Study and Development on Report Automatic Creating System for Engine Performance Test-Bed Based on VBA

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Abstract. Test reports given by test institution are mostly stylized text. Editing such text is a hard and odd work. A method is introduced to implement report automatically creating based on VBA and Word's template technology, such as bookmark, ChartObject etc. The method used in our engine performance test-bed laboratory works well and reduces report editing time form half a day to half an hour.

1 Introduction

There are many third-party independent product inspect organizations which test product's quality, performance and provide test reports to their clients, ordinary product manufacturer or product agent.

Test reports are usually stylized and relatively changeless except part text to be modified. Traditionally, report writer manually recomposes the report contents using text-edit software based on a template file. This is a hard, odd and time-consuming work.

Microsoft's Excel provides a powerful and easy way to liberate report writer from odd work [1,2] . Using embedded VBA program [3], Excel can easily execute calibration, create charts, handle tables, and finally create report file [4]. This paper presents a new solution to operate test data and create reports automatically in our engine pedestal test laboratory which reduces report writing time from half a day to half an hour.

2 Report editing procedure

The below is the procedure of handwork report editing in our engine performance test laboratory.

engine pedestal test of product A and product B   using professional software to process data, creating charts and tables   handwork edit text to a formal report

Ordinarily, report writer renames a former report file as a new one and then edit it by replacing product name, manufacture name etc with copy and paste tools. Then copy data, tables and charts processed by professional software and ultimately compose final report.

3 Report automatic creating system

Word's template is an easy editing-tool solution for a stylized text [5,6]. The text to be replaced can be defined as a "bookmark". Embedded VBA program codes in Excel files change bookmark's values, create tables and charts.

3.1 System Structure

Test report automatic creating system is mainly made of 3 Excel files where program codes are embedded and a Word template file where many bookmarks are defined to be modified. Figure 1 shows the procedure of report automatic creating system [7].

1) Excel Files

There are 3 Excel files in the system: product A's data Excel file, product B's data Excel file and report automatic creating Excel file

Product A's test data are saved in product A's data Excel file where you can input test data, pre-process data and test tables can be created. Figure 2 shows the main interface of a data Excel file with three sheets. Basic info sheet contains basic information of a test, including product name, test date etc. Input data sheet contains original test data to be input manually. Pre-process sheet contains pre-processed tables created based on original data. Product B's data Excel file contains product B's test data which structure are same as product A's.
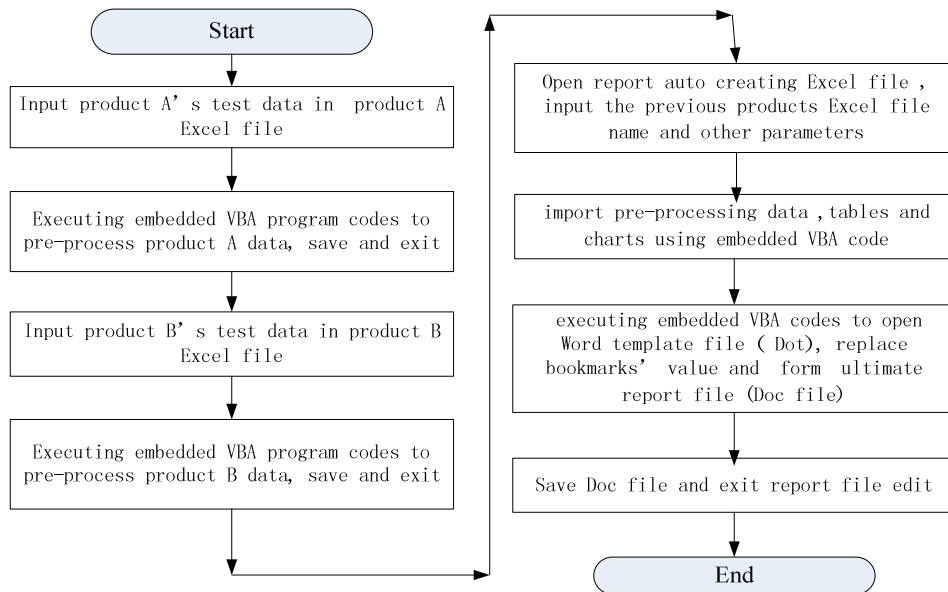

