

The National Finnish Patient Record Archive & EMC Documentum-DMX-Centera solution



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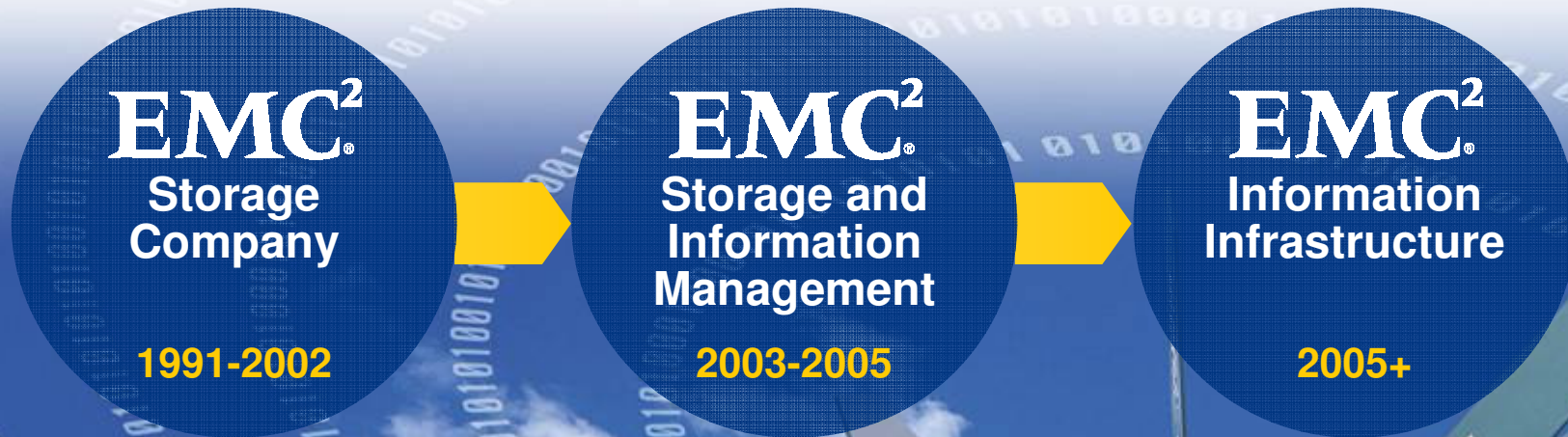


