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# Interoperability Standards for AAL and Personal Health Applications – the Role of CEN TC251 / WGIV

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AAL Forum Odense 15 September 2010

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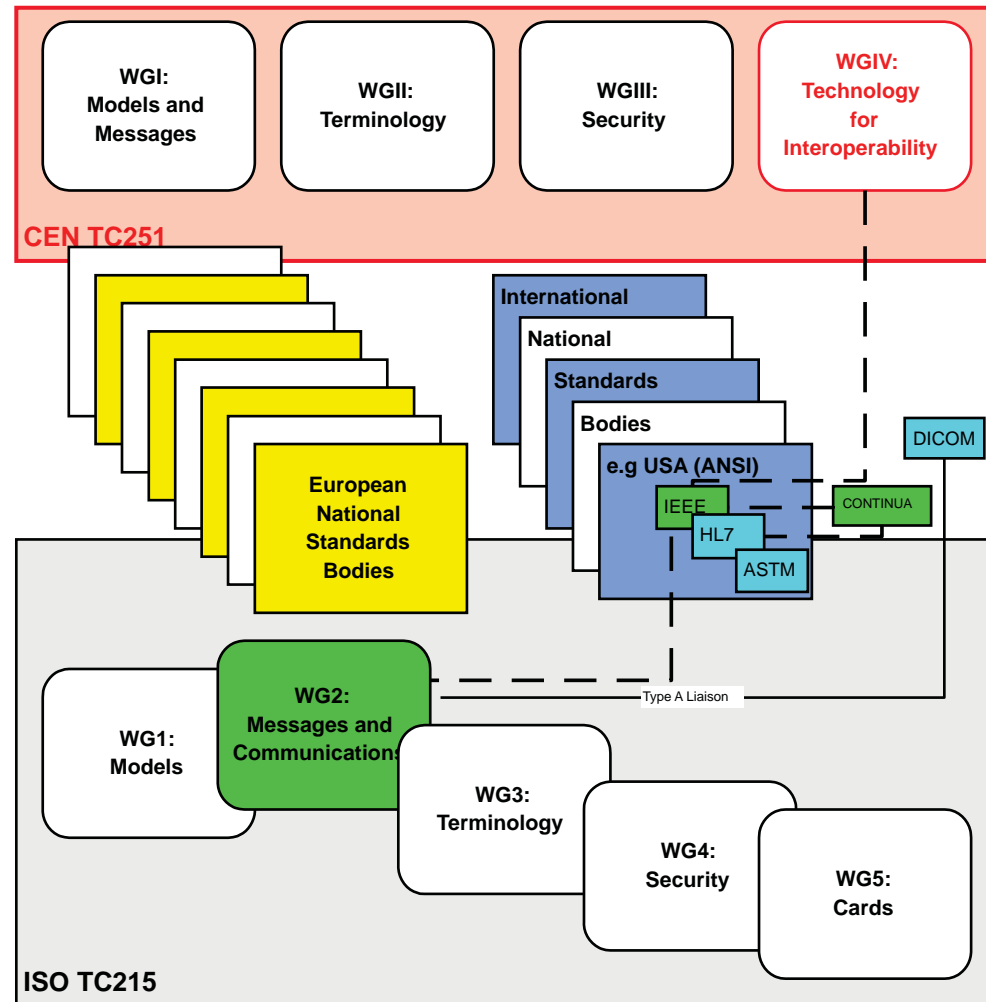
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# What is CEN TC 251 / WGIV ?

