

University
Geographic
Information
System

Introductions



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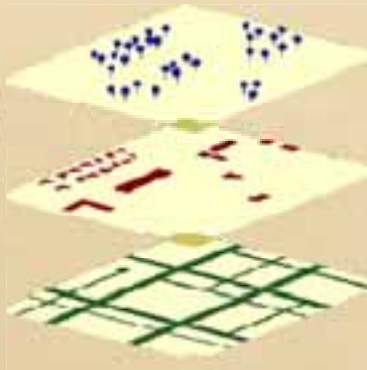
Presentation Topics

- University of Kentucky GIS (U-GIS)
- **GIS & Facilities Management**
- **Custom GIS Facility Management System**
- **System Design**
- **System Demo**
- **Key Decisions**
- **Next Steps**

U-GIS

One

Map



**Current
Accurate
Campus-wide
Information**



Why create a U-GIS?

- **To provide “one” Facilities map & interior space interface**
- **To provide a graphical interface to diverse information sets**
- **To graphically analyze data for better decisions**
- **To fill the need for accessing data from many different platforms**
- **To allow users to manipulate & extract consolidated information**
- **To share information across units eliminating redundancies**

U G I S



Accessibility



Police



Parking



Student Housing



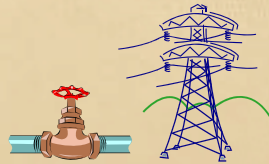
Bus Routes



Health Care



Weather Shelters



Campus Utilities



Wireless Access



Transportation



Athletics



Interior Space



Environmental Health & Safety



Maps & Directions



Construction Capital Projects

eFacTS (electronic Facility Technology System)



Accessibility



Police



Parking



Student Housing



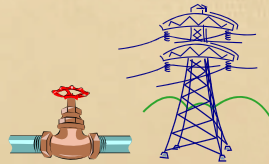
Bus Routes



Health Care



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Campus Utilities



Wireless Access



Transportation



Athletics



Interior Space



Environmental Health & Safety



Maps & Directions



Construction Capital Projects

eFacTS (electronic Facility Technology System)

Focus Areas for U-GIS

- **Data Collection:** Organize, verify and collect data
- **Consolidation:** Reorganizing resources to support system
- **eFacTS:** Facilities Archives (GIS, CAD, Archives, Utilities, Imagery)
- **eBARS:** Plant Assets (Space, Equipment, & Vehicle Inventory)
- **SAP:** UK's ERP (including HR, FI, CM, MM, PM, other)



