

Job Details	Qualifications Pack Code	TEL/Q2300		
	Job Role	Telecom Terminal Equipment Application Developer (Android)		
	Credits(NSQF) [OPTIONAL]	TBD	Version number	1.0
	Sector	Telecom	Drafted on	23-06-2014
	Sub-sector	Application Development	Last reviewed on	24-06-2014
	Occupation	Android Application Developer	Next review date	26-12-2016

Job Role	Customer Premises Equipment
Role Description	Telecom Terminal Equipment Application Developer is responsible for interpreting the business logic required to create an Android Application, Creating User Interface, Writing Business logics for events and actions, processing data and information, testing the application and publishing application.
NSQF level	4
Minimum Educational Qualifications	12 th Pass Preferably.
Maximum Educational Qualifications	
Training	Practical knowledge of Java programming language is essential.
Experience	0-2 years
Applicable National Occupational Standards (NOS)	(Click to open the below hyperlinks) Compulsory: <ol style="list-style-type: none"> 1. TEL/N2300 (Setting up Android Application Development environment & creating User Interface) 2. TEL/N2301 (Creating Android VAS Application) 3. TEL/N2302 (Creating Applications for Android Tablets) 4. TEL/N2303 (Testing and Publishing Android Applications)
Performance Criteria	As described in the relevant OS units

Qualifications Pack for Telecom Terminal Equipment Application Developer(Android)

Definitions

Keywords /Terms	Description
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of OS.
Job Role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
OS	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the knowledge and understanding they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
NOS	NOS are Occupational Standards which apply uniquely in the Indian context.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Qualifications Pack	Qualifications Pack comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Unit Code	Unit Code is a unique identifier for an Occupational Standard , which is denoted by an 'N'.
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
Organizational Context	Organizational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills or Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the OS , these include communication related skills that are applicable to most job roles.

Acronyms

Keywords /Terms	Description
JDK	Java Development Kit
IDE	Integrated Development Environment
SDK	Standard Development Kit
ADT	Android Development Tools
ADV	Android Virtual Devices
UI	User Interface
API	Application Programming Interface
SQL	Standard Query Language
SMS	Short Message Services
VAS	Value Added Services
SHE	Safety Health & Environment
OHS	Operational Health & Safety



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National Occupational Standard



Overview

This unit is about Handing Data and Content Providers, Creating Value Added Services using Messaging , Networking , Email, Location Based Services.

Unit Code	TEL/N2300
Unit Title (Task)	Creating VAS Application
Description	This unit is about Setting up the Android Application Development environment and creating the User Interface for Android Application
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Understanding the Android Application Development Framework • Setting up Android Application Development Environment • Creating Android Projects • Creating Android User Interface Elements
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Understanding the Android Application Development Framework	<p>To be competent, the user/individual on the job must be able to</p> <p>PC1. Differentiate various Mobile operating Systems , key features and benefits</p> <p>PC2. Identify key features for various versions of Android</p> <p>PC3. Identify the various tools and softwares required for developing an Android Application</p>
Setting up Android Application Development Environment	<p>PC4. Install Java and Android SDK</p> <p>PC5. Install Eclipse IDE</p> <p>PC6. Configure Android Development Tool</p> <p>PC7. Create Android Virtual Devices</p> <p>PC8. Identifying the components of an Android Project</p>
Creating Android Projects	<p>PC9. Creating an Android Project</p> <p>PC10. Identifying the role of .src, Android Library, gen, assets, res, AndroidManifest.xml</p>
Creating Android User Interface Elements	<p>PC11. Understanding activities and Intents</p> <p>PC12. Applying Styles and themes to activities</p> <p>PC13. Creating Dialog window and Process Dialog</p> <p>PC14. Linking Activities using Intents</p> <p>PC15. Creating built in Application using Intents</p> <p>PC16. Using Intent Object, Intent Filters and Categories</p> <p>PC17. Displaying Notifications</p> <p>PC18. Understanding the components of a Screen, Views and viewGroups</p> <p>PC19. Understanding Absolut Layout, Linear Layout, Table Layout, Relative Layout, Frame Layout and Scroll Layout</p> <p>PC20. Adapting to Display orientation using anchoring views , resizing and</p>

