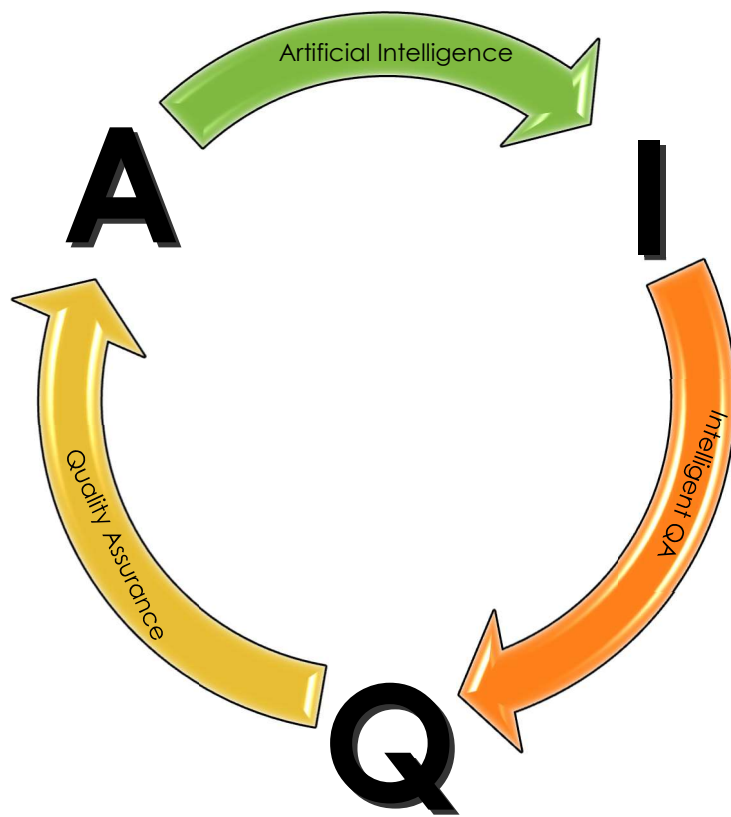


## Intelligent QA – Have we come a full Circle?



**Sandeep S Sudame**

Capability Leader – QA Practice  
New Vision Software

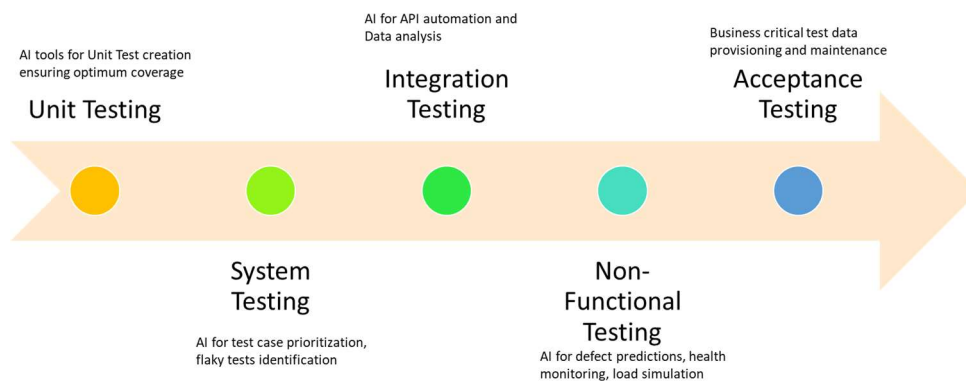
## The journey...

Hushhhh...it has been a long journey, indeed. And guess what, it has not finished yet! In fact, it is becoming more intense, challenging, interesting as the landscapes around us are changing lightning fast, naturally. Yes, I am talking about our journey as Testing enthusiasts, together. Truly, the Quality Assurance (QA) has come a long way,

- from the times there weren't any dedicated testers and Developers used to test their own code,
- through various stages of dedicated testing and Automation tools, experts,
- and now, where again there is a buzz if we need manual testers when RPA, AI/ML has taken over most of your testing?

With rise and rise of **DevSecOps**, there is an unprecedented surge in use of **AI/ML** based tools and technology to support IT delivery functions. How can QA stay behind? Let's have a look at how Quality Assurance is adapting to this paradigm shift.

There is no question, QA must be Intelligent today to keep pace with emerging trends in the information technology space. However, there is no thumb rule or one-size-fits-all solutions for various sectors this industry is serving. Every customer, domain, program, project has different requirements and priorities. While some of their needs are common viz. faster time to market, cost, quality are all common imperatives. Quality Assurance has adopted AI/ML tools or created bots using languages like Python to aid the end-to-end Testing process. Testing has not only become efficient, faster, accurate but above all, more **intelligent!**



## The Use Cases...

Let us look at some use cases where AI has both strengthened and simplified the testing process.