GIS & Facilities Management

- EXAMPLES -

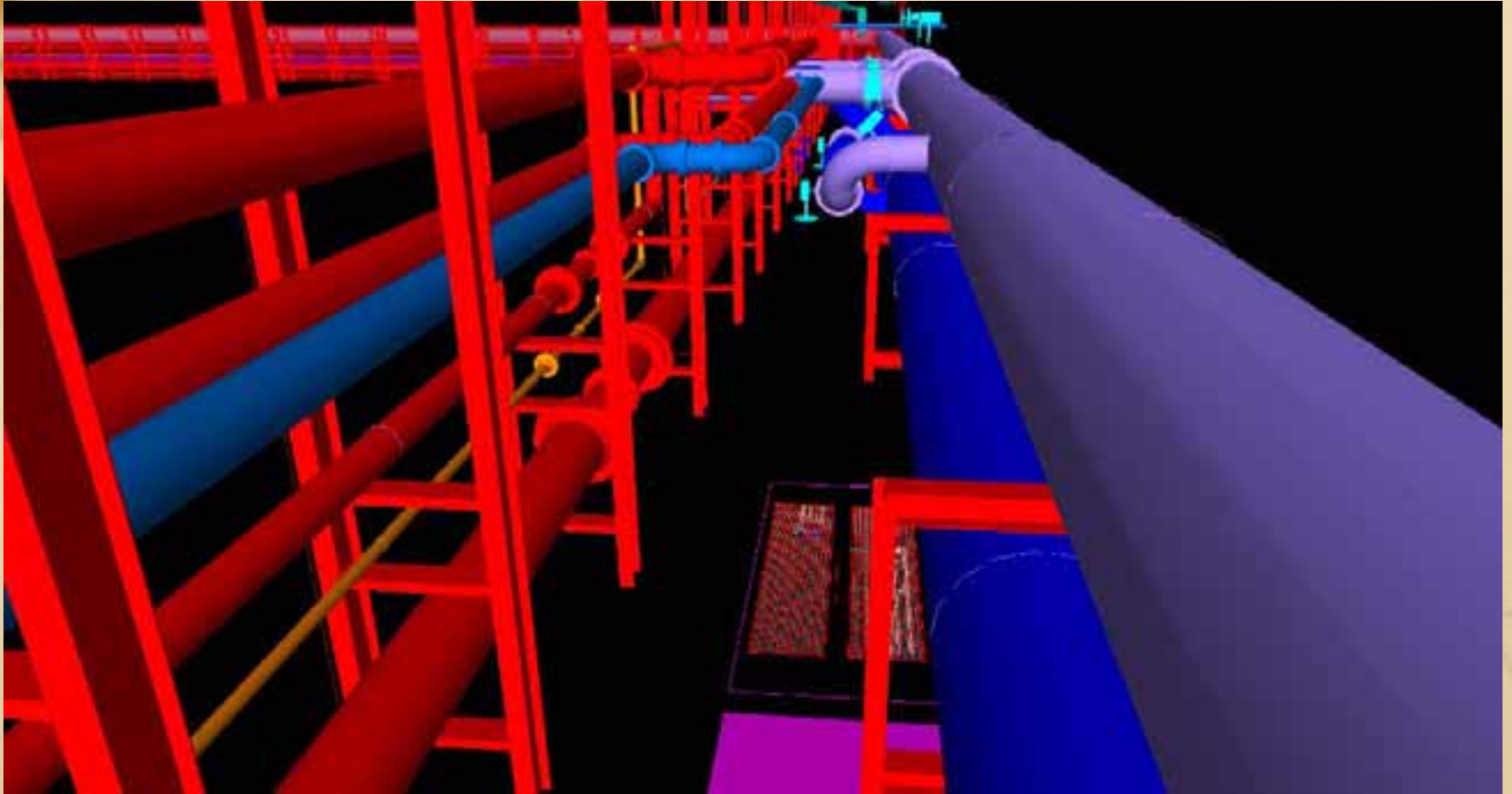
GIS & Facilities Management



GIS & Facilities Management



GIS & Facilities Management



GIS & Facilities Management

The screenshot displays a web-based GIS application interface. The top section shows a map of a facility floor plan with various rooms color-coded: purple, green, orange, and grey. A search bar at the top right is set to 'Search by Functional Location'. Below the map is a table with 9 results, listing details for each room.

Actions	Functional Location	BuildingID	Floor	RoomNumber	DepartmentCode	DepartmentName	FunctionalName	SubfunctionalName	RoomTypeCode	RoomTypeDescription	SquareFootage
	LP-0012-00-A00044	0002	00	A00044	Y1100	EMERGENCY & TRAUM	Treatment	Treatment	000	TRTMENT/TRAUMA 114	
	LP-0012-00-A00044	0002	00	A00044	Y1100	EMERGENCY & TRAUM	Treatment	Treatment	000	TRTMENT/TRAUMA 111	
	LP-0012-00-A00043	0002	00	A00043	Y1100	EMERGENCY & TRAUM	Treatment	Treatment	000	TRTMENT/TRAUMA 112	
	LP-0012-00-A00044	0002	00	A00044	Y1100	EMERGENCY & TRAUM	Treatment	Treatment-Duress	000	TRTMENT/TRAUMA 110	
	LP-0012-00-A00046	0002	00	A00046	Y1100	EMERGENCY & TRAUM	Workstation-Team	Workstation-Team	000	NURSE STATION	120
	LP-0012-00-A00043	0002	00	A00043	Y1100	EMERGENCY & TRAUM	Treatment	Treatment-Trauma	000	TRTMENT/TRAUMA 200	
	LP-0012-00-A00042A	0002	00	A00042A	Y1100	EMERGENCY & TRAUM	Treatment	Treatment-Trauma	000	TRTMENT/TRAUMA 206	

GIS & Facilities Management

The screenshot displays a web-based GIS application for facilities management. The main interface includes a map of a building with various rooms highlighted in different colors. A detailed data sheet for a specific room is overlaid on the map, and a smaller window shows a photograph of the room's interior.

UK Building
 Building Id: 0002

Room Data Sheet
 Fri Apr 16 2010

University of Kentucky

Floor: 00
 Room Number: A00226
 Functional Name: Medication
 Sub-Functional Name: Medication Room
 Functional Location: LX-0602-00-A00226
 Square Footage: 63 sq ft

Equipment

Qty	Description	Manufacturer	Model #	Comments
1	Dispenser, Medication, Hot (Hot)	CareFusion - Pyxis	Medication 300-8-8	
1	Dispenser, Medication, Auxiliary	CareFusion - Pyxis	Medication 300-500	
1	Autogenerator, Commercial, Undercounter	Food Corporation	REFS	
1	Dispenser, Giva, Triple Box	Medline Industries	800P013-Postglass	
1	Trash Can	Mussermat Commercial	2124-Eng Item#2542	

Technologies

Qty	Description	Manufacturer	Model #	Comments
1	Phone	Sony	VGP-Phone	
1	Computer	Dell	T5047-Computer	

Room List

Functional Name	Sub-Functional Name	Rooming Code	Rooming Description	Square Footage
Treatment	Treatment	600	TRTMENT/CLAMINA 154	
Treatment	Treatment	600	TRTMENT/CLAMINA 151	
Treatment	Treatment	600	TRTMENT/CLAMINA 152	
Treatment	Treatment-Diaphy	600	TRTMENT/CLAMINA 153	
	Workstation-Exam	600	NURSE STATION	520
	Treatment-Trauma	600	TRTMENT/CLAMINA 200	
	Treatment-Trauma	600	TRTMENT/CLAMINA 206	

New

UK Chandler Hospital

- **2 Bed Towers**
- **16 Floors**
- **Total 1.2 million square feet**
- **State-of-the-art Level 1 Trauma Center**
- **System needed to support occupancy**

System Design

- **GIS License & Software**
- **Enterprise Servers**
- **ERP Naming Standard**
- **Graphical Interface**
- **Single Sign-On**
- **Flexible DB Design**
- **Service Architecture**
- **Stored Procedures**

