Project IWork

Visual Representation of System Architecture

1. About us
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2. Introduction
   The purpose of this document is to provide the specifications of our solution to address the theme of Microsoft Imagine Cup 2009 “Imagine the world where technology helps solve the toughest problems facing us today”. To address this theme, we propose a solution that aims at Goal 1 Eradicate Extreme Poverty and Hunger in the United Nations’ Millennium Development Goals, in particular, the two targets in this goal, which are Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day and Achieve full and productive employment and decent work for all, including women and young people.

   Our solution is known as Instant Work, or IWork in short, that is designed to ease the unemployment problems currently facing developing countries. The IWork allows facilitating communication between Job seekers and Job providers. In fact, most of the IWork transaction from initiation to completion will be SMS-based and automatic. Job seekers register their skills related information to the system and receive job vacancies accordingly. Job providers message their employee requests and receive employment vacancies accordingly. Alternatively, IWork also allows users to access via website that covers all the functions. IWork is built using latest Microsoft technologies such as Silverlight 3.0 and .NET Framework 3.5.

3. Problem Definition
   In order to address Goal 1 in the United Nations’ Millennium Development Goals, we have analyzed unemployment problem in developing countries. In fact, the trend of urbanization in developing countries has been soared rapidly nowadays. People in rural areas move away the poverty, drought, crop losses, war, etc, happening in their hometowns. They look for brighter future in places where there have higher demands, higher opportunities in term of job seeking. However, urbanization leads to the overpopulation crisis in cities and potential places where are supposed to bring fortune but eventually, it is a result of job seeking becoming competitive. There is far more people than jobs.
Some of them are looking for jobs with handy skills or physical competencies rather than specialists and fully training skills that vary from gardening, cleaning, cooking, plumbing, construction assistance, etc. Many of them are very skillful in particular job and/or multi jobs. However, they are migrants to a new place and hence they can be very limited in finding information relating to their jobs. Should there be some ways to help them find jobs?

Potential job providers are wealthy people living in big cities. Other potential job providers are people at middle level who are very busy with their jobs at companies. They are looking for skillful people with reasonable price to take care of their gardens, houses, kitchens. Should there be some ways to help them find employees?

There are some current solutions that help job seekers and job providers. However, there still has a gap between job seekers and job providers regarding their relationships. Job providers have found difficult to hire suitable employee in term of skill and moral. On the other hand, job seekers have found difficult to prove themselves especially for the first time. Moreover, many jobs are instant jobs because they are short time-based period and required unforeseen due to job providers’ requirements. Hence, regular job agencies have found very hard to satisfy to match jobs in this situation. Should there be ‘instant’ job agency to help solve this problem?

4. Our Solution – Instant Work (IWork Solution)

4.1 Solution statement

We believe Short Message Service (SMS) communication is the most appropriate answer. Recently, mobile phone usages and its SMS-function have obviously spread around the world (50% of the earth’s population owned mobile phone in 2008 – UN study). Mobile phone usages have become integrated into everyday lives of people including low-income people in developing countries. Even low-income people can afford to buy a phone with SMS-function built in and afford to pay the bill with limited SMS transactions every month.

The accompanying web-based solution beside SMS services has proved itself another popular means of communication. It is believed and reported that the number of internet services, cafes with reasonable charge have been emerging rapidly in cities at developing countries which serve a large number of low-income people. Hence, less-than-one-dollar-income people will be given opportunities to benefit from internet and internet services via website.

By above reasons, we chose to implement our solution consisting IWork SMS Application and IWork Web Site. The solution tried to take advantage of the popularity of two technologies mentioned above to the max.

IWork SMS Application supports most mobile phone available in the World. The subsystem helps matching job providers’ job offerings with appropriate job seekers. In order to do that, our solution
objective is to provide simplicity, user-centric, ease of use and cost saving in term of total number of
SMSs between transactions to perform a task, with additionally smart algorithms which attempts to
automatically select appropriate job seekers for particular jobs.

**IWork Web Site** is an additional feature for those who prefer the web. The subsystem makes used of the
latest technologies such as Silverlight 3.0 and WCF services provides various friendly and user-centric
tools. Performing tasks will never be more interesting to the web users using the web site thanks to
various abilities such as drag-and-drop, animations and effects.