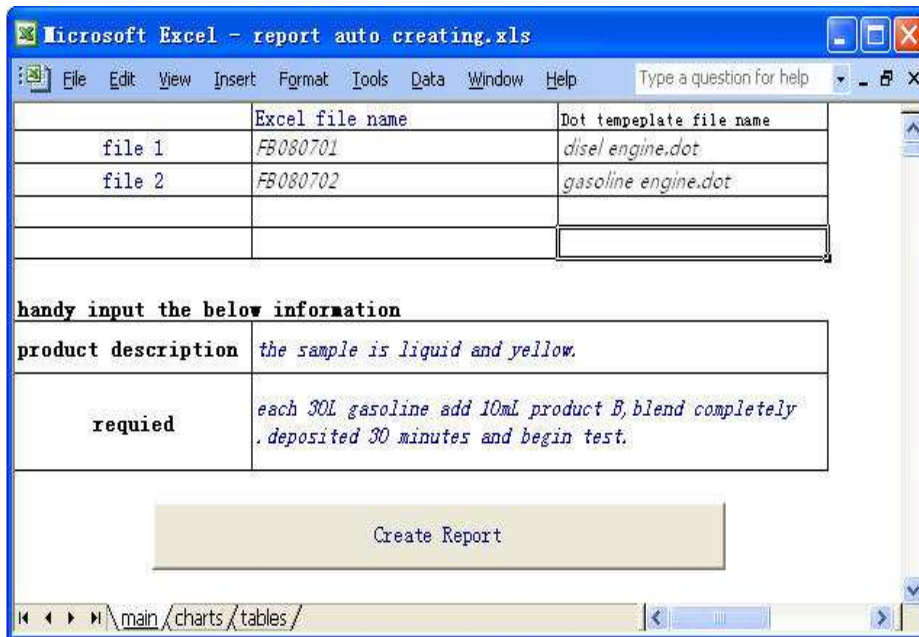Fig. 1 Procedure of report automatic creating system

Fig. 2 Main interface of report creating Excel file

Report automatic creating Excel file: import pre-process data, tables and charts of product A and product B; create product A's and B's contrastive tables and charts; using Word's template file to create Doc draft file; replace predefined Bookmark's value of the Doc draft file; form a final report file.

2) Word Template

In a test report Dot template file there are many predefined bookmarks. The Dot file is called in report automatic creating Excel file and saved as a Doc file where these bookmarks' value will be modified by executing embedded program to implement report's auto recomposing.

3) VBA

The kennel and the brain of the report automatic recomposing system are the embedded VBA program codes which implement data calibration, tables creating, charts creating and report recomposing [8,9]. These codes can implement the same functions of the originally professional data software which are developed by VB or VC tools [10].

3.2 Bookmark

A bookmark identifies a location or a selection of text that you name and identify for future reference. In a Word document file, we use a bookmark to identify text to be modified at a later time. The contents same to this bookmark's in other location are defined as a reference to the bookmark. If a bookmark's value changes, its reference's value changes too.

   The following steps guide you to create a bookmark in an Excel file.

   1) Select a block of text to be defined as a new bookmark

   2) Define a new bookmark: from tools menu, operate insert bookmark fill the name of the bookmark add, define a bookmark which you can change or delete it later using edit tools or by executing VBA program codes.

   3) Add a bookmark's reference: select a block of text which contents are same to the bookmark, press Ctrl+F9, fill the name of the bookmark's reference. A bookmark reference is defined.

3.3 Call Word Template in Excel

The following program is an example to open a Word's Dot file in Excel file.
Dim wdApp As Object
Set wdApp = CreateObject("Word.Application")
wdApp.Documents.Add Template:="c:\template.dot", Visible:=True

4 Conclution

Report automatic creating system is implemented using Excel's powerful table and chart function, Word's template technology, embedded program VBA codes. The system liberates report writer from odd edit work and reduce report editing time. The system has passed the test in Windows XP, Office 2000 and Visual Basic 6.0 environment.

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