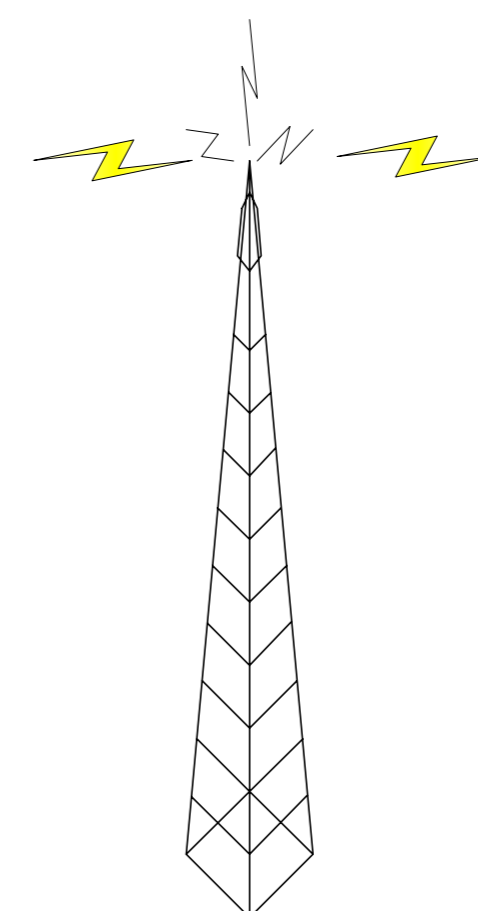


The European Commission have set ambitious e-Health targets for member states to achieve in the coming years. In particular, Member states should develop Health Information Networks, accelerating information flow through health care systems. e-Health applications of the future will involve mobile patients interacting with a ubiquitous computing environment that detects their activity, current context and adapts accordingly. However, the promise of such ubiquitous computing environments will not be realised unless these systems can effectively disappear. Developing the architectures, tools and techniques which permits such environments to become self-managing is therefore essential.

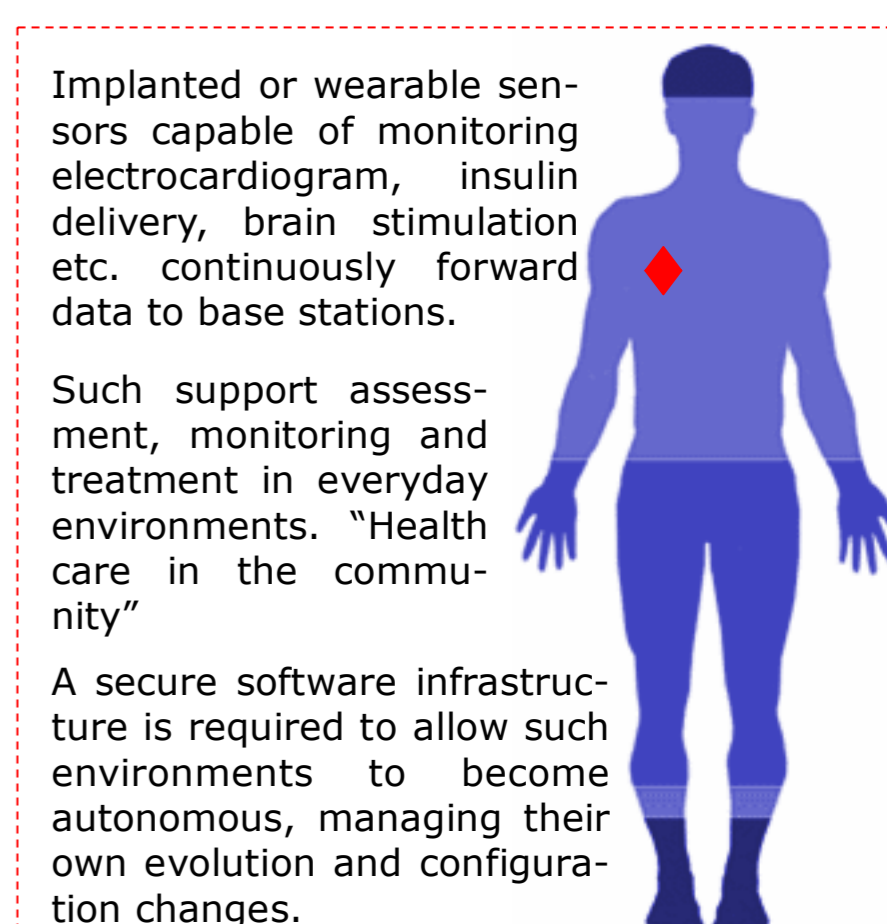


Patient data is made available remotely to health workers, allowing constant, accurate patient monitoring. This could provide doctors the data required to advise patients or forewarn emergency teams of danger etc. Such data would be passed to such institutions via a form of e-Health Service Provider.

Health Broker



Public Operator



Implanted or wearable sensors capable of monitoring electrocardiogram, insulin delivery, brain stimulation etc. continuously forward data to base stations.

Such support assessment, monitoring and treatment in everyday environments. "Health care in the community"

A secure software infrastructure is required to allow such environments to become autonomous, managing their own evolution and configuration changes.

