Web Application for the Management and Scheduling of Medication Delivery in Famisanar EPS

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***Abstract*—This document describes the contextual, organizational, and functional requirements engineering for the development of a web application to manage and schedule the delivery of medications within Famisanar EPS. The project aims to reduce congestion in physical pharmacies, improve patient satisfaction, and enable full digital integration between physicians, patients, pharmacies, and administrative systems.**

***Index Terms*—Health information systems, scheduling, medication delivery, Famisanar EPS, web development, Spring Boot.**

I. General Context of the Organization

A. Company Information

- **Name:** Famisanar EPS S.A.S.
- **Slogan:** "We care for you, because your health comes first."
- **Legal Name:** Health Promotion Entity Famisanar EPS S.A.S.
- **Economic Activity:** Provision of health insurance services and administration of healthcare benefits (appointments, authorizations, medication delivery, and associated services).

1) Mission: To provide quality health insurance services, promoting integral, accessible, and timely care for users, with a focus on prevention, treatment, and continuous improvement.

2) Vision: To be recognized as the leading EPS in Colombia for innovation in digital health services, patient-centered care, and efficiency in the delivery of medical and pharmaceutical services.

B. Company Objectives

- Ensure coverage and treatment continuity for members.
- Reduce physical congestion through scheduling and alternative delivery points.
- Implement integrations with Electronic Health Records (EHR) and pharmaceutical providers.

C. Company Goals

- Reduce pharmacy waiting time by 50% annually.
- Achieve electronic scheduling coverage for at least 80% of prescriptions within 12 months.
- Reach a user satisfaction score (NPS) $\geq$ +40 (above 85% satisfaction).
- Maintain system availability at 99.95% annually (SLA).

D. Company Policies

- Compliance with Colombian health regulations.
- Confidentiality and security of patient information.
- Quality, equitable, and timely user care.
- Digital transformation as a strategic axis.

E. Company Strategies

- Responsive web portal + mobile app for patients, and a clinical module for physicians.
- API integration with EHRs, pharmacy inventories, and logistics operators.
- Decentralized delivery points through operator partnerships (design must handle operator changes dynamically).
- Training programs for physicians and users on system usage.

F. Organizational Structure

- Board of Directors
- General Management
- Medical Directorate
- Administrative Directorate
- IT Directorate
- Development Team (Frontend, Backend, Integration)
- DevOps / Infrastructure
- Security and Compliance
- Pharmacies (Operations / Contracts)
- Customer Service (Call Center / Digital Channels)

G. Functional Structure

Processes are divided into:

- **Core Processes:** affiliation, prescription, verification/authorization, delivery scheduling, delivery/validation at the pharmacy, post-delivery follow-up.
- **Strategic Processes:** planning, alliance management with pharmacies, continuous improvement.
- **Support Processes:** IT, document management, legal/privacy, supplier management.
- **Control Processes:** auditing, SLA monitoring, information security.

Simplified Flow:

Physician → registers diagnosis and electronic prescription → system validates inventory and generates delivery options → patient receives options and schedules delivery → system confirms and generates antifraud code → pharmacy validates and delivers → satisfaction survey recorded.

II. Requirements Engineering

A. Functional Area Identification and Justification

Problem: Congestion at physical delivery points (long queues, failed collections) affects treatment adherence and satisfaction. A web system is needed for scheduling medication deliveries based on prescriptions issued by registered doctors, with stock verification and reporting capabilities. This aligns with Famisanar's goals of digital transformation and service decentralization.

Recent Context Impact: Contract transitions with pharmacy operators (e.g., termination with Colsubsidio) require dynamic updates of delivery points and routes without service downtime.

B. Process and Activity Characterization

1) Top-Down — Processes and Subprocesses: **Clinical Record**

- Physician authentication (MFA, roles).
- Diagnosis and e-prescription registration.
- Authorization request (if applicable).

Stock and Eligibility Validation

- Inventory query in associated pharmacies via APIs.
- Coverage/authorization validation.

Delivery Scheduling

- Generation of delivery point/time slot options based on stock and capacity.
- Display of alternatives (local pickup, home delivery, allied pharmacies).
- Confirmation and antifraud code generation.

Notifications and Reminders

- Initial notifications (SMS/Email/App).
- Reminders (24h, 2h before delivery).
- Incident notifications (stock shortage, location change).

Validation and Delivery

- QR/Code scanning for antifraud validation.
- Digital signature and delivery confirmation.

Reports and Monitoring

- KPIs: waiting time, deliveries per point, complaints, SLA compliance.
- Audit logs and access tracking.

2) Bottom-Up — Components and Data:

- Patient: id, document, contact info, prescription history, consents.
- Physician: id, credentials, specialty, authorization to prescribe.
- Prescription: id, medication(s), dosage, issue date, authorizations.
- Delivery Point/Operator: id, type, inventory, schedules, capacity.
- Appointment: id, patient, point, time slot, status, antifraud code.
- Delivery Transaction: id, appointment id, receiver, evidence, timestamp.

C. Information Requirements Analysis

- Diagnosis registration.
- Medical prescription management.
- Delivery scheduling.
- History consultation.
- Efficiency reporting.

D. Requirements Elicitation

1) Functional Requirements:

- RF1: Register medical diagnoses.
- RF2: Generate prescriptions and check availability.
- RF3: Patient selects delivery date and location.
- RF4: Automatic notifications.
- RF5: Delivery reports.

2) Non-Functional Requirements:

- RNF1: 24/7 availability.
- RNF2: Compliance with data protection laws.
- RNF3: Intuitive interface.
- RNF4: Scalability for up to 10,000 concurrent users.

3) Domain Requirements:

- Only authorized physicians can register diagnoses.
- Integration with a central medication database.
- Appointments with unique antifraud code.

4) User Requirements:

- Physicians: register diagnoses.
- Patients: consult and schedule deliveries.
- Administrators: view global reports.

5) System Requirements:

- Responsive web application using Bootstrap and Tailwind (HTML, CSS, Java).
- Email/SMS notifications via JavaMail API.
- Relational database in SQL integrated with Spring Boot.
- Backend implemented in Java with Object-Oriented Design.

E. Software Requirements Specification (SRS)

Actors: Physician, Patient, Administrator, Pharmacy/Operator, EHR System. **Scope:** Digital management of prescriptions and medication delivery scheduling with antifraud confirmation and full traceability. **Constraints:** Compliance with Colombian health and data protection laws (Law 1581/2012). **Assumptions:** Users have internet access; pharmacy operators expose APIs or CSV/FTP interfaces.

MoSCoW Prioritization:

- **Must:** Prescription registration, delivery scheduling, notifications, antifraud validation, security.
- **Should:** EHR integration, dashboards, dynamic multi-operator support.
- **Could:** UX personalization, home delivery integration.
- **Won't:** IoT device integration at delivery points (for now).

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