Key Technology of Online Writing System Development

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Keywords: online writing; system development; key technology; Spring; literature management; Word VBA

Abstract. With the development of information technology, new writing tools are emerging, to help inspire authors and to improve writing skills and efficiency. This paper studies the problems existed in the popular writing tools. Firstly, studies the system framework, discusses the advantages and workflow for Spring MVC framework; then, researches literature management, including literature management principles and main functional module design; finally, studies Word VBA applications, through the graphic demonstrated the main objects and property of the   Word objects, illustrated the implementation method of assisted writing functions. Contents of this paper solved the key technical problems for the development of online writing system, laid the foundation for software development.

Introduction

Article with text as a medium, is the information carriers of having chapters organized forms that declared sensible things or express emotion [1]. Writing is the overall performance of individual multiple intelligent, including critical thinking skills, namely observing life, identifying affair, thinking problem, deciding article subject matter; structural capacity, namely rules and layout, determine the structure, context and level of the article; writing skills, namely the skill of rhetoric and expression, determines the language form of articles. The former writer with the pen write, with the development of the Internet, new writing tools are emerging, to help inspire authors and to improve writing skills and efficiency. Through the full investigation, analyze the advantages and the problem of online writing system at home and abroad, research the key technology of online writing systems development and provide the support for developing the writing software that fit the author's needs.

Spring MVC Framework

MVC (Model View Controller) is a software design model, Model is the part used for processing application data logic in the application, model object usually responsible for access to data in the database; View is part of the application process the data displayed, usually view is created on the basis of the model data; Controller is part of the application process user interaction, usually controller is responsible for reading the data from the view, control user input, and to send data model. MVC organizes code with business logic, data, interface display separating method, business logic gathered inside a part, at the same time improving and customization of the interface and user interaction, without rewriting the business logic. MVC used for mapping traditional input, processing and output functions in a logical structure of graphical user interface.   Spring MVC framework structure is shown in Fig. 1.
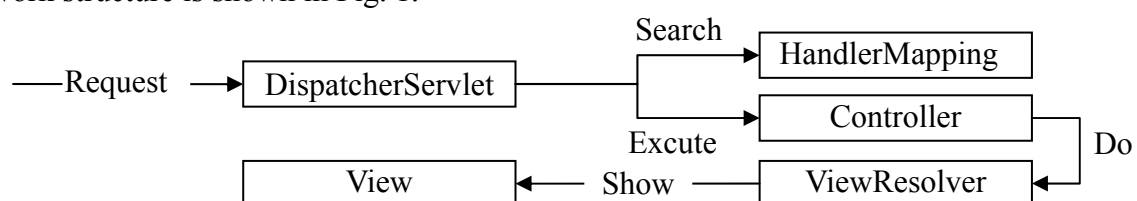

