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## KATA PENGANTAR

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Buku Prosiding ini berisi sekumpulan *Paper* dari hasil penelitian ilmiah yang telah diseleksi, untuk dipresentasikan dalam kegiatan Seminar Nasional dan Konferensi Sistem Informasi, Teknik Informatika, dan Komunikasi (SEMMAU) tahun 2017 dan bertempat di *Ballroom* Swiss Belinn Kristal Hotel Kupang Nusa Tenggara Timur pada tanggal 25 November 2017, kegiatan ini diikuti oleh peserta pemakalah yang berasal dari berbagai perguruan tinggi yang tersebar di kawasan Nusa Tenggara Timur (NTT), maupun di luar NTT, yang terdiri dari 26 makalah dari para peserta pemakalah.

Seminar Nasional yang bertemakan "*E-BUSSINES* SEBAGAI DAYA DUKUNG INDUSTRI KREATIF" ini menghadirkan pembicara utama berkelas nasional yakni Prof. Dr. Ir. Eko Sediyono, M. Kom.

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Kupang, November 2017

Panitia,

Sumarlin

# DAFTAR ISI

# FUTURE COMPUTING PROFESSION

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**Abstrak**

*It is now become public knowledge that, the evolution of the Information Communication and Technology (ICT)has been an integral and important part of the human life. The ICT brings people closer, more qualities in the services, and the availability means for satisfying the human needs. Furthermore, it creates a new culture and norms into the society. Every effort, which is built toward the new technologies and systems have to be for the welfare of the human actuality.*

*The ICT and systems are enabling us to monitor things closely by using Radio Frequency Identification (RFID), Global Positioning System (GPS), Close Circuit TV (CCTV), Internet of Things, Big Data, Business Intelligent (BI), and Video Conferencing (VC). The social networks such as Facebook, Skype, IBM Connections and Domino Sametime, twitter, Bebo, Hang-out, and much more to come. These all are developed and created in which allowing users (community) to be flexible in communicating and collaborating with their respected team, partners, and groups. The ultimate aim is to be more productive and have good life time.*

*The mobility and flexibility of users' within time and location constraint will be no longer an issue. They are able to attend the meetings, sharing and collaborating knowledge, and learning and working; these all can be done virtually. Moreover, businesses are able to deploy virtual team for specific projects, to deliver goods and services within Supply Change Management (SCM)which focusing on Just In Time (JIT), able to do market segmentation, business meetings without have to travel to the destination or venue. The technologies and systems are enabling doctors to identify diseases and do proper diagnostics, surgeries, and therapies. The intelligent machines are created for helping human being in accuracy, fast calculation, and solutions.*

*The creativity of human being in the sector of ICT brings new challenges for computing profession. The computing profession knowledge become overloaded and obsoleted very quickly. The computer profession has to be prepared to enter new era of information revolution whereas to create new field of jobs and businesses, in meantime the creation of robots may replace human and employees may challenge with losing jobs.*

***Key Words:*** *monitored, knowledge obsoleted and overloaded, information revolution, new culture and norms, computing profession*

## 1. INTRODUCTION

### 1.1 Background

We are currently in the middle of technology revolution; information communication and technology and its system grows in every hour's evenevery second around the globe. Human are so creative and innovative to develop new technology and system for the sake of the society. Moreover, we are informed of the birth of new technology. This technology industry revolution has covered many sectors.

According MCafee (2015),the USA president candidate, internet security expert, and founder of MCafee Anti-Virus most recently has releasednew productcalled 'Everykey'. It is a revolution key for accessing your things with one single tool.

According to Wieser(1991) idea, 'machines that fit the human environment, instead of forcing humans to enter theirs' has become a reality. Mobile computing becomes more relevant tothe human environment. The mobility creates new environment which is virtual. This virtual possibility enables experts to share their knowledge, expertise, and skills without reallocation.

The IBM Watson is built for answering human questions (Markoff, J., 2011). Moreover, technology is enabling long distance relationshipvirtually.

Moving forward there is a debate about whether machines will eliminate the need for human employment is no longer just an academic. According to Boston Consulting Group prediction by 2025, up to a quarter of jobs will be replaced by either smart software or robots, while a study from Oxford University has suggested that 35% of existing UK jobs are at risk of automation in the next 20 years.

