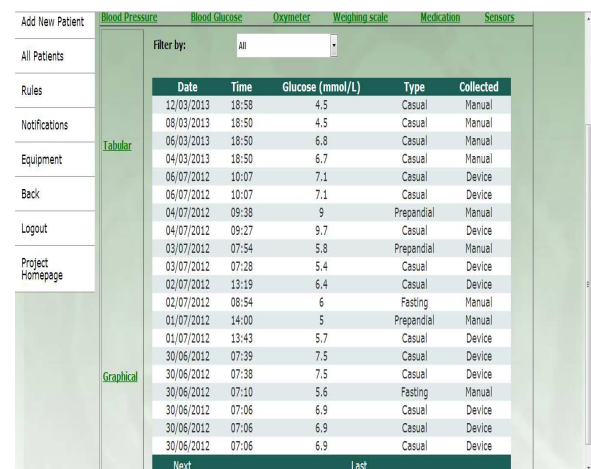# LinkWatch™ Care Portal

## An Integrated Care Management Solution for Primary and Social Care w. Patient Access to Data and Care Plan

The LinkWatch Care Portal provides access to Telemonitoring data and health management for professional carers and patients through dedicated interfaces.

It provides an integrated backend repository for health and social data collected automatically by the LinkWatch Patient Front-end with optional manual entry of physiological data and questionnaires.

The LinkWatch **Clinical Portal** provides access for professional carers to all patient data with various data management and analysis tools as well as management of care plans:

- Data analysis (above/below thresholds, patterns, visualisation) with risk assessment
- Data collection by questionnaires about diet, physical activity and medication compliance and with textual summary generation
- Administrative functions (user management, equipment management etc.)
- Definition of patients care plans and personalized user settings
- Integration of data from various external repositories such as EPR systems
- Advanced alert handling and notifications (alerts, reminders, sms)

The LinkWatch **Patient Portal** provides access for patients and relatives to their own data as well as information about care plan and recommended medical information.

- Patients can view graphical trend and tabular data
- Patients can view their own care plan
- Patients can view educational material recommended by the healthcare professionals
- Decision support for patients (e.g. improved lifestyle advice, recommended educational resources)
- Video conferencing capabilities

linkwatch

# LinkWatch™ Care Portal
## System Architecture

The **System Architecture** is shown in the figure below.

The central data repository is a SQL database specially designed to contain measured data, questionnaires, medical advice and all data management information used in the Data Management subset, the Patient Portal and the Clinical Portal.
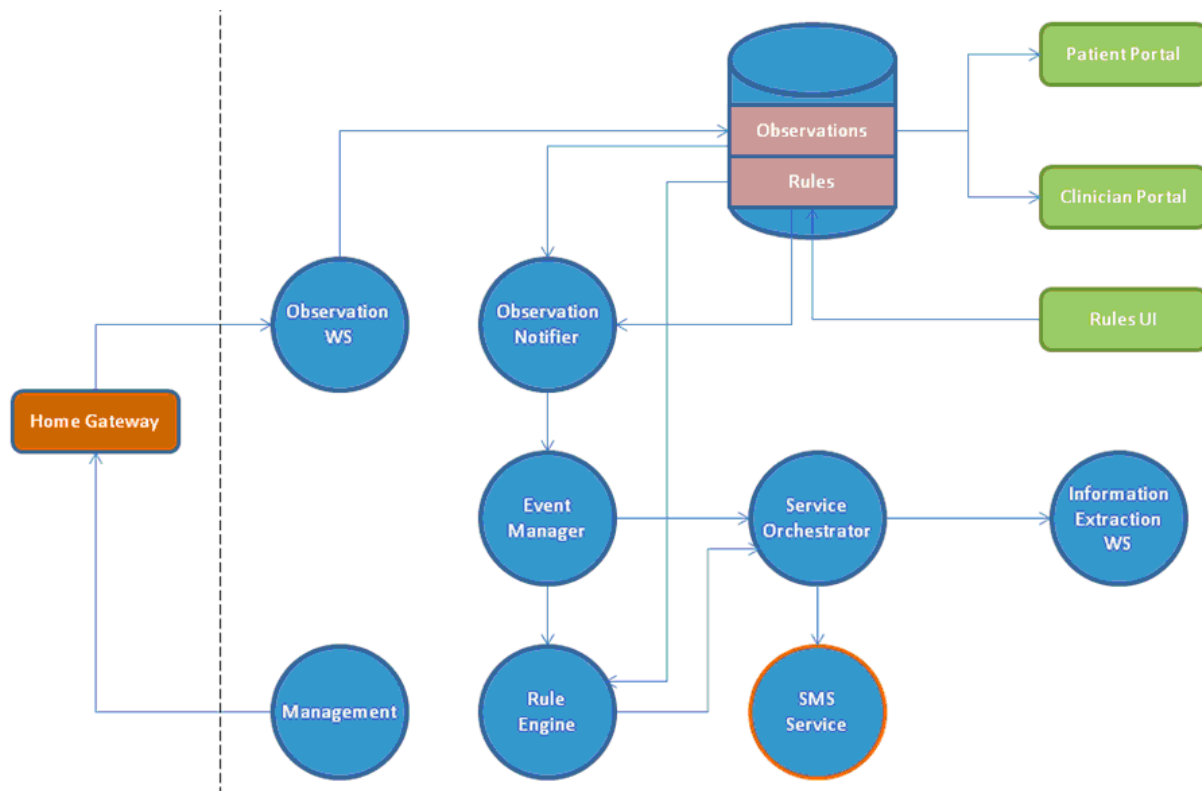


