Course: Test Development and Evaluation (6462)
Semester: Autumn, 2021

ASSIGNMENT No. 1

Q.1 What are the appropirate tools for studetns' evaluation? Describe them in detail.

Assessment tools aid in assessing and evaluating student learning and can provide different options to assess students beyond the traditional exam. Several tools are available including grading rubrics, Canvas Assignments, plagiarism detection, self-assessment, and peer assessment, surveys, and classroom polling.

Assessment tools can be used to help support active learning, facilitate team-building activities, and foster peer-to-peer learning. They also provide alternative assessment methods and can be used to check in on student learning in real time.

Because these tools are all online, there can be a number of technical considerations to take into account. Although most are easy to use, extra time to learn how to use and navigate them can be required. Instructors will also want to thoughtfully design assessments around the capabilities of the tools.

Different evaluation techniques are used by teachers to know all the changes that take place in the child as a result of teaching.There are various tools and techniques of evaluation. Generally, they are classified into two categories

1. Quantitative technique
2. Qualitative technique

Oral Tests

- The oral exam (also oral test or viva voce) is a practice in many schools and disciplines, where an examiner poses questions to the student in spoken form. The student has to answer the question in such a way as to demonstrate sufficient knowledge of the subject in order to pass the exam.
- Many programs require students to finish the program by taking an oral exam or a combination of oral and exams in order to show how well a student has comprehended the material studied in the program.
- Schools use oral exams just to test knowledge, but the ability to respond on the spot. Sometimes the oral exam is offered in schools as an alternative to a written exam for students with a learning disability, like dysgraphia, developmental coordination disorder, or non-verbal learning disorder. Often the parents of the students have to request that the oral exam be given to their child in lieu of the written exam.

Written evaluation techniques/devices

- Most commonly used tool of evaluation.
- Various types of written tests are conducted throughout the academic session.
- Written tests are tests administered on paper or on a computer.
- Here student appearing for the written test have to provide answers by writing or typing in the space given or on a separate sheet.

So, written tests are tests that are administered on paper or on a computer. A test taker who takes a written test could respond to specific items by writing or typing within a given sp[ace of the test or on a separate form or document.

In some test; where knowledge of many constants or technical terms is required to effectively answer questions, like Chemistry or Biology – the test developer may allow every test taker to bring with them a cheat sheet. A test developer's choice of which style or format to use when developing for testing. Be that as it may, certain test styles and format have become more widely used than others. Below is a list of those formats of test items that are widely used by educators and test developers to construct paper. As a result, these tests may consist of only one type of test item format (e.g., multiple choice test, essay test) or may have a combination of different test item formats (e.g., a test that has multiple choice and essay items).

Written examination include the following type of tests.

1. Essay type tests
2. Objective type tests
3. Short answer type tests.

Content of Written Test

This includes the following types of test items :

- Short-answer
- Long-answer
- Multiple-choice and matching
- True/false (alternative choice)

This is followed by a brief discussion on the use of graphics in test questions. It is important to use the appropriate types of tests in your evaluations.

(1) Essay type tests:-

In essay type test students give responses to many questions of the curriculum in some fixed devotion in the form of essay.

This type of tests is commonly employed to check the power of memorization, expression, recognition, etc. So these tests are used to measure the levels of interpretation and evaluation of the student.

Merits of essay type tests:-

1. Essay type tests are easy to construct. Here question papers are short, can be prepared in a small time frame and at a low cost.
2. These tests are suitable for all subjects.
3. Through essay type tests students can express their original ideas.
4. Essay types tests are very simple information, conduct and operation.
5. The mental abilities like thinking, reasoning, expression, and criticism, etc. can only be measured by essay type questions.
6. Through essay type tests, the writing style of the students can be developed.
7. Here students are free to express their ideas in a logical way.
8. Essay type tests inspire students for extensive study.

Demerits of essay type tests:-

1. The essay type tests look at clearly defined objectives.
2. It promotes cramming and rote memorization.
3. The scores of there tests show variations and the results are also not consistent.
4. The personal views, opinions, ideas, etc. of examiner and examinee affect the response of a particular answer as well as evaluation.
5. Sometimes these tests become time-consuming.
6. Proper evaluation is not possible by these tests.
7. Candidate with good handwriting sometimes gets more marks than the one who gives an exact and accurate answer in bad handwriting.
8. Evaluation of these tests is a hard, lengthy and difficult task in which let of time is wasted.

(2) Objective type tests:-

- Objective type questions are answered by just writing one or two words, or numerals, fill in the blanks, choosing one cut of multiple responses given, etc.
- In objective tests, the achievement of subjective knowledge of pupils, their aptitude, attitudes, interests, inelegance, etc are measured.
- These tests consist of about 150 to 200 short and pointed questions based on the entire curriculum in a very short duration.
- These tests have objectivity and their measurements will not effect scorability of the pupils.
- Since the answers to these types of questions even one and the same, therefore it is quite reliable, objective, valid and can not vary.

Type of Objective tests:-

(1) True/False (alternative choice) questions

The choices offered in these types of questions may be True/False, Yes/no, Fact/Opinion, High/Low, Agree/Disagree, and so on. There must be only one correct response to the question.

