Homework 1

ICT for Industrial Applications

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Introduction

The homework consists in analyzing the business model for a specific application scenario. The analysis needs to cover the following aspects:

1. **Overall Value Proposition:** Define the unique value your chosen ICT application provides to its users and stakeholders. Consider what makes it indispensable or superior to alternative solutions. How does it solve a specific problem or improve efficiency, productivity, or connectivity within its industrial setting?
2. **Involved Technologies:** Detail the key technologies that enable your ICT application. Explain how these technologies are utilized within the application and their role in delivering the value proposition. Include any innovative or advanced technological aspects that set the application apart from others.
3. **Strategic Partners:** Identify potential or necessary strategic partners involved in the ecosystem of your ICT application. Explain the roles of these partners, including suppliers, distributors, technology providers, or other alliances, and how their collaboration contributes to the application's success.
4. **Revenue Sources:** Outline the primary revenue sources for your ICT application. Consider diverse revenue streams such as direct sales, subscription models, licensing fees, advertising, or any other relevant mechanisms. Discuss how these revenue sources align with the value proposition and market strategy.
5. **Costs:** Analyze the major cost factors associated with developing, deploying, and maintaining your ICT application. This could include technology development costs, operational expenses, marketing, partner agreements, and any other significant expenditures. Reflect on how these costs impact the overall business model and its financial sustainability.
6. **Key Activities:** Describe the key activities necessary to create, deliver, and sustain the value proposition of your ICT application. This may encompass technology development, market analysis, continuous innovation, customer support, and partnerships management, among others.

Your analysis should be comprehensive, demonstrating a deep understanding of the business model components and their interrelations. Provide concrete examples or hypothetical scenarios to illustrate your points when necessary. Ensure clarity and coherence in your writing. The analysis should be accessible to someone with a general understanding of business models in ICT for industrial applications.

The expected deliverable consists in a technical report of no more than 10 pages. You can organize it as you believe better, **but a good option is to have a section for each of the activities listed above.** Each section must report the name of a team member that takes the responsibility for that section.

Target scenarios

1. *Internet of Things for motion-impaired people*

The market is flourishing with Internet of Things (IoT) devices of different kinds that can realize a variety of home automation. Most of these applications are intended to support people in their daily activities or make living environments more comfortable, secure, and energy efficient. At the same time, these technologies can be very supportive to people in need of assistance for impairments depending on age, disabilities, or other problems. The purpose of the project is to investigate the possible utilization of IoT and 5G systems in the context of home-assisted living, with a particular focus on the support of people with motion impairments (e.g., in wheelchairs).

2. *Design of a Wireless Birdsong Recorder for Cloud-Based Processing and Identification*

The goal of this project is to design a robust, energy-efficient birdsong recorder capable of capturing high-quality audio recordings in wild environments and transmitting these recordings wirelessly to a cloud-based center. This center will process the recordings for bird species identification. You can consider combining devices already available in the market, or designing new ones. A careful analysis of the technical application requirements is needed, also including energy consumption aspects. The final goal is to design a self-sustainable, place-&-play device that can operate in different environments.

3. *Smarterization of a Professional Kitchen*

This project focuses on transforming a traditional professional kitchen into a "smart" kitchen equipped with Internet of Things (IoT) technologies. The aim is to enhance efficiency, safety, sustainability, and food quality through automation and data analytics. Students have to propose and design an integrated system of smart devices and applications, addressing specific needs within the professional kitchen environment.

4. *Touristic path planning*

Currently, navigator services typically support different types of mobility (car, public, walk) and preference options (fastest, shortest, avoid toll). However, when walking, these navigators may suggest paths that are inconvenient from a perceptual perspective, driving you through very noisy roads, or neighborhoods, or areas where a person may feel unsafe, particularly at dark. The objective is to design a navigation service tailored for pedestrians who wish to reach their destination safely and enjoyably. The service should offer routes that not only avoid potentially unsafe areas and minimize exposure to unpleasant urban elements (e.g., noise, pollution) but also highlight scenic and touristic value where feasible, without causing unreasonable detours.

5. *Environmental monitoring of datacenters for predictive maintenance*

Develop a comprehensive Internet of Things (IoT) system that continuously monitors various environmental parameters and power consumption within a data center. The system should collect data on noise levels, temperature, humidity, airflow, and particulate matter levels, alongside power usage metrics. The primary goal is to create a detailed mapping of the data

center's operational environment and energy consumption patterns, allowing for the identification of inefficiencies, potential problems, and opportunities for optimization.