A Case Study of Internet of Things (IoT) & Business Process Management (BPM)
Agenda

• IoT & BPM: a match made in heaven or...?
  • A brief history of IoT & BPM
  • BPM & IoT
  • Predictions for future of IoT & BPM

• The Amedar IoT & BPM case study
  • Background
  • Lessons learnt
  • Best practice advice

• Q&A
About PNMsoft

- BPM software company with 20 years of proven experience
- 2015 Gartner iBPMS leading Microsoft-based platform
- Reputable track record of successful implementations
- Only BPM vendor with HotChange® architecture
PNMsoft customers include
IoT & BPM

a match made in heaven or...
The Internet of Things (IoT) is the network of physical objects – devices, vehicles, buildings and other items which are embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data.

British entrepreneur Kevin Ashton first coined the term in **1999** while working at Auto-ID Labs (originally called Auto-ID centers, referring to a global network of objects connected to radio-frequency identification, or RFID).

BPM (Business Process Management) is a discipline which aims to improve the efficiency of an organization by modeling and standardizing its core business processes.

http://www.pnmsoft.com/resources/bpm-tutorial/
BPM and IoT

- Media
- Environmental monitoring
- Infrastructure management
- Manufacturing
- Energy management
- Medical and healthcare systems
- Building and home automation
- Transportation
Predictions

According to Gartner, Inc., there will be nearly 26 billion devices on the Internet of Things by 2020. ABI Research estimates that more than 30 billion devices will be wirelessly connected to the Internet of Things by 2020.

The Amedar IoT & BPM case study

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Overview

• About Amedar.com
• Project Assumptions Versus Reality
• Project Goals
• How We Did It
• Lessons Learnt
• Best Practice Advice
About Amedar.com

Two pillars of activities

✓ Business Consulting
  • Process & Operation Performance Management
  • Project & Portfolio Management
  • Customer Experience Management
  • Strategic Management

✓ Technology Consulting
  • Web Application and Database Development
  • Mobile Application Development
  • Implementation and Integration with Third Party Solutions
Amedar Projects

INDUSTRIES AND COUNTRY PROJECTS IMPLEMENTED

INDUSTRIES:
- Insurance
- Distribution
- Utilities
- Telecommunications
- Healthcare

COUNTRIES:
- Poland, USA
- UK, Belgium
- Israel, Ukraine

BUDGET, TEAM, PROJECT DURATION

BUDGET:
- 0.25m – 2.5m EUR

TEAM:
- 5 – 30 people

PROJECTS DURATIONS:
- 3 – 26 months
Project Assumptions Versus Reality

- Complex flow of medical information in Hospices;
- Complete absence of process automation tools;
- Absence of a tool for the electronic collection of personal data and medical devices;
- Lack of reporting and documents required by the National Health Fund (NHF).
Project Goals

The main objectives of the project

- Improving the flow of medical information and organizational issues related to the activities conducted by the Hospice;

- Supporting the management of home care & care provided at hospices on operational level.
Functionalities available through the integration of external systems

• Programming & presentation of the measurement results (current & historical):
  - ECG & pulseoximeter,
  - blood pressure,
  - body weight,
  - blood oxygen saturation
  - Insuline.

• Description of accumulated research using a dictionary ICD-10 codes.
• Device management i.e. the rental, return, transfer to the site, and so on.
Project Goals – cont’d

The platform performs the following functions

- Support the **process of admission** and queuing for admission of patients;
- Support the **process of discharge** of patients from the medical care unit;
- Allowing employees to access data online and interview patients and capture the results on various devices.
Project Goals – cont’d

Groups of forms and reports:

- Doctors, nurses;
- Physiotherapists, psychologists;
- Management, external organizations.
How we do it - System Architecture

- Exchange data with NHF
- Sequence BPM for Hospices
- Manage work & present data
- Telemedical station for data transmission to Sequence

Patients at home

Home Care & Hospice teams
How we do it – Devices
How we do it

Coordinator of doctors

Coordination of physiotherapists
- Physiotherapists

Coordination of psychologists
- Psychologists

Coordinator of nurses
- Deputy coordinator of nurses
- Nurses
How we do it – Define processes for home care