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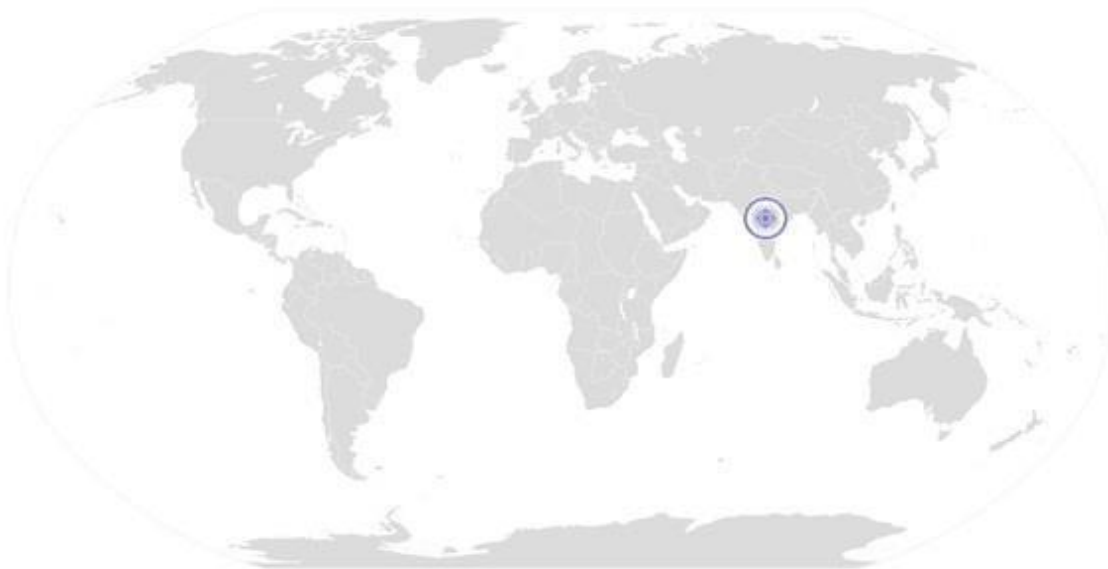
Setting up Android Application Development Environment & Creating User Interface

	<p>Repositioning. Managing Screen Orientation</p> <p>PC21. Creating User Interfaces programmatically</p> <p>PC22. Listening for UI Notifications</p> <p>PC23. Creating Basic Views (TextView, Button, ImageButton, EditText, CheckBox, ToggleButton, RadioButton, RadioGroup, ProgressBar, AutoCompleteTextView, TimePickerView, DatePickerView, ListView, SpinnerView</p> <p>PC24. Displaying Pictures using Imageview, ImageSwitcher and GridView</p> <p>PC25. Using Menus , Helper Methods, Options Menu and Context Menu</p> <p>PC26. Working with Android camera</p>
Knowledge and Understanding (K)	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Project Management concepts and applications</p> <p>KA2. risk and impact of not following defined procedures/work instructions</p> <p>KA3. escalation matrix for reporting identified incidents, troubles and/ or emergencies e.g. system failures ,fire and power failures</p> <p>KA4. records to be maintained and implications of non-maintenance of the same</p> <p>KA5. SHE and OHS guidelines and regulations as per company's norms</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Object Oriented Programming</p> <p>KB2. Java Programing (OOPS, Classes and Objects, Multithreading, Inheritance, AWT, Networking etc)</p> <p>KB3. Eclipse (Installation, using Eclipse Interface for creating Java Applications)</p>
Skills (S)	
<p>A. Core Skills/ Generic Skills</p>	<p>Basic Reading & Writing Skills</p>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. fill up appropriate technical forms, activity logs in required format of the company</p> <p>SA2. maintain proper records as per given format</p> <p>SA3. read and understand manuals, work orders, health and safety instructions, memos, reports etc.</p>
	<p>Communication Skills</p>
<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA4. corteous to the customers</p> <p>SA5. Liaisoning and coordination skills</p> <p>SA6. communicate with supervisor and peers</p> <p>SA7. communicate in the local language (preferable)</p>	
<p>B. Professional Skills</p>	<p>IDE installation/Task ManagementSkills</p>

