

Applying SFIA framework in ITI Mobile Application Development Track: Case Study

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Abstract— As a leading institute in the human capacity building and development, Information Technology Institute (ITI) has witnessed the evolving challenges of training and employment for its aspiring interns. One of the major challenges is providing the IT market with the right candidate that is empowered with the market's set of skills. On one hand, Information Technology Institute provides the employers with the potential candidates throughout its professional 9-months professional diploma Knowledge Transfer Program (KTP) program that targets different market job profiles. On the other hand, SFIA (Skills Framework for the Information Age) provides a common language to communicate the value and relevance of a course to a target job profile. Hence, this case study has created a platform to make use of this advantage for the gap analysis and recommendation on the current ITI tracks towards better matching with the target job profiles.

This platform has helped us to identify the gaps in one of the existing ITI training tracks to better fit with the market.

Keywords— SFIA; ITI; Job skills, Skills management, Job profile, Capacity building.

I. INTRODUCTION

INFORMATION Technology Institute is a pioneering national institute that provides a large pool of promising youth with world-class training programs and empirical learning approach to support the IT professional workplace with potential calibers. The ITI's headquarter is located in the hub of Egypt's Technology Park "Smart Village", with branches in 4 governorates (Alexandria, Assiut, Ismailia & Mansoura), more than 1000 students across 23 tracks in 13 departments distributed on the 5 sites, with over 80% ITI graduate employment rate.

Since it was founded, ITI had the privilege to observe the power of bright minds empowered with "A class" hands-on human capacity building programs, accompanied by the charm of technology, creating the perfect equation for discovery, innovation and change-making thus paving the way to ICT aspiring pioneers. [1-4]

Information Technology Institute "9-Month Professional Diploma" is one of the recognized training programs in the Information and Communication Technologies' sector.

Over a quarter-century, the program accepted the brilliant graduates from the Egyptian universities to empower their

academic skills towards professional and innovative leaps in their practical life, locally, regionally, and worldwide.

Various worldwide ranked universities acknowledged the full-time 9-Month Professional Diploma as a 120-Credit-Hours Diploma, as it delivers wide spectrum of technical and interpersonal skills. Those universities accept the 9-Month Postgraduate Diploma as equivalent credit hours in their Master Programs.

Mobile Applications Developer track offers an extraordinary learning experience, giving the students the chance to gain experience in developing applications for mobiles from different categories and with different platforms and operating systems. More than 46% of the track focus on making a standalone mobile application on feature phones or smart phones and deliver them on diverse operating systems like android, iOS and BlackBerry BB10, and how can we use Java Enterprise Edition (JEE) API's to integrate with custom made web applications and Enterprise applications.

An Intensive soft skills package is also delivered so that graduates can understand how to manage projects and build teams. [5-8]

Information on current market employment requirements are provided in order to match target job profile for ITI graduates, we provide the background information for the current employment requirements for the ITI graduates to match the target job profile, in the next section we will describe the problem definition, followed by the case study and the built SFIA platform, and discussing the results and conclusion.

II. WHY SFIA?

SFIA is a framework of professional skills needed by IT professionals. It can underpin and enhance all your people management activities. SFIA is simple and practical frame of work developed by people experienced in the management of skills in IT, SFIA tells you what you need to know and leaves it at that. It is designed as a resource for people who understand IT and know what they are doing. SFIA fits in with our way of doing things. Of course there are other frameworks, usually aimed at specific areas of IT and often going into a lot of detail. SFIA is the general-purpose framework that covers the whole of IT.

Because we have stayed true to this simple approach SFIA has become successful around the world. It has become a de

facto standard. SFIA has over 2,500 corporate users in 195 countries. These companies employ over 25 million people. IT User organizations form the greater part of our users. SFIA helps them have the right skilled people in the right place at the right time [9-10].