System Design

GIS License & Software

Kentucky.gov

KY Agencies | KY Services

Search



COMMONWEALTH
OFFICE OF
TECHNOLOGY

Products &
Services

Doing Business
with COT

GIS

KEWS

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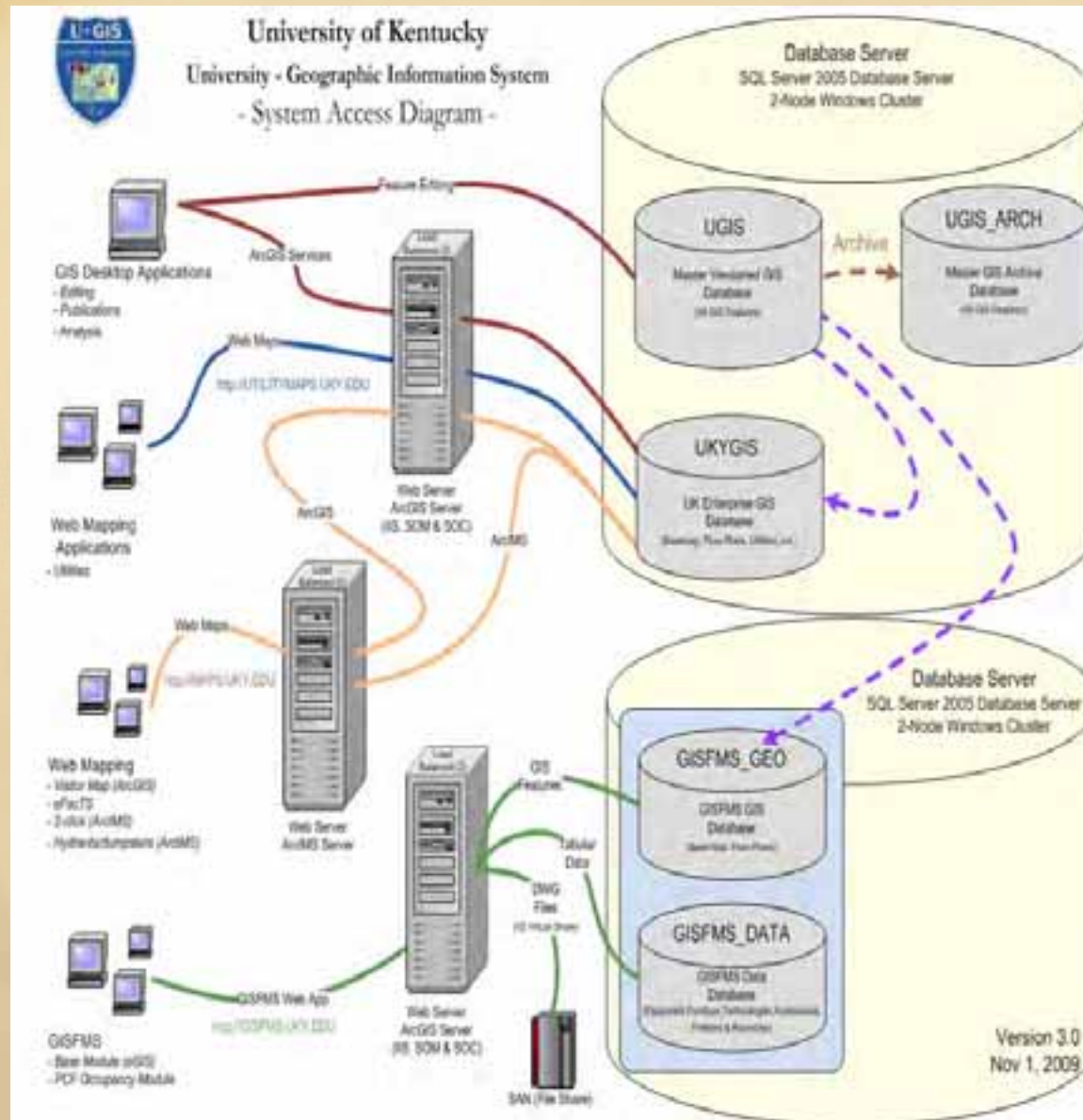
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Twelve postsecondary institutions and the Kentucky Virtual High School currently participate in the ESRI site license. In addition to receiving ESRI software, each of these sites also receives hardware keys and key codes which allow the software to be used by authorized users. Software documentation is available online.

ESRI technical support is obtained through the administrators and technical support contacts at each university/college (see [Campus Contacts](#) below). Online courses are offered through the ESRI Virtual Campus. ESRI administrators, technical support contacts, and ESRI Virtual Campus representatives are also listed on the [Campus Contacts](#) page.

