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The eHealth Transformation Key: The Integration Competence Centre

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The Integration Question

Over the past 10 years, computer-based patient record systems have been increasingly used in hospitals the new technological era we are living in than in response to a clear request on the part of physicians, or due to the obvious benefits that such a system is able to offer The installation of these systems has often proven to be incomplete; departmental systems have only included some of the areas and display different objectives (patient management, data acquisition, exams, prescriptions, etc.)⁵

The idea of a "global solution" or of a single application that will work for everything is simply not feasible in organisations that have a number of functional levels with their own specific technological solutions. Suppliers are not currently capable of offering the range of solutions required by a complex organisation and acknowledge the crucial importance of the integration question⁶.

This evolution takes on similar features in hospital computer systems that are made up of various hospital computer departmental applications. Interoperability and integration represent the key to success for eHealth processes. To this end, the implementation of an integration engine and the use of a standard and universal language represent equally important requirements for a hospital computerisation project. As part of a memorandum drawn up in 2002, Gartner stated that organisations employing the professional services of independent integrators may obtain direct benefits, in terms of reduced development costs and improved integration stability⁷

The organisation's competence in terms of application integration therefore appears crucial for the purposes of developing a real-time enterprise.

Creation of an Integration Competence Centre (ICC)

An Integration Competence Centre is a new concept of an independent organisational technical-functional group from the IT department, with advanced capabilities and tools such as:

- Clinical workflow understanding;
- Integration methodology and skills;
- Knowledge of industry standards (HL7, DICOM, IHE) and terminologies (SNOMED, LOINC); and
- An independent Enterprise Application Interface (EAI).

While the hospital or corporate ICC can consist of an organisation's own technicians or be out sourced to an external company, certain requirements have to be met. First, it must be an independent organisation, not linked to any involved information system - the ICC task is only to integrate. Secondly, there must be deep expertise in the EAI tool to ensure the maximum profit. General consulting companies do not normally provide deep expertise.

The Integration Engine (EAI)

An integration engine is a software tool that has been specifically conceived to simplify the creation and management of interfaces between single applications and systems within an organisation. Integration engines share messages amongst the various systems and allow for the

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management, mapping, translation and modification of data between separate computer systems in order to guarantee an actual data exchange within the organisation, as illustrated in Figure 1.

The employment of an independent integration engine into the ICC guarantees, to the end user, complete transparency in connection with each individual application. Message conversion, transformation, or mapping is graphically and visually duplicated in the EAI tool. This, in turn, makes it possible to monitor and evaluate said processes, thus ensuring a clear vision as to the role played by the various applications involved and making it possible to see which of these roles needs to adapt to the final process. The employment of an independent EAI allows the final customer to make an advised assessment, monitor the problems and reach a final opinion.



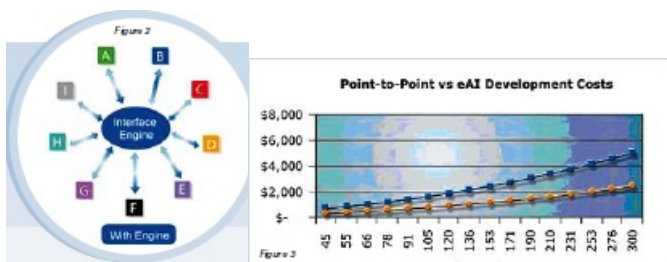
There are several integration engine tools on the market. Before starting up an ICC in the Health Organisation, a deep evaluation about integration engine tools has to be done, taking in consideration objective market analysis (looking to objective industry-recognised evaluations in selecting products) and specific requirements from each organisation that are only known by the organisation.

Gartner have issued reports about Integration Competence Centres functionalities and roles. One important key factor that market studies note is that an integration engine for an ICC in Healthcare should ideally be an independent and specialised integration engine. Figure 2 Klas, market intelligence leaders (www.healthcomputing.com), produces a well-known yearly market analysis report about EAI. It is a product market evaluation of different EAI providers, reviewing more than 20 indicators. The last evaluation, presented in March 2006, "INTERFACE ENGINE MARKET REVIEW 2006" TM from Orion Health as best integration engine available in the healthcare Rhapsody market.

