Ontology Services for Point-of-care Medical Device Communication, Maintenance Agency — project outline©

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This project targets creation of a shared resource to enable a more effective worldwide implementation of EN ISO/IEEE 11073: Health informatics - Point-of-care medical device communication standards, thus opening markets for integrated home, community and provider-site care provision.

The EN ISO/IEEE 11073 standards enable communication between medical devices or between devices & external computer systems, providing real-time plug & play communication of patient vital signs information, therapy and operational data. Information from such systems that collect real time data from multiple devices can be used use to detect patient safety problems (e.g. adverse drug events) allowing checking of the patient's condition and perhaps adjustment to the device's operation. The plug-and-play aspect means that the user only needs to make the connection – the systems automatically detect, configure and communicate without human intervention. The choice of EN ISO/IEEE 11073 as the basis for the development of such a level of interoperability is well founded in that major vendors, heath authorities and user interests support it. The UK NHS National Programme for Information Technology has mandated use of the standards for medical device communication. In the US the Federal Drug Administration Center for Devices and Radiological Health has set up a liaison with IEEE-P1073 to ensure that patient safety and efficacy concerns are fully addressed in the standards.

The EN ISO/IEEE 11073 set of standards fall into four main partitions:

1. transports;
2. general application services;
3. data representation;
4. interworking & gateways (to other non-real-time communications).

It the third of these that is causing the most concern and which is the basis of this proposal.

When devices communicate such items as 'heart rate' or 'temperature', it is imperative that the concept and the parameters that are used to provide values are made very explicit. Unfortunately, device manufacturers often have their own interpretations of such concepts that make it unsafe to for other systems, devices or health professionals to accept values and to act upon them without a detailed knowledge of the device, measurement technique and/or the concepts they are using. The EN ISO/IEEE 11073 standards derive directly from international consensus amongst users, specifiers and manufacturers and have the specific aim of reducing or eliminating these problems.

In order to achieve this there is already a collection of many thousands of terms (concepts) and their representations. However, as the number grows so does the complexity of manually vetting additional terms that may be duplicates with possibly similar, but not identical, properties.

