

Future of Testing in the Digital World



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Software Testing has been evolving since the dawn of computing as a science, an art, and a profession. Testing discipline too has evolved fast. Regardless of the changes in technologies and Information Technology (IT) landscape, testing has continued to remain focus areas for organizations, more so in today's digital world, where the cost of failure is high.

Before one makes an attempt to chart out future of testing in next decade, it would be good to summarize the technologies of tomorrow that the testing discipline needs to cater to.

Key technology trends that would shape future of Information Technology

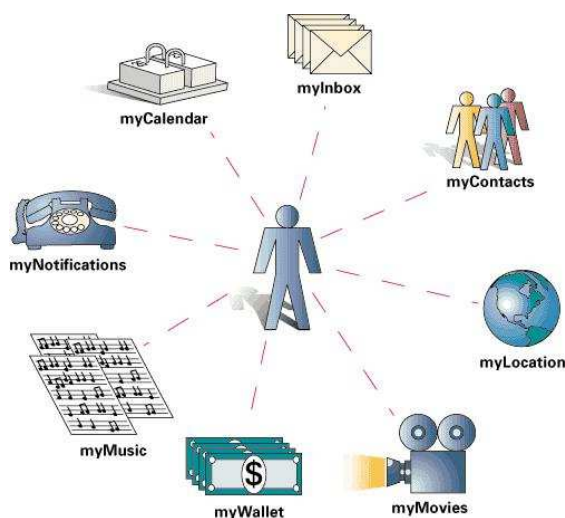
In this section, we would present 5 key technology trends, viz.

- Pervasive technologies and predictive analytics for customer experience
- Cognitive Intelligence in connected autonomous vehicles
- Multi-channel customer connect and wearable technologies
- Dis-intermediation eliminating middlemen
- changing workplace of future with arrival of robots

Pervasive technologies and predictive analytics for customer experience

Pervasive technologies deal with the flow of information between the built-in environment and its occupants. The environment is rich with information that can be utilized to enhance the quality of our work and life. Some basic examples such as customized deals in shopping malls based on geo-localization and buying pattern, traffic alert based on the route taken to the office every day, etc.

Even Connected Autonomous Vehicles (CAV) are good examples of pervasive technologies and predictive analytics as they interact with their environment and based on some specific triggers, predict the outcome of the events and perform appropriately.



Disintermediation – Business Platform to connect new partners

Disintermediation platforms are removing intermediaries from a supply chain in connection with a transaction or a series of transactions. In order to decrease the cost of servicing customers, traditional distribution channels, which had some type of intermediate companies such as distributors, wholesalers, brokers or agents, are now dealing with every customer directly or via the internet.

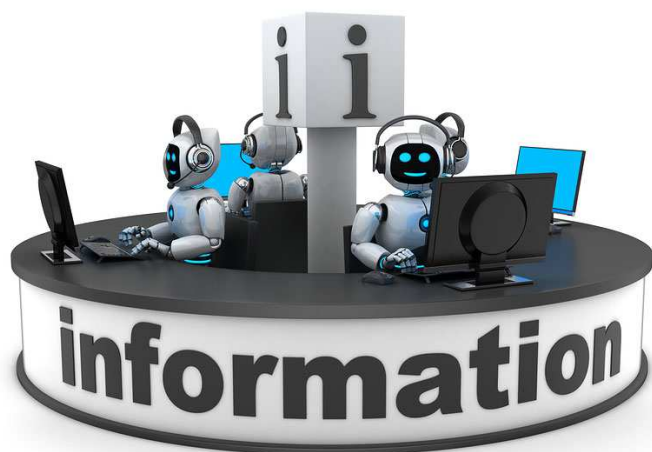
Some basic examples are eCommerce platforms such as FlipKart and Amazon, which source products directly from the manufacturer. Other examples are reselling platforms such as OLX, which connects the buyer and seller directly enabling the successful transaction.

ITC's e-Choupal has completely removed the middlemen and benefitted a huge number of Indian farmers, who can sell their produce at a much better price.



Changing workplaces of future – Robotic Process Automation (RPA)

In Robotic Process Automation (RPA), software "robot" replicates the low-skilled actions of humans such as entering data into an enterprise resource planning (ERP) platform or follow a set of repetitive processes. RPA software can be configured to capture and interpret the actions of their existing applications used in a variety of business processes. Once the software has been trained to grasp certain processes, it can automatically manipulate data, communicate with other system, and process transactions as needed.



Testing considerations for new technologies

How are we going to test these new technologies? Is it going to be tricky or just a cakewalk? Let's try to find out the testing considerations for each of these new technologies.

Pervasive technologies and predictive analytics

Testing for pervasive technologies and predictive analytics will have three basic components: (i) Business analytics testing on the huge amount of information gathered from the environment; (ii) Thorough testing of the prediction model for extensive coverage of test scenarios; and (iii) Testing of the adopted Near Field Communication (NFC) technology

Cognitive intelligence–Connected Autonomous Vehicle (CAV)

During testing of CAV, two most critical factors are cognitive intelligence of the prediction model and response time. While the software onboard will be responsible for predicting the next move of the other objects on the road, the hardware will be responsible for performing the required action within a fraction of a second.

Along with basic connectivity testing, thorough testing of the prediction logic and performance testing of the hardware response time will be of prime importance.