But many types of organization involved in the general business of skills management are also users of SFIA. SFIA is used in many contexts, acting as a unifying influence for the way skills are viewed in education, employment in all sectors, professional bodies, awarding bodies and training companies [12-13].

III. PROBLEMS STATEMENT

As different IT organizations use SFIA [1] to improve their people management processes and to help solve critical business problems affecting their people. SFIA can support people management processes such as organization and role design, training and development, career development, workforce planning, recruitment and performance management.

Typical business problems helped by using SFIA are IT out-sourcing, mergers and acquisitions, transformations of IT organizations and talent management in IT organizations.

In the same time, ITI needs to ensure that each given course is relevant to the skills that will be expected of graduates when they are in subsequent employment lay the foundations that enable graduates subsequently to develop those skills.

Also it needs to start the skills development process and communicate the value of the course to potential employers, so that they can understand the capability of graduates; this includes communicating to potential applicants the usefulness and relevance of the qualification and communicating the value of the qualification to potential employers of people having that qualification. [2-4]

IV. SIMILAR/PREVIOUS WORK

A. University of Tasmania (UTAS), Australia:

University of Tasmania as a case applying SFIA in educational IT universities in the year 2013, they had a unique case in which they applied the ACS process to design an ICT curriculum.

This curriculum meant to illustrate to employees the capabilities of graduates and give evidence to applicants that course relates to the advertised career outcomes relevant to the local and national ICT industry and also the necessary SFIA skill sets 27 potential careers were used to lead to a new developed curriculum focusing on and identifying both the skills required for the attainment of these career graduates beside all the identified skills were put against the responsibility level needed in each to determine the level which the skill could be enhanced in the set curriculum.

Reaching the final step aimed to have a curriculum and course structure that would assume that the university's graduates have the relevant skills at the time they look for employment. So finally they succeeded to conduct a curriculum that develops the identified skill sets within a

reduced number of units.

B. Southampton Solent University, England and the b.i.b. International College, Germany:

Another case study conducted as a joint project designed to enhance the employability of students from Southampton Solent University and the b.i.b. International College through work-based learning, industry-focused activities and transnational collaboration ^[6]. The case study aimed to make students more aware of what employers expect and SFIA were used as one of the main drivers for identifying professional IT skills. This done by understanding the employment market while defining specific skill sets associated with potential graduates which is reflected in courses in higher education.

V. ITI-SFIA CASE STUDY

A. Rationale

ITI needs to ensure that each given course is relevant to the skills that will be expected of graduates when they are in subsequent employment lay the foundations that enable graduates subsequently to develop those skills.

B. Process

A skill framework is designed and developed for ITI - Mobile Applications Developer track to apply SFIA level 4; the following steps are followed to create this framework; awareness phase, matching phase, scope phase and gap analysis phase.

1. Awareness phase

This first step in the case study which aims to give common understanding of the SFIA framework across all ITI departments and tracks. To achieve this we have conducted different approaches have been conducted including group orientation sessions, focus groups sessions and one-to-one with some persons.

The orientation sessions provide bi-directional communications and include open questions and feedback collection.

2. Matching phase

After completing the awareness phase, the next step was to go to the matching phase which aims to pick three tracks out of twenty seven running tracks in the ITI 9-month Professional Diploma. To do this matching we have three steps; skill classifications, courses' skills breakdown and creating the platform.

The skill classifications have been the most important steps where we picked the relevant skills to the selected three tracks; eLearning, embedded systems and mobile application developer tracks. The relevancy here is identified based on the target job profile for each one of these tracks.

Each conducted course in these tracks is split into different skills where the students acquire by studying this course. Once this step was completed, the required skills for each target job profile and the breakdown of each course are fed into our platform so it can be used in the next application step.

3. Scope phase

In this phase we have selected one track from our three tracks to apply the SFIA framework using the built framework, the selected track was the Mobile Application Developer (MAD) track considering the high market demand on this job profile. We used this to do the gap analysis as in the next phase of the case study. Table 1 : Course versus skills in MAD track shows the different courses in mobile applications developer track against the skill sets for each of these courses.

