BACHELOR OF SCIENCE IN COMPUTER SCIENCE

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IS 335 ASSIGNMENT 01

QN: 01. Explain why professional software that is developed for a customer is not simply the programs that have been developed and delivered.

Answer; because;

Software engineering is intended to support professional software development rather than individual programming. It includes techniques that support program specification, design, and evolution, none of which are normally relevant for personal software development.

When it comes to software engineering, software is not just the programs themselves but also all associated documentation, libraries, support web-sites, and configuration data that are needed to make these programs useful. A professionally developed software system is often more than a single program.

For example; a system may consist of several separate programs and configuration files that are used to set up these programs. It may include system documentation, which describes the structure of the system, user documentation, which explains how to use the system, and websites for users to download recent product information.

QN: 02. Briefly discuss why it is usually cheaper in the long run to use software engineering methods and techniques for software systems.

Answer

Because; Failure to use software engineering methods leads to higher costs for testing, quality assurance, and long-term maintenance. Since, software engineers tend to adopt a systematic and organized approach to their work, as this is often the most effective way to produce high-quality software.

However, engineering is all about selecting the most appropriate method for a set of circumstances, so a more creative, less formal approach to development may be the right one for some

kinds of software. For example; a more flexible software process that accommodates rapid change is particularly appropriate for the development of interactive web-based systems and mobile apps, which require a blend of software and graphical design skills.

QN: 03. Software engineering is not only concerned with issues like system heterogeneity, business and social change, trust, and security, but also with ethical issues affecting the domain. Give some examples of ethical issues that have an impact on the software engineering domain.

Answer;

The following are ethical issues that an impact on the software engineering domain, the software engineer should observe;

1. **Confidentiality;** The software engineer should normally respect the confidentiality of his or her employers or clients regardless of whether or not a formal confidentiality agreement has been signed.
2. **Competence;** The software engineer should not misrepresent his or her level of competence. He or she should not knowingly accept work that is outside his or her competence.
3. **Intellectual property rights**; The software engineer should be aware of local laws governing the use of intellectual property such as patents and copyright. He or she should be careful to ensure that the intellectual property of employers and clients is protected
4. **Computer misuse**; the software engineer should not use his or her technical skills to misuse other people's computers. Computer misuse ranges from relatively trivial to extremely serious.

QN: 04. Based on your own knowledge of some of the application types discussed in Section 1.1.2, explain, with examples, why different application types require specialized software engineering techniques to support their design and development.

Answer;

Different application types require specialized software engineering techniques to support their design and development because of the following reasons;

1. **Costs and frequency of change**. Some systems such as embedded systems in consumer devices are extremely expensive to change; others must change frequently in response to changing

requirements e.g. business systems. Systems which are very expensive to change need extensive upfront analysis to ensure that the requirements are consistent and extensive validation to ensure that the system meets its specification. This is not cost effective for systems that change very rapidly.

2. **The most important 'non-functional' requirements**. Different systems have different priorities for non-functional requirements. For example, a real time control system in an aircraft has safety as its principal priority; an interactive game has responsiveness and usability as its priority. The techniques used to achieve safety are not required for interactive gaming; the extensive UI design required for games is not needed in safety critical control systems.
3. **The software lifetime and delivery schedule**. Some software systems have a relatively short life time, others have a lifetime of ten of years. Some systems have to be delivered quickly if they are to be useful. The techniques used to develop short lifetime, rapid delivery systems e.g. use of scripting languages and prototyping are inappropriate for long lifetime systems which require techniques that allow for long term support such as design modeling.

QN: 05. Explain how electronic connectivity between various development teams can support software engineering activities.

Answer;

Having different electronic connectivity between various development teams can support software engineering because it allows teams in different geographic locations and still code the same project in real time and host meetings.

QN: 06. Noncertified individuals are still allowed to practice software engineering. Discuss some of the possible drawbacks of this.

Answer;

The possible drawbacks include;

1. Could lead to conflicting ideas about security and development processes.
2. Since most of the non certified individuals are not aware of the code of ethics, they could easily violate the code of ethics which as a result could lead to legal problems in the company.

QN: 07. For each of the clauses in the ACM/IEEE Code of Ethics shown in Figure 1.4, propose an appropriate example that illustrates that clause.

