

Full Stack Testing

In today's world, digitalization is required to sustain and grow any business



NETFLIX

DVD rental portal in the **1990s**

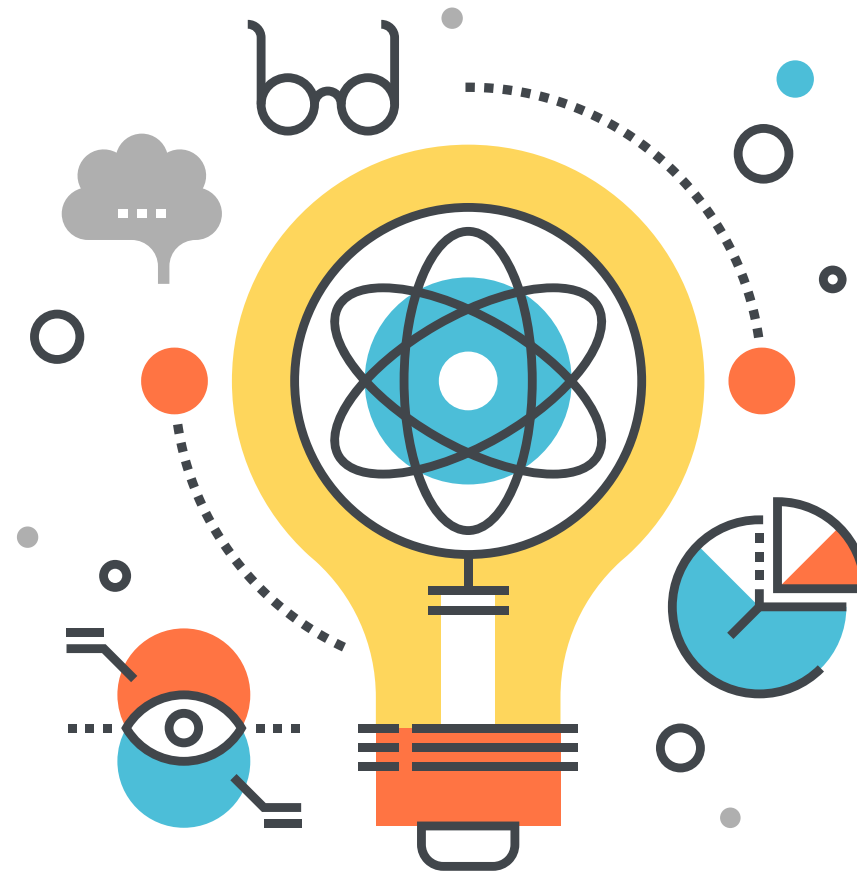
Online streaming in **2007**

As of the end of **2021**, Netflix was the largest online streaming service with well over 200 million global subscribers



From online book store, to billion dollar ecommerce giant

Innovation and versatility help businesses be successful in acquiring a critical mass of customers





Why are we discussing these details while
learning **Software Testing**?

- Software quality has become a **Nonnegotiable Criterion** in today's competitive market
- Compromising on software quality is equivalent to running a race knowing that you will lose it



October 2014 Indian ecommerce giants Snapdeal and Flipkart went head to head on their seasonal sale after months of marketing. Unfortunately, Flipkart's website crashed multiple times during the "Big Billion Day" sale due to overwhelming demand, causing it to lose many customers and a great deal of revenue to Snapdeal.



[https://www.thehindubusinessline.com › article64240270](https://www.thehindubusinessline.com/article64240270) ⋮

Flipkart fumbles on the big day as server fails

06-Oct-2014 — For **Flipkart**, the poster boy of Indian e-commerce, it was supposed to be a 'big' day. But things didn't quite go as planned as a technical ...



What went wrong?

YAHOO!