Table 1 Course versus skills in MAD track

| Ser | Course Code | Course Name | SFIA | | | | | | | | | | | | | | | | |
|-----|----------------|--|----------------------|------|------|-----------------|---|------|------|------|------|------|--------------------|------|------|--|--|--|---|
| | | | Information strategy | | | Business change | Solution development and implementation | | | | | | Service management | | | | | | |
| | | | RSCH | EMRG | METL | BUAN | DESN | DBDS | PROG | UNAN | HCEV | PORT | RELM | SYSP | PRMG | | | | |
| 1 | ESS/OSF/100 | Operating Systems Fundamentals | ✓ | | | | | | | | | | | | | | | | |
| 2 | ESS/DBF/100 | Database Fundamentals | ✓ | | | | | ✓ | | | | | | | | | | | |
| 3 | ESS/ONF/100 | Computer Networks Fundamentals | ✓ | | | | | | | | | | | | | | | | |
| 4 | ESS/CP/200 | C Programming Language | ✓ | | | | | | | ✓ | | | | | | | | | |
| 5 | ESS/OOP/PP/300 | Object-Oriented Programming Using C++ | ✓ | | | | | | | ✓ | | | | | | | | | |
| 6 | ESS/DSA/300 | Data Structures and Algorithms | ✓ | | | | | | | ✓ | | | | | | | | | |
| 7 | ESS/INT/100 | Introduction to Web Technologies | ✓ | | | | | | | ✓ | ✓ | ✓ | | | | | | | |
| 8 | ESS/SWE/100 | Introduction to Software Engineering | ✓ | | | | ✓ | ✓ | | | | | | | | | | | |
| 9 | JD/AFX/400 | Advanced GUI using JavaFX | ✓ | | | | | | | ✓ | ✓ | | | | | | | | |
| 10 | JD/PSW/200 | Advanced Java Programming and Swing Components | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |
| 11 | JD/SRV/SP/500 | Advanced Servlets & JSP | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |
| 12 | JD/API/XML/300 | API for XML Processing Using Java | ✓ | ✓ | | | | | | | | | | | | | | | ✓ |
| 13 | JD/AJAX/500 | Asynchronous JavaScript & XML(AJAX) | ✓ | | | | | | | ✓ | ✓ | | | | | | | | |
| 14 | MD/DMA/200 | Designing Mobile Applications | ✓ | | ✓ | | | | | | ✓ | ✓ | | | | | | | |
| 15 | JD/DHOS/300 | Developing Applications for iOS | ✓ | | ✓ | | | | | ✓ | ✓ | | | | | | | | |
| 16 | JD/SWIFT/400 | Developing Applications for iOS using Swift | ✓ | | ✓ | | | | | ✓ | ✓ | | | | | | | | |
| 17 | JD/AND/400 | Developing Mobile Applications for Android | ✓ | | | | | | | ✓ | ✓ | | | | | | | | |
| 18 | MM/ILL/100 | Adobe Illustrator Basics | ✓ | | | | | | | | | ✓ | | | | | | | |
| 19 | JD/SRV/SP/400 | Developing Web Applications using Servlets & JSP | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |
| 20 | MM/INTM/100 | Introduction to Multimedia | ✓ | | | | | | | | ✓ | | | | | | | | |
| 21 | MM/INTD/100 | Introduction to Design | ✓ | | | | | | | | ✓ | ✓ | | | | | | | |
| 22 | JD/HB/400 | Introduction to Hibernate | ✓ | | | | | | | | | | ✓ | | | | | | |
| 23 | ERP/OSQL/200 | Introduction to Oracle SQL and PL/SQL | ✓ | | | | | | | ✓ | | | | | | | | | ✓ |
| 24 | JD/XML/100 | Introduction to XML | ✓ | | ✓ | | | | | | | | | | | | | | |
| 25 | JD/DP/300 | Java Design Patterns | ✓ | | ✓ | | | | | | ✓ | | | | | | | | |
| 26 | JD/PI/100 | Java Programming | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 27 | JD/WS/700 | Java Web Services | ✓ | | | | | | | | | | | | | | | | |
| 28 | SD/SDHTML/200 | JavaScript & Dynamic HTML | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 29 | JD/OB/C/200 | Objective C | ✓ | | | | | | | | | | | | | | | | |
| 30 | SWE/UML/200 | Object-Oriented Analysis & Design using UML | ✓ | | | | ✓ | | | | | ✓ | ✓ | | | | | | ✓ |
| 31 | ESS/LIOS/200 | Linux Operating System | ✓ | | | | | | | | | | | | | | | | |
| 32 | JD/RMI/300 | Remote Method Invocation (RMI) | ✓ | | ✓ | | | | | | | | | | | | | | ✓ |
| 33 | MD/UX/200 | User Experience Design (UX) | ✓ | | | | | | | | | ✓ | ✓ | | | | | | |
| 34 | JD/TIT/200 | Developing Mobile Applications using Appcelerator Titanium | ✓ | | | | | | | | | | ✓ | | | | | | |