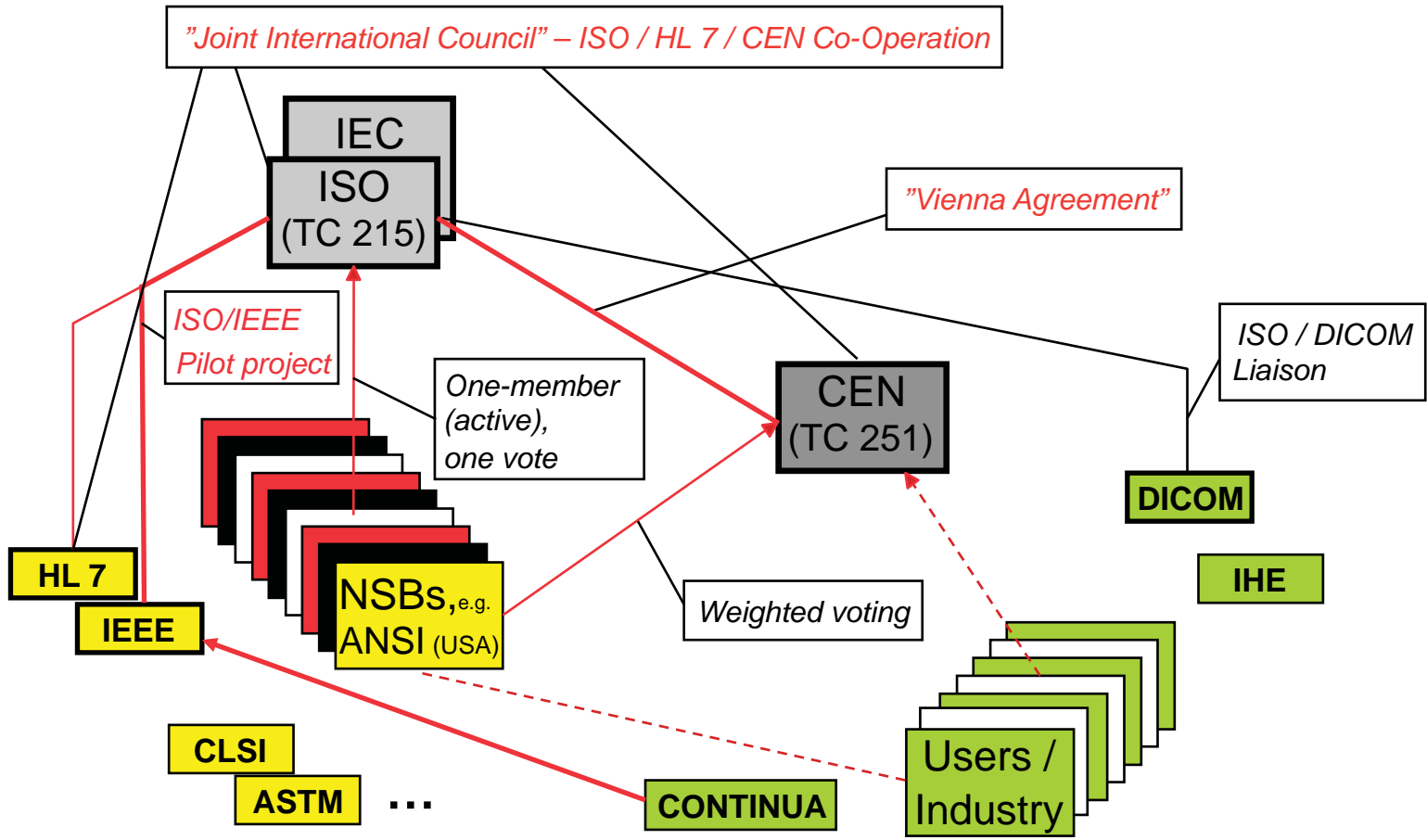


European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

## WG Structure of CEN TC 251 (Health Informatics) and Related International Organizations (about 2005)



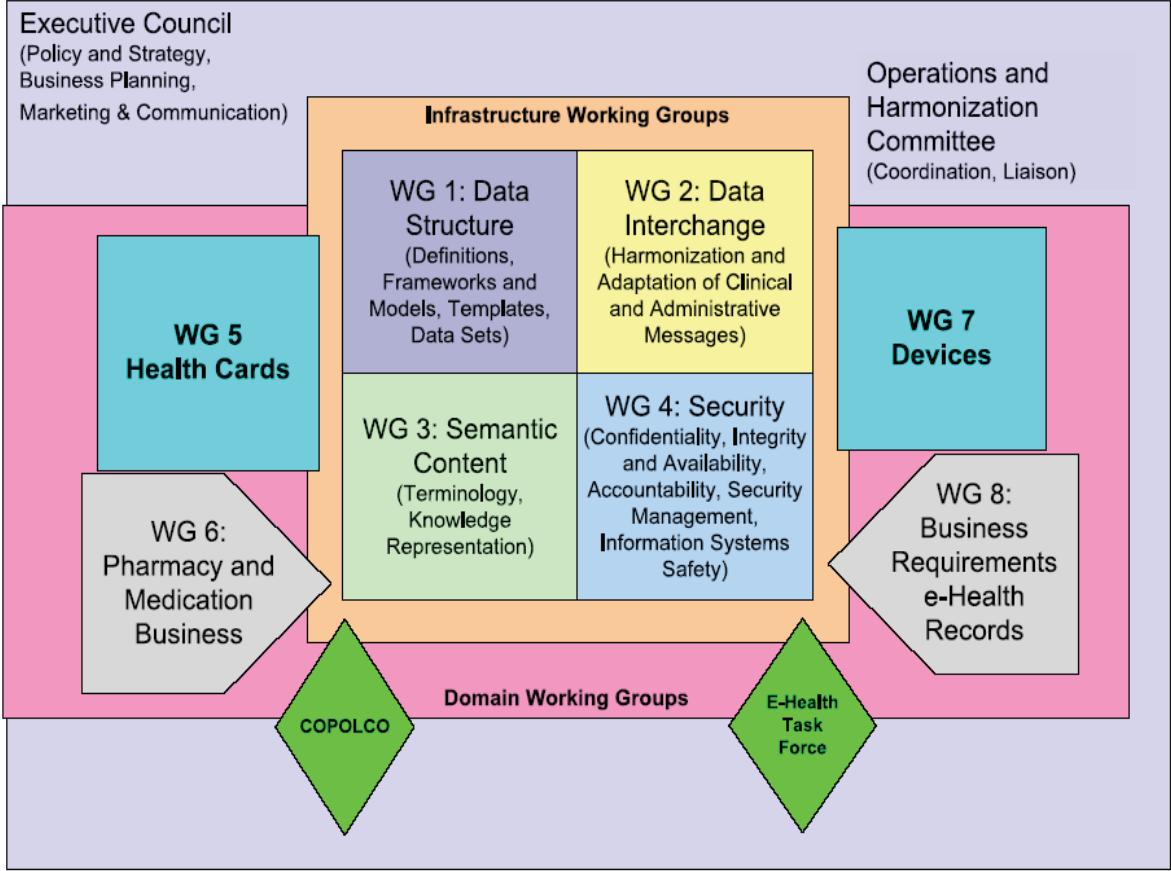
# International Standardization Co-Operation on Health Informatics: How It Works



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# ISO TC 215: The Shift Towards Global Standards

## ISO TC 215 (Health Informatics) Structure (since 2007)



2009: ca. 200 Continua members developing Personal Health solutions





- Chronic disease
- Post trauma
- Pre-op

## Disease Management

- Vital sign monitoring (Remote Patient Monitoring)
- Medication reminders and compliance
- Utilize home network to locate devices in logical places:
  - Scale in bathroom
  - Pill minder in kitchen
  - Blood Pressure cuff in living room
- Trend analysis and alerts
- Email, chat, video
- Appointment scheduling



*Continua member companies help people with chronic conditions live healthier lives by connecting them to their care team through a more efficient exchange of personal health information.*





