

## Software User's Guide

---

### Contents

---

1. Introduction
  2. L-DPM Routines
  3. L-DPM Primary Form
  4. 'Project' Menu
    - 4.1. Creating a New Project
    - 4.2. Opening an Existing Project
    - 4.3. Deleting a Project
  5. 'DTD' Menu
    - 5.1. Importing a DTD File
    - 5.2. Importing a DTD from another Project
    - 5.3. Editing a DTD
    - 5.4. Exporting a DTD
    - 5.5. Deleting a DTD
    - 5.6. Generating an Export Routine
-

## 1. Introduction

The Lastic DTD Project Manager [ *L-DPM* ] is a GUI development tool for the Mumps [ *M* ] / Caché environment, designed to ease the development and maintenance of XML generation software by automatically creating export routines based on specified DTDs.

The L-DPM consists of two components:

### GUI Interface

The L-DPM application itself is a GUI interface created using Lastic GUI, and as such requires the appropriate client PC software [ *to run on Windows 9x, NT, 2000* ] and host M system database drivers [ *written in ANSI Standard Mumps, 1990* ] available from Lastic. The application provides a simple and easy-to-use environment for importing and editing DTDs within your M system. The L-DPM makes use of the **Routine Generator** function for creating XML export interfaces based upon these DTDs. Additional facilities include the ability to re-export DTDs to PC files and the grouping of DTDs into 'Projects', simplifying the management and maintenance of project software.

### Routine Generator

The Routine Generator function is what actually creates the XML export interfaces from a specified DTD. It has been developed, and is available, independently of the L-DPM and as such does not require any Lastic GUI software to be installed on your system. The function is written in ANSI Standard Mumps [ *1990* ] and will run on all major Mumps implementations. The generated export routines write XML content directly from your M database to any specified output device.

The *Developer's Guide* provides detailed information about the Routine Generator function - what it does, what it doesn't do, and what is required of the developer.

The purpose of this *Software's User's Guide* is to provide information about the L-DPM application itself - including the installation, invocation and functionality of the application, along with descriptions of its various forms and how they are used.

It is assumed that the reader is familiar with the contents of the *Developer's Guide*.

For information regarding the global structures maintained by the L-DPM, refer to Appendix F of the *Developer's Guide*.

## 2. L-DPM Routines

The L-DPM routines, along with those for the Routine Generator function, are shipped within a Lastic Distribution File.

Table 2.1 lists the routines included within this file.

Software	Runnable Routines	Overlay Routines
L-DPM Application	^xmlmgr	
		^xmlmgred
		^xmlmgrif
		^xmlmgrip
		^xmlmgrlu
		^xmlmgrnp
		^xmlmgrop
		^xmlmgrrd
		^xmlmgrrg
Routine Generator function		^xmlgen <sup>1</sup>
		^xmllib

**Table 2.1**

**Shipped Routines**

The shipped Lastic Distribution File contains full installation instructions.

Provided the Lastic GUI client PC software and M database drivers have been installed on your system, along with the above routines, the L-DPM can be invoked by the following routine call:

```
DO ^xmlmgr
```

**Figure 2.1 Invoking the L-DPM**

<sup>1</sup> Routine 'xmlgen' contains the Routine Generator function, and is invoked by the L-DPM. However, this function may also be run independently of the L-DPM [ *see the Developer's Guide* ].

### 3. L-DPM Primary Form

Upon invoking the L-DPM [ 'DO ^xmlmgr' ], the primary form of the application is displayed, as shown in Figure 3.1.

Name	Imported	Generated

Figure 3.1 L-DPM Primary Form

The 'Project' menu provides access to facilities for creating, opening and deleting projects (see section 4.).

The 'DTD' menu [ *currently disabled* ] provides options for importing, exporting, editing and deleting DTDs, along with the facility for generating export routines (see section 5.). The 'DTD' menu is only enabled when a project is open.

The project 'Code' and 'Name' output fields at the top of the form display details of the currently open project. These fields are for display purposes only and are non-editable.

The main grid displays details of all DTDs within the currently open project. Column 1 displays the DTD name. Column 2 shows the last date and time that the DTD was imported or edited. Column 3 displays the last date and time that an export routine was successfully generated from the DTD.

