or consider the time saved when someone builds a custom script to generate test data automatically. None of these tasks are glamorous — much like a Domestique (the real one) delivering bottles of water to other riders — but they save hours of frustration and help everyone else to concentrate on what matters the most. Every Tour de France victory depends on those working behind the scenes. Put on your Domestique helmet and help the whole team shine.

NEVER ENDING ROAD

Would it surprise you to hear that there are even more "helmets" you can wear as a tester?

Think about being a Mechanic for your team, enabling developers to work on test automation by providing the right tools and frameworks. Or you could step into the role of a Data Analyst (yes, Tour de France teams have Data Analysts too!), gathering insights about your software and identifying trends. And don't forget one very important role — the role of a Fan! Celebrate the wins, no matter how big they are, create great memories and cheer on your teammates on every stage of the race.

The key is to understand what the team needs and no one knows this better than you and your teammates. Identify where you can make the biggest impact and go for it.

But the path isn't always clear and there will be moments when your role feels uncertain — it can take time to figure out how your contributions fit into the bigger picture. Don't let that scare you, these moments of uncertainty are part of the journey. The beauty of this role is how much freedom it gives you to experiment and be creative. If you're brave enough to step out of your comfort zone, you'll find yourself tackling interesting and unexpected tasks.

Remember, just because the role of a tester is evolving, it doesn't mean it's any less meaningful. Enjoy the ride and don't forget to wear your helmet!

Photo by bady abbas on Unsplash

Liza Nikolaevich
Quality Advocate @Freeletics

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The UK Post Office Horizon Scandal

Author: Kevin Harris

When Lee Castleton first noticed problems with the computer system in the Post Office branch where he worked as a subpostmaster, he did what he was supposed to do and rang the technical helpline. Little did he realise that those technical issues would lead to him losing his job, losing all his money and having to declare bankruptcy, and being labelled a criminal.

Lee was one of more than 900 people (yes, I really mean 900!) who were successfully prosecuted for monetary shortfalls highlighted by a system called 'Horizon', an application used in UK Post Office branches since 1999. All of those convictions were based on data that has since been shown to be false – created by hundreds of bugs on a system that the Post Office and makers Fujitsu stated was 'robust' for 20 years.

SOME BACKGROUND.

The UK Post Office – where you can go to buy stamps and envelopes, send parcels, apply for passports, obtain pension payments, etc – has thousands of branches across the UK. Subpostmasters are contracted by the Post Office to run individual branches (i.e. are independent and not directly employed by the Post Office).

From 1996 to 2000, the Post Office installed Horizon into their network of branches. It was designed to manage all of the accounting, stock-taking and other services that had mostly been paper-based, into a single electronic system.

Unfortunately it had a rather chequered background – it was initially designed as a swipe card system that hadn't worked – but had cost around £700

million, and so was instead repurposed to transform the Post Office branches. Horizon became the largest non-military IT contract in Europe.

THE PROBLEM.

The major problem was that it was just a very buggy system. Users on the pilot scheme had logged many issues with it, which continued when Horizon was rolled out across all of the branches. The helpline was inundated with thousands of calls every month. Lee Castleton, who you'll remember from the introduction, rang the helpline 91 times before he was eventually suspended by the Post Office. By that time the discrepancies on his system totalled £23,000.

11,000	12,000 - 15,000
Number of local Post Office brances run by subpostmasters	Calls being made every month by sub-postmasters resporting technical problems with Horizon

THE REAL PROBLEM.

Every computer system has bugs. The real problem was that both the Post Office and Fujitsu constantly stated that Horizon was working properly, and instead blamed the subpostmasters for the discrepancies. The helpline constantly told callers that they were the only people who had issues with Horizon.

PROSECUTIONS

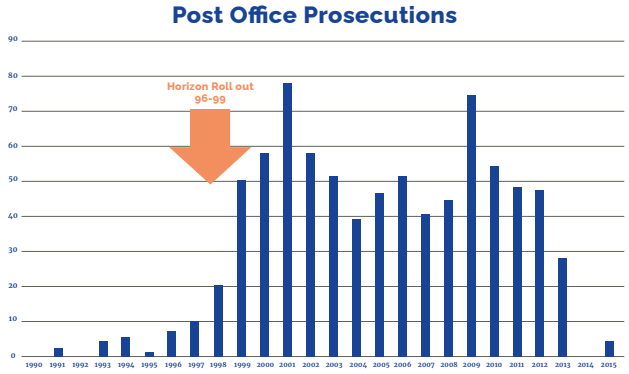
Rather than believe the subpostmasters, the Post Office chose to believe the false data coming from Horizon was valid. So every shortfall had to be paid back. For many Post Offices this rapidly grew into tens of thousands of pounds. If the subpostmasters refused, or couldn't pay the money back, then they were typically charged with fraud, theft or false accounting.

