Database Proposal for FUSE Arts & Sciences Centre

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Databases_ICT Skills
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Introduction

The purpose of this project is to model and implement a relational database for a medium-sized gallery and cultural centre. The database should serve various archival functions to aid in the daily working of the centre and to store vital records for future reference.

Presented here is a detailed description of the workings of FUSE cultural centre and an analysis of it's data needs. Following this a comprensive Enhanced Entity Relationship digram maps the structure of the database complemented by a Matrix Diagram displaying the relationships between the database entities and Normalised Tables illustrating the various entities and their respective Table Mappings. Finally, a list of frequently used queries is presented to show how the database can and will be used.

Business Description

FUSE Arts & Sciences Centre is a cultural centre dedicated to education and research whose aim is to engage with the community and provide a space for discussion and education in the Arts & Sciences. It has an extensive collection of artefacts, instruments and artworks which are regularly displayed in themed exhibitions. For each exhibition the centre publishes a limited edition catalogue.

Specialised staff at the centre provide free guided tours of these exhibitions to facilitate the public's comprehension and appreciation of the work. Also, the centre is a frequent host of panel discussions and lectures on topics related to it's current exhibition, all of which are open to the public. Additionally, workshops in arts & crafts and scientific disciplines are given on a regular basis, these activities are also led by the academic team.

At FUSE the necessity of a database stems from the ethos of the centre; to engage and educate. The centre requires certain visitor data to be recorded to assist in the future planning of events, the centre also wishes to document it's exhibitions for posterity. Additionally for insurance and security purposes, certain information on staff and the collection must be recorded. All administrative staff will have administrator permissions for the database, academic staff will have user permissions.

The database will cater to the following needs:

- For insurance purposes, the centre needs to be able to track at all times the location of each of it's objects. Also, (if known) the details for each object should be recorded. Each object belongs to a specific 'type' (Fine Art, Craft, Artefact, Specimen, Instrument) and title, which are used to search the objects.

- For insurance and security purposes, the centre needs to keep a record of the location and time of each shift.

- The centre keeps a number of licenced security guards on staff, for quality and insurance purposes, the details of their licences need to be recorded.

- The centre needs to keep personal contact details of each of it's employees and record
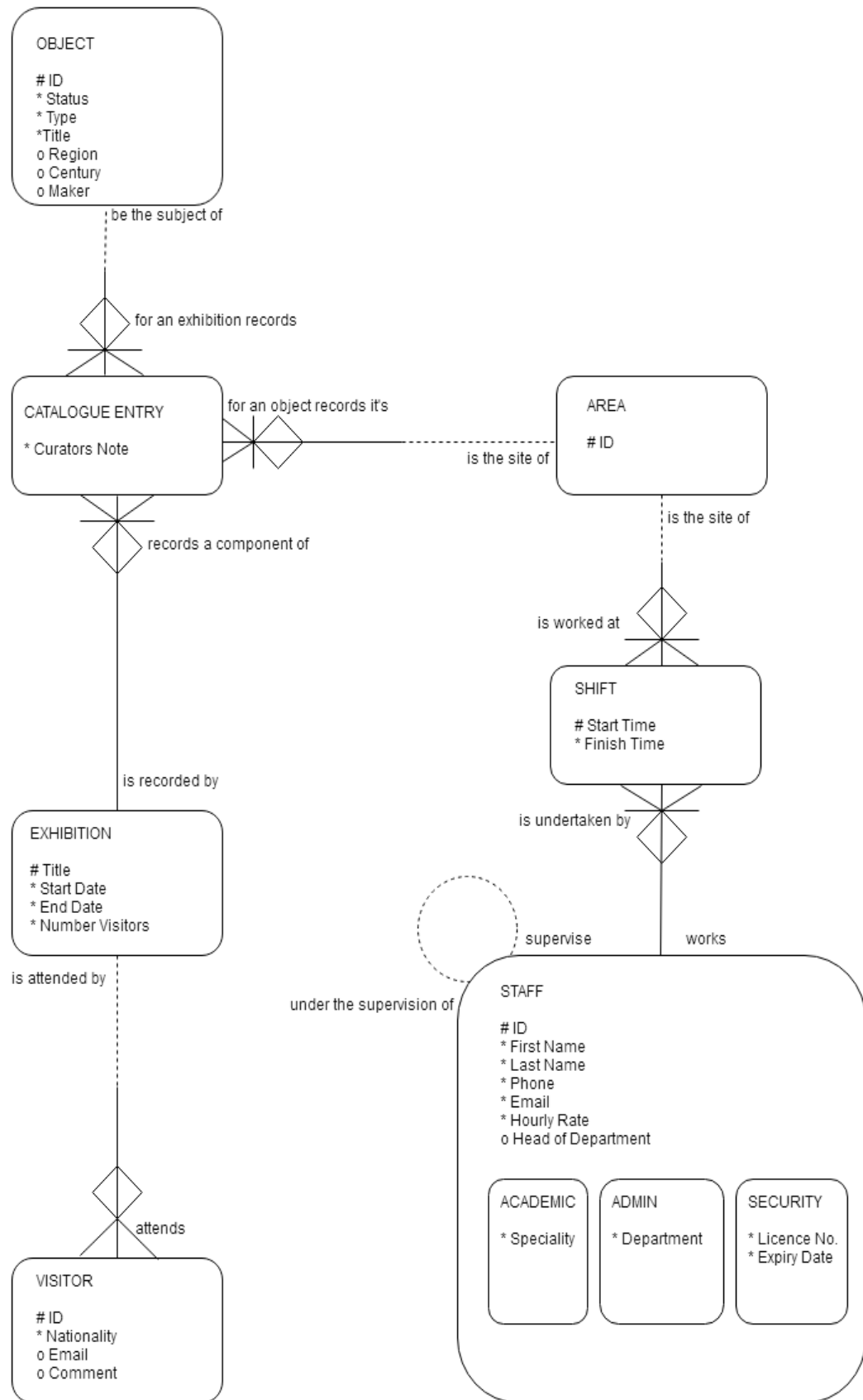
their pay. As few staff members work regular hours, the hourly rate of reimbursement is to be recorded rather than monthly salary.