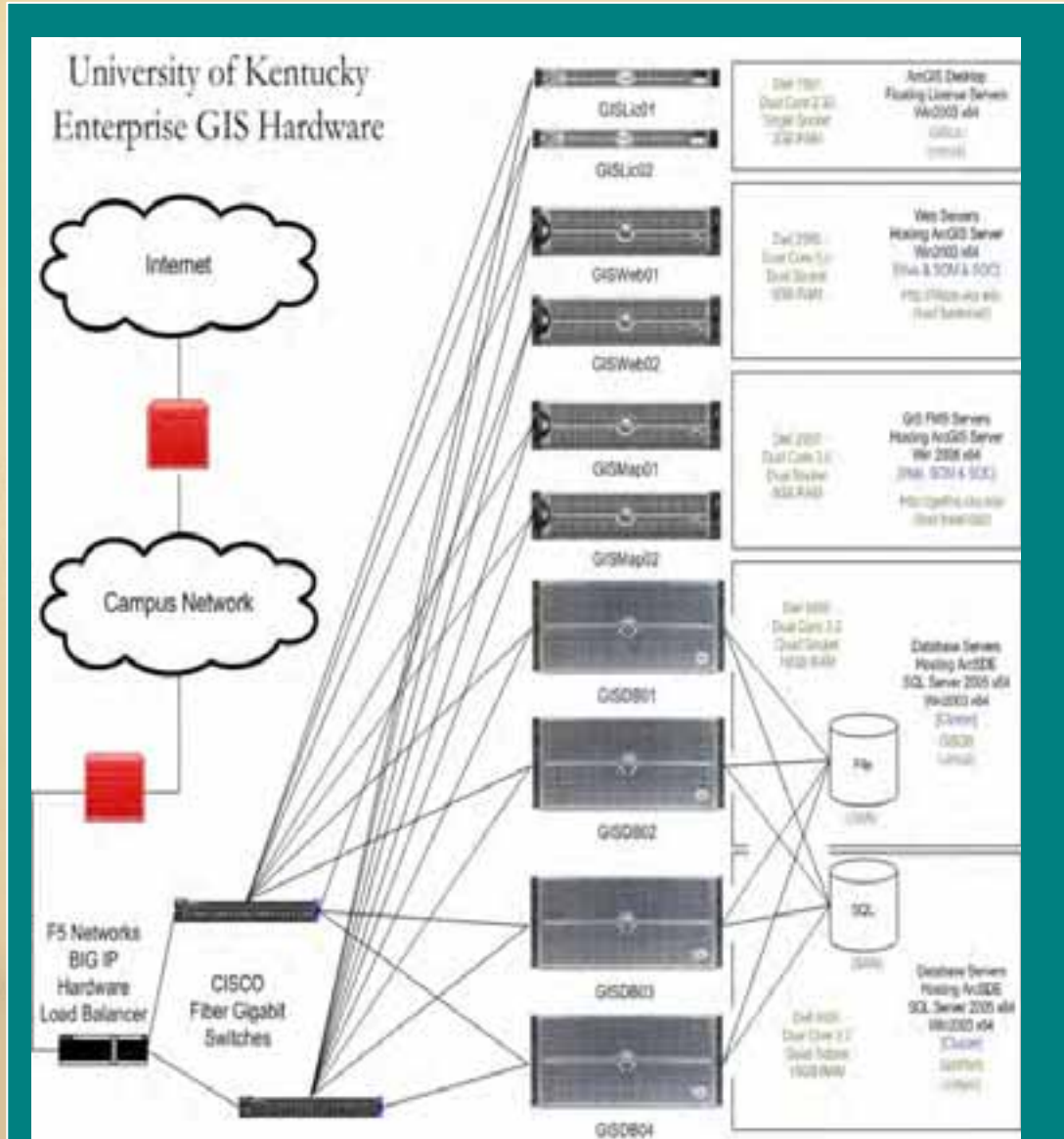
System Design

Enterprise Servers



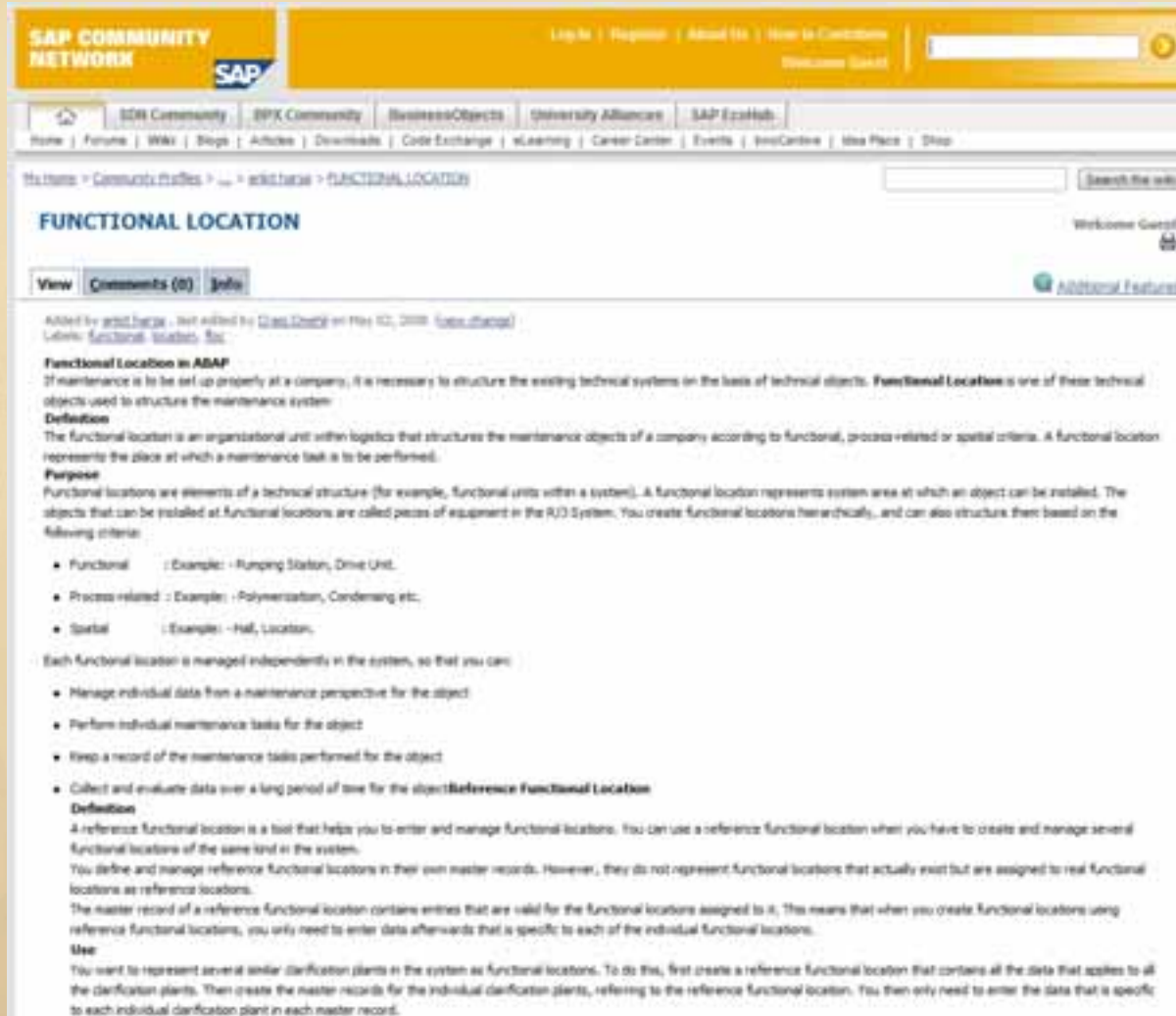
System Design

Enterprise Servers



System Design

ERP Naming Standard



The screenshot shows a forum post on the SAP Community Network. The page header includes the SAP logo and navigation links. The forum breadcrumb is 'Home > Community > Articles > ask4base > FUNCTIONAL LOCATION'. The post title is 'FUNCTIONAL LOCATION'. The post was added by user 'ask4base' on May 12, 2008. The content discusses the importance of structuring technical systems for maintenance, defining functional locations, and providing examples of functional locations based on criteria like functional, process-related, and spatial. It also mentions reference functional locations for managing multiple similar objects.