The prosecutions began in 1999, and rapidly accelerated. The Post Office moved from prosecuting one or two people every year at the start of the 90s, to 60 – 80 people every year in the 2000s.

Out of more than 900 people successfully prosecuted between 1999 and 2014 (and remember – none of these people had actually done anything wrong), more than 200 were given prison sentences. All of them lost their jobs and got a criminal record. Most had to repay the phantom discrepancies. Some were given community sentences. Some were fined additional costs.

Almost 3000 other subpostmasters are known to have made up shortfalls by using their own savings, borrowing more money, or remortgaging their homes.

THE HUMAN COST



When Lee Castleton lost his court case, he had already lost his job. Not only was he ordered to pay back £25.000, he was then charged court costs of £321,000. He had to declare bankruptcy, and returned to his previous job as an electrician.

Noel Thomas had been working for the Post Office for 42 years when he was convicted of theft. He spent his 60th birthday in jail.

Jo Hamilton tried to keep up with the discrepancies by using her own savings and remortgaging her home, and borrowing money from family, but still ended up with a shortfall of £36,000. She had to plead guilty to false accounting in order to avoid prosecution for theft. She was given a supervision order, and had to remortgage her home again in order to pay back the £36,000.

Photo by Johannes Plenio on Unsplash

Seema Misra was labelled ‘The Pregnant Thief’ by her local newspaper, and was found guilty of false accounting and theft, She was jailed while 8 weeks pregnant and was ordered to pay the Post Office £40,000. She was still wearing an electronic tag when she gave birth to her son.

Harjinder Butoy was convicted of ten counts of theft due to a shortfall of £206,000 and spent a year and a half in jail. He lost his shop, his home, was declared bankrupt, and his family had to move in with his parents.

And remember – each one of those five people represent almost 200 other people who suffered similarly.

It’s hard to imagine the emotional hardships that these people have had to deal with. Being convicted of a crime that you know that you have not committed. Going to jail when you have done nothing wrong. Losing your job, your home, your savings, your reputation. Relationships have broken down because of it. Those effected have suffered from stress, anxiety, isolation, depression. And all this because of a buggy computer system

Photo by Johannes Plenio on Unsplash

BUGS – EXAMPLES:

The Dalmellington Bug*: A subpostmaster was trying to record the transfer of £8000 cash from her main branch to a sub-branch when her screen froze. While frozen, she hit the Enter key 3 more times – and each one was recorded as a separate transaction. So instead of transferring £8,000, Horizon recorded that she had transferred £32,000. The subpostmaster was expected to repay the £24,000 difference.

The first independent review stated that the system was prone to errors due to faulty or outdated equipment, communication errors, and lack of security. It stated that Horizon had not been accurately tracking money from lottery terminals, Vehicle Excise Duty payments or cash machine transactions. There was also the "Callendar Square Bug," where the system would create duplicate database entries in the ledger.

NO SUCH THING AS A BUG FREE SYSTEM

As testers we know that there is no such thing as a bug-free project. During the late 90s to early 2000s, I worked on 3 major software projects (for 2 companies), and raised over 1000 bugs on each of those projects. I led a similar project to Horizon in the early 2000s, and during a 3 year development project we raised over 10,000 bugs. 1000 of those were still outstanding when we first went Live.

But we told our customers...

WHAT HAS HAPPENED SINCE.

The prosecutions finally finished in 2015 – after 16 years. Since then the subpostmasters have been seeking justice. It was only in 2019 – twenty years after the first Horizon prosecution – that the Post Office finally admitted that it was at fault and issued an apology.

There has been a public enquiry, that started in 2021 and has only just finished. It heard from 298 witnesses – not just subpostmasters, but witnesses from Fujitsu, the Post Office and from the UK Government (who own the Post Office).

As of this date, no-one has been made accountable – though the inquiry is looking into potential prosecutions due to perjury, withholding evidence, etc.

£26,000,000	Amount the Post Office estimate they wrongly took from subpostmasters
£1,800,000,000	Amount the Government has put aside for reparation

*Named after the Post Office branch where it was first discovered.

Questions we should ask ourselves

How good is our relationship with our customers? Are we being honest and open with them?

Do you believe your company would behave in the right way when issues occur? Would you feel able to speak out?

What is the worse outcome if something goes wrong with your application (and could we ever imagine something like Horizon happening on our systems)?

Are you looking at all of your data? Is there information you could use to discover hidden issues?

FURTHER READING

In this article I have only been able to discuss a subset of the many aspects that went into making this case the disaster that it turned into. I haven't mentioned the toxic management within the Post Office; the ability of the Post Office to prosecute its own cases; the lack of communication both within the Post Office, and between Fujitsu and the Post Office. Then there's the legality of the subpostmasters contracts; the reports of document shredding. The Post Office worker's union being run and financed by – you guessed it – the Post Office.

