CS 553 Spring 2004

Web service descriptions

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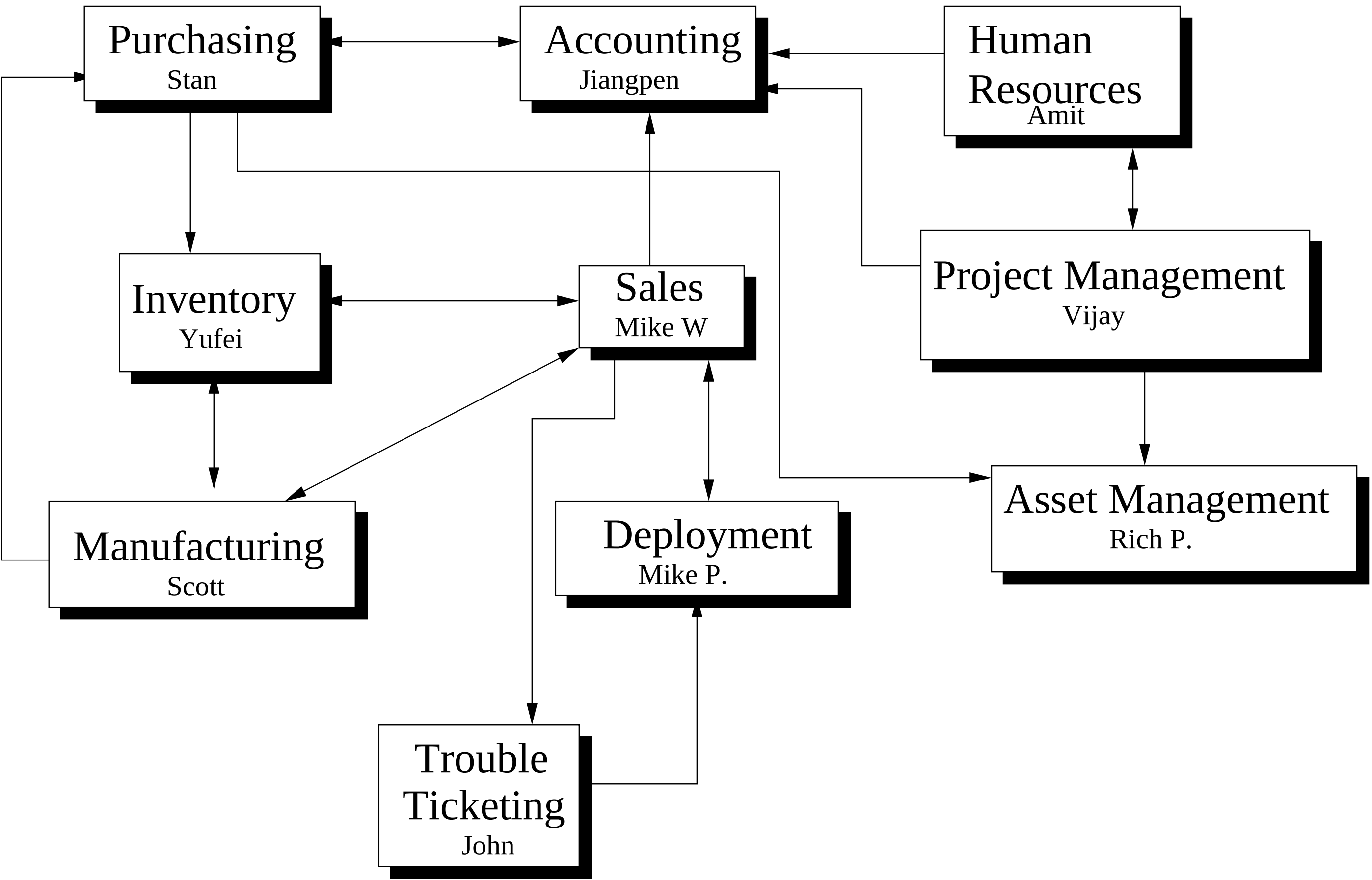
Services Overview Diagram



Stan Rajan
CS 553 – Internet Services

PURCHASING

Types

PurchaseOrder

Purchasing requires keeping track of every purchase order either pending or complete.

Field	**XML-RPC Type**
PurchaseOrderNum	- int
VendorID	- int
VendorPartNum	- string
BuyerID	- int
ShippingCode	- int
OrderStatusCode	- int
OrderDate	- dateTime
PricePerUnit	- double
QuantityOrdered	- int

OrderStatus

Each order must be tracked and in a known state (completed, shipped, etc.).

Field	**XML-RPC Type**
OrderStatusCode	- int
StatusDescription	- string

ShippingMethod

The shipment method of each purchase must be tracked to anticipate arrivals.

Field	**XML-RPC Type**
ShippingCode	- int
MethodDescription	- string
ArrivalLocation	- string

Buyer

Each purchase order must be linked with a buyer for billing and delivery purposes.

Field	**XML-RPC Type**
BuyerID	- int
DepartmentID	- int
ContactName	- string
ContactPhone	- string

Vendor

Vendor information is necessary to track where each piece of equipment was purchased.

Field	**XML-RPC Type**
VendorID	- int
Name	- string
StreetAddress	- string
City	- string
State	- string
ContactName	- string
ContactPhone	- string

Return

Necessary to track the status of each return request.

Field	**XML-RPC Type**
ReturnID	- int
PurchaseOrderNum	- int
ReturnDescription	- string
ReturnDate	- dateTime

Types needed from other services:

Department type with a unique Department ID field (int)
- Human Resources

Methods

Purchase Order Processing

CreatePurchaseOrder(VendorID, VendorPartNum, BuyerID, ShippingMethod, OrderStatus, OrderDate, PricePerUnit, QuantityOrdered)
- Create a new purchase order. Purchase order ID is automatically generated.