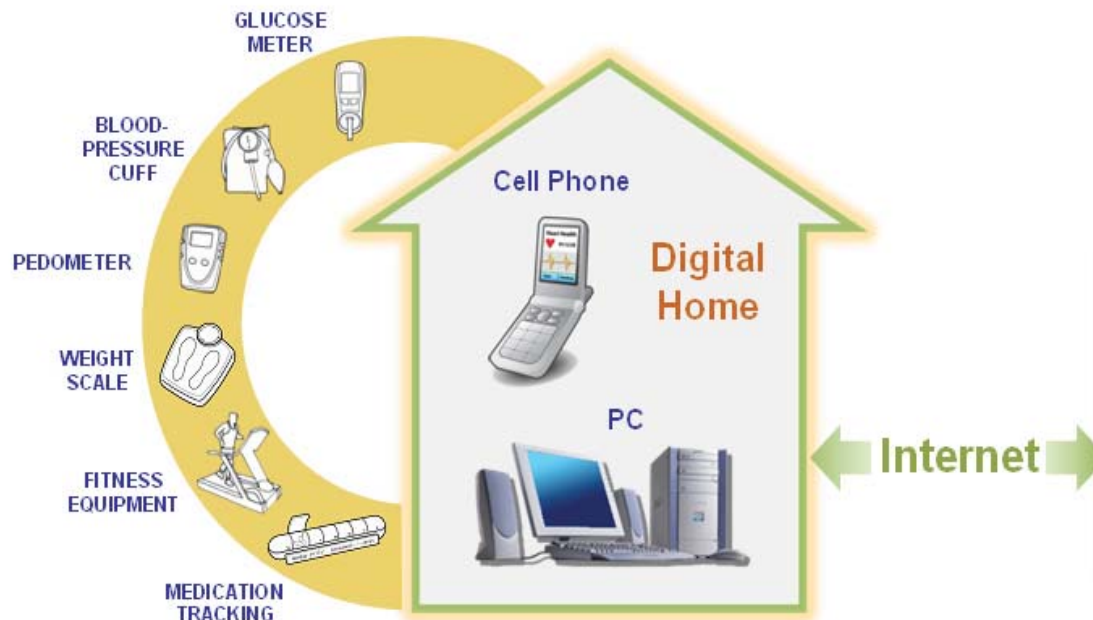
**Healthy Family**

## Health & Wellness

- Weight loss
- Fitness
- “Worried Well” vital sign monitoring:
  - Weight
  - Blood pressure
  - Glucose
  - Cholesterol
  - Activity level
- Personal Health Records
- Appointment scheduling

## In the future...

- Extension of healthcare system into the home
- Initial triage of non-emergency conditions
  - Vital signs
  - Images
  - Email / chat / video



*Continua member companies help people live healthier, more active lives by connecting them to their health and wellness team through a more efficient exchange of their personal fitness information.*

Weight loss and fitness coaching

Healthcare Professionals

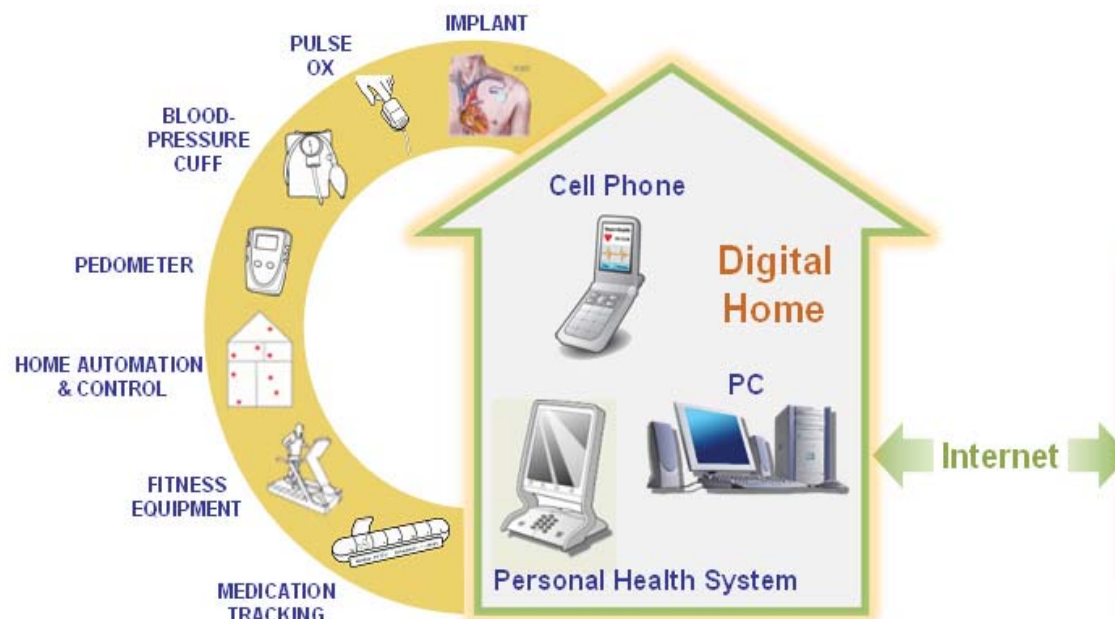
Personal Health Record



- Independent living
- Chronic disease

## Aging Independently = „Ambient Assisted Living“ !

- An adult child helping their elderly parents age gracefully in their own home
- Basic life monitoring as appropriate (ADL):
  - Bed pressure (sleep)
  - Bathroom sensor
  - Gas / water sensor
  - Emergency sensor
- Vital sign monitoring (RPM)
- Medication reminders and compliance
- Trend analysis and alerts
- Email, chat, video
- Appointment scheduling