If you do want to investigate further, then both Computer Weekly and BBC News website have many hundreds of detailed articles about the case. There are now books and many documentaries covering what happened, and a four part British drama entitled 'Mr Bates vs The Post Office', which is compulsive viewing.

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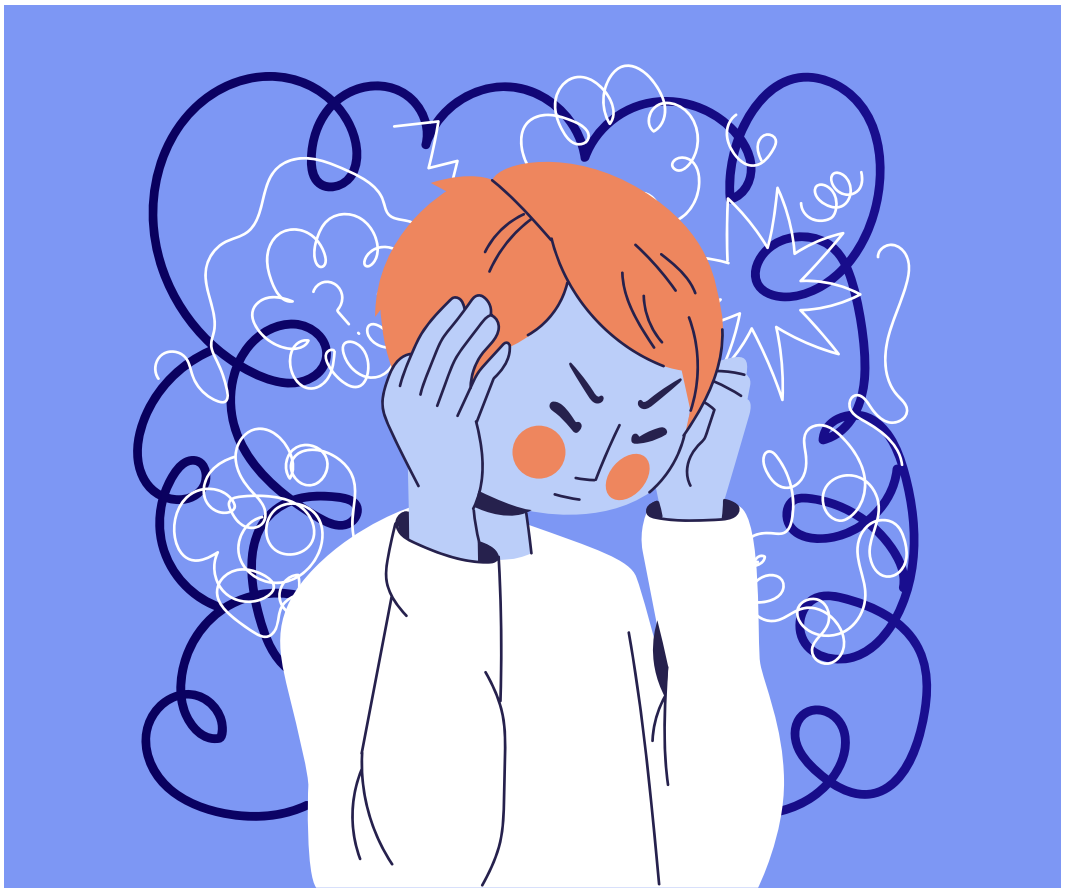


ADHD at Work

From Chaos to Creativity – What Really Matters!

"You don't look like you have ADHD."

"Ah, but you see, I also tend to forget a lot of things."

"You are just lazy."

"But you are able to sit still?"

These and other similar sentences are phrases that people with ADHD hear often.

Hi, I am Vero. I am in my late twenties and I was diagnosed with ADHD in 2024. And by far, I am not the only one: Around 6,8% of all adults worldwide have symptomatic ADHD that is diagnosed. Moreover, experts say that the number of undiagnosed persons living with ADHD is even higher. But why is this important? And why is this also of importance for the workplace?

I will start from the beginning, before doing a deep dive into the topic, I want to explain what happens in the brain of neurodivergent people with ADHD and which factors could lead to having ADHD.

Facts about ADHD

ADHD is the short form for "Attention Deficit Hyperactivity Disorder". That means people with it have a higher amount of inattention, hyperactivity and impulsivity. It is commonly differentiated between three types: The predominant inattentive type, the predominant hyperactive and impulsive type, and a combination of both (for more input: take a look at Myth 5).

So, how does ADHD arise? First of all, it is good to know that this neurological difference is neither something that is evolving by getting older nor something that can be healed by getting older. Current research shows that ADHD is something a person gets born with and will die with. Some symptoms may vary during the lifetime but healing is not possible.