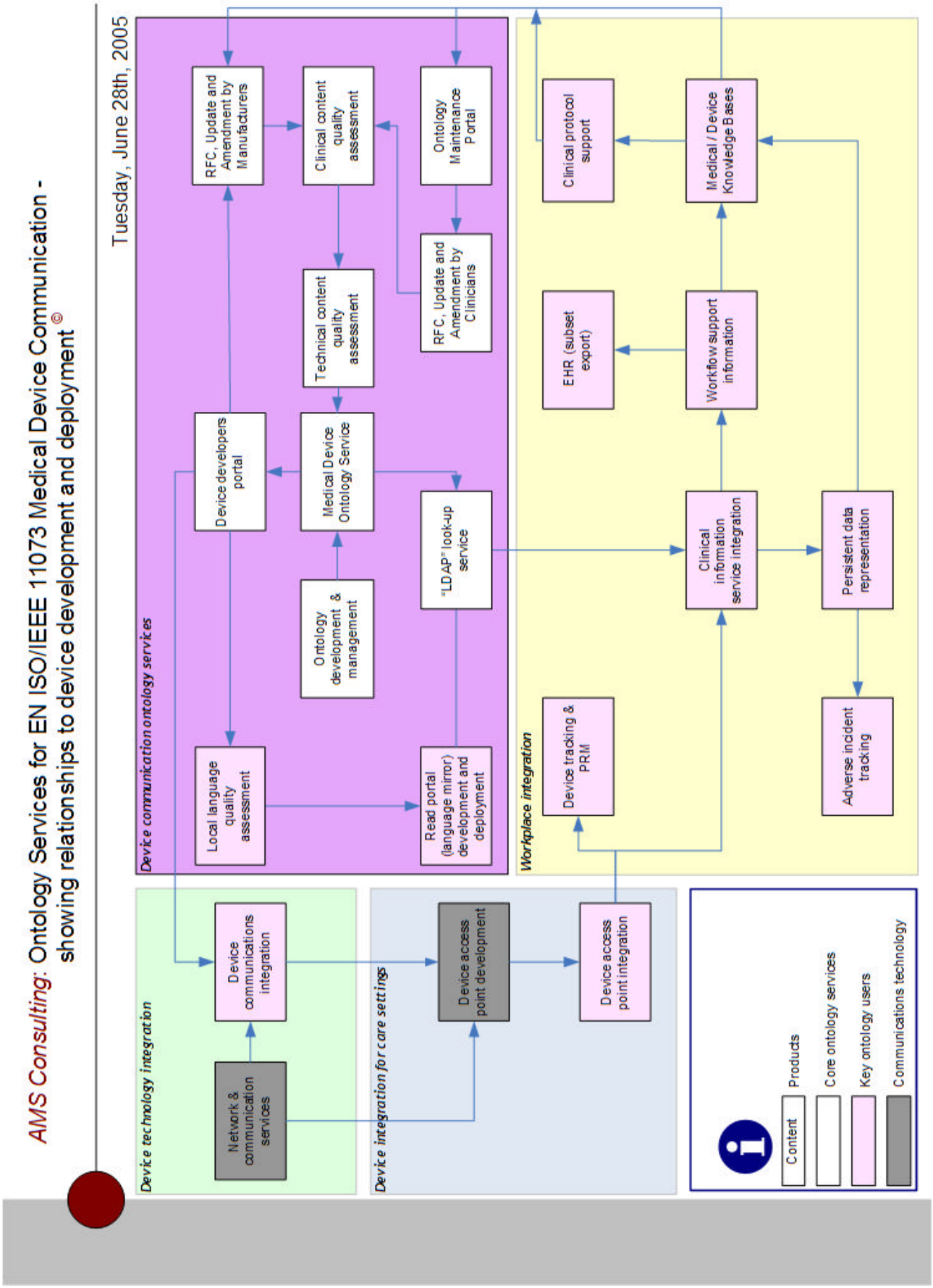
The achievement of any meaningful communication between devices, and their population of electronic health records, is totally dependent on the use of the EN ISO/IEEE 11073 series of standards. Without these standards it is not possible to accomplish any form of coherent information exchange between devices and records. However, the robust methodology (ontology) that enables these definitive statements is not currently underpinned by any maintenance tooling.

The complete project (it will need to be tackled in phases) therefore has the aim of providing an international registration, maintenance, and dissemination resource (Maintenance Agency) where:

- For device manufacturers, existing terms that already meet their requirements (and to which they only need to prove conformance) are made available through web-based tools which will aid communication software production;
- For clinical domain or device users, new terms can be vetted and registered (or rejected). The to be by multi-national panels of experts representative of each community;
- For non-English users and manufacturers, multi-lingual support can be populated and provided by using the existing EN ISO/IEEE 11073 language-independent terminological syntax;
- For recipient software applications, a real-time reference directory can be provided such that they can look-up and adopt new terms already deployed in devices but of which they are hitherto unaware.

It is seen as imperative that the Maintenance Agency is independent of both device suppliers and national device regulatory bodies. A UK-based not-for-profit body would be well placed to provide such a service and provide a degree of independence acceptable to major manufacturers in Europe, the Far East and the Americas.

Once the Maintenance Agency is established it will produce definitive content to EN ISO/IEEE 11073 under the auspices of the IEEE Standards Association, and will be self-financed through user subscriptions.


AMS Consulting: Ontology Services for EN ISO/IEEE 11073 Medical Device Communication - showing relationships to device development and deployment ©
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Device technology integration
Network & communication services
Device communications integration
Device integration for care settings
Device access point development
Device access point integration
Device communication ontology services
Local language quality assessment
Device developers portal
RFC, Update and Amendment by Manufacturers
Ontology development & management
Medical Device Ontology Service
Technical content quality assessment
Clinical content quality assessment
Read portal (language mirror) development and deployment
"LDAP" look-up service
Ontology Maintenance Portal
RFC, Update and Amendment by Clinicians
Workplace integration
Device tracking & PRM
Clinical information service integration
EHR (subset export)
Workflow support information
Clinical protocol support
Medical / Device Knowledge Bases
Persistent data representation
Adverse incident tracking
Products
Content
Core ontology services
Key ontology users
Communications technology