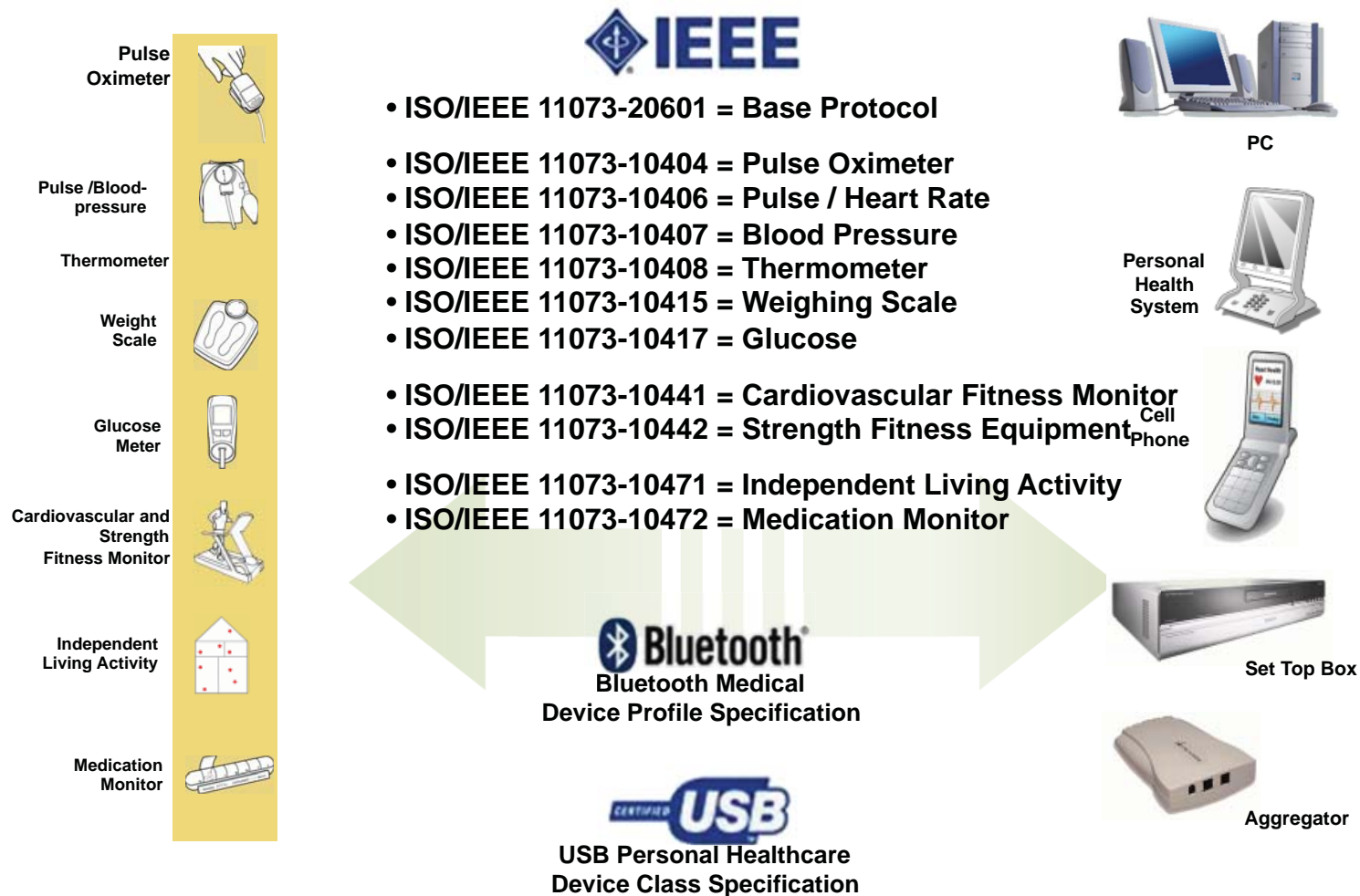


*Continua member companies help the elderly age independently, with dignity and security, through the efficient exchange of personal health and safety information that connects them to their family and care team.*





# Continua Version One Device Connectivity Standards



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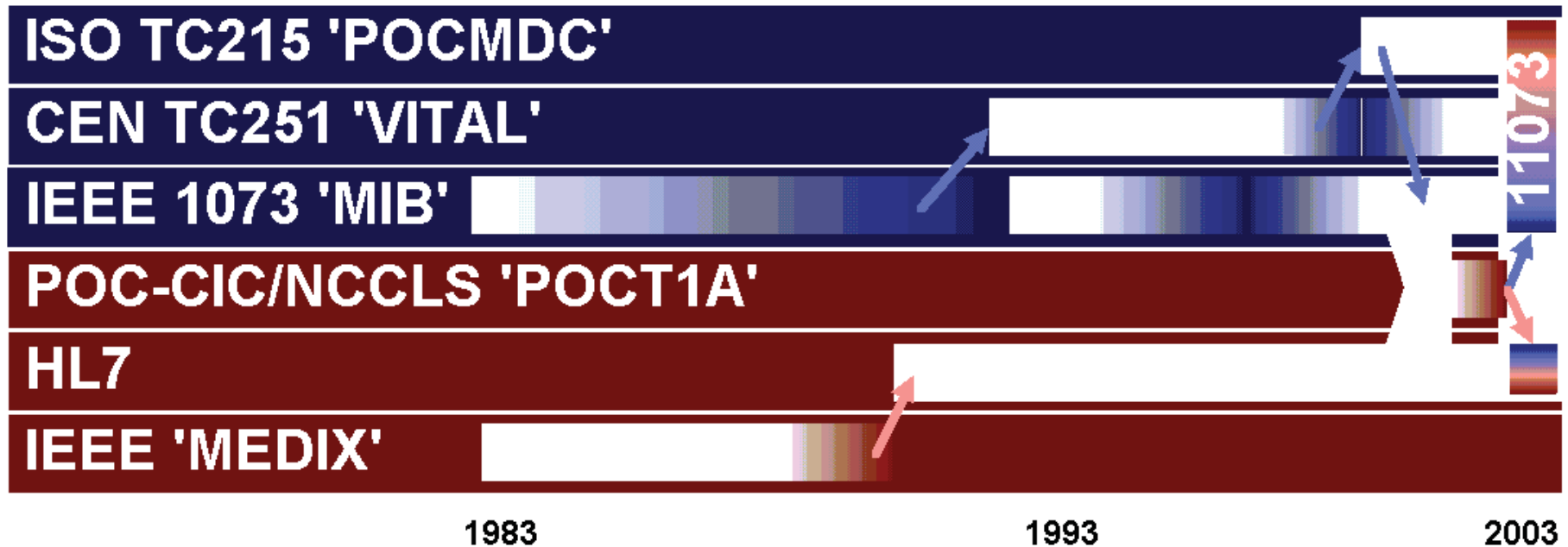
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## **Why were ISO/IEEE 11073 standards & group selected for (Continua) Personal Health standardization?**

- Respected standards body with open participation
- Harmonized with ISO for International Standards
- Also harmonized with NCCLS/CLSI, HL7, CEN TC251, ISO TC215, IHE, FDA, and NIST
- ISO/IEEE 11073 already formed and active
- ISO/IEEE 11073 Charter contains health care devices
- Standards structured to be transport portable
- Able to support Disease Management, Health and Fitness, and Independent Living
- Low cost for membership and access to standards

# Development of CEN/ISO/IEEE 11073 Standards

A history of co-operative and complementary working (1983 -2003):

