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THE USE OF DBMS
AND DOCUMENT ORIENTED INTERFACE
IN THE TPLAN-SYSTEM

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1 Introduction

The DOI (Document Oriented Interface) is a oriented task, which allows access to applications through documents and its seamless and transparent integration of applications. Built on, and intimately tied to, an object oriented foundation, the DOI is a more powerful and intuitive way to work with your computer than any other available interfaces. The DOI is an advanced user interface that makes documents, not applications, the focus of personal computing.

In a DOI environment, competition could be fierce because all DOI tools would be universal and compatible with all other tools. With this sense, the TPLAN system was developed to manage all the information related with the annual of JINR Topical Plan of Research. Our paper describes the user - friendly input / output interface for the TPLAN database management system (DBMS) that includes high quality output in \LaTeX [1] format from databases and retrieves selected information from \LaTeX document (according to a defined grammar that includes a subset of the \LaTeX grammar) to be stored in the databases.

2 General description of the TPLAN - system

The general view of the TPLAN system is shown in Fig. 1.

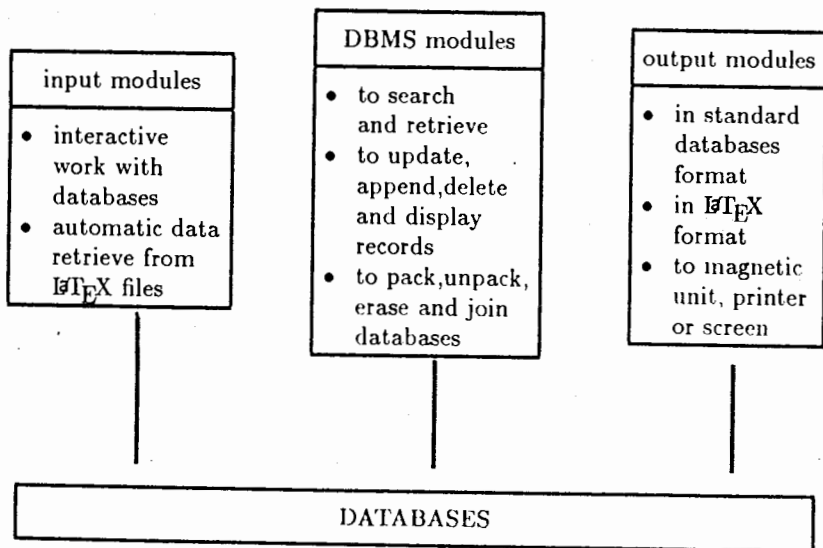


Fig. 1. General view of the TPLAN system

A reduced version of the TPLAN - system (TPLAN-R) was developed and it is oriented to users with limited computer resources. It was implemented

in FOXBASE + [2] and "C" languages [3] and includes the searching and retrieval modules, modules for updating, appending, deleting and displaying selected database information, and all of the input / output modules, except the retrieval modules from files in \LaTeX format. The main menu of the TPLAN - R(educed) system is shown in Fig. 2.

MAIN MENU	
Topical Plan - TPLAN - R(educed) System, JINR	
Option	Description
0	- output (print) selected fields to \LaTeX file
1	- standard output (print) to LATEX file
2	- update information about a Topic
3	- delete information about a Topic
4	- append a new Topic
5	- display information about a Topic
6	- search on the TP - R(educed) databases

