

ABSTRACT

Case-based reasoning applied to the real time control system, P.O. Box Automation System, is studied in this thesis. Case-based reasoning (CBR) is an alternative reasoning paradigm method that solves new problems by adapting previously successful solutions to similar problems. CBR makes direct use of the past experiences to solve a new problem by recognizing its similarity with a specific known problem and by applying its solution to find a solution for the current situation.

This CBR supported system assists the technical engineers with the system fault diagnosis and repair for the P.O. Box Automation System. The automation system monitors the mail boxes' status and provides an interface public to the owners for querying their mail status through public telephone.

The system consists of two parts: Detecting Module and Interactive Voice Response Module (IVR Module). Detecting Module takes the responsibility of controlling the box's detectors and collecting the mail status. IVR Module processes information about mail box status, collecting it from all post offices distributed in Macau, Taipa and Coloane, and providing an interface for inquiry service to the public.

In present application, the purpose of the CBR system is to assist technical engineers to maintain the automation system for the P.O. box. The whole automation system is cooperated by several modules. For the sake of this, several case libraries are developed for each of them. The cases are described with the help of the chosen important features of hardware configurations, and system behaviors, etc.

Keywords: Case-Based Reasoning, Nearest Neighbor, Induction, Decision Tree, P.O. Box Automation System, Interactive Voice Response (IVR), Incoming Call, Outgoing Call, Client/Server Architecture.