The Information Technology is a multi-disciplinary area of the knowledge. It is being used widelyacross sectors, such as public and private. We can emphasize them deeplythat, it is being used in agriculture, government and non-government, education and culture, tourism, telecommunication, transportation, economic and finance, weather prediction, chemical and non-chemical industries,

health, and etc.Therefore, each of the knowledge area will be always tied to the evolution of the information and the technologies. A newlycreated system, application, and technology should be complying with ethical, professional, health, safety, and environment. The central idea is bringing a technology and system more user friendly by satisfying, answering enquiries,and fulfilling the human need and requirements.

As computing professionals, we have to accept that, we should continually studyand do more researchesand also to be the focal point of this industry revolution and evolution. All computing professionals, scientists, and researchers have tried to give their best answers to the needs and to the requirements of the society however, this sectormaybe will continue to improve or may be will change in the following years? Who knows?

### 1.2 Formulation of the Problem

How senior high school or university graduates decide entering the new high education or simple decide entering professional certification skill courses?

### 1.3 Research Objectives

To develop several strategic answers for computing professionals

To disseminate an newly information on future of computer professional

### 1.4 Some new Technology Approaches

There is a several design and implementation of technology that currently and will happen in near future. We can list some of them which are certainly have impacted to human work force and computer professional fields. The power of Internet of Things (IoT) may help to improve the work live balance capability, e.g. have long distance relationship,the "JUNO". Partners that are not living in the same living room will still able to feel get feels from his or her respective partners. JUNO can transmit his respective partner feels and protect private zone to have each other. The essential part of this technology is a privacy and work live balance. Please find below tools for a long distance relationship.

Figure 1: Juno

It has been started that robots already replace several human works such as replacing backup tapes, routing human tasks (receptionist, updates calendars), and etc.

Figure 2: Robotics work Force

The robot is doing an agenda briefing for the CEO's.

Figure 2: Robot agenda briefing

The professional remote works are performing tasks without need a relocation process.

Figure 3: Virtual Workers

Everykey is a bluetooth device that replaces your keys and passwords. Everykey unlocks your phone, laptop, tablet, house door, car door, and other access-controlled devices when you are nearby, then locks them back down when you are walking away.

Everykey also generates secure passwords for your website accounts, then automatically logs you in when you visit a website. If you lose your Everykey, you can remotely *freeze it*, so no one else can use it.

Figure 4: Every Key

### 1.5 Software professional Certification requirement as follows

#### 1.5.1 Software Requirements

Software requirements engineering are the process of determining what is to be produced in the software systems. These have the widely recognized goal of determining the needs for, and the intended external behavior, of the system designs.


Figure 5: Software Development certifications

#### 1.5.2 Software Design

Software designs are the process of defining the architectures, components, interfaces and other characteristics of the systems. Essentially, software designs are the software life cycle activity in which parameters outlined and defined in the Requirements processes are translated into a description of a software system's internal structure which can then be used as a basis for construction.

#### 1.5.3 Software Construction

Software construction combines coding, verification, unit and integration testing, and

debugging to build the working software described in the software design process.

### 1.5.4 Software Testing

Software testing dynamically verifies that a program behaves as expected on a finite set of test cases selected from an infinite domain of execution possibilities. Testing confirms that the requirements were achievable, that the design was buildable, and that the construction has been successful.

## 2. RESEARCH METHODOLOGY

According to Institute of Electrical and Electronics Engineers (IEEE) a computer professional can be formed by using below diagram:

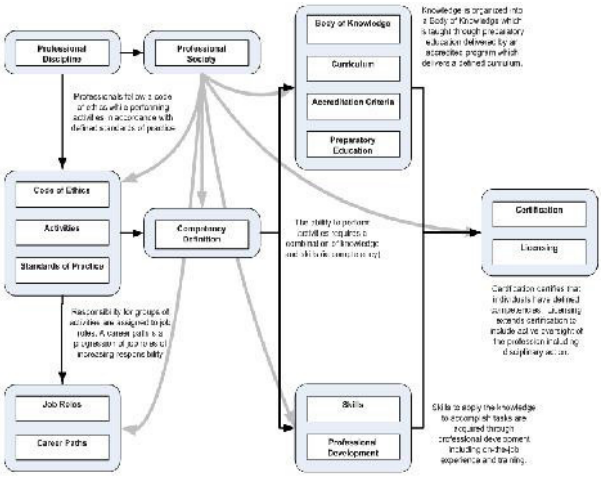


Figure 7: IEEE professional framework

Above diagram shows how computing professional upgrade their knowledge according to the need and requirements in the appropriate field. Otherwise knowledge will become obsulated, overloaded, and might not be used.