When a project is open, a 'right mouse click' within the grid invokes a pop-up menu identical to the 'DTD' menu at the top of the form (see section 5.). The grid is non-editable.

The 'Close' button terminates the application.

#### 4. 'Project' Menu

The L-DPM uses the concept of a '*project*' to allow an enterprise to organise and group its DTDs into specific application- or business-oriented domains [ *e.g. purchase ordering, sales ordering, invoicing, etc.* ], simplifying the management and maintenance of those DTDs and the generated XML export routines.

The '*Project*' menu provides access to facilities for creating, opening and deleting projects.

- To create a new project choose **Project: New** (*see 4.1.*)
- To open an existing project choose **Project: Open** (*see 4.2.*)
- To delete an existing project choose **Project: Delete** (*see 4.3.*)

**NOTE:**

The **Project: Open** and **Project: Delete** menu items will only be enabled if at least one project is defined on the M system.

#### 4.1. Creating a New Project

Click the **Project: New** menu item on the L-DPM's primary form.

The 'Create New Project' form is displayed, as shown in Figure 4.1.

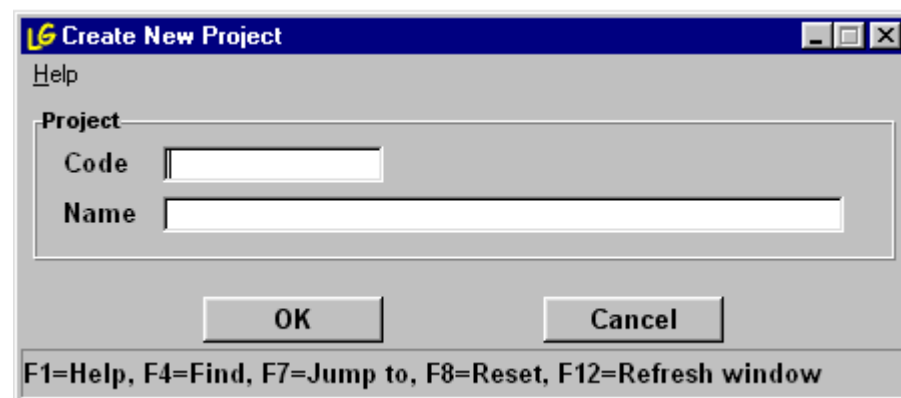


Figure 4.1 'Create New Project' Form

Enter a maximum 10 character alpha-numeric project code in the 'Code' field. This code is used within the M database as a subscript of the ^xmlDTD global for holding DTD information - see Appendix F of the *Developer's Guide*.

Enter a maximum 30 character narrative description of the project in the 'Name' field. The project name is used only to provide clarification to users of the L-DPM as to the project's purpose.

Click the 'OK' button to create the project. The user is returned to the primary form of the L-DPM, with the project code and name displayed (*see section 3.*), and the 'DTD' menu (*see section 5.*) enabled. If the chosen project code is already used by another project, an error message to this effect will be displayed and another code must be selected.

Click the 'Cancel' button to close the form without creating the project. The user is returned to the primary form of the L-DPM.

#### 4.2. Opening an Existing Project

Click the **Project: Open** menu item on the L-DPM's primary form.

The '*Open Project*' form is displayed, as shown in Figure 4.2.

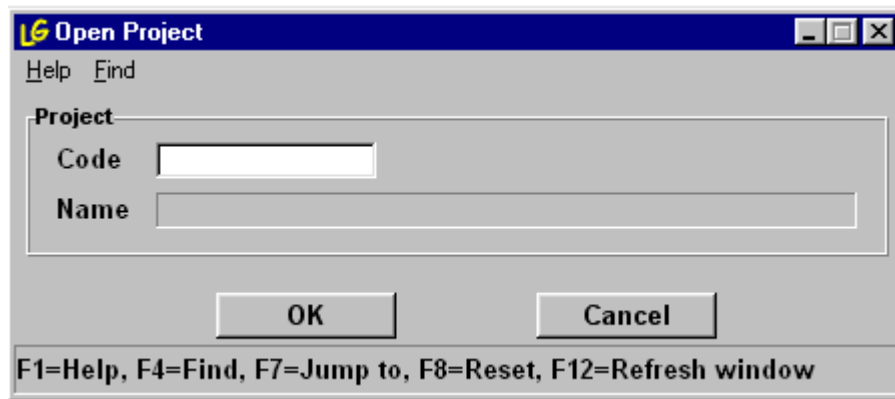


Figure 4.2 'Open Project' Form

Enter the required project code in the '*Code*' field.