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Setting up Android Application Development Environment & Creating User Interface

	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. Installing Java, Android SDK and Eclipse</p> <p>SB2. Work systematically with required attention to detail and adherence to all safety requirements</p>
	<p>Technical Skills</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. Read and comprehend/understand equipment installation manual</p> <p>SB4. Interpreting Application Requirements</p> <p>SB5. Interpreting UI requirements</p>



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NOS Code	TEL /N2300		
Credits(NSQF) [OPTIONAL]	TBD	Version number	1.0
Industry	Telecom	Drafted on	23-06-2014
Industry Sub-sector	Handset (Terminal Application)	Last reviewed on	24-06-2014
		Next review date	26-12-2016



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National Occupational Standard



Overview

This unit is about Handling Data, Content Providers, and creating Android VAS applications.

Unit Code	TEL/N2301
Unit Title (Task)	Creating Android VAS Applications
Description	Involves in working with Data sources, Databases, Content Providers, Messaging Services, Email Services, Networking Services, Location Based Services, Creating customized Android Services
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Data Handling • Messaging and Networking • Location Based Services • Developing Android Services
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Data Handling	<p>To be competent, the user/individual on the job must be able to</p> <p>PC1. Implementing Data Persistence</p> <p>PC2. Sharing and Loading user Preferences</p> <p>PC3. Storing Data to internal Storage, External Storage (SD Card) and static resources</p> <p>PC4. Storing Data in Cloud</p> <p>PC5. Using Database SQL Lite</p> <p>PC6. Applying SQL commands</p> <p>PC7. Using Contacts with Database</p> <p>PC8. Bundling Database with Application</p> <p>PC9. Using Content Providers</p>
Messaging and Networking	<p>PC10. Sending SMS messages programmically</p> <p>PC11. Sending SMS using Intent</p> <p>PC12. Receiving SMS and Processing SMS</p> <p>PC13. Sending Email</p> <p>PC14. Understanding Networking Fundamentals</p> <p>PC15. Working with Bluetooth</p> <p>PC16. Downloading Text Files, Binary Data, Accessing Web Services</p> <p>PC17. Performing Asynchronous Calls</p>
Location Based Services	<p>PC18. Understanding the MAP concept for Android and Creating a MAP Project</p> <p>PC19. Obtaining the Maps API Keys, Displaying the Map</p> <p>PC20. Controlling the Zoom abd changing the Views</p> <p>PC21. Navigating to specific locations</p> <p>PC22. Adding Markers</p> <p>PC23. Getting a locations that was touched</p>