CancelPurchaseOrder(PurchaseOrderNum) - cancels the specified purchase

GetVendorID(PurchaseOrderNum) - returns the VendorID
SetVendorID(PurchaseOrderNum, VendorID) - sets the VendorID

GetVendorPartNumber(PurchaseOrderNum) - returns the Vendor part number
SetVendorPartNumber(PurchaseOrderNum, VendorPartNum) - sets the Vendor part number

GetBuyerID(PurchaseOrderNum) - returns the BuyerID
SetBuyerID(PurchaseOrderNum, BuyerID) - sets the BuyerID

GetShippingMethod(PurchaseOrderNum) - returns the shipping method code
SetShippingMethod(PurchaseOrderNum, ShippingMethod) - sets the shipping method code

GetOrderStatus(PurchaseOrderNum) - returns the order status
SetOrderStatus(PurchaseOrderNum, OrderStatus) - sets the order status

GetOrderDate(PurchaseOrderNum) - returns the purchase date
SetOrderDate(PurchaseOrderNum, OrderDate) - sets the purchase date

GetPrice(PurchaseOrderNum) - returns the purchase price per unit
SetPrice(PurchaseOrderNum, PricePerUnit) - sets the purchase price per unit

GetQuantityOrdered(PurchaseOrderNum) - returns the quantity ordered
SetQuantityOrdered(PurchaseOrderNum, QuantityOrdered) - sets the quantity ordered

DisplayPurchaseOrder(PurchaseOrderNum) - displays the specified purchase order info
DisplayAllPurchaseOrders( ) - displays all purchase orders

Vendors

AddVendor(Name, Street, City, State, Contact, ContactPhone) - adds a new vendor
RemoveVendor(VendorID) - removes the specified vendor

GetVendorName(VendorID) - returns the vendor name
SetVendorName(VendorID, Name) - sets the vendor name

GetVendorStreet(VendorID) - returns the vendors street address
SetVendorStreet(VendorID, StreetAddress) - sets the vendors street address

GetVendorCity(VendorID) - returns the vendors city

SetVendorCity(VendorID, City) - sets the vendors city

GetVendorState(VendorID) - returns the vendors state
SetVendorState(VendorID, State) - sets the vendors state

GetVendorContact(VendorID) - returns the vendors contant name
SetVendorContact(VendorID, ContactName) - sets the vendors contact name

GetVendorContactPhone(VendorID) - returns the vendors contant phone number
SetVendorContactPhone(VendorID, ContactPhone) - sets the vendors contact phone #

DisplayVendor(VendorID) - displays the specified vendors info
DisplayAllVendors( ) - displays info for all vendors

Returns

ProcessReturn(PurchaseOrderNum, ReturnDescription, ReturnDate) - process a return on the given PO, ReturnID is automatically generated

GetReturnID(PurchaseOrderNum) - returns the ReturnID if it is not null

GetReturnDescription(ReturnID) - returns the reason for the return
SetReturnDescription(ReturnID, ReturnDescription) - sets the reason for the return

GetReturnDate(ReturnID) - returns the return date
SetReturnDate(ReturnID, ReturnDate) - sets the return date

DisplayReturn(ReturnID) - displays the specified return info
DisplayAllReturns( ) - displays all return info

OrderStatus

AddOrderStatus(StatusDescription) - adds a new order status, code automatically generated
RemoveOrderStatus(OrderStatusCode) - removes the specified order status

GetOrderStatusDescription(OrderStatusCode) - returns the status description
SetOrderStatusDescription(OrderStatusCode, StatusDescription) - sets the status description

DisplayOrderStatus(OrderStatusCode) - displays specified order status info
DisplayAllOrderStatus( ) - displays all order status info

ShippingMethods

AddShippingMethod(StatusDescription, ArrivalLocation) - adds a new shipping method
RemoveShippingMethod(ShippingCode) - removes the specified shipping method

GetShippingMethodDescription(ShippingCode) - returns shipping description

SetShippingMethodDescription(ShippingCode, StatusDescription) - returns shipping description

GetShippingArrival(ShippingCode) - returns the arrival location
SetShippingArrival(ShippingCode, ArrivalLocation) - sets the arrival location

DisplayShippingMethod(ShippingCode) - displays specified shipping info
DisplayAllShippingMethods( ) - displays all shipping method info

Buyers

AddBuyer(Department, ContactName, ContactPhone) - adds a new buyer
RemoveBuyer(BuyerID) - removes the specified buyer

GetBuyerDepartment(BuyerID) - returns the buyers department
SetBuyerDepartment(BuyerID, Department) - sets the buyers department

GetBuyerContactName(BuyerID) - returns the contact name for the buyer
SetBuyerContactName(BuyerID, ContactName) - sets the contact name for the buyer

GetBuyerContactNumber(BuyerID) - returns the contact phone number for the buyer
SetBuyerContactNumber(BuyerID, ContactPhone) - sets the contact phone number for the buyer

DisplayBuyer(BuyerID) - displays specified buyer info
DisplayAllBuyers( ) - displays info for all buyers

Justification of Types and Methods

The purchasing types and methods used in this web service are based on the business model found in the SAP tutorial in addition to commercial purchase order software packages. The *Buyer* and *Purchase* types and methods are based on those used in the *Purchase Order* software package by Cougar Mountain Software. *Vendor* and *Shipping* methods were also based on this package in addition to KDI Information Systems Support *Purchase Orders* documentation.

Simulated Load

The initial load of the purchasing service will be loaded from a flat file. This initial load will be predominantly populated with completed purchase orders but will also include new and in progress orders. A client program will simulate the daily interactions of the purchasing service. The client program will use a flat file containing a list of method calls and queries as input to simulate the various day to day interactions with the service.

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CS533 – Internet Services
Proposal for eb Service # – Accounts Payable Accounts Receivable

Objects:

pense

pense represents e penses occurred during all purchases.
Assumptions:

- Amount is always paid in full (no partial payment)
- The vender specified by *Vender d* is the payee
- *Vender* object is stored by the **Pu chasin** S
- Ignore late fee, etc.

Field	**Type**
E penseId	int
PONumber	int
Amount	double
VenderId	int
EmployeeId	int
ScheduledDate	date
PaidDate	date
IsPaid	Boolean
CheckId	int

n oice

n oice represents invoices that are going to be sent to customers.
Assumptions:

- All payers are considered as customers
- Amount is always paid in full (no partial payment)
- The customer specified by *us o er d* is the payer
- *us o er* object is stored by the **Sales** S
- Ignore late fee, etc.