Multi-channel customer connect–wearable technology

Wearable technology primarily consists of sensors and IoT. The testing of wearable technology will primarily focus on testing the sensors and the information captured by them.

Testing the connectivity and internet protocols should also be part of the testing consideration.

Disintermediation–business platform

During testing of a business platform for disintermediation, knowledge of the end-to-end business scenario and process flow is very important. Therefore, the testers have to be savvy with domain understanding as well as the technology used to realize the platform.

Also, from end user testing perspective, crowd testing can be a viable choice for all these business platforms.

Changing workplaces of future–robotic process automation

Robotic process automation is going to change the way we do testing and test automation today. The software components of RPA should be tested the way we test any software component. However, instead of a traditional waterfall, it will be more inclined towards agile, Extreme Programming (XP), Test Driven Development (TDD), or Behavior Driven Development (BDD). Having System Development Engineers in Test (SDET)s in the testing team rather than pure career testers should also help test the RPA.

Concluding Thoughts

With the advent of new technologies, basic testing process and methodology will not change significantly; but at the same time, as these new technologies are evolving and the test basis is ever changing, traditional waterfall model will give way to more flexible methodologies such as agile, TDD, BDD, micro-services architecture, etc.

Looking ahead in the future, testing will be more tools-oriented; even the automation scripts will be created by robotic software. Testers also need to upgrade their skills from pure, independent career testers to a more holistic skillset from technology and business perspective. Eventually, they will have to wear multiple hats as apart from their testing job they have to perform troubleshooting and if needed, coding as well.

About the Author

Renu Rajani is a seasoned IT Services/Consulting leader with 28 years of experience. She is Vice President and Delivery head with Infosys in Financial Services. Prior to Infosys, she has worked with reputed tier-1 IT services companies including Capgemini, Citi, IBM, and KPMG Consulting in key leadership roles. Renu's experience spans across complex delivery, Transformation, Technical Solutioning, Outsourcing Governance, and Consulting.

Renu has been recipient of Testing Thought Leadership award in 2008 by PureTesting and Testing Leader of the year award by Unicom in 2015.

Renu holds an MS from Krannert Graduate School of Management, Purdue Univ USA, an MBA in Finance from DAVV Indore, a B Tech in Computer Science from IET, Lucknow University. She is an IBM Sr PM Certified with DPE/SM discipline, and holds ITIL V3, CAIIB and PMP Certifications.

Renu is author of two books on software testing

“Testing Practitioner Handbook”, Renu Rajani, Packt Publisher, 2017, ISBN 978-1-78829-954-1

“Software Testing – Effective Methods, Tools and Techniques, 2nd Edition”; Renu Rajani, Pradeep Oak; Mcgrawhill Education, 2018; ISBN-13: 978-93-87432-67-3

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Techbits

India becomes world's second largest mobile phone producer: India has become the world's second largest mobile phone producer after China, as per information shared by Indian Cellular Association (ICA). According to the data, annual production of mobile phones in India increased from 3 million units in 2014 to 11 million units in 2017. India replaced Vietnam to become the second largest producer of mobile phones.

Robot designed for hiring humans made in Russia: Russian startup Stafory has developed an AI-powered robot named Vera designed for hiring humans. Robot Vera, which has been trained with 13 billion examples of syntax and speech, can shortlist or delete duplicate resumes and conduct interviews. The startup claims Vera has taken over 2,000 interviews so far and has 300 clients including PepsiCo, L'Oréal, and Ikea.

Smugglers used drones to send \$80 mn worth iPhones to China: Chinese customs officers have busted a group of smugglers who used drones to transport iPhones worth \$79.8 million from Hong Kong to Shenzhen city in China. The smugglers used drones to fly two 200-metre cables between Hong Kong and the mainland to transport refurbished iPhones. They reportedly transported as many as 15,000 phones in a single night.

Social network Arbtr lets users share one post at one time: Canada-based developer Daniel Grigsby is developing a social media network called Arbtr which limits users to sharing one post at one time. The platform claims to function on 100% human curation and deletes the old posts after users share a new one. However, users can turn this feature off to keep a log of everything they've shared for a fee.

Google to shut down its URL shortening service 'goo.gl': Google has announced that it will be shutting down its URL shortening service 'goo.gl'. The company said new and anonymous users won't be able to create links through the service from April 13 but it'll be available for existing users for another year. The URL shortener was launched in 2009 for users to share links and measure traffic online.

Mobile internet users in India may hit 478mn by June 2018: Report: The number of mobile Internet users in India is likely to reach 478 million by June 2018, according to a report by Internet and Mobile Association of India and Kantar-IMRB. The number increased by 17.2% from December 2016 to hit 456 million by December 2017. The popularity of the mobile Internet in the country was attributed to its affordability.

US approves SpaceX's plan to provide internet via satellites: The US Federal Communications Commission (FCC) has authorised Elon Musk-led space exploration startup SpaceX to deploy its proposed system to provide internet services using satellites. This will allow SpaceX to provide reliable and high-speed broadband service to consumers around the world, the FCC said. SpaceX filed an application seeking permission to launch 4,425 satellites in 2016.

Amazon India testing search feature using pictures, barcodes: Amazon India is testing a feature on the Android operating system which allows users to scan pictures and barcodes to find products on its platform and buy them. The feature is already available on its iOS app in India. The feature currently has a limited customer visibility, a spokesperson for the e-commerce giant said.