Neurodivergent refers to individuals whose neurological development and functioning differ from what is typically considered "normal" or "neurotypical." This term includes a range of conditions such as autism, ADHD, dyslexia, dyspraxia, and other cognitive variations.

Experts assume that there are a few factors that influence if someone will have ADHD or not. These factors could be hereditary predisposition, psychological influences, risks in the womb and the daily lifestyle. Hereditary predisposition means that chances are high that if you have ADHD at least one of your parents may have it too. For the topic of psychological influences it is important to point out that bad parenting for example does not influence the occurrence of ADHD directly. There are factors like instability and too much criticism that could worsen the symptoms of having ADHD. Also, some experts think that our way of lifestyle could affect ADHD but this seems to be the most vague and unexplored idea of how ADHD arises.

Having now in mind how ADHD could occur in people, what is happening in the brain of a person that has ADHD? There are different kinds of neurotransmitters in the brain. People with ADHD have a lack of dopamine. The dopamine does not spend long enough time in the synaptic cleft.

That means it returns too fast back to the releasing nerve cell and that leads to a loss of information and impulses. As an explanatory example, think of a car that just changes his direction every time before it reaches its destination. But it is not just this, one is also unable to control in which direction the car is going or what is the final destination. And that is the other problem: For people with ADHD it is also not controllable which impulses they want to take care of. They feel and hear everything that is around them, anytime, every day.

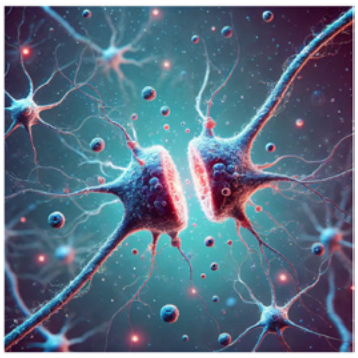


Photo created with Dalla

If now comes to mind the stereotype of "Fidgety Philip" - a character from the book "Shock-Headed Peter" that could never sit without moving - this is not what ADHD is meant to be and this is still very much a problem. If it is talked about being hyperactive it could be something that can be seen like luffing your leg but it can also be something in your brain so like the thoughts are bouncing.

ADHD influences work-life

Referring to the example above, one can already see how neurodivergence can affect daily work life. This is exactly the point where it could affect work life. A lot of people with ADHD have problems with organizing themselves and having routines. This could result in a lot of procrastination and/or lack of motivation especially if the brain finds the task

boring. It could be that people with ADHD have problems with their own time management and also have highly emotional reactions about small things. It could lead to a hyperfocus on things that are not important but nonetheless engaging, concentration problems and a difficulty to finish tasks. These, however, are examples on how ADHD can affect the workplace negatively.

SUPPORT NEURODIVERGENT AND NEUROTYPICAL PEOPLE

Feeling good at work should be everyone's concern—whether you are an employer, a colleague, or reflecting on your own mental well-being in the workplace. Achieving well-being at work is a collective effort that requires open communication and a shared commitment to avoid stereotyping or pigeonholing individuals. True workplace well-being involves collaboration among employees, supportive colleagues, and an enabling environment fostered by employers.

A healthy work environment is built on mutual respect and understanding. Employees need to feel empowered to openly discuss challenges and seek support. This requires colleagues who collaborate effectively, respect boundaries, and utilize the resources provided by the employer. It also requires employers to create frameworks that allow flexibility and adaptability for everyone, including neurodivergent individuals.

During hyperfocus, a person becomes deeply absorbed in an activity they find interesting or rewarding, which can lead to high productivity and creativity in that area. However, it can also lead to challenges if other important tasks or obligations are neglected

For individuals with ADHD, creating an inclusive workplace often involves specific adaptations. Employers should actively ask employees about their needs, as understanding individual requirements is key to offering meaningful support. For example, giving employees flexibility in how they plan and prioritize tasks allows them to work in ways that suit their unique strengths. Encouraging people with ADHD to unmask and share their authentic selves is critical, but this only works if employers and colleagues foster a safe, stigma-free environment. This means normalizing conversations about ADHD and mental health, destigmatizing challenges, and promoting open dialogue without fear of judgment.

Colleagues can play an essential role by being mindful of their interactions. This includes offering support in practical ways, like helping with task management or checking in on how their peers are doing without being overbearing. Encouraging collaboration that respects individual working styles can create an atmosphere of mutual support and understanding.

