Initial Fast Loading Standard Dictionaries in an integrated TMS and Oracle Clinical Environment

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Introduction

- Sunil G. Singh of DBMS Consulting, Inc
- Specialize in large Oracle Clinical and Oracle Application implementations and long-term support

Acknowledgements

- Thanks to the OCUG and TMS Focus Group for the opportunity to present this paper

Overview

- **Discussing Initial TMS Dictionary Loading only**
- Review Documented Dictionary loading process
- Why attempt different loading techniques?
- Accelerating Documented Dictionary loading process
- Using export/import for Fast Initial Standard Dictionary Loading
- Using Transportable Tablespaces in 8i

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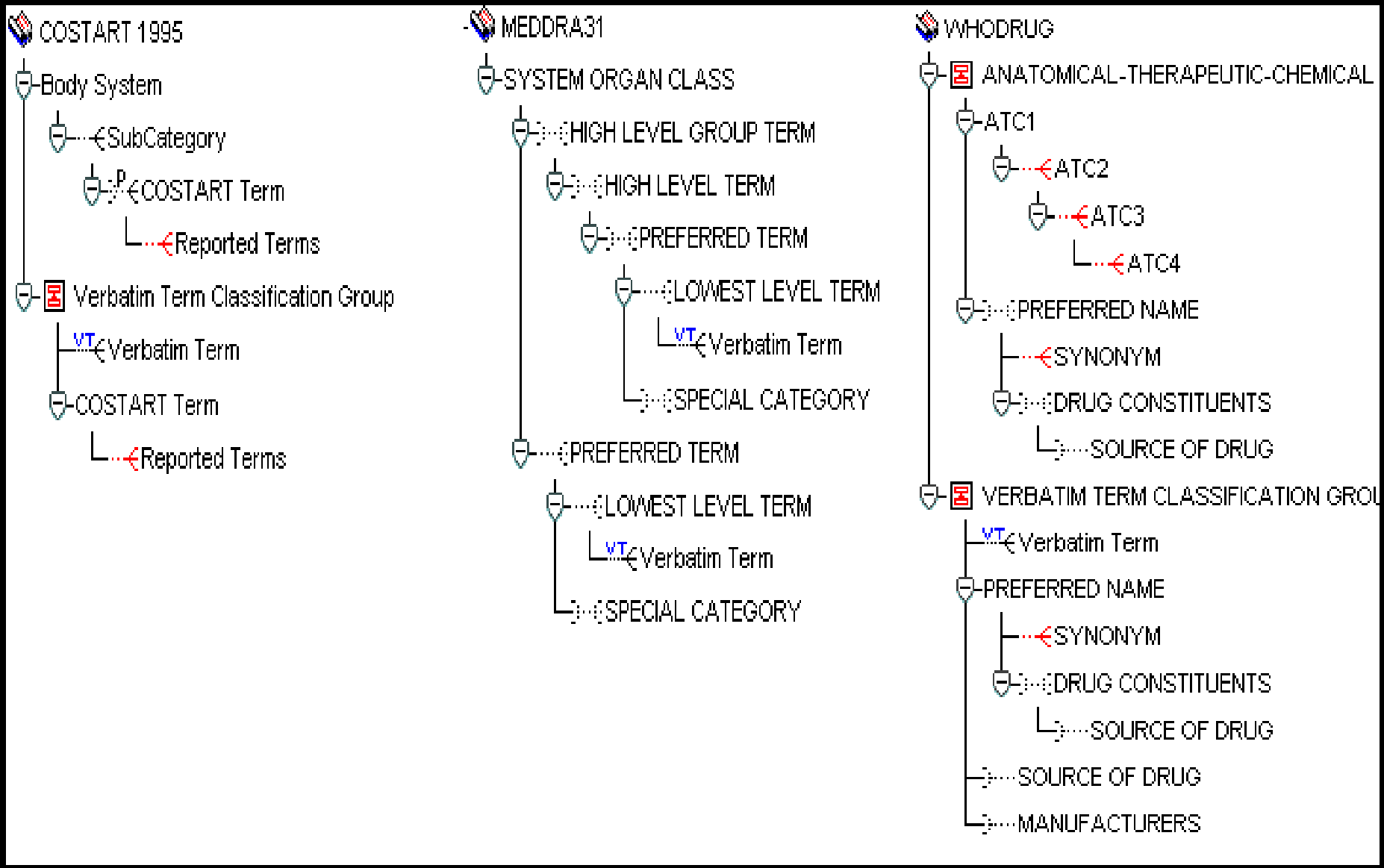
TMS Dictionary loading process

- Base install of TMS required
- Each dictionary has to be manually created via the TMS interface very carefully
- Loading scripts for staging tables need to be developed for SQL*Loader

TMS Dictionary loading process(2)

- Loading Scripts for populating TMS_PREDICT tables need to be developed
- Activation of Dictionaries with periodic Database statistic generation needs to occur, can be a very long process
- Dictionary has to be tested and checked for any loading errors
- Repeat for other TMS environments, such as testing, validation, training, development, etc…

OCUG Orlando 2000: Fast Loading Standard Dictionaries in TMS and OC Environment



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Why consider alternate TMS dictionary loading methods ?