Biggest data breach in history, exposing 3 billion user
accounts in 2013

Full Stack Testing for High Quality

***"Software quality was once equated to a
only a bug-free application"***

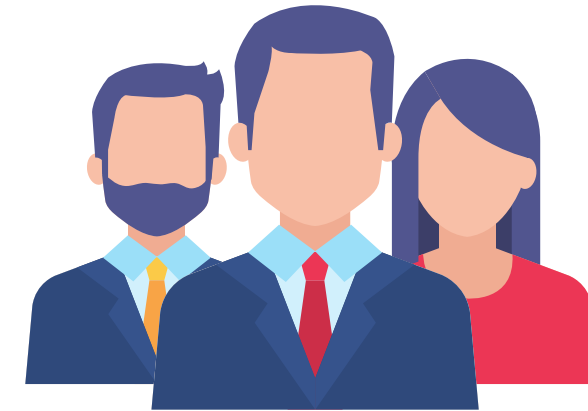
it's not just that anymore

Define Quality?



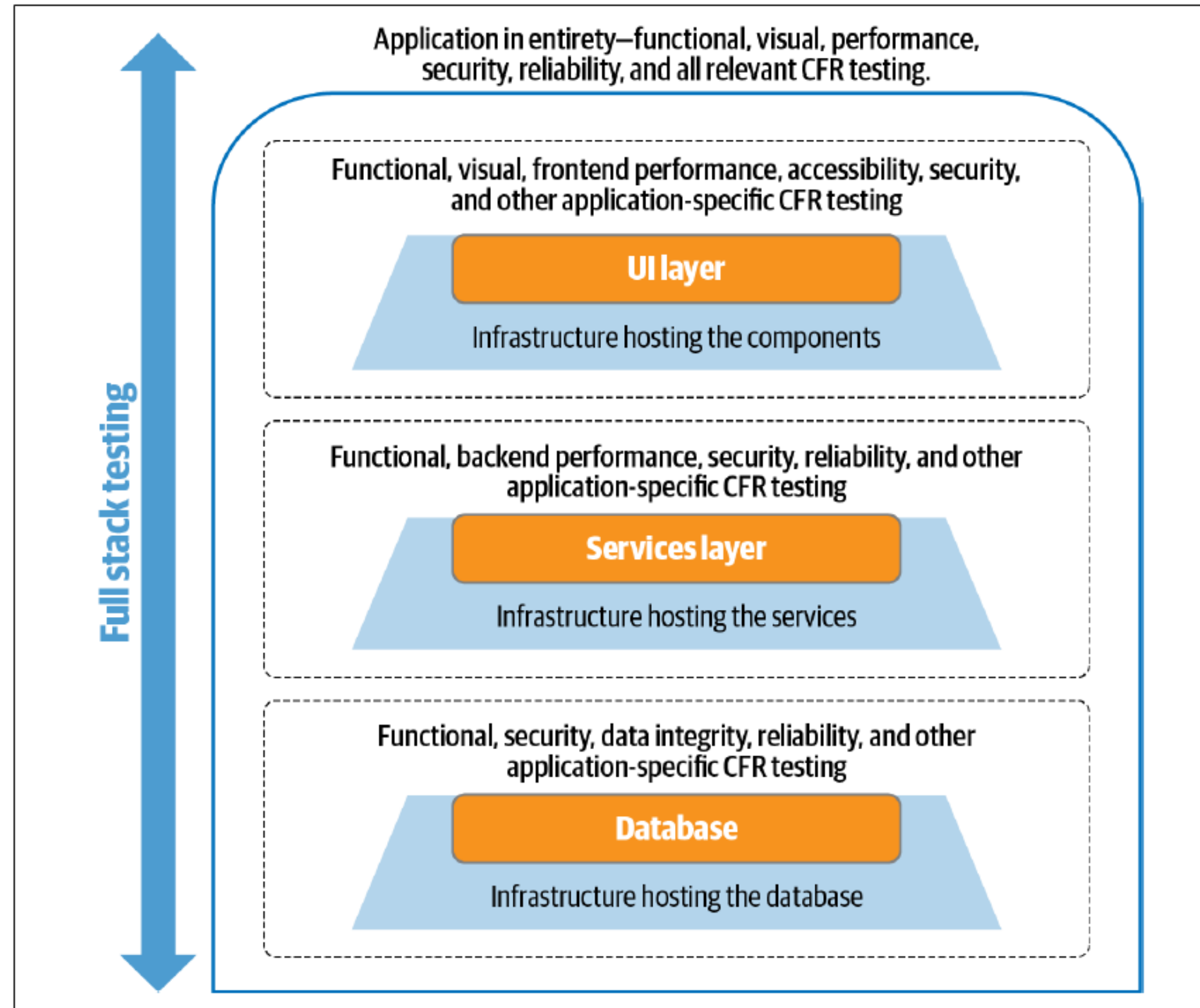
End User

- Ease of use
- Look and feel
- Data privacy
- Swiftiness in rendering information
- 24/7 availability of services

