

## **Archiving Cultural Heritage in Malaysia: The Nyonya Kebaya**

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### Abstract

Malaysia is a multi-racial country with a rich cultural heritage where cultures have been meeting and mixing since the very beginning of its history. Much of its cultural heritages are recorded in various format - manuscripts, artefacts, sculptures, traditional motifs and designs on textiles and jewellers and kept in libraries, museums, archives, art galleries and cultural centres. These cultural potentials demand proper preserving, management and promotion. Preserving this culturally related potential means preserving the nation, a situation that in turn would keep human civilization in Malaysia sustainable. Nevertheless the information of this cultural heritage is not easy to access because the lack of accessibility to culturally related material resources. This paper describes the design of a cultural database accessible through the Web for the Nyonya Kebaya, the dress of the female Peranakan. This will provide for a systematic and standardized documentation of the Nyonya Kebaya information, easy access as well as provide for effective retrieval.

**Keywords:** cultural heritage, Nyonya Kebaya, cultural database.

## 1.0 Introduction

Malaysia is a multicultural society with a rich cultural heritage. It has a total population more than 21 million consisting of the Malays, Chinese, Indians, Kadazans, Dayaks, Bajaus, Melanaus, Muruts, Eurasians and the aborigines (Shahar, 2000). Malaysia's uniquely diverse cultural heritage stems from these ethnic communities and the immigrant population like the Chinese and Indians. One example of which Malaysia's immigrant populations have contributed to the nation's culture as a whole is in the history of Chinese immigrants ([Geographia](#); 2005). The first Chinese to settle in the country, primarily in and around Malacca, gradually adopted elements of Malay culture and intermarried with the Malay community. Straits Chinese, Straits Born Chinese, Baba Chinese, Baba (and their womenfolk Nyonya) and Peranakan are terms used interchangeably in Malaysia to describe the Baba Nyonya community, a subethnic group of the Peranakan Chinese community. The Baba Nyonya community has since firmly established themselves in Malacca, Penang and in the island state of Singapore (Mahmood, 2004). Their culture consists of a set of practices, beliefs, and arts, combining Malay and Chinese traditions. Unfortunately the esthetic of the Peranakan culture which is perceived as beautiful is dying slowly because of modernization and of inter-marriages (Cheah, 2005). Datin Seri Endon Mahmood has also been accredited with the revival of the culture as well as the revival of the dress for the female Peranakan, the Nyonya Kebaya ([www.kakiseni.com.my](http://www.kakiseni.com.my)). Thus a series of exhibitions were planned and organized in the museums and cultural centers in Malaysia. One of the main aims of this exhibition is to inspire the Malaysian public to help conserve and keep alive the Nyonya Kebaya which has been used by the female Peranakan for over a century (Mahmood, 2004).

In Malaysia several issues arise in conserving cultural heritage information. The issues are:

- i. Lack of standards on the description and graphic presentations of cultural products.
- ii. Large portions of invaluable cultural heritage are fast deteriorating due to poor maintenance and preservation practices.
- iii. Large portion of cultural heritage are in oral traditions, some are regarded as sacred.
- iv. Most cultural products are located in different institutions and most often they are not properly documented.
- v. Large portion of cultural heritage products are in private or individual hands and very little is known about it.

There is a need for training on documentation of cultural heritage information sources and database creation and on cultural information resources complete with graphic presentation of cultural images (Sahar,2000). The availability of cultural databases that are accessible through the Internet is lacking in Malaysia (Sahar,2000). Therefore here the researchers have collected data on the Nyonya Kebaya from various sources and than systematically documented the data, created a data model which is then implemented using a RDBMS. This cultural heritage information can then be easily accessed by anyone through the Internet. This will ensure accurate, timely and integrated cultural information on the Nyonya Kebaya thus helping to preserve its esthetic beauty.

## 2.0 Related Work

Metadata, literally "data about data," is a term that is used in different ways by the diverse professional communities that design, create, describe, preserve, and use information systems and resources. As these communities come together to realize the information age, it is essential that we understand the critical roles that different types of metadata can play in the development of effective, authoritative, interoperable, scalable and in the preservation cultural heritage information ([www.getty.edu](http://www.getty.edu)). In order for metadata to be as useful and cost-effective as possible, it is essential that its structure, semantics and syntax conform to widely supported standards. However there are descriptive standards used in the documentation of cultural collections that differ by institution type, collection type, curatorial methodology, level of detail and granularity, and intended applications and audiences ([www.rlg.org](http://www.rlg.org)). In addition cultural applications are implemented as custom-built, in-house solutions using tools such as Microsoft Access and FileMaker Pro.

