doi:10.21311/001.39.11.25

**Analysis on HTML5 UI Design Paradigm under the Background of Data Flow and Interactive Experience**

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**Abstract:** With the bursting development of the website techniques, the optimal design pattern needs to be analysis and found out. Under this background, this paper conducts analysis on HTML5 UI design paradigm under the background of data flow and the interactive experience. Software interface design as the basis of the software design, software development in the long, the interface design work has not been taken seriously. People who do interface design have also been derogatory known as the "art." A friendly and beautiful interface will give people the comfortable visual enjoyment, closer to the distance between people and computers while creating a selling point for the businesses. Software interface design is not a simple art painting with the needs to locate the user, the use of the environment, the use of methods and designed for end users that is a purely scientific art design. HTML5 permission procedure through Web browser movement among, and at the present and so on video frequency needs the plug-in unit and other is accommodating the multimedia contents which the method can use also to integrate, this will cause the browser to become one kind of general platform, and by using this general feature, this paper construct the robust system with the empirical implementation.

**Key words:** HTML5, UI Design, Data Flow, Interactive Experience, Background

1. **INTRODUCTION**

The contact surface design is between the human and the machine the transmission and the exchange information medium, that including the hardware contact surface and the software contact surface is the computer science and the psychology, design art study, the cognitive science and man-machine engineering overlapping research area (Tom, 2014). Software interface design as the basis of the software design, software development in the long, the interface design work has not been taken seriously. People who do interface design have also been derogatory known as the "art." In fact, the software interface design is like industrial products in the industrial design, is an important selling point of the product. A friendly and beautiful interface will give people the comfortable visual enjoyment, closer to the distance between people and computers while creating a selling point for the businesses. Software interface design is not a simple art painting with the needs to locate the user, the use of the environment, the use of methods and designed for end users that is a purely scientific art design. Web pages, regardless of their type, size, function, style and the basic elements are consistent with the graphic design, in addition to images and text, the web interface contains more elements (Friederike, 2015) that can be organized as the follows.

1) The graph must have to conform to the homepage subject, each picture all must have to have its existence value that makes good use of the graph and that may the vivid image express the homepage intuitively the subject, the enhancement homepage propaganda strength, the rallying point and the power with attraction browsing attention and the interest.

2) Accurately use color in web design, in order to achieve the purpose of conveying the specific information and render the effect of page. Color plays an important role in web design. Firstly, color pages more attractive than monochrome pages; secondly, the color itself has a symbolic role, the viewer easy to associate.

3) In layout design, still need to be applied to the previously mentioned Photoshop or Fireworks graphics processing tools, web page layout to see the visual effect, draw a good page layout in Photoshop or Fireworks after the first section and then export section (Xinhui, 2013).

4) Sometimes we can put the words in image processing software such as Photoshop or fireworks is saved as a JPG or GIF format of slice images then applied to the web interface, so that we can achieve any want to the artistic effect.

Under this condition, to promote the further development of the UI design, in this paper, we propose the HTML5 UI design paradigm under the background of data flow and interactive experience. The later subsections will illustrate the proposed model in the detail, and in the figure one we show the sample UI design paradigm.
2. OUR PROPOSED METHODOLOGY

2.1. The Data Flow Modelling and Influences

In general, frequent data units in the data stream is more important, the impact on the results of the larger, the need to focus on. Therefore, the significance of frequent data recognition is to find the more important data, which is conducive to further processing of data. There are two influential research groups in the field of data flow mining abroad: the research team led by Prof. R. Motwani of Stanford University and the research group led by C. Aggarwal and J. Han of UIUC. The former researches focus on the data stream management, continuous query of data flow and data flow clustering, and propose DSMS concepts different from traditional DBMS. Their research is supported by the National Natural Science Foundation of China (Vincent, 2014). From their perspectives, for the issue of the data flow modelling, the primary issues should be focused on the following items.