Alternatively, an optional look-up facility is provided. Press the F4 key or click the **Find: Find** menu item whilst focus is maintained on the '*Code*' field. A scrollable list of projects matching the entered code will be displayed in a pop-up form<sup>1</sup>. Select the required project with a 'double click' of the mouse [ *or use the cursor keys and Space bar* ]. The selected project code will be entered into the '*Code*' field.

Upon losing focus from the '*Code*' field the project name will be displayed for confirmation. If the project code is not recognised, an error message will be displayed to this effect and focus returned to the '*Code*' field.

Click the '*OK*' button to open the selected project. The user is returned to the primary form of the L-DPM, with the project code and name displayed, and the grid populated with details of all DTDs within the project (*see section 3.*).

Click the '*Cancel*' button to close the form without opening the project. The user is returned to the primary form of the L-DPM.

<sup>1</sup> If no code is entered a full list of all defined projects will be displayed [ upto a maximum of 500 ]. If only one project matches the entered code, the '*Code*' field will be populated automatically. If no projects match the entered code, an error message will be displayed to that effect.

### 4.3. Deleting a Project

Click the **Project: Delete** menu item on the L-DPM's primary form.

The 'Delete Project' form is displayed, as shown in Figure 4.3.

Figure 4.3 'Delete Project' Form

Upon invocation of the form, the code and name of any currently open project will be displayed in the appropriate fields. If this is the project to be deleted, click the 'OK' button. If not, clear the 'Code' field and continue as follows.

Enter the required project code in the 'Code' field.

Alternatively, an optional look-up facility is provided. Press the F4 key or click the **Find: Find** menu item whilst focus is maintained on the 'Code' field. A scrollable list of projects matching the entered code will be displayed in a pop-up form<sup>1</sup>. Select the required project with a 'double click' of the mouse [ *or use the cursor keys and Space bar* ]. The selected project code will be entered into the 'Code' field.

Upon losing focus from the 'Code' field the project name will be displayed for confirmation. If the project code is not recognised, an error message will be displayed to this effect and focus returned to the 'Code' field.

Click the 'OK' button to delete the selected project. A messagebox will be displayed for confirmation of the deletion. If confirmed, the user is returned to the primary form of the L-DPM. If the deleted project is that which is currently open, the project 'Code' and 'Name' fields, along with the 'DTDs' grid, are all cleared (*see section 3.*), and the 'DTD' menu (*see section 5.*) disabled.

Click the 'Cancel' button to close the form without deleting the project. The user is returned to the primary form of the L-DPM.

**NOTE:**

*Be careful when deleting a project. The L-DPM has no way of restoring deleted projects.*

<sup>1</sup> If no code is entered a full list of all defined projects will be displayed [ upto a maximum of 500 ]. If only one project matches the entered code, the 'Code' field will be populated automatically. If no projects match the entered code, an error message will be displayed to that effect.

## 5. 'DTD' Menu

Once a project has been created or opened (*see section 4.*) the 'DTD' menu is enabled, providing access to a range of facilities for managing the DTDs within that project.

The purpose of the L-DPM is, of course, to automatically generate XML export routines based on these DTDs. It is assumed that the reader is familiar with the contents of the *Developer's Guide*, and in particular how the Routine Generator function [ *called by the L-DPM* ] creates the export routines from 'data-access-enhanced' DTDs.

The first step in generating the routines is to import DTDs into the project.

- To import a DTD file from a PC choose **DTD: Import from file** (*see 5.1*)
- To import [ *i.e. copy* ] DTD data from another project choose **DTD: Import from project** (*see 5.2.*)

Once a DTD has been imported into the project it's contents may be edited [ *e.g. amending or adding the data access functionality* ], re-exported out to a PC file, or even deleted.

- To edit a DTD choose **DTD: Edit DTD** (*see 5.3.*)
- To export a DTD to a PC file choose **DTD: Export to file** (*see 5.4.*)
- To delete a DTD choose **DTD: Remove from project** (*see 5.5.*)

The final step is to actually generate the XML export routines from the DTDs.