- The details of each exhibition need to be documented, this will be done by recording the details of all catalogue entries, start / end dates and the number of visitors to the exhibition. This information will be used to help in the planning for future exhibitions. Each exhibition is disassembled on the day following it's closure, the objects are then moved to storage.

- Visitor data will also be recorded, and any feedback they may provide, to help in the future planning of exhibitions and activities. Feedback data is not mandatory, indeed absent data will itself be used to indicate the necessity of improving methods of interaction with visitors. Each visitor is allocated a new ID number on entry.

- To facilitate the recording of shift data and catalogue data, the premises are to be mapped by location IDs. The 8 spaces will be allocated IDs 100 – 800. The 5 gallery spaces (100, 200, 300, 400, 500) will each be allocated 20 sub-spaces to allow for catalogue records, the remaining 3 spaces are the offices (600), auditorium (700) and workshop (800).

Procedural Rules to be programmed

- Each time a new visitor is created, visitor ID and Number Visitors for the current exhibition are incremented. If a visitor leaves an email address, upon entry the address is checked against the database, if not found it is added.

- Two days following the end date of any exhibition, Status of all objects set to 'storage'.

- Two months prior to to the expiry of a security guard's licence, Head of Department is notified by email.

- Each time an new object is added, object ID is incremented.

- Each time a new staff member is added, Staff ID is incremented

Enhanced Entity Relationship Diagram

OBJECT

\# ID
* Status
* Type
*Title
o Region
o Century
o Maker

be the subject of

for an exhibition records

CATALOGUE ENTRY

* Curators Note

for an object records it's

AREA

\# ID

is the site of

is the site of

records a component of

is worked at

SHIFT

\# Start Time
* Finish Time

is undertaken by

is recorded by

EXHIBITION

\# Title
* Start Date
* End Date
* Number Visitors

is attended by

supervise   works

under the supervision of

STAFF

\# ID
* First Name
* Last Name
* Phone
* Email
* Hourly Rate
o Head of Department

attends

VISITOR

\# ID
* Nationality
o Email
o Comment

ACADEMIC

* Speciality

ADMIN

* Department

SECURITY

* Licence No.
* Expiry Date

Normalised Tables (3NF)

Object (OBJ)

Key Type	Optionality	Column Name
pk	*	ID
	*	status
	*	title
	O	region
	O	century
	O	maker

Area (AR)

Key Type	Optionality	Column Name
Pk	*	ID

Exhibition (EXB)

Key Type	Optionality	Column Name
Pk	*	title
	*	start_date
	*	finsh_date
	*	number_visitors

Catalogue Entry

Key Type	Optionality	Column Name
	*	curators_note
Pk, fk	*	OBJ_ID
Pk, fk	*	EXB_title
Fk	*	AR_ID

Visitor

Key Type	Optionality	Column Name
Pk	*	ID
	*	nationality
	O	email
	O	v_comment
Fk	*	EXB_title

Shift

Key Type	Optionality	Column Name
Pk	*	start_time
	*	finish_time
Pk, fk	*	STF_ID
Pk, fk	*	AR_ID

Staff (STF)

Key Type	Optionality	Column Name
Pk	*	ID
	*	first_name
	*	last_name
	*	phone
	*	email
	*	hourly_rate
	O	speciality
	O	department
	O	licence_number
	O	expiry_date
Fk	O	head_dept

Matrix Diagram of Table Relationships

	OBJECT	CATALOGUE ENTRY	EXHIBITION	VISITOR	LOCATION	SHIFT	STAFF
OBJECT	--------------------------	Is the subject of	------------------------------------	------------------------------------	--	------------------------	------------------------------
CATALOGUE ENTRY	For an exhibition records	--	Records a component of an	--	For an object recods it's	--	------------------------------
EXHIBITION	--------------------------	Is recorded by	------------------------------------	Is attended by	--	------------------------	------------------------------
VISITOR	--------------------------	--	attends	------------------------------------	--	------------------------	------------------------------
LOCATION	--------------------------	Is the site of a	------------------------------------	------------------------------------	------------------------------------	Is the site of a	------------------------------
SHIFT	------------------------------------	--	--	------------------------------------	Is worked at	--	Is undertaken by
STAFF	------------------------------------	--	--	------------------------------------	--	works	Is under the supervision of