The metadata standards which are particularly pertinent in the Web include the "keyword" and "description" meta tags as implemented by the search engines, the Dublin Core Metadata Initiative, and the Resource Description Framework ([www.getty.com](http://www.getty.com))

The AltaVista search engine popularized the use of the metadata elements "keywords" and "description". The "keyword" metadata could be used to provide more effective retrieval and relevance ranking whereas the "description" would be used in the display of search results to provide a more accurate summary of a Web resource ([www.getty.com](http://www.getty.com)). However lately many search engines have stopped using meta tags to improve relevance ranking because of the increase in meta tag spamming (<http://doc.altavista.com>)

The Dublin Core Metadata Element Set (a.k.a. "Dublin Core" or just "DC") is a set of 15 information elements that can be used to describe a wide variety of information resources on the Internet for the purpose of simple cross-disciplinary resource discovery (<http://purl.org/dc/>).

Although significant progress in raising awareness and increasing deployment of the Dublin Core has been made over the last few years, there is still a long way to go before it can begin to deliver on its promise of better resource discovery on the Web. This is due to the reluctance of the major search engines to support Dublin Core (Sullivan,1997). CIMI, the Consortium for the Computer Interchange of Museum Information found that the Dublin Core could not be recommended for information interchange within the museum community, because it could not support the rich descriptions that museums need to share ([www.cimi.org](http://www.cimi.org)).

The Resource Description Framework (RDF) produced as part of the World Wide Web Consortium's Metadata Activity is a metadata application of XML, the Extensible Markup Language ([www.w3.org/XML](http://www.w3.org/XML)). The Resource Description Metadata Framework is built upon a simple data model in which resources are described in terms of their properties ([www.w3.org/RDF](http://www.w3.org/RDF)). RDF is a framework for resource description; it has to be adapted in order to be useful to communities or applications through the use of RDF schemas.

## 3.0 Methodology

The method used to collect data includes interviews from relevant authorities in museums, art galleries, cultural association and cultural centre. It also involves scanning of pictures of the Kebaya from related books. Before we start building the database for the Nyonya Kebaya we first had to develop the data model – the conceptual structure for organizing the information that was used as the blueprint for designing the database. We then designed the entity-relationship diagram logical data model. A logical data will capture the underlying logic in the data and is then used as

the basis for the physical database design. The physical model was created describing the database structure in detail to create the physical database tables with the performance of the database as the main issue. Building the database was then a matter of expressing the physical model as SQL database definition statements and running them in the MySQL database management software.

## 4.0 Data Collection

The research base of the Nyonya Kebaya is wide but to satisfy our requirements the data was collected for the data model in the historic town of Melacca - the researchers visited the Baba Nyonya Heritage Museum, and the The Peranakan Chinese Association . However the Peranakan culture has a strong presence in Singapore and Penang. Due to financial constraints the researchers were unable to visit these places and get any data. Much of the data was also sourced from the much acclaimed book "The Nyonya Kebaya – A Living Splendor" by Datin Seri Endon Mahmud and Malaysian government tourist web sites.

The Nyonya Kebaya is adapted from the Malay baju kurung and the sarong kebaya. The lacework for the Nyonya Kebaya involves a very delicate needlework technique called *tebuk lubang* (to punch holes). It involves sewing the outlines of a floral motif on the fabric and cutting away the inside. The end result is a fine lace-like embroidery on the collar, lapels, cuffs, and hem and the two triangular front panels which drape over the hips, known as the *lapik*. ([www.tourismpenang.gov.my](http://www.tourismpenang.gov.my))

The researchers identified four main types of the Nyonya Kebaya, that is the *Kebaya Panjang*, *Kebaya Renda*, *Kebaya Biku* and *Kebaya Sulam* (Mahmood,2004). The *Kebaya Panjang* is a loose tunic, calf-length garment and is worn with a sarong and secured with the kerongsang or brooches. The *Kebaya Renda* is shorter than the *Kebaya Panjang* made of plain coloured voile and it has laces sewn over them. The *Kebaya Biku* was the first type of Nyonya Kebaya to have embroidery that featured simple scallops. The other characteristics of the *kebaya biku* were its tapered silhouette and the use of printed voiles such as polka dots, floral prints and candy stripes. *Kebaya sulam* means a kebaya decorated with embroidery. The major difference between the *Kebaya Biku* and the *Kebaya sulam* is that while the *Kebaya Biku* uses simple embroidery on the fabric, the *Kebaya Sulam* makes the embroidery as the main focus in the garment. The fabric for the *Kebaya Sulam* is made from a single color.