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FUNCTIONAL LOCATION

Added by ask4base - last edited by Gerd Goebel on May 12, 2008 (see change)

Labels: [functional location](#), [fnc](#)

Functional Location in ABAP

If maintenance is to be set up properly at a company, it is necessary to structure the existing technical systems on the basis of technical objects. **Functional Location** is one of these technical objects used to structure the maintenance system.

Definition

The functional location is an organizational unit within logistics that structures the maintenance objects of a company according to functional, process-related or spatial criteria. A functional location represents the place at which a maintenance task is to be performed.

Purpose

Functional locations are elements of a technical structure (for example, functional units within a system). A functional location represents system area at which an object can be installed. The objects that can be installed at functional locations are called pieces of equipment in the R/3 system. You create functional locations hierarchically, and can also structure them based on the following criteria:

- Functional : Example: - Pumping Station, Drive Unit.
- Process related : Example: - Polymerization, Condensing etc.
- Spatial : Example: - Hall, Location.

Each functional location is managed independently in the system, so that you can:

- Manage individual data from a maintenance perspective for the object
- Perform individual maintenance tasks for the object
- Keep a record of the maintenance tasks performed for the object
- Collect and evaluate data over a long period of time for the object

Reference Functional Location

Definition

A reference functional location is a tool that helps you to enter and manage functional locations. You can use a reference functional location when you have to create and manage several functional locations of the same kind in the system. You define and manage reference functional locations in their own master records. However, they do not represent functional locations that actually exist but are assigned to real functional locations as reference locations.

The master record of a reference functional location contains entries that are valid for the functional locations assigned to it. This means that when you create functional locations using reference functional locations, you only need to enter data afterwards that is specific to each of the individual functional locations.

Use

You want to represent several similar clarification plants in the system as functional locations. To do this, first create a reference functional location that contains all the data that applies to all the clarification plants. Then create the master records for the individual clarification plants, referring to the reference functional location. You then only need to enter the data that is specific to each individual clarification plant in each master record.

System Design

Graphical Interface

ArcGIS Resource Center

ArcGIS Viewer for Flex

Home Concepts Samples ArcGIS Code Gallery

- Overview
- Getting Started
- What's New
- Migrating from beta
- Configure The Viewer
- Widgets
- Developer Guide
- Localization
- Using proxy
- Event Helper
- FAQ

ArcGIS Viewer for Flex

Overview:

- Ready to deploy GIS Web client mapping application for ArcGIS Server built on the ArcGIS API for Flex.
- Easily configurable to meet custom business needs and requirements - no programming skills required to deploy.
- Viewer functionality is defined by widgets - many core widgets are included.
- New functionality can be created with custom widgets developed using the ArcGIS API for Flex.

The ArcGIS Viewer for Flex is a ready to deploy configurable client application built on the [ArcGIS API for Flex](#). It is ESRI's solution for creating customized GIS enabled Web mapping applications, without requiring programming. It is designed to work with [ArcGIS Server](#) and [ArcGIS Online](#) Web services. It supports the new capabilities offered at ArcGIS Server 10 (e.g., Web editing, support for time aware data) and is built with the latest [Adobe Flash Builder](#), a best practices and technology.

With the ArcGIS Viewer for Flex, users can quickly create and deploy a custom GIS Web mapping application that supports: data display, interactive querying, Web editing, data extraction, geocoding, and printing. Functionality in the Viewer is based on an extensible widget programming model. Widgets are portable code blocks that provide functionality in the Viewer in a modular fashion; they can be easily added to or removed from the Viewer as needed. Many [widgets](#) are included with ArcGIS Viewer for Flex. New widgets (and therefore, new custom functionality) can be developed using the ArcGIS API for Flex.



After downloading the Viewer application and placing its component files into the appropriate location (see [Getting Started with the ArcGIS Viewer for Flex](#) help topic), the Viewer can be used immediately. It enables users to easily set-up, configure, and deploy a Web client mapping application that works with their own ArcGIS Server Web services and data content from ArcGIS Online. It is designed with the "non-developer" in mind; in other words, no programming skills are required to set-up and build a Web client application. The Viewer application is conceptually like a site starter template; users edit XML configuration files to customize the appearance, functionality, and data contents of the Viewer.

The ArcGIS Viewer for Flex also enables users with developer skills to extend the core Viewer functionality by creating new widgets via development with the ArcGIS API for Flex. Organizations and Web application designers are able to quickly and easily deploy custom business solution applications.

System Design

Single Sign-On

UNIVERSITY OF KENTUCKY see blue

Prospective Students Current Students Visitors & Parents Faculty & Staff Academics Adult Ed Job Ed Research Athletics UK HealthCare Libraries Admin Community & Engagement News Media Site Index Search

UNIVERSITY OF KENTUCKY Home

- Activating Your Account
- Account Services Site
- Account Manager
- Exchange
- Blackboard
- myUK
- Sharepoint
- Student Web Server
- Software Downloads
- Electronic Locker
- Wireless Network Access
- Student Computing Labs
- EEProxy
- MathClass
- Academics Sharepoint
- OC'S Communicator

Link Blue

The University of Kentucky Information Technology created the term "link blue" to define a directory account (user id and password) which can be used when connecting to many campus-wide systems.

Anywhere you see the link blue phrase or logo you can login with the same user id and password, just as you know anywhere you see a VISA® or MasterCard® logo you know those cards are accepted.

Your link blue account is created within a business day of either, as a student you are accepted, or as an employee you are entered into payroll. For further information regarding link blue accounts, visit the Account Services Site.