Field	**Type**
InvoiceId	int
InvoiceNumber	int
Amount	double
DueDate	date
PaidDate	date
CustomerId	int
CustomerPONum	int
IsPaid	boolean
Reminders	date
CheckId	int

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hec

hec represents checks that carry money.
Assumptions: Only consider the basic information of a check

Field	**Type**
<u>CheckId</u>	int
CheckNumber	int
Amount	double
CheckDate	date
IsCustomerCheck	boolean

Methods:

ccounts Paya e

ScheduleE pense

→	PONumber	int
→	ScheduledDate	date
→	Amount	double
→	VerderId	int
→	EmployeeId	int
←	(E penseId)	int

PayE pense

→	E penseId	int
←	CheckNumber	

IsE pensePaid

→	E penseId	int
←	(IsPaid)	boolean

GetE pensePONumber

→	E penseId	int
←	(PONum)	int

GetE penseAmount

→	E penseId	int
←	(Amount)	double

GetE penseVenderId

→	E penseId	int
←	(VenderId)	int

GetE penseScheduledDate

→	E penseId	int
←	(ScheduledDate)	date

GetE pensePaidDate

→	E penseId	int
←	(PaidDate)	date

GetE penseCheck

→	E penseId	int

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←	(Check)	Check

SetE pensePONumber

→	E penseId	int
→	PONum	int
←	void	

SetE penseAmount

→	E penseId	int
→	Amount	double
←	void	

SetE penseVenderId

→	E penseId	int
→	VenderId	int
←	void	

SetE penseScheduledDate

→	E penseId	int
→	ScheduledDate	date
←	void	

SetE pensePaidDate

→	E penseId	int
→	PaidDate	date
←	Void	

ReportAllE penses

→	void	
←	(E penseId s)	int

ReportE pensesOfPO

→	PONum	int
←	(E penseId s)	int

ReportE pensesOfVender

→	VenderId	int
←	(E penseId s)	int

ReportE pensesOfEmployee

→	EmployeeId	int
←	(E penseId s)	int

ReportAllPaidE penses

→	void	
←	(E penseId s)	int

ReportAllUnpaidE penses

→	void	
←	(E penseId s)	int

DumpE penses

→	E penseIds	int
←	(E penses)	E pense

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ccounts Recei a e

Some Getters Setters are omitted

IssueInvoice

→	CustomerId	int
→	CustomerPONum	int
→	DueDate	date
→	Amount	double
←	(InvoiceId)	int

ReceivePayment assuming always pay in full

→	InvoiceId	int
→	CustomerCheckNumber	int
→	CustomerCheckDate	date
←	void	

RemindCustomer

→	InvoiceId	int
←	void	

IsInvoiceOverDue

→	InvoiceId	int
←	(IsOverDue)	Boolean

IsInvoicePaid

→	InvoiceId	int
←	(IsPaid)	boolean

ReportAllInvoices

→	void	
←	(InvoiceId s)	int

ReportInvoiceOfCustomerPO

→	CustomerPONum	int
←	(InvoiceId s)	int

ReportE pensesOfCustomer

→	CustomerId	int
←	(InvoiceId s)	int

ReportAllPaidinvoices

→	void	
←	(InvoiceId s)	int

ReportAllUnpaidInvoices

→	void	
←	(InvoiceId s)	int

DumpInvoices

→	InvoiceIds	int
←	(Invoicess)	Invoice

hec ontro ing

GetCheckInformation

→	CheckNumber	int
←	(Check)	Check

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Professor Martin

Process eb Service – Human Resource Management

The basic types I will model are:

mployee

This the main type which forms the basis of HR Management

Field	**XML RPC Type**
Employee ID	String
irstName	String
MiddleName	String
LastName	String
DOB	dateTime
Se	String
obID	int
DepartmentID	int
Status ield	boolean

epa tment
Tracks the Departments in the company

Field	**XML RPC Type**
DepartmentID	int
DepartmentName	String
EmployeeList	int

Jo esc iption
Keeps a list of All the ob Descriptions in the company.:PositionID is an instance of a particular ob

Field	**XML RPC Type**
obID	int
DepartmentID	int
PositionID	int

Position   esc iption

Describes the specific position job

Field	XML RPC Type
PositionID	int
PositionTitle	String
SalaryGrade	int
Status ield	boolean

Sala y

Keeps track of Salary Information for Each employee

Field	XML RPC Type
EmployeeID	int
SalaryGrade	int
SalaryAmount	int
BonusPlan(earlyAmt)	int

Hi in   P omotions

Keeps Hiring and Promotion Information for Each Employee

Field	XML RPC Type
EmployeeID	int
HireDate	dateTime
PromotionDates	dateTime
ReleaseDate	dateTime

enefits

Keeps tracks of Benefits for Each Employee

Field	XML RPC Type
EmployeeID	int
SavingsPlan	String
MedicalPlan	String
DentalPlan	String

METHODS

AddEmployee(EmployeeID, irstName,MiddleName,LastName,DOB,Se , obID, SalaryAmount,BonusPlan,HireDate,SavingsPlan,MedicalPlan,DentalPlan)-used to add employees to the system
DelEmployee(EmployeeID,ReleaseDate)-removes employee from the system:sets Status ield to false
ListEmployees()-gives the list of employees

AddDepartment(DepartmentID,DepartmentName)-Add a department to the system
RemoveDepartment(DepartmentID)-removes a department
ListDepartments()-list all the departments
ListEmpDepartment(DepartmentID)-list employees working in a particular department

Add ob(obID,PositionID,PositionTitle,Status,DepartmentID,SalaryGrade)-add a job to the system
Remove ob(obID)-remove a job from the system
List obs()-list the current active jobs
Open obs()-Lists open positions

ChangeSalary(EmployeeID,SalaryAmount,Bonus)-change the salary of a particular employee
ListSalaries()-generate a list of all employees with their salaries

AddPromotions(EmployeeID,PromoDate,NewSalary)-Assign a promotion
ListPromotions(EmployeeID)-List the Promotion dates for a particular emplpyee
ListHireDate(EmployeeID)-List the Hire Date for a particular employee

ChangeBenefits(EmployeeID,Savings,Medical,Dental)-change the benefit plan
ListBenefits(EmployeeID)-list benefits for a particular employee