Patient registration

Visit for qualification of patient

Assign team

Doctor visit

Physiotherapist visit

Psychologist visit

Rent equipment

Reconfiguration Of ECG

Nurses visit

Telehealth data analysis

Multidimensional reporting
How we do it – Define processes for hospice care

1. Patient registration
2. Onboarding of patient
3. Patient check
4. Doctors duty
   - Physiotherapist visit
   - Psychologist visit
5. Discharge the patient
6. Nursing duty
   - Collective administration of medicine
   - Collective scheduled dressings
   - Collective scheduled treatments

- Multidimensional reporting
- Monthly schedule
- Daily schedule
Information on the current number of tasks

Summary information on all tasks

The transition to reporting module

The transition to the module Patient Cards

Information on the number of tasks delayed

Information on the number of tasks whose due date passes today

Information about alerts with Pump displayed at the doctors prescribing the device to the patient

Information about the tasks assigned to me

New tasks, which can be opened by a person logged on. The list of tasks that can be opened depends on the role and powers.

Information about the tasks entrusted to
Tab - My Tasks

This tab shows all tasks - you can assign to each:
- PENDING
- DUE
- DELAYED
- COMPLETED

<table>
<thead>
<tr>
<th>Szukaj</th>
<th>Oczekujące</th>
<th>Uprawnienia dalszych</th>
<th>Opóźnione</th>
</tr>
</thead>
</table>
|        | Nadanie numeru historii choroby
Rejestrowanie pacjenta w hospicjum stacjonarnym
2015-12-22 # Ewa Bohrer | | |
|        | Ubezpieczenie
Rejestrowanie pacjenta w hospicjum stacjonarnym
2015-12-22 # Agnieszka Magierowska | | |
|        | Ubezpieczenie
Rejestrowanie pacjenta w hospicjum stacjonarnym
2015-12-18 # Agnieszka Magierowska | | |
|        | Rejestrowanie pacjenta w hospicjum stacjonarnym
2015-12-18 # Agnieszka Magierowska | | |

Information about the meanings of the icons for tasks:
- Zadanie ma wielu odbiorców, nie należy do nikogo
- Zadanie ma wielu odbiorców, teraz należy do Ciebie
- Twoje odczytane zadanie
- Twoje nieodczytane zadanie
- Wiadomość, informacja
In this tab, we can see all the tasks assigned to the patient and the process. Depending on permissions, a person who is logged in can select a specific process that they want to review.
In this tab we have multidimensional reports on work and activities of stationary hospice and home. Choosing the name of the selected report group, you can preview the current state in the area.

The system allows you to change the analyzed data and select the "dimension", after which the data will be displayed. Click on the selected data series and determine what details you want to see.
In this tab, you can search for a patient who is already in a hospice or home by selecting “first name”, “last name” or “social security number”.
After searching for a particular patient in the History of illnesses tab, we are able to browse – broken down by their doctor, nurse, psychologist, physiotherapist, and all activities. In addition, in the Data tab, we have all the information related to the Patient.
After searching in the Telemedicine tab, we can review the distribution of types of equipment and telemedicine results transmitted in real-time. And by selecting Charts we can see the data in graphical form.

Green indicates a NEW medical device reading, not opened yet.
Tab - Patient Card - Telemedicine data from devices
Processes

- Patient registration
- Visit for qualification of patient
- Assign team
- Doctor & Nurse visits
Processes

Physiotherapist visit

Psychologist visit
Processes

Reconfiguration of ECG

Rent equipment
Lessons Learnt

- Model processes in Sequence iBPMS, instead of other modelers;
- Use Agile methodology & deliver projects faster;
- Start device integration with WebServices sooner;
- Estimate 20%-30% of time for testing;
- Work more closely and in collaboration with all key stakeholders
Best Practice Advice

- Consider Mobility – extending your business applications to tablet and smartphone devices.

- To maximize time, work in parallel on:
  - Processes, tasks, forms;
  - Integration of medical devices with BPM;
  - Reporting.

- Integrate ProcessTO GO – Sequence mobile portal – with Google charts and BI

- Sequence can integrate with any IoT device.
Questions & Answers Time!
Book a demo of Sequence

pnmssoft.com/get-demo