- To generate an export routine choose **DTD: Generate export routine** (*see 5.6.*)

### NOTE:

A 'right mouse click' within the 'DTDs' grid of the L-DPM's primary form invokes a pop-up menu identical to the 'DTD' menu at the top of the form, as described above.

The **DTD: Edit DTD** and **DTD: Export to file** menu items are only enabled if a DTD is selected within the 'DTDs' grid.

### 5.1. Importing a DTD File

Click the **DTD: Import from file** menu item on the L-DPM's primary form.

The '*DTD File Import*' form is displayed, as shown in Figure 5.1.

Figure 5.1 'DTD File Import' Form

If a DTD is currently selected within the '*DTDs*' grid on the primary form of the L-DPM (see section 3.), it's details will be displayed in the above form, when invoked. If this DTD is to be re-imported, and the file path/name is still correct, click the '*OK*' button. If not, continue as follows.

Click the '*Find File*' button.

A standard Windows '*Open File*' dialog box will be invoked.

Navigate to the required file directory and select the DTD file to be imported. Click the '*Open*' button on the dialog box.

The file path and name will be displayed.

The DTD name will be extracted from the file name [ *file name minus the '.dtd' extension* ], and displayed. This name is non-editable.

If data for the DTD name is already held within the project, the date and time the DTD was last imported will also be displayed.

Click the '*OK*' button.

If import data for the selected DTD name is already held within the project, a messagebox will be displayed for confirmation that the data may be overwritten. Click '*Yes*' to confirm.

The selected DTD will be imported into global node [ `^xmlDTD(project_code, dtd_name, 0)` ] - see Appendix F of the *Developer's Guide*.

The user is returned to the primary form of the L-DPM. The DTD name is displayed [ *in it's alphabetic sequence within the project* ] in the '*DTDs*' grid, and the current date and time shown in the corresponding '*Imported*' column (see section 3.).

Click the '*Cancel*' button to close the form without importing the DTD. The user is returned to the primary form of the L-DPM.

## 5.2. Importing a DTD from another Project

Click the **DTD: Import from project** menu item on the L-DPM's primary form.

The '*DTD Project Import*' form is displayed, as shown in Figure 5.2.

Figure 5.2 'DTD File Import' Form

The purpose of this facility is to allow the copying of imported DTD data from another project into the currently open project. Upon invocation of the form, the code of the open project will be displayed in the '*To: Project*' field.

Enter the source project code in the '*Project*' field at the top of the form. The source project cannot be the same as the currently open project.

Alternatively, an optional look-up facility is provided. Press the F4 key or click the **Find: Find** menu item whilst focus is maintained on the '*Project*' field. A scrollable list of projects matching the entered code will be displayed in a pop-up form<sup>1</sup>. Select the required project with a 'double click' of the mouse [ *or use the cursor keys and Space bar* ]. The selected project code will be entered into the '*Project*' field.

Enter the source DTD name in the adjacent field. Again, an optional look-up facility is provided, listing all DTDs in the selected project.

Upon losing focus from the source '*DTD Name*' field, the selected DTD name will be entered into the destination '*DTD Name*' field at the bottom of the form. This field is non-editable.

Click the '*OK*' button.

If data for the selected DTD name is already held within the destination project, a messagebox will be displayed for confirmation that the data may be overwritten. Click '*Yes*' to confirm.

Data from the source Project/DTD will be copied into the destination Project/DTD using a MERGE command:

```
[ i.e. MERGE ^xmlDTD(destination_project_code, destination_dtd_name) =
      ^xmlDTD(source_project_code, source_dtd_name) ]
```

<sup>1</sup> If no code is entered a full list of all defined projects [ except the currently open project ] will be displayed [ upto a maximum of 500 ]. If only one project matches the entered code, the '*Project*' field will be populated automatically. If no projects match the entered code, an error message will be displayed to that effect.

All global nodes defined for the source DTD will be copied [ *i.e.* `^xmlDTD(source_project_code, source_dtd_name, 0..6)` ]. If the source DTD has only been imported, this will just be global node 0. If an export routine has been generated for the source DTD, this will be global nodes 0..6 - see Appendix F of the *Developer's Guide*.

The user is returned to the primary form of the L-DPM. The DTD name is displayed [ *in it's alphabetic sequence within the project* ] in the '*DTDs*' grid, with the original date and time of file import and routine generation for the source DTD shown in the corresponding '*Imported*' and '*Generated*' columns (*see section 3.*).

