Software Engineering

هندسة البرمجيات

جامعة بغداد
كلية التربيه للعلوم الصرفه/ابن الهيثم
قسم علوم الحاسبات
المرحلة الثالثة

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Testing Levels

Topics covered

- ✧ Testing Levels
- Unit Testing
- Integration Testing
- System Testing
- Acceptance Testing
  - Alpha Testing
  - Beta Testing
- Regression Testing

Testing Levels

- Testing itself may be defined at various levels of SDLC. The testing process runs parallel to software development. Before jumping on the next stage, a stage is tested, validated and verified.
- Testing separately is done just to make sure that there are no hidden bugs or issues left in the software. Software is tested on various levels -

Unit Testing

- While coding, the programmer performs some tests on that unit of program to know if it is error free. Testing is performed under white-box testing approach. Unit testing helps developers decide that individual units of the program are working as per requirement and are error free.

Figure 43: Unit testing

Integration testing

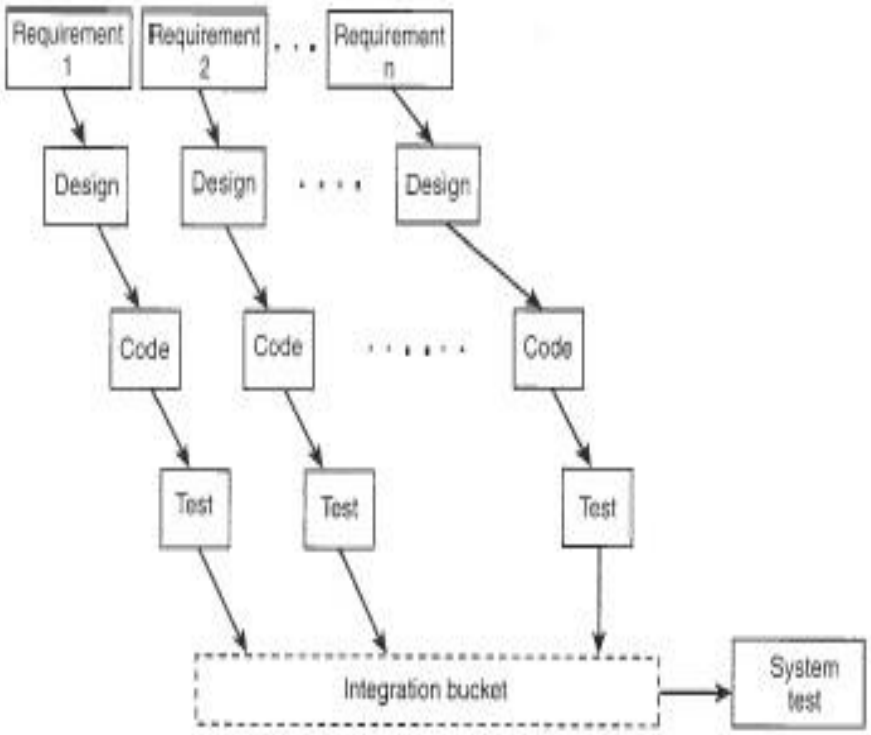

Figure 44: Integration testing

Even if the units of software are working fine individually, there is a need to find out if the units if integrated together would also work without errors. For example, argument passing and data updating etc.

System Testing

- The software is compiled as product and then it is tested as a whole. This can be accomplished using one or more of the following tests:
- **Functionality testing** - Tests all functionalities of the software against the requirement.
- **Performance testing** - This test proves how efficient the software is. It tests the effectiveness and average time taken by the software to do desired task. Performance testing is done by means of load testing and stress testing where the software is put under high user and data load under various environment conditions.
- **Security & Portability** - These tests are done when the software is meant to work on various platforms and accessed by number of persons.

Acceptance Testing

- When the software is ready to hand over to the customer it has to go through last phase of testing where it is tested for user-interaction and response. This is important because even if the software matches all user requirements and if user does not like the way it appears or works, it may be rejected.
- **Alpha testing** - The team of developer themselves perform alpha testing by using the system as if it is being used in work environment. They try to find out how user would react to some action in software and how the system should respond to inputs.
- **Beta testing** - After the software is tested internally, it is handed over to the users to use it under their production environment only for testing purpose. This is not as yet the delivered product. Developers expect that users at this stage will bring minute problems, which were skipped to attend.

