

Driving the change in enterprise hospital information systems

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Agenda

1. Introduction and setting the main thesis
2. Enterprise HIS architecture encountering future trends/demands
3. How can SME and patients drive the change – thru real projects
4. Back to the thesis – summary and Q&A

IN2 group



30

Years

600+

Employees

250+

Clients

450+

Projects

■ IN2 Zagreb

■ IGEA

■ Pardus

■ Svam plus

■ IN2 Koper

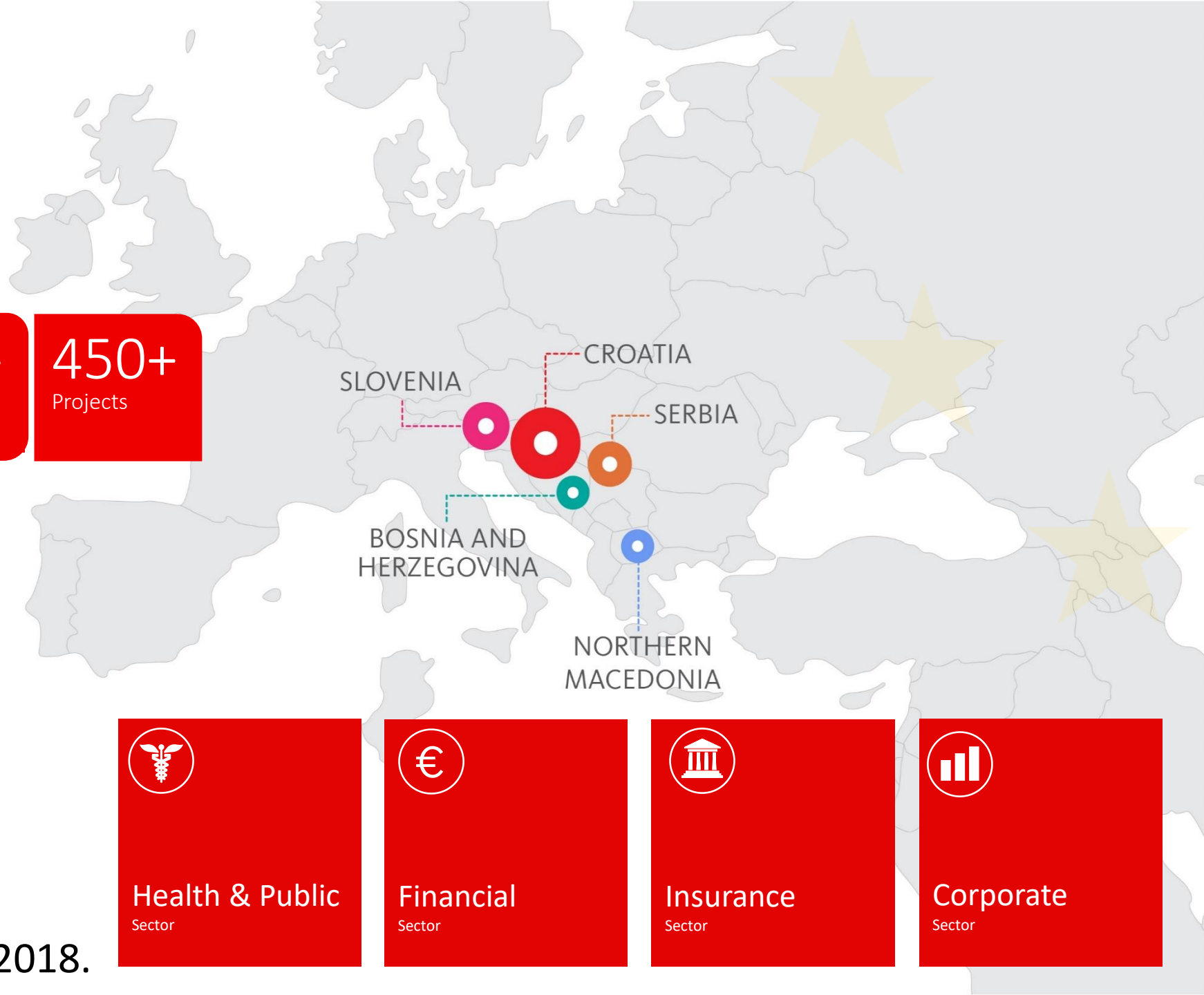
■ IN2 Sarajevo

■ IN2 Belgrade

■ IN2 Skopje

■ MCS Zagreb

■ Libusoft Cicom



Health & Public

Sector



Financial

Sector



Insurance

Sector



Corporate

Sector

CSI – Vela – Juniper from 2018.

IN2 Healthcare sector - Croatia



Hospital IS

System - Croatia

- Diagnostic modules
- Infirmity/Policlinic
- HL7 integrations
- Hospital management



Hospital ERP

System - Croatia

- Standard ERP
- HR
- Management tools



Laboratory

System - International

- Biochemistry
- Microbiology
- Cytology
- HL7 integration



eHealth

Platform – Croatia, Slovenia

- eWaitingLists
- eBooking
- eReferral
- ePrescription



Hospital IS

System - International

- Medical modules
- Logistic modules
- Integration platform
- Hospital management



Insurance