Use True/False questions to test a student's ability to :

- Recognize a correct statement of fact or opinion
- Identify relationships (including cause)
- Identify attitudes, values, and beliefs
- Identify a new situation where known principles apply.

These type of tests are presented in the form of a simple declarative statement, to which the pupil responds indicating whether the statement is true or false.

Example:-

Direction – write 'T' if the statement is true and 'P' if the statement is false.

(a) (a+b)^2 = a2+b2 +2ab._____

(b) (a-b)^2 = a2-b2._____

(c) The sum of the angles of a triangle is equal to two right angles._____

(2) Completion test:-

A fill-in-the-blank item provides a test taker with identifying characteristics and requires the test taker to recall the correct term. There are two types of fill-in-the-blank test. The easier version provides a word bank of possible words that will fill in the blanks. For some exams, all words in the word bank are used exactly once. If a teacher wanted to create a test of medium difficulty, they would provide a test with a word bank, but some words may be used more than once and others not at all. The hardest variety of such a test is a fill-in-the-blank test in which no word bank is provided at all. This generally requires a higher level of understanding and memory than a multiple choice test. Because of this, fill-in-the-blank tests are often feared by students. In these tests, the pupils are required to complete the given incomplete statement.

Direction: Fill in the blanks in the following sentences.

Examples :

(i) 4 : 5 : : 8 : _____

(ii) (a+b)2 +a2+_____+ 2ab

(iii) sum of the exterior angles of a polygon is_____.

Q.2 Describe in detail the concept of testing?

Assessment can serve many purposes. These include examining Duquesne's academic programs and the role curriculum, pedagogy, and program structure play in student learning. Assessment findings are useful for

- maintaining high quality programs that are consistent with the University's mission
- highlighting program and University strengths
- Identifying areas for strategic change or improvement.

What we learn through assessment helps the institution determine how best to support needed changes. Assessment enables us to evaluate the competence of graduates in terms of both the program's goals and those of the core curriculum and University mission. Ultimately, the purpose of assessment is to promote student learning and development.

The process of outcomes assessment is guided by the following principles:

1. Responsibility and expertise for assessment reside with the faculty in each department or program. Faculty together determine the appropriate assessment plan, and several are involved in implementing the plan.
2. Assessment of student learning flows from the learning goals faculty establish for each program of study. These goals are written in terms of what students are expected to know, be able to do, and value.
3. These learning goals and assessment pertain to all learning environments, including classroom, distance learning, clinical, laboratory, practicum, and service-learning experiences.

4. Assessment methods (i.e., ways of gathering information about student learning) are realistic, manageable, and meaningful within the culture of the particular academic program, department or school. They are informed by the standards relevant to the discipline such as those established by national associations.
5. The usual learning activities in which students engage often provide an appropriate and feasible source of assessment information.
6. The results of assessment are interpreted, communicated, and used constructively to promote future program evaluation and continuous improvement.
7. Faculty regularly reflect upon and improve the assessment process itself.
8. Assessment at the course and program levels is aligned with institutional goals for student learning.

Role of Assessment

1. **Clarify for your students what good performance is (goals, criteria, standards). Define the expectation.**

   To what extent do students in your course have opportunities to engage actively with goals, criteria and standards, before, during and after an assessment task?
2. **Encourage 'time and effort' on challenging learning tasks.**

   To what extent do your assessment activities encourage regular study in and out of class and deep rather than surface learning?
3. **Deliver high quality feedback information that helps learners self-correct.**
4. What kind of feedback do you provide – in what ways does it help students self-assess and self-correct?
5. **Encourage positive motivational beliefs and self-esteem.**
6. To what extent do your assessments and feedback processes activate your students' motivation to learn and be successful?
7. **Encourage interaction and dialogue around learning (peer and teacher-student).**

   What opportunities are there for feedback dialogue (peer and/or tutor-student) around assessment tasks in your course?
8. **Facilitate the development of self-assessment and reflection in learning.**

   To what extent are there formal opportunities for reflection, self-assessment or peer assessment in your course?
9. **Give learners choice in assessment – content and processes.**

   To what extent do students have choice in the topics, methods, criteria, weighting and/or timing of learning and assessment tasks in your course?
10. **Involve students in decision-making about assessment policy and practice.**

    To what extent are your students in your course kept informed or engaged in consultations regarding assessment decisions?

11. Support the development of learning communities.

To what extent do your assessments and feedback processes help support the development of learning communities?

12. Help teachers adapt teaching to student needs.

To what extent do your assessment and feedback processes help inform and shape your teaching?

Q.3 Describe the concept and use of taxonomies in testing.

While evaluating the test programs of numerous defense contractors, we have often observed that they are quite incomplete. For example, they typically fail to address all the relevant types of testing that should be used to (1) uncover defects (2) provide evidence concerning the quality and maturity of the system or software under test, and (3) demonstrate the readiness of the system or software for acceptance and being placed into operation. Instead, many test programs only address a relatively small subset of the total number of potentially relevant types of testing, such as unit testing, integration testing, system testing, and acceptance testing. In some cases, the missing testing types are actually performed (to some extent) but not addressed in test-related planning documents, such as test strategies, system and software test plans (STPs), and the testing sections of systems engineering management plans (SEMPs) and software development plans (SDP). In many cases, however, they are neither mentioned nor performed. This blog, post, the first in a series on the many types of testing, examines the negative consequences of not addressing all relevant testing types and introduces a taxonomy of testing types to help testing stakeholders understand--rather than overlook--them.