- Very time consuming and very expensive to develop loading scripts for TMS
- Scripts need to be tested and validated
- Load process itself can be extremely long and error-prone
- Necessary to consistently rebuild dictionary environments for testing and validation

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Accelerating Documented TMS dictionary loading process

- Use direct=true and buffer=10000000 for sqlload commands to load staging tables
- Generate statistics continuously during activation if there is enough I/O and CPU power. Documentation says to generate statistics “half-way” through the activation process, but this can be difficult to determine.
- Separate staging tables into a different tablespace and I/O path.

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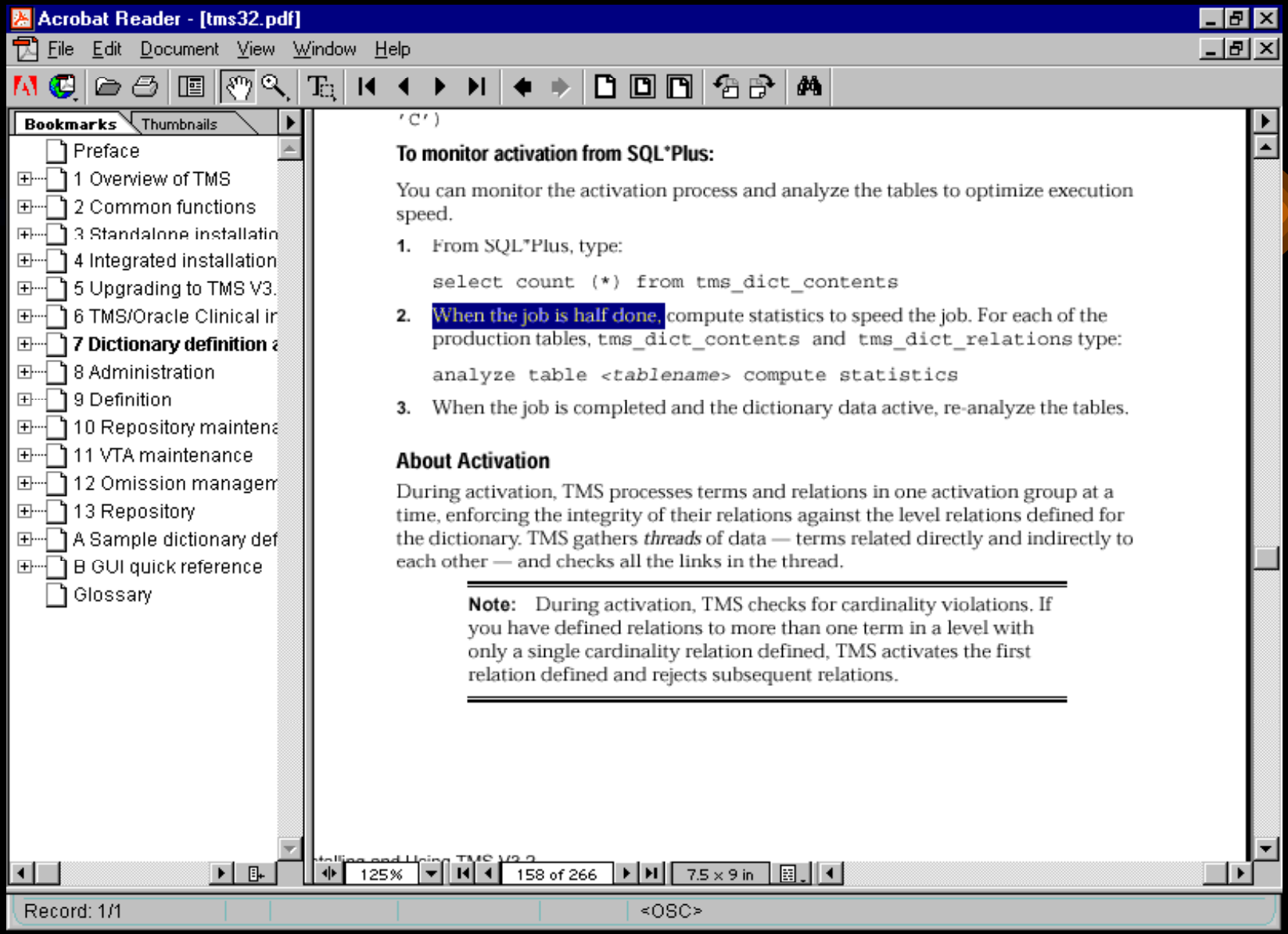

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Goal: Perform the Initial TMS dictionary Load once

- Test and validate dictionary structure and integrity one time
- Use this TMS instance as a SOURCE database
- Consistently rebuild standard TMS dictionaries quickly from this source.

