



Datastream[®]7i

Maintenance management with Datastream 7i at CERN.

An overview of current & future functionality

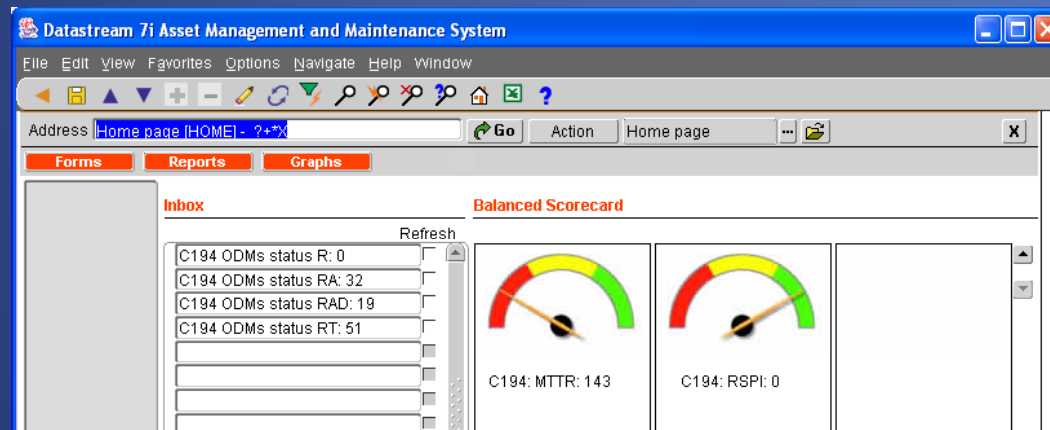
David Widegren
TS/ASE/EPS

Agenda

1. What is Datastream 7i and why using it?
2. Overview of its main capabilities.
3. How can Datastream 7i improve your maintenance processes?
4. Auxiliary & Coming functionality.
5. Conclusions & Questions.

What is Datastream 7i?

- Maintenance management and asset tracking is never easy – especially not if having large and complex installations.
- That is why most companies and organizations are using information systems to facilitate and organize this work – so called CMMS (Computerized Maintenance Management Systems) or EAM (Enterprise Asset Management) Systems.
- At CERN the official and centrally supported CMMS for asset tracking and maintenance management is called **Datastream 7i (D7i)**.



What is Datastream 7i?

- D7i is one of largest systems of its kind of the market and has been used in previous versions at CERN for almost 20 years.
- D7i is today used at CERN by:
 - Many groups in the TS Department (EL, ASE, CV, EL, FM, etc)
 - Some groups in the AT Department (ACR, ECR, etc).
 - Via the MTF application by even more groups in the TS, AT, AB, SC & PH Departments
- D7i at CERN manages currently information about **over a million equipment entries** (assets, systems, locations and functional positions).
- It is based on an Oracle database and the web-based user interfaced can be accessed from both inside and outside CERN.



Why using D7i?

- Is D7i an intuitive tool that can be used without any training or initial instructions?
- Can I start using D7i without knowing what equipment to maintain or how to maintain it?
- Will D7i solve all my maintenance problems?

No!

No!

No!

However, if I know what equipment to maintain and I know how to maintain it...



- Is D7i a powerful tool that after some initial training can help me organizing and documenting my maintenance work?
- Can D7i make the maintenance interventions more efficient by providing technical details and a complete technical history log for each individual component?
- Can D7i help me reducing MTTR and improve my spare parts management?