Fig. 1. Framework structure on Spring MVC

Spring Web framework designed around a DispatcherServlet. The role of DispatcherServlet is to distribute requests to different processors. Spring Web framework includes a processor mappings, view resolution, locale resolution, theme resolution and support for upload files. Controller interface processor is realized, it defines "ModelAndView handleRequest" methods to achieve its own controller via this interface. A ModelAndView instance contains a view name and a type Map Model, a Model name of some to Bean as key, with Bean object value of name-value pairs. Map of the Model is based on a high degree of abstraction, for a variety of presentation layer technology. That is, any reproduction layer can be directly and Spring integration, whether JSP, Velocity, or other presentation layer technology [2]. "Map Model" can be converted into an appropriate format, such as "JSP Request attribute" or "Velocity template model". Spring MVC workflow is shown in Fig. 2.
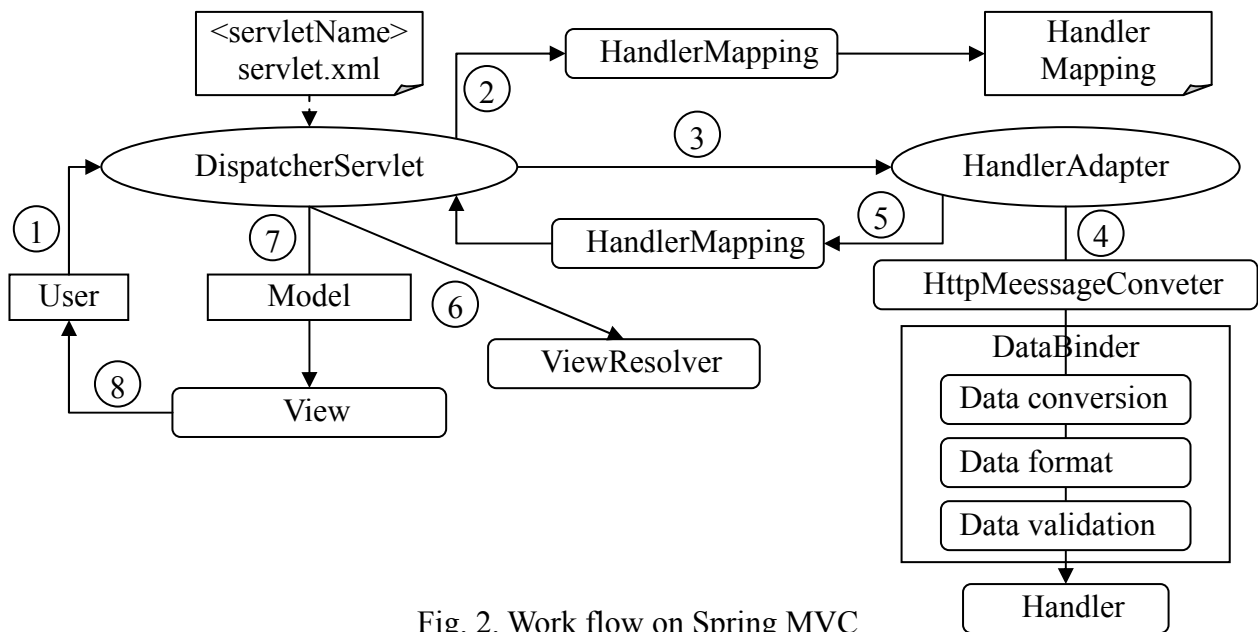

Fig. 2. Work flow on Spring MVC

Workflow shown in Fig. 2 are briefly described as below: (1) The user sends a request to the server, the request is captured by Spring front control Servelt DispatcherServlet; (2) DispatcherServlet parsing request URL and obtained the requested resource identifier, calling HandlerMapping obtained all related objects with Handler configuration, and finally return as the form of HandlerExecutionChain object; (3) according to Handler obtained by DispatcherServlet, select an appropriate HandlerAdapter; (4) extract the model data in the Request, and fill Handler into parameter, started Handler; (5) after Handler execution, return a ModelAndView object to the DispatcherServlet; (6) According to the returning ModelAndView choose a suitable ViewResolver returned to DispatcherServlet; (7) ViewResolver combined Model with View called the view; (8) calls the results returned to the client.

