

DRUGS INTERACTION CHECKER BASED ON IOT.

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Motivation

- ❑ Drug interaction can cause ADR
- ❑ 8% (Spain), 6.5% (UK) [2]
- ❑ 80% cases require admission [2]
- ❑ Converting between ratios
- ❑ Need for assistant



ADR's

- Modifications of effects of one drug by addition of other drug or nutrients

- Drug interactions with undesired effects

- Drug – Drug

- Drug – Nutrients



Types of ADR's

- Drug allergies caused by active ingredient

- Skin rashes

- Breathing difficulty



- Alarming the patient

Types of ADR's

- Active Ingredient Interactions

- Drug-Drug interaction

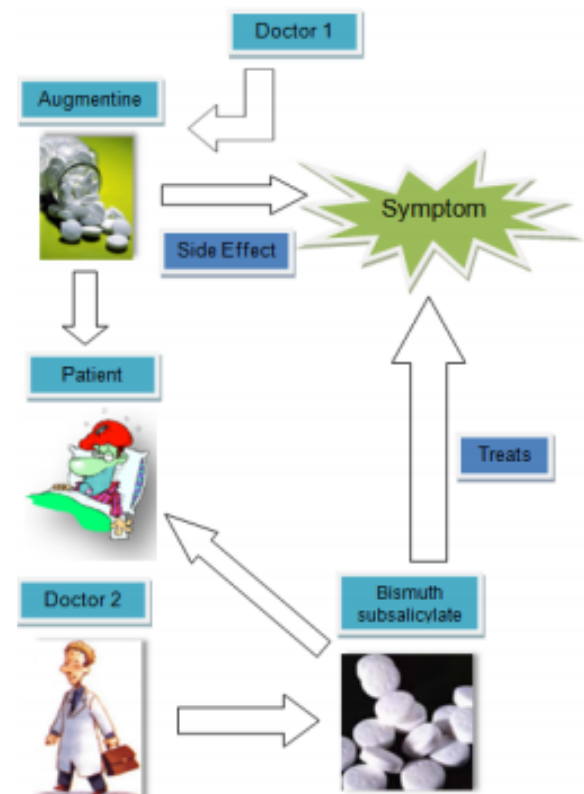
- Increase/decrease effect



- Warning about drug-drug interaction

Types of ADR's

- Drugs Loop
- Undesired effect of a drug can be treated with another drug
- Advice to patient



Types of ADR's

- Renal Impairment
- Doses of drugs according to renal and liver functions
- Biological test
- Dose Information