4. SFIA Skills Levels For ITI- Mobile Applications Developer track:

The ITI- SFIA case study focused on catching- as much as possible SFIA level 4 for all skills and by going practically in the pilot track we found there are core courses which may have level 4 as a target and another group of courses act as complimentary target (assigned to be SFIA Skills level 3). The next table summarizes the SFIA levels allocations for the ITI pilot track

Table 2 SFIA Skills Levels For ITI- MAD track

| SFIA Skills Levels For ITI- Mobile Apps Dev. Track | | | |
|--|---|------|---|
| SFIA Skills Levels | Information strategy | RSCH | 4 |
| | | EMRG | 4 |
| | | METL | 4 |
| | Business change | BUAN | 3 |
| | Solution development and implementation | DESN | 4 |
| | | DBDS | 4 |
| | | PROG | 4 |
| | | UNAN | 3 |
| | | HCEV | 3 |
| | Service management | PORT | 4 |
| RELM | | 3 | |
| SYSP | | 3 | |
| PBMG | | 4 | |

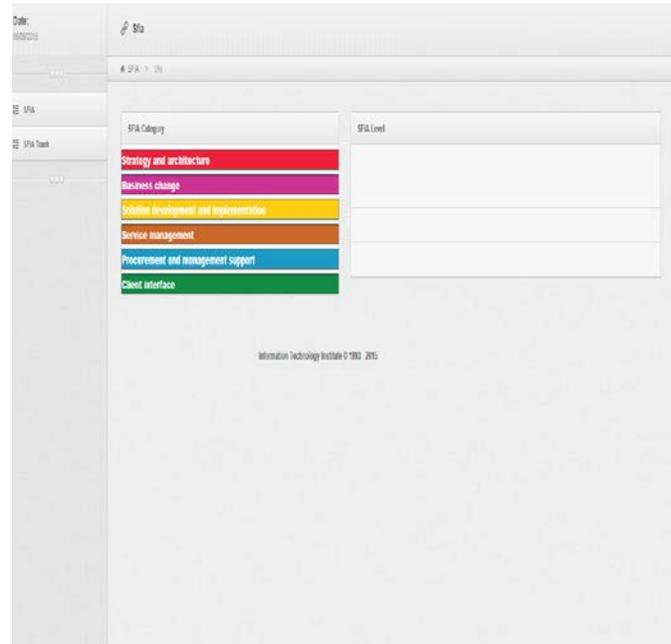


Fig. 2 ITI platform for SFIA framework

5. ITI SFIA Platform

The platform is built dynamically to allow the easy manipulation and mapping between the different SFIA skills and courses in different tracks.