Through this series of blog posts, I will also challenge testing practitioners to examine and determine the degree of completeness of their

- personal testing expertise, experience, and training
- test programs and associated test planning

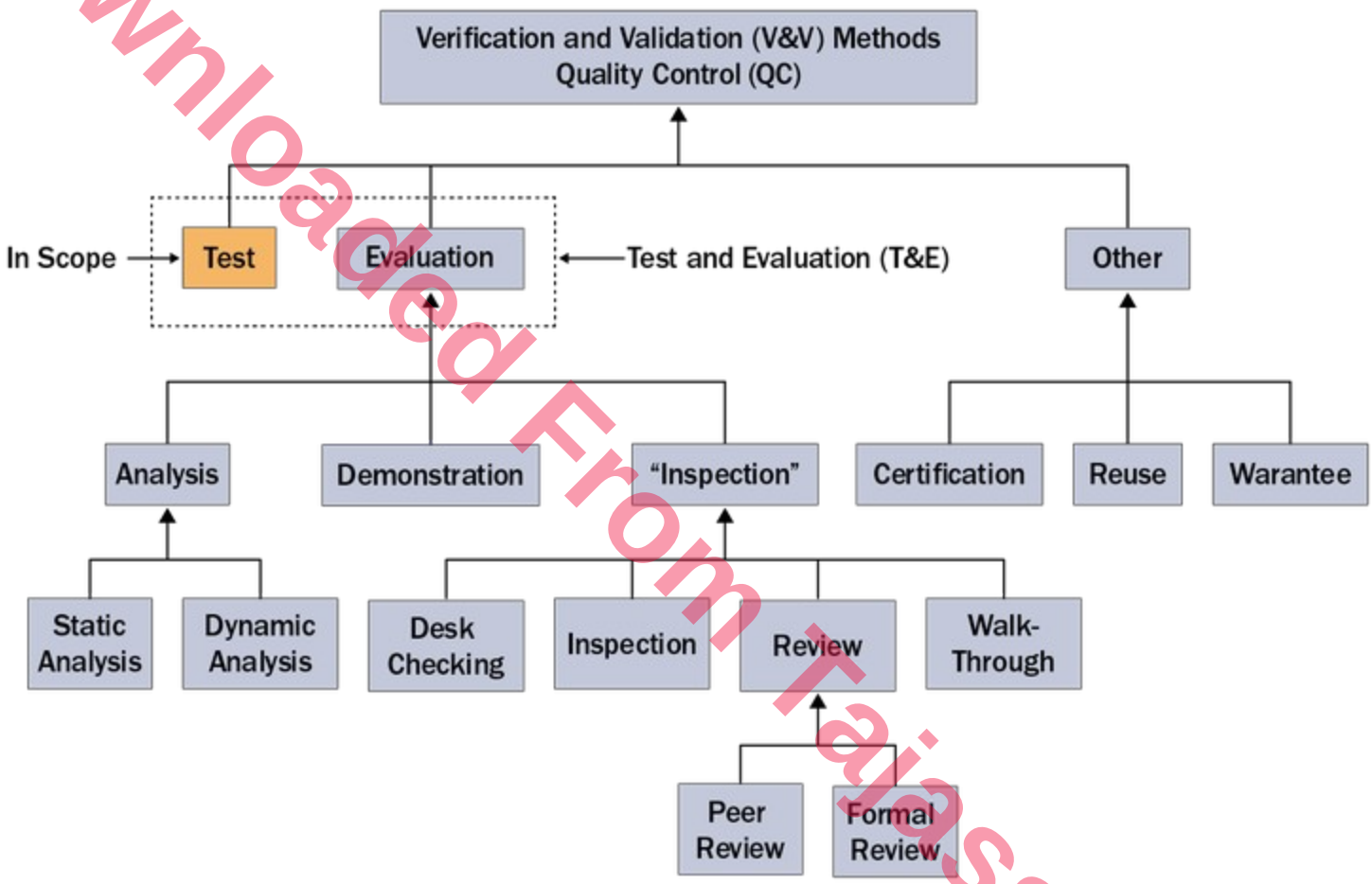
It's well known that different types of testing uncover different types of defects and produce different defect removal rates (DRR). Ignoring relevant types of testing can therefore increase the number of residual defects. Incomplete testing test planning is just another case of failing to plan equating to planning to fail and out of sight, out of mind.

Through our work on Independent Technical Assessments (ITAs), we also often observe that many testers and test managers lack sufficient expertise, experience, and training in these useful types of testing. This lack of knowledge is particularly problematic for project leaders, chief system/software engineers, and developers who have had little or no formal training in testing. This problem is exacerbated on Agile projects where everyone on the cross-functional development team is expected to perform all development activities, including testing. In fact, testing stakeholders are often unable to define these types of testing when prompted or are unaware that many of these types of testing even exist.

To address these problems, we developed a taxonomy that organizes roughly 200 types of testing into a structure that can help testing stakeholders understand these testing types and can use as a checklist to ensure that no important type of testing falls through the cracks.

