BCS Digital Industries Apprenticeship

Template 4 – Employer Reference

Level 4 Software Developer Apprenticeship

Version 4.0
May 2019

Change History

Any changes made to the project shall be clearly documented with a change history log. This shall include the latest version number, date of the amendment and changes made. The purpose is to identify quickly what changes have been made.

Version Number and Date	Changes Made
V4.0 May 2019	Change History table added to document. Major changes to document throughout. Standard specific competencies and proficiencies unchanged.

Software Developer Template 4 – Employer Reference

Apprentice Details

Name	Maruf Ahmed
ULN number	

Training Provider Details

Contact name	Michelle Anthony
Company name	Makers Academy
Company address	50-52 Commercial Street, London, E1 6LT

Employer Details

Name	Deloitte MCS
Company address	1 New Street Square, London, EC4A 3HQ

Input provided by:

Manish Narula (Manager)
Jack Bell (Manager)
Karen Ching (Assistant Director)
Darren Dunford (Director)

Signed by: DocuSigned by: Inna Kataeva 282604A0EF8E4E3...

Print name: Inna Kataeva

Job title: Manager

Date: 12/12/20

Section 1
Starting the Apprenticeship

The apprentice may have just joined your organisation but could also be an existing employee who has joined the apprenticeship programme.

The intent of the employer reference is for you to support your apprentice by validating the evidence that they have submitted for end point assessment (EPA).

You should complete this initial section when the apprenticeship starts.

Software Developer Standard Number ST0116

The knowledge, skills and behaviours that must be demonstrated by the end of this apprenticeship are defined by the Standard:
https://www.instituteforapprenticeships.org/apprenticeship-standards/software-developer/

Role Profile

The primary role of a software developer is to build and test simple, high-quality code across front end, logic and database layers. A developer will typically be working as part of a larger team, in which they will have responsibility for some of the straightforward elements of the overall project. The developer will need to be able to interpret design documentation and specifications. The customer requirements will typically be defined and agreed by more experienced or specialist members of the team, such as a business analyst or technical architect.

Typical Job Roles

Web Developer, Application Developer, Mobile App Developer, Games Developer, Software Developer.

Please complete the following fields:

Job Title of Apprentice	Brief Summary of the Common Duties that the Apprentice Will be Doing for your Organisation	Date Started
Consultant	Working on client and internal projects to resolve complex problems. Supporting delivery managers and other stakeholders to support with development of technology enabled services and business improvements.	28th January 2020

The standard defines the technical knowledge and understanding that will be required by the apprentice, these will generally be delivered by the training provider that you have chosen to work with. This knowledge and understanding will be confirmed by the two knowledge modules, each of these must be successfully covered, either by passing an approved knowledge module exam or via a vendor certification proxy. In the case of this standard one

approved vendor certifications must be passed. This certification will provide a proxy for a specific knowledge module.

Over their time on the apprenticeship, your apprentice will apply the underpinning knowledge gained through the training to actual work-related activities required by the role that you have employed them to fulfil. The apprentice should work with one or more mentors within your organisation who will provide advice, guidance and training on how the knowledge gained by the apprentice is applied in actual working situations.

The standard also defines a number of technical competences, your apprentice must demonstrate competence in all of them to achieve the standard. The following must be demonstrated by the apprentice in their Summative Portfolio, which provides evidence against the totality of the standard, based on the application of knowledge, competence and behaviours to real work projects in the work environment.

Technical Competencies

- **Logic:** writes good quality code (logic) with sound syntax in at least one language.
- **User interface:** can develop effective user interfaces for at least one channel.
- **Data:** can effectively link code to the database/data sets.
- **Test:** can test code and analyse results to correct errors found using either V-model manual testing and/or using unit testing.
- **Problem solving:** can apply structured techniques to problem solving, can debug code and can understand the structure of programmes in order to identify and resolve issues.
- **Design:** can create simple data models and software designs to effectively communicate understanding of the program, following best practices and standards.
- **Analysis:** can understand and create basic analysis artefacts, such as user cases and/or user stories.
- **Deployment:** can understand and utilise skills to build, manage and deploy code into enterprise environments.
- **Development lifecycle:** can operate at all stages of the software development lifecycle, with increasing breadth and depth over time with initial focus on build and test.
- Can **apply good practice** approaches according to the relevant paradigm (for example object oriented, event driven or procedural).
- Can **interpret and follow:**
    - software designs and functional/technical specifications;
    - company defined ‘coding standards’ or industry good practice for coding;
    - testing frameworks and methodologies;
    - company, team or client approaches to continuous integration, version and source control.
- Can **respond to the business environment** and business issues related to software development.