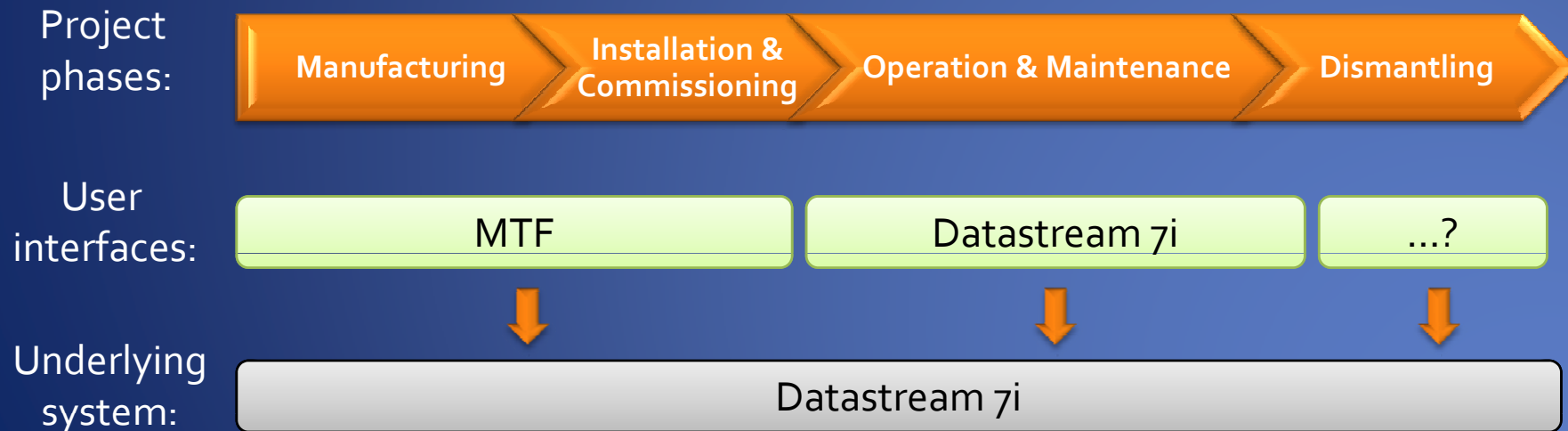
Yes!

Yes!

Yes!

D7i and MTF

- D7i is the CMMS at CERN but it is also the foundation of the MTF application, which has been used for the manufacturing, installation and commissioning follow-up of LHC .
- This means that all equipment registered and followed-up with MTF are already registered in D7i and ready to benefit from the available maintenance management functionality.
- A complete equipment lifecycle follow-up can be provided – if required!



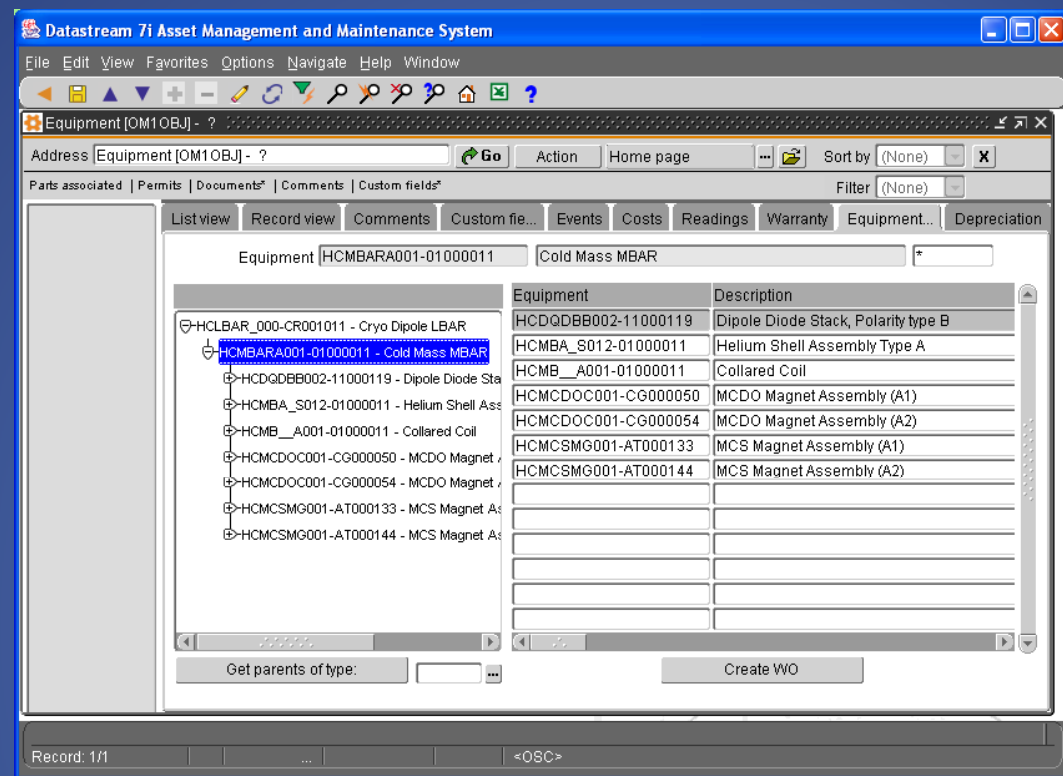
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Asset management