TEL/N2301

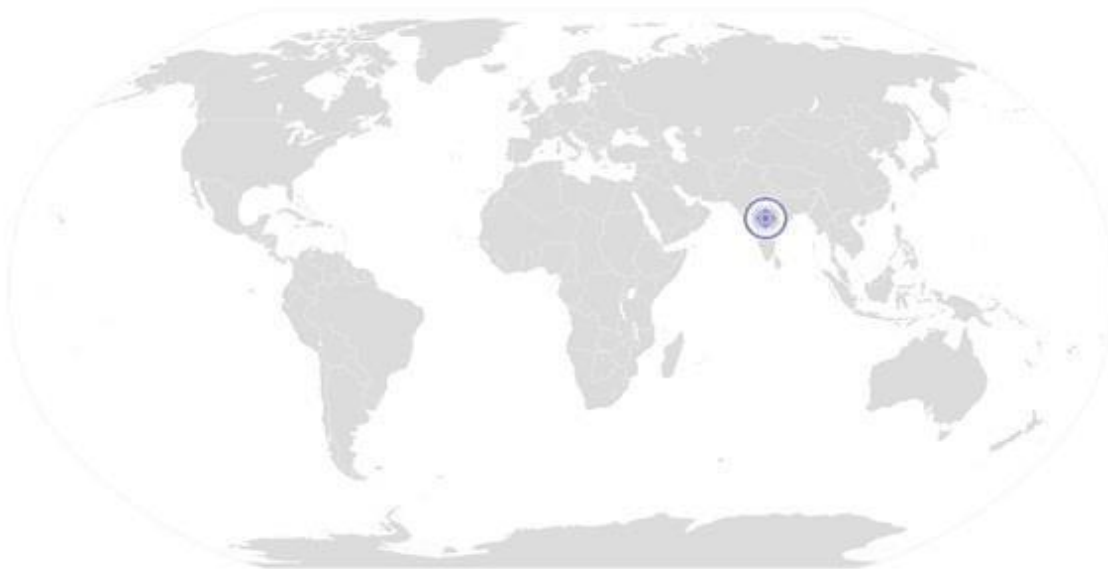
Creating Android VAS Applications

	<p>PC24. Geo coding and reverse Geocoding</p> <p>PC25. Monitoring Locations</p>
Developing Android Services	<p>PC26. Creating your Own Android Services</p> <p>PC27. Performing Long-Running tasks, Repeated Tasks, Asynchronous Tasks in a Service</p> <p>PC28. Using Multi Threading</p> <p>PC29. Communicating between a Service and Activity</p> <p>PC30. Building Activities into Services</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Project Management concepts and applications</p> <p>KA2. risk and impact of not following defined procedures/work instructions</p> <p>KA3. escalation matrix for reporting identified incidents, troubles and/ or emergencies e.g. system failures ,fire and power failures</p> <p>KA4. records to be maintained and implications of non-maintenance of the same</p> <p>KA5. SHE and OHS guidelines and regulations as per company’s norms</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB4. Object Oriented Programming</p> <p>KB5. Java Programing (OOPS, Classes and Objects, Multithreading, Inheritance, AWT, Networking etc)</p> <p>KB6. Eclipse (Installation, using Eclipse Interface for creating Java Applications)</p> <p>KB7. Creating Android User Interface Elements</p> <p>KB8. SQL Essentials</p>
Skills (S)	
A. Core Skills/ Generic Skills	Basic Reading & Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. fill up appropriate technical forms, activity logs in required format of the company</p> <p>SA2. maintain proper records as per given format</p> <p>SA3. read and understand manuals, work orders, health and safety instructions, memos, reports etc.</p>
	Communication Skills
B. Professional Skills	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA4. corteous to the customers</p> <p>SA5. Liaisioning and coordination skills</p> <p>SA6. communicate with supervisor and peers</p> <p>SA7. communicate in the local language (preferable)</p>
	IDE installation/Task ManagementSkills