Fig. 2. The main menu of TPLAN - R(educed) system

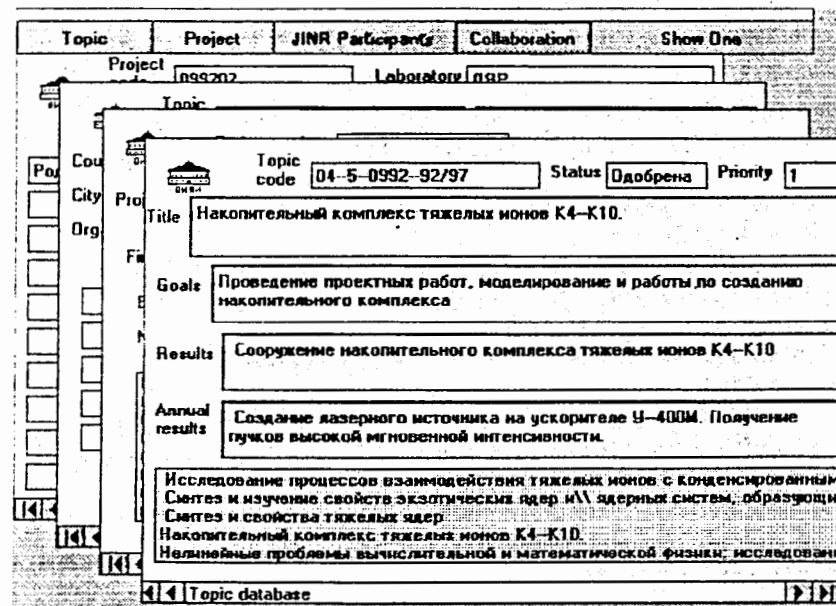
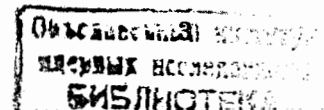


Fig. 3. Screen of the TPLAN system prototype in Visual Basic and ACCESS



Both versions of the TPLAN - system provide sharing access to databases according to FOXBASE + or FOXPRO [4] restrictions to work in the local area network (LAN).

This application was prototyped in Visual Basic [5,6] (VB) and ACCESS [7] (Microsoft's Windows Database) using standard VB controls (i.e., buttons, text fields and list boxes). Structured Query Language (SQL) and ISAM data meet Visual Basic in ACCESS, Microsoft's powerful database tool. See Fig. 3.

The output module in \LaTeX format is an interface between databases management system and \LaTeX word processor. It incorporates the needed \LaTeX commands to the retrieved information from the databases and creates an output \LaTeX file ready to print. The information may be retrieved in different levels using different user filter conditions. For example, you can obtain the topical plan of JINR with indices and chapters, or a selected chapter (scientific field or laboratory) or only a page (topic or project) or a group of pages.

The output modules output the selected information to the screen, printer or disk unit in standard ASCII file or \LaTeX format file by country, topic or scientific field. Additionally, \LaTeX format file may be also obtained by laboratory. See Fig. 4.

```

\documentstyle{article}
\topmargin -5.4mm
\textwidth 160mm

\newcommand{\TC}[1]{\bigskip\noindent{\large\bf Участвующие
страны или международные организации:}\#1}

\newenvironment{stage}{\bigskip\noindent{\large\bf Основные
этапы темы и проекты:}\}
\hspace*{\labelwidth}\hspace*{\labelsep}\makebox[54mm][l]{\bf
Этап темы или проект.}\makebox[35mm][l]{\bf Руководитель.}
\hfill\makebox[50mm][c]{\bf Статус.}\}
\hspace*{\labelwidth}\hspace*{\labelsep}\hspace*{4mm}
\makebox[54mm][l]
{Лаборатория.}\parbox[t]{35mm}{\bf Ответственный}\ от лаборатории.}
\hfill\parbox[t]{50mm}{\bf Основные исполнители}\ и число участников.}
\begin{enumerate}\end{enumerate}
\newcommand{\PS}[3]{\parbox[t]{50mm}{\bf #1}\hspace{4mm}\parbox[t]
{41mm}{\bf #2}\hfill\framebox[50mm][c]{#3}\medskip}
\newcommand{\psei}{Заявка}

\hfill\parbox[t]{50mm}{#3}
\newenvironment{result}{\bigskip\noindent{\large\bf Ожидаемые
результаты:}