Furthermore, I define a simple framework for the computing professional as an approach to build a relevant knowledge capabilities and skills within computer profession domain and within the demand of the financing for the investment. This can allow who ever enter to a computing professional field will able to determine a viable judgments their return on investment (ROI) on the knowledge and skills.There are three main approaches after students are graduated from high school and universities.

First, apply to universities for attending normal classes. Secondly attend formal certifications and professional licensing courses and exams agents or institution. Thirdly, during and after universities education still need a professional licensing which will be professional certifications.

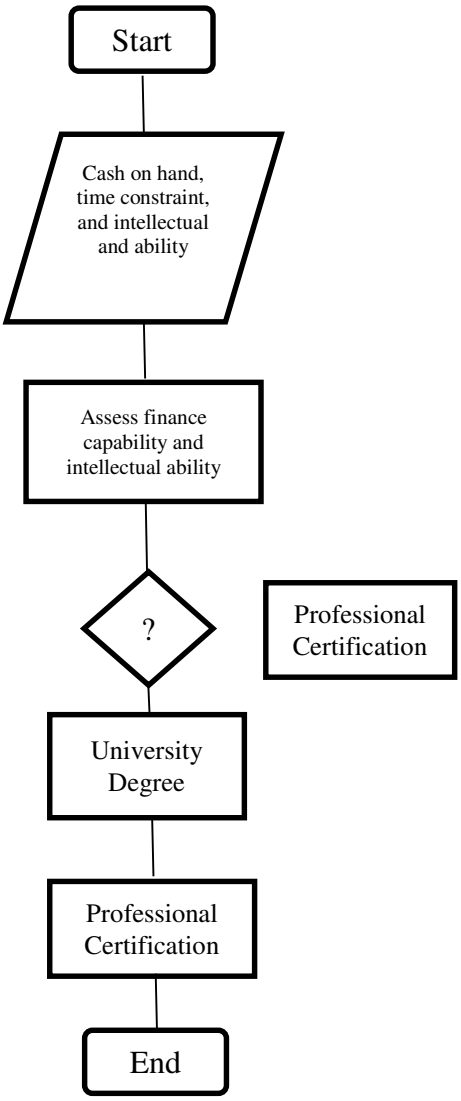


Figure 8: RB framework

## 3. INFORMATION COMMUNICATION TECHNOLOGY (ICT) PROFESSIONAL JOB'S TITLES IN THE MARKET

There are more than 50 job titles are globally available and can be applied differently to the industrial sectors and institutions, either in private and public sectors or both. It depends on each sectors needs and requirements. The effective ratio of having computing professional in their organizations is 1:15. This means 1 computing professional can effectively serve 15 employees in the institution. This computing professional can be deployed internally or outsourcing. There are several studies have been done toward the ratio. According to computer economics (August 2016) stated that *Help Desk Staffing Steady over Time*. The ratio will vary by organization size and sectors, however, below graph provides some illustration after did an assessment of the overall help desk staffing trend.

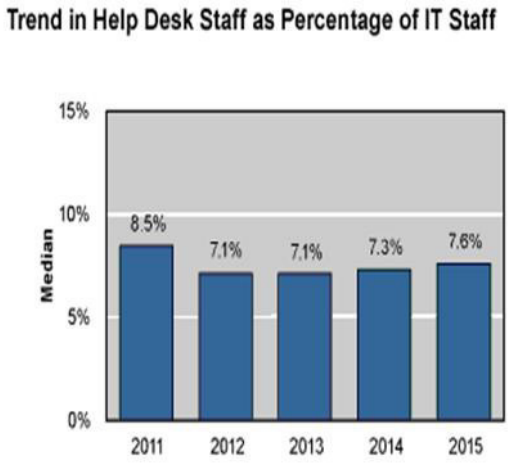


Figure 9: Source Computer Economic 2016

Usually Help Desk staff resolves 50%-85% incidents at 1st Level on call bases. Moreover, other incidents will be registered and assigned to the 2nd and 3rd Level.
There are 14 key of IT jobs function that each organization has to have. They are:

| | |
|---|---|
| • Help Desk<br>• Desktop Support<br>• Network Support<br>• Server Support<br>• ERP Support<br>• Database Administration (DBA)<br>• Data Management | • Application Development and Maintenance<br>• Business Analyst<br>• IT Quality Assurance and Testing<br>• Web/E-Commerce<br>• Project Management<br>• IT Security<br>• IT Management |

In some cases the IT staff has multi-function. For instance, Help desk staff does desktop support function or even does Network support function. In the professional manner, each function has to fill up with one specific profession.