EMC Solutions for the Healthcare Market

EMC's Evolution

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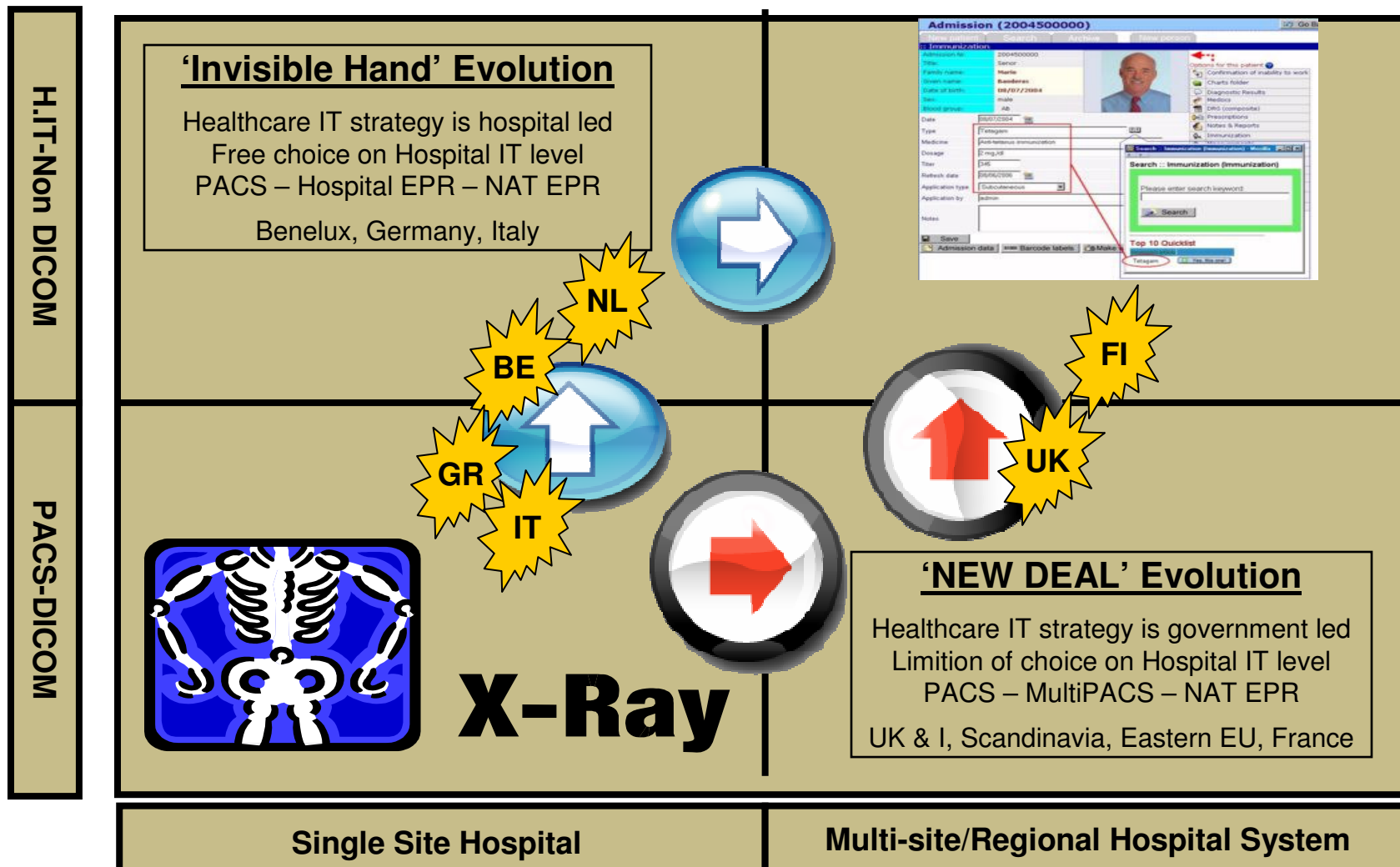
EMC's Evolution



EMC Solutions/technologies per healthcare sub segment

H.I.T-Non DICOM	<p><u>Digitization/IT Consolidation</u></p> <ul style="list-style-type: none"> -On-line storage (SAN/NAS) -Claims management (Documentum)/paper digitalisation (Captiva) - On-line universal archiving (Centera) - Patient portal (RSA) -Backup optimization (files, email, others) 	<p><u>Regional/National EHR</u></p> <ul style="list-style-type: none"> -EHR On line storage DB (SAN/NAS) -EHR On-line archiving (Centera) -Network management (SMARTS) - Patient record management & archiving (Documentum) - Patient portal/EHR security (RSA)
	PACS-DICOM	<p><u>Hospital PACS</u></p> <ul style="list-style-type: none"> -DICOM On line storage (SAN/NAS) -DICOM On-line archiving (Centera) -PACS DB backup solutions (Legato)
Single Site Hospital		Multi-site/Regional Hospital System

2 healthcare IT market evolutions; one end-station



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Project Background

Background of the national patient record project

- Finnish eHealth roadmap:
 - Launched mid 1990s
 - Underlying principle: development of integrated healthcare delivery service chains in the country
 - Requirements: new types of IT architectures and better compatibility between existing information systems
- First step (98-03) : regional architectures & reference directory
 - Regional Integration of patient information systems from different suppliers on the basis of messages integration (HL7)
 - Reference directory = contains data indicating which information system contained the actual electronic patient record required
 - 1998 : start of 1st region (SATAKUNTA) followed by Helsinki area, Pirkanmaa area and all other areas after 2000.
 - However the concept of regional reference directories failed ;
 - In practice: proprietary patient data directory
 - Very slow and not at all user friendly
 - Proprietary, no sharing possible between the different regional directories.