```

```

\newenvironment{intcoop}{\bigskip\noindent{\large\bf
Сотрудничество по теме:}
\begin{tabbing}
\parbox[t]{32mm}{\bf Страна или\ международная\ организация}\}
\mbox{ }}=
\makebox[28mm][l]{\bf Город} \} =
\parbox[t]{30mm}{\bf Институт или\ лаборатория} \} =
\newcommand{\msd}{\bf Договор}
\newcommand{\msi}{\parbox[t]{20mm}{\bf Совместные\ работы}}
\T{ 01--3--1001--94/98 }{ 1 }{ Новая }
% название темы %
\TN{ Поля и частицы } %
% Руководитель темы: %
\TL{ Филиппов А.Т.\ Казаков Д.И. } %
% Сотрудничество. (перечень стран) %
\TC{Россия ,Словакия,Украина,Чехия,ФРГ,Австралия,Великобритания,
\ Израиль ,Канада,США,Швейцария,Финляндия,Франция} %
% Цель исследования %
\TA{ Структура квантовой теории поля, ее применения в физике
частич}
% Ожидаемые результаты по завершении этапов темы или проектов %
\begin{result}
\item Создание компьютерной сети ЛТФ и разработка численно-
аналитических пакетов программ на основе проекта СПЕКТР.
\end{result}
% Международное сотрудничество %
\begin{intcoop}
\mtab{ }{ }{ ИФ }{ Федоров Ф.И. + 3 чел. \} \ Томильчик П.М.
+ 2 чел. \} \ Богущ А.А. + 4 чел. \} \ Рудак Э.А. }{ \mso }
\mtab{ Россия }{ Москва }{ ИТЭФ }{ Морозов Ю.А. + 2 чел.
\} \ Кудрявцев А.Е. + 1 чел. \} \ Перепомов А.М.}{ \mso }
\mtab{ }{ }{ ИЯИ }{ Матвеев В.А. + 1 чел. \} \ Катаев А.Л.}{ \msi }
\mtab{ Канада }{ Торонто }{ Ун-т }{ Моффет Дж.}{ \mso }
\mtab{ Франция }{ Лион }{ ЕНС }{ Сорба П.\ Дельдук Ф. }{ \msa }
\mtab{ }{ Сакле }{ СЕН }{ Пешански Р. + 1 чел.\} \ Зинн-Хустен Ж.}
{ \msa }
\end{intcoop}
\end{document}

```

Fig. 4. Fragments of the input / output files in \LaTeX format

Using menus and tables, the retrieval and searching modules retrieve from and search in the databases according to different filter criteria. Additionally, the user

that knows dBASE [8] /FOXBASE + /FOXPRO language or SQL language for FOXPRO can do "free search" using the TPLAN-system. For example, the user can select and display the structure of the databases, can define the filter criteria or conditional expression according to the DBASE III grammar and later can select the display or print format.

The modules for searching the databases provide the following actions: to display on the screen or to print selected information from the databases using the standard tables or the screen window formats, and to display / print selected articles in the REPORT (dBASE) formats. The selected information is retrieved from the databases using filter conditions. See Fig. 5.

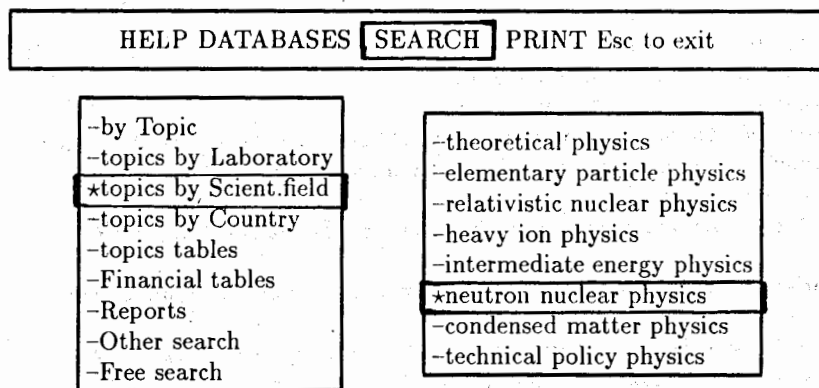


Fig. 5. Usual screen of the TP - system in FOXPRO

For example, the TPLAN - system provides the following standard searching criteria: topics by scientific field, laboratory, status, country, topic title and code; JINR participants by topic, project, and laboratory; projects by topic, project title, project code, status; collaborations by country, city, organization, topic and status; finances by topic, project, laboratory, scientific field; expert by scientific field and name; expert recommendation by expert, topic, scientific field; etc. See Figs. 5 and 6.