Testing and Types of Testing

As shown in the following figure, the scope of this series of blog posts is strictly limited to testing. The non-testing aspects of Verification and Validation (V&V), Quality Control (QC), and Test and Evaluation (T&E) are thus out of scope.



Based on our experience at the SEI, many in the software development community seem to equate testing with quality assurance (QA) and confuse testing with evaluation, I will start by defining testing and types of testing before moving on to the taxonomy of testing types.

For the purpose of this blog post, I define testing as

The execution of an object under test (OUT) under specific preconditions with specific stimuli so that its actual behavior can be compared with its expected or required behavior.

In the definition above, preconditions includes

- pretest mode
- states
- stored data

- external conditions

In the definition above, stimuli includes

- calls, commands, and messages
- data inputs (data flows)
- trigger events such as state changes and temporal events

In the definition above, actual behavior includes

- data returned and exceptions raised in response to stimuli
- call, commands, and messages to other external entities
- post-conditions including post-test mode, states, stored data, or eternal conditions

Given the definition above, a type of testing is a specific way to perform testing (i.e., a class or subclass of testing).

A Taxonomy of Testing Types

This work began when it became clear just how many more types of testing existed than were commonly addressed in contractor test planning. While exploring ways to address this incomplete planning, I decided to make an initial list of testing types based on personal experience and a brief online search, including the examination of glossaries of various testing organizations, such as the International Software Testing Qualifications Board (ISTQB). I quickly realized that the software and system engineering communities were using roughly 200 test types during the development and operation of software-reliant systems, far too many to merely create an alphabetized list. Such a long list would be so large and complex that it would be overwhelming and thus of little use to testing's stakeholders. Instead, we needed a taxonomy of testing types to provide structure and to divide and conquer this complexity.

I initially created 12 general types of testing, which eventually grew to 16. One of my colleagues, however, pointed out that a better way would be to first organize them by the way they primarily answer one of the following standard sets of questions, commonly known as the 5Ws (who, what, when, where, and why), and an 2Hs (how and how well). This in turn led to the development of the following questions, which formed the foundation of my taxonomy for organizing testing types:

What are we testing?

When are we testing?

Why are we testing?

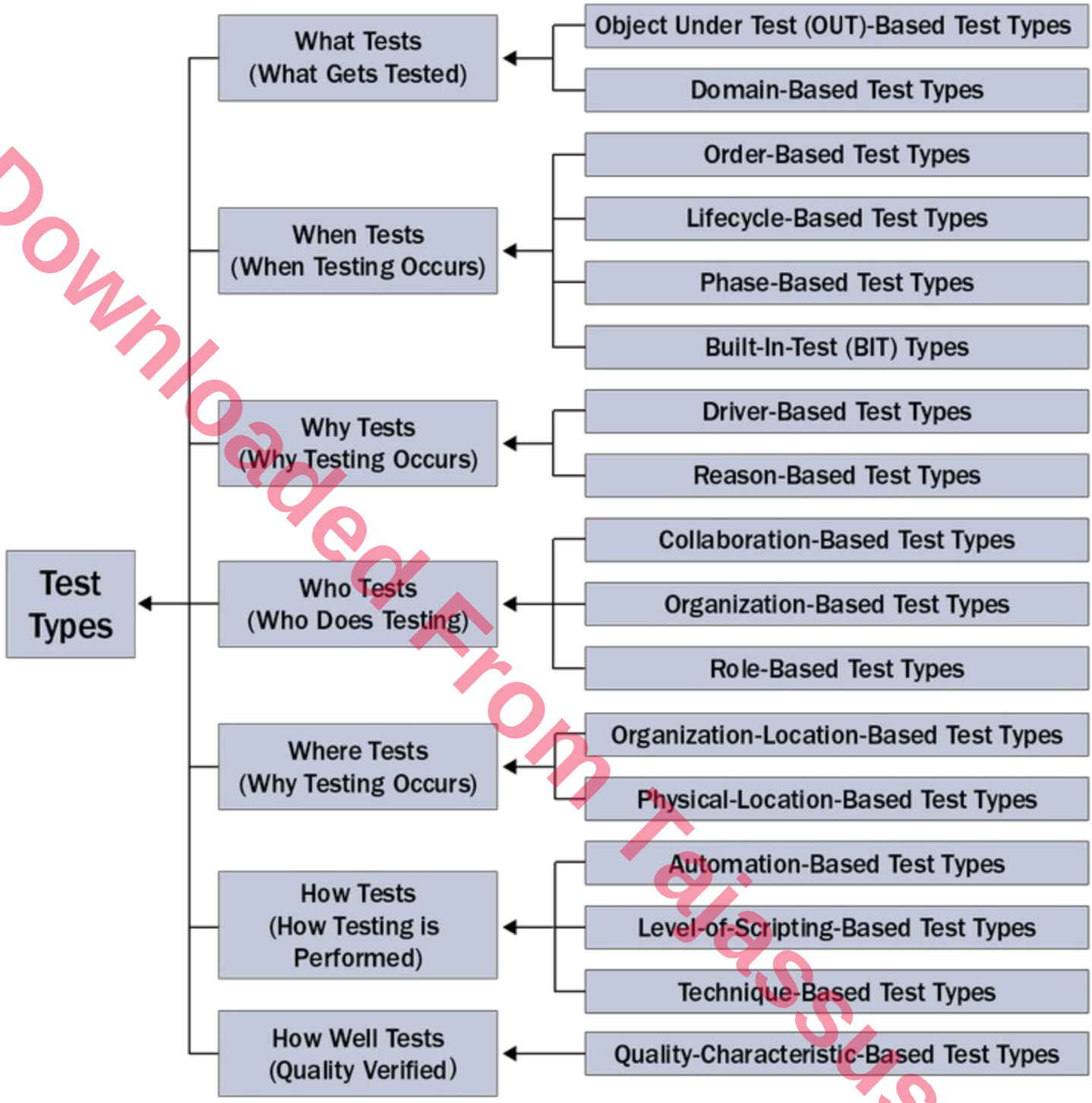
Who is performing the testing?