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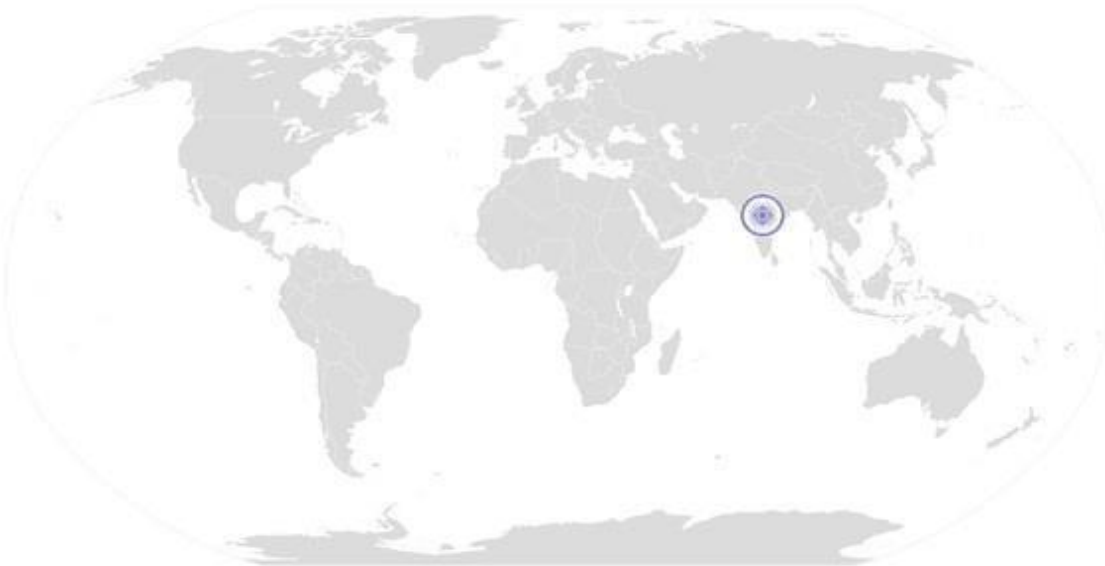
Creating Android VAS Applications

	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. Installing Java, Android SDK and Eclipse</p> <p>SB2. Work systematically with required attention to detail and adherence to all safety requirements</p>
	<p>Technical Skills</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. Read and comprehend/understand equipment installation manual</p> <p>SB4. Interpreting Application Requirements</p> <p>SB5. Interpreting UI requirements</p>



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NOS Code	TEL /N2301		
Credits(NSQF) [OPTIONAL]	TBD	Version number	1.0
Industry	Telecom	Drafted on	23-06-2014
Industry Sub-sector	Handset (Terminal Applications)	Last reviewed on	24-06-2014
		Next review date	26-12-2016



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National Occupational Standard



Overview

This unit is about Creating Applications for Android Tablets

National Occupational Standard	Unit Code	TEL/N2302
	Unit Title (Task)	Creating Applications for Android Tablets
	Description	This unit is about Creating Applications for Android Tablets
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Creating Android User Interfaces for Tablet App • Creating VAS Applications for Android Tablets
	Performance Criteria(PC) w.r.t. the Scope	
	Element	Performance Criteria
	Creating Android User Interfaces for Tablet App	<p>To be competent, the user/individual on the job must be able to</p> <p>PC1. Differentiate between creating an App for Smartphone and Tablet</p> <p>PC2. Understanding the components of an Android App for Tablet</p> <p>PC3. Work with Activities, Fragments, Action Bars</p> <p>PC4. Creating Android User Interface Elements (Views, ViewGroups, Layouts, Basic Views, Fragments, Buttons, Menu, Boxes)</p> <p>PC5. Working with Events</p>
	Creating VAS Applications for Android Tablets	<p>PC6. Working with Database and Data storage</p> <p>PC7. Working with Emails</p> <p>PC8. Working with SMS</p> <p>PC9. Working with Networking and Bluetooth Devices</p> <p>PC10. Working with MAPS and creating Location Based Services</p> <p>PC11. Creating custom Services</p>
	Knowledge and Understanding (K)	
	A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Project Management concepts and applications</p> <p>KA2. risk and impact of not following defined procedures/work instructions</p> <p>KA3. escalation matrix for reporting identified incidents, troubles and/ or emergencies e.g. system failures ,fire and power failures</p> <p>KA4. records to be maintained and implications of non-maintenance of the same</p> <p>KA5. SHE and OHS guidelines and regulations as per company's norms</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Object Oriented Programming</p> <p>KB2. Java Programming (OOPS, Classes and Objects, Multithreading, Inheritance, AWT,</p>	