Table 1. The Data Flow Modelling Principles

<table>
<thead>
<tr>
<th>Item</th>
<th>Key Principles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real-time monitoring and identification of data stream changes</td>
<td>Regarding dynamic change data stream, not only must monitor whether changes, moreover can distinguish the change the nature, the discrimination remarkable change and the noise change.</td>
</tr>
<tr>
<td>Reduce the demand for class standard data update model and architecture</td>
<td>The update or reconstruction of the model relies on the training data class data known to the class labels, whereas the class mark of the data requires a higher cost marking resource. Therefore, how to reduce the demand for class data is the key problem of data stream classification.</td>
</tr>
<tr>
<td>Classification algorithm has less time and space complexity</td>
<td>The high speed and non-reproducibility of data stream can be processed in real time by the algorithm, and it is best to access the entire data stream only once.</td>
</tr>
</tbody>
</table>

In recent years, a large number of data flow mining algorithms have been proposed, usually divided into two categories: the exact algorithm and approximation algorithm. The precision method can mine all the frequent patterns whose support is greater than the minimum support, such as Moment and CPSTree approximation algorithms. In order to guarantee the efficiency of mining, the tolerable accuracy is lost. Most mining algorithms are approximate algorithms such as Lossy counting, FPStream and Msw (Lee, 2013). The network data stream uses in Baotou's field to define generally, the application is different the use field also slightly has the difference. Most general is a network data stream by source address IP, destination address IP, the source port number, the general goal port number, agreement type only marking. Besides uses in the network survey based on this kind of definition the network data stream counting, regarding also has based on the condition network security examination system the vital significance may solve in the system to connect the table to open the major problem, avoids the connection table exploding.
On the other hand, the algorithm regularly prunes the tree structure by recording the transaction Tid which contains the node recently. However, this method cannot cut out all the expired transactions while in other words resulting in inaccurate results. An the core question can be transferred into the optimization issues of formula 1 and 2.

\[
\begin{align*}
\text{minimize} & \quad \frac{1}{2} \| w \|^2 + C \sum_{j=1}^{\ell} \xi_j, w \in \mathbb{R}^N, b \in \mathbb{R}, \xi \in \mathbb{R}^l \\
\text{subject to} & \quad y_i(w \cdot x_i + b) \geq 1 - \xi_i, i=1,\ldots,\ell \\
& \quad \xi_i \geq 0, i=1,\ldots,\ell 
\end{align*}
\]

(1)

\[
\begin{align*}
\text{maximize} & \quad L_D(\alpha) = \sum_{i=1}^{\ell} \alpha_i - \frac{1}{2} \sum_{j=1}^{\ell} \alpha_i \alpha_j y_i y_j x_i^T x_j \\
\text{subject to} & \quad \sum_{i=1}^{\ell} \alpha_i y_i = 0 \\
& \quad 0 \leq \alpha_i \leq C, \ i=1,\ldots,\ell 
\end{align*}
\]

(2)

Where \( \alpha_i, y_i, x_i, x_i^T \) and \( y_i(w \cdot x_i + b) \geq 1 - \xi_i \) denote the subjective term and the \( \frac{1}{2} \| w \|^2 + C \sum_{j=1}^{\ell} \xi_j \) is the objective function. In this algorithm, a k-tree structure is constructed to synthesize the statistical results of a single data stream. The leaf nodes that collect statistics on a single data stream send statistical results to their parent nodes at intervals and these nodes are aggregated and then sent to the upper nodes. Finally, the statistical results of all input data streams are obtained at the root node. The optimization is then transferred into the formula three.

\[
\begin{align*}
\max_{\beta} & \left\{ \sum_{j=1}^{\ell} \left[ q_m(j) + q_e(j) \right] + \theta \cdot \min \left[ \hat{k} - \frac{1}{N} \sum_{j=1}^{\ell} k_i(j), 0 \right] \right\} \\
\text{s.t.} & \quad 0 \leq \beta \leq \beta_{\text{max}} 
\end{align*}
\]

(3)
It contains the number of clusters is a fixed value k and DS segmented clusters the data flow, each cluster corresponds to a data flow sequence number and transaction. With the new data arrives, the sliding window update in clusters, each into a new cluster, the oldest cluster to be deleted, changing and updating data in the sliding window. In the figure 3, we demonstrate the connection patterns of the data flows.

