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National Competency Standards

For

Mobile Application Developer

Introduction

The National Competency Standards are written specifications of skill and knowledge competencies required in a particular trade. The competency standards are developed in collaboration with United Nations Industrial Development Organization (UNIDO), GIZ and National Vocational & Technical Training Commission (NAVTTTC).

Industry experts from the relevant industries from different geographical locations across Pakistan were consulted during the development process of these competency standards to ensure input and ownership of all the stakeholders. NAVTTTC approves these competency standards on the recommendation of Industry Advisory Group (IAG) for the Information Technology sector.

The National Competency Standards could be used as a referral document for the development of curricula to be used by training institutions.

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STRUCTURE OF COMPETENCY STANDARDS

Competency Standards are performance specifications that identify the knowledge and competencies an individual needs to succeed in the workplace. A competency standard has the following elements:

Competency Unit

A competency unit is a statement which points to an outcome that employers will value and is observable and assessable. The competency unit is derived during the process of Occupational Analysis and is called 'Task Statement' in a DACUM Chart.

Overview

An overview is a description of the competency standard. It briefly describes the purpose and linkage of the competency unit with a job role.

Performance Criteria

Performance criteria statements set the standard of performance of a task in a job role. It describes 'how well' a task or competency unit is to be performed. It should be observable and written in a measurable term. It is one of the basic criterions for conducting assessment of the performance of a tradesman.

Knowledge and Understanding

Supporting knowledge and understanding statements include the essential knowledge and understanding, covering facts, principles, procedures, processes and methods. These statements cover the basic knowledge and understanding that is required to master a competency unit in an occupation.

Tools & Equipment

All the related tools, equipment and machinery that are required to perform a particular competency unit or task are listed under this heading.

COMPETENCY MAP

A. Design Screen Layout

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|------------------------|----------------------------|----------------------|---------------------|--|--|
| A1. Prepare Wire frame | A2. Prepare User Interface | A3. Prepare Workflow | A4. Perform Testing | | |
|------------------------|----------------------------|----------------------|---------------------|--|--|

B. Perform Coding

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|--------------------------|---------------------------------|------------------------------|--------------------------------|---------------------------------|--|
| C1. Prepare Architecture | C2. . Perform Breakdown Feature | C3. Perform Database linkage | C4. Perform Coding of Features | C5. Perform Feature Integration | |
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C. Perform Testing

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|-----------------------|--------------------------|---------------------------------|----------------------------|-----------------------------------|--|
| D1. Prepare Use Cases | D2. Perform Unit Testing | D3. Perform Integration Testing | D4. Perform Stress Testing | D5. Perform Compatibility Testing | |
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E. Perform Written / Verbal Communication.

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|-------------------------------|----------------------------|------------------------------|--|--|--|
| F1. Communicate with Managers | F2. Communicate with peers | F3. Communicate with clients | | | |
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1. Unit Title: Design Screen Layout

| Competency Unit | Overview | Performance Criteria | Knowledge & Understanding | Tools & Equipment |
|----------------------------|---|--|--|---|
| A1. Prepare Mock-ups | Preparing the preliminary UI designs that will serve two purposes: To Help the developer understand the frontend UI requirements and to let the client know how exactly the UI will look. | <p><i>You must be able to:</i></p> <p>P1. Correctly interpret customer UI requirements</p> <p>P2: Create appropriate designs with respect to the App type.</p> <p>P3. Using customer defined fonts and colors with respect to the App Type.</p> <p>P4. Using appropriate colors with respect to the Trade Dress.</p> | <p><i>You need to know and understand:</i></p> <p>K1: Understanding of customer UI requirements</p> <p>K2: Understanding of User behaviors</p> <p>K3: Knowledge of user interface designs, layouts and patterns.</p> <p>K4: Knowledge of graphic designing tools</p> | <ul style="list-style-type: none"> • Adobe Photoshop. • Pencil Tool • Paint • Interface builder |
| A2. Prepare User Interface | Develop the UI interfaces as per customer requirement which may include mobile application platform, screen resolution, and color schemes, themes, CSS, HTML layouts and | <p>P1. Illustrate customer’s UI interface requirements.</p> <p>P2. Prepared a User friendly Interface.</p> <p>P3. Develop an Attractive “look and feel” of the interface.</p> | <p><i>You need to know and understand:</i></p> <p>K1. Must know the user experience/requirement.</p> <p>K2. Describe Color theory</p> <p>K3. UI design layouts/patterns knowledge.</p> | <ul style="list-style-type: none"> • Adobe Photoshop. |