The embroidery area is the area where the embroidery is done on the Kebaya. The embroidery area can be found in the sleeves, lapels, front and back of the hemline, and on the front and back of the neckline. Each Kebaya can have more than area which is embroidered on.

The three types of motifs embroidered on the Nyonya kebaya include the floral, figural, and geometric designs. The types of embroidery stitches used on the motifs are the satin stitch, straight stitch, zigzag stitch and button-hole stitch. These stitches can be man made or done by machines. Cutwork is the drawn-thread and pulled-thread work which is done together to create a lacework effect on the Kebaya. The Kebaya may or may not have cut work done on it and each Kebaya can have more than one cutwork .Voile is sheer, lightweight and a woven fabric used as the base fabric for the Nyonya Kebaya. However organza and polyester is also used. Every Nyonya needs to have to wear the right accessories to complete her looks. The accessories that served to complete the Nyonya Kebaya look includes a batik sarong, a pair of embroidered or beaded shoes, a generous amount of Peranakan jewellery such as kerongsang, cucuk sanggul, hand beg and undergarments. The batik sarong is the most important part of the garment to complete the Nyonya Kebaya costume. The main types of sarong that is used are the batik tulis, batik Cina or Perkalongan batik and Batik Lasem. There are several types of shoes which serve as accessory to the Nyonya Kebaya, such as kasut kodok or tongkang, kasut seret,

and kasut manik. The types of embroidery on the shoe are the satin stitch and Peking knot.

## 5.0 The Conceptual Data Model

The first step is to identify the objects which we had gathered from data collection. Since we have no user requirements we used our judgment and experience to identify the entities. From the researchers' perspective these would support both search and browse access powerful enough for research, learning as well as for viewing pleasure. For this research the following entities have been identified. They include the main entities of kebaya, fabric, pattern, colour, cutwork, embroidery, embroidery type, labour, motif and accessory.

We then identified the attributes and determined the domain for each entity followed by identification of its unique identifiers and the relationship types between the entities. However additional data types can also be identified from other cultural sources and added into the data model. Therefore while developing the data model and choosing a database system, flexibly, extensibility and reliability are key considerations.

## 6.0 Logical Data Model

The logical model includes the relational schema, presented below and the ER diagram in Figure 1.

### The Relational Schema for Nyonya Kebaya Database

*Kebaya (KebayaType, KebayaName, Desc, Picture, Origin, FabricName)*  
*Fabric (FabricName, Desc, ColourName, PatternName)*  
*Accessory (AccessoriesType, Picture, Desc)*  
*AccessoryGroup (AccessoryType, KebayaName)*  
*Embroidery (EmbroideryName, Picture, KebayaName, LabourType, MotifName)*  
*EmbroideryGroup (EmbroideryName, StichName)*  
*StichType (StichName, Desc, Picture)*  
*EmbroideryArea (EmbroideryArea, Desc)*  
*AreaGroup (EmbroideryArea, KebayaName)*  
*Labour (LabourType, Desc)*  
*Motif ( MotifName, Desc)*  
*Pattern (PatternName, Style)*  
*Colour (ColourName, Desc)*  
*Cutwork (CutworkType, CutworkName, Desc, Picture)*  
*CutworkGroup (CutworkType, KebayaName)*

The relational schema was validated using the rules of normalization to ensure that each relation is structurally correct.

The data for the Nyonya Kebaya consist of images and textual descriptions about the images. The images are in jpeg format and the data about the images known as the schema is in text form.

Figure 1 below represents the entity-relationship diagram (ERD) of the Nyonya Kebaya using crow's foot notation. The researchers drew the ERD using Microsoft Word to design the logical model because it was readily available and familiar and provided a graphical representation of the entities and relationships. Each box in the diagram corresponds to an entity in the database.

Entities are related by a relationship represented by solid lines, the multiplicities are represented by numbers and asterisk.