System - International

- Terminologies
- Insurance core modules
- eServices (contract, invoice...)
- Business Intelligence

45 hospitals:
University hospitals
Regional hospitals
Special hospitals

43 hospitals:
University hospitals
Regional hospitals
Special hospitals

5 countries
140+ laboratories
1000+ analyzers
Add-on devices
Mobile apps

2 countries (HR, SLO)
National platform
4 million eOrders/y

3 countries (AZ, VN, KSA)
Single hospitals
Multiple sales channels
Groups and Regional targets

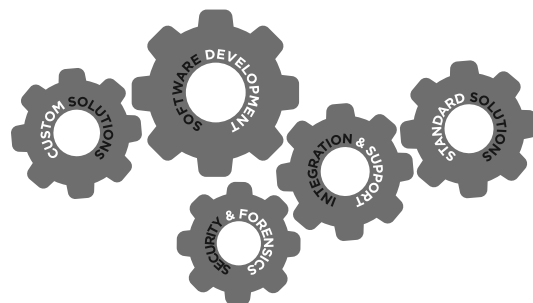
Targeting:
Country level
Healthcare vertical
eProcesses

MCS

ePrimaryHealth

Platform – Croatia

- General Practitioners
- Pediatrics
- Gynecology
- Dental



MCS

eHealth

Platform – Croatia













- ePreventivePrograms
- mPatientPortal
- mHealth

150+50
Healthcare sector
employees

Enterprise HIS architecture












Medical



-  Patient EMR
-  Admission
-  Outpatient clinic
-  Inpatient
-  ER
-  Operating theatre
-  Maternity
-  Diagnostics
-  Day hospital
-  ICU
-  Oncology
-  Hemodialysis
-  Blood bank
-  Pharmacy

Operations



-  Dashboard
-  Billing
-  Cashbox & POS
-  Consumables
-  Administration
-  Shifts & duty roasters
-  Administration (IT)
-  Consumption
-  Purchasing
-  Supplies
-  Productivity