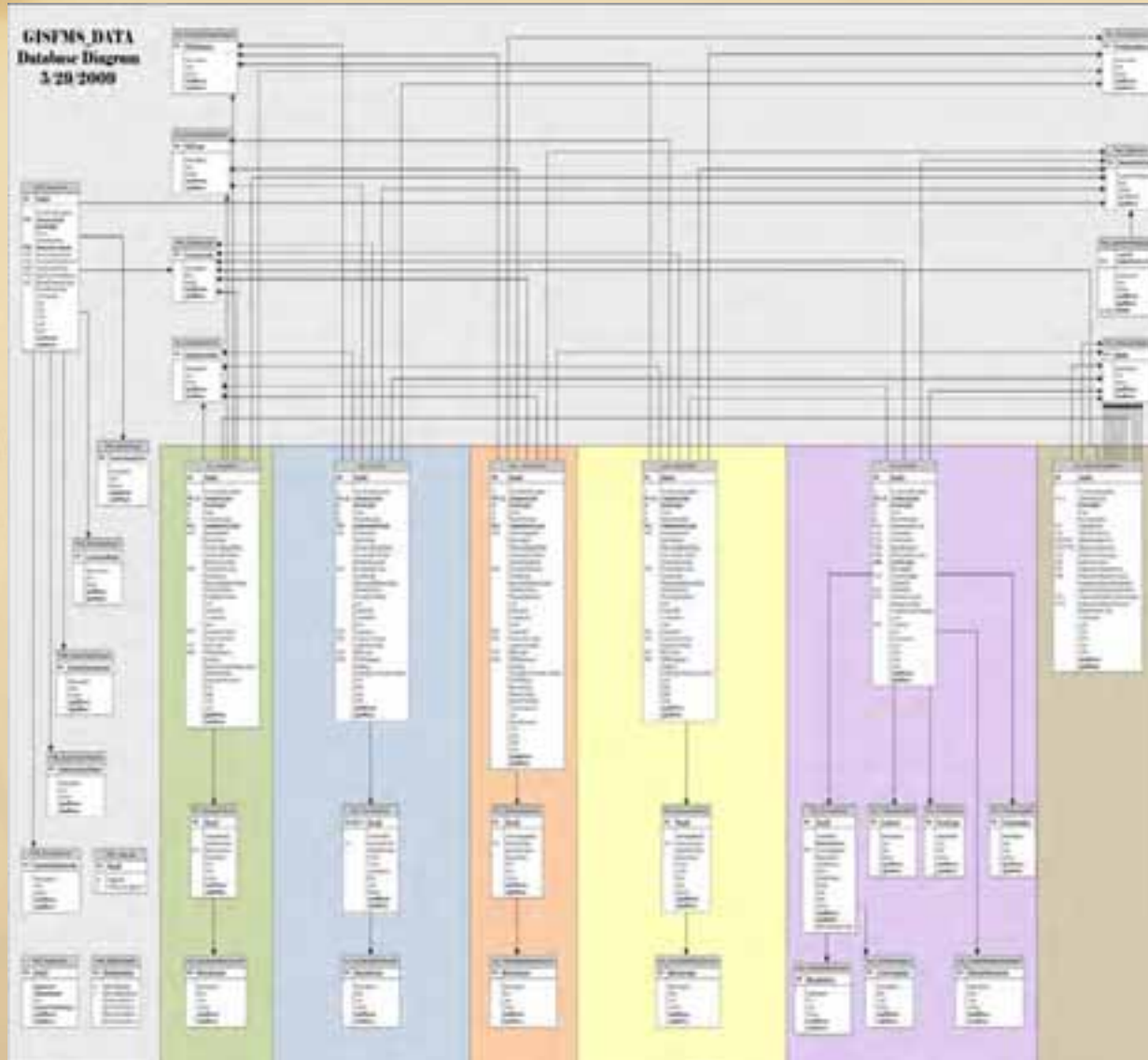


Before you can use your account to login to any services, your account must be activated. New students and employees can read detailed instructions on activating your link blue account on the Activating Your Account wiki page.