D7i allows you to:

- Identify, track, locate and analyze performance of physical assets.
- Associate technical characteristics and measured parameters with assets.
- Create asset structures to track assembly configurations or to group assets by for example systems or locations.



Asset management

D7i allows you for each asset to:

- Log meter readings, inspection notes and free-form comments.
- Access its complete historical record, including location and status changes as well as all maintenance interventions.
- Associate permits and documentation (e.g. EDMS or CVS) – especially interesting for equipment running software codes or requiring configuration files.

Equipment: HCLMQMD001-CR000602 Cold Mass LMQMD
Organization: Documents associated with Equipment (HCLMQMD001-CR000602) ?+*X

Document	Type	Filename	File type	Description
EDMSCID1137241	F	497309/1	EDM	497309 (ver.1)
EDMSCID1398267	F	566663/1	EDM	566663 (ver.1)
EDMSCID1583686	F	497296/1	EDM	497296 (ver.1)
EDMSCID1853011	F	497312/1	EDM	497312 (ver.1)
EDMSCID1863554	F	497303/1	EDM	497303 (ver.1)
EDMSCID1949468	F	497336/1	EDM	497336 (ver.1)

Buttons: New document, Update document, Download

EDMS: HCLMQMD001-CR000602 Leak Test - Windows Internet Explorer provided by CERN
https://edms.cern.ch/cedar/stop/doc.info?cookie=71

EDMS Document Information Page
User: EDMS_MGR

Number: 497309
EDMS Id: 497309 ver.1
Status: Released

HCLMQMD001-CR000602 Leak Test
Hervé PRIN
Report - Test
2004-09-10

Files of the Document
LMQMD602_pressure_test.xls (12 Mb)

Work management

- Controls work order processes for routine, response and periodic preventive maintenance.
- Can manage, plan and monitor work and resources needed to complete work.
- Stores material and tasks lists in a library for easy reference and retrieval.
- Determines cause and effect relationships and provides a full range of diagnosis tests.

The screenshot displays a web-based interface for work order management. The browser window title is "Work orders [WMJOBS] - ?+*X". The address bar shows "Work orders [WMJOBS] - ?+*X". The interface includes a navigation bar with tabs for "Documents", "Comments", "Custom fields", and "Audits". Below this is a filter dropdown set to "(None)". The main content area shows details for work order 1126920, with the description "Sas personnel de droite ne fonctionne plus". Other fields include Equipment (C\$\$-ACSUSI), Project, Department (CSAC), and WO type (Correctif Depannage). The status is "Termine". Below the main details are tabs for "WO details", "Equipment", "Schedule", "Service request", and "Closing". The "WO details" tab is active, showing fields for Class, Priority (H), Problem code, Parent work order, Standard WO, Requested by (19646, LEBEGUE BERNARD 7939), Shift, and Work package. There is also a "Print" button at the bottom left.

Work management

- The Preventive Maintenance (PM) management module can generate work orders based on fixed dates, time intervals or meter readings.
- It is also possible to create routes to group interventions for multiple assets that require identical PM tasks under a single work order.

Preventive maintenance schedules [WMPPMS] - ?+*X

Address Preventive maintenance schedules [WMPPMS] - ?+ Action Equipment of PM

Documents | Comments* Filter (None)

List view Record view Comments Activities Work orders Calendar Equipm

PM

Organization * ... Default organization

Class ...

Status Revision Out of service

WO class ...