The motif entity stores data about the name and description of the motif. The motif entity is linked to the embroidery entity which has the picture of the embroidery in jpeg format. The embroidery entity is related to labor which describe if the embroidery is done by hand or machine. The Kebaya entity is linked to the fabric which is in turn related to the pattern and colour. This gives a picture of the fabric used for the kabaya as well as the pattern in the fabric and its colour. To show the cutwork, the kebaya is link to the cutwork group which is in term link to cutwork. The embroidery area is the area where the embroidery is done on the Kebaya. This is shown by linking the kebaya entity to the area group and the embroidery area. The accessory entity is of four different types that is shoes, undergarment, jewellery and sarong. This logical design allows us to extend to new entities with minimal redundancies without impacting the existing database schema.

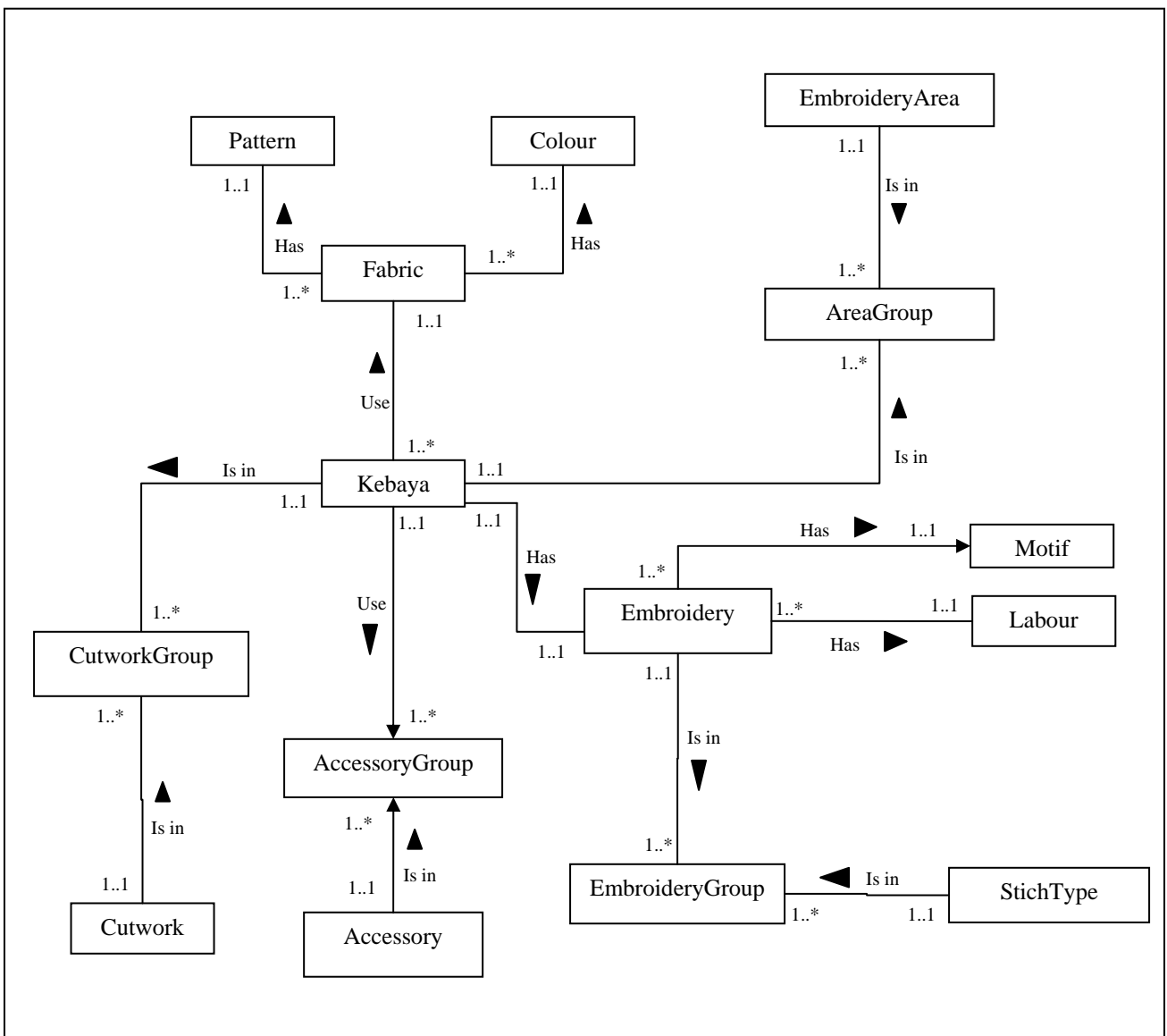


Figure 1: ERD for the Nyonya Kebaya database

## 7.0 Physical Model Design

Physical database design is a process in producing a description of the implementation of the Nyonya Kebaya database; it describes the base relations, file organizations and indexes to achieve efficient access to the data as well as the security measures adopted.