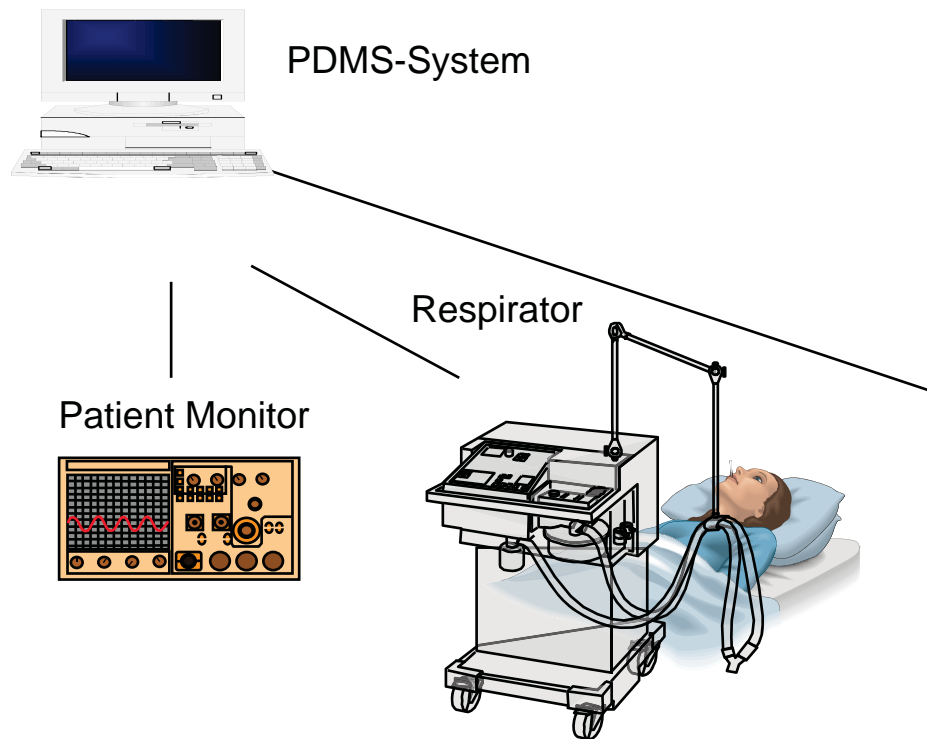


Arrows indicate effective transfer of development and/or maintenance responsibility.

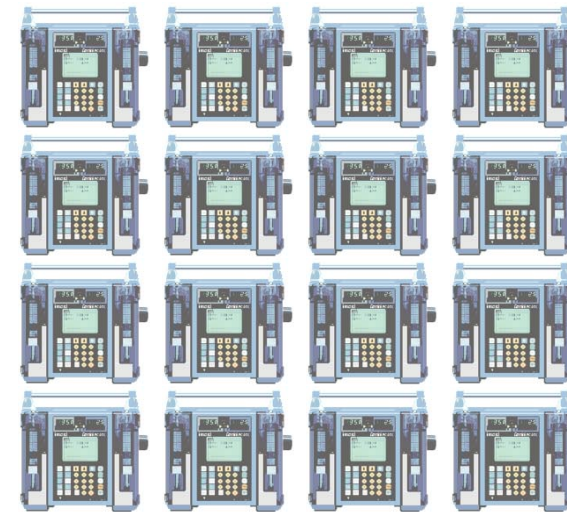
**CEN TC 251/WG IV VITAL Work Items**

- | Number                             | Year        | Title   |
|------------------------------------|-------------|---|
| • ENV 1064                         | 1993        | Medical informatics -<br>Standard communication protocol -<br>Computer- assisted electrocardiography                                  |
| • ....                             |             |   |
| • ENV 13728                        | 1999        | Health informatics - Instrument interfaces<br>to laboratory information systems   |
| • ...                              |             |   |
| • <b>ENV 13734</b>                 | <b>1999</b> | <b>Health Informatics - Vital signs<br/>information representation<br/>(CEN Project Team PT021 VITAL 1994-1997)</b>                   |
| • <b>ENV 13735</b>                 | <b>1999</b> | <b>Health Informatics - Interoperability of patient<br/>connected medical devices<br/>(CEN Project Team PT035 INTERMED 1998-2000)</b> |
| • ...                              |             |   |
| • <b>SSS-HIDE</b>                  | <b>2001</b> | <b>Health Informatics – Strategies for<br/>and integration of device-level<br/>wide methodologies</b>                                 |
| • harmonisation<br>and enterprise- |             |   |