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Testing and Publishing Android Applications

	<p>Networking etc)</p> <p>KB3. Eclipse (Installation, using Eclipse Interface for creating Java Applications)</p> <p>KB4. Creating Android User Interface Elements</p> <p>KB5. SQL Essentials</p>
Skills (S)	
A. Core Skills/ Generic Skills	Basic Reading & Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA8. fill up appropriate technical forms, activity logs in required format of the company</p> <p>SA9. maintain proper records as per given format</p> <p>SA10. read and understand manuals, work orders, health and safety instructions, memos, reports etc.</p>
	Communication Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA11. courteous to the customers</p> <p>SA12. Liaisoning and coordination skills</p> <p>SA13. communicate with supervisor and peers</p>
B. Professional Skills	IDE installation/Task Management Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB6. Installing Java, Android SDK and Eclipse</p> <p>SB7. Work systematically with required attention to detail and adherence to all safety requirements</p>
	Technical Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB8. Read and comprehend/understand equipment installation manual</p> <p>SB9. Interpreting Application Requirements</p> <p>SB10. Interpreting UI requirements</p>
	Basic Reading & Writing Skills
<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA14. fill up appropriate technical forms, activity logs in required format of the company</p> <p>SA15. maintain proper records as per given format</p> <p>SA16. read and understand manuals, work orders, health and safety instructions, memos, reports etc.</p>	

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Testing and Publishing Android Applications

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NOS Code	TEL /N2302		
Credits(NSQF) [OPTIONAL]	TBD	Version number	1.0
Industry	Telecom	Drafted on	23-06-2014
Industry Sub-sector	Handset (Terminal Applications)	Last reviewed on	24-06-2014
		Next review date	26-12-2016



National Occupational Standard



Overview

This unit is about Testing and Publishing Android Applications

National Occupational Standard	Unit Code	TEL/N2303
	Unit Title (Task)	Testing and Publishing Android Applications
	Description	This unit is about Creating Applications for Android Tablets
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Android Application Testing • Securing Android Applications • Publishing Android Applications
	Performance Criteria(PC) w.r.t. the Scope	
	Element	Performance Criteria
	Android Application Testing	<p>To be competent, the user/individual on the job must be able to</p> <p>PC1. Testing fundamentals, Types of Testing</p> <p>PC2. Testing Android Application using Unit Testing</p> <p>PC3. Functional /Usability Testing Android Applications</p> <p>PC4. UI Testing</p> <p>PC5. Performance Testing</p> <p>PC6. Localization issues & Battery Impact</p>
	Securing Android Applications	<p>PC7. Application Security Testing</p> <p>PC8. Security Best Practices for Android VAS Applications</p>
	Publishing Android Applications	<p>PC9. bundle application for release on app store</p> <p>PC10. Google licensing</p> <p>PC11. Using Admob SDK for ad</p> <p>PC12. Backward compatibilty strategies</p>
	Knowledge and Understanding (K)	
B. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA6. Project Management concepts and applications</p> <p>KA7. risk and impact of not following defined procedures/work instructions</p> <p>KA8. escalation matrix for reporting identified incidents, troubles and/ or emergencies e.g. system failures ,fire and power failures</p> <p>KA9. records to be maintained and implications of non-maintenance of the same</p> <p>KA10. SHE and OHS guidelines and regulations as per company’s norms</p>	

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Testing and Publishing Android Applications