Alpha Testing VS Beta Testing

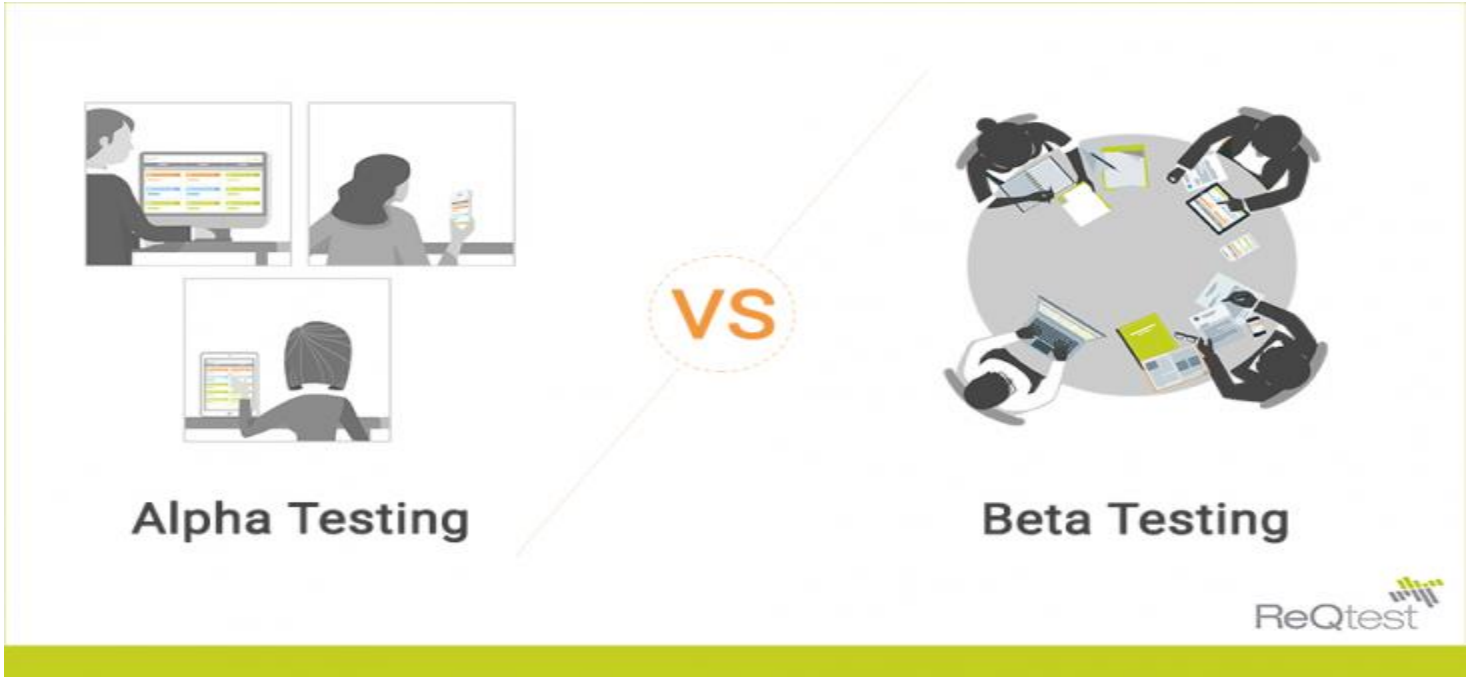

Figure 45 Alpha testing VS Beta testing

Alpha Testing VS Beta Testing

No.	Alpha Testing	Beta Testing
1)	It is always done by developers at the software development site.	It is always performed by customers at their own site.
2)	It is also performed by Independent testing team.	It is not be performed by Independent testing team.
3)	It is not open to the market and public.	It is open to the market and public.
4)	It is always performed in virtual environment.	It is always performed in real time environment.
5)	It is used for software applications and projects.	It is used for software products.
6)	It follows the category of both white box testing and Black Box Testing.	It is only the kind of Black Box Testing.
7)	It is not known by any other name.	It is also known as field testing.

Table 46 Alpha testing VS Beta testing

Regression Testing

- Whenever a software product is updated with new code, feature or functionality, it is tested thoroughly to detect if there is any negative impact of the added code. This is known as regression testing.

Thanks