Where is the testing taking place?

How are we testing?

How well are the objects-under-test functioning?

The following figure clarifies the top three levels of the resulting hierarchical taxonomy of testing types.



The seven abstract classes of test types in second level of the taxonomy (middle column) classify all test types into seven subtypes that answer the corresponding 5W+2H questions. Each of these second level classes of test types is further classified into from one to three third level abstract classes of test types. As will be shown in this and future blog postings, the actual concrete classes of test types occur in the fourth, fifth, and sixth levels of the hierarchical taxonomy.

One notable characteristic of the figure above is that individual concrete testing types can (and typically do) belong to multiple third-level categories. I have therefore placed each concrete test type under the category that

best describes it. The best way to look at this overlap of categories is to consider it analogous to multiple inheritance, where subclasses inherit from multiple superclasses.

Q.4 How behaviors can be assessed? Write a comprehensive note.

Behavioral assessment is a crucial pre-employment assessment test used to gain insights on a candidate's behavior. This is done to measure the traits and behaviors of the job applicant. The assessment also gives a sneak peek at various parameters like skills, competencies, emotions, and overt behaviors.

As a part of applicant testing, behavioral assessment is done to portray the mindset of the person understudy, to depict what he does and why he does it. Mainly, behavioral assessment is conducted through functional analysis. Anomalies related to a candidate's personality like hyperactivity, aggression, low attention span, peer relationship problems, etc., are all evaluated through behavioral assessments.

Functional Behavioral Assessment or **FBA** is carried out to evaluate the 'why', 'what', and 'how' of the behavioral changes of individuals. It is used to determine the underlying characteristics of the behavior of a potential candidate. FBA is done to clarify the behavioral changes that remain inaccessible to the normal eye. Specifically, a hiring manager conducts FBA by putting the individual in different situations to study the changes according to the situation. This type of assessment may also include background checks, family interviews, etc.

Steps of Functional Behavioral Assessment

- Determine the behavior.
- Gather information about the behavior.
- Find the reason behind the behavior.
- Devise an intervention program to eradicate the behavior.

Companies around the world carry out behavioral assessments during their hiring processes, especially during the interview phase to weed out the most appropriate candidate. As a test for attention to detail, interviewers estimate the candidate's problem-solving skills, cultural fitness, strengths, and weaknesses, etc., through different behavioral assessments.

Uses of Behavioral Assessment

Behavioral assessments are conducted for various purposes. **Resolving the behavioral issue is the main agenda behind the behavioral assessment.** Reaching the base of the behavior and rectifying any deviation or abnormality that causes the behavior to change is the basic purpose of such pre-hire skills assessment.

Types of Behavioral Assessment

Broadly, behavioral assessment has been divided into 5 types. Each of it explores a specific behavioral aspect of the candidate's personality.

- **Direct assessment:** This is the study of behavior as it changes during the situation. Also known as 'Situational Behavioral Assessment.' Ex: A specific challenge

- **Analog assessment:** This type of behavioral assessment is done to study the changes under simulated or made-up situations. Baseline observations are conducted to record the response frequencies depending on various situations. Ex: A phobia
- **Indirect Assessment:** In this type of assessment, the behavior is not observed but inferred through retrospective analysis. Ex: Group discussion
- **Idiographic assessment:** This describes the behavioral characteristics of the individual concerned. Ex: Threats and Aggression
- **Contextual assessment:** The stimuli in the environment that cause the change in behavior are in focus in this method of assessment. Ex: Cultural differences

Functions of Behavior

Generally, there are 6 functions of behavior, namely:

- To obtain something.
- Escape or avoid something.
- To get attention from someone.
- To communicate with someone.
- Self-stimulation.
- Control or power over anyone or anything.

These functions of behavior are the basis of behavioral assessment. A behavioral specialist identifies each function with the help of the **ABC of behavioral assessments**. Further, the theory also defines the 3 pivotal parts of behavior. They help in identifying the phases and changes.

- **Antecedent:** The stimulus that creates the behavior.
- **Behavior:** The actual behavior that gets created due to the situation.
- **Consequence:** The result of the behavior.