PM Details

Priority ... Basse

WO type ... Preventif systematique

Scheduling group ... Duration Work package PM plan

Scheduling Data

Perform every Nesting buffer back Nesting buffer forward

Estimated workload People required Calculated workload

Meter #1 interval ... Nesting buffer back Nesting buffer forward

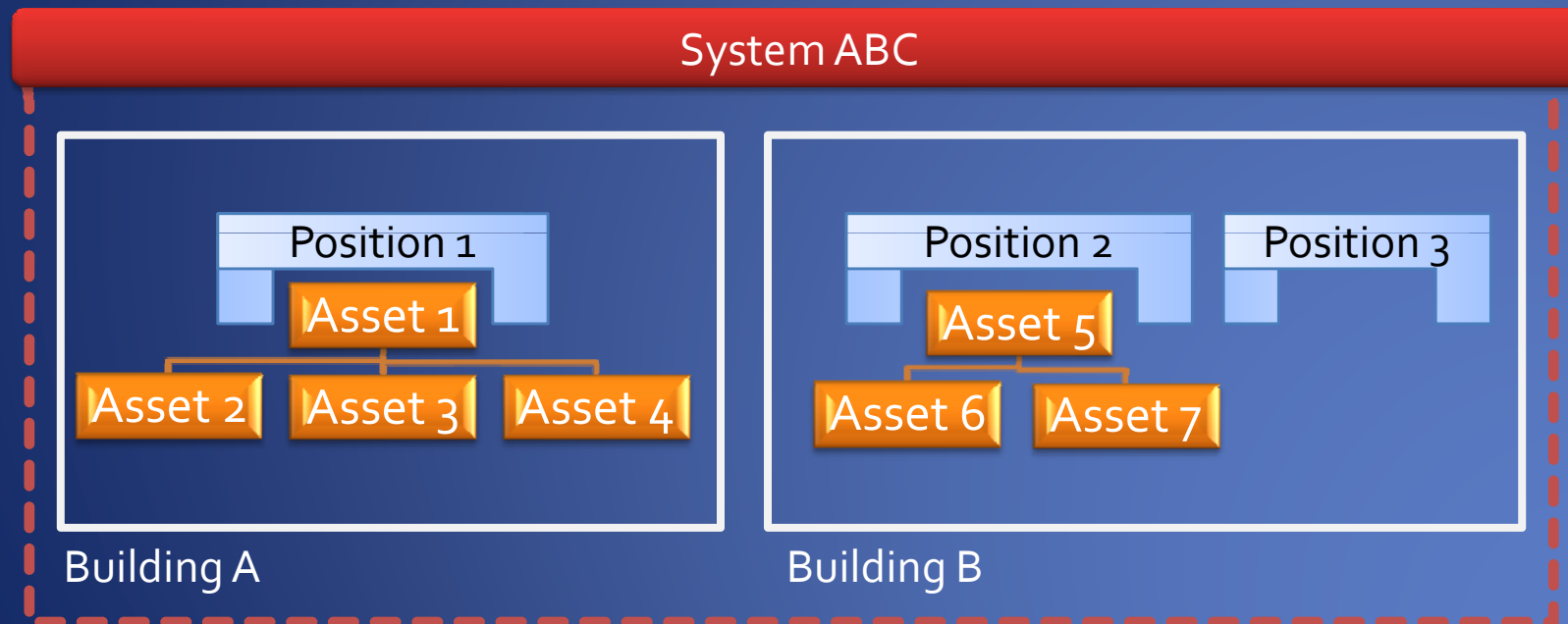
Meter #2 interval ... Nesting buffer back Nesting buffer forward

Nesting reference ... PM type Complete status

Ok window % Near window % Release window %

Analyzing performance of assets

- The work management module together with the advanced equipment structuring capabilities gives powerful possibilities of analyzing the performance of your assets – such as;
 - Maintenance costs (for example rolled-up into more general systems)
 - MTTR or MTBF (for example based on asset type, location or system, etc)



Materials management

- Streamlines part and materials management by maintaining inventory and monitoring materials movements.
- Enables equipment groups to provide acceptable level of supplies (e.g. spares and consumables) to meet anticipated demand from maintenance.
- Allocates materials to Work Orders and generates pick lists for materials.
- Identifies materials that need to be purchased based on existing stock levels, forecasts and current reservations.