UNIVERSITY OF KENTUCKY

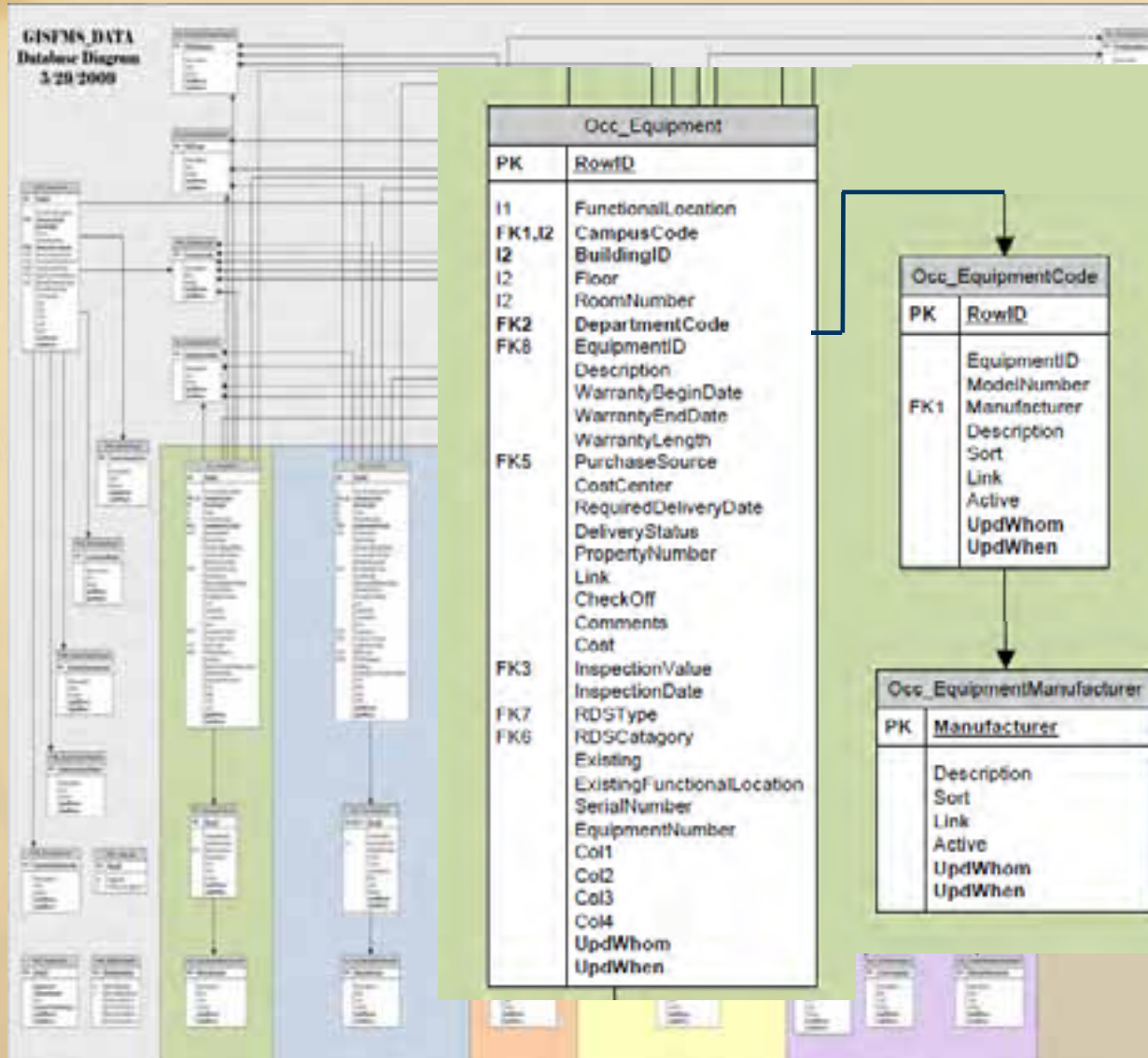
System Design

Flexible DB Design



System Design

Flexible DB Design




System Design

Service Architecture



System Design

Stored Procedures



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Stored procedure

From Wikipedia, the free encyclopedia



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(December 2009)

A **stored procedure** is a [subroutine](#) available to applications accessing a [relational database system](#). Stored procedures (sometimes called a **proc**, **sproc**, **StoPro**, **StoredProc**, or **SP**) are actually stored in the database [data dictionary](#).

Typical uses for stored procedures include [data validation](#) (integrated into the database) or [access control](#) mechanisms. Furthermore, stored procedures are used to consolidate and centralize logic that was originally implemented in applications. Extensive or complex processing that requires the execution of several [SQL](#) statements is moved into stored procedures, and all applications call the procedures. One can use nested stored procedures, by executing one stored procedure from within another.

System Design

Stored Procedures

Select

Table Name	Includes Additional Departmental Security	Stored Procedure Name	All Mod		Occupancy Module							Adulst Count	
			gFacMgmt_GISFMS_Admin	gFacMgmt_GISFMS_Public	gFacMgmt_GISFMS_Asset_Viewer	gFacMgmt_GISFMS_RoomUse_Editor	gFacMgmt_GISFMS_OCC_Accessories_Editor	gFacMgmt_GISFMS_Equipment_Editor	gFacMgmt_GISFMS_Finishes_Editor	gFacMgmt_GISFMS_Furniture_Editor	gFacMgmt_GISFMS_OpenClosedStatus_Edito		gFacMgmt_GISFMS_Technologies_Editor
Total Procedures			AD Roles (Checkmark = Execute Permission)										230
Select Procedures													64
FMS_BldgNameHist	No	N/A											0
FMS_CampusCode	No	pFMS_CampusCode_Sel	✓		✓	✓	✓	✓	✓	✓	✓	✓	1
FMS_Department	No	pFMS_Department_Sel	✓		✓	✓	✓	✓	✓	✓	✓	✓	1
FMS_DepartmentalSecurity	No	pFMS_DepartmentSecurity_Sel	✓										1
FMS_FunctionalArea	No	pFMS_FunctionalArea_Sel	✓		✓	✓	✓	✓	✓	✓	✓	✓	1
FMS_FunctionalName	No	pFMS_FunctionalName_Sel	✓		✓	✓	✓	✓	✓	✓	✓	✓	1
FMS_HyperLinks	No	pFMS_HyperLinks_Sel	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
FMS_LastLogin	No	N/A											0
FMS_RoomPressureType	No	pFMS_RoomPressureType_Sel	✓		✓	✓	✓	✓	✓	✓	✓	✓	1
FMS_RoomUsage	No	pFMS_RoomUsage_Sel	✓		✓	✓	✓	✓	✓	✓	✓	✓	1
FMS_RoomUse	No	pFMS_RoomUse_Sel	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
FMS_SubFunctionalName	No	pFMS_SubFunctionalName_Sel	✓		✓	✓	✓	✓	✓	✓	✓	✓	1
Occ_Accessories	Yes	pOcc_Accessories_Sel	✓		✓		✓						1
Occ_AccessoriesCode	No	pOcc_AccessoriesCode_Sel	✓		✓		✓						1