The HELP menu of the TPLAN - system includes the general system description, the system diagrams and some information about methodological and organizational procedures for working on the annual topical plan of JINR.

Поиск в Базе Данных Topical Plan - - R(educed) System, JINR			
Код	Описание	Код	Описание
I- Тема		III- Проект	
-1-	науч. направление	-С-	наименование
-2-	лаборатория	-D-	код проекта
-3-	проект	-Е-	статус
-4-	статус	-F-	участники от ОИЯИ
-5-	наименование		в проекте
-6-	страна	-G-	участники от ОИЯИ
-7-	участники от ОИЯИ		
II- Колаборация		IV- Финансы	
-8-	организация	-H-	тема
-9-	темы		
-0-	статус		
-A-	страна	Q-	Выход
-B-	город		

Fig. 6. Menu for searching in the databases in FOXBASE +

Using the main menu (see Fig. 5), the user can access to the following databases: Topics, Projects, JINR participants, Collaborations, Expert, expert Recommendations, Finances and access Attributes. The latter one defines the read / write access attributes for each user. For each database the system provides the following menus and windows: to copy, join and erase databases; and update, append, delete, display and print selected articles and fields. To accelerate the work with databases, auxiliary index files were used.

The kernel of the TPLAN - system was written in C and FOXBASE + languages. It automatically loads the modified modules to work in FOXPRO, when needed.

The user can select the Russian or English interface, that includes menus, messages and texts in Russian or English respectively.

To solve the tasks related with the annual topical plan of JINR, normalized databases were created that contain the following main fields:

```
<topic code>:=<scientific field code><laboratory code>
<topic number><duration>;

<topic>:=<topic code><status><priority><title><chief>
<goals><results><annual results>;

<project code>:=<topic number><number>;
```

- [3] - Programming in C++, Stephen C. Dewhurst, Katty T. Stark, Prentice Hall Inc., New Jersey, 1989.
- [4] - FOXPRO 2.0, Reference manual, Fox Software, Inc., 1989-91.
- [5] - Programmer's Guide, Microsoft Visual Basic. Programming System for Windows V. 3, Microsoft, 1993.
- [6] - Object-oriented programming for WINDOWS, Ernest R. Tello, John Wiley & Sons, Inc., New York, 1991.
- [7] - Microsoft's Windows Database, John Udell, Byte, December 1992, Vol. 17, number 14, p. 51-52.
- [8] - Programming with dBASE III Plus., Aston Tate Corp., 1986.

Фернандес Нодарсе Ф.
Использование СУБД и интерфейса,
предназначенного для документов в TPLAN-системе

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В работе описывается дружественный интерфейс (ИПД) для ввода/вывода информации в/из СУБД TPLAN. Он включает высококачественный выход в формате LaTeX из базы данных (в соответствии с определенной грамматикой, которая включает подмножество грамматики LaTeX) и хранение выборной информации из документа в LaTeX в базе данных. Система TPLAN разработана для управления годового проблемно-тематического плана ОИЯИ. Она написана на «С» и DOS FoxBase/FoxPro для персональных компьютеров, совместимых с IBM. Также выполнен прототип в Visual Basic и Windows ACCESS с использованием стандартных контролей VB.

Работа выполнена в Лаборатории вычислительной техники и автоматизации ОИЯИ.

Сообщение Объединенного института ядерных исследований. Дубна, 1994

Fernandez Nodarse F.
The Use of DBMS and Document Oriented Interface
in the TPLAN-System

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The paper describes the user-friendly input/output interface (DOI) for the TPLAN database management system that includes high quality output in LaTeX format from databases and retrieves selected information from LaTeX document (according to a specific grammar that includes a subset of the LaTeX grammar) to be stored in the databases. The TPLAN-system was developed to manage the annual Topical Plac of JINR. It was written in «C» and DOS FoxBase/FoxPro for IBM compatible personal computer. It was also prototyped in Visual Basic and Windows ACCESS using standard VB controls.

The investigation has been performed at the Laboratory of Computing Techniques and Automation, JINR.

Communication of the Joint Institute for Nuclear Research. Dubna, 1994