The screenshot displays the 'Datastream 7i Asset Management and Maintenance System' interface. The main window shows a 'Parts [SMPART] - ?+*' view. The address bar contains 'Parts [SMPART] - ?+*' and the 'Filter' is set to '(None)'. The 'Part' field is populated with 'QMSVAL0000011' and the description 'CONNECTEUR FEMELLE CORDON FA111 & CFA222'. Below this, a table displays stock information for the part.

Store	Class	Class org	Stock method	Minimum quantity	Maximum quantity	Order quantity	Reorder level	Stocktake date	Quantity	Pri
QM1	QI	*	Reorder level	1			1	10-OCT-2007	2	

Inspection management

- Manages condition-based maintenance by defining inspection points belonging to one or several assets.
- Allows inspections ad hoc, triggered by time frequency, meter readings or based on previous inspection result (condition-based).
- Analyzes trends and predicts when certain thresholds will be reached – and launches preventive Work Orders based on this information.

Monitored data [IMMONT] - ?+*X

Monitored data [IMMONT] - ?+*X Action Calculate critical valu... Sort by (Default) X

Filter (None)

List view Equipment Details Points Aspects Aspect points Condition Result

Equip/cat A PX1147 TRITON 955B *

Aspect.Point Details

Aspect U(B) U(Cal B)

Point type CAL1 Origin C

Point 001 Calibration point

Nominal value UOM *BQ/MPS Method

Risk focus Confidence rating

Repl freq Factor

Last value Finding Date



Minimum Threshold

Formula

Extreme value Reached Next date

Critical value

Tolerance (%)

Standard WO

PM

Reporting & Views

- Over 100 predefined reports are available in D7i to analyze different aspects of the maintenance work and the performance of assets.
- In addition to this a large number of customized web reporting tools have been developed at CERN.
- For users with additional reporting needs, direct access to database views can be given.
- Fully customized reports can then be created with for example Business Objects.



Datastream7i

D7i Reports

General	TS-CV	TS-FM
<ul style="list-style-type: none">• Object search• Object history• Object hierarchies 1• WO Overview 1• PMP Overview 1• Objects in PMP 1• WO View 1• PMP/WO Calendar 1• Top 50 1• Yearly Statistics 1• Yearly Statistics per zone• WO Time Delay 1• Stock• Object Changes	<ul style="list-style-type: none">• CV MITC• CV Objects Audit• Route• Weekly Status• CV Maintenance Delays• Object Hierarchies• CV Work Control• CV WO View• CV WO Overview	<ul style="list-style-type: none">• FM Materials Previsions 1• FM WO Overview 1• Réalisation de la Maintenance 1• Maintenance Préventive Perdue 1• Charge de travail prévue CEGELEC• Charge de travail prévue 1• FM Performance Indicators 1• FM Status• FM Yearly Statistics• Personel Hours• Top 50 FM
TS-IC-HM	TS-CSE-CO	TS-CSE-TCR
<ul style="list-style-type: none">• Last WO for Object• HM Rapport de Travail - Overlook• HM Rapport de Travail - Chaque Agent du Service• HM Rapport de Travail - Chaque Agent du Service - Overview• HM Rapport de Travail - Chaque Agent du Service - Overview (NEW)• WO Overview (HM) (HM-E072)• WO Overview (HM)• Object Information• HM Daily• Top 50 HM	<ul style="list-style-type: none">• GTD Hours 1• GTD Hours Weekly 1• Siemens store	<ul style="list-style-type: none">• Dépannages Faites par la TCR• Demande de Dépannages Faites par la TCR• WO Overview (TCR)

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Practical example of workflow



An alarm appears on a screen or a problem reported to CCC.

CCC registers a Work Order in D7i for the faulty equipment listing all known details of the reported problem.



D7i sends an automatic SMS notification (and email) to the concerned maintenance team – a subcontractor in this particular case.



A maintenance technician at the subcontractor logs in to D7i, reads the Work Order details and acknowledge that this is a task for him.

He reads the history log for the faulty equipment and discovers that a similar problem was reported and corrected two years ago.