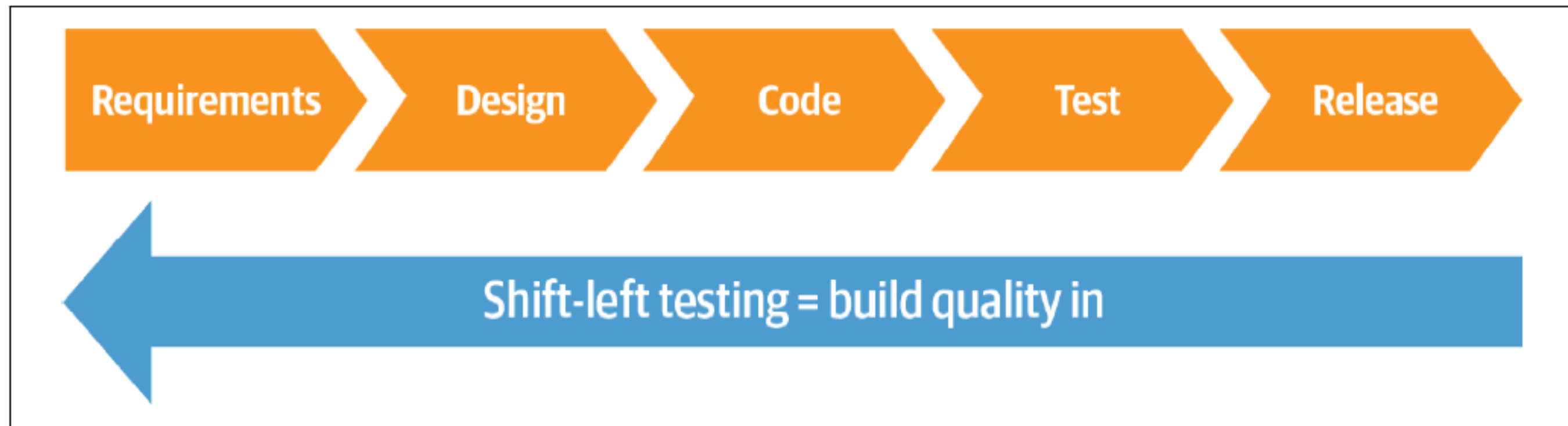


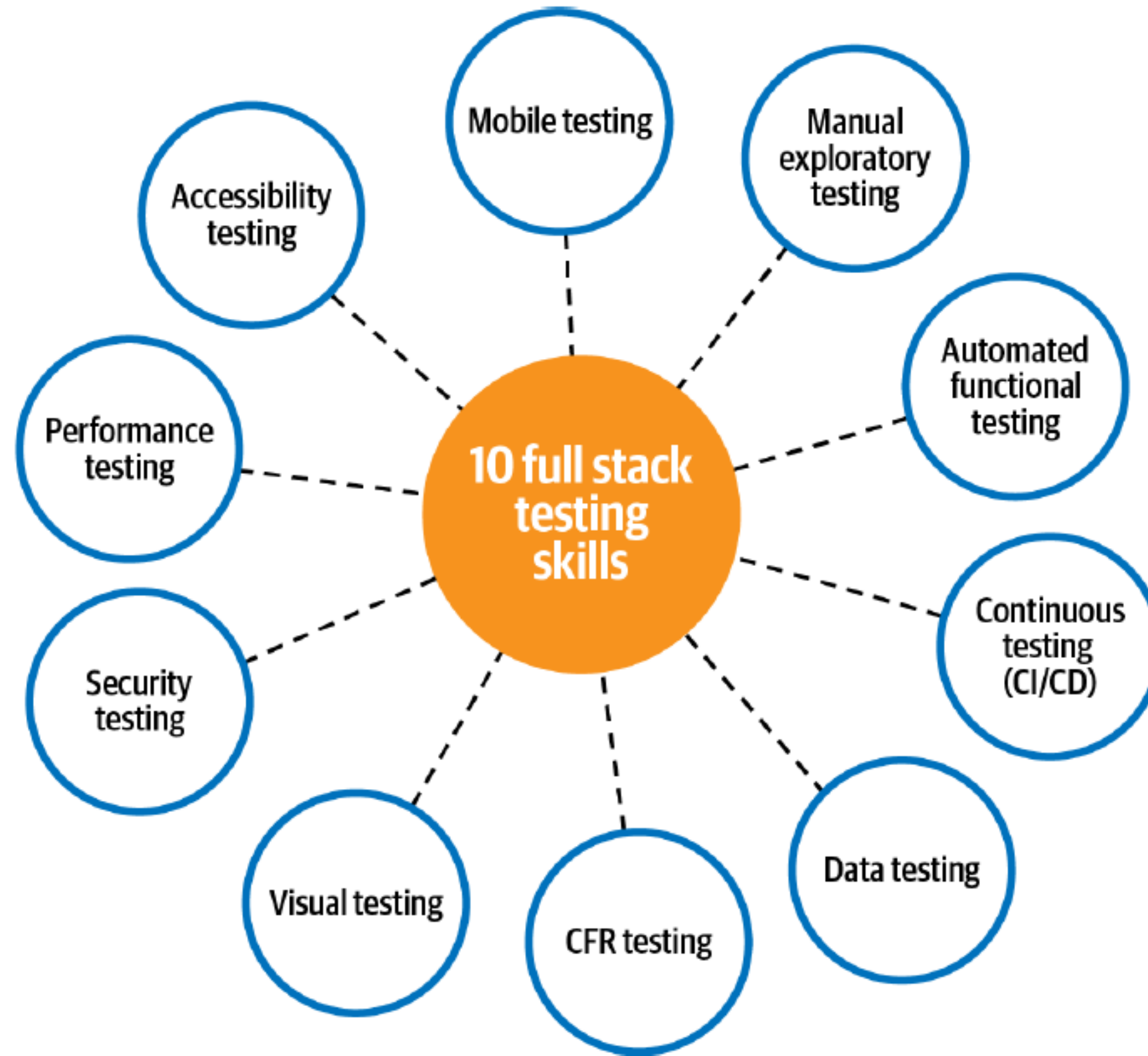
Buisnesses

- Return on investment
- Real-time analytics
- Zero downtime
- No vendor lock-in
- Scalable infrastructure
- Data security
- Legal compliance



The practice of starting testing early in the delivery cycle is referred to as shift left testing





Manual Exploratory Testing

- *Manual exploratory testing is different from manual testing*
- *Manual exploratory testing is the skill of delving into the application details, coming up with different real-life scenarios apart from what is documented in user stories, simulating them in a test environment, and observing the application's behavior*
- *It demands a logical and analytical mindset and is the first and foremost skill required to create a bug-free application.*

Automated Functional Testing

- *Doing automated testing also significantly reduces manual testing effort, especially when the application grows to include more features.*
- *In simple terms, the skill here is to write code to test feature requirements automatically, without human intervention.*
- *To do this we need tools, and therefore knowledge of different tools that can be used to write tests at different application layers is required to acquire this skill.*