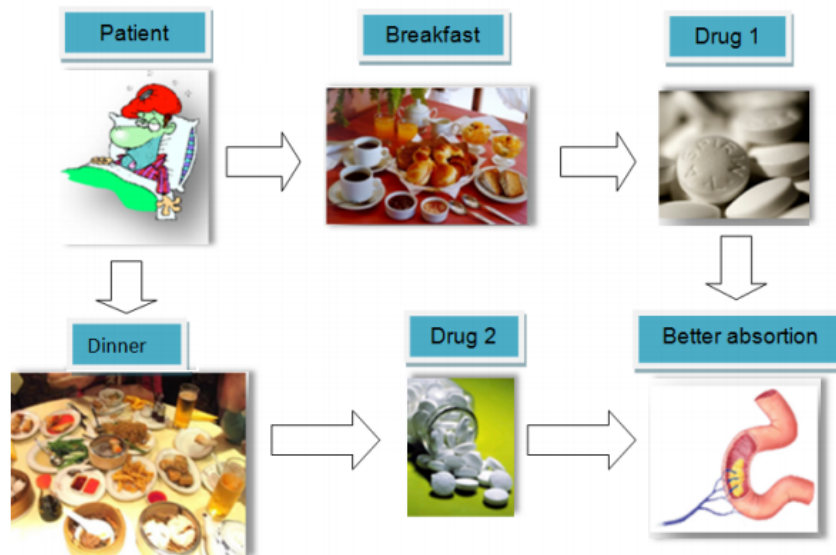


Types of ADR's

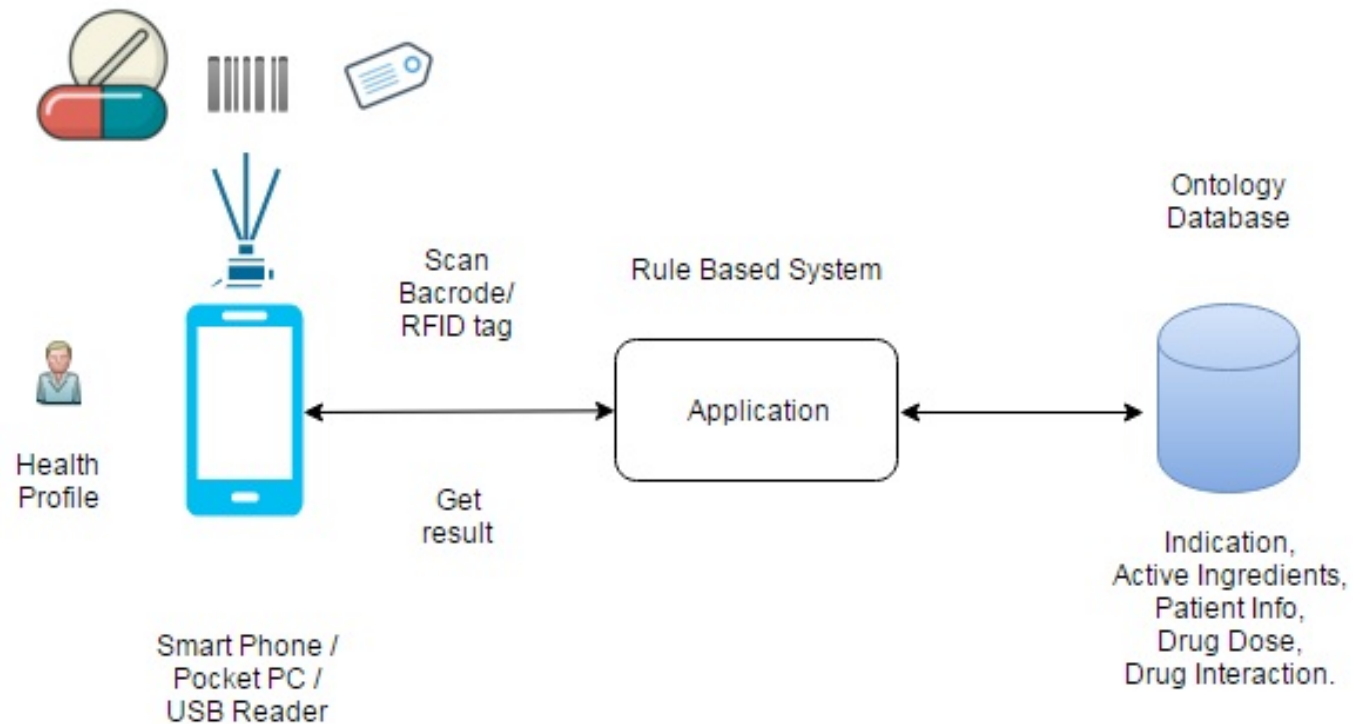
- Pregnancy
- Avoided drugs: Captopril, Cilazapril, Ramipril, Quinapril [2]
- List of drugs to be avoided

Types of ADR's

- Optimizing the absorption depending on time



Methodology



Pharmaceutical Intelligent Information System

Methodology

- Ontology
- Classification – Drug, Allergic, Patient

The screenshot displays two panels from an ontology editor for a project named 'pis_ampliado'.