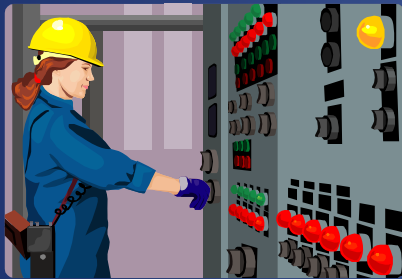


Practical example of workflow



The technician prints the Work Order containing problem details, information about equipment location as well a check list for this type of interventions.

Thanks to work log from earlier interventions and the check list, he manages quickly to restore the proper functioning of the equipment.



If the intervention took place in an area with wireless network coverage it would be possible to report the details about the resolution of the problem in D7i using a laptop. Otherwise it would have to be typed back in the office.

Practical example of workflow



As a final step, the completed Work Orders are then finally closed in D7i after a check and approval by the concerned equipment group at CERN.



Even for a simple problem like this many advantages of using D7i can be seen:

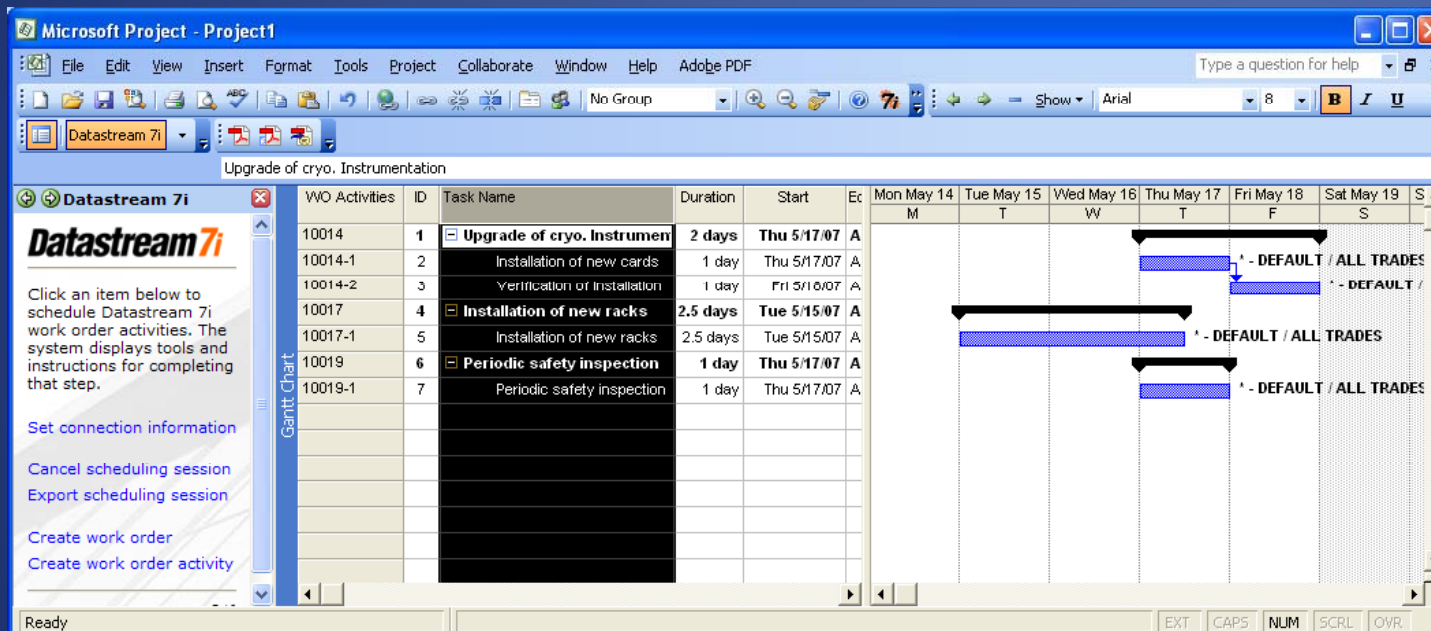
1. The contractor was notified instantly, the notification was recorded and thanks to the work log of earlier interventions the problem was quickly solved.
2. Statistics and trends about equipment, equipment types or locations can be generated and analyzed with D7i or its reporting tools.
3. Payment to the contractor can be based on D7i data.
4. More precise forecasting of required maintenance resources can be done with D7i reports.