The design of the base relations was represented using extended DBDL and implemented using MYSQL.

It is propose that all the files which include the data files, image data files and the database schema are stored in same file server. The image data files will remain accessible to other applications which may require it.

Choosing a file organization for each base relation is important to store and retrieve data in a more efficient way. Thus an optimal file organization is essential. Here the researchers have selected the indexed sequential access methods as it supports retrieval based on exact key match. Because the hash file organization is a good storage structure for rows that are retrieved based on an exact match on the hash field value some of the relations are proposed to have this type of file organization.

## 8.0 System Security and Backups

It is very important to have some sort of mechanism to protect the database against unintentional or intentional threats. Security of a database does not only encompass the data inside the database but also the hardware, software and people that may affect the database. Here the researchers propose two types of security:

1. System security, the standard user name and password mechanisms where a user needs to provide a valid user name and password before given access to database
2. Privilege, it is the right to execute a particular action on the database. There are two types of privileges; system and object privilege.

There are two types of users that will be using the database. The public user that includes researcher and anyone wanting to know more on Nyonya Kebaya and the second type is the administrator, the person who will maintain the database. It is decided to set the system security to allow only administrator to access the database.

The standard web protocol hypertext transfer protocol (HTTP) will transmit request and responses in plaintext over the internet, however HTTP poses some security concerns as the information can be captured and easily read by third party. To prevent this the researchers suggest using a secure web server HTTPS (secure hypertext transfer protocol). HTTPS is a standard extension for secure data transmission over the internet. This protocol ensures that the connection between web client and web server is secure by encrypting the transmission. So if transmission is captured they cannot be read by third party.

## 9. Database Architecture

Nyonya Kebaya Database will be implemented based on the three tier client server architecture design. The architecture includes the client server, application server and database server which is maintained separately. The three tier architecture is selected as it improves the performance, flexibility and maintainability of the Nyonya Kebaya and at the same time hiding complex processes from the client. For example any changes to the user interface only affects client server as the three tier architecture allows any of the tiers to be changed independently. Figure 2 shows the Nyonya Kebaya database architecture.

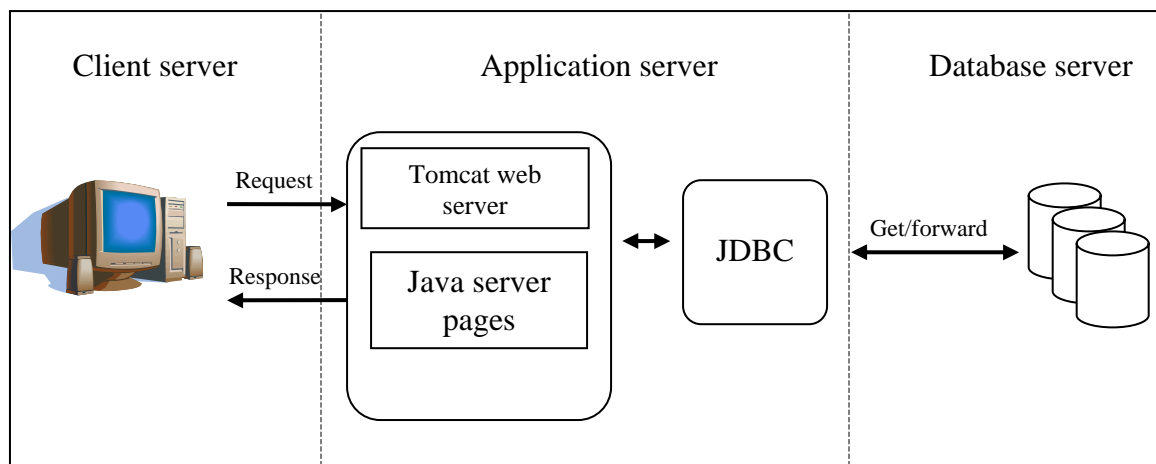


Figure 2

**Client:** Client is the end-user computer that provides access to the database through the application of user interface. The user interface displays the information of the Nyonya Kebaya and request information from the database.