5 Factor Model of Behavior

Psychologists have divided a person's behavior or personality into 5 traits. These are abbreviated into **OCEAN** or **CANOE**. These 5 traits are:

- **Openness:** Openness to experience is the trait that makes people appreciate life and everything that comes with it. As per this trait, people or candidates who are open to experience are more curious, intellectual, and willing to try new things as compared to people who are not.
- **Conscientiousness:** This trait showcases self-discipline and self-gratification. Candidates with this trait are considered to be stubborn and result-oriented.
- **Extraversion:** It determines engagement with the world. People are of two types: extroverts and introverts. Extroverts are those who like to engage with people as much as possible, whereas, introverts are the opposite. According to Hans Eysenck's "Theory of Personality" most people's theory, candidates of this trait are a mixture of extroversion and introversion.

- **Agreeableness:** This trait displays the different concerns regarding social harmony. Agreeable persons are kind-hearted and soft whereas disagreeable persons are stubborn and hard to work with.
- **Neuroticism:** Neuroticism is the tendency of showing anger, anxiety, and all other kinds of negative emotions. Accordingly, candidates with high levels of neuroticism display aggressiveness and tend to have less mental stability as compared to people with less neuroticism. Hans Eysenck also links neuroticism with a low tolerance in stressful situations.

Importance of Behavioral Assessment

Hiring a candidate requires a lot of time and dedication. A wrong candidate means a wrong investment for the company. Along with the educational and technical skills, a candidate requires to have the right set of mind. Ideally, the candidates should shape their character with the working environment of the company. It generates a healthy relationship with his colleagues.

Behavioral assessment helps in determining the personality of the candidates so that the right candidate can be selected for the company.

Evaluation Techniques

Psychologists execute various techniques to evaluate the personality of a person. Some of the common techniques are also part of pre-hire assessment tests:

- **Case Study Method:** This method is used to determine the personality traits of a person who has psychological problems. In this process, the individual's past life is studied and incidents are funneled out to determine their effects on the person's behavior.
  It is a long process that takes place over a while. This method is executed on individuals who have prolonged issues with behavioral disturbances.
- **Interview Method:** This is the most common form of behavioral assessment where the psychologist interviews the individual to assess the behavioral changes in the candidate.
- **Experience Sampling Method:** In this method, the analyst pings the individual at a certain time of the day to study the behavior at that exact moment.
- **Biological Method:** Some analysts use **Positron Emission Tomography** to study the behavioral traits of individuals. They scan the brain of the individual to ascertain the change in behavioral patterns.

Q.5 What is the procedure of piloting? How to make pilot test item?

Pilot testing is a type of Software testing which is performed by a group of end-users prior to the deployment of the software in production.

The component of the system or the complete system is tested in the real-time scenario in this testing type. The system is installed at the customer end to perform this type of testing. The customer does continuous and regular testing to find the bugs. The component of the system or the complete system is tested and verified in the real-time scenario.

The best practice followed is to test the component continuously so that areas that are more prone to bugs are identified and reported back to developers for the fixes to be done in the next released build.

Group of end-users who verifies the system, provide the bug list to the developers to be fixed in the next release. It lets the users find the bugs before it goes into production. This testing type is a replica of a real environment or verification before the system actually goes live.

Pilot Testing comes in between the User Acceptance test and Production deployment. The purpose of performing this testing is to define the project's cost, risks, feasibility, time, and efficiency.

Objectives Of Pilot Testing

Objectives include:

- To define project cost, feasibility, risks, time, etc.
- To conclude for the success or failure of the software.
- To find the inputs of the end-users.
- To provide a chance to developers to fix the bugs.

Why Pilot-Testing Is Important

Pilot test is very important as it helps in:

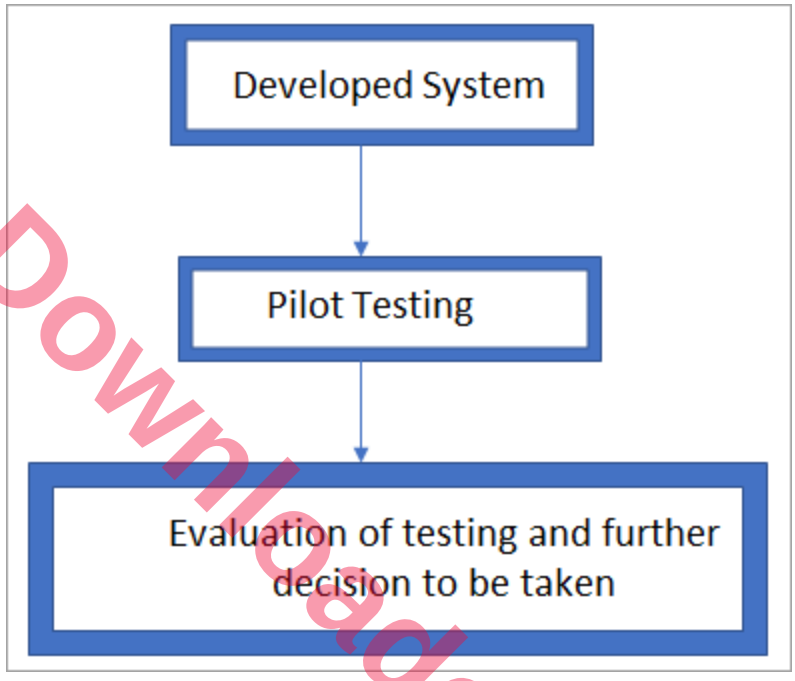
- To decide on software readiness for production deployment.
- Debugging of the software.
- Testing processes to be followed.
- Taking decisions on the allocation of time and resources.
- Checking the response of the end-users
- Getting the information for the overall progress of the project.