+ Medical subspecialty
modules/solutions

+ Fully integrated

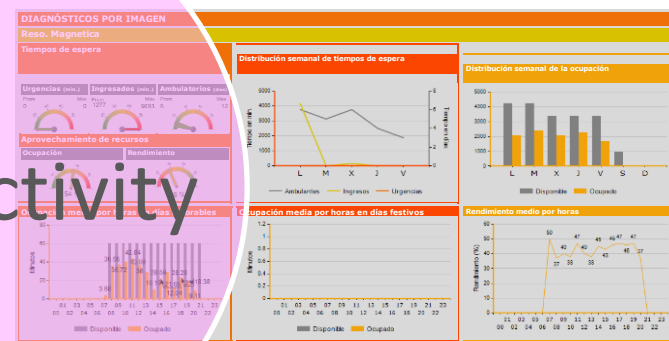
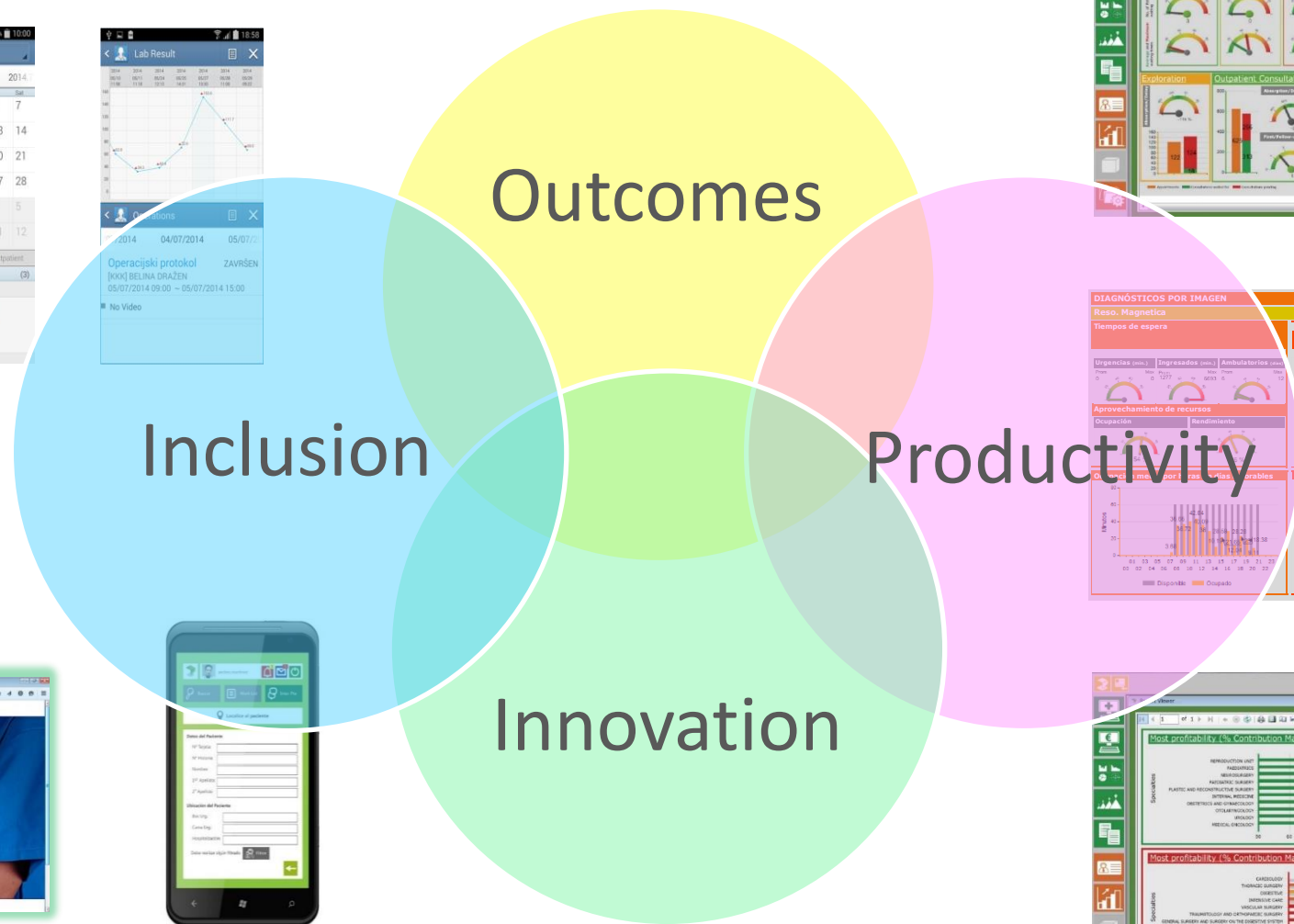
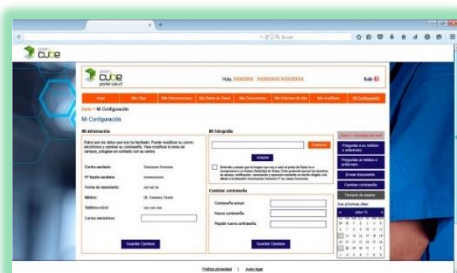
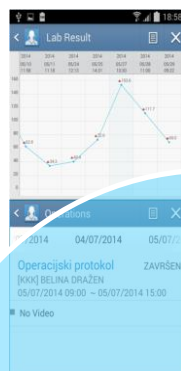
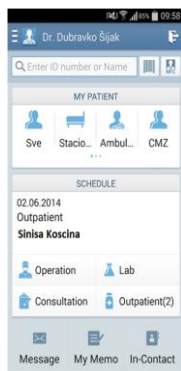