SIMULATI N

or populating jobs and employees to the system I will first generate a list of jobs and assign these jobs to a list of Employees.
I plan to use flat files to store my data structures
After there are sufficient employees in the system, the program will randomly call one of the methods to
i)change employee information: change job description,change salary information,change benefits information
ii)change job information:either to add new jobs, remove jobs from the system

In order to keep payroll salary information for each employee I will need to interact with the Payroll webservice, to keep Department information I would need to track changes such as creation deletion of departments in the company

CS 553 Spring 2004

Web service descriptions

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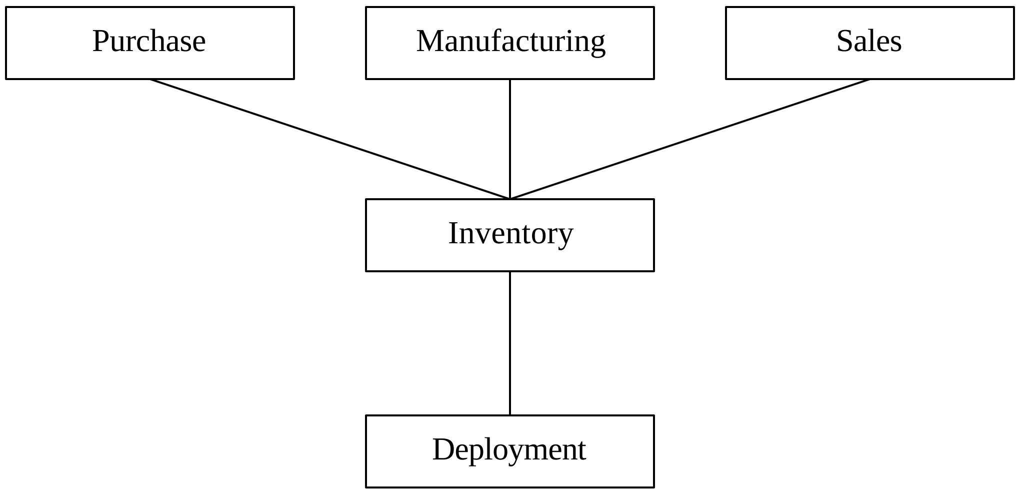
CS553: Inventory service design

Yufei Pan

Interaction with other services:



Data Types:

<u>ProductType</u>

Field	XML-RPC Type
PartNum	string
Name	string
Description	string

Field specification:

- PartNum: a unique identification number standing for the product type
- Name: a string giving the human-readable name for the type
- Description: a string describing the product-specific properties

<u>ProductItem</u>

Field	XML-RPC Type
SerialNum	int
BarCode	string

PartNum	string
UnitID	int
LocationID	int

Field specification:

- SerialNum: a unique serial number for a product item.
- BarCode: a unique bar code for a product item
- PartNum: the ID of the type of the product item
- LocationID: the id of the location where item is stored currently. -1 means that item is on the way.

<u>ItemHistoryEntry</u>

Field	XML-RPC Type
SerialNum	int
Action	string
LocationID	int
Time	dateTime

Field specification:

- SerialNum: the serial number of item.
- Action: the defined action is “REMOVE” and “ADD”.
- LocationID: the id of location involved.
- Time: the time when action is taken

<u>Unit</u>

Field	XML-RPC Type
UnitID	int
ItemArray	array of string

Field specification:

- UnitID: the id of Unit, which is a group of items.
- ItemArray: the serial numbers of items in the Unit

<u>Location</u>

Field	XML-RPC
LocationID	int
Site	int
Building	string
Floor	string
Room	string

Field specification

I just keep the same definition of location used in Asset Service.

Methods:

BarCoding

Boolean	assignBarCode(string SerialNum, string barCode);;
string	queryBarCode(string SerialNum);;
int	queryItemSN(string barcode);;

Warehouse Management

boolean	assignUnit(string SerialNum, Unit Unit);
boolean	addItemToUnit(String serialNum, Integer unitID);
String[]	getItemsInUnit(Integer unitID);
boolean	storeUnitToWH(Integer unitID, Integer locationID);
boolean	removeUnitFromWH(Integer unitID);
int	queryUnit(string SerialNum);

Location Query

int	queryItemLocation(string SerialNum);
int	queryItemLocation(string SerialNum);

History Query

ItemHistory[]	queryItemHistory(string SerialNum);

Type tracking

String	queryProductType(string SerialNum);

Quantity tracking

int	queryQuantity(string PartNum);

Indirection query

ProductType	getProductType(string PartNum);
ProductItem	getProductItem(string SerialNum);
Unit	getUnit(int UnitID);
Location	getLocation(int locationID);

Junk Query

int[]	getAllItems();
int[]	getAllUnits();

Sales Order

boolean	handleSalesOrder(String partNum, Integer quantity);

Simulated load generation:

I will generate about 100 locations, 100 production types, 1,000 - 10,000 items for each type. Also, I will execute about 2 random movements (from one location to another location); for each item.

Michael Wood
CS 553 Web Service Proposal

My project is to develop a Sales Management package for Fubar, Inc. Here are the data types and methods I propose.

DATA TYPES

Product
The system needs to know about Fubar's products so that sales reps can enter orders without having to fill in all the details. The product information maintained here will likely be different from that maintained by the Inventory and Manufacturing services.

PartNumber	string	
ProductLineID	int	
Description	string	-- the product name
BasePrice	double	
DiscountCodes	array of strings	
DiscountRates	array of doubles	
SubstitutePartNumber	string	-- what to substitute if this item is out of stock
IsActive	boolean	-- set "false" for discontinued items

Customer
We must store the customer's address for shipping and returns purposes. The status value tells us if a contract job is ongoing, if the customer is no longer valid, etc.

CustomerID	int	
CustomerName	string	
CustomerPhone	string	
BillingStreetAddress	string	
BillingTown	string	
BillingState	string	
BillingZip	string	
ShippingStreetAddress	string	
ShippingTown	string	
ShippingState	string	
ShippingZip	int	
AccountBalance	double	-- sales or accounts receivable?
Status	string	

Sale
The *Sale* object comprises the information a sales rep needs in order to fill out an invoice and complete a sale.