![Figure 3. The Connection Patterns of the Data Flows](image)

Therefore, all statistical node may use the same statistical table to complete the basic statistical task, in such different data stream same data unit can carry on the statistics after the Hash operation in the different statistical table same unit. Thus will be directly many a statistical table to accumulate may obtain this many data stream synthesis statistics result (Silva,2012). Thumbnail-based statistical method uses a number of Hash functions of statistical tables to achieve statistical functions, each hash as a counter, and the length of multiple Hash table to maintain the same. Therefore, if all the input data flow statistics using the same statistical table, the same data unit statistical result in as each table is the same position, the corresponding table directly to the corresponding unit of data units can be accumulated in the entire system of the statistical results. Under this perspective, the core issues in the formula 1 and 2 can be transferred into the equation 4.

\[
R_{reg}(f) = C \sum_{i=0}^{j} \Gamma(f(x_i) - y_i) + \frac{1}{2} ||w||^2
\]  

(4)

Where the \( \Gamma(f(x_i) - y_i) \) is the transferred term into the consideration, it used the fixed measure the memory, real-time processes the data, has highly effective constructed an effective decision tree sorter. It is different in the traditional batch run method, VFDT processes each decision tree and when the node only relies on the entire data molecular sample, only makes a scanning to the entire class data obtains an approximate solution. Absorb the advantage of DSTree method, the tree node set count list item in each cluster in the sliding window support. Through the items in the first table I nodelinks domain in order to find the same node in the tree, and slide each node count list, covering the count list in the first column that empty out the counting list last as the latest preparation into the clusters. Traverse the I in this way from top to bottom of each item and so as to achieve the aim of update all the nodes based on the following procedures.

\[
\lambda_{T}(t) = \mu_{T}(t) + \mu_{r}(t) \times \frac{1}{1 + \exp\left(\alpha_{1}(c_{T}(t) - c_{r}(t)) + \alpha_{2}\beta(t) + \gamma\right)}
\]  

(5)

\[
\ln\left(\frac{\mu_{r}(t)}{\lambda_{T}(t) - \mu_{T}(t)} - 1\right) = \alpha_{1}(c_{T}(t) - c_{r}(t)) + \alpha_{2}\beta(t) + \gamma
\]  

(6)

Where the \( \left(\frac{\mu_{r}(t)}{\lambda_{T}(t) - \mu_{T}(t)} - 1\right) \) is then the enhanced data flow term, Bloom Filter query algorithm required space and elements of their own size element off, only the elements mapped to the vector number of bits related. Therefore, the Bloom filter is very suitable for storage space is limited and can allow the slight misjudgment of the occasion. In the later following sections, we will discuss the issues based on this prior (Derboven,2012).
2.2. The HTML 5 Features and Characteristics

The work team establishes the HTML5 standard, and that the standard focal point will concentrate in improves the HTML4.0 the weak part, also will be to the web application support above. The former HTML standard was bad to the web application support, had to depend on the plug-in unit generally based on the browser rich client side application to realize, but also had the very many web application to have to get realize based on the independent client side. But the development personnel might complete the past through HTML5 API front end on the browser to depend upon the function which the client side completed. The new generation of the Internet standard essentially may let the procedure through the Web browser, this meant, the consumer will then be able from to include the personal computing, the notebook computer, the intelligent handset or the plate computer random equipment visit same procedure and based on cloud content. HTML5 permission procedure through Web browser movement among, and at the present and so on video frequency needs the plug-in unit and other is accommodating the multimedia contents which the method can use also to integrate, this will cause the browser to become one kind of general platform, the user can complete the task through the browser. In addition, the consumer also may visit by the long-distance way memory in “the cloud” each kind of the content, not position and equipment limit.

![Figure 4. The HTML 5 Features and Characteristics Demonstration](image)

Typically, Servlet from the HTTPServletResponse object to obtain a PrintWriter object, through this object, Servlet will be able to format the text data stream sent back to the Web browser. Most servlets populate the response stream with the HTML pages, which means that developers need to embed hundreds or even thousands of hard-coded HTML tags and JavaScript into each servlet, and when it comes to general new requirements in appearance or behavior while it may affect a lot of the dynamically generated Web pages, developers must be combing each Servlet, and one by one to modify, which resulted in the system maintenance and expansion of the difficulties of fierce. To deal with this basic drawback, the HTML 5 provides the following countermeasures as the solution.

1) Simplifies the HTML page the production, we must cause the view development personnel not the HTML detail and the browser unique behavior puzzle and must maintain the simplicity which the HTML page produces.

2) Page elements modularity and this is the essence of the HTML generation class framework. The basic purpose of this framework is to allow developers to build a simple page from the basic type of structure. A page may contain a table, an input form and some text, a cell in the table may contain an image, and the another cell may contain another complete table.