Main thesis

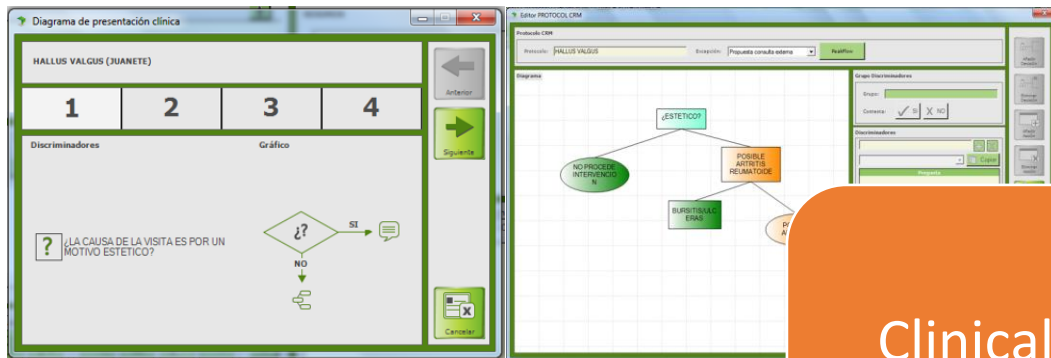
1. Enterprise hospital information systems are:
 - Big and slow in providing full process coverage
 - Will not disappear
 - Will change slower than users needs

2. Current trends are requiring adoption of the following concepts:
 - **Inclusion** of patients and medical staff
 - Improved quality of medical **outcomes**
 - Raising **productivity** to ensure sustainability
 - **Innovation** to support high level of change

Inclusion & Productivity



Outcomes & Innovation



Alarm Message

There are alarms for the patient's vitals.

Patient is too young for aspirin. It can cause Reye syndrome.

Alarm Message

There are alarms for the patient's vitals.

Patient has allergy on penicillin.

Alarm Message

There are alarms for the patient's vitals.

Prescribed therapy has to be changed - interaction with buspirone!

Clinical pathways

Decision support & Guidelines

External knowledge

Re-engineering processes

Clinical Guidelines Assignment

Clinical Guideline

GUÍA CLÍNICA DANI

Associated Diagnosis: artrosis de rodilla

Associated Recommendation: recomendaciones al alta, prótesis de rodilla

Key Words: PROTESIS, RODILLA, ARTROSCOPIA

Planned Stay: 800,00

Inclusion criteria:

Assign Recommend

Help

PRÓTESIS DE RODILLA - DÍA DE LA INTERVENCIÓN

Acogida planta (entrega dibujos)

Via periférica lado contra lateral

Comprobación de consentimiento informado quirúrgico

Comprobación de ayuno desde noche anterior.

Toma constantes (T°, TA, FC) Preparado campo quirúrgico

Medicación pasada solo IV

Protocolo prequirúrgico, Aseo y Rasurado.