ReferenceNo	int	
CustomerID	int	
SalespersonID	string	
DateAndTime	dateTime.iso8601	
LineItems	array of SalesLineItem objects	
SalesTax	double	
ShippingCharge	double	
DeliveryTax	double	-- related to the customer's location
Total	double	
AmountPaid	double	
Status	Boolean	-- shipped yet (Y/N)
TrackingNo	int	

SalesLineItem
BillingRate applies to contract jobs, in which case *Quantity* will be the hours billed.

PartNumber	string
SerialNumbers	array of string
BillingRate	double
HoursBilled	double
DiscountCode	string
SoftwareKey	string

Return
Keeps a record of all merchandise returns; Fubar's decision to accept or reject the return (based on condition, etc.) and the amount credited to the customer's account.

ReferenceNo	int	-- local key
SalesReferenceNo	int	-- foreign key into the Sales database
PartNumber	string	
QuantityReturned	array of SerialNums	
DateReturned	dateTime.iso8601	
IsAccepted	array of Boolean	
AmountCredited	array of double	
Comments	string	
ReplacementReferenceNo	string	

METHODS

Sales order processing

CreateOrder (customerID, salesperson) – sets up a new order/invoice for the sales rep.
AddItemToOrder (SalesLineItem) – adds a line item to an invoice. Fills in product description, software key (if applicable)
RemoveFromOrder (productID, quantity) – deletes a line item from an invoice
PostOrder () – Creates and returns a ReferenceNo for this order. Posts the order/invoice so that the warehouse can fulfill it and it can be shipped.
DisplayOrder (ReferenceNo) – Displays a simple list of the sales line items, tax, total, and customer name/ID
CreateLineItem(productID, quantity)—initializes a new SalesLineItem object
Get/SetItemQuantity(SalesLineItem)
Get/SetSoftwareKey(SalesLilneItem)
SetDiscountCode(SalesLineItem)
CalculateTax(Sale object), CalculateTotal(Sale object)
DisplayBalance (CustomerID) – returns the balance on an account
CreateProduct (description, price, discount rate) – adds a new product to the database; creates and returns a product ID
Get/Set{product attribute}(productID, attributeValue) – for those attributes that should be readable/writable by a salesperson
DiscontinueProduct (productID)
DisplayProduct (productID) – Displays the product information maintained in the sales database
ProductName2ID(productID), ProductID2Name(description)
CreateCustomer (Name, {Shipping,Billing}{Address, Town, State, Zip}) – adds a new customer to the database
Get/Set{customer attribute}(CustomerID, attributeValue) – for those attributes that should be readable/writable by a salesperson
DeactivateCustomer (CustomerID) – marks a customer as no longer valid/active
DisplayCustomerHistory (CustomerID, Date) – shows the purchases on record for this customer since *date*
DisplayCustomer(CustomerID) – Displays the customer information maintained in the sales database
CustomerName2ID(), CustomerID2Name()
ApplyCharge(CustomerID, Amount) – returns the account balance after the charge
ApplyCredit(CustomerID, Amount) – returns the account balance after the credit

Quotations

GetPriceOrRate (ProductID, discountCode, bool includeTax) – returns the full or discounted price of an item, or the rate for contract work

Invoicing

** Invoices and orders display different collections of "sale" information in different ways**
DisplayInvoice (ReferenceNo) – displays the full invoice pertaining to a specific order

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CS 553 – Internet Services
Dr. Richard Martin

Project – Stage I Description
Topic: Project Management

Based on my understanding of the topic and the ways to interpret it, I chose to break it down into 2 broad components –

1) Project Management is often used to track the progress of and manage the resources (i.e. people, equipment, subcontractors, etc.) used in complex projects.
2) From a customer's perspective, it involves preparing bills (including pricing) and tracking orders.

This web service may interact with Asset management (which may place asset requests), Purchasing (where the asset requests will be checked and redirected), and HR(place staffing requests)

These are the various types I feel the need for, as I make an initial design of the system:

Asset Requirements
This type would get information from Asset Management when the need is felt for asset purchases and the information would be passed on to the Purchases Department

asset_req_id	int
asset_type	string
quantity	int
requirements_text	string
date_required_by	datetime

Department
Various departments in the company that can place requests for staff

department_id	string
department_name	string
requirement_text	string
requirement_num	int

Staffing Requirements
This type would get information regarding staffing requirements from any department and the matter would be referred to HR.

staff_req_id	int
department_id	string
requirements_text	string
number_required	int
date_required_by	datetime

Bill
Get order information and generate a bill for customer.

CustomerID	string
Purchase Order Number	int

All classes/tables created by Stan Rajan for Purchasing will be crucial to my implementation. Maybe, the '**<u>return products</u>**' implementation is better suited in my project – since Project Management deals with customer interaction and status checking.

//in Customer table/entity, "Boolean payment_received" to be included for the purposes of my project.

Methods:

submit_asset_req(type, number, date, notes)
submit_staffing_req(dept, number, date, notes)
send_asset_req(asset_req_id)
remove_staffing_req(asset_req_id)
remove_staffing_req(staff_req_id)
send_staffing_req(staff_req_id)
create_bill(cust_id, order_id)
update_status(order_id, status_text, shipping_date, delivery_date)
create_return(order_id, return_reason, date)
track_return(return_id)
credit_payment(return_id)

<u>Simulated Load</u>
A program would create a simulated system with a bunch of customers, orders, and departments. Then, the asset management department will place various asset requests, various other departments will place many staffing requests, the status of various orders would be updated, bills generated, customer tracking requests placed, and the ability of the web service to handle such multiple simultaneous requests correctly will be tested.

CS553 Web Services

Updated: Monday, April 26, 2004 by Scott Battaglia

avaDocs are available via:
http: battaglia.homeip.net: cs553 doc

Sample SP pages are available via:
http: battaglia.homeip.net: client

Services are available via:
http: battaglia.homeip.net: cs553 services InventoryManagerService
http: battaglia.homeip.net: cs553 services ManufacturingManagerService

Manufacturing Web Service

Vendor Class

- Address (Address class)
- ContactName (String)
- ContactNumber (String)
- Id (int)
- Name (String)

SpecificPart

A vendor specific instance of a part (i.e. Radio Shack s battery pack).