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MS Project integration

- The two-way integration between Datastream 7i and Microsoft Project (2003) has recently been installed at CERN.
- It allows easy visualization and modification of planned interventions.
- Very useful for scheduling of jobs planned for machine shutdown periods.

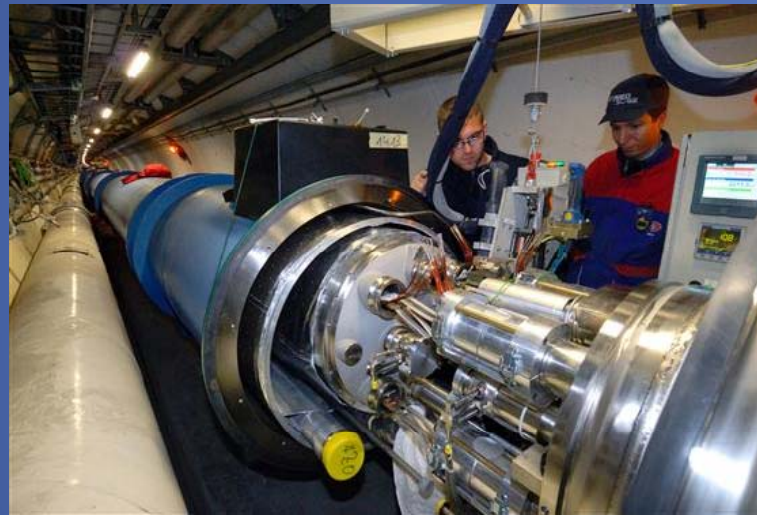


Datastream 7i Mobile

- Tests are also being done on the mobile version of D7i which opens many new possibilities;
 - Possible to record information directly in the field – no need for re-typing information back in the office.
 - Possible to work with Datastream 7i in places without network connectivity – i.e. in undergrounds areas or in workshops.
 - Possible to simplify data entries by using barcode or RFID scanner.
 - Possible to provide equipment and job details to technicians in the field.



23 February 2008



EDMS: 887481

Datastream 7i Mobile

- The two versions exist and are now tested at CERN;
 - Version for hand-held PocketPC devices.
 - Full-VGA version for normal PC laptops.
- If the current feasibility testing turns out positive and user requests exist we will purchase this software module – and charge the clients!



Datastream 7i Mobile

Datastream 7i > Mobile

FILE OPTION HELP

Work Equip Matl Inspect Prompt

Work Order

List View Record View Activity Comments Custom Fields Permits Close WO Attachments Service Request Equipment Equipment Comments

WO New WO Repair requested for PC:[10kA 8V 1Q] FWD:8kA DCCT: * Org *

Equip HCRPHFB__KP000001 *

Proj

Type BRKD * Status R *

Dept ABPQ

Warranty Safety

Locatn

Class

CostCo

Assign

Target 05/24/2007 Due 05/24/2007

Meter Critic

SysLvl

StdWO

Priority

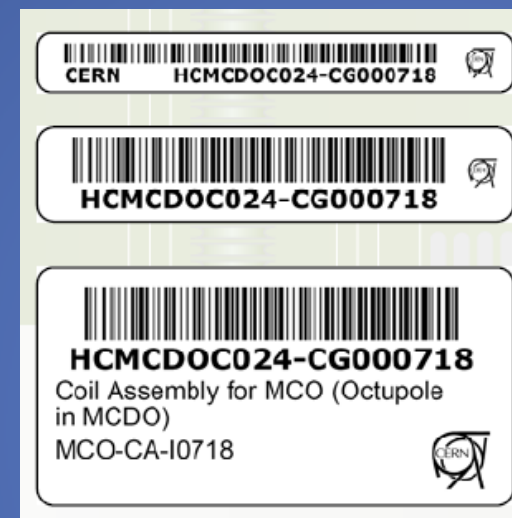
ProbCo

Parent

Duratn 1 Report 05/24/2007 12:27:32 PM *

Barcode label printing service

- A central barcode label printing service is today available for all users with equipment registered in the D7i or MTF tools:
 - Quick and easy identification of equipment is essential for an efficient equipment management.
 - Three standard label sizes are proposed.
 - The cost for the labels is charged internally to clients every 6 months or earlier if amount exceeds 500 CHF.
- Examples of clients so far;
HwC Team, AB/CO, AB/BI, AB/PO, TS/CV,
AT/ACR
- More information about label material
and other technical details:
<http://edms.cern.ch/nav/ST-003199>



Coming functionality

- A new version of D7i (D7i Extended) with a simplified and more user-friendly interface will be installed during 2008. (Date still depending on Oracle database upgrades in IT.)