Literature Management

Referring to literature is an important work for writing. Traditional method is to check the catalog and summaries of recent magazines in the relevant field in library, select a few to read carefully. Also often use electronic resources or the network to find the direction of related fields, selectively and critically read. In the informational age mainly includes electronic literature, because the number is very large, literature management is a very complex task [3, 4]. The problems existed in the process of literature management includes: a lot of literature from different databases repeatedly download; literature storage chaos, it is difficult to quickly find the required literature; when writing, references attached the article very tedious; when repeatedly contributed, need to repeatedly revised references format. To solve these problems, many authors use the literature management system to manage; the principle is shown in Fig. 3.
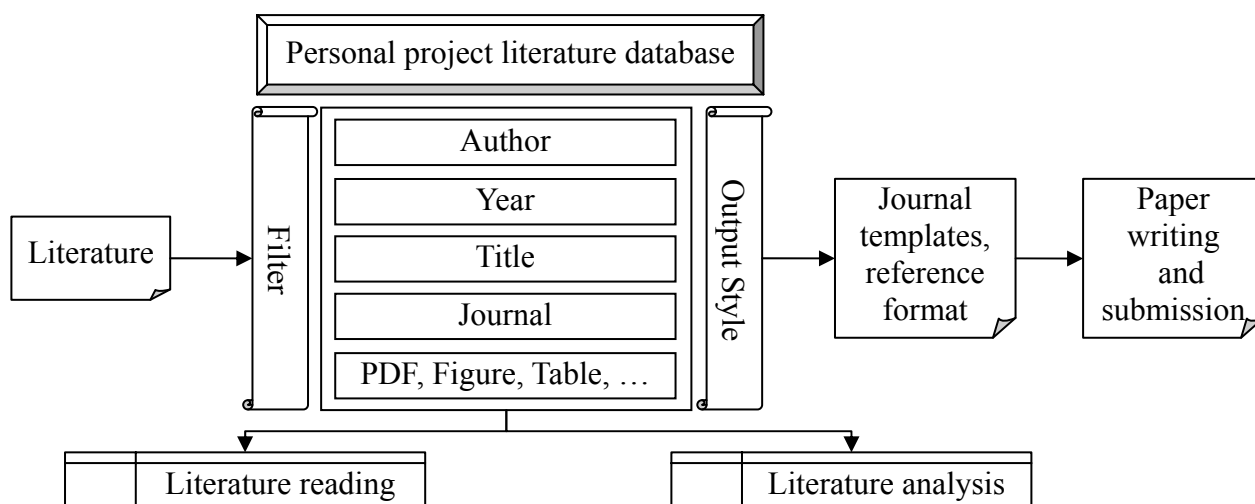
Fig. 3. Principle of literature data management

Literature management system is an important part of online writing system, complete "Literature data collection, Literature classification management, Literature auxiliary writing, Literature system management" and other functions, the functional structure is shown in Fig. 4.
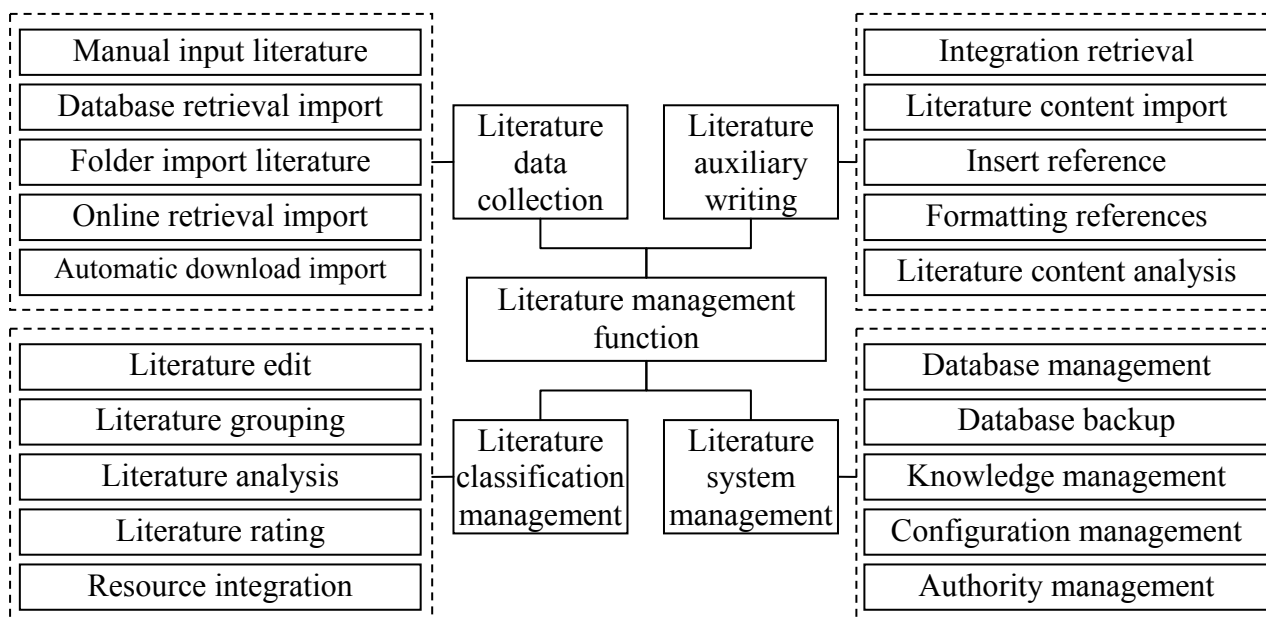