- Cost (double)
- GenericPart (GenericPart)
- Id (int)
- Quantity (int)
- Vendor (Vendor)
- VendorPartNumber (String)
- VendorSpecificName (String)

ProductInstance

Represents the creation of one of our products (i.e. Mote with Serial Number 3 3)

- Parts (Collection of SpecificParts
- Product (Product)
- SerialNumber (String)
- ManufacturedDate (Date)

Product

- Name (String)
- PartNumber (String)

PartSwap (used by ECN)

Denotes two parts that need to be swapped in an ECN

- Part (int)
- Replacement (int)
- ReplacementAmount (int)

GenericPart

Denotes something like a screw

- Id (int)
- Name (String)
- Quantity (int)

EngineeringChangeNotice

- Id (int)
- Product (Product)
- ReplacementParts (Collection of PartSwaps)

BillOfMaterial

- Id (int)
- Parts (Collection of GenericParts)
- Product (Product)

Address

- Address (String)
- City (String)
- State (String)
- ipCode (String)

Inventory Manager Service

Collection getOutOfStockParts() get the out of stock parts
Collection getLowStockParts() get parts with what we defined as low stock
Collection getParts ithStockLessThan(int amount) get parts with stock less than what is passed in

Collection getParts   ithStockGreaterThan(int amount)   get parts with stock greater than what is passed in
Collection getSpecificParts romGenericPartId(int id)   get all the specific parts for a generic type
int incrementPartAmount(int id, int amount)   increment the amount we have for a part
int decrementPartAmount(int id, int amount)   decrement the amount we have for a part
GenericPart addPartType(String name)   add a generic part type
SpecificPart addSpecificPart(SpecificPart part)   add a specific part
void updateSpecificPart(String partId, String partName)   update a specific part
Collection getVendors()   get the list of vendors in the database
Vendor getVendor(int vendorId)   get a specific vendor
Collection getPartsByVendor(int vendorId)   get all the parts a vendor has
Double getAveragePartPrice(int genericPartId)   get the average price for a part
double getAverageProductCost(String productId)   get the average product cost
void updateGenericPart(GenericPart part)   update the name of a generic part
BillOfMaterial insertBillOfMaterial(BillOfMaterial b)   insert a bill of material
Collection getGenericParts()

Manufacturing Manager Service

ProductInstance buildSensor(String productId)   build one sensor
Collection buildSensors(String productId, int amount)   build a specific amount if possible
Collection buildSensorsToStock(String productId)   build all we can
boolean increaseStage(String serialNumber)   increase the stage of a product
Collection getProducts()   get the list of product types
Collection getProductInstances(String productId)   get the product instances of a product

Simulated Load

Data will be entered in to the database. This will either be done using a script to enter directly into the database, or via the methods provided. A program will then be created that will simulate building up an inventory of parts and then continually building sensors and updating parts via simulation of both build-to-stock and build-to-order. This should simulate the day-to-day build-up and use of parts as well as the creation of new products. At the end the reporting methods can be used to see what was created and used.

```
	public void removeProductFromMasterProductionSchedule(Product product, Date estimatedStartDate);
}
```

Note: There will also be other methods to do things such as addBillOfMaterial, etc. that will essentially be the data entry into the database.

Simulated Load

Data will be entered in to the database. This will either be done using a script to enter directly into the database, or via the methods provided. A program will then be created that will simulate building up an inventory of parts and then continually building sensors and updating parts via simulation of both build-to-stock and build-to-order. This should simulate the day-to-day build-up and use of parts as well as the creation of new products. At the end the reporting methods can be used to see what was created and used.

Michael Pagliorola
Internet Services

A deployment web service, as researched, is best be described as unifying system of post inventory management and support services. The methods described below should be adiquite to allow for the support service to get information on individual, and the over all, states of the deployed products. As such this service should be fed by the sales and trouble ticket webservices in order to keep the information up to date.

Objects:

Product

Field	**XML-RPC Type**
Product Name	- String
Part Number	- String
Serial Number	- String
Customer ID	- Int
Software Version	- String
Operational Status	- boolean
Recall Notice	- boolean
Manufacture Date	- dateTime
End of Mantenence	- dateTime
End of Life	- dateTime

Customer

Field	**XML-RPC Type**
Customer ID	- Int
Customer Name	- String
Street Address	- String
City	- String
State	- String
Postal Code	- String
Country	- String
Contact Name	- String
Contact Email	- String
Contact Phone Number	- String

Software

Field	**XML-RPC Type**
Product Name	- String
Customer ID	- Int
Software Version	- String
Update Available	- Boolean
Recall Notice	- Boolean
End of Mantenence	- dateTime
End of Life	- dateTime

Methods:

> ***Product***
> addProduct(Product, Customer, dateTime)
> removeProduct(serialNumber)
> updateProductStatus(serialNumber, operationalStatus)
> getProductStatus(serialNumber)
>
> ***Software***
> addSoftware(Software, Customer, dateTime)
> removeSoftware(productName, customerID)
> updateSoftwareAvailable(productName)
> getSoftwareAvailable(productName)
>   * Calls support services to check if an update is available
> updateSoftwareVersion(productName, softwareVersion);
>
> ***Shared***
> getRecall(productName);
>   * Calls support services to check for a recall
> updateRecall(String productName, Boolean status)
>   - Announce/cancel recall of specified product
> getEndOfMantenence(productName, customerID);
> updateMantence(productName, CustomerID)
> getEndOfLife(String productName);
>   * Calls support service to check for EndofLife
> updateEndOfLife(productName, dateTime)
>
> ***Informative Queries***
> getTotalDeployed(productName, dateTime, dateTime)
>   - Returns the total amount of product deployed between a given date
> getTotalCustomers(customerID, productName);
>   - Returns the total amount of customers with the specified product
> getTotalFailedProducts(productName);
> getFailedProducts(productName, dateTime, dateTime)
>   - Returns product(s) that failed during the time period
> getCustomersByProducts(productName);
>   - Returns all products a customer has
> getProductsByCustomer(customerID);
>   - Returns all customers that have a product

Simulated Load:

A basic main program will randomly create sales and service events then update the system appropriately while also dumping it's output to a log file for verification upon completion. After a given amount of time the main program will then ask for statics from the serivice which can be checked against the output file to ensure proper execution.