<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB6. Object Oriented Programming</p> <p>KB7. Java Programming (OOPS, Classes and Objects, Multithreading, Inheritance, AWT, Networking etc)</p> <p>KB8. Eclipse (Installation, using Eclipse Interface for creating Java Applications)</p> <p>KB9. Creating Android User Interface Elements</p> <p>KB10. SQL Essentials</p>
<p>Skills (S)</p>	
<p>C. Core Skills/ Generic Skills</p>	<p>Basic Reading & Writing Skills</p>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA17. fill up appropriate technical forms, activity logs in required format of the company</p> <p>SA18. maintain proper records as per given format</p> <p>SA19. read and understand manuals, work orders, health and safety instructions, memos, reports etc.</p>
	<p>Communication Skills</p>
<p>D. Professional Skills</p>	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA20. courteous to the customers</p> <p>SA21. Liaisoning and coordination skills</p> <p>SA22. communicate with supervisor and peers</p>
	<p>IDE installation/Task Management Skills</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB11. Installing Java, Android SDK and Eclipse</p> <p>SB12. Work systematically with required attention to detail and adherence to all safety requirements</p>
	<p>Technical Skills</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB13. Read and comprehend/understand equipment installation manual</p> <p>SB14. Interpreting Application Requirements</p> <p>SB15. Interpreting UI requirements</p>
	<p>Basic Reading & Writing Skills</p>
<p>D. Professional Skills</p>	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA23. fill up appropriate technical forms, activity logs in required format of the company</p> <p>SA24. maintain proper records as per given format</p> <p>SA25. read and understand manuals, work orders, health and safety instructions, memos, reports etc.</p>

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Industry	Telecom	Drafted on	23-06-2014
Industry Sub-sector	Handset (Terminal Applications)	Last reviewed on	24-06-2014
		Next review date	26-12-2016



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PERFORMANCE CRITERIA

Job Role	: Telecom Terminal Equipment Application Developer- Android
Qualification Pack	: TEL/Q2300
Sector Skill Council	: Telecom

- Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
- The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
- Individual assessment agencies will create unique question papers for theory and skill practical part for each candidate at each examination/training center.
- To pass the Qualification Pack, every trainee should score a minimum of 40% in every NOS and overall 50% Pass percentage
- In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