Personal Area Network

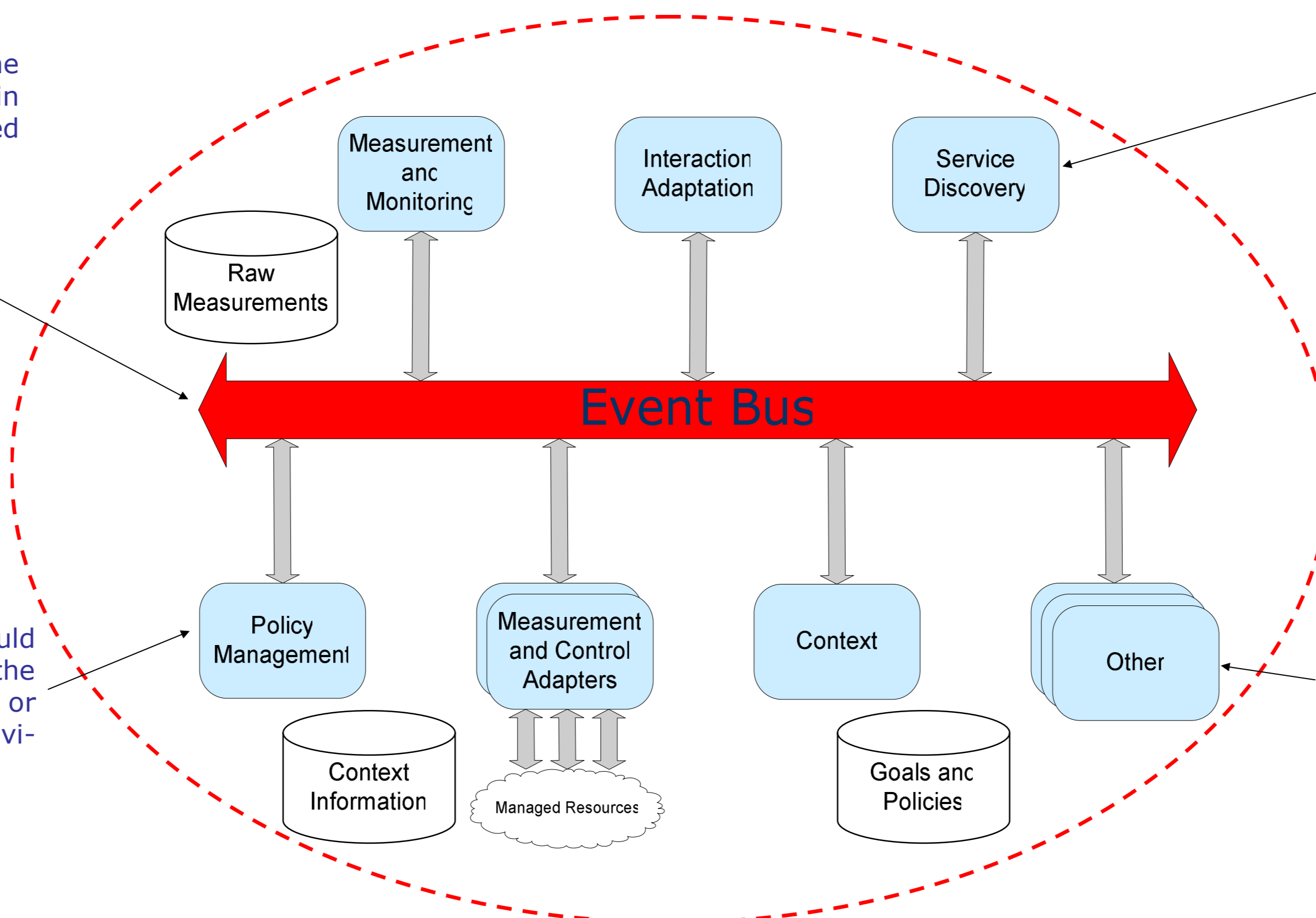
## The Self-Managed Cell

Existing technologies such as the Java Messaging Service or Elvin DSTC will be evaluated, adapted and employed as the event bus.

Usually composed of the Registration Service and Lookup Service.

Specifies which adaptation should occur in response to changes in the state of the managed resource or changes in the context of the environment.

Other services may include accounting, resource planning optimisation and analysis.



To provide self-management at varying levels we advocate the concept of a self-managed cell (SMC). The cell itself consists of hardware and software components which form an administrative domain capable of functioning autonomously. The services offered by the cell interact through asynchronous ex-

changes over an event bus. The minimum requirement for the cell would include functionality for measurement and event correlation, policy-based control mechanisms, a discovery service and management components.

*Self-Configuring : Self-Optimising : Self-Healing : Self-Protecting*

## Research Challenges

1. Specifying the required management functionality, dynamically altering resources, deploying across distributed nodes and making the SMCs adaptive and context aware?
2. Expressing, deploying, enforcing, refining and managing policies in relation to various SMC types and structures?
3. Supporting the adoption and configuration of SMCs into larger structures and promoting scalable SMC structures?
4. Determining what management interaction is required for composed, layered and peer-to-peer SMC structures?

## Work Packages

1. The SMC will be defined and we will implement the core SMC pattern in terms of the monitoring, service-discovery, context and policy-control services.
2. A study will be conducted into how SMCs can be dynamically joined into larger structures.
3. Techniques will be reviewed into how individual SMCs can be composed and subordinated.
4. Specialised SMCs will be created and assessed for two e-Health application scenarios.