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### Hospital Mergers and IT in the Czech Republic

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The accession of the Czech Republic to the European Union has entailed dramatic changes in its hospital structures and healthcare delivery policies. IT has been both a driver and a passenger in such a process. An analysis of the experience of RHC, the Czech Republic's largest hospital group, shows the challenge of boarding a moving bus (namely the EU) and running ahead to its front. Its lessons may have relevance well beyond the country's borders.

#### ***RHC: The Czech Cutting Edge of Change***

Regional Health Corporation ("Krajská zdravotní, a.s.") consists of five hospitals with a long history – the regional Masaryk Hospital in Ústí nad Labem, and four district hospitals: Decín Hospital, Teplice Hospital, Most Hospital and Chomutov Hospital.

The RHC group has total of 3,350 beds and about 6,500 employees (838 doctors and 2673 nurses), and is the biggest healthcare provider in the Czech Republic.

RHC was created in September 2007 after the merger of the four district hospitals with Masaryk, owned by the Ústí Region, and itself already one of the country's largest and most modern health care institutions, ranging from super-specialised interventions to undergraduate and postgraduate medical education.

The RHC Center of Information Systems operates a proprietary regional optical network on the basis of dark fibre technology with a 10 Gbps backbone interconnecting all hospitals.

It also provides indirect connection via the national research network CESNET2+ for institutions in the entire region, using optical DWDM (dense wavelength division multiplexing).

As a data/communication RHC Center, Masaryk Hospital is the first Czech filmless healthcare facility and its PACS is used by all RHC hospitals.

#### ***Initial Situation: IT Background***

##### **Organisation Structure**

Each of the five RHC hospitals inherited its own IT department, whose position (and roles) in the organisation structure was different in each hospital. In Masaryk Hospital, the CIO was a member of the top management. All communication, information, security and reprography services, including medical devices services, were consolidated in the IT department – as were the medical archives, central and ancillary receptions, switchboard and help desk services. The CIO's responsibilities covered coordination of projects financed from structural European Union funds as well as a variety of development and research grants.

On the other side, it excluded activities such as those connected with clinical control, healthcare statistics, performance indicators, DRG etc., which fell under the purview of the controlling department of the organisation.

The intention during transformation was to create a shared IT services structure. However, such a radical change did not prove feasible in a

short period. The main obstacles were major differences in the structure and culture of the original five hospitals, procedural differences as well as limited

resources. So too were sensitivities about the potential impact on employees and patients.

What was therefore sought was a gradual shift of competencies in the field of IT from hospitals to headquarters. This is now in progress, while the IT substructure is itself intrinsically reorganised.

### ***Heterogeneous Information Systems***

Three RIC hospitals have clinical information systems (CIS), but they are different from one another. Two do not yet have a CIS. They also use three different financial systems, as well as different laboratory, radiology and pharmacy systems.

While the biggest hospital, Masaryk, uses advanced solutions, such as mySAP ERP 2005, data warehouses, modern middleware for integration of RIS – CIS – PACS, grid storage infrastructure, blade servers and IP telephone communication and videoconferences, other hospitals have been saddled with PCs running MS-DOS

as well as entire buildings without a local network or connection to the Internet.

### ***IT Transformation Strategy Within the New Company***

#### ***Parameters of IT Transformation***

At the beginning of 2007, start-up conditions for IT were defined as follows:

• ERP system mySAP in all hospitals

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Data and communication center in Masaryk Hospital

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Consolidation of IT and communications infrastructure and levelling the processes in all parts of the company

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Converging services to be managed together, as Information Systems/ Information and Communications Technology (IS/ICT)

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IT devices and information systems

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Medical devices • Communication and security devices

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Telecommunication devices

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Reprography and reprography devices

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Connection of medical libraries

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IS/ICT to be managed in compliance with ISO 9001:2000 and ISO 27001:2005 standards requirements and national accreditation standards

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Filmless and paperless hospitals conception

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Changes in IS/ICT and their management to support and speed up processes to make the new company more agile and effective (faster, more simple and cheaper)

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Taking note of future possibilities to become a part of a bigger group of health care providers in compliance with globalisation trends of this service sector.

***Minimum Required Parameters at the Day of Hospitals Merger***

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All hospitals have broadband connection to Internet

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System mySAP is filled with data to the extent that assures continuous operation of the hospitals after merger

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All mySAP users, necessary for transformation process, have suitable hardware configuration and Internet connection

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The adjustment and appropriate management of processes for transforming mySAP implementation into a routine operation status in the short-term

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All other information systems to attain an operation status, which protects the company from any kind of operating failure

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The change of IS/ICT is able to demonstrate the advantages of chosen form of legal status and organisation of the hospitals in the region.

***Goals During the Period of Transformation Time***

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Creating the regional optical network for hospitals

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Implementation of mySAP ERP

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Audit, analysis of ICT area

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Formulation of strategy and conception of IS/ICT area

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Launch of project realisation: Information and communication center of The Ústí Region hospitals – infrastructure for secured exchange of information and image health care documentation.

***Creation of Regional Optical Network for Hospitals***

One feature of IT supporting the transformation of hospitals into one company was to create a regional optical network hospitals with parameters that enable access to geographically remote working sites as one organisation, with a single information and telecommunication infrastructure. Masaryk Hospital in Ústí nad Labem completed the realisation in the period September 2006-August 2007 of a major project called "Public Internet in The Ústí Region hospital network", cofinanced from EU structural funds. This enabled the creation of a regional highspeed communication network among The Ústí Region hospitals on the basis of rented dark fibre connection between towns and the realisation of last mile access via the same technology. Modular active elements used in individual localities are equipped and ready to be transferred to 10 Gbps Ethernet. Protocol MPLS of the backbone network enables operation of a variety of information systems, including the regional health care

Information system, PACS etc. A crossregional PC network, owned and run by RHC, is connected to the Internet and the national academic network.

***Realised Goals***

The transformation of RHC has proceeded under conditions where target dates have been shifted several times, and in a way which disabled advance readiness, the conduct of audits and analyses of function areas and the formulation standardised strategies. Crucial projects were realised under time pressure and with parameters continuously changing, alongside implementation of information systems.

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Implementation of uniform enterprise information system

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CommonmySAP ERP 2005 system, salary information system, system for HR management, electronic ordering system and pharmacy system

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Implementation of electronic medical record

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Uniform data storage for digital image medical documentation, common web browser for PACS

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CIS in two remaining hospitals

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Exchange and sharing of electronic patient records within the company, including the whole region

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Preparation of patient portal with services, e.g. booking of health care

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Consolidation of IT infrastructure and services

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Implementation of uniform identity management

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Consolidation of telecommunication services

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Central HelpDesk

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Common intranet with uniform document management system

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Uniform security systems

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Consolidation of IT and communications environment

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Solution of critical status of IT in the second biggest hospital in the region.

### **Conclusion**

We have recently undergone one of the biggest reorganisations in the health care sector in our country. Without any prior experience, we have been forced to face changes we were expecting for several years.

However, the real character of these changes is being revealed to us as and when it is happening. Although we can review model situations describing ICT structures in hospital networks from overseas, we are now going through a unique experience with a real-life situation in a specific country.

Trying to reach optimal effectiveness and use innovations while simultaneously implementing modern e-Health concepts has required learning new approaches, which were previously applied by business and commerce - not healthcare at public hospitals.

However, knowing and adopting these new approaches is the only way to enable IT to drive company strategy and change management.

The requirements for this are likely to intensify in the years ahead.



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