### 3.1 List of I.T. Job Titles:

| | |
|---|---|
| • Applications Engineer<br>• Information Technology Director<br>• Information Technology Manager<br>• Management Information Systems Director<br>• Network Architect<br>• Network Engineer<br>• Network System Administrator<br>• Programmer<br>• Programmer Analyst<br>• Security Specialist<br>• Senior Applications Engineer<br>• Senior Database Administrator<br>• Senior Network Architect<br>• Senior Network Engineer<br>• Senior Network System Administrator<br>• Senior Programmer<br>• Senior Programmer Analyst<br>• Senior Security Specialist<br>• Senior Software Engineer<br>• Business Analyst (BA) | • Senior BA<br>• Junior BA<br>• IT Project Manager<br>• Web Developer<br>• Webmaster<br>• Web Administrator<br>• Senior Support Specialist<br>• Senior System Administrator<br>• Senior System Analyst<br>• Senior System Architect<br>• Senior System Designer<br>• Help Desk Technician<br>• Chief Technology Officer<br>• Chief Information Officer<br>• Computer and Information Systems Manager<br>• Database Administrator<br>• Senior Systems Analyst<br>• Senior Systems Software Engineer<br>• Senior Web Administrator<br>• Senior Web Developer<br>• Software Engineer<br>• Software Quality Assurance Analyst<br>• Support Specialist<br>• System Administrator<br>• System Analyst<br>• System Architect<br>• System Designer<br>• Systems Analyst<br>• Systems Software Engineer<br>• Technical Specialist<br>• Telecommunications Specialist<br>• Etc. |

How these job titles above can be filled? In my own opinion, these job titles can be filled by professionals who as higher education in information and technology plus experiences and skills in the field, who attends specific course, exam, and certified and also globally recognize and comply such as ITPM, Cisco CCNA, IBM Notes,Risk Management, Quality Management, etc.

## 4. SOME FUTURE COMPUTING PROFESSION PERSPECTIVE

The information revolution has come as primary needs of the society; nowadays without assessing information a person will be isolated. In

other hand information becomes an expensive and only available for those who have money. The distribution of the information is still not fully reach out to the indigenous people in the remote locations. As computing profession has to think how to bring technology and information that is fitted to indigenous people. For instance, develop graphic interface, screen touch technology, voice recognize tools, etc.

**4.1 In 10 years' Time**:

I assume that in 10years' time, the computing professional figures will change dramatically;however, the natural of the information revolution will be continuously exist and actual situation will be improving and more close the nature. I think, thebiggest revolution and evolution will be on total integration of the cloud computing inside the organizations. *"Cloud computing is internet-based computing inwhich the cloud is really an arena for sharing,"* (Pitta, D.A., 2011).Therefore, computing professional has to be ready to develop and implement these systems. Additionally, the computing professional has to know how to protect them.

The computing professional skills that should have and ready are computerprogramming, computer security,big data, information overloaded, knowledge overloaded, information and knowledge strategy, knowledge collaboration, profile centric, and networking. In other end, the hardware devices evolution has to think about the environmental impact. The Green IT is become a popular in last few years back and will continue to do so. *"Companies in the 21st century accept and acknowledge their responsibility in protecting the environment,"*(Berthon, P. at all, 2010).

**4.2 In 25 years**:

In the middle term, we can now see the evolution of maximizing internet protocol. One of example is VoIP (Voice over Internet Protocol). *"The evolution of this technology, an organization can gain a great financial benefit over traditional telephony system,"* (Ismail, M.N., 2010).Moreover,the evolution of the Internet Protocol (IP) is IPv6 comparison to the IPv4; this will be improving amechanism for assuring a secure and confidential transfer bits or packagesofthe information among users and their electrical devices. For instance transfer data packages from cars to palm devices, from computing devices to mobile devices, etc. In this case, computing professional should prepare to answer company necessities such as 'Bring Your Own Device' (BYOD) demands which help companies or organizations will have less infrastructure investment.However, companies have to invest human resource capacity in order to develop an open standard and cross plat form application whereas to be compatible with the variety of the electronic devices. The computer professional fields that need to be ready are programming, computing security expert, business analysts, project management,help desk supports, and networking skills.