Revisión preoperatorio (AS, Rx, Ecg)

Assign Data Sheet

Data Sheet

Ficha de la Via Clínica de Prótesis Total de Rodilla

Parámetro

Valor

Variaciones debidas al enfermo

Variaciones debidas a la personal sanitario y a las Ningun

Variaciones debidas a la institución

Ningun

Clinical Scenarios

Body Areas

Acute Respiratory Illness in Immunocompetent Patients

Acute resp illness, <40 years old, exam positive or risk factors

Acute resp illness, <40 years old, negative exam, no other symptoms or risk factors

Acute resp illness, dementia, any age

Acute resp illness, pneumonia or pneumothorax suspected

Acute resp illness, elevated WBC or pain or CAD or CHF

COPD exacerbation, uncomplicated

Pneumonia complicated

Acute Respiratory Illness in Immunocompromised Patients

Acute resp illness, immunocompromised, CXR positive, non infectious etiol suspected

Acute resp illness, immunocompromised, CXR positive, pcp suspected

Appropriateness ratings for a 30 year old male

Indications: Tobacco use Y, Bad pain, acute mid-thoracic, Acute resp illness, dementia, any age Y, Bad, neck, chest X

Appropriateness	Procedure	Cost	BSL
Green	XRAY, chest	\$	select this exam
Yellow	CT, chest, w/o iv contrast	\$5	select this exam
Red	CT, chest, w/ iv contrast	\$55	select this exam
Red	CT, chest, w/iv iv contrast	\$55	select this exam

Izdavnice

ZAL-001101

16. stu 2018.

ZAH-011351

211130

CENTAR ZA KRONIČNE UPALNE BOLESTI CRIJEVA

ZAL-001100

14. stu 2018.

ZAH-011350

211000

ZAVOD ZA GASTROENTEROLOGIJU I HEPATOLOGIJU

ZAL-001099

16. lis 2018.

ZAH-011349

210000

KLINIKA ZA UNUTRAŠNJE BOLESTI

ZAL-001096

12. lis 2018.

ZAH-011343

210000

KLINIKA ZA UNUTRAŠNJE BOLESTI

ZAL-001097

12. lis 2018.

ZAH-011344

210000

KLINIKA ZA UNUTRAŠNJE BOLESTI

ZAL-001098

12. lis 2018.

ZAH-011345

211500

POLIKLINIKA ZAVODA ZA GASTROENTEROLOGIJU I

ZAL-001101

ZAH-011351 (16. stu 2018.)

211130-CKO CKC - CENTAR ZA KRONIČNE UPALNE BOLESTI CRIJEVA

R Rojazol krema 2%, 1x30 g

10/17

test opis.

K Klimicin caps. 16x150 mg

17/23

Ibuprofen Farml tbl. 30x600 mg

5/5

Real projects with „non-HIS” engagement

1. Patients – Portal and mobile app
2. Patient admission – Integrated waiting rooms
3. Outpatient/Inpatient – Mobile Electronic Medical Record
4. Pharmacy – Reengineering processes thru serialization upgrade
5. Laboratory – Automatized LAB sample processes
6. Smart logistics – Hospital transport service

1. Patient portal and mobile app

- Opening hospitals to patients using new technologies
 - Patient portal (information, appointments, medical documentation, communication)
 - Next step: integrating private healthcare records

Sv. Katarina
SPECIJALNA BOLNICA

Narudžbe Nalazi Naručivanje Moj profil Odjavi se

Naručivanje

Poruka

Uputnica

Odaberite datoteku

Nalaz

Odaberite datoteku

Naručite se

Dokumente koje prilažete zahtjevu za naručivanje moraju biti u pdf, jpg, gif formatu.

1. Odaberite gumb "Odaberite datoteke"
2. Pozicionirajte se na mjesto gdje ste lokalno pohranili nalaze
3. Desnom tipkom miša kliknite na jedan nalaz
4. Dodajte li više nalaza, odaberite tipku CTRL+ pozicionirajte se klikom miša na drugi željeni dokument na popisu datoteka (ovaj korak možete ponavljati onoliko puta koliko nalaza prilažete zahtjevu)
5. Odaberite gumb "Open" ili "Otvori" (ovisi o operativnom sustavu)

© 2022 - Portal za pacijente - Politika privatnosti - Korisničke upute

Powered by **in2**

15:49

Početna **Lijekovi** Odjava

① Odaberite lijekove za zamolbu i pritisnite "Pošalji zamolbu" na dnu ekrana.