### **#1 Defect & Test Prediction**

**Problem Statement:** Repeated defects across different User Stories (under similar Features of an Epic) consuming huge triage efforts.

**Solution:** Developed **Machine Learning (ML)** bots using **Supervised Learning algorithms**. Here the bots were trained with **known data** related to the past defects and associated test cases on similar User Stories (e.g., payment methods). When a User Story is picked up for Development, a bot will generate a detailed report of similar user stories in the past, associate these with past defect occurrences and test cases ids and finally suggest the defect owner teams based on past defect RCAs.

**Impact:** Saved efforts for both Developers and QA teams by identifying defects early in lifecycle and optimising the overall test efforts by predicting the adequate coverage. Developer will be alerted in advance of the possible failures and can take proactive remediation actions. QA, on the other hand, would know the TCs and Defects occurred on similar User Stories so that they can prioritize the test cases during the Sprints.

### **#2 – Failure Analysis**

**Problem Statement:** Delays in delivery due to time consuming RCA for failed test cases and effort wasted on false negatives owing to flaky tests.

**Solution** Scrum teams often spend hours to analyse the failures of automation scripts with little success, as the test failures are random and intermittent (Flaky tests) particularly UI based tests. AI bots were developed using **ML Unsupervised Learning algorithms**. Here, the bots were trained with **unknown data to detect the trends or patterns** in random test failures and give the response. These were further used in developing more resilient test cases to accelerate the process.

**Impact:** 80% efforts saved in analysing the root cause for Flaky Tests and 50% reduction in such tests itself.

## The Advantages...

We all are aware that AI-powered testing tools can simulate or mimic human behaviour and help QA lifecycle more efficient, faster and intelligent. Let us look at the key benefits of AI infused Quality Assurance process-

### **Faster Time-to-Market**

Use of artificial intelligence algorithms and natural language processing significantly reduces testing lifecycle. Few examples on how the testing is expedited includes automated test case generation, regression test suit optimization, failure analysis and predictions, test prioritization all of which are extremely arduous tasks if done without AI.

### **The Ops Quality**

As the technology landscape is expanding, we often witness lot of data related or integration issues as Production incidents. The primary reason for missing out on those bugs is the enormous amount of data we play with (often missing the Business-critical edge cases) and the mesh of microservices implemented in the application. Using AI, the logs can be analysed quickly and effectively for any defect analysis, identification and most importantly, prediction. As more critical defects can now be either found or predicted early, the Defect Leakage to Production is significantly reduced, thus improving the Quality in Production.

### **Accessibility – The UX Factor**

There are international compliance standards to which web and mobile development today must be adhered to. The usual test approach of manual or automation testing for validating the accessibility requirements or ultimately the User Experience may not be the most efficient and accurate option. Automation remains at the centre of any QA process while AI assists to make the process of accessibility testing more precise and effective.

AI helps to make applications more accessible and personalized. AI is used to describe images and graphics for people with visual disabilities. Computer vision algorithms can identify objects in images and transform this information into text or audio, allowing users to better understand the visual content of the web. For example - AI helps people with low vision to the access information on the page with screen readers.

## Skill Development - an imperative...

The Quality Assurance leadership must adopt few unique initiatives to enhance the much-needed technical and soft skills for our new and experienced experts. There is a need to facilitate various programs round the year to sharpen the required skills in demand. While everyone keeps focusing on technical skills which has a wide range e.g., Data Science, RPA, Automation, DevOps, AI frameworks and platforms, Languages like Python, Hyper scalers like AWS, GCP, Azure and the list goes on. However, below sections sheds some light on the soft skills which are equally important to hone -

- ✚ **Communication Skills** – Encouraging people to talk and express in meetings, breakouts, social activities, and various quizzes.
- ✚ **Teamwork** – Team building games, festive celebrations and competitions, cross-projects engagements.
- ✚ **Cognitive Flexibility** – Continuous engagement at levels through podcasts and leadership messages on mental and physical health, work-life balance, Yoga, Mediation, etc.
- ✚ **Critical Thinking** – Monthly meetups for all levels to present any innovative ideas. Here, presenters need to explain the problem statement and the research, analysis, and relevance of the innovation/idea. Audience is encouraged to ask questions to challenge the idea in the best possible way.
- ✚ **Emotional Intelligence** – This, by far, has been the most critical soft skill, post Covid pandemic. As all of us were disconnected physically and emotionally, there has been a visible impact on how many of us deal with certain situations now vs then. To bring the old best ways back of co-existence and collaboration.

## Platforms and Tools...

Here are some of the top AI test automation tools and platforms available in the market –



Google AI Platform



TensorFlow



MS Azure



TestSigma



Eggplant



appitools



Testim