Example: Microsoft, Google, HP are a few to name and provide examples of this testing.

- **Microsoft:** For Windows 10 Pilot testing, the Windows insider program is run by Microsoft.
- **HP:** Pilot test of HP products and services are being run online. Refer to **this** for an insight into how the Pilot test is a part of the process.
- **Google:** To test the Android Operating System for Nexus users, Google runs the Android Beta Program.

Another example to understand using Pilot Testing:

Consider an organization having several departments, and there is a common application that is being used by all of them. The new application to be launched is deployed in any one of the departments first and once it is evaluated, based on that the next step is taken i.e. if it's a success, it can be deployed to other departments as well, or else it will be rolled back.



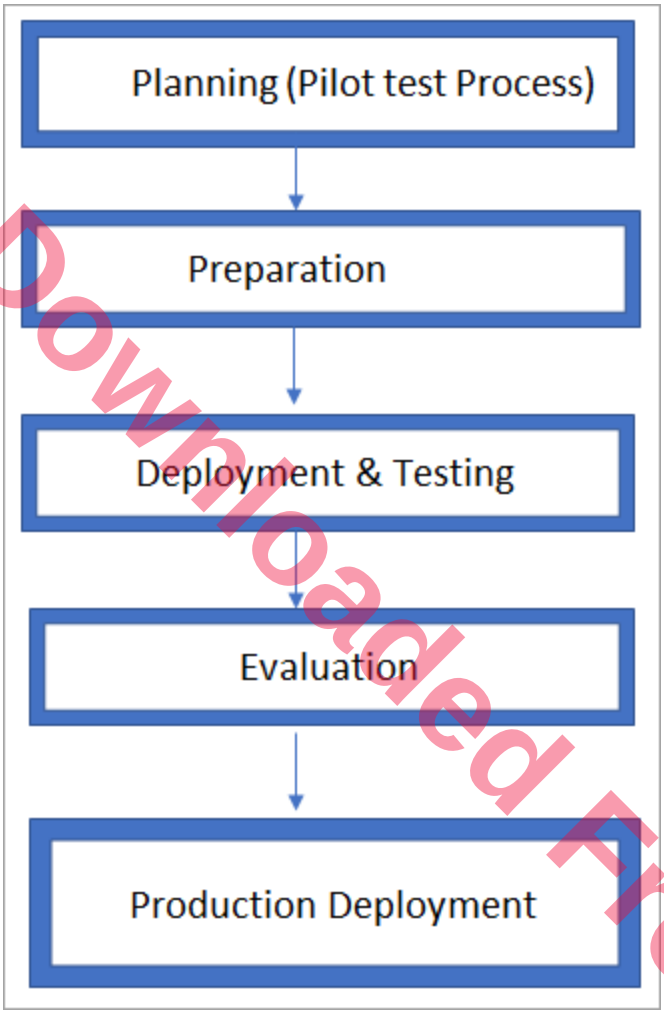
Also read => Baseline Testing And Its Benefits

Steps To Perform Pilot Testing

Software development companies follow the approach of storing site files on live servers or directories on the Internet to perform testing.

The Pilot Test process includes 5 steps:

1. Planning for Pilot test processes
2. Preparation for the pilot test
3. Deployment and Testing
4. Evaluation
5. Production Deployment



Let's understand the above-listed steps:

#1) Planning: The initial step in this particular testing is to plan for the test processes to be followed. The plan is created and approved for the same as the plan will be followed further and all the activities will be derived from this plan only.

#2) Preparation: Once the plan is finalized, the next step is the preparation for this type of testing i.e., software to be installed in the customer area, selection of the team for performing the tests, data required for testing to be collated. Before the testing starts, all the testing environment has to be in place.

#3) Deployment: After the preparation is done, deployment of the software is done at the customer premises. Testing is performed by the selected group of end-users who actually test like the targeted audience for the product.

#4) Evaluation: Once the deployment is completed, testing is being performed and evaluation is done by the group of end-users, who conclude the status of the software. They create a report and send the bugs to be fixed across the developers to fix in the next build. Based on their evaluation, further deployment in production is to be done or not, is being decided.

#5) Production Deployment: Production deployment is only done if the end user's evaluation results come out as the developed software is the same as expected, i.e., it meets the customer requirement.

Points to be considered in Pilot Testing:

For performing this test, few points need to be considered and taken care of. These are mentioned below:

#1) Testing Environment: Set up of proper testing environment plays a vital role as without the same testing cannot be performed. This testing requires a real-time environment that the end-user will actually face. Everything needs to be taken care of, including the hardware/software to be used and installed.

#2) Group of testers: To perform this type of testing, selecting the group of testers as a targeted audience is very important as testers have to represent the targeted users and if not selected correctly can lead to incorrect results. Proper training should be provided to the testers to have fruitful results.

#3) Proper Planning: For any successful project, planning is very important from the very beginning. Resources, timelines, hardware, and software required test scenarios, budget, deployment of servers: everything has to be well planned.