The Interface to the LinkWatch Patient Front-end (Home Gateway) consists of a management service and the **Observation WS** (web service). The Observation WS is the backend component that receives the physiological data of the patient collected by the LinkWatch Patient Front-end in the patient's home. All data communication with devices is based on Continua© standards.

All data transfers to and from the various nodes are driven by the service-oriented architecture, core service functionalities, data manipulation, and data fusion and event handling inside the Data Management subset. All communication with external repositories is based on HL7 / XML standards.

The high-level functioning of applications and services are governed by the Data Management subsets: **Event Manager**, **Rule Engine**, **Service Orchestration Manager** and **Observation Notifier**.

# LinkWatch™ Care Portal
## Data Management Structure

The **Event Manager** is responsible for providing publish/subscribe functionality to the LinkWatch Care Portal. Publish/subscribe communication provides an application-level selected multicast that decouples senders' and receivers' in time and space.

The **Rule Engine** is responsible for managing and executing a set of rules. A rule is triggered when a certain (complex) condition is met. The rule triggering prompts a specified action to be performed.

The Service Orchestration subset can be combined to handle clinical workflows and resource scheduling to control the monitoring process; including event handling. The **Service Orchestration Manager** is responsible for managing and executing services based on input from the Event Manager and the database. It uses the Rule Engine to orchestrate services and provide notifications.

The **SMS notification component** uses application-to-person (A2P) messaging. Its role is to provide a notification service to carers and patients. It should be noted that SMS messaging cannot be used for emergency alerting or alarms, since this service does not provide QoS (Quality of Service) i.e. guarantee that the message will reach the recipient or when.

The Data Management subset in the LinkWatch Care Portal provides **several APIs** for interfacing with other systems and platforms. API format is either XML or WSDL.

These API's are also offered with fully developed web applications for direct deployment designed to customer needs and wishes. The Clinical and Patient Portal are secure multiplatform web applications built on specific requirements for monitoring patients and supporting patient empowerment.

The LinkWatch Care Portal can be offered both as a **hosted solution** and as a solution deployed at the customer's facility.

**System requirements for the core LinkWatch Care Portal:**
- MS .net Framework 4.0 or later
- MS IIS Server 6.0 or later
- MS SQL Server 2008
- LinkWatch database tables and stored procedures

**System requirements for the SMS notification:**
- A Web Services API
- An appropriate SMS account with sufficient credits

# LinkWatch™ Care Portal
## Application and Contact Information

The LinkWatch Care Portal is a part of the full LinkWatch Telemedicine platform. The LinkWatch Care Portal provides a backend repository (database) for health and social data collected automatically by the LinkWatch Patient Front-end, patient data, care plans, medical guidelines and workflows, recommended literature, etc.

The Data Management subset provides a number of functions such as definition of patients care plans and medical information, data analysis with risk assessment, event detection and handling, design of questionnaires about diet, physical activity and medication compliance, administrative functions such as management of devices.

The LinkWatch Care Portal can also provide an intelligent middleware between the LinkWatch Patient Front-end and proprietary Health Information Systems via open API.

The **LinkWatch Patient Front-end** is a home monitoring platform for easy and secure collection of medical and social data from patients' location. It is adapted to the patient's environment and designed for flexibility and ease of use. The integrated health and social care solutions support patients in managing their diseases efficiently and help healthcare professionals provide better care with more frequent, reliable and relevant data about health status.

The **Patient Portal** provide healthcare services to patients and informal caregivers, such as blood glucose monitoring, weight monitoring, activity, monitoring. It also provides questionnaires about other health and social parameters and educational material supporting patient empowerment and improving self-management capability.

The **Clinical Portal** has as its main function the management of patients, including aspects such as presentation of patients' physiological measurements, presentation of questionnaire and diary results, medication compliance, analysis results, etc.

The LinkWatch Care Portal has been developed in the EU-funded REACTION project according to requirements and design from the Chorleywood Health Centre, London, UK. This is a pre-market notification of a product to be launched in the summer of 2014. Hence all specifications are subject to change.

**For more information**, contact Jesper Thestrup In-JeT ApS at jth@in-jet.dk. Or visit our web sites www.in-jet.dk and www.linkwatch.dk.

LinkWatch Telemedicine
Provided by In-JeT ApS
Jeppe Aakjærs Vej 15, 3460 Birkerød
www.linkwatch.dk
CVR DK 19054780

© 2014 In-JeT ApS