- Can operate effectively in their own business's, their customers' and the **industry's environments**.
- Can **apply the maths** required to be a software developer (e.g. algorithms, logic and data structures).

BCS have created a Standard Specific Guide for this standard and also provides Template 5 – Summative Portfolio Checklist which gives advice and guidance on what types of evidence are suitable for each of the above criteria, it also includes specific details of the minimum evidence requirements.

Please note, the apprenticeship standards are designed to cover a wide range of different job roles so there may be a small number of areas within these mandatory requirements that are not naturally occurring within the day-to-day duties of your apprentice. If you are a larger organisation, it is perfectly acceptable for you to second your apprentice to a different department for a period (at least a week) to allow them exposure to some activities that they may not come into contact with. If this is not possible, you, your apprentice and your selected training provider should select a synoptic project that will allow your apprentice to demonstrate that they are competent in criteria that they are not exposed to during their normal working activities. Please also note, the synoptic project is the only area within the submitted portfolio of evidence that does not draw from the real work environment

Section 2
Technical Competence Evaluation

Please provide your evaluation of the technical competence of the apprentice using the tables below. Under each heading are details of the activities that a competent apprentice should be able to demonstrate by the time that they are judged ready, by you, your chosen training provider and the apprentice themselves, to apply for the EPA.

We strongly recommend that you continually review your apprentice against these competences throughout the duration of the apprenticeship and periodically update this document. A suitable time to add comments and evidence could be during your performance reviews (or similar) with your apprentice.

Competence – Logic

Logic: writes good quality code (logic) with sound syntax in at least one language.

How has your apprentice demonstrated competence in this area? (please give examples)
Manish Narula: Maruf setup the backend of the application with NodeJS. One of the first tasks was to build a simple Restful API with NodeJS, Express, PostgreSQL, Sequelize and other dependencies. Once initial setup was ready, Maruf installed all the dependencies required. Once the dependencies were installed it can be seen and accessed in JSON file named package.json.In this case, Maruf took some time to get up to speed, but once he started getting comfortable with the backend logic, the output got better. As an example in Database > models > index.js Maruf has used standard naming convention along with some functional programming which is helping to initialize the database and once the initialize is complete Maruf has checked if config is set, in this case, his config variable is set to development object. NOTE: this box will expand as required

Competence – User Interface

User interface: can develop effective user interfaces for at least one channel.

How has your apprentice demonstrated competence in this area? (please give examples)
Darren Dunford: During the project, Maruf worked as part of the development team with the aim to build a portal that could store user information. As part of this work, Maruf's responsibility was to setup Vuex and specifically a workplace form, where a user can provide multiple workplace details V-bind was used to bind html attributes which is intended to be used to create custom props with components and pass data through.

Maruf had refactored and created elements of the form. The form creation was completed in development environment and tested. Maruf has demonstrated to be able to build basic user interface from his contribution to the project.

NOTE: this box will expand as required

Competence – Data

Data: can effectively link code to the database/data sets.

How has your apprentice demonstrated competence in this area? (please give examples)

Manish Narula: It was extremely important to create the mock data to full proof the logic layer, backend and front are interacting the way they should.I can confirm that Maruf did a decent job in doing this piece of work. He was struggling with understanding business context behind it in the beginning, but soon he caught up and delivered. The project team has then supported him in reviewing the data he created.

As shown in the portfolio, CRUD (create, read, update, delete) operation was performed in database > config folder. This folder contains the various services to assist the controller. This is where the business layer of the API sits. He used this folder where database calls are actually made. It is extracted from the controller because the logic is heavy and include setting audit column and checking previous data records to make sure the persistant of data.

NOTE: this box will expand as required

Competence – Test

Test: can test code and analyse results to correct errors found using either V-model manual testing and/or using unit testing.

How has your apprentice demonstrated competence in this area? (please give examples)

Manish Narula: Due to agile nature of the project, while building the application was on-going, so does the testing. Once the dependencies for test is installed he created a separate folder for testing and divided it with Unit Test and Integration test. As his test was directly linked to database he had to make sure the data base is ready for the test. In this case he had to clean up the database before each test runs and also create a sinon sandbox where it will put all the mocks and stubs. Maruf was found equally effective in

testing as other parts of the assignment. Maruf's contribution has helped the team achieve a certain code coverage in TDD practise.

NOTE: this box will expand as required

Competence – Problem Solving

Problem solving: can apply structured techniques to problem solving, can debug code and can understand the structure of programmes in order to identify and resolve issues. (Note – this has a requirement for using a minimum of two problem solving tools)

How has your apprentice demonstrated competence in this area? (please give examples)

Manish Narula:One of Maruf's initial tasks was to locate the data source that will fulfil the client's requirement. He was given a list of API's and had to go through each of them to see which one's will suit our requirement. He was given JSON schema for almost all the API which would fulfil our requirement. He had to go through each API to see what information it is pulling against the information we require for our project. In total there were 76 APIs.