Fig. 4. Literature management function

In which, "Literature data collection", used to collect literature and stored in the database. Key features include "Manual input literature, Database retrieval import, Folder import literature, Online retrieval import, Automatic download import" and so on; "Literature classification management", used for comprehensively managing literature in the database, the main features include "Literature edit, literature grouping, Literature analysis, Literature rating, Literature Resource integration" and so on; "Literature auxiliary writing", used to provide using method and mean for literature in the process of writhing, the main features include "Literature integration retrieval, Literature content import, Insert reference, Formatting references, Literature content analysis" and so on; "Literature system management" is the management that system administrator manage software system, the main features include "Literature database management, Database backup, Knowledge management, Configuration management, Authority management" and so on.

Word VBA Application

VBA is a macro language for Visual Basic, is a programming language used to perform common

automation tasks in the desktop applications for Microsoft and primarily used to expand the application functionality of Windows. Due to the popularity of Microsoft's Office software, Word, Excel, Access, Powerpoint in the office software can use VBA to make software application more efficient. VBA as a new generation of standard macro language has the ability of spanning a variety of application software and controlling application software objects, so programmers only need to learn a standard macro language, can convert to specific application software and save the studying time, improved the ability that mutual development and call among different software applications. The operation of VBA for Word implement through the object, Word provides many objects, the objects that often used and located the top-level in the object model and its main properties and methods are shown in the Fig. 5.
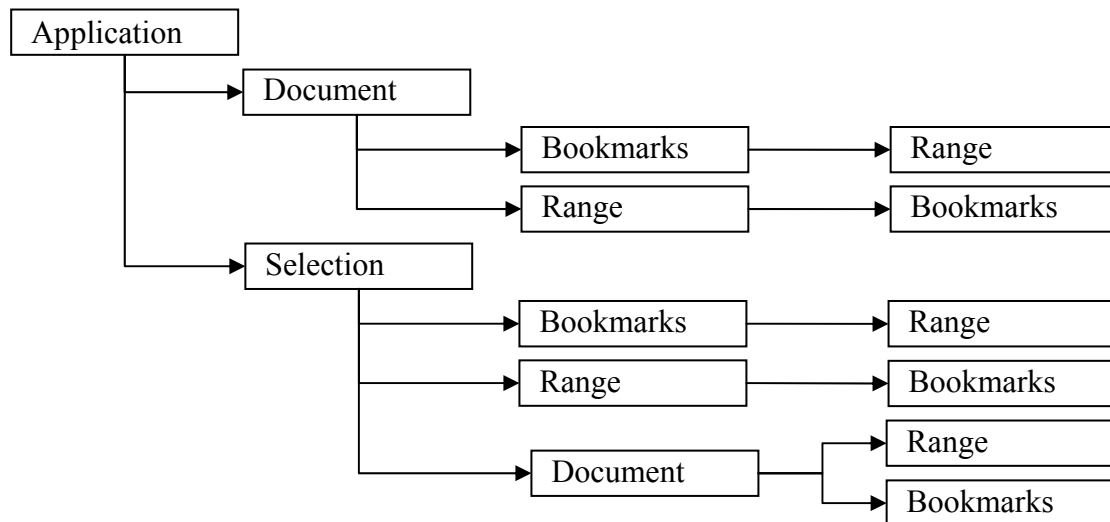
Fig. 5. Word main object model