**Application server:** In the application server, it includes the business logic and data processing layer of the Nyonya Kebaya. It is physically connected to the client and the database server over a network. The Nyonya Kebaya database application is written using Java Server Pages (JSP) to dynamically display information to the user and the Tomcat web server will deliver generated web pages that parses the request from clients. The application server is designed to serve multiple clients.

**Database server:** The database server stores the information and data required in the Nyonya Kebaya database. The Nyonya Kebaya database is accessed from the Java application server through Java Database Connectivity (JDBC) driver.



## 10. Using the Nyonya Kebaya database

The Nyonya Kebaya database will be accessed through a web browser independent of the geographical location. In this section we describe the database search and provide query examples.

Internet users can retrieve image/data sets using the user interface on the Nyonya Kebaya website. The user interface provides query tools to the user in form-based query mode. The form-based query mode provides simplicity to users to search the kebaya information for user unfamiliar with Structured Query Language (SQL). Two key query types have been identified to be used for the form-based query mode:

ID search: It is the basic way to search for the kebaya is by knowing the kebaya id or name.

Keyword search: this provides a way to search the description of the kebaya data as it scans through the database.

Some of the query examples include:

Q1: Search kebaya details by name.

Q2: Search kebaya details by type keyword.

Q3: Search the various types of embroidery on the kebaya

Q4: Search the different fabric used in the kebaya.

Q5: Search the accessories that is used with the kebaya

All the above queries are simple queries, by indexing the relevant fields the efficient execution of the query is provided. The WEB application generates the appropriate SQL query and forwards it to the database. The database returns a result set which is formatted into user-friendly pages.

The results of the above queries will be displayed in image and text form as required by the user. Sample data for the Nyonya Kebaya was scanned from the late Datin Seri Endon Mahmood's book 'The Nyonya Kebaya – A Century Of Straits Chinese Costumes'. Figure 3 shows the execution of the query when the user wants to see the information on Nyonya Kebaya known as White Chrysanthemum (Mahmood, 2004). The result of the query is shown Figure 4. As can be seen from the presentation various details of the Kebaya can be viewed by the user for a clearer picture and better understanding. In this example the details the user can view are the fabric, embroidery, the cutwork and the accessory. Figure 5 shows the details of the embroidery for the white chrysanthemum kebaya.

The detail of the accessory, that is the shoes which can be used by the kebaya is shown in figure 6.




MAIN MENU	
	<p>Search By :</p> <p>Kebaya Name : <input type="text" value="White Chrysenthenum"/></p> <p>Keyword : <input type="text"/></p>

Figure 3: The query for the Nyonya Kebaya Database

WHITE CHRYSANTHEMUM	
	<p><b>Fabric</b> <a href="#">VIEW</a></p> <p>Type : Fine Voile Pattern : None Colour : Light Blue</p>
	<p><b>Embroidery</b> <a href="#">VIEW</a></p> <p>Type : Satin stich edging Area -Extensive in front, back and cuffs -Decorative edges along the collar, front and sides</p>
	<p><b>Cutwork</b> <a href="#">VIEW</a></p> <p>1) Chrysenthenum petals 2) Chicken wire mesh</p>
	<p><b>Accesories</b></p> <p>Sarong : Batik Cina <a href="#">VIEW</a></p> <p>Jewellery : Cucuk sanggul <a href="#">VIEW</a></p> <p>Shoe : Kasut Seret <a href="#">VIEW</a></p>

Figure 4: The result of the query of the White Chrysenthenum Kebaya


EMBROIDERY DETAIL		
	Embroidery Type: Satin stitch edging	
	Motif: Chrysanthemum blue flower	
	Description : None	
	Done By Hand	
	<a href="#">BACK</a>	

Figure 5: The details of the embroidery

KASUT SERET	
	Description :
	Embroidered shoe with Sun Motif
<a href="#">BACK</a>	

Figure 6: The details of the kebaya accessory

## **11. Summary**

The researchers have collected the data requirements for the Nyonya Kebaya and successively developed a logical data model which has been implemented using MYSQL. The data model is effective in supporting the meaningful dissemination of cultural information and promotes learning and discovery. The sample data used allows any interested party to query and visualize the beauty of the Nyonya Kebaya.

Further developments in this database will include new designs for access functions which can be incorporated to provide better answers and allow for a wide range of query capabilities.

However this project is not without shortcomings as it would be very appealing to portray the beautiful ethnic designs of the Nyonya kebaya in a 3D multidimensional database. For these researchers the challenges of portraying the Nyonya Kebaya in 3D will be in their future research.

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