Background of the national patient record project

- Second step (02-07): definition national electronic patient record
 - Government resolution 11/04/02 : an integrated national patient record system is to be introduced by the end of 2007
 - Steering group at KELA (national actor) to implement national patient record
 - Principal requirements to which all local Finnish hospital IT systems should conform was published in 2005
 - Finnish government deblocked 30M Euro's to support adaptation of local Hospital IT systems during 2005-2007
 - Definition of the project showed that centralized services at national level are needed
 - In this context the creation of a **centralized national electronic registry (metadata) and repository (data)** for the healthcare sector emerged as a fundamental functional requirement.

Background of the national patient record project

- Centralized national electronic registry & repository
 - Sharing of data:
 - Point to point -> many to many
 - If information is not present in local EPR -> info search via national registry -> checking of permissions & consent -> delivering information -> keeping logged information
 - Overcome acceptance problems of regional archives (response times, availability, ease of use)
 - IHE XDS like
 - Document Sharing
 - Local Hospital IT systems like EPR/HIS/PACS/Lab act as sources and consumers of information
 - Central registry contains metadata
 - Central repository (archive) contains data
 - Universal Archiving:
 - Seperate application silo's -> all medical data
 - Repository will contain all types of patient content (images, eprescriptions, EPR summary data, lab data, images)
 - Patient Centric approach
 - Citizen view (lab results, imaging reports, booking, instructions, etc)

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IT requirements for the Finnish National Patient Record Archive

IT requirements to built the national archive

- Interoperability
 - Aim: attain operability between the different the different information systems (HIS, PACS, LIS, eprescriptions)
 - Technical interoperability: Finnish legislation enforces local systems to technically interoperate with to the national archive based on clear messages using international standards like HL7 CDAR2 (Documents) and DICOM (Images).
 - Semantic interoperability: based on national defined structure for the electronic health record. (existence of 30 thematic headings that have been agreed nationally).
 - Creation of national code service responsible for standardization of codes and classifications (STAKES)
 - Major training program to implement codes and structures

IT requirements to built the national archive

- Identification and authentication of patients:
 - Every Finnish citizen has an electronic ID card
- Identification and authentication of healthcare professionals
 - Finnish legislation requires the National Authority for Medicolegal affairs (TEO) to administer a certification service for all healthcare professionals
 - Administration of user authorizations will be organised on local level
 - Aim : introduce role-based and rule-based authorization based on international standards (SSO, LDAP)

IT requirements to built the national archive

Electronic signatures

- Regulated by Finnish legislation
- The national patient archive architecture requires that all patient documents by electronically signed before being archived
- The electronic signatures must be created in the healthcare units that generate the records to be signed
- Specifications on how extensively personal signatures will be required and when server signatures are sufficient.
- Eprescriptions will always require personal signature
- Electronic signatures on patient consent documents will be done using the FINEID card