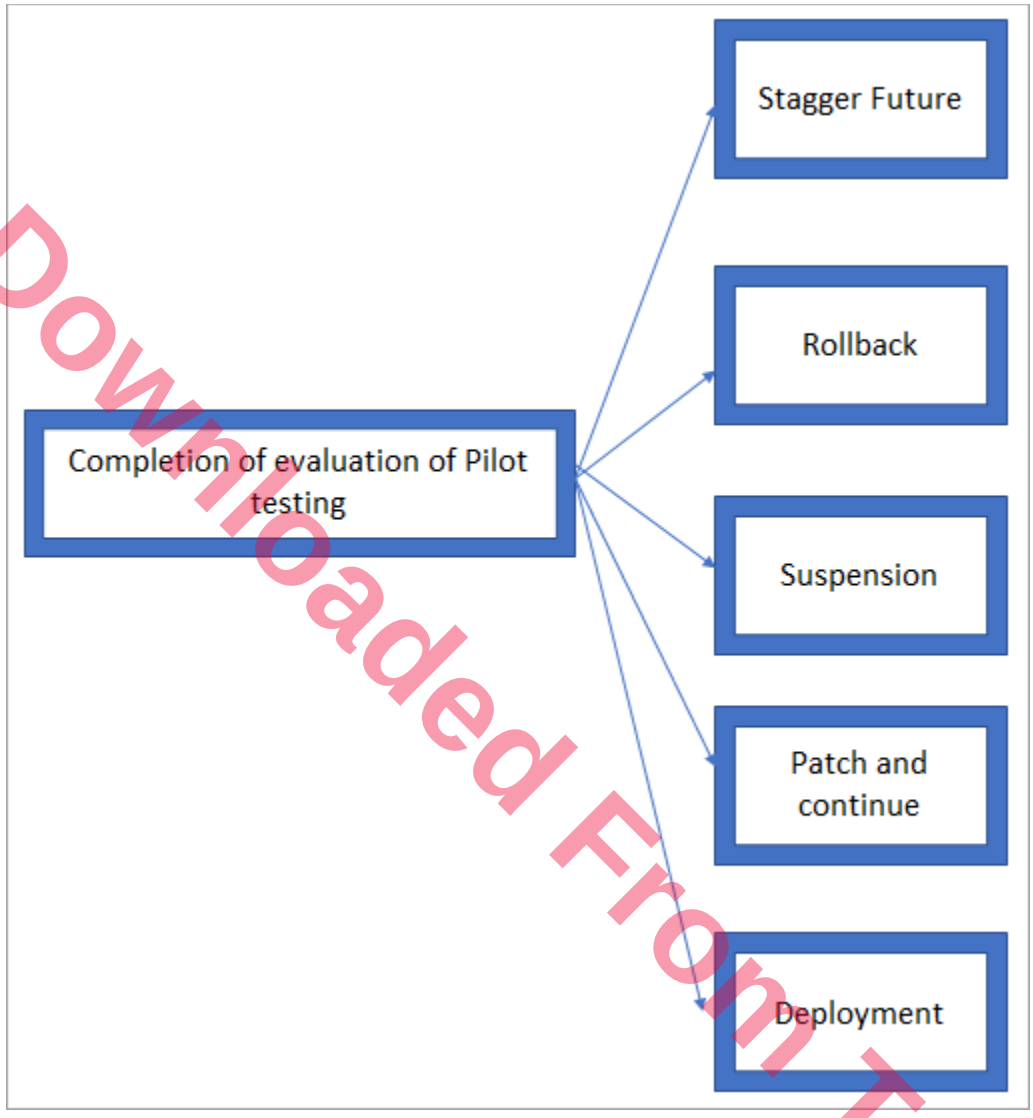
Evaluation criteria for the pilot test should be planned as the number of users who participated, number of satisfied/dissatisfied users, support requests and calls, etc.

#4) Documentation: All the required documents should be prepared and shared across the teams. The installation process should be documented properly before testing starts. Test scripts should be available for the software to be tested, along with the list of functions to be executed.

A list of issues/bugs should be shared with the developer/designers on a timely basis.

Steps After Evaluation Of Pilot Testing

Once the pilot test is completed, the next step is to finalize the next strategy for the project. The test outputs/results are analyzed and based on that next plan is chosen.



1. **Stagger Future:** In this approach, a new release resource is deployed to the pilot group.
2. **Rollback:** In this approach, the rollback plan is executed i.e., the pilot group is reserved back to its previous configurations.
3. **Suspension:** As the name suggests this testing is suspended in this approach.
4. **Patch and continue:** In this approach, patches are deployed to fix the existing issues and testing is continued.
5. **Deployment:** This approach comes in when the output of the test is as expected, and software or component tested is good to go in a production environment.

Benefits

It has many advantages as listed below:

1. This particular testing is done from the user's perspective, so it helps in knowing the actual demand of the product.
2. It helps to get the errors/bugs before going into production, which leads to a good quality product and less costly errors.

3. It helps to make the product/software more attractive to the end-users.
4. It helps to roll out the software more effortlessly and fast.
5. It helps to predict the success ratio of the product.
6. It helps to make the product the best.