Moreover, during this period of time, the computing profession prediction will be more focusing on the 'Infrastructure as a Service' (IaaS) and Software as a Service (SaaS). The **IaaS** is a standardized infrastructure, highly automated offering, where compute resources, complemented by storage and networking capabilities are owned and hosted by a service provider and offered to customer's on-demand.

According to Gartner, "*customers are able to self-provision this infrastructure, using a Web-based graphical user interface that serves as an IT operations management console for the overall environment. API access to the infrastructure may also be offered as an option"*.

Gartner defines *"**SaaS** as software that is owned, delivered and managed remotely by one or more providers. The provider delivers software based on one set of common code and data definitions that is consumed in a one-to-many model by all contracted customers at any-time on a pay-for-use basis or as a subscription based on use metrics"*.

**4.3 In 50 years**:

In next 50 years, the computing future will be more complicated to predict. In my own opinion,there will be more innovation on the integration plat forms and open standard, artificial intelligent, archiving, business intelligent, more analytical apps, and more focusing automation process. For instant IBM current develop 'Watson', more technology and science on health improvements, etc.

Alan Turing may consider as the father of the modern Artificial Intelligence (AI).0 years. Dr.Turing started to ask himself. Could machine think as human? Could machines reply human questions? In order to answer at these questions, dr. Turing proposed a test called 'Turing Test', in which is used to understand, if those machines are intelligent or not and he concluded with this statement:

"*We can only see a short distance ahead, but, we can see plenty there that needs to be done*", (Turing A.M., 1950).

"*And he also predicted that by the year 2000machines would have a 30% chance of passing a five minutes Turing Test*", (Brookshear, 2010:508)

Although, today Turing prediction still not respected fully, however, in next 50 years these machines will

able to think. There are several research current runs to improve Watson from IBM. If I will be still alive in 2063, I will be a witness of this success. Additionally, computing technology is to greater extent and improves society life.

## 5. SEVERAL CONCLUSIONS

As computing professionals, we have to be ready engaging technology that has beendeveloped and design new capable system to accommodate society requirements.

The future computing profession will be similar as it is today however there would be a new additional field and functions. There would be no major changes in this field of the profession. More computing profession becomesa good CEOs and leadership because they had multidisciplinary background knowledge and experiences.

There would be lot of developers whereas to develop the databases or information systems databases will be not as difficult as it is today and it maybejust using drag and drop tools. Or the developer found the smarter application databases that can adjust and adapt to any needs.

In the schools will be starting to use a computers, let say starts from elementary to senior high in order to entertain their interactive learning process and as part of the curriculum too. It would be possible also to implement the on-line study forelementary schools. The youth under care and travel can also continue their learning process from anywhere while accompany the live sessions from classes.

Today, green environment campaign also triggers to have a paperless at schools, offices, and etc. Therefore, in coming future from 10 to 50 years there would be no more paper foundin the schools, shops, home, and offices; all are in digitals. The trend is mobility. A lot palm devices will be producing with interactive applications in which to use on time decision making processes their business, connect from anywhere and anytime, and easy to operate.

The cloud computing and internet communication are also helps a lot for the new running enterprise business because this new entrepreneurs do not need to invest in Information Technology Infrastructure. They can just started with their own mobiles and connect to cloud computers in which all data are being processed. Moreover, there will be lot of integrate system such IaaS and SaaS, to accommodate the data centers, archiving system, cross plat forms, open standard, workflow, and social networking capabilities.

Most importantly, the ethical computing and professional are still in needs because it is dealing with the copyright, trade-marks, privacy, data security, and freedom of speech.

Other aspectsof the technology need to be constantly increased the awareness's are the cultures.The culture will be quite different because people are going to use toconnect, communicate, coordinate, and collaborate (4Cs) and there will be no clear boardersare defined.Internet connection will be everywhere. Anyone can interact or communicate with everyone-else without have a precondition. The Video conferences can be available from palm to palm or mobility (Cars, mobiles), from a fix phone terminal to other fix phone terminals; from mobility to video conference tools, etc. This will be allow other professional can be interact quick decision making process. For example, hearth disease patient need to establish a quick communication with his or her Cardiology Doctor whilehe or sheis on trips in order to have adoctor. prescription, Auto drive cars, etc.

Howabout language in computing profession? I think English still a preferable language for the information and technology and however there would be an adaptation to the original mother tongue, acronyms, and slogans.

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