IT requirements to built the national archive

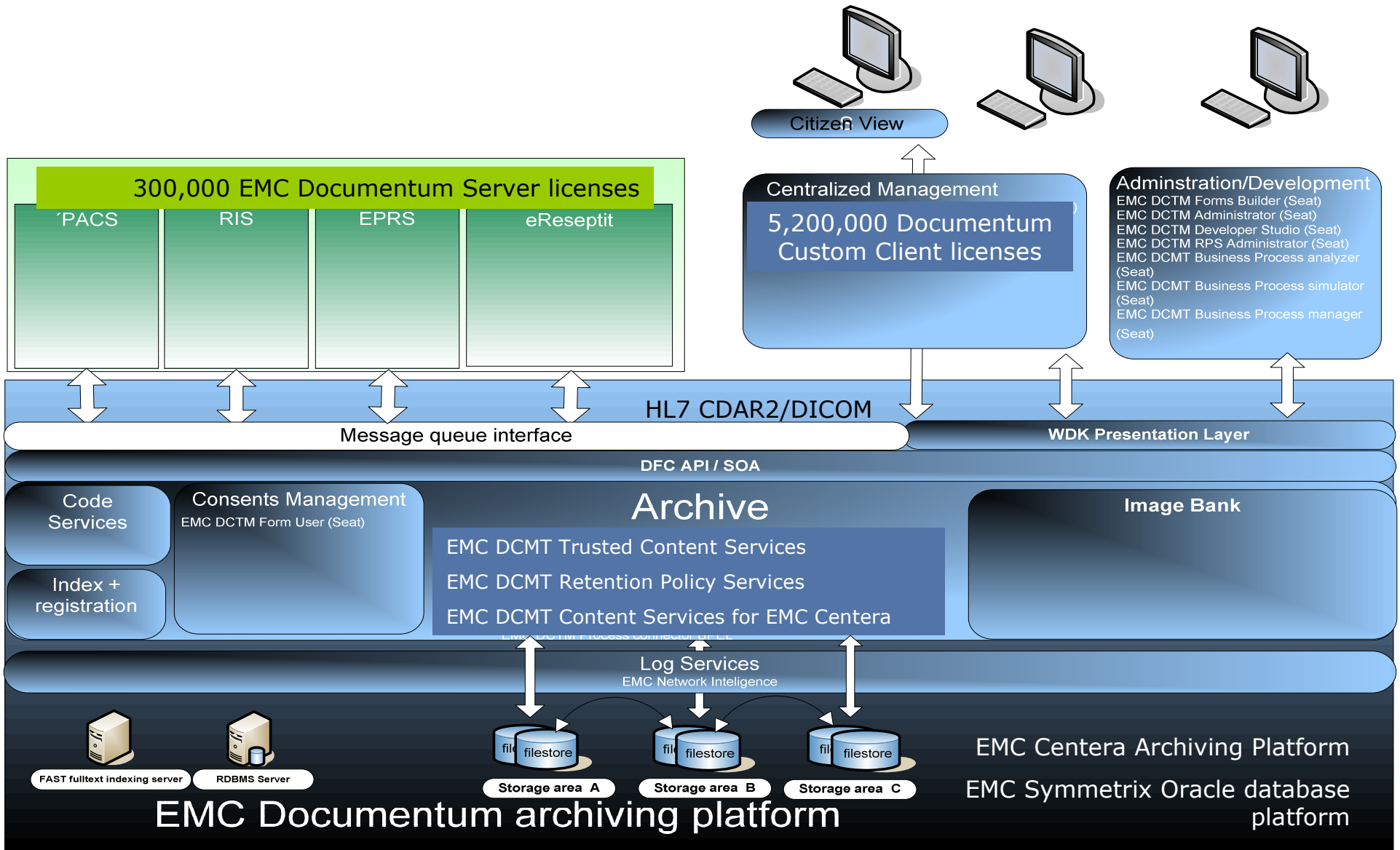
- Infrastructure and information network
 - No dedicated network- use of existing public and commercial networks
 - Under the new legislation, following healthcare information services will be maintained by KELA:
 - Patient record registering and directory services (messaging layer)
 - National archive
 - Consent management services, logging & monitoring
 - E-Prescription database
 - A secure message handling system will be built to link the local and regional patient information systems, the national archive and the e-prescription database

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EMC Solutions for the National Patient Record Archive

High-level architecture Finnish National Patient Archive



EMC Main Components for the National Patient Record Archive

- EMC Documentum
 - Universal content management repository (all patient data!)
 - Documentum manages data and metadata (registry, archive)
 - Native connection into Centera (one EMC message)
 - 3 main licensing components delivered to KELA:
 - Documentum server user license for 300,000 healthcare professionals (5 university hospitals, 20 central hospitals, 257 healthcare centers)
 - Documentum client user license for 5,200,000 Finnish citizens
 - Documentum Centera API archiving license for up to 550 PB storage
- EMC Centera
 - Connected to Documentum via native Centera API
 - High-speed disk based archiving service
 - Archives patient data based on retention policies defined in Documentum (data and metadata)
 - 2 Centera systems delivered to KELA
- EMC Symmetrix
 - Storage platform for the National Archive Oracle database
 - Highest requirements needed from a performance and from a high-availability 24X7 level (service needs to be user friendly)
 - 2 Symmetrix systems delivered to KELA.