This was an intensive piece of work that required someone to go through open API schema and validate what is required. Maruf was able to diligently work it out and meet the expectations.

Darren Dunford: Maruf was working with a number of developers in front end of the project. The team encountered issues with Git pull and merge. Maruf was able to resolve the issue, where the project was at risk of losing the work from the entire team. Rebase and Git Pull, local repository, basic understanding of how git works and some other git command were used to solve the merge conflicts.

Competence – Design

Design: can create simple data models and software designs to effectively communicate understanding of the program, following best practices and standards.

How has your apprentice demonstrated competence in this area? (please give examples)

Manish Narula: Finalising the list of APIs put him in a better place to focus on data model. Maruf used ERD diagram to relate the database with the wider application. The cardinality of a relationship is one to one or one to many, it is generally affiliated into a table representing the related entity.

The clue for merging tables is the attributes comprising primary key of the separated tables is a strict superset of the primary key of the table representing the main entity. Foreign key is extracted in the data structure in extraction step for one-to-one or one-to-many relationships.

Maruf was found to be able to take on this new and challenging work effectively while working with his tech lead and architect to understand issues if blocked. He was actively engaging with backend teams to scale up and deliver.

Competence – Analysis

Analysis: can understand and create basic analysis artefacts, such as user cases and/or user stories.

How has your apprentice demonstrated competence in this area? (please give examples)

Jack Bell: As part of the Innovation Factory initiative, Maruf has familiarised himself with the tools and methodology associated with Scrum and applied these by using Jira and in leading the team.

In his role in Innovation Factory Maruf worked with other BA's get first set of user stories ready and for developer to work on them. While doing that he tried to understand the product requirement and best way to achieve them as a team.

OTE: this box will expand as required

Competence – Deployment

Deployment: can understand and utilise skills to build, manage and deploy code into enterprise environments.

How has your apprentice demonstrated competence in this area? (please give examples)

Darren Dunford: As part of the work, Maruf had to follow certain rules in order to pull requests to merge. As part part of the process, at least 2 reviews were required before any commit could be merged. This also needed to be a regular process to ensure the review backlog wouldn't become too big. One the process is completed, it would pass the CI/CD requirement and deployed in AWS server. All code committed was deployed in CI/CD pipeline and passed necessary firm standards (including but not limited to automating as much as possible, all code needs to have version control and build quality in the process).

NOTE: this box will expand as required

Competence – Development Lifecycle

Development lifecycle: can operate at all stages of the software development lifecycle, with increasing breadth and depth over time with initial focus on build and test.

How has your apprentice demonstrated competence in this area? (please give examples)

Jack Bell: Maruf was in the role of Scrum Master for the innovation factory while driving the team at different stages of the lifecycle going from design through the development completion. His role was paused due to other priorities, therefore deployment and testing were not covered.

Maruf has familiarised himself with the tools and methodology associated with Scrum and applied these in Jira and with the team.

NOTE: this box will expand as required

Competence – Applying Good Practices

Can apply good practice approaches according to the relevant paradigm (for example object oriented, event driven or procedural).

How has your apprentice demonstrated competence in this area? (please give examples)

Darren Dunford: Maruf has demonstrated the ability to apply good practice to his work. As part of this piece of work, Maruf has familiarised himself with Vuex which is centralised state management tool for Vue which represents a central store for the components. Maruf has been applying the good practice set out by the firm including separation of concerns (i.e. if a change in code is required it would only apply to the relevant feature)

In Project Handbook for code writing section in his portfolio Maruf explain the best practise he followed throughout the project which also involves indentation, code commit, deployment and other ways of working his project used.

NOTE: this box will expand as required

Competence – Interpret and Follow

Can interpret and follow:

- **software designs and functional/technical specifications;**
- **company defined 'coding standards' or industry good practice for coding;**
- **testing frameworks and methodologies;**
- **company, team or client approaches to continuous integration, version and source control.**

How has your apprentice demonstrated competence in this area? (please give examples)

Darren Dunford: Maruf has demonstrated to be able to follow and interpret guidelines to ensure the quality of the deliverables. This was a PoC and only basic functionality of the solution has been

developed. As per “applying good practices” standard, Maruf has followed the project handbook for code writing consistently throughout the PoC.

Jack Bell: In his role as Scrum Master, Maruf has been applying the firm framework for agile delivery, including ceremonies and ways of working which included Daily Standup, Sprint Planning, Sprint Retro. He also used this ceremonies to get feedback from the wider team to improve next iteration. All the ceremonies are part of the standard firm methodology.