SUBCLASS EXPLORER
For Project: pis_ampliado
Asserted Hierarchy

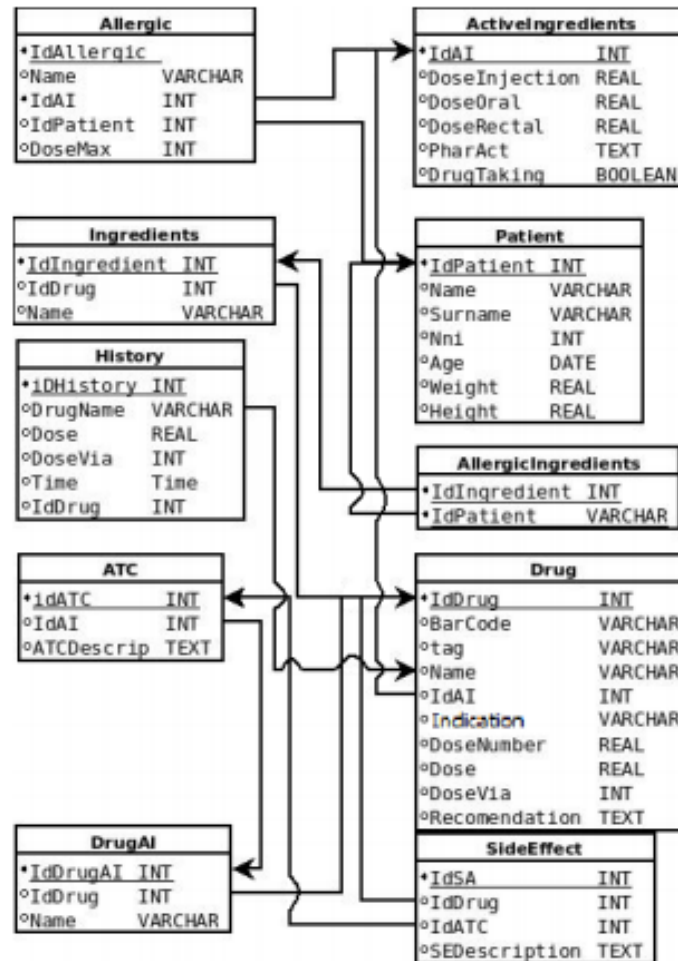
- owl:Thing
 - Allergic
 - Drug
 - Patient

PROPERTY BROWSER
For Project: pis_ampliado
Object | Datatype | Annotation | All

Datatype Properties

- Indication
- ActiveIngredient
 - AIDose
 - AIDoseMax
 - AIName
 - AIDoseOral
 - AIDoseRectal
- ActiveIngredientIncompatible
- PatientName
- ATC
 - ATCAI
- PatientAllergic
- SideEffects
 - SideEffectsATC
- DrugDose
- AllergicName
 - AllergicIngredientID
- AllergicIngredient
- DrugInteraction

Methodology



Methodology

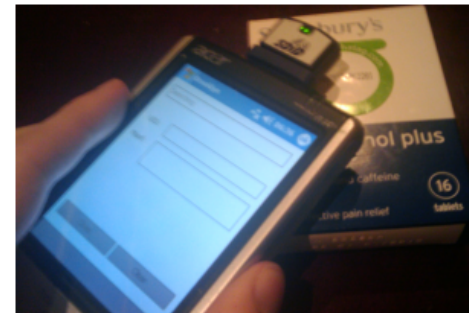
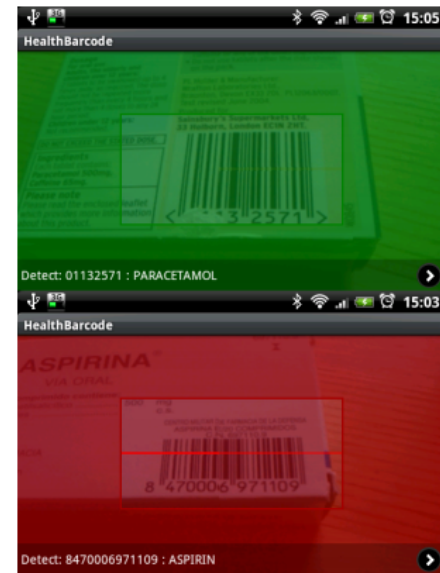
- Rule-based System
- Detects interaction, drug loop, allergic ingredient, etc
- Takes into account age, liver, heart, state.