EMC Main Components for the National Patient Record Archive

- Project deadlines
 - Phase 1: ePrescriptions:
 - Acceptance test : June 2008
 - In production : October 2008
 - Phase 2: patient record archive (HL7CDAR2 messages)
 - In production: February 2009
 - Phase3: Picture archive (DICOM)
 - In production: May 2009
- Capacity Growth of the Archive
 - Expected size in 2009 : 3 PB
 - Expected size in 2025 : 550 PB
- Why EMC?
 - Acceptance of the new service by the citizens and healthcare professionals is crucial for KELA → need for high-available, very performant and very well integrated content management, storage & archiving platform
 - EMC was the only vendor that could fulfill these requirements
 - Documentum integration with Centera
 - Oracle integration & performance on Symmetrix
 - EMC Service credentials around building high-availability environments

Search Patient

Patient ID:

Surname:

First name:

Consultant:

Date of Birth:

Text in Document:

From:

To:

Patient Data

Patient ID:

File Name:

File Type:

Scanned Date:

File Dates:

Number of Pages:

Audit Trails

User Name	Time	Event Description
documentum	14/02/07 11:58	View/Export
documentum	08/02/07 08:45	View/Export
documentum	06/02/07 15:04	Save Object

- Patient Records(1 found)
- Smith, John - B123456
 - Correspondence
 - 03_Jun_1931**
 - 07_May_2003
 - Investigations and Results
 - Miscellaneous
 - Clinical Notes
 - Patient Notes

Create Document

Name:

Search Patient

Patient ID:
 Surname:
 First name:
 Consultant:
 Date of Birth:
 Text in Document:
 From:
 To:

Patient Data

Patient ID:
 First name:
 Surname:
 Gender:
 Date of Birth:
 Address:
 Postcode:
 NHS Number:
 Consultant:
 First Seen:

Procedures

Select the procedure that you wish to request then press Submit to initialise the process

<p>X-Ray</p> <p><input type="checkbox"/> Head</p> <ul style="list-style-type: none"> <input type="checkbox"/> Skull <input type="checkbox"/> Nose <input type="checkbox"/> Jaw <input type="checkbox"/> Cheek <p><input type="checkbox"/> Body</p> <ul style="list-style-type: none"> <input type="checkbox"/> Neck <input type="checkbox"/> Upper Torso <input type="checkbox"/> Lower Torso <input type="checkbox"/> Upper Back <input type="checkbox"/> Lower Back 	<p><input type="checkbox"/> Left Arm</p> <ul style="list-style-type: none"> <input type="checkbox"/> Hand <input type="checkbox"/> Wrist <input type="checkbox"/> Forearm <input type="checkbox"/> Elbow <input type="checkbox"/> Upper Arm <input type="checkbox"/> Shoulder <p><input type="checkbox"/> Right Arm</p> <ul style="list-style-type: none"> <input type="checkbox"/> Hand <input type="checkbox"/> Wrist <input type="checkbox"/> Forearm <input type="checkbox"/> Elbow <input type="checkbox"/> Upper Arm <input type="checkbox"/> Shoulder 	<p><input type="checkbox"/> Left Leg</p> <ul style="list-style-type: none"> <input type="checkbox"/> Foot <input type="checkbox"/> Ankle <input type="checkbox"/> Tibia <input type="checkbox"/> Fibula <input type="checkbox"/> Knee <input type="checkbox"/> Kemur <input type="checkbox"/> Hip <p><input type="checkbox"/> Left Leg</p> <ul style="list-style-type: none"> <input type="checkbox"/> Foot <input type="checkbox"/> Ankle <input type="checkbox"/> Tibia <input type="checkbox"/> Fibula <input type="checkbox"/> Knee <input type="checkbox"/> Kemur <input type="checkbox"/> Hip 	<p>Blood Test</p> <p><input type="checkbox"/> Clinical Biochemistry</p> <ul style="list-style-type: none"> <input type="checkbox"/> Electrolytes & Metabolites <input type="checkbox"/> Liver <input type="checkbox"/> Enzyme & Proteins <input type="checkbox"/> Ion & Trace Metal <input type="checkbox"/> Lipids <input type="checkbox"/> Tumor <input type="checkbox"/> Hormones <p><input type="checkbox"/> Hematology</p> <ul style="list-style-type: none"> <input type="checkbox"/> Red Blood Cells <input type="checkbox"/> White Blood Cells <input type="checkbox"/> Coagulation <p><input type="checkbox"/> Immunology</p> <ul style="list-style-type: none"> <input type="checkbox"/> Acute Protein Markers <input type="checkbox"/> Autoantibodies <p><input type="checkbox"/> Serology</p>
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Patient Records (1 found)