Specific tools and approaches can be particularly helpful for individuals with ADHD. For instance, tools like Jira boards, which break down tasks into smaller, visible steps, can provide a much-needed source of dopamine. Seeing tasks get completed offers a sense of accomplishment and motivation, addressing the dopamine deficiency often associated with ADHD. Additionally, employers should provide space—both literal and metaphorical—for uninterrupted work. In an office setting, this could mean quiet rooms or access to noise-canceling headphones. For remote workers, it might involve fewer chat notifications and opportunities to focus without the disruption of phone calls.

Lastly, employers, colleagues, and employees must understand that for individuals with ADHD, entering a deep state of concentration is challenging, but losing it happens easily. Respecting this dynamic is key to fostering productivity and well-being. By working together, we can create workplaces where everyone, including neurodivergent individuals, can thrive.

ADHD CHANCES

I could write a lot more about how to deal with the aspects of ADHD but I also want to mention some more positive impacts: People with ADHD are easily thrilled over tasks and small things, they are normally very creative, solution-oriented and people who can think outside of the box - just like every person has their respective pros and cons, even without neurodiversity. The crux here is: Find a space in which you can work using your qualities, while not masking yourself. And at the same time getting the support in a work environment which fits you.

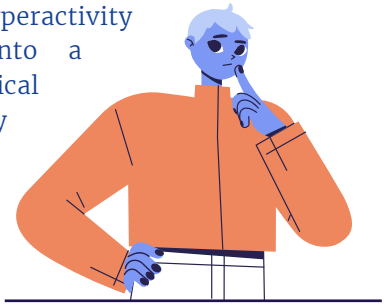
Myth Check

Myth 1: Adults don't have ADHD

ADHD is something people are born with; it doesn't just go away with age and can't be cured. However, the symptoms can change over the years (see Myth 2). Adults who were diagnosed with ADHD as children often feel less psychological strain because they've either gotten used to their symptoms or learned skills to manage them.

Myth 2: ADHD is changing with the years

Indeed, ADHD can change. It can change because people are changing by getting older, so also the neurodiversity can change. Although it will never be gone (see Myth 1), it can change in different ways. For example it could be that a physical hyperactivity could change into a more psychological hyperactivity by getting older and not being able to be so active anymore.



Myth 3: Everyone nowadays has ADHD

It is correct to say that there is a higher amount of ADHD diagnoses throughout the years. One explanation for this is social media and people who talk about their ADHD because this increases the awareness for ADHD itself. According to different studies the amount of people who have ADHD and are not diagnosed is significantly higher than people diagnosed with ADHD. Around ¾ of all children with ADHD also don't get treatment for it. Also ADHD is a lot fewer diagnosed by women or girls because they are often not the typical "Fidgety Philip" (see Myth 4). So, we still have a significant undertreatment of ADHD all over the world.

Myth 4: Persons with ADHD are always a "Fidgety Philip"

If a person is thinking about a typical person with ADHD, most of them will have a young boy in mind that cannot sit still. And that is exactly one of the biggest still present ADHD cliches. ADHD does not have to mean to be physically hyperactive. People with ADHD can also be shy, daydreaming or helpless (see Myth 5). The important thing is: Alone from observation it is not possible to see if a person has ADHD or not.

"Struwwelpeter" from Heinrich Hoffmann

Myth 5: ADHD is the same for everyone

If we take a look at the three described sub types from ADHD alone, it can be seen that ADHD is affecting every person in a different way. To go a little bit more into detail, take a look at this diagram:

3 Types of ADHD

INATTENTIVE

- Consistent forgetfulness
- Poor attention to detail
- Difficulty completing tasks
- Easily distracted
- No signs of hyperactive behavior

HYPERACTIVE/IMPULSIVE

- Experiencing restlessness and constant fidgeting
- Often manifests as excessive talking, constant movement, or a preference for staying perpetually active

COMBINED

- Encompasses a combination of inattentive and hyperactive/impulsive traits and behaviors
- Ranges from mild to servere and requieres consistent presentation over several months or years for diagnosis

Also keep in mind that ADHD often comes with other psychological diseases, for example: addictions, anxiety disorder, depression, borderline disorder and many more. That is the reason why it is also called a "spectrum", meaning it could have different facettes.

Myth 6: ADHD medicine changes people

ADHD medicine can help people feel less impulsive, be calmer and overall get more concentration and focus. ADHD medicines are not changing people, it is nothing that sedates people because for people without ADHD it would react as a stimulant.
The medication changes the interactions of the neurotransmitters in the brain. So the concentration and the duration of action of dopamine and noradrenaline are changed which leads to increase the attention span, reduces hyperactivity, controls the impulsive behavior and manages the executive dysfunctions.

Depending on the side effects of other already diagnosed diseases, currently taken medication and depending on the type of ADHD a psychiatrist or neurologist will adjust the correct dose together with the affected person.