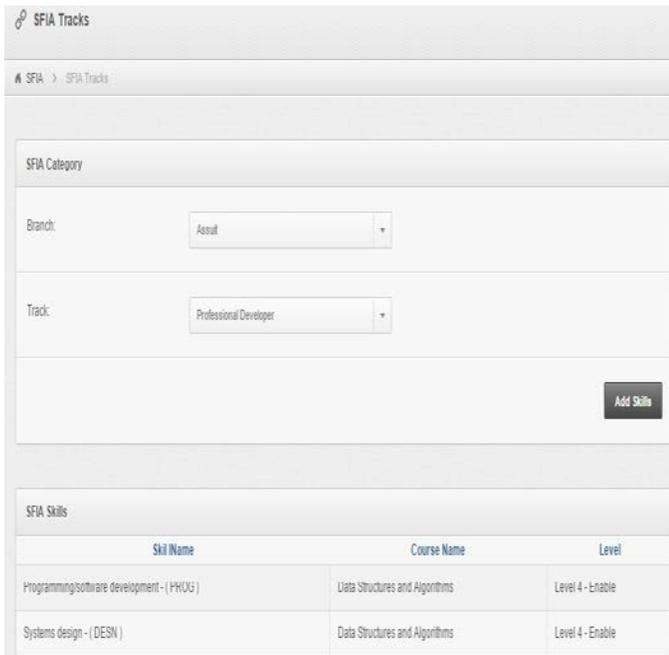


Fig. 1: ITI platform for SFIA framework

The system is designed with simple interface that enables different track managers to define the courses and select the corresponding SFIA skills. It also helps the managers to understand each skill against its level so they can pick the proper required skill. In Fig. We can see the platform interface.

6. Gap Analysis

The gap analysis of the selected track contains two aspects; the courses that do not fit with the SFIA skills or the SFIA skills that do not match any course in this track. The importance of this step is to give us an idea about the gap between the target job profile of this track (i.e. MAD) and the required job profile skill set to cover the missing areas.

Table 3 SFIA skills versus MAD courses

| SFIA | Skill | Course Code | Set | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------|-----------------------|-----|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | |
| Information strategy | RSCH | OS | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EMRG | Database Fundamentals | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | METL | Computer Network | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Business change | BUAN | C Programming Lin | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DESN | Object-Oriented Pr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Solution development and implementation | DBDS | Data Structures and | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PROG | Introduction to Web | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | UNAN | Introduction to Soft | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HCEV | Advanced Java Prog | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PORT | Advanced Servlets | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Service management | RELM | API for XML Proce | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SYSP | Asynchronous Java | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PBMG | Designing Mobile | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Some of track courses that failed to follow in corresponding set of SFIA skills are identified; the reason behind this is

mostly the conflict of the selected SFIA level and the target job profile assumption. One of the goals of this case study research is to give the proper recommendations on the required skill sets and therefore the required courses for each track.

VI. CONCLUSION AND FUTURE WORK

By applying SFIA skills framework in the MAD track, we targeted to be SFIA skills level four (The MAD track matched 13 SFIA skills and finally we got 8 skills level 4 and 5 skills level 3). We have ensured that each given course is relevant to the skills that will be expected from the graduates in that department in which the employer can work in developing them according to the job profile requirements that match these skills. This also provides evidence that the qualifications are related to IT industry in a practical way.

The future work includes expansion of the application of this framework to other ITI departments/tracks and follows up with the execution results over years to ensure the benefits from that framework over the long run.

ACKNOWLEDGMENT

We would like to express our appreciation and gratitude to those who have generously contributed to the work presented in this Case Study. Special mention goes to Dr. Rada Hussein, Chairman Assistant for Research & Innovation for her inspiring efforts bringing up the SFIA Initiative into life. Moreover, many thanks go to Eng. Sherif Sharaf, Professional Training Program Manager for his tremendous support, and Eng. Asmaa Ezzat, JETS Director, especially for sharing his taxonomic expertise so willingly.

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