- Bloggs, Joe - A123456
 - Investigations and Results
 - Correspondence
 - Miscellaneous
 - Clinical Notes
 - Consultants Letters
 - Referral Receipt Letters
 - Patient Appointment Lett

Search Patient

Patient ID:

Surname:

First name:

Consultant:

Date of Birth:

Text in Document:

From:

To:

Patient Data

Patient ID:

File Name:

File Type:

Scanned Date:

File Dates:

Number of Pages:

Document Content

1 / 1 | 25.9%

Find

- Patient Records (1 found)
- Bloggs, Joe - A123456
 - Investigations and Results
 - 06_Feb_2007**
 - 06_Feb_2007_2
 - 10_May_2003
 - 10_May_2003
 - 10_May_2003
 - 10_May_2003
 - Correspondence
 - Miscellaneous
 - Clinical Notes
 - Consultants Letters
 - Referral Receipt Letters

Selecting a document shows both the image and the document data



Awaiting Tasks

Subject	From	Received	Status
<input checked="" type="checkbox"/> Send Receipt of Referral	documentum	07/02/07 13:25	acquired
<input checked="" type="checkbox"/> Complete Scanning	documentum	07/02/07 15:57	acquired
<input checked="" type="checkbox"/> Scanning Completed	documentum	08/02/07 08:52	dormant
<input checked="" type="checkbox"/> Complete Scanning	documentum	09/02/07 10:58	dormant
<input checked="" type="checkbox"/> Scanning Completed	documentum	09/02/07 17:02	acquired

Displaying 1 to 5 of 7 Page 1 of 2

Send Receipt of Referral

Instructions:
Please send receipt of this referral letter

Name	Format	Modified
18_Jan_1972	pdf	07/02/07 13:25

Sign Off Required

Password: Password is blank. Please enter a valid password.

Document Content

Print Save Refresh Back Forward 1 / 3 56.7% Find

THE SLEREXE COMPANY LIMITED

SAPORS LANE - BOOLE - DORSET - BH 25 8 ER
TELEPHONE BOOLE (945 13) 51617 - TELEAX 123456

Our Ref. 350/PJC/EAC 18th January, 1972.

Dr. P.N. Cundall,
Mining Surveys Ltd.,
Holroyd Road,
Reading,
Berks.

Dear Pete,

Permit me to introduce you to the facility of facsimile transmission.

In facsimile a photocell is caused to perform a raster scan over the subject copy. The variations of print density on the document cause the photocell to generate an analogous electrical video signal. This signal is used to modulate a carrier, which is transmitted to a remote destination over a radio or cable communications link.

At the remote terminal, demodulation reconstructs the video signal, which is used to modulate the density of print produced by a printing device. This device is scanning in a raster scan synchronised that at the transmitting terminal. As a result, a facsimile

8.47 x 10.88 in

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