## CEN 13734/35 Scenario: Intensive Care

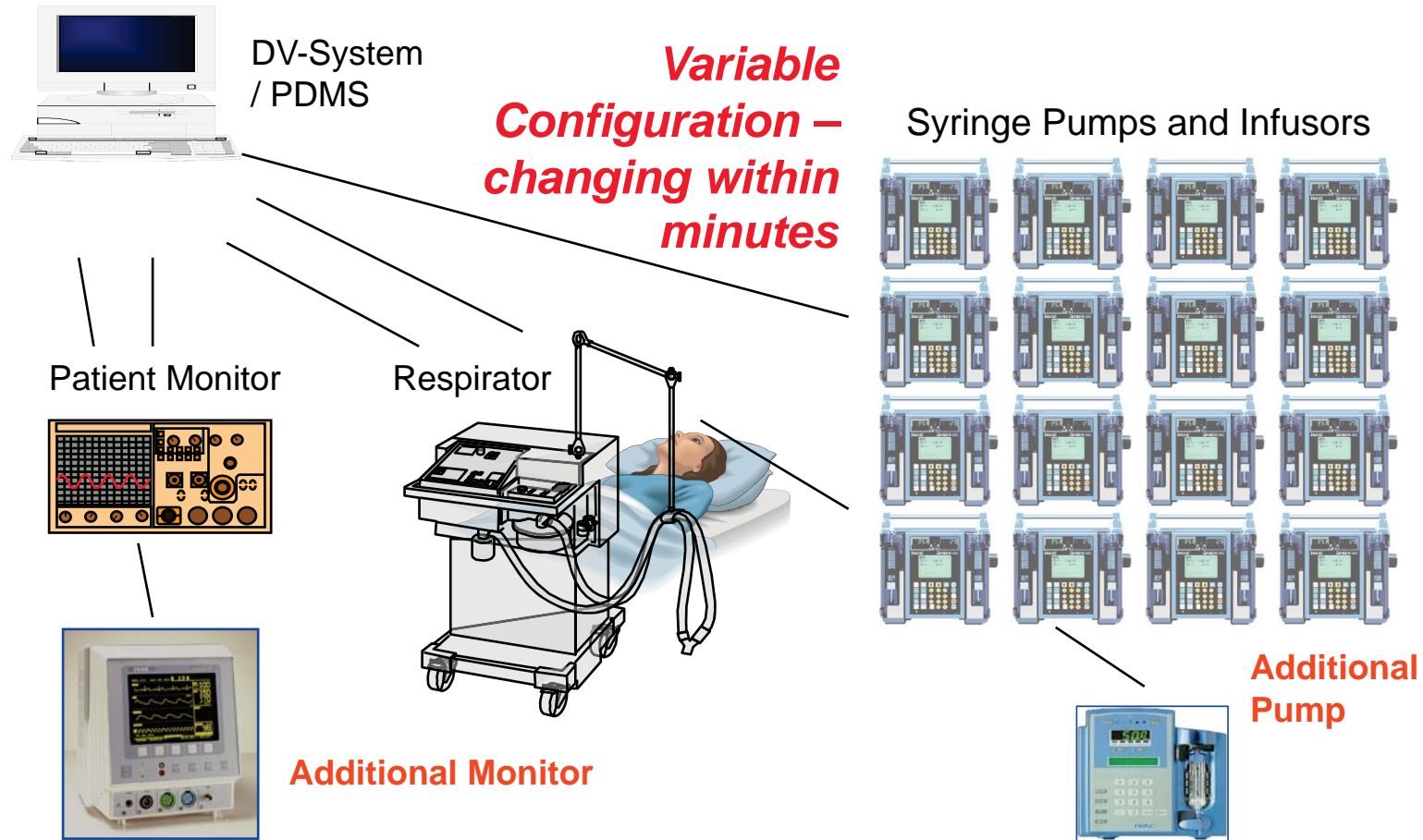


### Syringe Pumps and Infusors

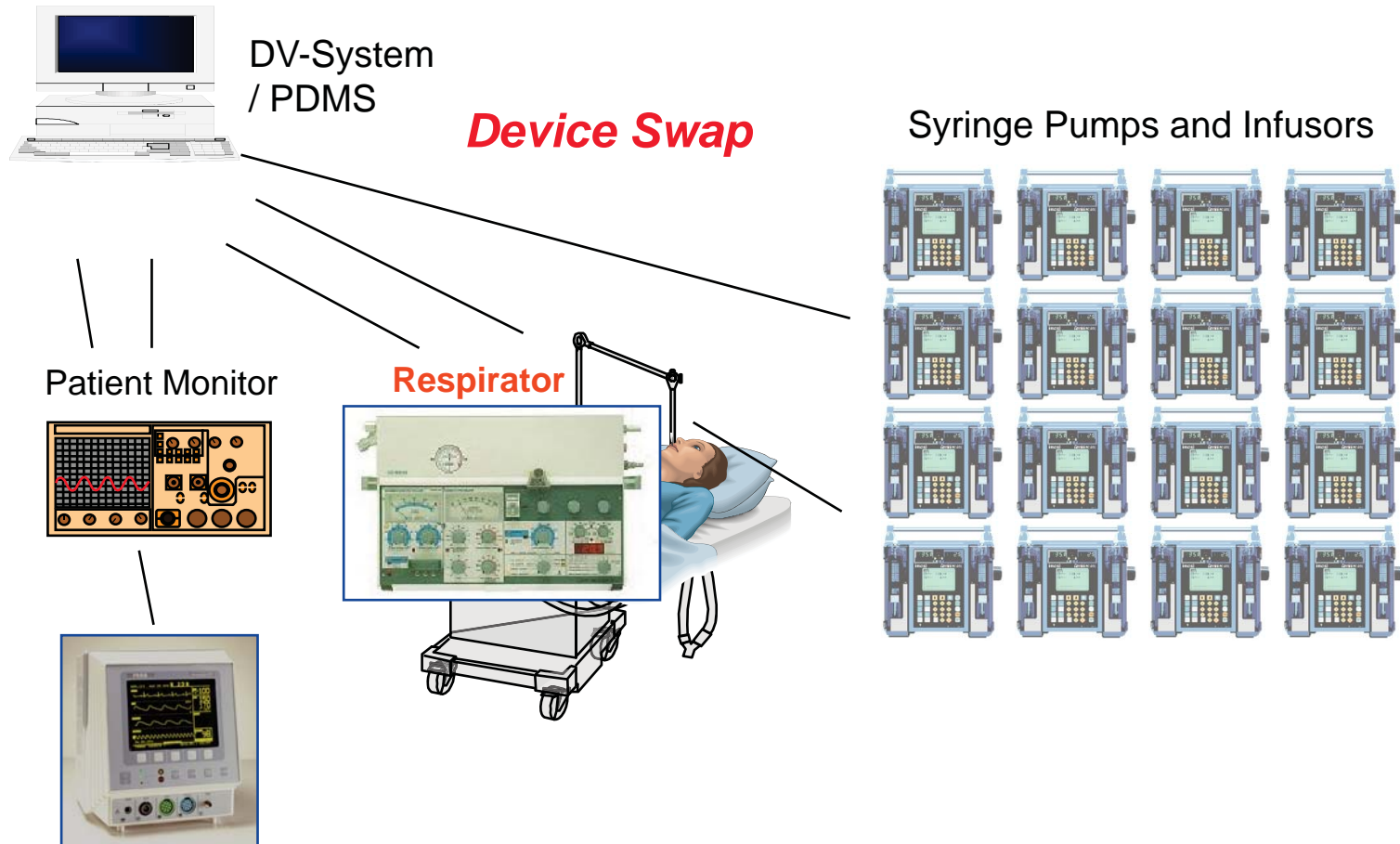


***“Plug & Play”  
Functionality:***

## CEN 13734/35 Scenario: Intensive Care



## CEN 13734/35 Scenario: Intensive Care



## Device Interoperability & ISO/OSI Context

### “Health informatics”:

- generally interpreted as relating to ISO/OSI Level 7 (HL7!)

### Medical Device & (Mobile) Personal Systems Interoperability:

- implies all ISO/OSI Levels,
- defines/ modifies standards in ISO/OSI levels 7 – 5
- in levels 1 – 4 chiefly references to other standards  
(such as 802.x, IrDA, BT, ...)