Richard Psota
CS 553 – Internet Services
Professor Martin

For my job, one of my projects is the deployment of an **enterprise asset management** system for my division. Based on my familiarity with the system and the data stored in the system, I put together the following types and methods.

TYPES:

Employee

The asset tracking module would need to track some basic information on employees since it is necessary to know who owns the equipment.

Field	**XML-RPC Type**
Employee ID	- string
First Name	- string
Last Name	- string
Department Number	- int

Asset

The asset tracking module would need to track detailed information on all of Fubar's assets. This includes information related to the purchase, installation, and disposal of the assets.

Field	**XML-RPC Type**
Asset ID	- int
Asset Description	- string
Asset Classification	- string
Model #	- string
Serial #	- string
Owner – Employee ID	- string
Department Number	- int
Purchase Date	- dateTime
Purchase Price	- double
Installation Date	- dateTime
Location ID	- int
Vendor ID	- int
Disposal Date	- dateTime
Status	- string

Vendor

The asset tracking module would need to track some basic information on vendors since it is necessary to know who sold the equipment to Fubar.

Field	**XML-RPC Type**
Vendor ID	- int
Vendor Name	- string
Vendor Street Address	- string
Vendor Town	- string
Vendor State	- string
Vendor Country	- string
Vendor Contact	- string
Vendor Contact Phone #	- string

Location

The asset tracking module would need to track the exact location of the equipment. In order to achieve this level of detail, the location type would be required.

Field	**XML-RPC Type**
Location ID	- int
Site	- string
Building	- string
Floor	- string
Room	- string

Department

The asset tracking module would need to track some basic information on the departments within the company.

Field	**XML-RPC Type**
Department Number	- int
Department Name	- string

Depreciation

The asset tracking module would need to track important values to be used in the depreciation calculations.

Field	**XML-RPC Type**
Asset Classification	- string
Depreciation Percentage per year	- double
Expected lifetime in years	- int

Methods

Detailed Tracking

AddEmployee(FirstName,LastName,EmployeeID,DepartmentNumber) – Adds a new employee to the employee table.
RemoveEmployee(EmployeeID) – Removes an employee from the employee table.
GetAllEmployees() – Returns an array of all employees.
GetAllAssets() – Returns an array of all assets.
AddVendor(Name,StreetAddress,Town,State,Country,Contact,ContactPhone) – Adds a new vendor to the vendor table.
RemoveVendor(VendorID) – Removes the vendor from the vendor table.
GetAllVendors() – Returns an array of all vendors.
AddLocation(Site,Building,Floor,Room) – Adds a new location to the location table.
RemoveLocation(LocationID) – Removes the location from the location table.
GetAllLocations() – Returns an array of all locations.
AddDepartment(DepartmentNumber,DepartmentName) – Adds a new department to the department table.
RemoveDepartment(DepartmentNumber) – Removes a department from the department table.
GetAllDepartments() – Returns an array of all departments.
AddDepreciationValue(Class,Percentage,Lifetime) – Adds a new depreciation value to the table.
RemoveDepreciationValue(Class,Percentage,Lifetime) – Removes the depreciation value from the table.
GetAllDepreciationValues() – Returns an array of all depreciation values.
CreateAsset(Description,Classification,SerialNumber,ModelNumber,EmployeeID,PurchasePrice,PurchaseDate,Department,LocationID, VendorID) – Create a new asset record with the required fields provided.
GetAssetDescription(AssetID) – returns a description of the asset with the given asset ID
SetAssetDescription(AssetID,Description) – sets the description of the asset
GetAssetClassification(AssetID) – returns the classification of the asset with the given asset ID
SetAssetClassification(AssetID,Classification) – sets the classification of the asset
GetModelNumber(AssetID) – returns the model number of the asset with the given asset ID
SetModelNumber(AssetID,ModelNumber) – sets the model number of the asset
GetSerialNumber(AssetID) – returns the serial number of the asset with the given asset ID
SetSerialNumber(AssetID,SerialNumber) – sets the serial number of the asset
GetPurchaseDate(AssetID) – returns the purchase date of the asset
SetPurchaseDate(AssetID,PurchaseDate) – sets the purchase date of the asset
GetPurchasePrice(AssetID) – returns the purchase price of the asset
SetPurchasePrice(AssetID,PurchasePrice) – sets the purchase price of the asset
GetInstallationDate(AssetID) – returns the installation date of the asset
SetInstallationDate(AssetID,InstallationDate) – sets the installation date of the asset
GetLocationID(Site,Building,Floor,Room) – returns the location id for the entered location
GetLocation(AssetID) – returns the Site + “-“ + Building + “-“ + Floor + “-“ + Room of the given asset ID
SetLocation(AssetID,LocationID) – sets the location id of the asset
GetVendorId(VendorName) – returns the vendor id for the given vendor name
GetVendor(AssetID) – returns the Vendor Name for the given asset
SetVendor(AssetID,VendorID) – sets the vendor id for the given asset
GetAvailableCount(Classification) – returns the number of assets available for the inputted classification

Depreciation and Gain/Loss Detail

CalculateDepreciation(AssetID) – returns the depreciated value for the given asset using the depreciation percentages in the Depreciation table.
RunningTotal() – returns the total value of assets that have not been disposed

Ownership

GetEmployeeID(FirstName,LastName) – returns the employee identifier for the given employee
GetOwnerName(AssetID) – returns the first and last name of the employee that owns the asset
SetOwnerName(AssetID,EmployeeID) – sets the employee id for the owner of the asset
GetDepartment(AssetID) –returns the department that owns the asset
SetDepartment(AssetID,DepartmentNumber) – sets the department that owns the asset

Disposal
GetCurrentStatus(AssetID) – returns the current status of the asset
SetCurrentStatus(AssetID,Status) – sets the current status of the asset (In Service, Broken, Disposed)
GetDisposalDate(AssetID) – returns the date that the asset was disposed
DisposeOfAsset(AssetID,DisposalDate) – sets the disposal date of the asset to DisposalDate and updates the status to disposed

Simulated Load

There will be a main client program that initially generates new assets. This will simulate the initial population of assets into the asset management system. After there are sufficient assets in the system, the program will randomly choose different get and set methods to represent daily asset operations. This will simulate the day to day queries and updates that would take place in Fubar. During this time, new assets would be sporadically added and other items would be disposed. The function calls would allow for the correct system operation to be verified. At the end of the program, the RunningTotal() function would be run to determine the total value of Fubar's assets.