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| | controls/widgets placement. | | | |
| A3. Prepare Workflow | Develop workflows and navigational flows between user interfaces which includes navigational models | <p>P1: Correctly navigate to between all tiers of navigation as per requirements.</p> <p>P2: Correctly order the navigational model</p> <p>P3: Demonstrate Correct planning of tiers of navigation</p> | <p><i>You need to know and understand:</i></p> <p>K1: Knowledge of Navigation patterns and models</p> <p>K2: Knowledge of flow charts.</p> | <ul style="list-style-type: none"> • Excel/Paint • GoMockingBird.com |
| A4. Verification of Mockup. | Evaluate on the basis of targeted platform – guidelines/ user requirement guide lines. Evaluation on the basic standards of User experience. Evaluation of cross devices. Compatibility cross devices – responsibility. Accessibility of design. | <p>P1. Assess the responsiveness of the User Interface.</p> <p>P2. Ensured Cross devices and platform compatibility</p> <p>P3. Check the Interactivity of the layout</p> <p>P4. Accessibility.</p> <p>P5. Met the User Interface requirements/targeted platform guidelines.</p> | <p><i>You need to know and understand:</i></p> <p>K1. UX knowledge</p> <p>K2. Customer understanding</p> <p>K3. Different platform environments' knowledge</p> | |

2. Unit Title: Perform Coding

| Competency Unit. | Overview | Performance Criteria | Underpinning Knowledge & Skills | Tools & Equipment |
|-------------------------------|--|---|---|---|
| B1. Prepare Architecture | <p>Architecture is a logical model of the whole system which has to be built afterwards and provides a direction to the developers. Generally this model is presented in the form of sequence diagram and domain model</p> | <p><i>You must be able to:</i></p> <p>P1. Incorporate all the user requirements into the architecture</p> <p>P2. Should be flexible for further changes and enhancement.</p> <p>P3 Check components in a specific module performed related tasks.</p> <p>P4 Demonstrate that architecture is built in a way that it reduces any chance of uncertainty</p> | <p><i>You need to know and understand:</i></p> <p>Knowledge of any modeling language (Unified Modeling language).</p> | <ul style="list-style-type: none"> • Adobe Photoshop • Paint |
| B2. Perform Breakdown Feature | <p>Breaking down a task into smaller modules and sub tasks helps achieving a goal</p> | <p><i>You must be able to:</i></p> <p>P1. Ensure subtask should contain related features only.</p> | <p><i>You need to know and understand:</i></p> <p>K1. Knowledge of Domain and</p> | <ul style="list-style-type: none"> • Knowledge of modeling skills and language |

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| | efficiently by following principal of Divide and Conquer | P2. Check the Inter dependency between sub tasks should be managed efficiently. | application K2. Knowledge of Rapid Application Development K3. Experience and skills of system analysis. | |
| B3. Perform Coding of Features | Development of all the features which were Break Down | <i>You must be able to:</i> P1. Followed Coding standards. P2. Fulfilled functional and non functional requirement P3. Demonstrate optimized and robust code. P4. Check readability and re-usability of code. | <i>You need to know and understand:</i> K1. Knowledge of relevant language. K2. Knowledge of relevant platform and framework K3. Knowledge of best coding practice | IDE that support language |
| B4. Perform Feature Integration | Integration of all the developed | <i>You must be able to:</i> P1. Organized and integrated modules into | <i>You need to know and understand:</i> K1. Knowledge of | |