ISO/OSI Level 7: Application

ISO/OSI Level 6: Presentation

ISO/OSI Level 5: Session

ISO/OSI Level 4: Transport

ISO/OSI Level 3: Network

ISO/OSI Level 2: Datalink

ISO/OSI Level 1: Physical

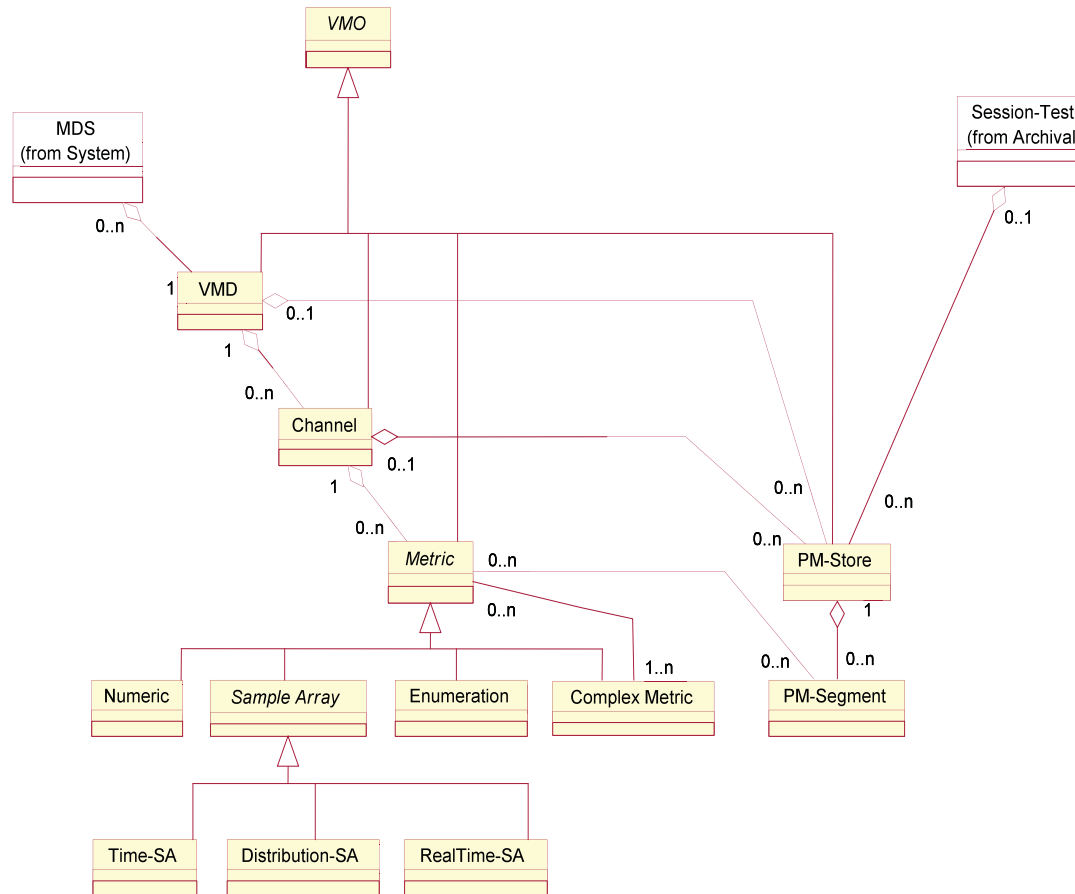


## Domain Information Model

An object oriented data model that specifies objects, attributes, attribute groups, event reports, and services that may be used to Communicate device data and to control / configure the reporting of information...

- **Medical Devices and functionalities**
- **Measured Data and Settings**
- **Alert Information**
- **Remote Control**
- **Patient Information**
- **Communication**