		Total Mark (400)	Out Of	Theory	Skills Practical
TEL/N2300 Understanding the Android Application Development Framework	PC1. Differentiate various Mobile operating Systems, key features and benefits	100	4	4	0
	PC2. Identify key features for various versions of Android		4	4	0
	PC3. Identify the various tools and softwares required for developing an Android Application		4	4	0
Setting up Android Application Development Environment	PC4. Install Java and Android SDK		3	2	1
	PC5. Install Eclipse IDE		3	1	2
	PC6. Configure Android Development Tool		3	1	2
	PC7. Create Android Virtual Devices		3	1	2
	PC8. Identifying the components of an Android Project		3	2	1
Creating Android Projects	PC9. Creating an Android Project		4	3	1
	PC10. Identifying the role of .src, Android Library, gen, assets, res, AndroidManifest.xml		4	2	2
Creating Android User Interface Elements	PC11. Understanding activities and Intents		3	3	0
	PC12. Applying Styles and themes to activities		5	2	3
	PC13. Creating Dialog window and Process Dialog		3	1	2
	PC14. Linking Activities using Intents		3	1	2
	PC15. Creating built in Application using Intents		4	1	3
	PC16. Using Intent Object, Intent Filters and Categories		3	1	2
	PC17. Displaying Notifications		4	1	3
	PC18. Understanding the components of a Screen, Views and viewGroups		4	2	2
	PC19. Understanding Absolut Layout, Linear Layout, Table Layout, Relative Layout, Fram Layout and Scroll Layout		5	2	3
	PC20. Adapting to Display orientation using anchoring views, resizing and repositioning. Managing Screen Orientation		5	2	3
	PC21. Creating User Interfaces programmatically		4	1	3
	PC22. Listening for UI Notifications		3	1	2
	PC23. Creating Basic Views (TextView, Button, ImageButton, EditText, CheckBox, ToggleButton, RadioButton, RadioGroup, ProgressBar, AutoCompleteTextView, TimePickerView, DatePickerView, ListView, SpinnerView		5	2	3
	PC24. Displaying Pictures using ImageView, ImageSwitcher and GridView		5	2	3
PC25. Using Menus, Helper Methods, Options Menu and Context Menu	5		2	3	
PC26. Working with Android camer	4		1	3	
TEL/N2301 Data Handling	PC1. Implementing Data Persistence	100	5	2	3
	PC2. Sharing and Loading user Preferences		4	2	2
	PC3. Storing Data to internal Storage, External Storage (SD Card) and static resources		3	2	1
	PC4. Storing Data in Cloud		3	1	2
	PC5. Using Database SQL Lite		3	2	1
	PC6. Applying SQL commands		6	3	3
	PC7. Using Contacts with Database		5	2	3
	PC9. Using Content Providers		2	1	1
PC8. Bundling Database with Application	3		1	2	
Messaging and Networking	PC10. Sending SMS messages programmically		3	1	2
	PC11. Sending SMS using Intent		3	1	2
	PC12. Receiving SMS and Processing SMS		3	1	2
	PC13. Sending Email		2	1	1
	PC14. Understanding Networking Fundamentals		6	3	3
	PC15. Working with Bluetooth		3	1	2
	PC16. Downloading Text Files, Binary Data, Accessing Web Services		2	1	1
PC17. Performing Asynchronous Call	3		1	2	
Location Based Services	PC18. Understanding the MAP concept for Android and Creating a MAP Project	100	4	3	1
	PC19. Obtaining the Maps API Keys, Displaying the Map		3	1	2
	PC20. Controlling the Zoom abd changing the Views		3	1	2
	PC21. Navigating to specific locations		3	1	2
	PC22. Adding Markers		3	1	2
	PC23. Getting a locations that was touched		3	1	2
PC24. Geo coding and reverse Geocoding	4		1	3	
PC25. Monitoring Locations	3		1	2	
Developing Android Services	PC26. Creating your Own Android Services		3	2	1
	PC27. Performing Long-Running tasks, Repeated Tasks, Asynchronous Tasks in a Service		3	1	2
	PC28. Using Multi Threading		3	2	1
	PC29. Communicating between a Service and Activity	3	1	2	
	PC30. Building Activities into Services	3	1	2	
TEL/N2302 Creating Android User Interfaces for Tablet App	PC1. Differentiate between creating an App for Smartphone and Tablet	100	10	5	5
	PC2. Understanding the components of an Android App for Tablet		10	7	3
	PC3. Workign with Activities, Fragments, Action Bars		15	7	8
	PC4. Creating Android User Interface Elements (Views, ViewGroupss, Layouts, Basic Views, Fragments, Butttons, Menu, Boxes)		15	7	8
	PC5. Working with Events		10	5	5
Creating VAS Applications for Android Tablets	PC6. Working with Database and Data storage		10	5	5
	PC7. Working with Emails		5	2	3
	PC8. Working with SMS		5	2	3
	PC9. Working with Networking and Bluetooth Devices		5	2	3
	PC10. Working with MAPS and creating Location Based Services		10	4	6
	PC11. Creating custom Services	5	3	2	
TEL/N2303 Android Application Testing	PC1. Testing fundamentals, Types of Testing	100	8	5	3
	PC2. Testing Android Application using Unit Testing		8	3	5
	PC3. Functional /Usability Testing Android Applications		8	3	5
	PC4. UI Testing		8	3	5
	PC5. Performance Testing		8	3	5
	PC6. Localization issues & Battery Impact		8	5	3
Securing Android Applications	PC7. Application Security Testing		10	5	5
	PC8. Security Best Practices for Android VAS Applications		10	7	3
Publishing Android Applications	PC9. bundle application for release on app store		10	6	4
	PC10. Google licensing		4	4	0
	PC11. Using Admob SDK for ad		10	5	5
	PC12. Backward compatibility strategies		8	4	4