Methodology

Rule	Jess' Rule
Drug Interaction Rule	<pre>(defrule rule1 (object (is-a http://PIIS_ampliado.owl#Drug) (object ?d1) (http://PIIS_ampliado.owl#ActiveIngredient ?ai)) (object (is-a http://PIIS_ampliado.owl#Drug) (object ?d2) (http://PIIS_ampliado.owl#ActiveIngredientI ncompatible ?aii)) (test (= (?ai ?aii)) => (printout t "Drug Interaction found"))</pre>
Allergy Interaction Rule	<pre>(defrule rule2 (object (is-a http://PIIS_ampliado.owl#Drug) (object ?d1) (http://PIIS_ampliado.owl#ActiveIngredient ?ai)) (http://PIIS_ampliado.owl#PatientAllergic ?pa)) (test (= (?ai ?pa)) => (printout t "Allergy Interaction found"))</pre>
Drug Loop Rule	<pre>(defrule rule3 (object (is-a http://PIIS_ampliado.owl#Drug) (object ?d1) (http://PIIS_ampliado.owl#SideEffect ?se)) (object (is-a http://PIIS_ampliado.owl#Drug) (object ?d2) (http://PIIS_ampliado.owl#Indication ?in)) (test (= (?se ?in)) => (printout t "Drug Loop found"))</pre>

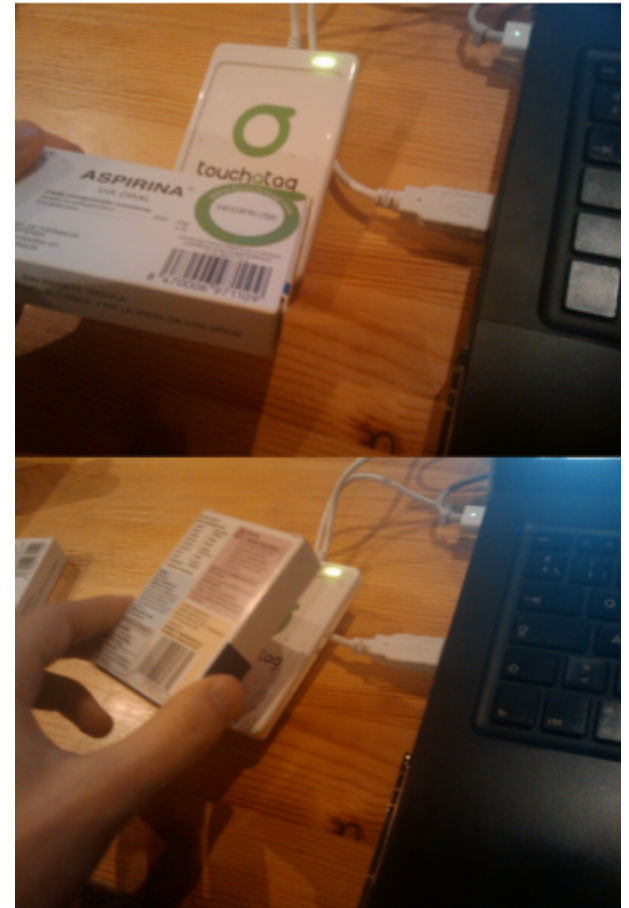
Methodology

- Drug Reader
- Using Smart Phone
- Using Pocket PC
- USB Reader



Methodology

- USB reader for pharmacist
- Smart Health Cards



Benefits & Conclusion

- Reduce clinical errors
- Conversion errors
- Helps new pharmacists
- Reduces chances of getting ADR's
- Can save life
- What I think?

Suggestion

Possibility of allergy?



Admitted Patient

Same age

Age: 55- 60
Some allergy



Patient 1



Patient 2



Patient 3

References

- [1] Celestial Prescription, <http://www.celestialprescriptions.com/wp-content/uploads/2013/02/RX-for-blog-pic-300x300.jpg>, March 13, 2016
- [2] Jara AJ, Alcolea AF, Zamora MA, Skarmeta AG, Alsaedy M. Drugs interaction checker based on IoT. In Internet of Things (IOT), 2010 Nov 29 (pp. 1-8). IEEE.
- [3] Right At Home, http://www.rightathome.net/assets/franchises/foxvalley/medicine_pill_figure_400_clr_8471.png, March 13, 2016
- [4] Bipolarhappends, <http://bipolarhappends.com/bhblog/wp-content/uploads/med-question3.gif>, March 13, 2016



Thanks You!