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Quality Mentor
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SOURCES:
https://add.org/adhd-facts/
https://www.cdc.gov/adhd/about/?CDC_AAref_Val=https://www.cdc.gov/ncbddd/adhd/facts.html
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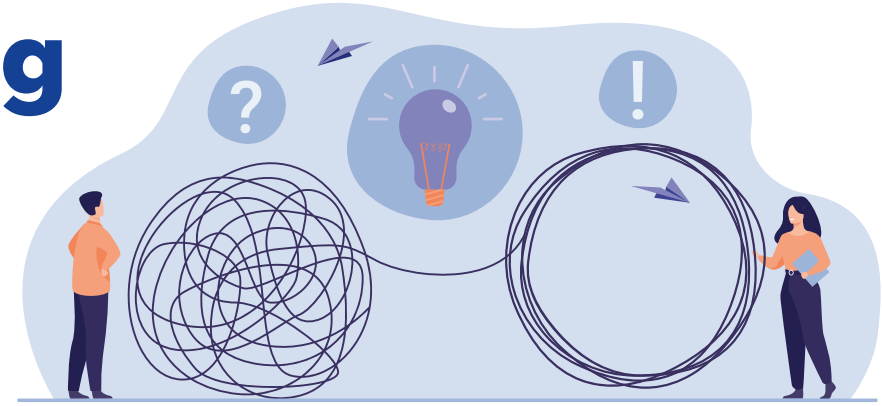
Level Up Coaching Skills - A Practical Approach to Improve One-on-One Coaching

Author: Derk-Jan de Grood



As a transformational leader, it is key to bridge the gap between what is really happening in the teams and the organizational ambitions and goals. There is a delicate balance between what you think is needed from a transformational perspective and identifying the actual bottlenecks or inefficiencies that limit team performance. Individual one-on-one coaching sessions help me understand what is needed on the office floor and connect transformational topics with real-life stories and data. This creates narratives that resonate and lead to changes that stick.

BALANCE BETWEEN STRUCTURE AND THE COACHEE'S NEEDS

With the above in mind, it is always a challenge to balance the individual needs of the coachee with the topics I believe should be addressed, especially when these topics benefit the organization and need resolution from a broader perspective.

This implies that in coaching sessions, we aim to balance structure with the coachee's needs. As coaches, we must listen carefully to the coachee, learn about their struggles, and truly understand them. Coachees are on the front lines and often see things that may not be apparent to us. On one hand, it is wise to let the conversation organically develop during coaching sessions. On the other hand, the coachee might have blind spots that need to be addressed.

Opting for the former risks overlooking personal struggles and challenges faced by the coachee, even if it enables us to discuss topics that align with the broader transformation goals. Conversely, the latter approach allows for personalized attention tailored to the coachee's specific needs, but it may be influenced by their own perceptions. For instance, what should one do when a Scrum Master believes everything is fine, despite evidence to the contrary?

The Clover Model

The Clover framework helps you find this balance. It is not just a set of questions; it is a framework for building trust, identifying patterns, and empowering people to create change. It helps connect individual needs with organizational goals, tying personal experiences to organizational patterns so meaningful, lasting changes can be made.

The Clover model consists of four leaves, each focusing on a specific topic. This creates a mental map that guides you through your coaching conversations. I will explain each leaf first, and then later we will see how, when combined, they unlock even more coaching magic.

THE FIRST LEAF: CHALLENGES OF THE DAY - WHAT IS HOT?

Imagine you have a coaching session. As your coachee walks in, she seems clearly upset. If urgent matters arise, discussing long-term strategies becomes futile—nor is the coachee likely to be receptive to other topics when the office floor is metaphorically ablaze. As a coach, it seems only logical to address and discuss this, right? By hearing the coachee out, practicing active listening, and summarizing their feelings, you might guide the coachee onto a pathway for them to move forward. Channeling emotions and insights creates room for the coachee to step back and oversee the bigger picture.

If there is a major issue, you might guide the coachee onto a pathway to move forward. Once there is cognitive space beyond the daily realities, we can discuss topics from the other leaves as well.

LEAF TWO - ROLE FULFILLMENT

If a Scrum Master is good at firefighting, that does not mean they excel at addressing team culture issues. If your PO is good at stakeholder management, does not mean he is an ace at refinement. Whether you are new to the job and still discovering your strengths, or a senior professional, we all have blind spots. Maybe we've created patterns that make us efficient in one way but less open to other aspects of our role.

"It's a bit like that old Swiss Army knife. It offers many tools, but sometimes we get stuck using only the screwdriver."

It's a bit like that old Swiss Army knife. It offers many tools, but sometimes we get stuck using only the screwdriver. By asking questions like, "What part of your job gives you the most energy?" and "What skills do you find most challenging?" we can connect individual patterns with personal learning potential, and even organizational expectations. Awareness of personal preferences and biases is crucial. In coaching sessions, we explore the root causes behind overemphasized or neglected responsibilities and strategize to achieve balance. Role fulfillment matters, especially as organizations aim to enhance agility and encourage their employee to grow to new levels of proficiency.