Object shown in Fig. 5 briefly described as follows: Application object represents the Microsoft Word application, is the top of all other Word objects; Document object represents a Word document, is the focus of the Word program design; Selection object represents a window or the contents of the currently selected cell in the window; Range object represents a contiguous range in a document, each range object is defined by a start and a termination character location; Bookmark object represents a single bookmark and is used to represent a continuous range in document. By manipulating and accessing objects, perform the following functions:

(1) Word document transfers jpg file. When a large Word document or high-volume Word document is converted to image files, use VBA statement call office file to achieve macro, both to keep the format of Word document, to maintain rich colors for Word documents. Conversion steps as follows: BrowseForFolder command opens the specified Word document and read the path and file name of document; open the Word document in the selected folder; in the folder that existed Word document files create folder with the same name as Word document; read the page number of opened Word document; utilizing loop statements copy by page the content of opened Word document; create blank PPT and set the size; paste the copied content on the new blank PPT; using the export method to save PPT file as jpg document in the Powerpoint [5].

(2) Automatically typesetting. Automatically typesetting is an important application of Word automation; when user editing only consider the content of inputting text, but layout format achieved automatically. Using VBA functions provided by Word design plug-in can run in Word, executing Plug-in program can achieve the automatic typesetting for each part of words. The process of Plug-in implementation as follows: write VBA procedures realized the function; add a menu item or the command button in Word; combined the command buttons in the menu item or toolbar with functions that achieve the program, the user can run the program using menu item command or toolbar button. Use the Word objects selected a continuous range of text in document, and then using property setting of the object achieve a variety of layout formats.

(3) Split and merged document [6]. In the process of writing, if the number of documents is fewer or the volume is smaller, it can easily consult, but when the number is more and the volume is large, the operation will have to spend a lot of time and effort, and easily produce error. With the VBA achieving document batch operation can improve the efficiency and accuracy of writing operations. When batch merged, VBA program automatically find each document need to be merged, the entire contents of the document is automatically copied to the specified merge document and automatically saved until all required documents are completed merger. When batch split, VBA program check the key word symbol the start of separate document in the required split document, after find the second key word, to cut the front part of the keyword into the specified document, and saves with the required document name, cycle repeatedly until the entire document has been split successfully.

(4) Operation form. Using VBA to operate Excel table is very simple, similarly, processing Word forms is also very convenient. In the process of writing often used a variety of forms, operate with VBA, it will improve operational efficiency and make form beautiful. Using VBA to process forms can complete the following functions: create a table, insert text, and application format; insert text in a table cell; returns text in the table cell, but does not include a table cell end tag; Convert text to a table (at the beginning of the activity document insert a text with tab-delimited, then converted the text to the form); returns the contents of each table cell (For Each ... Next structure used to return the contents of each table cell and the text assigned to the corresponding array elements); copy all the tables in the activity document to a new document.

Conclusion

Threw himself into writing, comprehensively mobilize the realm and literacy for authors in many aspects, including a wealth of experience, that is inexhaustible subject matter; the lofty realm of thought, that is reflecting the depth and breadth of life; vast knowledge training, namely writing both ways, do a job with skill and ease; elegant taste trials, namely articles style and taste. The application of online writing system achieved writing automation. Software should have the following features: Cross-platform synchronization, support for synchronously updating and using on the browser, phone, tablet three devices; multi-topic, multi-modular, improve reading speed and fine typography layouts; multi-modular can easily add multimedia interactive elements. Contents of this paper solved the key technical problems for the development of online writing system and laid the foundation for software development.

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