3) Local data storage. When off-line needs the data storage local, in order to online time synchronization to server on. In order to meet the different memory need, HTML5 has provided DOM Storage and Web SQL the Database two kind of the core memory mechanisms. In the application may consider user’s some data storage in local, applies for the off-line pattern under.

4) HTML 5 video and audio. In HTML 5 web page is no longer needed plug-in play audio or video multimedia files, only need to add video and audio tags and using JavaScript code development operation panel, can be realized in flexible playing multimedia web page, at the same time can combine Canvas technology increase the effect and control operation of multimedia files.

5) Device Orientation Event has provided to the equipment physics direction and the movement information event processing, mainly pays attention to the movement and the position sensor, it does not provide visit to the basic sensor data or to the sensor the control, but is the high level seal.
2.3. The Software and Web Application Design Patterns

Erich Gamma and others divided the design patterns into the three categories: creation mode, structure mode and behavior mode. A total of the 23 specific design patterns were proposed. And Frank Buschmann and others from the architecture, design patterns and language-specific idioms of the three levels of abstraction mode were discussed. Other research efforts include the CASE tool to support pattern organization and core indexing, pattern mining, and so on. However, in these studies, the description of design patterns is mostly informal or semi-formal. In fact, structure also is designs the pattern the core part. It is all oneself knows or the unknown software engineering similar kind of solid structure abstract structure template. Therefore, it will transform with the specific kind of chart to Object-Z is different, the design pattern structure drawing formalization will be supposed to be more abstract, more importantly will describe class, the group, the abstract function and the function collection as well as between them the relations, but will not be concrete kind of, the object, the news and the general concrete operation.

As shown above, the sample is illustrated, as for the design of the applications, the infrastructure layer for the application to provide the data access services, it can be the application itself, the persistence mechanism can also be external systems to provide data access web service and so on. It provides the common technical framework that can be accessed by other layers, such as the general exception capture and processing, logging, authentication, authorization, authentication, tracing, monitoring, caching, etc. A schema has four basic elements: a schema name, a mnemonic name that describes the schema problem, the solution, and an effect. The question describes when the schema should be used. It explains the design problems and problems of the existence of the antecedents and consequences, may describe a specific design problem, it may lead to inflexible design of the class or object structure and solution that describes the various components of the design, as well as their interrelationships and their respective responsibilities and ways of collaborating. Effects, describes the use of the model and the use of the model should pay attention to the problem. The software architecture style is describes in the some specific application domain the system organization way habitually used pattern.

It had reflected in the domain the multitudinous systems altogether have the structure and the semantic characteristic, how and do instruct organize effectively each module and the subsystem a complete system. Understood according to this way that, the software architecture style defined has used in describing the system
terminology table and a basic group instruct the construction system the rule. For this, we can try the listed suggestions.

1) **Consistent network communication service applications.** Using WCF service layer that realize the business's ability to function in the network transmission, multiple client applications to provide a basic unified service interface, avoid the repeated development make simple mobile or fixed terminal, personal computer terminal, etc. can be networked client can access the unified service address that realize the consistency of system services.

2) **Aspect oriented programming AOP application.** Through the AOP technology, to achieve such as log, transaction management, access control, such as cross cutting concerns of the general logic can focus on the core focus, it will focus on solving the logic up.

3) **Dependency injection and its implementation.** The lamination construction design between the level and the level is the loose coupling, the upper formation cannot rely on specifically the lower level, only relies on its connection. Thus, the upper formation cannot in the direct instantiation lower level kind, but only has the connection and actually does the connection refer to the variable is finally which kind, then pours into the mechanism decision by the dependence.

4) **AOP and IoC are carry on logic to separate and to reduce the coupling degree most main way.**

   The AOP technology, in the dissection seal object, will affect many kind of the public behavior seal will be may entrust with the heavy responsibility the module, and its named “aspect”. It divides into the software system two parts: Core attention and the transverse cutting attention spot. The handling of traffic main flow is the core attention spot, with it relations not major part is the transverse cutting attention spot.