Acipen tbl. žel. otp. 14x40 mg
Lijek nije dostupan na tržištu, stoga postoji mogućnost da Vam ljeknik izda drugi lijek ili Vas pozove na pregled.

Controlloc tbl. 28x20 mg

Euthyrox 50 tbl. 50x50 mcg

Normabel tbl. 30x2 mg

Niže se nalaze lijekovi za koje trenutno nije moguće poslati zamolbu.

Belformin tbl. film obl. 100x500 mg
Zbog izmjene na listi lijekova HZZO-a za ovaj lijek potrebno se javiti izabranom ljekniku.

Peptoran tbl. 20x150 mg
Zbog izmjene na listi lijekova HZZO-a za ovaj lijek potrebno se javiti izabranom ljekniku.

Pošalji zamolbu

mobilni.portal.zdravlje.hr — Private

15:50

Početna **Naručivanje** Odjava

MARKOVIĆ MARKO (12.12.1955)
Specijalistička ordinacija obiteljske medicine dr. Demo
+385 (23) 252879

① Odaberite jedan od slobodnih termina za datum i vrijeme kada se želite naručiti. Aplikacija automatski preskače dane u kojima nema slobodnih termina.

14.03.2023
Utorak

17:30 - 17:45

17:45 - 18:00

18:00 - 18:15

18:15 - 18:30

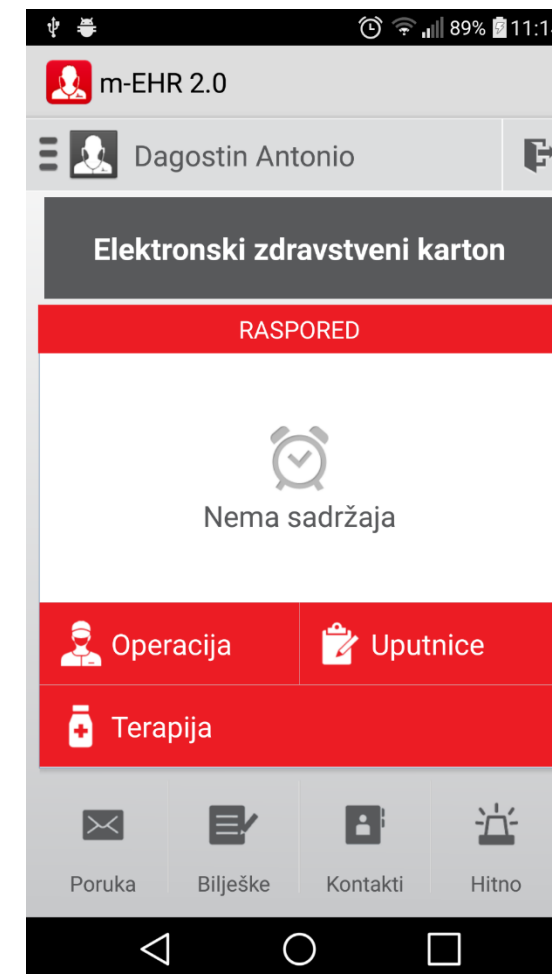
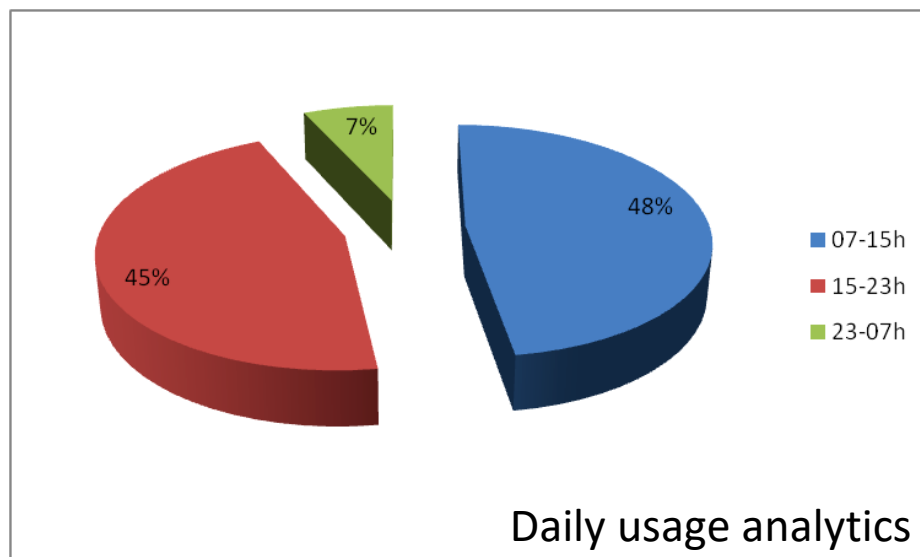
18:30 - 18:45