Answer;

1. **Public**- A developer should not build a system that collects and sells users data without their knowledge.
2. **Client and employer** – Developers should build a system that works efficiently and is easily maintainable by developers that come behind them. For example ARIS is a system developed by Dr. Lungo at COICT but it is maintained by Mr. Rashid Bakari and Mr. Mbele of the ICT department of UDSM.
3. **Product** – Developers should constantly update their knowledge on what the current standards are. For example; there has been updates on Instagram from its first version, it now allows multiple video calls and you can send a voice note to another user.
4. **Judgment** – The developer should not compromise his or her morals to develop a system. For example, WhatsApp does compromise its morals since it does not allow downloading one's status and profile picture.
5. **Management** – Managers should only ask developers to build systems that they know are legal and ethical.
6. **Profession** – While developing, if a developer has an idea that would help a framework build better systems, they should propose that change/update to the team that maintains the framework.
7. **Colleagues** – a developer shouldn't withhold information from his or her team just so that they can be the best developer on the team.
8. **Self** – Developers should stay up to date with the latest frameworks and security practices

QN: 10. The "Drone Revolution" is currently being debated and discussed all over the world. Drones are unmanned flying machines that are built and equipped with various kinds of software systems that allow them to see, hear, and act. Discuss some of the societal challenges of building such kinds of systems.

Answer;

Societal challenges of building drones;

1. Can be used to facilitate terrorist activities.
2. Can be used by thieves and robbers in their activities.
3. Allows other people to intrude on other people's privacy and spy on them.

QN:11. Describe at least one custom made software in Tanzania, including the customer and contractor.

Answer;

1. **Fix Chap Fundi**

   It is a portal for managing services requests. It is a digital platform (web app) through which clients can book repair requests and get connected instantly verified handymen within their locations. Handymen are sourced from the vocational training institutions; these have centers countrywide with networks of trained youths.

   This enables home owners and office owners to be attended by competent people who can handle well these repair tasks.

   Customer; anyone who requires repairing services at home or in the office such as door fixing, air conditioner fixing, satellite decoder or a leaking tap.

   Contractor; FIXCHAP company limited located at Kinondoni Dar-es salaam, Tanzania.

   Founded; Feb 7, 2018 it's an active application.

2. **Ajira Forum**

   Is an android application, that has advertisements on job opportunities offers. It gives new job/employment opportunities, scholarship. Tender, education and academic news, interview tips and samples.

   Customers; mostly are university graduates, anyone looking for a job opportunity and tenders and students searching for scholarships on different levels.

   Contractor; Bekaboy

   Founded; march 27, 2018.

3. **Millard Ayo app**

   Is a mobile application, which gives news of the ongoing issues in the nation to the users. It gives all breaking news at an appropriate time and notification of the latest news.

Customer; all people who listen to news.

Contractor; Millard Ayo

Founded; July 19, 2017

QN:12. Describe at least one software that has had huge impact in Tanzania's societies, communities, industries, academia, or government.

Answer;

1. **Zoom Tanzania**

   Is an application that connects you with buyers and sellers in Tanzania. You can search to find electronics, clothes, you can post an ad and it's a data saving application.

   This software, has huge impacts in Tanzania's economy since it acts as online market, hence contributes to the nation's economy.

2. **ITV Tanzania Live**

   Is an application that that enables a Tanzanians worldwide to watch live ITV Tanzania and Capital Tv channel full news together with watching other television shows. This application has brought the media service close to the society, giving them updates of what going on in the country socially, politically, economically and even in sports. It also contributes to the nation's economy.

3. **Nida Tanzania**

   Is an application owned by the president's office under the national identification card department. Due to high population, the application aims to help Tanzanians get their identifications cards while online instead of directly going to Nida's offices. This has helped both the government and citizens by easing the provision of this service.

4. **Dalali App TZ**

   Is a platform which helps to simplify the real state the real estate business management processes. Through this app, customers can receive the response of their submitted order through application and can directly interact with property owners or brokers.

It allows to specify a house or plot you want and directly speak to the property owner or dalali to close the deal. Property owners or Dalali do respond to orders and list new houses every day, every hour.

REFERENCES

- Software engineering 10th edition by Ian Sommerville.