### 2.4. The Interactive Experience Design

In essentially, the sentiment influence design is one kind pays attention to the user innermost feelings emotion demand center the design idea. In the design process, the sentiment influence design through to the product alternately operating mode, the shape, the color, the structure, the decoration, the superficial mechanism as well as essential factors and so on narrative background indication carries on creative conformity design, anticipated the user emotion factor integrates to in the product physical essential factor. Therefore, compared with the modernist design focus on the technical function of the product, pay attention to the relationship between utility and formal structure, emotional design to the user's artistic life and emotional experience as the ultimate goal as not to practical function for the sole purpose which can be expressed as the follows. And the interactive experience design principles for the web are shown in table 2.

- In the technique of expression, the key of emotional design is through the way of interaction, products quality, shape, color and other design elements to stimulate the user's emotional experience, especially pay attention to the product details of the impact of user psychology and emotion, and through some symbolic product elements of significance to arouse consumers' memories.
- If the design of the product contains consumer memory, thoughts, feelings, hopes, habits, social values and other attributes, will be able to effectively stimulate the consumer positive emotional response and emotional resonance, and promote the purchase and use of consumer behavior. Emotional design is customer-oriented design, therefore, the design of customer emotional response mechanism.
- Define federation requirements. Through a limited number of steps, to solve the problem from the abstract concept of the initial transformation of the specific realization of the logic. The use of the HLA for the development of application systems, we must first determine the core structure of the system to determine its federation by the following federal members.
- Federal object model design. The subclass has inherited his/her father's class attribute and the interactive characteristic, and carries on the refinement according to the concrete application request and increases some characteristics. Through an object/kind of the design mainly determined alternately between each federation member's data stream and the control class, Interoperability and the simulation resources between the basic realization simulation object may entrust with heavy responsibility. Based on designs and prearranges to determine the object class and alternately the kind, each federation member obtains data message at the same time from exterior which this federation needs, feels other federation member the interest the information to transmit.

**Table 2. The Interactive Experience Design Principles for the Web**

<table>
<thead>
<tr>
<th>Item</th>
<th>Key Principles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphic design</td>
<td>The belt filler graph may provide the time date and various aspects characteristic uses for to filter the information that promotes the data performance ability. In order to touch the click object to retain the enough screen space, recommends places the control item the screen</td>
</tr>
</tbody>
</table>
base that is advantageous for the user thumb operation.

<table>
<thead>
<tr>
<th>Form design</th>
<th>Editable form, not suitable for mobile devices editable form a great deal of data input, because most of the mobile device keyboard does not support the keyboard navigation, so don't use the editable form for a large number of data input.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability feature</td>
<td>The website usability is refers to the website to be able to provide the customer function information truly the usability. The website usability is must let the website structure, the content, as well as the guidance system and the operation flow facilitates easily to use.</td>
</tr>
<tr>
<td>Content features</td>
<td>To ensure that the site content to have a strong readability, text organized, such as the text color, size, density, graphic links and other visual effects to carefully arrange, through the graphic design and typesetting.</td>
</tr>
<tr>
<td>Extended navigation</td>
<td>Extended menu-driven navigation displays more information through the drop-down screen. A menu button placed at the top will display a list of the main menus after clicking, mostly for site mobile clients.</td>
</tr>
<tr>
<td>Tabbed navigation</td>
<td>Tabbed navigation is often displayed in the interface at the top or bottom of the toolbar, allows users to quickly switch between different interface, the application is suitable for less menu options, depending on the mobile screen available width in horizontal direction.</td>
</tr>
</tbody>
</table>

3. **THE EMPIRICAL IMPLEMENTATION**

The part is mainly focused on the empirical implementation of the system. In the following figures, based on the discussions of the prior sections, we implement the paradigms of the proposed methodology.

![Figure 6](image1.png) *Figure 6. The Empirical Implementation Set One*

![Figure 7](image2.png) *Figure 7. The Empirical Implementation Set Two*
4. CONCLUSION

This paper conducts analysis on HTML5 UI design paradigm under the background of data flow and interactive experience. A friendly and beautiful interface will give people the comfortable visual enjoyment, closer to the distance between people and computers while creating a selling point for the businesses. Software interface design is not a simple art painting with the needs to locate the user, the use of the environment, the use of the methods and designed for end users that is a purely scientific art design. Starting from the analysis of the HTML 5 features and the UI design patterns, we propose the novel and new paradigm for the design. The empirical simulation gives the illustration of the proposed method. In the future, we will apply the proposed approach in the modern web UI design application scenarios.

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