Continuous Testing

- *Continuous delivery is a practice where features are delivered incrementally to end users in short cycles, instead of through a single big-bang release*
- *To power continuous delivery, we have to test the application continuously so that it is always in a ready-to-be- released state*
- *As obvious as it may seem, the wise way to do this is to automate and integrate quality checks into your CI/CD pipelines and run them frequently to ease the testing process.*

Data Testing

- *You may have heard the sayings “Data is money” and “Data is the new oil.”*
- *These ideas highlight how important testing for data integrity is today. When users’ data is lost, or the application shows the wrong data to end users, they lose trust in the application itself.*
- *The skill of data testing requires knowledge about the different types of data storage and processing systems typically used in web and mobile applications (databases, caches, event streams, etc.) and the ability to derive appropriate test cases*

Visual Testing

- *The look and feel of the application is a major contributor to the business's brand value, and especially when it comes to big business-to-customer (B2C) products used by millions, low visual quality can impact brand value instantly.*
- *It is essential to validate that end users have a harmonious and pleasant visual experience by conducting visual testing of the application.*
- *Visual testing requires an understanding of how the UI components interact with each other and with the browser, for web applications. Such checks can be automated too, using tools that are different from those used for automated functional testing*

Security Testing

- *Security breaches have become all too prevalent in today's world, and not even giants like Facebook and Twitter are excluded from such attacks.*
- *Security issues have a heavy cost for both the end users and the business in terms of loss or exposure of sensitive information, legal penalties, and brand reputation.*
- *Security testing with qualified penetration testers typically engaged only toward the end of the development cycle to look for security issues.*
- *But with the lack of available professional security testing talent and growing incidence of security breaches, software teams are well advised to incorporate basic security testing as part of their day-to-day work*

Performance Testing

- *Even a slight drop in application performance can lead to huge financial and reputational losses for a business—recall the Flipkart example discussed earlier.*
- *The skill of performance testing involves measuring a set of key performance indicators at different application layers.*
- *Performance tests can also be automated and integrated with CI pipelines to get continuous feedback.*

Accessibility Testing

- *Web and mobile applications have become everyday commodities.*
- *Making them accessible to people with permanent or temporary disabilities is not only mandated by legal regulations in many countries, but also ethically the right thing to do.*
- *In order to acquire the accessibility testing skill, we must first understand the accessibility standards required by law. We can then use both manual and automated accessibility auditing tools to validate whether those standards are met.*

Cross-functional Requirements Testing

- *End users and businesses have a tall list of quality requirements, such as availability, scalability, maintainability, observability, and so on, apart from just needing bug-free functionality. These are called the cross-functional requirements (CFRs) of an application.*
- *Although functional requirements generally grab the most attention, it is the CFRs that imbue quality into the application, and failing to test these will lead to unsatisfied business or software teams, end users, or both. Therefore, CFR testing skill is a fundamental testing skill.*

Mobile Testing

- *The explosion in the number of mobile apps stems mainly from our increased usage of mobile devices.*
- *Mobile and tablet internet usage across the globe had surpassed desktop usage. So, the ability to test mobile applications and the compatibility of websites across mobile devices is a critical skill today.*

QA vs QC

	QA	QC	Testing
<i>Purpose</i>	Setting up the adequate process, introducing the standards of quality to prevent the error and flaws in the product	Make sure that the product corresponds to the requirements and specs before it is released	Detecting and solving software errors and flaws
<i>Focus</i>	Process	Product as a whole	Source Code and Design
<i>What</i>	Prevention	Verification	Detection
<i>Who</i>	The team including the stakeholders	The team	Test Engineers & Developers
<i>When</i>	Throughout the process	Before the release	At the testing stage or along with the development process

What will be learn?

- *JIRA - Bug Management Tool*
- *Robotics Process Automation for Testers*
- *API Testing*
- *Database Testing*
- *Selenium for Testers*
- *UnitTesting for NodeJS and Python*
- *Using Jenkins for Testers*
- *Using GitHub Actions for Testers*
- *AWS Cloud for Testers*