External Interfaces

Fixed Asset Management will receive the employee number for a first name and last name combination by calling a getEmployeeID function in the HR system. FAM will store only employees listed as owners of Fubar assets. Two of the other modules will be utilizing Fixed Asset Management. Purchasing will call the CreateAsset method in FAM when new company assets are purchased. Project Management will call the GetAvailableCount method to check the availability of different classes of assets.

John Francisco

Internet Services

Rich Martin

19 February, 2004

Trouble Ticketing Web Service Revised API

Types:

There are three data types in the Trouble Ticketing API (TT-API); the Trouble Ticket (TT), Incident Report (IR), and Bug Report (BR).

Trouble Ticket:

Attribute:	XML Type:	Description:
Ticket ID	dateTime.iso8601	Time ticket was opened, primary key
Owner	string	Owner of the faulty product
PartNumber	string	Part # of faulty product
CloseDate	dateTime.iso8601	Time ticket is closed
Closer	string	Person who closes the ticket
Status	int	Determines status of ticket
Description	string	Description of problem

Logical Ticket Types:

Pending Ticket:	Newly created TT	Status = -1

- newly created with little or no Incident Reports assigned to it

Trouble Ticket:	Active TT	Status = 0

- complete and active Ticket

Closed Ticket:	Inactive TT	Status = 1

- a Ticket for a problem that is no longer an issue

Incident Report:

Attribute:	XML Type:	Description:
Ticket ID	dateTime.iso8601	Ticket this IR is associated with
Incident ID	dateTime.iso8601	Time this IR was generated, primary key
Description	string	Description of the problem
SerialNumber	string	Serial # / version of the faulty product
PartNumber	string	Part # of the faulty product
Owner	string	Owner of faulty product

Bug Report:

Attribute:	XML Type:	Description:
Bug ID	dateTime.iso8601	Time this BR was created
PartNumber	string	Part # of buggy product
SerialNumber	string	Serial # of product bug was initially found in
Description	string	Description of bug
Workaround	string	Workaround, if any, for this bug

Methods:

CreateIncidentReport(Owner, ProductNumber, SerialNumber, Description)

-create a new Incident Report; Ticket ID and Incident ID are set automatically

CreateTicket(Owner, ProductNumber, Description)

-create a new Trouble Ticket; Ticket ID and Status are set automatically

OpenTicket(Ticket ID)

-opens a Pending or Closed Ticket and makes it an Active Ticket

CloseTicket(Ticket ID, Closer)

-closes an Active Ticket and makes it an Inactive Ticket

DeleteTicket(Ticket ID)

-removes an Inactive Ticket from the system

DeleteIncident(Incident ID)

-removes an Incident Report from the system that either is not associated with a Ticket, or whose Ticket has been deleted

DeleteBug(Bug ID)

-removes a Bug Report from the system

CreateBugReport(PartNumber, SerialNumber, Description, Workaround)

-creates a new Bug Report; Bug ID is set automatically

MakeBugReport(Incident ID, Workaround)

-makes a Bug Report out of the Incident Report specified

SetIncidentTicketID(Incident ID)

-set the Ticket ID that an Incident Report belongs to

GetIncidentTicketID(Incident ID)

-returns the Ticket ID that an Incident Report belongs to

GetAll()

-returns all Tickets and Reports

GetAll(Ticket ID, Ticket ID)

-returns all Tickets for a date range

GetTicket(Ticket ID)

-returns Ticket

GetBugReport(Bug ID)

-returns Bug Report

GetAllBugReports()

-returns all Bug Reports

GetAllBugReports(Bug ID, Bug ID)

-returns all Bugs for a date range

GetAllIncidentReports()

-returns all Incident Reports

GetAllIncidentReports(Incident ID, Incident ID)

-returns all Incidents for a date range

GetAllActiveTickets()

-returns all Active Tickets

GetAllActiveTickets(Ticket ID, Ticket ID)

-returns all Active Tickets for a date range

GetAllInactiveTickets()

-returns all Inactive Tickets’ Ticket IDs

GetAllInactiveTickets(Ticket ID, Ticket ID)

-returns all Inactive Tickets for a date range

GetAllBugReports()

-returns all Bug Reports

GetAllBugReports(Bug ID, Bug ID)

-returns all Bug Reports for a date range

GetAllIncidentReportsByOwner(Owner)

-returns all Incident Reports for a specific Owner

GetAllActiveTicketsByOwner(Owner)

-returns all Active Tickets for a specific Owner

GetAllInactiveTicketsByOwner(Owner)

-returns all Inactive Tickets for a specific Owner

GetAllIncidentReportsByOwner(Owner)

-returns all Incident Reports for a specific Owner

GetAllIncidentReportsByPart(PartNumber)

-returns all Incident Reports for a specific part

GetAllActiveTicketsByPart (PartNumber)

-returns all Active Tickets for a specific part

GetAllInactiveTicketsByReporter (PartNumber)

-returns all Inactive Tickets for a specific part

GetAllBugReportsByPart(PartNumber)

-returns all Bug Reports for a specific part

GetOwner(Ticket ID / Incident ID)

-returns the Owner of a Ticket or Incident

GetPart(Ticket ID / Incident ID)

-returns the PartNumber of a Ticket or Incident

GetDescription(Ticket ID / Incident ID / Bug ID)

-returns the Description of a Ticket, Incident or Bug

GetNewestIncident()

-returns the most recently logged Incident Report

GetOldestIncident()

-returns the oldest logged Incident Report

Load:

In order to simulate accesses to the service, a client program will be written to first generate Incident Reports. As the database begins to be populated it will create less Incident Reports while executing the other web service status-changing and lookup functions more often.