Click the '*Cancel*' button to close the form without importing the DTD. The user is returned to the primary form of the L-DPM.

### 5.3. Editing a DTD

Click the **DTD: Edit DTD** menu item on the L-DPM's primary form.

The 'Edit DTD' form is displayed, as shown in Figure 5.3.

The screenshot shows a window titled "Edit DTD (Project 'ordering' DTD 'purchaseOrder')". The window has a menu bar with "Help" and "Edit". The main text area contains the following XML DTD code:

```
<!-- Purchase Order DTD -->
<!-- Created on 05/06/2001 for ABC Retailers Inc -->
<!--%PM poNo -->
<! ELEMENT purchaseOrder (shipTo | shipDate | ItemList)>
<!-- %EL purchaseOrder ACCESS=getOrder() VARREF=ord -->
<! ATTLIST purchaseOrder
    PONumber      CDATA      #REQUIRED
    customerID    CDATA      #REQUIRED
    customerName  CDATA      #IMPLIED
    orderDate     CDATA      #REQUIRED>
<!-- %AF getOrder()
    n rec k ord
    s rec=$g(^POrders(poNo))
    i rec=" " q 0
    s ord("at","PONumber")=poNo
    s ord("at","customerID")=$p(rec,"*",1)
    s ord("at","customerName")=$p(rec,"*",2)
    s ord("at","orderDate")=$p(rec,"*",3)
    q 1
-->
<! ELEMENT shipTo EMPTY>
<!-- %EL shipTo ACCESS=getShip() VARREF=ship-->
<! ATTLIST shipTo
    street  CDATA      #REQUIRED
    city    CDATA      #REQUIRED
```

At the bottom of the window are "OK" and "Cancel" buttons. Below the buttons is a status bar with the text: "F1=Help, F4=Find, F7=Jump to, F8=Reset, F12=Refresh window".

Figure 5.3 'Edit DTD' Form

The contents of the DTD selected within the 'DTDs' grid of the primary form will be displayed.

The contents may be amended as required.

Click the 'OK' button to save the changes.

There is no validation of the amended data.

The user is returned to the primary form of the L-DPM. The current date and time is displayed in the 'Imported' column of the 'DTDs' grid against the selected DTD (see section 3.).

Click the 'Cancel' button to close the form without importing the DTD. The user is returned to the primary form of the L-DPM.

**NOTE:**

Amendments are only saved within the M system, not within the original DTD file. To save the changes back out to the DTD file, choose **DTD: Export to file** (see 5.4.)

#### 5.4. Exporting a DTD

Click the **DTD: Export to file** menu item on the L-DPM's primary form.

A standard Windows *'Save File'* dialog box is invoked, with the file path and name of the original DTD file imported set as defaults.

Navigate to the required file directory, amend the file name if necessary, and click the *'Save'* button on the dialog box. The user is returned to the primary form of the L-DPM.

Click the *'Cancel'* button to close the form without exporting the DTD. The user is returned to the primary form of the L-DPM.

### 5.5. Deleting a DTD

Click the **DTD: Remove from project** menu item on the L-DPM's primary form.

The '*Remove DTD*' form is displayed, as shown in Figure 5.4.

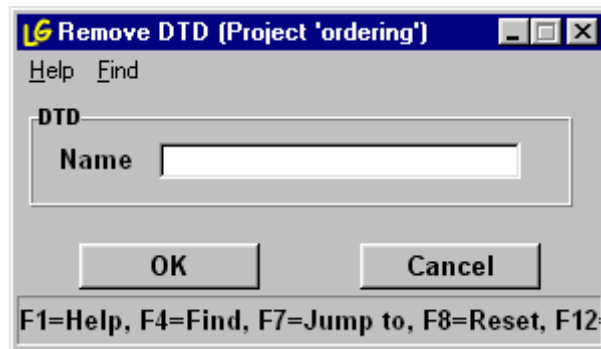


Figure 5.4 'Remove DTD' Form

If a DTD is currently selected within the '*DTDs*' grid on the primary form of the L-DPM (see section 3.), its name will be displayed in the above form, when invoked. If this is the DTD to be deleted from the project, click the '*OK*' button. If not, clear the '*Name*' field and continue as follows.