mobilni.portal.zdravlje.hr

2. Mobile – Electronic Medical Record

- Mobile EMR

- extending service reach
- enabling personal touch to the patient
- organizing physician time
- providing secure collaboration



3. Patient admission – Integrated waiting room

- Use check in, queuing and infotainment systems to:
 - Speed up waiting room process
 - Boost productivity
 - Manage your clinic

- Smart patient reorder engine
 - First-come-first-serve
- vs
- Time-of-the-order

- Fully LIS/HIS integrated
- Fully GDPR compliant



4. Pharmacy – Reengineering processes

- Medicine cart preparation
 - cart preparation without paper
 - fully mobile process
 - EU legislation supported (from February 2019.)
 - automatic authenticity verification
 - integrated ERP material processes
 - supporting unpacking / full box issuing
 - supporting replacements with ATC constraints
 - handover without paper (smart user tags)



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MBS: 080071082

Izdatnice		
CKC	ZAL-001101 211130 CENTAR ZA KRONIČNE UPALNE BOLESTI CRIJEVA	16. stu 2018. ZAH-011351
KZG	ZAL-001100 211000 ZAVOD ZA GASTROENTEROLOGIJU I HEPATOLOGIJU	14. stu 2018. ZAH-011350
INT	ZAL-001099 210000 KLINIKA ZA UNUTRAŠNJE BOLESTI	16. lis 2018. ZAH-011349
INT	ZAL-001096 210000 KLINIKA ZA UNUTRAŠNJE BOLESTI	12. lis 2018. ZAH-011343
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PZG	ZAL-001098 211500 POLIKLINIKA ZAVODA ZA GASTROENTEROLOGIJU I	12. lis 2018. ZAH-011345

ZAL-001101		
ZAH-011351 (16. stu 2018.) 211130-CKC CKC - CENTAR ZA KRONIČNE UPALNE BOLESTI CRIJEVA		
R	Rojazol krema 2%, 1x30 g 10/17 test opisa.	0 7
K	Klimicin caps. 16x150 mg 17/23	0 6
D	Ibuprofen Farmal tbl. 30x600 mg 5/5	0 1 ✓

5. Automatized LAB sample processes

- SortIN2 - Scanning LAB samples to:

- Automate admission process
- Eliminate human errors
- Ensure traceability
- Achieve accreditation metrics

- ArchvinIN2 – Scanning to:

- Automate archiving process
- Fully LIS integrated



6. Smart hospital logistics

- Smart logistics
 - confirming locations of pickup / delivery
 - tagging objects in transport
 - fully mobile
 - adaptive and predictive logic



Possible other fields for SME engagement

- Post acute care using AI technology
- Smart nursing carts supporting bedside processes
- Speech2Text and NLP AI to structured medical data
- Scanning results and medical documentation
- Introducing PHR into hospital processes
- Software robotization
- Data monetization
- Clinical trials support
- ...

Q & A

Enterprise hospital information systems are:

Big and slow in providing full process coverage

Will not disappear

Will change slower than users needs

But working together may help...



Contacts:

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