The screenshot displays the Datastream 7i web application interface. At the top, there is a navigation bar with tabs for Work, Materials, Equipment, Purchasing, Operations, and Administration. Below this, the main content area shows the details for an asset with ID HCQYMCT001-JT001985, identified as a 'Temperature and Pressure Card'. The interface includes various input fields and dropdown menus for asset classification, department (MTF1), and status (Installe et Maintenu). It is organized into several sections: Equipment Details (including Class, Commission Date, Category, Equipment Value, Assigned To, Meter Unit, Production, Safety, Out of Service, and Criticality), Tracking Details (Manufacturer, Model, Serial Number, Revision), Part Association (Part, Bin, Store, Lot), and Hierarchy (Parent Asset, Parent Dependant, Cost Roll-up, Position, Position Dependant, Cost Roll-up, Location). A Custom Fields section is also visible at the bottom right, containing fields for D tenteur (ID CERN), Resp. Technique (ID CERN), Ann e de construction, User, Group, and EDB ID (806,853).

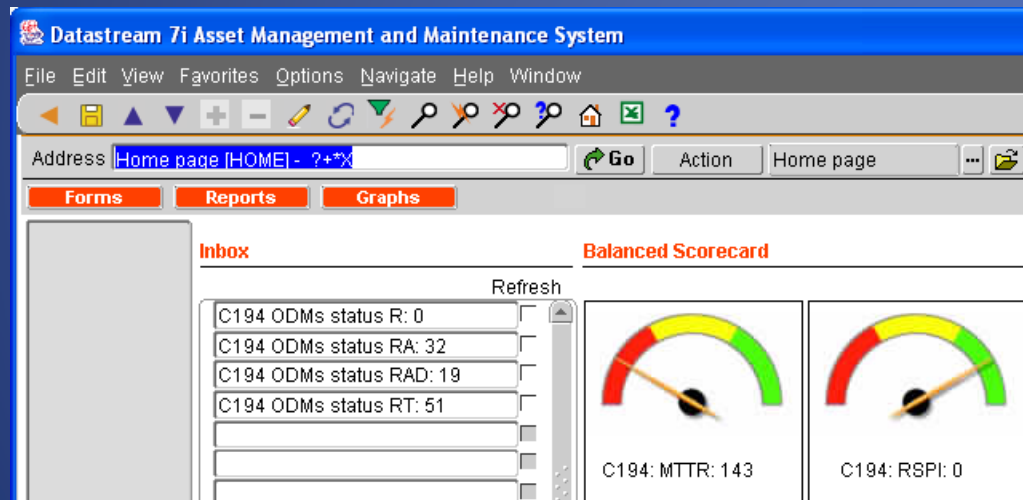
- Several new and simplified facilities for massive imports of Work Order data will be provided during 2008. (User needs still being collected.)

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Conclusions

- D7i has proven to be a very useful tool for improving, automating formalizing and documenting maintenance processes at CERN.
- Significant amounts of time, money and frustration (not finding documentation etc) can be saved if using D7i to organizing the maintenance work.
- D7i is integrated with the EDMS-MTF applications and provides this way a complete platform for managing and tracing information about your equipment throughout their entire lifecycle.



Conclusions

- However, a significant initial effort is required to get started;
 - Your assets needs to be identified
 - Your overall maintenance policy must be defined
 - You and your colleagues would require some initial D7i training.
- The CAMMS support team is there to help you with system-related issues like;
 - D7i training & consulting
 - Data imports & (limited) reporting support
 - Standard system customization, etc.
- D7i can help you to organize and streamline your maintenance work – but it will not do it for you!

Questions?

Help to get started – contact:
cmms.support@cern.ch