NutriME
Pervasive nutritional monitoring & advising system
NutriME is a software based system for nutritional monitoring & advising

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- Collaboration
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- Institutional Partners
  - GS1 Portugal Codipor, ...
World Health Organization (WHO) reports that [WHO 2006]:

- Nutritional misbehaviour is a major cause of diseases, morbidity and death.

- Epidemic of obesity poses one of the most serious public health challenges, particularly alarming in children and adolescents, responsible for up to 6% of health care expenditure in EU, no indirect costs included.

- 80% of cardiovascular disease cases, 90% of diabetes mellitus type 2 and 33% of all types of cancer could have been prevented by adopting healthier lifestyles, which includes correct nutrition, regular physical activity and non-smoking.

- Obesity will likely become the first cause of chronic disease worldwide in XXI.
International Associations for the Study of Obesity:

- In 2005, 39.4% of Portuguese population between 18–64 years old was overweight and 14.2% was obese, 45.6% of the sample suffer increased cardiovascular health risks.

European Childhood Obesity Surveillance Initiative (2008/9):

- Portuguese children (6-10 years old), 18.1% pre-obesity, 13.9% obesity (32% total overweight).

World Health Organization also states that:

- A change in dietary habits, physical activity and tobacco control, have a major impact in reducing the rates of these chronic diseases, often in a relatively short time.

“The obesity epidemic is reversible!”
NutriME is a software based system for nutritional monitoring & advising

In an individual point of view stands for...

- Individual nutritional behaviours analysis and customised advising by nutritional monitoring, reporting and alarming features.

In a national/global (observatory) point of view stands for...

- Nutritional policy definitions and evaluation, education planning and nutritional caused diseases tracking by national/global monitoring through data collection and summarisation into a nutritional observatory.
Pervasive Monitoring & Advising System

**NutriME**

**Food consumption data collection**

- Automatic data collection done from electronic invoice sources - Food suppliers POS (Point-of-Sale) systems
- Transmission of e-Invoices done via wireless communication technologies (v.g. Bluetooth) from POS to users mobile devices (PDA, Smartphones, etc.)
- Transmission of consumption/nutritional data from user mobile devices to observatory

**Nutritional evaluation of consumptions**

- Food to nutrients mapping via *local databases, GS1 SyncPT, PortFIR, global Gs1-GDSN, EuroFIR*
Pervasive Monitoring & Advising System

Prototype NutriME

Diagram showing the flow of data and services, including:
- PortFIR/EuroFIR Services
- IPLEiria DB
- GS1 - GDSN Services
- Bluetooth/IP Gateway
- Wi-Fi/3G/... Network
- IP Network
- Observation DB
- Food characteristics
- Consumption data
- Products data (GTIN, GPC,...)
- Product Subscription
- e-Invoice
- Point-of-Sale System

Data and services are interconnected, illustrating the monitoring and advising system's functionality.
Integration Scenario 1

- GTIN (Global Trade Item Number) made available by POS system
- Data inquiry to GS1 & PortFIR based on product GTIN
- Dataflow: POS (GTIN) -> PDA -> IPLeiria_DB (GS1 GTIN, GPC, ...) -> PortFIR (GTC, ...)

Integration Scenario 2

- Ordinary invoice made available by POS system (no product IDs provided)
- GS1 and PortFIR product ID extracted by product description lexical/semantic parsing & semantic treatment
Case study (at Instituto Politécnico de Leiria)

- **Location:**
  - IPLeiria self service canteens, bars, vegetarian restaurant, ...

- **Population:**
  - Students, professors, staff

- **Food to nutritional characteristics mapping:**
  - GS1 Portugal (& INSA/PortFIR ??)

- **Nutritional behaviours analysis:**
  - SAS IPLeiria, ...
Conclusions

- Obesity is recognised as a public health (epidemic) problem in developed countries

- Economic (direct/indirect) costs of obesity (nutritional [mis]behaviours) caused diseases represent an important share of national healthcare budgets

- Although obesity was identified as a public health problem one decade ago, action to reduce it does not seem to have been effective to date (International Association for the Study of Obesity, 2007)

- There are several products (including software) for advising but no automatic collection of users daily nutritional behaviour is available (monitoring is not supported)

- Nutritional monitoring is vital for individual and group analysis

- NutriME can take part on dealing with the obesity epidemic