Integrating Medication and Health Monitoring Systems

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INTRODUCTION

Current health care providers (medical practitioners, insurance companies, pharmacies) have disjointed proprietary systems. This makes data sharing and collaboration very difficult. Furthermore, consumers (patients) have no abilities to interact directly with these systems. This chapter discusses an ecosystem for patient medication and health monitoring called the patient medication and health monitoring system (PMHMS). PMHMS proposes global and ongoing collaboration of data between the patient, various medical practitioners, and pharmacies. Existence of this ecosystem helps to enable some of the following scenarios:

- Medical practitioners can view the patient's current medication (from other medical practitioners as well) to ensure that the current prescription will not conflict with other medications.
- The medical practitioner's office can monitor if chronic patient is skipping medication (e.g., no refills ordered). The medical practitioner's office can also monitor patient's stats (patient uses PC to upload, for instance, blood sugar levels, blood pressure, and so forth).
- Pharmacies will be able to automatically send refills to patients.
- Patients can get a quick off-site consultation from the medical practitioner's office (using video conferencing to show some visual symptoms as needed by the medical practitioner)
- Patients get automated dosage reminders.

BACKGROUND

A consumer facing commerce model generally consists of the consumer, main and ancillary services, and a financial broker or approver. As an example, we look at some sample models. Figure 1 shows the constituents and associated transactions of a consumer electronics store, while Figure 2 shows the same for a travel agency. Both of these depict seamless end-consumer experience.

In comparison, Figure 3 shows an example model of today's health care systems. While this example is more relevant to certain geographies like North America and Europe, it does highlight the lack of integration in the health care system constituents. The PMHMS system is a sample implementation aiming to rectify some of these issues.

PATIENT MEDICATION AND HEALTH MONITORING SYSTEM (PMHMS)

Overview

PMHMS is an ecosystem for patient medication and health monitoring. There is global and ongoing collaboration of data between the patient, various medical practitioners, and pharmacies. Existence of this ecosystem helps to enable some of the following scenarios (for a complete list of PMHMS possibilities, see Use Cases in Figure 4):

- Medical practitioners can view the patient's current medication (from other medical practitioners as well) to ensure that the current prescription will not conflict with other medications.
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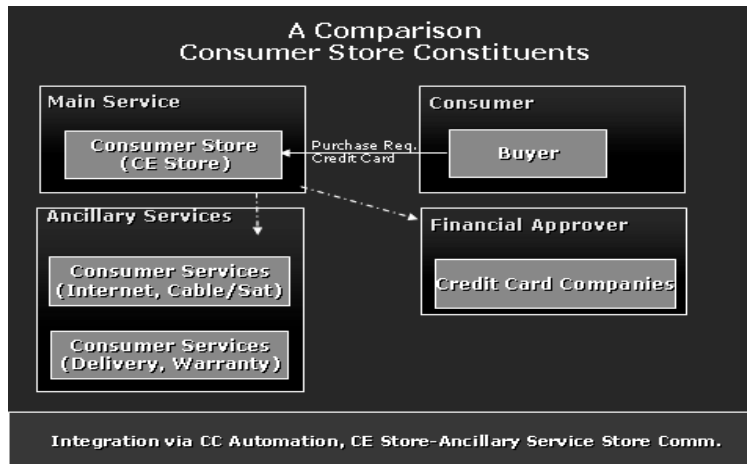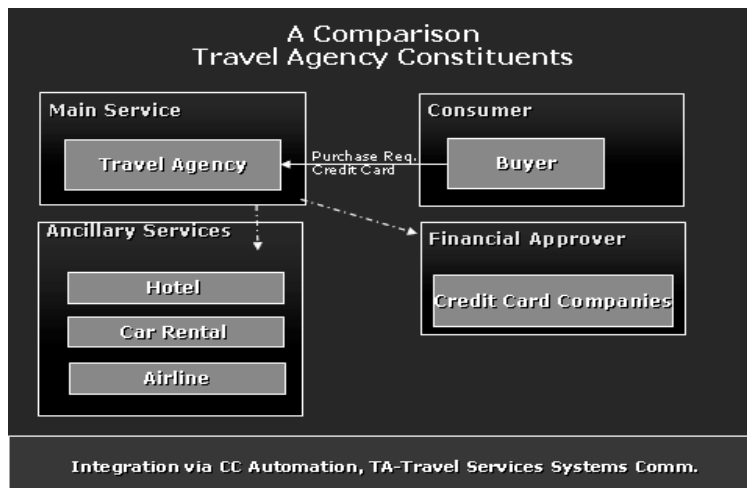*Figure 1. Consumer store economic model constituents*

Figure 2. Travel agency economic model constituents

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PMHMS Subsystems

PMHMS consists of the subsystems as shown in Figure 5.

Central Patient Repository (CPR)

CPR is a centrally available database of the medication history of the patient. (This repository also can be upgraded later to include a patient's medical records (e.g., previous diagnosis, X-ray scans, blood reports, etc.). CPR is run as a commercial service. Multiple vendors may be offering CPR services, and the insurance provider may choose to use its vendor of choice based on factors such as cost, features, security, and so forth. The system is built on an established set of open standards (e.g., HL7 [Std1]).

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