LEAF THREE: METRICS - WHAT CAN WE LEARN?

Some coaches are surprised to see team metrics entering the conversation. When I explain that we aim not just to look at the data but also to identify discrepancies between what it tells us and our observations as coaches, they often express approval. That's where the magic happens.

What you see as a coach, and what you hear from the coachee—does the story align with the data provided?

Many teams have a set of metrics, such as team happiness, velocity, delivered value, or predictability, measured each iteration. Agile Maturity scans are also often used, albeit less frequently. It's worthwhile to examine these metrics and assess whether they align with the Agile coach's perspective on the team. For example:

"You mentioned that the team is gaining momentum, but the velocity is decreasing."

"Earlier, you highlighted a toxic atmosphere, yet team happiness is currently at an all-time high."

"You say the team is on fire and completing many items. How come the delivered value has dropped?"

There is no absolute "good" or "bad." These discrepancies spark valuable discussions about the metrics themselves, their insights, and their significance. Furthermore, analyzing metrics can help uncover blind spots or biases in the Coachee's mindset

LEAF FOUR: GROWTH & TRAINING – DEVELOPMENT OF THE INDIVIDUAL, TEAM, AND STAKEHOLDERS

The fourth leaf centers on knowledge enhancement and skill development. For this, we need to shift gears a bit, looking ahead instead of backward. This is the most proactive of all.

As we delve into previous topics, we often uncover gaps in knowledge, blind spots, or the need for deeper understanding of certain practices. Coachees benefit from defining specific short-term actions. For example, reading about a development practice might help a Product Owner better understand the team's activities. Longer-term investments may also be necessary if the coachee wants to master specific skills to advance to the next level. Regardless, these needs must be articulated clearly.

Growth and training needs extend beyond Individuals. Stakeholders and teams can benefit from training to enhance their understanding of their roles or align with agile principles. For example, teams might work on better refinement practices or participate in a feedback workshop. Anything goes when identifying needs for growth and training.

"It's all connected—by understanding individual leaves, we reveal organizational health and create lasting transformation."

BOTTOM-UP TRANSFORMATIONAL DRIVER

The Clover model's power is unlocked when we start connecting the individual leaves to gain a better view of organizational patterns and health. By looking at the fires of the day, we learn what is truly happening. This insight often reveals origins in role fulfillment gaps, organizational clarity issues, or misaligned responsibilities.

When examining data, we may discover patterns, such as teams hitting velocity targets but sacrificing quality. How does the organization define success and measure progress? Are these measures aligned with their goals? Cultural issues may surface as well—does the organization allow for failure and learning? Is there time for training or experimentation? Do people dare to speak up and rock the boat?

Similarly, individual training needs often signal broader organizational requirements, such as improving stakeholder management or conflict resolution. These might also reflect the culture or the operational health of the organization.

The training needs also prompts us to align expectations. If we want to send the team to a training, do we receive support for this initiative? Furthermore, if we believe that teams would benefit from workshops on topics like Continuous Deployment, BDD, or other engineering practices, do we receive support? Does this align with the IT and development strategy? Can we allocate time for developers to participate? If not, what does this say about the transformation process?

It's all connected. By paying attention to individual leaves, you gain a snapshot of the organization's overall health. Translating individual coaching meetings into organizational patterns enables us to create changes that stick—not just temporary fixes but meaningful, lasting transformation.

As a transformation coach, I have consistently advocated for addressing these topics within the organization. Unfortunately, there have been instances where leadership did not fully grasp their importance, and in response, they asked me to focus solely on the teams. With the clover model, I am pleased to have defined a set of questions that allow us to do so at team level, while simultaneously triggering relevant discussions for those topics that are relevant for successful transformations. The Clover model is not just a set of questions. It's a framework for building trust, identifying patterns, and empowering people to drive change.

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Surviving and thriving as a Junior QA Lead:
Tips & Tricks

Author: Ima-Abasi Effiong

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FROM QA ENGINEER TO QA LEAD

Currently, I am the QA Lead at my company from being just a regular QA engineer in the team. This is a shift from being an individual member who contributes to the team to leading the team. Suddenly, you're not just writing test cases and executing them, you're responsible for planning, delegating and ensuring the team's success.