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| | features into one product | proper sequence. | information and application flow. K2.Understand Exception handling K3. Knowledge of sub versioning of application and module. K4. Knowledge of Rapid application development | |
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3. Unit Title: Perform Testing

| Competency Unit | Overview | Performance Criteria | Underpinning Knowledge & Skills | Tools & Equipment |
|-----------------------|---|---|--|--|
| C1. Prepare Use Cases | Identifying user activities, events and responses based on respective activities and events | <i>You must be able to:</i> P1: Covered all events performed by user as per requirement P2: Ensured the test cases meets workflow | <i>You need to know and understand:</i> K1: The ability to analyze and understand requirements. K2: Understand use case diagrams | <ul style="list-style-type: none"> • MS Office • MS Project, • MS Visio |

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| | | <p>requirements</p> <p>P3: Checked that the test cases cover functional and non-functional requirements.</p> | <p>K3: Use relevant tools to create basic drawings.</p> | |
| C2. Perform Unit Testing | <p>Verifying assigned modules within an application against functional and non-functional requirements.</p> | <p><i>You must be able to:</i></p> <p>P1: Correctly aligned compliance with application requirements</p> <p>P2: Correctly define logic as per requirement</p> <p>P3: Tested all the units.</p> | <p><i>You need to know and understand:</i></p> <p>K1: Clear understanding of the scope of target units</p> <p>K2: Awareness of latest unit testing techniques.</p> | |
| C3. Perform Integration Testing | <p>Integration testing in which individual software modules are combined and tested as a group. Integration testing is done after unit testing.</p> | <p><i>You must be able to:</i></p> <p>P1. Checked that all integrated application modules should work together properly as per requirement.</p> <p>P2. Maintained performance after integration.</p> <p>P3. Ensured that individual</p> | <p><i>You need to know and understand:</i></p> <p>K1. Working knowledge of all modules involved in integration.</p> <p>K2. Able to do unit testing.</p> <p>K3. Knowledge of workflow of information between integrated modules.</p> | <p>Dalvick Debugging Tool</p> |

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| | | modules are functional. | | |
| C4. Perform Compatibility Testing | Since the mobile devices have different size, resolution, screen, version, hardware so the application should be work across different devices to ensure the application should work as desired across different devices. | <p><i>You must be able to:</i></p> <p>P1. Verified readability across all the devices.</p> <p>P2. Maintained user experience across all the devices.</p> <p>P3. Performed testing to make sure application properly functional across all the targeted platforms.</p> <p>P4. Ensured features of application worked as desired on all the targeted devices.</p> | <p><i>You need to know and understand:</i></p> <p>Knowledge of different hardware.</p> | <ul style="list-style-type: none"> • Android studio. • Debugging tools for iOs and hybrid application. |

4. Unit Title: Perform Verbal / Written Communication

| Competency Unit | Overview | Performance Criteria | Underpinning Knowledge & Skills | Tools & Equipment |
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| D1. Communicate with managers | This unit of competency deals | <p><i>You must be able to:</i></p> <p>P1. Seek guidance from</p> | <p><i>You need to know and understand:</i>K1. Knowledge of</p> | <ul style="list-style-type: none"> • Family members • Friend of family |

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| | with following instructions of the seniors to perform proper job. | seniors P2. Follow the instructions from seniors P3. Consult seniors in case of emergency. | seniors to enhance the efficiency of products. K2. Senior suggestions and instructions. | members |
| D2. Communicate with peers. | This unit of competency is designed to manage the workers and other personnel that can help in improving work quality and quantity. | <i>You must be able to:</i> P1. Perform the duty with other team members. P2. Support the peers in their work and achieve targets in minimum time. P3. Appreciate the peers in order to enhance the efficiency. P4. Make work environment comfortable for peers. | <i>You need to know and understand:</i> Time management. | <ul style="list-style-type: none"> • Notice board • Schedule • Web portal |
| D3. Communicate | This unit of | <i>You must be able to:</i> | <i>You need to know and understand:</i> | <ul style="list-style-type: none"> • Data of customers |

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| with clients. | competency is designed to build good relationship with customers. | <p>P1. Provide comprehensive support.</p> <p>P2. Update customers with new products.</p> <p>P3. Kind and honest with customers.</p> <p>P4. Be polite with customers in dealing.</p> <p>P5. Keep record of customers.</p> <p>P6. Share details of project/products with clients</p> | Maintaining data of related customers. | <ul style="list-style-type: none"> • Mobile • Computer • Reference • Chambers. |
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