Table Mappings

Table Name: **Objects (OBJ)**

Field	Type	Size	Null/ Not Null	Default	Constraints	Index	Description
ID	NUMBER	4	Not Null		Unique	PK	
Status	VARCHAR2	7	Not Null	Storage	Must be set to either 'Storage' or 'Display'		
Type	VARCHAR2	10	Not Null				
Title	VARCHAR2	20	Not Null				
Region	VARCHAR2	15					
Century	NUMBER	4					
Maker	VARCHAR2	20					

Table Name: **Catalogue Entries**

Field	Type	Size	Null/ Not Null	Default	Constraints	Index	Description
Curators_Note	VARCHAR2	1000	Not Null				Comments from the curator for this object in this exhibition.
OBJ_ID	NUMBER	4	Not Null			PK, FK	
EXH_Title	VARCHAR2	20	Not Null			PK, FK	
LOC_ID	VARCHAR2	4	Not Null			FK	

Table Name: Exhibitions (EXH)

Field	Type	Size	Null/ Not Null	Default	Constraints	Index	Description
Title	VARCHAR2	50	Not Null		Unique	PK	
Start_Date	DATE		Not Null		Unique Check start_date < finish_date		
Finish_Date	DATE		Not Null		Unique		
Num_Visitors	NUMBER	5	Not Null	0			

Table Name: Visitors

Field	Type	Size	Null/ Not Null	Default	Constraints	Index	Description
ID	NUMBER	5	Not Null	0	Unique	PK	
Nationality	VARCHAR2	15	Not Null				
Email	VARCHAR2	25			Unique		
Comment	VARCHAR2	400					
EXH_Title	VARCHAR2	50	Not Null			FK	

Table Name: Areas (AR)

Field	Type	Size	Null/ Not Null	Default	Constraints	Index	Description
ID	NUMBER	5	Not Null		Unique	PK	

Table Name: Shifts

Field	Type	Size	Null/ Not Null	Default	Constraints	Index	Description
Start_Time	DATE		Not Null			PK	
Finish_Time	DATE		Not Null				
LOC_ID	NUMBER	3	Not Null			PK, FK	
STF_ID	NUMBER	5	Not Null			PK, FK	

Table Name: Staff (STF)

Field	Type	Size	Null/ Not Null	Default	Constraints	Index	Description
ID	NUMBER	5	Not Null			PK	
First_Name	VARCHAR2	10	Not Null				
Last_name	VARCHAR2	15	Not Null				
Phone	NUMBER	10	Not Null				
Email	VARCHAR2	25	Not Null				
Hourly_Rate	NUMBER	4,2	Not Null	9.15			
Speciality	VARCHAR2	20					Academic Speciality
Department	VARCHAR2	15					Administrative Department
Licence_Num	NUMBER	8					Licence Number of security staff
Expiry_Date	DATE						Expiry date of security licence
Head_Dept	NUMBER	5				FK	

Frequently Used Queries

All catalogue entries for a given exhibition (here 'Building Blocks: Natural Structures')

SELECT * FROM CATALOGUE_ENTRIES WHERE EXB_TITLE = 'BUILDING BLOCKS : NATURAL STRUCTURES'

All comments for a given exhibition, excluding null entries (here 'Building Blocks: Natural Structures')

SELECT V_COMMENT FROM VISITORS WHERE EXB_TITLE = 'BUILDING BLOCKS : NATURAL STRUCTURES' AND V_COMMENT IS NOT NULL

Information for the exhibition given a date (here 22 June 2010)

SELECT * FROM EXHIBITIONS WHERE START_DATE < '22/JUN/2010' AND FINISH_DATE > '22/JUN/2010'

Return names of staff who have worked in a specific location

SELECT FIRST_NAME, LAST_NAME FROM STAFF WHERE ID IN (SELECT STF_ID FROM SHIFTS WHERE AR_ID = 100)

Object Status for object ID / Title (here title = cloudbuster)

SELECT STATUS FROM OBJECTS WHERE TITLE = 'CLOUDBUSTER'

All objects for a given type in a given exhibition (here type = 'fine art', exhibtion = 'Building Blocks: Natural Structures'

*SELECT * FROM OBJECTS WHERE TYPE = 'FINE_ART' AND ID IN (SELECT OBJ_ID FROM CATALOGUE_ENTRIES WHERE EXB_TITLE = 'BUILDING BLOCKS : NATURAL STRUCTURES')*

ID and names for all itmes currently on display

SELECT ID, TITLE FROM OBJECTS WHERE STATUS = 'DISPLAY'