Enter the required DTD name in the '*Name*' field.

Alternatively, an optional look-up facility is provided. Press the F4 key or click the **Find: Find** menu item whilst focus is maintained on the '*Name*' field. A scrollable list of DTDs in the currently open project matching the entered name will be displayed in a pop-up form<sup>1</sup>. Select the required project with a 'double click' of the mouse [ *or use the cursor keys and Space bar* ]. The selected DTD name will be entered into the '*Name*' field.

Click the '*OK*' button to delete the selected DTD from the project. The user is returned to the primary form of the L-DPM, with the deleted DTD removed from the '*DTDs*' grid (see section 3.).

Click the '*Cancel*' button to close the form without deleting the DTD. The user is returned to the primary form of the L-DPM.

<sup>1</sup> If no name is entered a full list of all DTDs in the project will be displayed [ upto a maximum of 500 ]. If only one DTD matches the entered name, the '*Name*' field will be populated automatically. If no DTDs match the entered name, an error message will be displayed to that effect.

## 5.6. Generating an Export Routine

Click the **DTD: Generate export routine** menu item on the L-DPM's primary form.

The 'Export Routine Generation' form is displayed, as shown in Figure 5.5.

Figure 5.5 'Export Routine Generation' Form

If a DTD is currently selected within the 'DTDs' grid on the primary form of the L-DPM (see section 3.), its details will be displayed in the above form, when invoked. If this is the DTD to be used for routine generation, and the 'Root Element' and 'Routine Name' fields are complete and correct, click the 'OK' button. If not clear the DTD 'Name' field and continue as follows.

Enter the required DTD name in the 'Name' field at the top of the form.

Alternatively, an optional look-up facility is provided. Press the F4 key or click the **Find: Find** menu item whilst focus is maintained on the 'Name' field. A scrollable list of DTDs in the currently open project matching the entered name will be displayed in a pop-up form<sup>1</sup>. Select the required project with a 'double click' of the mouse [ or use the cursor keys and Space bar ]. The selected DTD name will be entered into the 'Name' field.

If an export routine has previously been generated for the selected DTD, the date and time of the last generation, along with the DTD's root element and the routine name used, will be displayed when focus is lost from the DTD 'Name' field. The 'Root Element' and 'Routine Name' fields may be amended, if necessary.

Enter the name of the root element for the selected DTD in the 'Root Element' field. The Routine Generator function uses this parameter to build the document flow code from the appropriate 'start point'. If the specified root element does not exist in the selected DTD, the Routine Generator function will return an error - see the *Developer's Guide*.

Enter the routine name to be used for saving the generated export code within the M system in the 'Routine Name' field. The routine name must be a maximum 8 characters in length, beginning with an alpha character and containing only alphanumerics. Do not include any file extensions. The Routine Generator function saves the generated export routines using a ZSAVE command - see the *Developer's Guide*.

Click the 'OK' button.

<sup>1</sup> If no name is entered a full list of all DTDs in the project will be displayed [ upto a maximum of 500 ]. If only one DTD matches the entered name, the 'Name' field will be populated automatically. If no DTDs match the entered name, an error message will be displayed to that effect.

If the specified routine name already exists within the M system, a messagebox will be displayed for confirmation that it may be overwritten. Click 'Yes' to confirm.

The project code, DTD name, root element and routine name are passed as parameters to the Routine Generator function (*see the Developer's Guide*).

Any errors raised by the Routine Generator are returned to the L-DPM and displayed in a messagebox. If an error is returned, the function will not have completed and the routine will not have been saved. The error should be amended before the Routine Generator function is called again - see the *Developer's Guide* for information on error types.

Any error will delete global nodes 1-6 [ i.e. `^xmlDTD(project_code, dtd_name, 1..6)` ] generated during this [ or any previous ] Routine Generator function call. Upon return to the primary form of the L-DPM, the 'Generated' column of the 'DTDs' grid will appear blank against the selected DTD (*see section 3*).

If the function completes successfully, the routine will be saved in the M system and the user returned to the primary form of the L-DPM, with the current date and time displayed in the 'Generated' column of the 'DTDs' grid against the selected DTD (*see section 3*). The generated routine can be viewed using your usual routine editor.

Click the 'Cancel' button to close the form without generating an export routine. The user is returned to the primary form of the L-DPM.