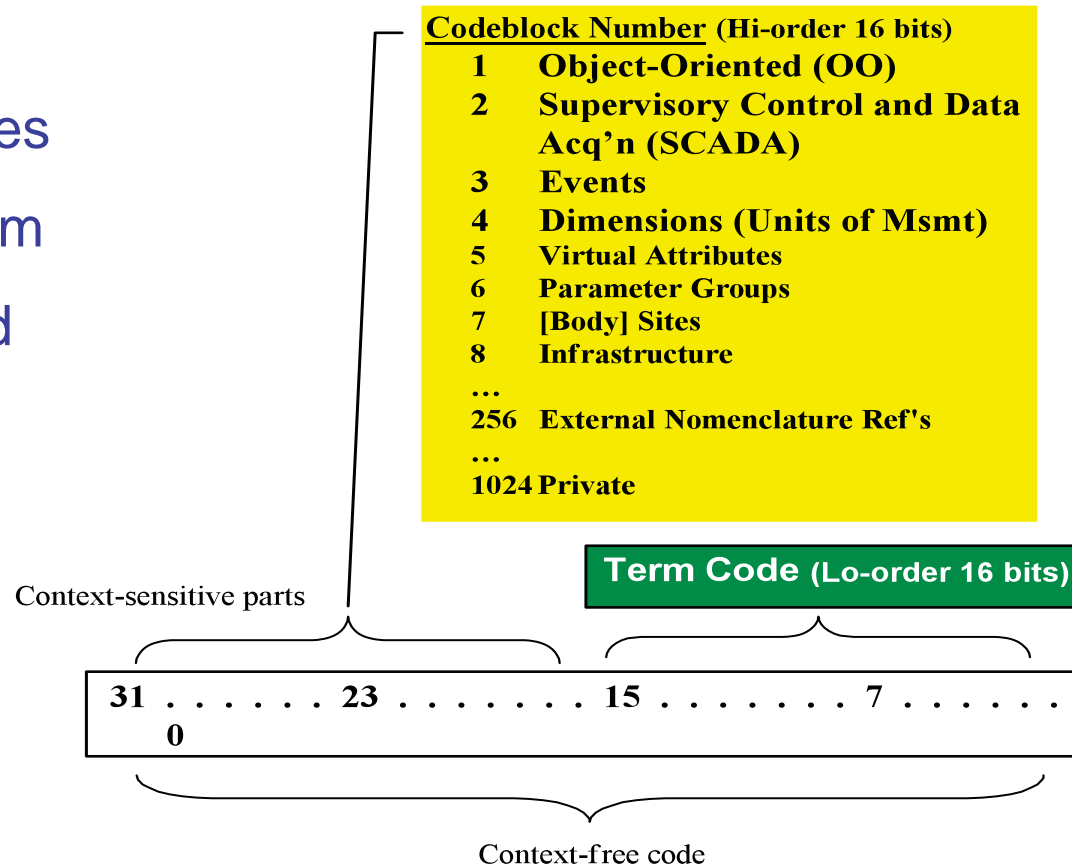
## Domain Information Model



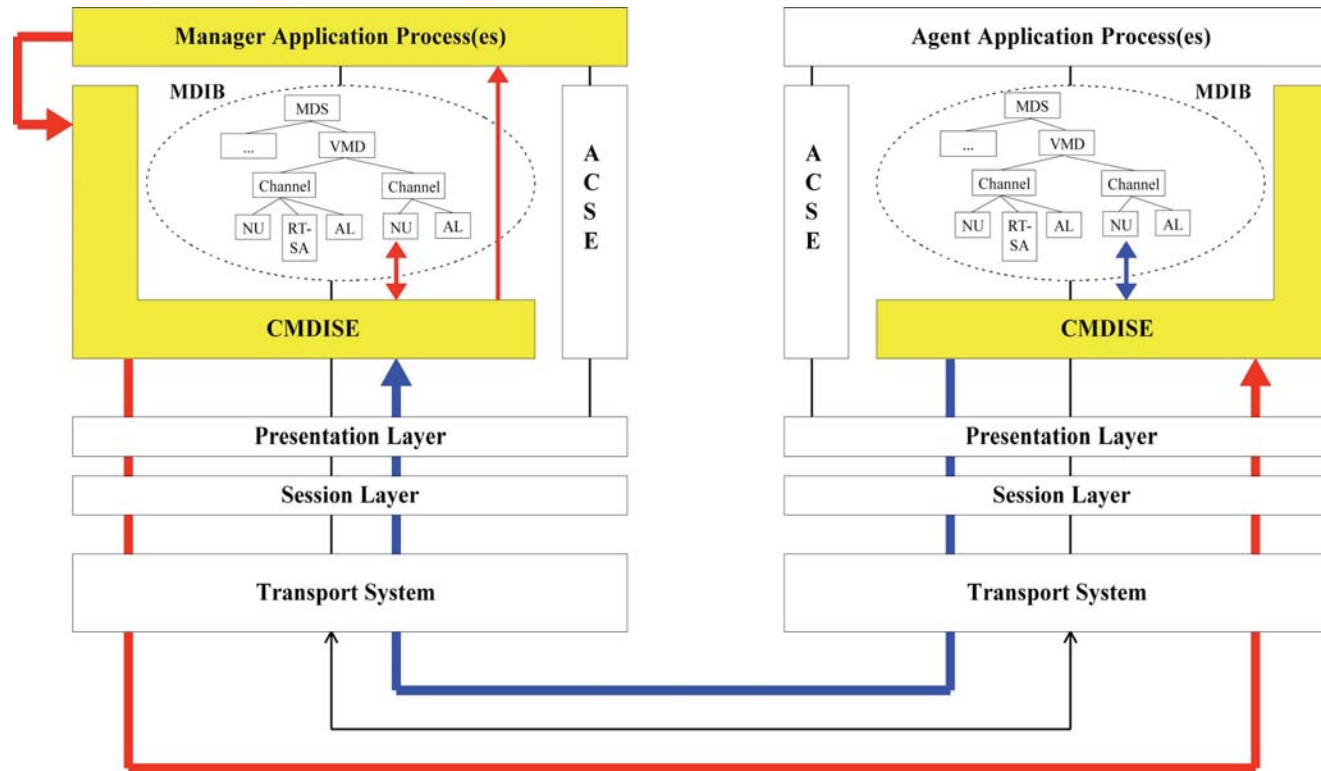
## Nomenclature Concept

Nomenclature:

A set of numeric codes that identify every item that is communicated between systems.



## Agent/Manager Communication Architecture



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**Large-scale integrating project (IP) proposal**  
**ICT Call 4**  
FP7-ICT-2009-4

**Objective 7.1b –**

**Open Systems Reference Architectures, Standards and ICT Platforms for Ageing Well:**

this should facilitate, interoperability, systems integration ... and services for independent living, smart workplaces and mobility of elderly people and for their carers. ... Concrete **contributions to relevant standardisation** is expected as well as a clear approach for making the **resulting work available to the wider community**

**UNIVERSal open platform and reference Specification for Ambient Assisted Living**



Inspired from the Rhyme from Tolkien's Lord of the Rings

FP6

[www.aal-persona.org](http://www.aal-persona.org)

[www.sintef.no/Projectweb/MPOWER](http://www.sintef.no/Projectweb/MPOWER)

[www.soprano-ip.org](http://www.soprano-ip.org)

[www.hitech-projects.com/euprojects/amigo](http://www.hitech-projects.com/euprojects/amigo)

FP7

[www.oasis-project.eu](http://www.oasis-project.eu)

[www.genesys-platform.eu/](http://www.genesys-platform.eu/)

[www.vaalid-project.org/](http://www.vaalid-project.org/)

[www.aaliance.eu](http://www.aaliance.eu)

List of initiatives	Good results		Things to improve	
	Technical	Non-technical	Technical	Non-technical
<b>AMIGO</b> (closed)	<i>Ontological approach for the interoperation of components Strong connection to home appliances</i>	<i>Partly open source solution. Existence of a stable community</i>	<i>Not addressed the mobile environment Deployment, initialization &amp; configuration</i>	<i>More powerful community Acceptance and usage</i>
<b>MPOWER</b> (still running)	<i>SOA based, what means stronger connection to industry trends. Rapid deployment tool</i>	<i>Open source solution</i>	<i>Not addressed the mobile environment. Few reference services were implemented</i>	<i>More powerful community Acceptance and usage</i>
<b>PERSONA</b> (still running)	<i>Flexible platform, supports mobile, hardware abstraction layer for ZigBee devices, very complete user interaction and personalization approach.</i>	<i>Clear business propositions. Under construction: open source (platform and hardware abstraction layer).</i>	<i>under construction: a flexible security framework tools to simplify service deployment</i>	<i>Lack of a development community (although envisioned)</i>
<b>SOPRANO</b> (still running)	<i>Context-awareness, Around 10 services to be implemented Good ontological approach.</i>	<i>Good results in user requirements collection</i>	<i>More involvement of mobile based services</i>	<i>Platform should be more clearly published</i>
<b>OASIS</b> (still running)	<i>Ontological interaction approach between legacy applications</i>	<i>Hundreds of users to test the proposed solution.</i>	<i>Still under development</i>	<i>Still under development</i>
<b>VAALID</b> (still running)	<i>The whole project develops a tool for modelling, prototyping and simulation of AAL Solutions.</i>	<i>Good solution to evaluate how tools are delivered effectively to software producers.</i>	<i>Still under development</i>	<i>Still under development</i>
<b>GENESYS</b> (still running)	<i>Good approach for devices abstraction layer</i>	<i>Initiated by ARTEMISIA</i>	<i>Still under development</i>	<i>Still under development</i>
<b>CONTINUA</b> <i>Ref. Arch.</i>	<i>Profiling standards for connected health and wellness and telehealth</i>	<i>One of the strongest world wide industrial communities in its field.</i>	<i>Very focused on interaction at the level of devices. Lack of technical proposal for high quality intelligent services.</i>	<i>Initial focus on telehealth domain rather than assisted living domain. Widely adoption of reference specifications is still starting (promising).</i>

# Thank you for your attention

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