Hochschule Karlsruhe Technik und Wirtschaft

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Alina Jaud Karlsruhe, April 26, 2019

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1 Introduction and goals

At one point of every students life, they have to make the decision about the specialization of their education. This decision is mostly due when applying for a course at a higher educational insitute.

1.1 NYP information technology courses

Nanyang Polytechnic (NYP) is a polytechnic located in Ang Mo Kio, Singapore. The school offers post-secondary education for students who successfully passed the GCE O-Level examination. The O-Level examination is an annually examination mainly for students who have visited a secondary school. [3]

It allows the students to take courses either on a junior college, a technical institute or a polytechnic. In Singapore, a polytechnic offers students a more practical and industry based education than a junior college which has a more fundamental approach. In general, students study 3 years at a polytechnic until they get their diploma. After getting a diploma, students can continue their education at a university but they can also start to work in the industry. [1]

NYP offers a wide range of courses in different fields. One of the fields is information technology (IT). This work will focus on the courses offered at the School of Information Technology, an institute of NYP. In the following the courses will be introduced briefly: [2]

Information Technology   This course offers students a broad range of the different fields in information technology. It focuses on an interdisciplinary education. By finishing the course, students are prepared to work in different areas, most commonly in software engineering. During the first year, the fundamental topics of information technology are educated. The second year deepens the knowledge in application programming, database management, software engineering, algorithms and several other topics. The third year will be for specialization. The students can choose elective courses in the fields of artificial intelligence, enterprise cloud computing, geospatial and mobile innovation and cybersecurity. As in all courses offered at the school of information technology, there is one practical industry project and an internship in the third year as well.

Infocomm and Security   This course covers topics in IT infrastructure, network engineering and security and the internet of things (IoT). Students learn how to program, but also how to secure applications in a connected environment. They also learn about managing connected infrastructures. During the first year there are basic classes in developing and infocomm to get a grounded knowledge in information technology. The second year will deepen the knowledge of network engineering, programming, and IT service management. There will be a practical IoT project for the students as well. In the third year there will be several elective courses in the areas of system and network security, enterprise infrastructure and infocomm solutions.

Cybersecurity and Digital Forensics   The cybersecurity and digital forensic course focuses on IT security. This includes securing systems and data for unauthorized access as well as tracing criminals in case a security incident happened. After graduating, students can work as security analysts, network penetration tester, security engineer and similar jobs. During the first year students learn fundamental IT skills. The second year offers classes in forensics, network security, operating systems, security standards and more. Students will also complete an applications security and an infosecurity project. The last year offers specialization in the topics cybersecurity track and cyber forensics track. It is possible to choose crossdisciplinary classes from other IT courses.

Business Intelligence and Analytics   The business intelligence and analytics course teaches analytics and interpretation of massive amounts of data. Therefore big data technologies, as well as artificiall intelligence is needed. After graduating, it is possible to work as a data or business analyst, a social media strategist or a digital marketing executive. During the first year student will gain basic IT and business statistic knowledge. The second year offers classes in big data management, digital marketing, predictive modelling and similar topics. Students participate on a big data and a business analytics project. During the third year, students will do a data science project and can choose between several elective classes.

Business and Financial Technology   This course focuses on information technology in the financial and business sector. After getting a diploma, students can work as IT or financial consultants, financial application specialists or business and financial analysts. From the beginning the focus lies on connecting business and financial topics with information technology. Therefore, in the first year students learn about economics, accounting and consumer banking as well as about basic programming skills. During the second year this knowledge is deepened through classes like software engineering or financial management. Besides the elective classes, the industry project and internship, students in the third year also collaborate in a fintech innovation project.

2 Design

2.1 Target group

2.2 Main story concept

To gain the users attention and let them grow interest in the application it is important to have a good main story. The main story will create a bridge between the several IT courses displayed in the application.

The application will start in the so called "Smart City". This is a futuristic urban environment in which the user can move around freely.There are five different buildings along the streets. Each building is interactive and represents a course offered by the NYP. By interacting with the buildings the user can enter laboratories, so called "labs", and complete different tasks. Every successful completion of a task has an impact to the main story.

The main goal of the VR application is to create a delivery drone which will deliver orders from online shops, just like Amazon announced in a video of 2013 (source). This is still a vision of future for now, but it is a good showcase for the user to show them how they can impact the future with IT. During the completion of the labs several challenges will occur. Once the user started programming their first drone, a lot more drones will start flying around in Smart City. To avoid crashing and chaos, the next task is to provide a proper and stable internet connection to the drones, so they can communicate. But the connected drones have their advantages and disadvantages: At first they are flying normally and communicating to each other but then an unknown IoT-Hacker infiltrates a virus into the drone firmware, so they start to misbehave. Now the user has to trace the hacker with basic cyber security concepts. After the hacker was found, more and more inhabitants of Smart City start to use the drones and provide a lot of data. It is now the job of the user to analyse this data and optimise the drones.

Bibliography

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