System Design

Stored Procedures

Insert

Table Name	Includes Additional Departmental Security	Stored Procedure Name	gFacMgmt_GISFMS_Admins	gFacMgmt_GISFMS_Public	gFacMgmt_GISFMS_Asset_Viewer	gFacMgmt_GISFMS_RoomUse_Editor	gFacMgmt_GISFMS_OCC_Accessories_Editor	gFacMgmt_GISFMS_Equipment_Editor	gFacMgmt_GISFMS_Finishes_Editor	gFacMgmt_GISFMS_Furniture_Editor	gFacMgmt_GISFMS_OpenClosedStatus_Editor	gFacMgmt_GISFMS_Technologies_Editor	Adult Count
Total Procedures			AD Roles (Checkmark = Execute Permission)									230	
Insert Procedures												36	
FMS_BldgNameHist	No	N/A											0
FMS_CampusCode	No	pFMS_CampusCode_Ins	✓										1
FMS_Department	No	pFMS_Department_Ins	✓										1
FMS_DepartmentalSecurity	No	pFMS_DepartmentSecurity_Ins	✓										1
FMS_FunctionalArea	No	pFMS_FunctionalArea_Ins	✓			✓							1
FMS_FunctionalName	No	pFMS_FunctionalName_Ins	✓			✓							1
FMS_HyperLinks	No	pFMS_HyperLinks_Ins	✓										1
FMS_LastLogin	No	N/A											0
FMS_RoomPressureType	No	pFMS_RoomPressureType_Ins	✓			✓							1
FMS_RoomUsage	No	pFMS_RoomUsage_Ins	✓			✓							1
FMS_RoomUse	No	pFMS_RoomUse_Ins	✓			✓							1
FMS_SubFunctionalName	No	pFMS_SubFunctionalName_Ins	✓			✓							1
Occ_Accessories	Yes	pOcc_Accessories_Ins	✓				✓						1

System Design

Stored Procedures

Update

Table Name	Includes Additional Departmental Security	Stored Procedure Name	gFacMgmt_GISFMS_Admins	gFacMgmt_GISFMS_Public	gFacMgmt_GISFMS_Asset_Viewer	gFacMgmt_GISFMS_RoomUse_Editor	gFacMgmt_GISFMS_OCC_Accessories_Editor	gFacMgmt_GISFMS_Equipment_Editor	gFacMgmt_GISFMS_Finishes_Editor	gFacMgmt_GISFMS_Furniture_Editor	gFacMgmt_GISFMS_OpenClosedStatus_Edito	gFacMgmt_GISFMS_Technologies_Editor	Adult Count
Total Procedures			AD Roles (Checkmark = Execute Permission)									230	
Update Procedures												41	
FMS_BldgNameHist	No	N/A											0
FMS_CampusCode	No	pFMS_CampusCode_Upd	✓										1
FMS_Department	No	pFMS_Department_Upd	✓										1
FMS_DepartmentalSecurity	No	pFMS_DepartmentSecurity_Upd	✓										1
FMS_FunctionalArea	No	pFMS_FunctionalArea_Upd	✓			✓							1
FMS_FunctionalName	No	pFMS_FunctionalName_Upd	✓			✓							1
FMS_HyperLinks	No	pFMS_HyperLinks_Upd	✓										1
FMS_LastLogin	No	N/A											0
FMS_RoomPressureType	No	pFMS_RoomPressureType_Upd	✓			✓							1
FMS_RoomUsage	No	pFMS_RoomUsage_Upd	✓			✓							1
FMS_RoomUse	No	pFMS_RoomUse_Upd	✓			✓							1
FMS_SubFunctionalName	No	pFMS_SubFunctionalName_Upd	✓			✓							1

System Design

Stored Procedures

Delete

Table Name	Includes Additional Departmental Security	Stored Procedure Name	gFacMgmt_GISFMS_Admins	gFacMgmt_GISFMS_Public	gFacMgmt_GISFMS_Asset_Viewer	gFacMgmt_GISFMS_RoomUse_Editor	gFacMgmt_GISFMS_OCC_Accessories_Editor	gFacMgmt_GISFMS_Equipment_Editor	gFacMgmt_GISFMS_Finishes_Editor	gFacMgmt_GISFMS_Furniture_Editor	gFacMgmt_GISFMS_OpenClosedStatus_Editor	gFacMgmt_GISFMS_Technologies_Editor	Adult Count
Total Procedures			AD Roles (Checkmark = Execute Permission)										230
Delete Procedures													36
FMS_BldgNameHist	No	N/A											0
FMS_CampusCode	No	pFMS_CampusCode_Del	✓										1
FMS_Department	No	pFMS_Department_Del	✓										1
FMS_DepartmentalSecurity	No	pFMS_DepartmentSecurity_Del	✓										1
FMS_FunctionalArea	No	pFMS_FunctionalArea_Del	✓			✓							1
FMS_FunctionalName	No	pFMS_FunctionalName_Del	✓			✓							1
FMS_HyperLinks	No	pFMS_HyperLinks_Del	✓										1
FMS_LastLogin	No	N/A											0
FMS_RoomPressureType	No	pFMS_RoomPressureType_Del	✓			✓							1
FMS_RoomUsage	No	pFMS_RoomUsage_Del	✓			✓							1
FMS_RoomUse	No	pFMS_RoomUse_Del	✓			✓							1
FMS_SubFunctionalName	No	pFMS_SubFunctionalName_Del	✓			✓							1
Occ_Accessories	Yes	pOcc_Accessories_Del	✓				✓						1
Occ_AccessoriesCode	No	pOcc_AccessoriesCode_Del	✓			✓							1



- SYSTEM DEMO -

Key Decisions

- **Finding a contractor w/expertise & flexibility (39 Degrees North)**
- **Choosing Flex for the user interface**
- **Integrating UK's existing CAD floorplan library**
- **Editing tabular data within the same site**
- **Integrating UK's existing single sign-on IDs & security**
- **Implementing role & departmental system permissions**
- **Designing database in-house with stored procedures**

Next Steps...

- **Support next phases of Hospital occupancy** – Ground floor Emergency Department completed Spring 2010, Public Space on Ground and First floors & 6th & 7th floors completed Spring 2011, future occupancy scheduled for Fall/Winter 2011/2012
- **Begin scoping efforts for Facility Management Module** – integrate other UK systems (SAP, eBARS, Space Inventory), incorporate construction pictures, documents, and Facilities-wide archive documents
- **Pursue leveraging and integrating other technologies** – mobile devices, RFID, BIM, wayfinding, video, ...



Questions & Comments

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