Benefits of ICC

One of the benefits of using an ICC is savings, in terms of technological unit development and maintenance costs. Market analysts state that organisations usually invest between 40% and 60% of the funds budgeted for technology on integration, and attribute most of these expenses to the maintenance of existing interfaces. EAI reduces new interface creation costs by 50% and can contribute to a reduction of pre-existing interface maintenance costs by 80%.

Based on a study conducted by Forrester Research in the field of cost savings, it was found that "by investing in integration architecture and work planning, companies can reduce EAI project costs by \$710,000 (500,000) in five years". This statement gives an idea of the return on investment that can be achieved by an integration architecture strategy compared to the development of point-to-point interfaces (see Figure 2).



In addition to cost savings, there are also many strategic benefits that can be realised from developing an ICC:

- Systems integration and simplified development: computer system development taking place in a non-destructive manner, by automatically adapting the process to the development timing for each element (HIS, Laboratory, RIS, PACS, etc.) and connecting all the data to the integration bus;
- Citizens' accessibility and continuity of the healthcare service: the adoption of standard interoperability platforms and of standard languages for healthcare data communications (HL7, CEN/TC-251, DICOM, IHE) significantly simplifies communication amongst the various health care centres (First Aid – Specialists, Public Sector – Private Nursing Homes), as well as among the various independent communities and towns, with the resulting consequence that healthcare assistance can be extended to citizens wherever they are, also ensuring the necessary healthcare information and activity control (cohesion funds, European patients' movements, etc.);
- Independence of suppliers and system management;
 - Absolute flexibility in identifying any software solution, with the only aim of meeting the standards set by the organisation in order to establish a connection with the integration bus;
 - Added value: this represents the necessary basis, for the purposes of developing systems based on hospital workflow and of supporting healthcare decision-making;

A necessary foundation for the purposes of developing new projects based on interoperability (electronic prescriptions, domiciliary care, etc.) in which the coordination between the various organisations plays a crucial role and eliminates the imposition of a single software supplier;

- It allows the management to have the planning and the controlled and safe development of healthcare computerisation applications and systems - the EAI platform must guarantee a safe and coded connection of operating data;
- Efficiency and hospital administration processes improve-it simplifies the exchange of appointments, cross-consultations, registration relations and laboratory test results interchange by significantly reducing the timing related to waiting for results or transferring X-rays and reports, as well as to the related distribution to the healthcare centres;
- It improves the safety, control and traceability of data shared between different centres; and
- Control over critical processes taking place at the healthcare centres is improved in terms of the processing of waiting lists, admissions and transfers. The sharing of data by means of the EAI makes it possible to record the critical times of the processes, thus ensuring that they are reviewed and improved.

The Future of ICC Development

The employment of an integration based on open platforms and standard languages is backed by a number of market studies conducted by industry analysts. From some hypotheses put forward by Gartner for the year 2005, the following data emerged:

- Over 50% of large enterprises will implement a corporate integration bus in 2006 (forecast 0.7)
- One-third of the Integration Competence Centres (ICC), among those that are most drawn to optimisation, will save on average of 30% in terms data interface development timing and 20% in terms of maintenance costs, thus obtaining a 25% recovery of integration components over the 2004 - 2007 period (forecast 0.8). The remaining two-thirds will not attain the result, owing to organisation problems and lack of human resources
- In 2008, 50% of the companies accomplishing B2B integrations will use a consolidated EAI to connect 50% of their partners and service suppliers (forecast 0.7)

The employment of an integration engine not only speeds up, but serves as a key element for, the development of regional national Electronic Health Records.

For a complete list of references contained in this article, please contact k.r@hitm.eu.

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