EXPECTATION VS REALITY

I thought becoming a lead meant less work for me. I thought all I needed to do was delegate tasks and wait for feedback. I thought it meant more alone time for me to do my personal stuff. But in reality, it means getting hands-on as well as managing a team. It means getting involved in product, architecture and development. In order to get involved in all these, you have to understand from everyone's perspective, having meetings with the different cross-functional teams to understand their perspective. I write test cases, test plans, discuss requirements, advocate quality, drive QA strategy, and attend senior management meetings. I make important decisions around releases. I am constantly talking about testability, reminding developers to test their code, asking questions on the architecture of new features, pointing out gaps and suggesting improvements-this is to help with ease of testing. And of course, I still get around to doing the testing job itself.

MANAGING A QA TEAM

Being a team lead comes with so many responsibilities like I have discussed above. But now, let's talk in detail about the leadership itself- managing a QA team. Asides every other thing you do, this is your primary responsibility as a lead. For me, it was overwhelming balancing technical work with leadership duties. Let me tell you how I overcame this challenge:

Understanding the people I work with

I took the time to understand everyone in my team. I asked questions about their experiences and background. This helped me to know how best to approach and delegate tasks wisely - I knew who would do a better job at writing test cases, the one who is best at giving detailed reports, who would be good at testing a particular feature or module. This way, you are assigning tasks based on individual strengths and having clear expectations from each person. Also, here you can offer guidance on how each person can build on areas they are not good enough. Understanding the people you work with and identifying their strengths and weaknesses will help you avoid micromanaging. Initially, I did not trust anyone in my team to carry out any tasks successfully. I would assign tasks and still go behind to do them myself. It is okay to review your team's work, to offer assistance und guidance where need be. Because if you are giving tasks to your team members based on individual strength, you will trust them to deliver.

Encouraging collaboration and communication

A team that collaborates and communicates is an efficient and innovative one. In my company, we do stand up every day, during this time, I make it clear everyone's input is welcomed. I do this by ALWAYS asking them if they have any suggestion, idea, questions or concerns they would love to share with the team. This is to encourage team work and open communication.

HANDLING PRESSURE AND DEADLINE

Prioritization

As a QA lead, it is your job to make sure your team meets up with deadlines and that they stay focused. When deadlines are approaching and getting tight, prioritization is the key. Let's say I have a feature to deliver in two weeks and the deadline is almost here, I have learned to identify critical test areas and prioritize them. This means the most important features are tested and released.

Communication

Communicating early to your bosses or stakeholders is another way you can handle deadlines. Took me a while to finally get used to this and actually remembering to do it. I used to find it difficult to reach out to my bosses to say we would not be able to meet up with this deadline. In one of our meetings, my boss told me, "you should have informed us earlier". I got to understand that communicating your challenges earlier helps the stakeholders to manage their expectations and build trust. It also allows you and your team more time to deliver your tasks successfully. Make prioritization and communication key in handling pressure and deadlines as a lead.

PERSONAL GROWTH

Time Management

I have came to understand that my personal growth

as a QA lead is just as important as that of my team. Some of these growths are what you have been forced to learn or pick up while doing your job as a lead. Take for instance, time management, you don't even have to take a special course to learn how to manage your time efficiently. With experience joggling the different roles I play as a lead - leadership duties, technical duties and even my own personal duties and development, I now know how to manage my time efficiently. Afterall they say, experience is the best teacher.

CONFIDENCE

> **"Confidence doesn't come out of nowhere. It's a result of something... hours and days and weeks and years of constant work and dedication."**
> - Roger Staubach

Confidence is another growth I have noticed in myself since becoming a QA lead. I now believe in myself because I have overcome challenges I thought were too hard for me. I no more worry about being perfect but rather, seek the courage to still do it and work on getting it better. Nowadays, I do not fake to know something just so I don't look stupid. I am quick to ask questions, ask for further explanation, chip in my opinions here and there during design reviews or at any other meeting. I need to understand what my team needs to do so I can communicate clearly to the people I am leading.

MENTORSHIP

As a lead, you need people to fall back as a support system. Do not act like you've been here before (lol) because you haven't. You need guidance from people who have navigated the challenges of leadership you are currently facing. So, find a mentor. For me, I do not seek out structured mentorship, I reach out to seniors on Linkedln and ask my questions. I do a lot of contributions outside of my day to day job - like contributing to open source projects, being a mentor myself at different tech communities, so I have formed a network for myself in these communities where l can easily reach out senior leads for support and guidance. Another resource that has helped me tremendously is reading tech magazines like this one-Testing Experience, where experienced leads also share insights on different topics around software testing. I also make Harvard Business Review my mentor a lot (lol). I love to read it so much. It is like Reddit or Quora of corporates. There is no career advice you wouldn't see there. Whatever career challenge you are going through, someone has been there before and written about it.

SUMMARY

Leading a QA team for the first time is not a walk in the park. It is a situation where you wear many hats - you lead your team, do your technical work, you make conversations happen, make decisions, ensure product duct quality around and so many more. All these things require so much tips and tricks to navigate which I have shared some, from personal experience with you.

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