NOTE: this box will expand as required

Competence – Respond to Business Environment

Can respond to the business environment and business issues related to software development.

How has your apprentice demonstrated competence in this area? (please give examples)
Jack Bell: Maruf was able to work with limited product owner availability in his Scrum Master role and transitioned seamlessly to another project, effectively adapting to Deloitte business requirements.

NOTE: this box will expand as required

Competence – Industry Environment

Can operate effectively in their own business’s, their customers’ and the industry’s environments.

How has your apprentice demonstrated competence in this area? (please give examples)

Karen Ching:Maruf has demonstrated that he is able to adapt to different and challenging environments. He is working with a number of suppliers and service providers from industry to deliver an outcome.

NOTE: this box will expand as required

Competence – Application of Mathematics

Can apply the maths required to be a software developer (e.g. algorithms, logic and data structures).

How has your apprentice demonstrated competence in this area? (please give examples)

Darren Dunford: Maruf has demonstrated application of maths through developing simple data structures for user interface

NOTE: this box will expand as required

Section 3
Behaviours, Business Skills and Level of Responsibility Evaluation

Please provide an evaluation as to the level of responsibility of the apprentice you are providing a reference for using the tables below. Under each heading is a list of proficiencies that a competent apprentice should display.

Proficiency – Business Skills

- **Demonstrates an analytical and systematic approach to issue resolution.**
- **Takes the initiative in identifying and negotiating appropriate personal development opportunities.**
- **Demonstrates effective communication skills.**
- **Contributes fully to the work of teams.**
- **Plans, schedules and monitors own work (and that of others where applicable) competently within limited deadlines and according to relevant legislation, standards and procedures.**
- **Appreciates the wider business context, and how their role relates to other roles and to the business of the employer of client.**

How has your apprentice demonstrated competence in these areas? (please give examples)
Karen Ching: Maruf is a team lead on a challenging and fast paced programme. He liases with different teams in the programme to ensure that the right process is followed, managing complex requirements and 100+ suppliers as part of the supply mapping programme. He is also responsible for a team of junior resources supporting their work and co-ordinating dependencies with other teams and project managers.

NOTE: this box will expand as required

Proficiency – Complexity

- **Performs a range of work, sometimes complex and non-routine, in a variety of environments.**
- **Applies methodical approaches to issue definition and resolution.**
- **Undertakes all work in accordance with agreed safety, technical and quality standards, using appropriate methods and tools.**

How has your apprentice demonstrated competence in this area? (please give examples)

Karen Ching:Maruf is working on a challenging programme with complex and fast chaging environment. Requirements are often changing and Maruf is adapting quickly and ensuring good practice is followed witin his team

NOTE: this box will expand as required

Proficiency – Autonomy

- **Works under general direction.**
- **Uses discretion in identifying and responding to complex issues and assignments.**
- **Usually receives specific instructions and has work reviewed at frequent milestones.**
- **Determines when issues should be escalated to a higher level.**

How has your apprentice demonstrated competence in this area? (please give examples)

Karen Ching: As a team leader, Maruf not only manages his own work but also work of others. Working as part of a wider programme but able to work autonomously.

NOTE: this box will expand as required

Proficiency – Influence

- **Interacts with and influences colleagues.**
- **Has working level contact with customers, suppliers and partners.**
- **May supervise others or make decisions which impact the work assigned to individuals or phases of projects.**
- **Makes decisions which influence the success of projects and team objectives.**

How has your apprentice demonstrated competence in this area? (please give examples)

Karen Ching:In his role as team lead, Maruf is contributing to the wider programme team and influences the work of other on multiple levels. He is able to provide suggestions and recommendations on how work and structure could be improved both internally and for the client

NOTE: this box will expand as required

Overall Impressions and Constructive Feedback

This section is an opportunity for you to provide written feedback outside the rigid competency structure.

It is a free text field to allow you to share general thoughts on the apprentice's performance in case you were unable to say everything you wanted to say using the structured template.

For example, you may want to highlight some of the areas where you have not been able to give the apprentice the exposure they would have liked.

We would welcome any general constructive development advice you may wish to give.

Karen Ching:Maruf is very proactive and is a keen team player putting himself forward to support his team and other individuals whenever he has capacity. Taking responsibility for his actions, makes sure that outcomes are achieved and things get done. Has good stakeholder management skills, definitely a team player and a valuable member of the team. He has been given his team lead role as he has demonstrated to be trustworthy and reliable member of the programme.

NOTE: this box will expand as required

Please accept our sincere thanks for the support that you have provided to your apprentice.