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Export/Import loading of Initial TMS Dictionaries (1)

- Possible from the export command file given for installing TMS with Symmetric Replication across instances.
- Only way to move loaded dictionaries across different OS, e.g., UNIX to NT.
- Performs very well. Orders of magnitude faster than documented loading techniques.

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Export/Import loading of Initial TMS Dictionaries (2)

- Start with an export from of the full TMS schema in the SOURCE database
- Perform an initial install of TMS in the target environment
- Truncate tables and drop constraints and sequences from all TMS schema tables
- Re-import full TMS schema into TARGET instance listed in the export command
- Update the TMS_DEF_INSTANCES table

Transportable Tablespaces: Advantages

- Fastest method of loading dictionaries on the same server
- Uses some Oracle 8i functionality
- Exact, dead-consistent match of TMS data between instances

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Transportable Tablespaces: Drawbacks

- Source and target databases must:
  - be on same OS platform
  - have same character set
  - have same database block size
- TMS uses domain indexes when Oracle Intermedia is installed. This is NOT supported
  - create index tms_dict_contents_ci1 on tms_dict_contents(term) indextype is ctxsys.context;
- TMS can not be in use.

Initial Load of TMS Dictionaries: Transportable Tablespaces (1)

- Drop domain index tms_dict_contents_ci1
- Check if tablespaces are self-contained:
  - Exec dbms_tts.transport_set_check('tms_data,tms_idx',false);
- select * from transport_set_violations; This table should contain no records.

```
SQL>  exec dbms_tts.transport_set_check('tms_data,tms_idx',false);

PL/SQL procedure successfully completed.

SQL> select * from transport_set_violations;

VIOLATIONS
--------------------------------------------------------------------------------
Secondary Object TMS.DR$TMS_DICT_CONTENTS_CI1$I in tablespace TMS_DATA not allow
ed in transportable set

Secondary Object TMS.DR$TMS_DICT_CONTENTS_CI1$R in tablespace TMS_DATA not allow
ed in transportable set
```

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Initial Load of TMS Dictionaries: Transportable Tablespaces (2)

- Change status of tablespaces to read only:
  - alter tablespace TMS_DATA read only;
  - alter tablespace TMS_IDX read only;
- Get path information for datafiles that belong to the TMS tablespaces:
  - select file_name from dba_data_files where tablespace_name in ('TMS_DATA','TMS_IDX');

Initial Load of TMS Dictionaries: Transportable Tablespaces (3)

- Transportable tablespaces require a metadata export only, not actual data.
- Run an export with the following parameters:
  - USERID='sys/change_on_install as SYSDBA’
  - LOG=tms_trans_exp.log FILE=tms_data.dmp
  - TRANSPORT_TABLESPACE=Y
  - TABLESPACES=(tms_data,tms_idx)
  - CONSTRAINTS=Y GRANTS=Y TRIGGERS=Y
  - DIRECT=Y

Initial Load of TMS Dictionaries: Transportable Tablespaces (4)

- Copy datafiles to target server or location
- Put **SOURCE** tablespaces back in write mode:
  - alter tablespace TMS_DATA read write;
  - alter tablespace TMS_IDX read write;
- Drop TMS tablespaces at the **TARGET** database
  - drop tablespace tms_data including contents cascade constraints;
  - drop tablespace tms_idx including contents cascade constraints;

Initial Load of TMS Dictionaries: Transportable Tablespaces (5)

- Run Import on the **TARGET** database with the following parameters:
  - USERID='sys/change_on_install@octms as SYSDBA’
  - LOG=tms_trans_imp.log FILE=tms_data.dmp
  - TRANSPORT_TABLESPACE=y
  - DATAFILES=('C:\ORADATA\OCTMS\TMS_DATA1.DBF', 'D:\ORADATA\OCTMS\TMS_IDX1.DBF')
- DATAFILES= is the new location of the datafiles copied from the SOURCE Database

Initial Load of TMS Dictionaries: Transportable Tablespaces (6)

- Put new tablespaces into read-write mode
  - alter tablespace TMS_DATA read write;
  - alter tablespace TMS_IDX read write;
- Recompile all packages in the entire instance
- Re-Run %OPA_HOME%\tmscontext.sql to rebuild Domain indexes
  - Can take several minutes
- Update TMS_DEF_INSTANCES table
- Generate a template for controlfile rebuild
  - alter database backup controlfile to trace;

Conclusions:

- Both export/import and transporatable tablespace methods reduce initial dictionary load time remarkably and provide very consistent data
- Good Installation Qualification and QA tests can verify dictionary integrity after these loads
- Excellent way to rebuild test, development and training environment, especially for testing dictionary updates or changes in Domain structure.

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