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| Department of Software Engineering  Mehran University of Engineering and Technology, Jamshoro |

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| Course: SW426 - Software Quality Engineering | | | |
| Instructor | Rabia Iftikhar | **Practical/Lab No.** | 01 |
| Date | 05-08-2020 | **CLOs** | CLO-3 |
| Signature |  | **Assessment Score** | 1 Mark |

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| Topic | Validation & Verification |
| Objectives | * To learn validation and verification of a software program. |

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| Lab Discussion: Theoretical concepts and Procedural steps |

* **Validation**

The assurance that a product, service, or system meets the needs of the customer and other identified stakeholders. It often involves acceptance and suitability with external customers. Contrast with *verification*."

* **Verification**

The evaluation of whether a product, service, or system complies with a regulation, requirement, specification, or imposed condition. It is often an internal process. Contrast with *validation*."

* **Difference between Verification and Validation**

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| **Verification** | **Validation** |
| 1. Verification is a static practice of verifying documents, design, code and program. | 1. Validation is a dynamic mechanism of validating and testing the actual product. |
| 2. It does not involve executing the code. | 2. It always involves executing the code. |
| 3. It is human based checking of documents and files. | 3. It is computer based execution of program. |
| 4. Verification uses methods like inspections, reviews, walkthroughs, and Desk-checking etc. | 4. Validation uses methods like black box (functional)  testing, gray box testing, and white box (structural) testing etc. |
| 5. **Verification**is to check whether the software conforms to specifications. | 5. **Validation** is to check whether software meets the customer expectations and requirements. |
| 6. It can catch errors that validation cannot catch. It is low level exercise. | 6. It can catch errors that verification cannot catch. It is High Level Exercise. |
| 7. Target is requirements specification, application and software architecture, high level, complete design, and database design etc. | 7. Target is actual product-a unit, a module, a bent of integrated modules, and effective final product. |
| 8. Verification is done by QA team to ensure that the software is as per the specifications in the SRS document. | 8. Validation is carried out with the involvement of testing team. |
| 9. It generally comes first-done before validation. | 9. It generally follows after **verification**. |

* **Example**

In Software Engineering, consider the following specification:

1. ***A clickable button with name Submet***

Verification would check the design doc and correcting the spelling mistake. Otherwise, the development team will create a button like

[](https://www.guru99.com/images/blog/submet.png)

1. ***A clickable button with name Submit***

Once the code is ready, Validation is done. A Validation test found a button with name Submit, but not a clickable one. Owing to Validation testing, the development team will make the submit button clickable.

[](https://www.guru99.com/images/blog/ButtonClick.gif)

* **Validation of user input**

The validation of users input is a very important part of web development process. This is one the trickiest parts of any application at all. Why is that? Because the developer doesn't control it. You can write the best algorithm in the world, but still if it includes user input there is a place for mistakes. Even if we put some complicated logic to prevent the input of wrong symbols, check the consistence of the data and do whatever possible to make sure that it is all OK, there is still possibility that the users enter the wrong number. Though all said, we must try to prevent the most of human errors and the best way to do this is by using Regular Expressions.  
  
Basically Regular Expressions are used for string matches. They are based on search and pattern matching strings in text.

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| Lab Tasks |

1. ***We are going to create a registration form with required input fields. They are as follows:  
   - Full Name  
   - Address  
   - CNIC  
   - Email  
   - Phone  
   - Date  
   - Username  
   - Password***

***For the above mentioned fields, create registration form and validate it using PHP code.***

1. ***Create a software program of your choice, with at least one software development documents (i.e. PRD, UIRD, QRD, TRD, SRS, etc. ). Perform verification and validation of that software. You’ve this flexibility of writing the chosen software in any of the available programming languages.***

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| Lab Tasks Assessment/Rubrics along with Score/Marks | |
| *Rubric Description* | ***Rubric Marks*** |
| 1. Code originality | 0.25 |
| 1. Coding standards | 0.25 |
| 1. Result Accuracy | 0.25 |
| 1. Test Completeness and correctness | 0.25 |