### 4.2 System architecture

![System Architecture Diagram]

### 4.3 Design Rationale

**IWork SMS Application**: Microsoft SMS Server Toolkit was used to implement this subsystem. We are
using the recommended toolkit provided by Imagine Cup website because it supports our solution in
term of setting up an SMS server including a PC and a mobile installing Window Mobile 5.0 in order to
send and receive message from other mobiles. SMS Server Toolkit is a tool that runs well and stably as
well as nearly easy-to-use.

Other difficulty that emerged in our project at **IWork SMS Application** side is how to parse the received
messages. This kind of task seemed to be a task of natural language processing but certainly much
Our parser is a friendly and smart one and aims at the goal of understanding the sender SMSs. It tries to figure out the content of message and correct it even in the case of encountering incorrect structure messages. The final purpose is to help senders who have a low income save up their expenses.

Silverlight and WCF service: Silverlight brings opportunities for users taking its advantages that have never been used in previous web application. One of the advantages is drag and drop function which is typical but convenient in Window application. The reason why WCF web service is used in our solution is because that is the one of the few options for Silverlight to access to database.

In the project, both Web and Window applications, we also took advantages of great web services such as Microsoft MapPoint, Microsoft Virtual Earth to bring more functionalities and abilities for our solution. One of the most technical issues we had to encounter is how to combine, integrate and communicate between web and window application. However, by the careful and firm design structure as well as multi-thread programming technique, we passed over this issue.

### 4.4 Problem solution – with Scenarios

After analyzing the problems and possible solutions, we come up with **IWork solution** that will enable users to complete the following scenarios.

**Help function:** allow SMS users to understand and follow the SMS syntax when requesting for particular service from IWork  
**Availability:** IWork SMS Window Application  
**Scenario:**

Mrs. Anh is a new member of IWork system. She is looking for a cleaner but cannot remember how she can send a message to request services to IWork. However, she knows that she can ask IWork about the message syntax for all the services. She is starting to send ‘Help request services’ to IWork and immediately she receives a message including the format of Request service syntax which allows her to change some information inside and reply to IWork. She feels very happy because the syntax is common sense and she can always save this syntax into mobile memory for later use.

**Register membership:** allow user to register to be a member of the system.  
**Availability:** IWork Web Application  
**Scenario:**

Mrs Mary, an old lady, who is retired, wealthy and living in a big house with garden. She often hires a familiar gardener, however, she feels that the gardener works not as good as she is expected and wants to change a new employee. She has heard about IWork. She asks her nephew to register via IWork website. Within 5 minute, with a few clicks and answering a few questions on the screen, her nephew says he has successfully registered.

**Enter free time (availability):** allow job seeker registers their availability via website.  
**Availability:** IWork Web Application  
**Scenario:**
Mr. Andrei wants to register his availability with IWork. He is worrying because he is not familiar with using computer and typing onto the keyboard. He logs into the IWork website and clicks on Change My Availability. He has found easy while choosing available days. He only needs to use mouse with drag actions to choose, edit, delete days he wants on the screen. After finish choosing days he clicks on update availability button.

**Request and Reminder service**: allow job provider to offer job and receive suitable job seekers in term of their skill and availability

**Availability**: IWork SMS Window Application, IWork Web Application

**Scenario**:
Mrs. May is an old lady. She lives alone and she feels difficult in doing homework by her. She has been a familiar customer of IWork and even can request an employee via web and SMS by herself. She logs in under her account and starts to fill required information about job, number of employee, day, payment per hour, start time, duration. She is replied shortly the confirmation message that her request has been processed. After there has suitable employee, she is informed by IWork SMS service. IWork will also remind her before start day which she feels IWork is very friendly and informative.

**Give route instruction**: allow job seeker to find out how to go to job provider location.

**Availability**: IWork SMS Window Application, IWork Web Application

**Scenario**:
Mr. Andrei has a gardening job today. He is hurry going out of house before realizing that he has forgotten to bring the job provider’s address. He remembers that IWork has the route instruction service via SMS and Website. He then sends message to IWork to request map instruction and receives immediately the feedback. He is very satisfy with this instant service provide by IWork.

**Give weather forecast**: allow job seeker to view weather forecast at the hiring day which is restricted within 7 days from current day.

**Availability**: IWork SMS Window Application, IWork Web Application

**Scenarios**:
Mr. Andrei wants to know the weather for the job he is chosen in the next 2 days. He is worry because it has been raining heavily a couple of days and because his job is to do gardening. He then sends message to IWork to request weather forecast for his job and receives immediately the feedback. He is happy because the weather is fine on that day.

5. **Technologies**: