

Inventory Management System Proposal To ER Music Gallery

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System Development Team

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Executive Summary

Matador consulting was given the opportunity to analyze the business processes at ER Music Gallery to assist them towards attaining recognized efficiency. During our analysis, it was discovered that ER Music Gallery was manually managing critical business events. We continued with gathering information to better understand the business and current system. It became evident that ER Music Gallery was in need of an inventory management solution to address problems and opportunities.

After much communication with ER Music Gallery staff and business owner David, it was noted what system objectives the proposed solutions must satisfy. Some notable issues found is the time taken to locate and retrieve inventory, which decreases business efficiency and causes frustration in both employees and customers. Unmonitored access and lack of accountability, that leads to a vulnerable information system. This makes it extremely difficult to trace lost costs to source. It is also challenging to extract useful reporting which affects minimizing costs.

We were determined to find solutions that cuts wasted time, drastically reduces opportunity for error, and has the ability to forecast inventory need which is essential to meeting customer demands. Having a seamless business process in place allows a company to centralize data, increase inventory visibility, and ability to make informed decisions. Upon research our firm found the three following candidate solutions for system improvement: Access, QuickBooks, and Stitch. After analyzing feasibility criteria in conjunction with system constraints, Matador Consulting recommends that ER Music Gallery move forward with implementation of Access 2016 a Microsoft package solution, which will synchronize data and provide organized inventory management. Access is easy to integrate with existing company hardware. The user interface is intuitive thereby accelerating data input and retrieval. In addition, its multi-user support capability allows for secure data control.

This upgrade is estimated to cost \$19,977.99 for complete implementation of the information system and a \$ 172 annual subscription fee thereafter. A net present value of \$167,484 and lifetime cost of \$21,009.99 over 6 years, results in 160% return on investment. Considering all capabilities and economical advantages, Access maintains the lowest risk and highest score against feasibility criteria. Access is a mature information management tool that can encompass all of ER Music Gallery's activities and sustain business growth. Implementation is expected to take a week and a half and delivery of information system into production will be completed by late May.

Business Background

ER Music Gallery
5030 S. Decatur Blvd., #H, Las Vegas, NV 89118

888.990.0911
www.erpiano.com

ER Music Gallery is a family-owned store offering a full line of name-brand musical instruments, related parts, and accessories. ER Music Gallery started as a piano store in March 2010 in Los Angeles. As of January 2013, ER Music Gallery expanded with the opening of an online store. On October 1, 2015, ER Music Gallery relocated to Las Vegas, NV to provide better advantage for California customers in price and service. ER Music Gallery has also recently increased their online communication methods via social networking sites. Knowledgeable musician employees strive to provide customers with the most accurate information regarding all their musical purchasing needs.

ER Music Gallery is currently experiencing product inconsistencies in the inventory file and warehouse system. The business needs to implement an inventory management system to optimize inventory.

ER Music Gallery has been operating with an individually managed inventory system that is not synchronized. When new inventory is received or a sale is made, employees manually update the inventory levels using an excel spreadsheet. At the moment, there are duplicate inventory entries causing levels to be incorrect. The current lack of edit control in the spreadsheet increases processing errors. Without synchronized data from online orders, product that is out of stock has been sold resulting in customer dissatisfaction.

ER Music Gallery is operating at an inefficient, unreliable level. Given cost constraints and business need for inventory tracking, our team will provide an inventory management solution that can manage inventory by synchronizing its database across online, store, and warehouse.

Activities

A project group member, Rachel (Sukhyun) Kim is a former ER Music Gallery employee; she recalled various internal business problems while at ER Music Gallery and recommended them as a possible prospect to investigate the possibility of implementing an information system. In order to freely communicate their notable business problems for our project, Rachel contacted ER Music Gallery's owner, David, directly via e-mail to ask for consent to discuss the business for a system and design opportunity. David agreed and provided updated information when asked about their current business situation. He stated the store still has "normal" problems and they continue to manually manage most of their business processes. He stated that they have had an increase in online sales and they cannot keep up with the tracking of inventory since there is no centralized system that synchronizes all the data when sales occur. Both David and current staff expressed their discomfort with their current system because their number of sales has grown significantly over the last three years but their system has not changed to support the growth.

Following the initial conversation Rachel had with the company; we decided to further investigate what David defines as "normal" business problems. We listened as David explained over phone how any employee could access and manipulate data in their current system, which is the use of Excel for inventory management. He went on to say that they have gotten so busy that staff forgets to update inventory data which further delays the ability to confirm inventory. He states his inventory projections have led to overstock and found it necessary to offer discounts on those items. We scrolled through the company website and social sites as well for further insight. We started to realize some of the "normal" problems that increased stresses on employees, the difficulty in identifying errors in excel, and the extensive time spent in manual processing are not normal in business nature and there are a wide range of advanced technological solutions. This information helped us in confining the area problems within ER Music Gallery.

Project Plan

Business Problem

The current performance of ER Music Gallery's inventory system has a high throughput considering the technologies available to assist with management of the inventory file and warehouse system. The current management of inventory data is an excel spreadsheet. The spreadsheet is stored on the main office computer and is updated and accessible by all employees on site. Due to lack of formal training in excel the spreadsheet is improperly used, consequently producing errors and redundancies in data. For example, Inventory 'A' is found at the top of the spreadsheet. When additional Inventory 'A' is received, it is erroneously recorded as new inventory instead of updating the existing Inventory 'A' level. Due to lack of accountability there are various anomalies in the current inventory management system. In addition, the vast amount of accumulated data over the years has made the use of excel not feasible for the various employees that use it. The increased number of items listed online for sale makes synchronization a necessity in which excel cannot deliver. Customers are provided with manual updates on order status for online orders. The redundancy of data has an effect on the efficiency of the order process. When inventory items are not properly documented, they lose track of remaining inventory of an item and must go to the warehouse to determine how many inventories are left. To find the inventory level or the location of a particular inventory item is time-consuming, tedious, and unproductive. The true costs and profits are affected by the inaccuracies in the inventory data, such as loss sales for out of stock items sold online or the high cost of overstocked items on hand that sometimes requires it to be discounted deeply. The excessive response time by employees for inventory-related questions due to un-useful format of the data affects service and the ability to move more inventories through ER Music Gallery.

The current excel spreadsheet as an inventory management tool has several problems that need to be corrected or improved upon. Excel can no longer encompass all of ER Music Gallery's activities due to its inability to effectively provide:

1. Quick inventory location/retrieval
2. Managed inventory, sale, and delivery history
3. Restricted access to authorized users
4. Automatic updating
5. Purchasing trends
6. Ease of use
7. Synchronization between store and warehouse

ER Music Gallery must implement an inventory management system in order to fully achieve its purpose and goals.

Problem Statements Matrix

Project: ER Music Inventory Management System	Project Manager: Sukhyun Kim
Created By: Sandy Leon	Last Updated By: Lizeth Galvan
Date Created: February 24, 2016	Date Last Updated: April 15, 2016

Brief Statements of Problem, Opportunity, or Directive	Urgency	Visibility	Annual Benefits	Priority	Proposed Solution
1. Order/Inquiry response time in verifying inventory level or location of a particular inventory item is too long.	ASAP	High	\$11,000	1	New Development
2. Increased product listed online for sale puts further stress on the throughput requirements for current system.	3 Months	Med	Unknown	2	New Development
3. All employees can access and update inventory information.	ASAP	Med	\$7,000	2	New Development with user control function
4. Inconsistent data between inventory files and warehouse.	ASAP	Med	\$8,000	1	New Development with easy to learn tools
5. Difficult to extract useful information from excel.	ASAP	High	Unknown	2	New Development
6. Delayed delivery and customer dissatisfaction for out of stock product sold online.	2 Months	High	\$8,900	1	New Development with synchronization capability
7. There is opportunity to increase internet speed connection.	12 Months	Low	Unknown	3	Future version release of new development

Problems, Opportunities, Objectives, and Constraints Matrix

Project: ER Music Gallery Inventory Management System	Project Manager: Sukhyun Kim
Created by: Sandy Leon	Last Updated by: Sandy Leon
Date Created: February 24, 2016	Date Last Updated: May 05, 2016

CAUSE AND EFFECT ANALYSIS		SYSTEM IMPROVEMENT OBJECTIVES	
Problem or Opportunity	Causes and Effects	System Objective	System Constraint
1. Order/Inquiry response time in verifying inventory level or location of a particular inventory item is too long.	<ol style="list-style-type: none"> 1. The inventory system is currently manually managed. 2. When staff is busy they sometimes forget to update the inventory spreadsheet. 3. Data redundancies 	<ol style="list-style-type: none"> 1. Decrease the time it takes to do stock check by 75%. 2. Synchronize data across stores. 3. Reduce manual data entry required by 60%. 	<ol style="list-style-type: none"> 1. New system must be intuitive 2. The new system must accelerate data information retrieval.
2. Increased product listed online for sale puts further stress on the throughput requirements for current system.	<ol style="list-style-type: none"> 1. The small staff number cannot keep up with manual inventory management of increased online sales 2. Current system is further complicated with errors. 	<ol style="list-style-type: none"> 1. Replace manual email update status from ER Music to customer. 2. Easy point and click system that will allow for easy updating on various products. 	<ol style="list-style-type: none"> 1. New system must have quick reference help for users. 2. The new system must have easy functionality and set up. 3. Must be compatible with current Windows 7.
3. All employees can access and update inventory information.	<ol style="list-style-type: none"> 1. Lack of accountability causes increased errors. 2. Promotes stock shrinkage. 3. Lack of confidence in inventory info. 	<ol style="list-style-type: none"> 1. A system with 100% user access control. 2. Provide accountability to reduce shrinkage by 90%. 	<ol style="list-style-type: none"> 1. Proposed system must have real time synchronization. 2. New system must allow different user-level security access.
4. Inconsistent data between inventory files and warehouse.	<ol style="list-style-type: none"> 1. Lack of inventory specific functions in current system 2. Prevents extracting credible data for business intelligence use. 	<ol style="list-style-type: none"> 1. Web enabled access to view and update info when away from main computer. 2. Eliminate inconsistencies with the use of referential integrity. 	<ol style="list-style-type: none"> 1. New system must have cloud capability. 2. New system must have classification system to alleviate use of manual type data.

5. Difficult to extract useful information from excel.	1. Leads to overstock or no stock of products, which leads to cost overruns, backorders and/or customer complaints.	1. Track customer purchasing trends. 2. Reduce required item discounting by 40%.	1. New system must provide low inventory alerts. 2. New system must have forecasting tools.
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Project Scope

I. Purpose

ER Music Gallery is in need of a new system to manage onsite and offsite inventories. The primary goal of this new inventory management system is to provide the solution and services necessary to effectively and efficiently manage inventories for both the standalone store and online store.

II. Background

ER Music Gallery currently is experiencing product inconsistencies in the inventory file and warehouse system. When a new inventory is received or a sale is made, the store owner manually manages the inventory levels using an excel spreadsheet. At the moment, there are duplicate inventory entries causing levels to be incorrect. The project goal is to convert the current inventory system tracking method from using a spreadsheet to using a database application that has a lower margin of error. The database application is to eliminate product inconsistencies in the inventory file for both the standalone store and warehouse. Upon entering a new product into the database the location of the product will be specified, therefore, the time spent searching for the item at the store and warehouse will be eliminated. Duplicate entries of the same product will be eliminated.

III. Scope

The scope of the work will improve the knowledge of ER Music stakeholders, the two owners, three employees, and future customers. The knowledge of the inventory will be accurate and up to date. Updating the inventory will have one uniformed process.

IV. Project Approach

The sequential strategy project approach will be used during the project. The approach has four stages: system initiation, system analysis, system design, and system implementation. The system initiation will evaluate and understand the current inventory system through conversations with identified stakeholders. Through system analysis the flaws and the cause of the flaws will be identified. In addition, the project will work to ensure integration of the recommended system. A summarization of the required and desirable functionality of a new inventory system. A recommendation of three solutions for an inventory system will be

presented. An estimate of the first year costs of implementation for each solution will be provided. Implementation of the selected system, resources for data conversion, documentation, and training of store staff will be provided.

V. Managerial Approach

The project team consist of an Information Systems consultant, Computer Info Tech consultant, and an Accountant with a focus in Information Systems. The consultants in the different fields is a great combination for proposal of an inventory system. The manager of the project is the Information Systems consultant, Ms. Sukhyun Kim, an expert in designing various information systems for retail stores will assure the success of the project. The project team members will report among each other during weekly meetings through the life of the project. The project manager will report to ER Music Gallery the status of the project every two weeks via email following the second team weekly meeting.

VI. Constraints

ER Music Gallery's budget for project is \$25,000. The current operating system is Windows 7.

VII. Ballpark Estimates

Ballpark estimate of the project schedule is: Start Date April 4, 2016. Complete System Initiation by April 6, 2016. Complete System Analysis by April 19, 2016. Complete System Design by May 3, 2016. Complete System Implementation and Delivery by May 19, 2016. Ballpark estimate of the budget is \$22,000

VIII. Conditions of Satisfaction

The success criteria will be based on the results of the audit test after the system implementation. The major risk for the system implementation is the training of store staff may need more time than estimated.

System Objectives

An inventory system is to provide accurate inventory levels, orders, sales, and deliveries. The inventory system will alert inventory manager when an item needs to be reordered before the last one is sold and any items that have been discontinued. The system will limit access to only information and screens needed to conduct assigned level of work. Unique assigned login ID's will keep a history of changes made 100% of the time. The orders placed with vendors will be tracked with accuracy. Inventory will be updated upon a sale whether in store or online. Deliveries will be tracked with a master schedule that will include the time, date, inventory item, customer, and driver. Ultimately, with an accurate inventory system ER Music Gallery will satisfy the requirements of their customers.

PIECES Framework for System Improvement

Nonfunctional Requirement Type	Explanation
Performance	<ul style="list-style-type: none"> ▪ Performance of manual inventory system has a high throughput. ▪ Order/Inquiry response time in verifying inventory level or location of a particular item is too long.
Information	<ul style="list-style-type: none"> ▪ Store sale and acquisition data is not well organized and inaccurate. ▪ The system does not have useful inventory management tools to provide information in a timely manner. ▪ Due to lack of formal training in excel the spreadsheet is improperly used therefore there are errors and redundancies in data.
Economics	<ul style="list-style-type: none"> ▪ Costs are untraceable to source. ▪ Reducing redundant data can increase profits from orders.
Control (and Security)	<ul style="list-style-type: none"> ▪ Inventory data is a spreadsheet where all employees have access to create, read, update, and delete. ▪ Lack of confidence in stored inventory data due to lack of accountability.
Efficiency	<ul style="list-style-type: none"> ▪ Input data is not adequately edited when updating inventory levels. ▪ Storage and extraction of data requires excessive effort.
Service	<ul style="list-style-type: none"> ▪ The manual system is producing inconsistent results and unable to support company growth.

Proposition

ER Music Gallery needs a new inventory management system due to the current systems limitation that is compromising effective inventory management. ER Music Gallery stocks and sells very valuable instruments and accessories, which makes the need for a system to provide accurate real-time data crucial. An inventory management system, which mitigates the risk of errors, supports multiple users with activity tracking, and syncs across multiple platforms will ensure accountability, efficiency, and reliability of order processing at ER Music Gallery. The new system should offer ease of use to quickly update the inventory without having to modify multiple spreadsheets. It should maintain an accurate inventory count effortlessly that ends wasted time tracking down errors. The system should be able to generate reports to project future inventory needs. In addition, the new system should also provide integration of multichannel order tracking. Implementation of these business requirements by the new system is essential in order for ER Music Gallery to centralize inventory operations for effectiveness and reliability that sustains business growth. There exists available add-on features and the opportunity to increase internet speed connection which will be addressed accordingly after assessment of the first information system release.

Justification

Making the switch from the current system that is error ridden, time-consuming, and stagnant to business growth to the new system will allow improved control of inventory management. Excel spreadsheets are virtually manual data entry demanding. They do not keep track of when and who made changes nor do they allow for valuable reporting extraction. The new system will eliminate redundancy and provide real-time inventory control that increases efficiency and service.

System Modeling

Process Modeling- Logical Design: Current System

<System Outline>

System: Inventory Management System @ ER Music Gallery

Entities:
-Customer
-Vendor
-Office

Dataflows:

Input

-Order
-Inventory Status
-New Inventory

Output

-Confirmation E-mail
-Inventory Check Request
-Inventory Request
-Invoice + Order

1.0 Process Order

Database

2.0 Check Stock Availability

3.0 Deliver Order

Process/Task:

1.1-Log Customer Order
1.2-Send Order Confirmation E-mail

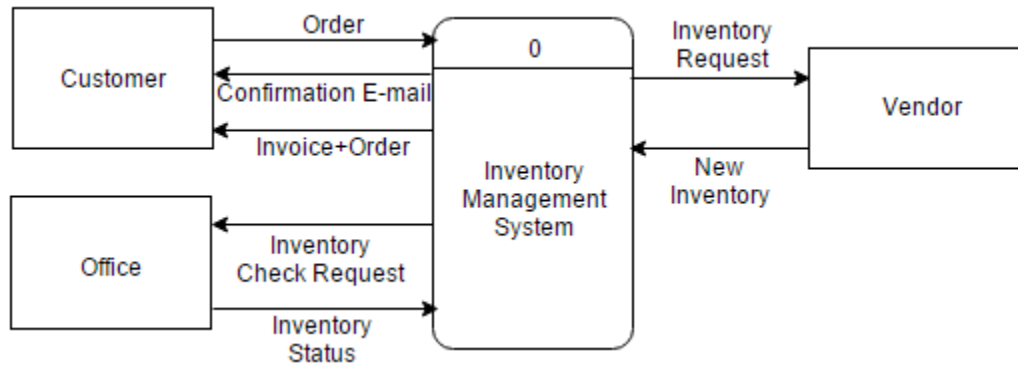
2.1-Check Inventory | If No Stock
2.2-Request Inventory do 2.2
2.3-Update Inventory
3.1-Generate Shipping Label
3.2-Generate Invoice
3.2-Update Delivery Record

Data Stores

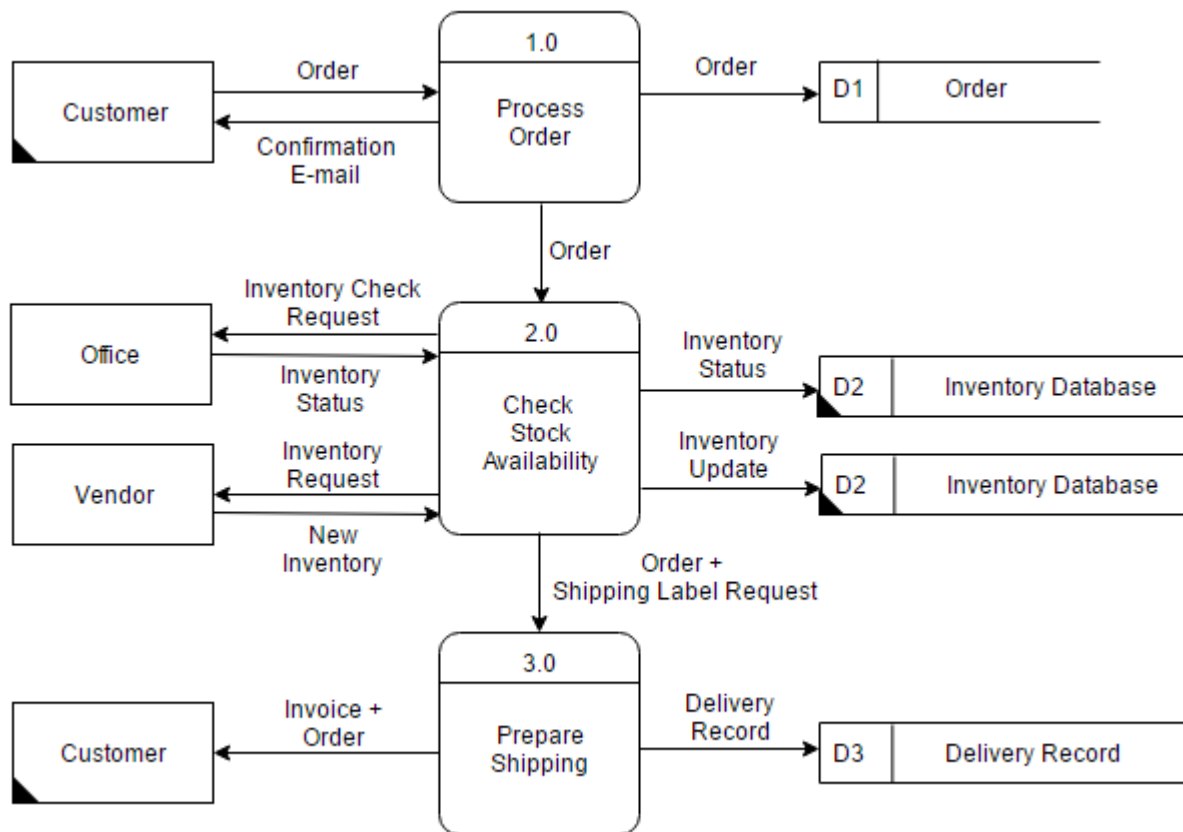
D1-Order
D2-Inventory

D3-Delivery Record

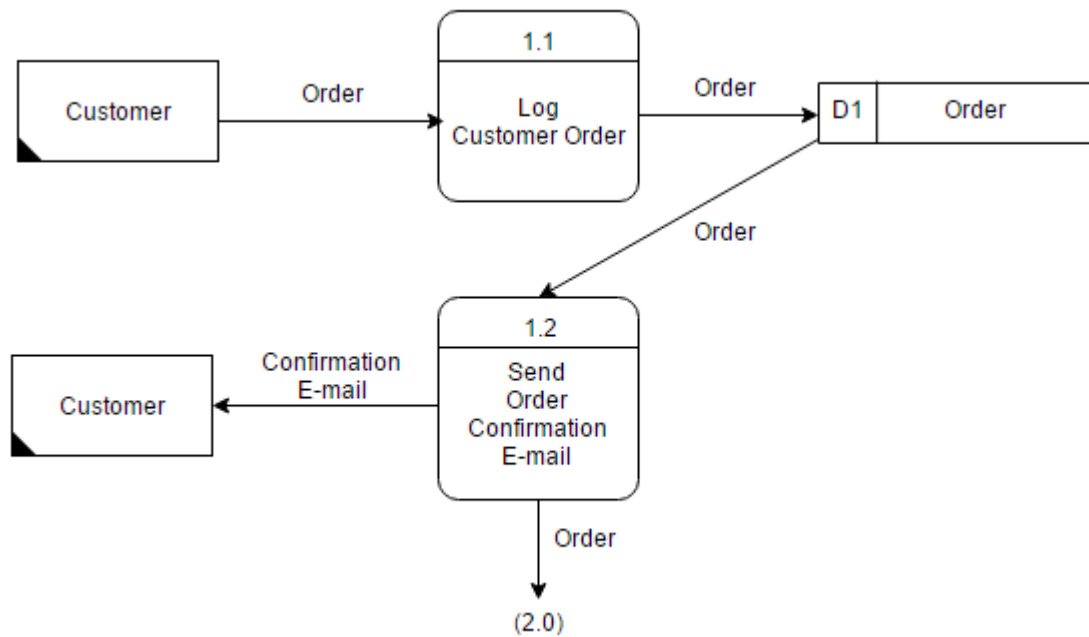
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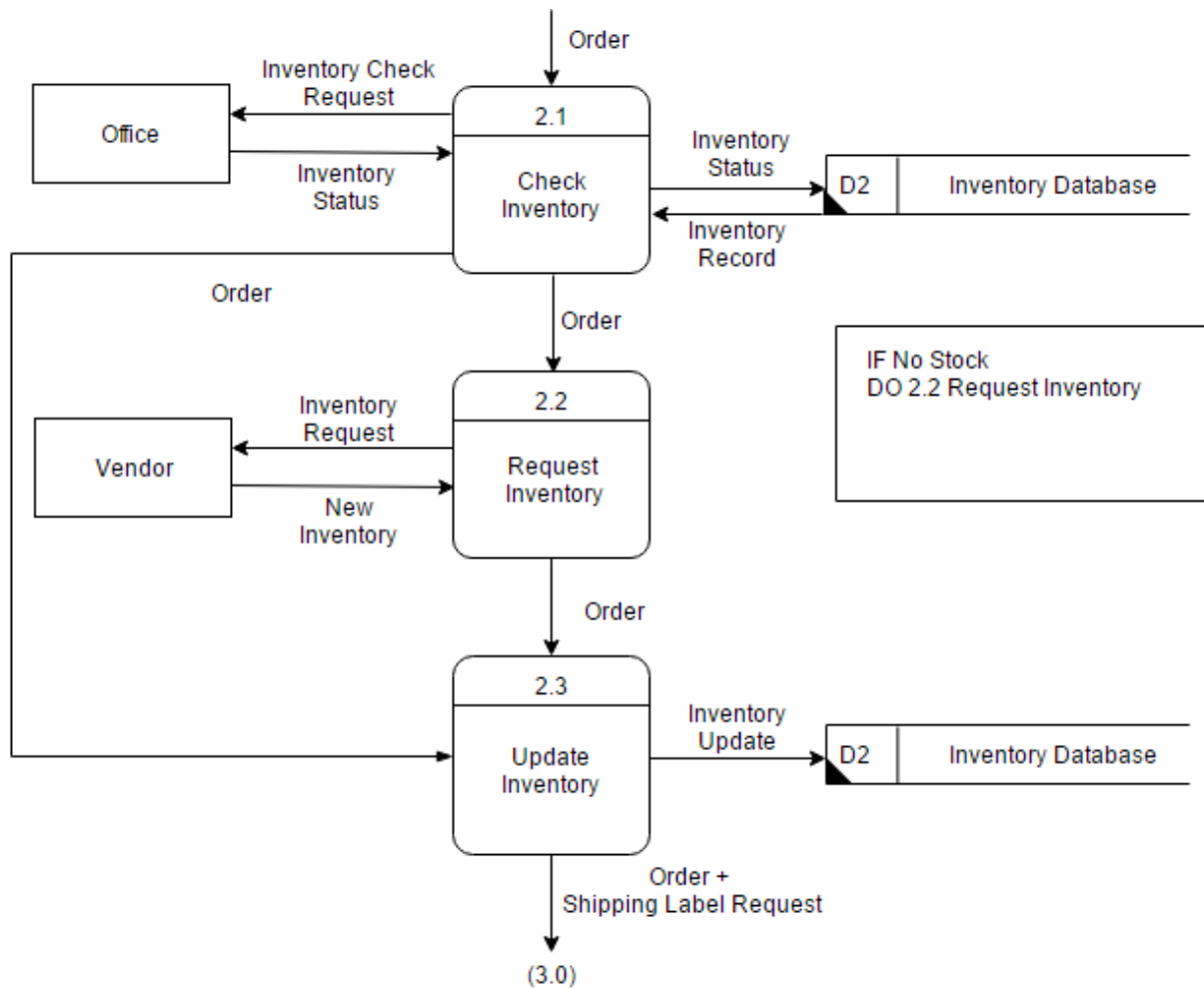
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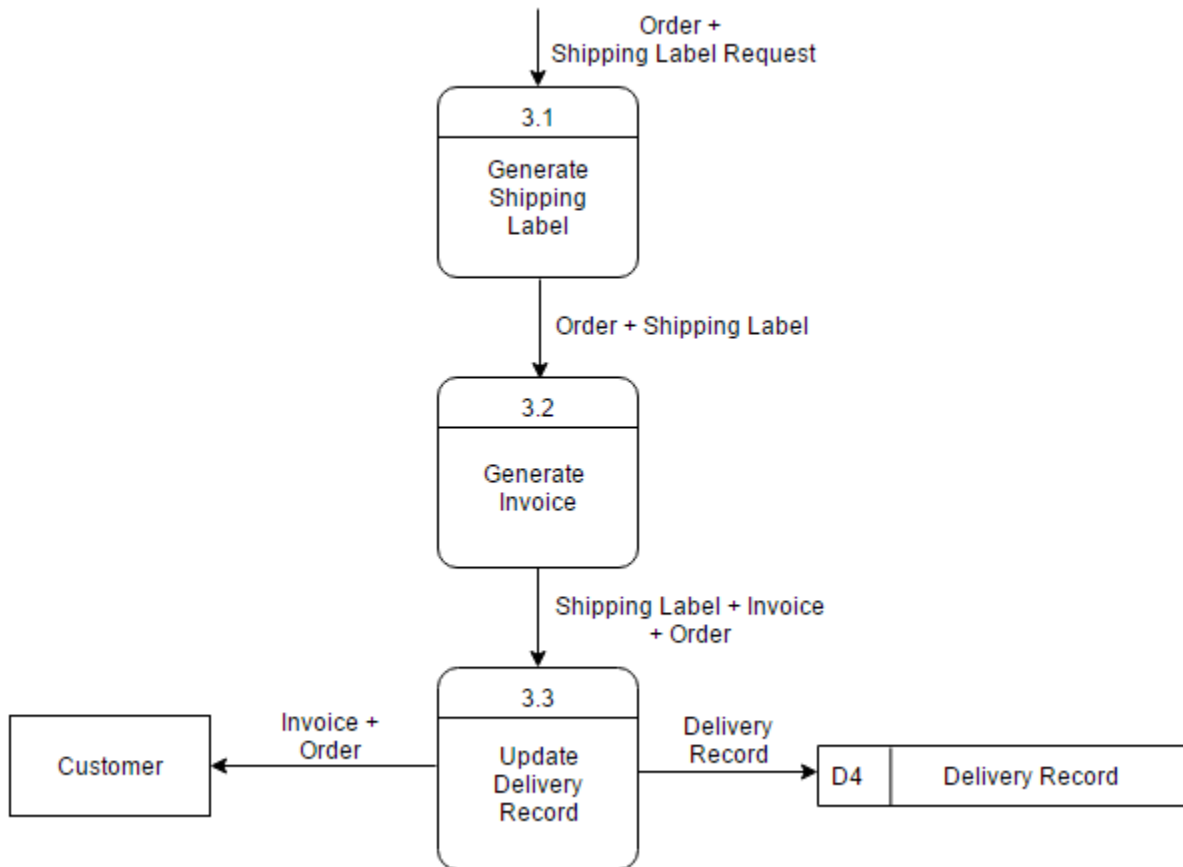
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**<Level-1 DFD for “2.0 Stock Check” of Inventory Management System
@ ER Music Gallery>**



<Level-1 DFD for “3.0 Prepare Shipping” of Inventory Management System @ ER Music Gallery>



Process Modeling - Logical Design: Proposed System

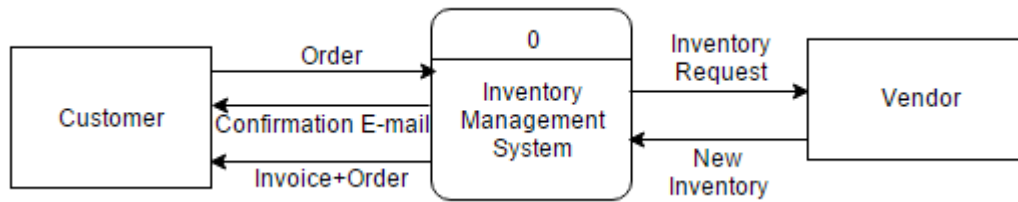
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System: Inventory Management System @ ER Music Gallery
Entities: -Customer
-Vendor

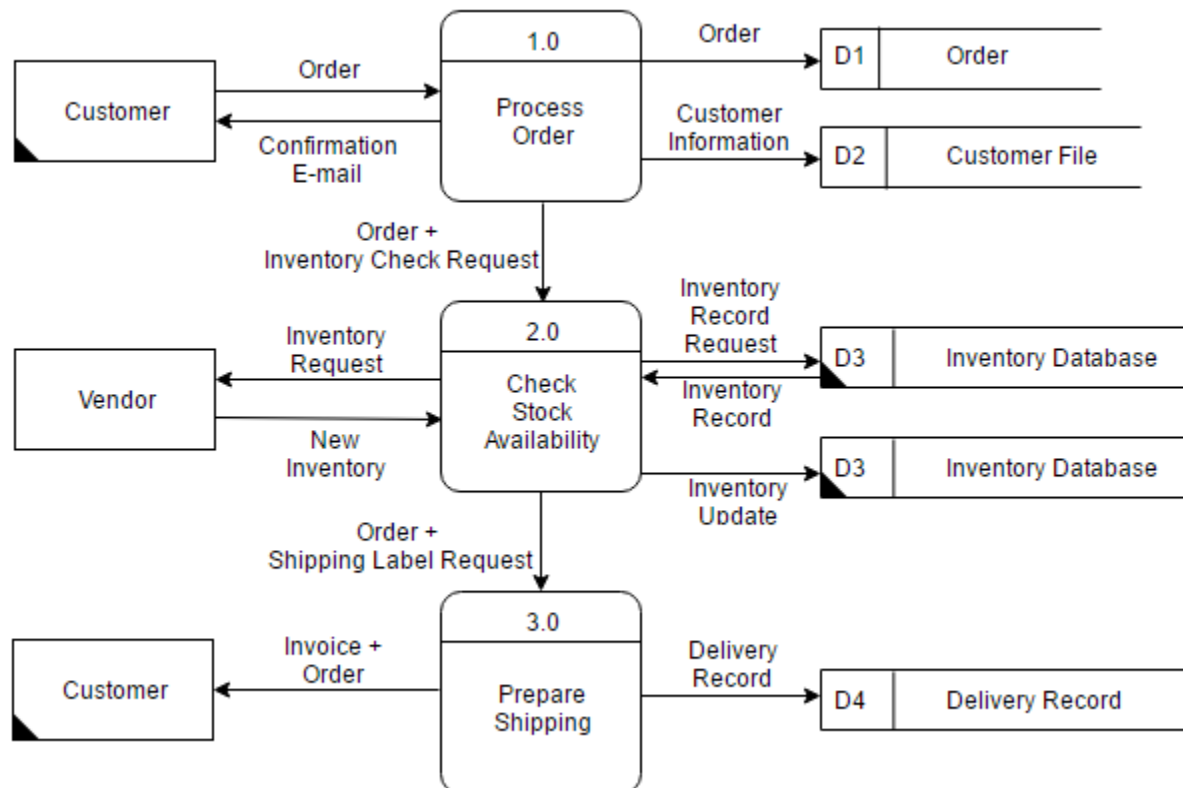
<u>Dataflows:</u>	<u>Input</u>	<u>Output</u>
	-Order	-Confirmation E-mail
	-New Inventory	-Inventory Request
		-Invoice + Order

	<u>Process/Task:</u>	<u>Data Stores</u>
1.0 Process Order	1.1-Log Customer Order	D1-Order
	1.2-Update Customer File	D2-Customer File
	1.3-Send Order Confirmation E-mail	D3-Inventory
Database		
2.0 Check Stock Availability	2.1-Check Inventory If ROP	D4-Delivery Record
	2.2-Request Inventory do 2.2	
	2.3-Update Inventory Database	
3.0 Prepare Shipping	3.1-Generate Shipping Label	
	3.2-Generate Invoice	
	3.3-Update Delivery Record	

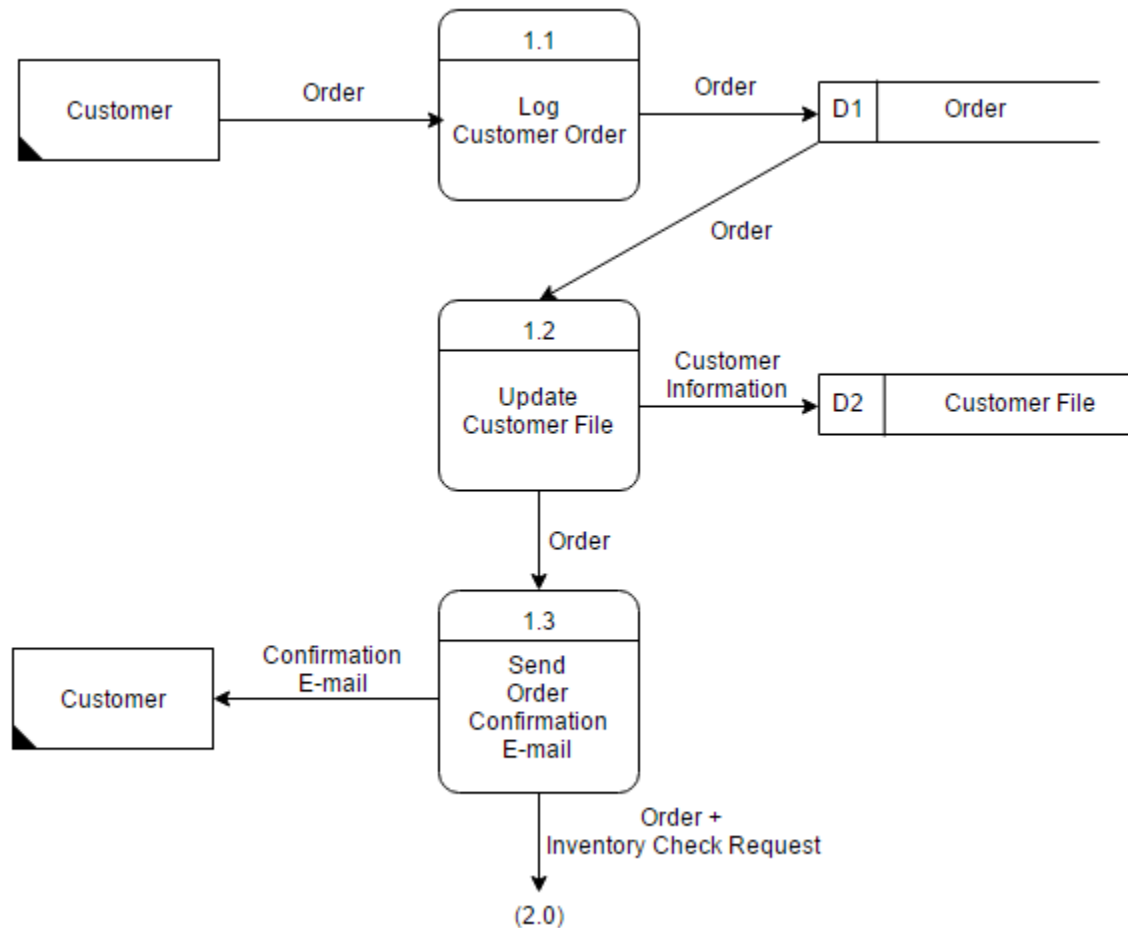
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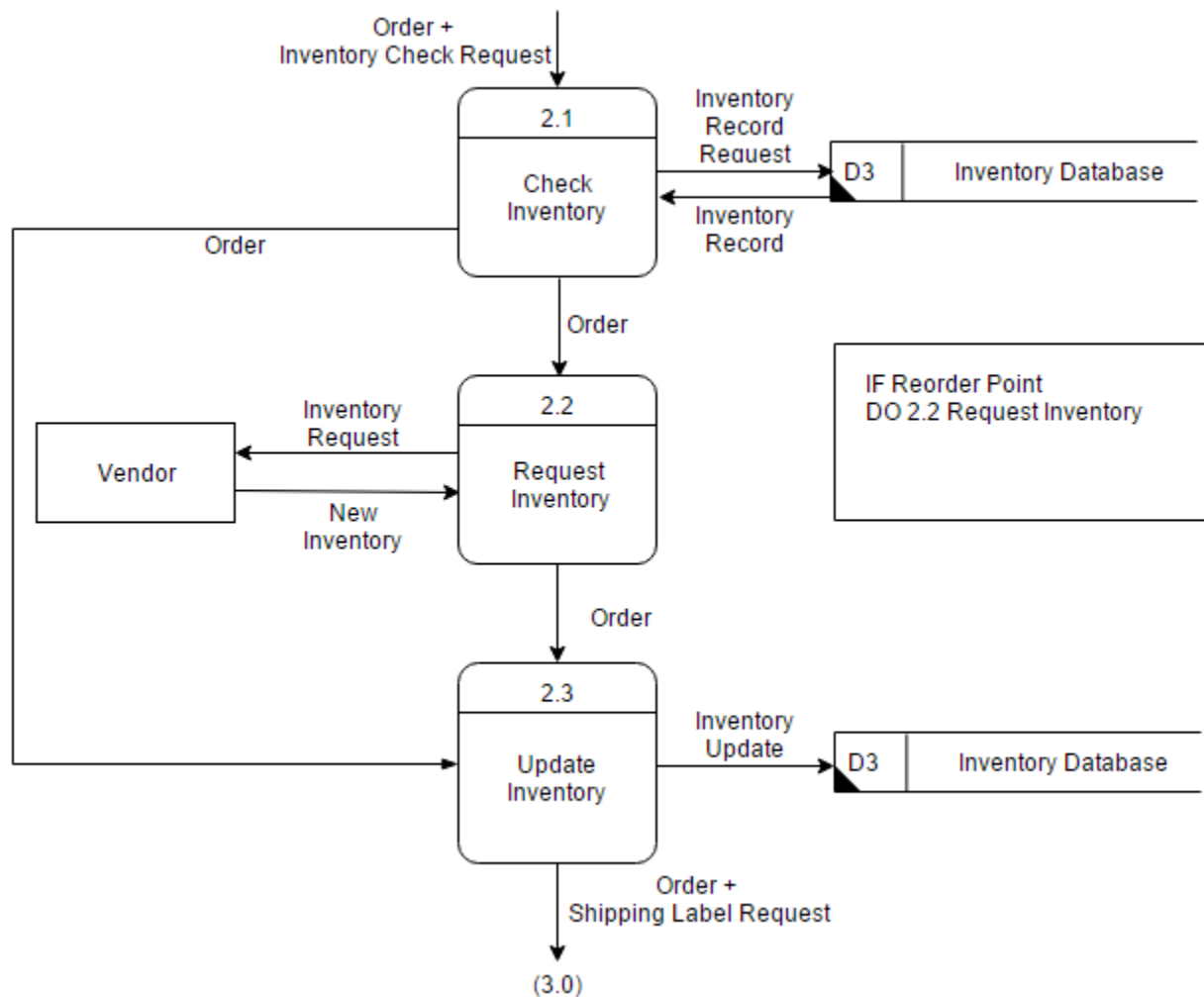
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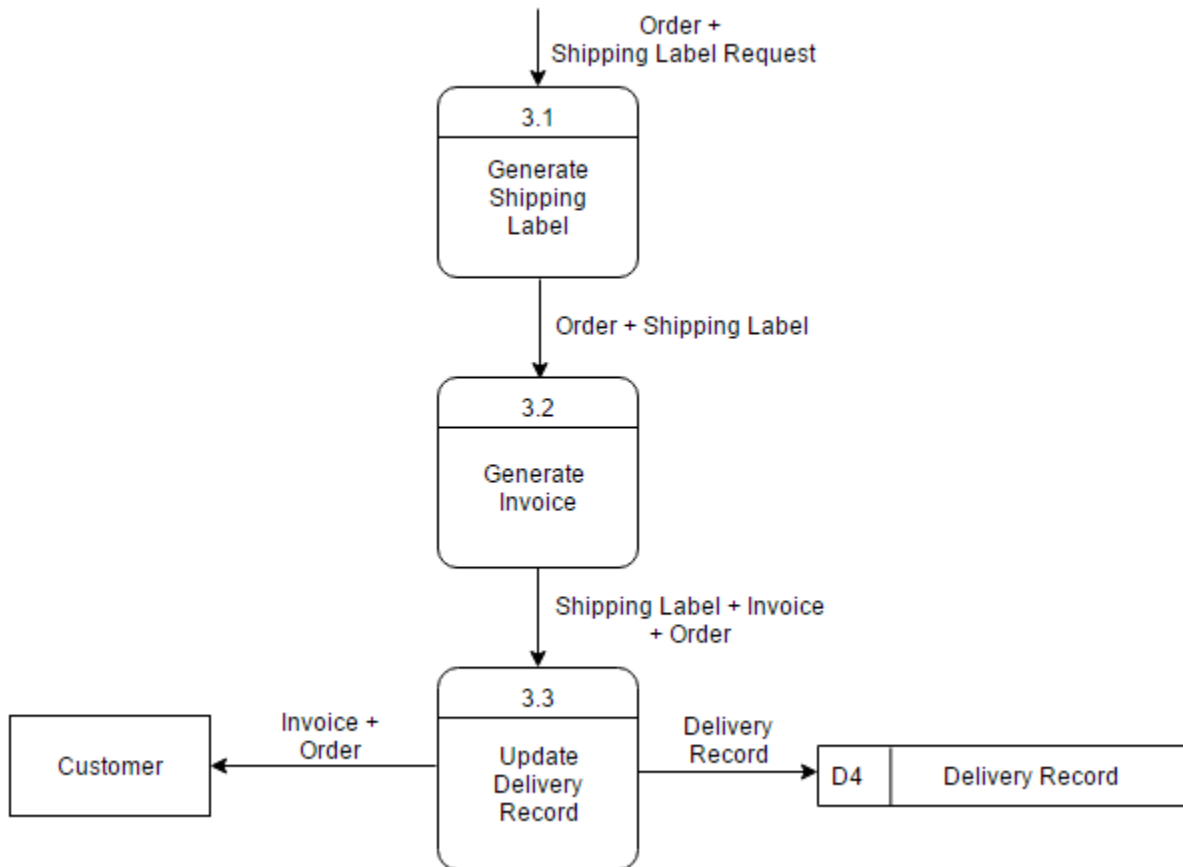
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<Level-1 DFD for “2.0 Check Stock Availability” of Inventory Management System @ ER Music Gallery>

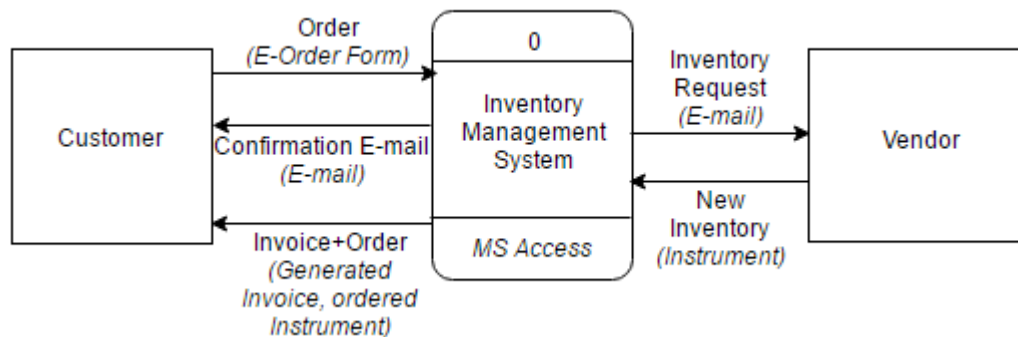


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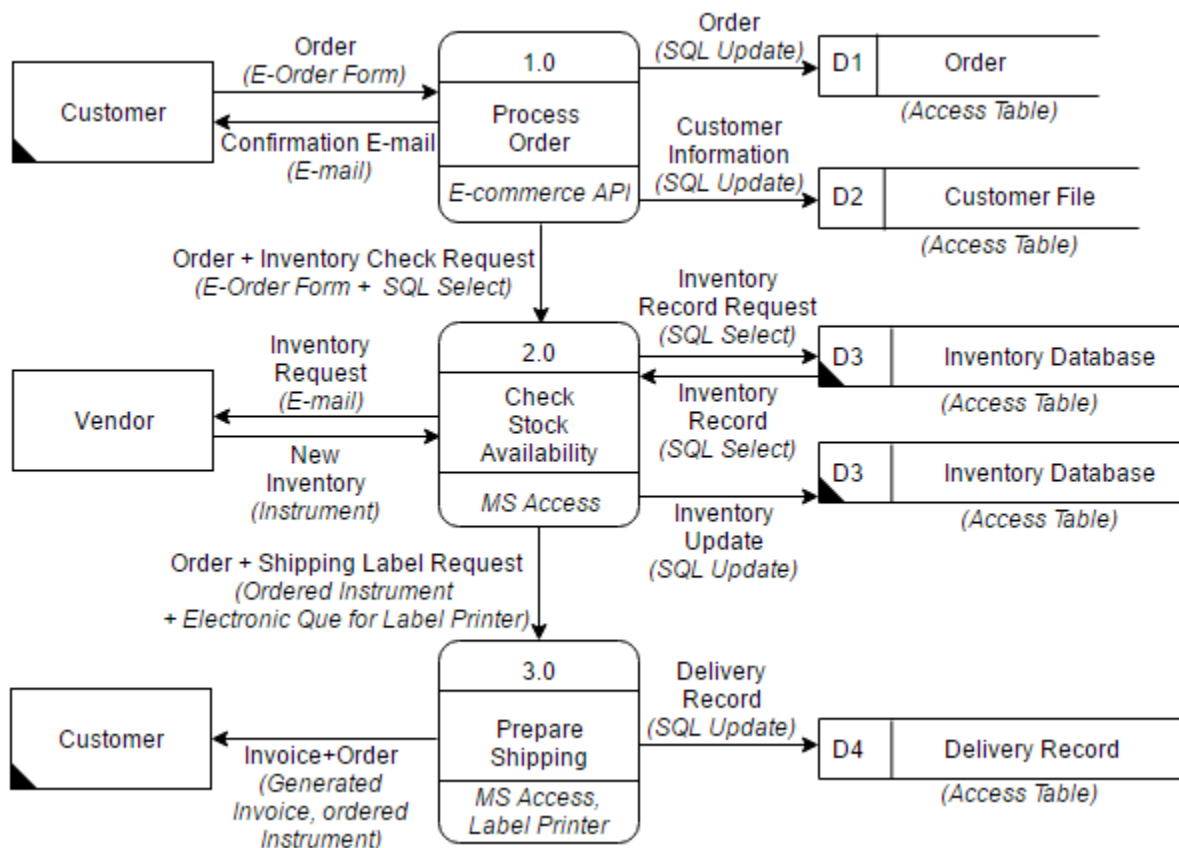


Process Modeling - Physical Design: Proposed System

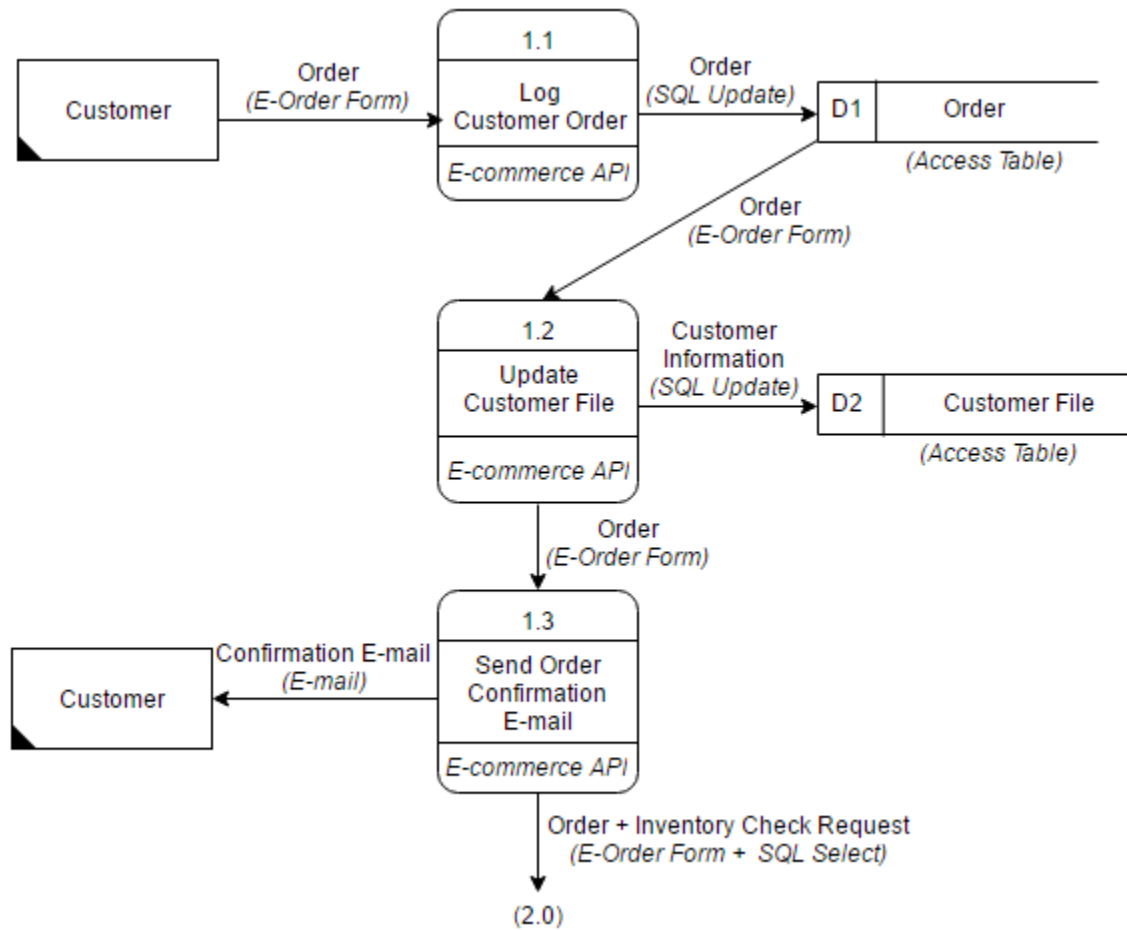
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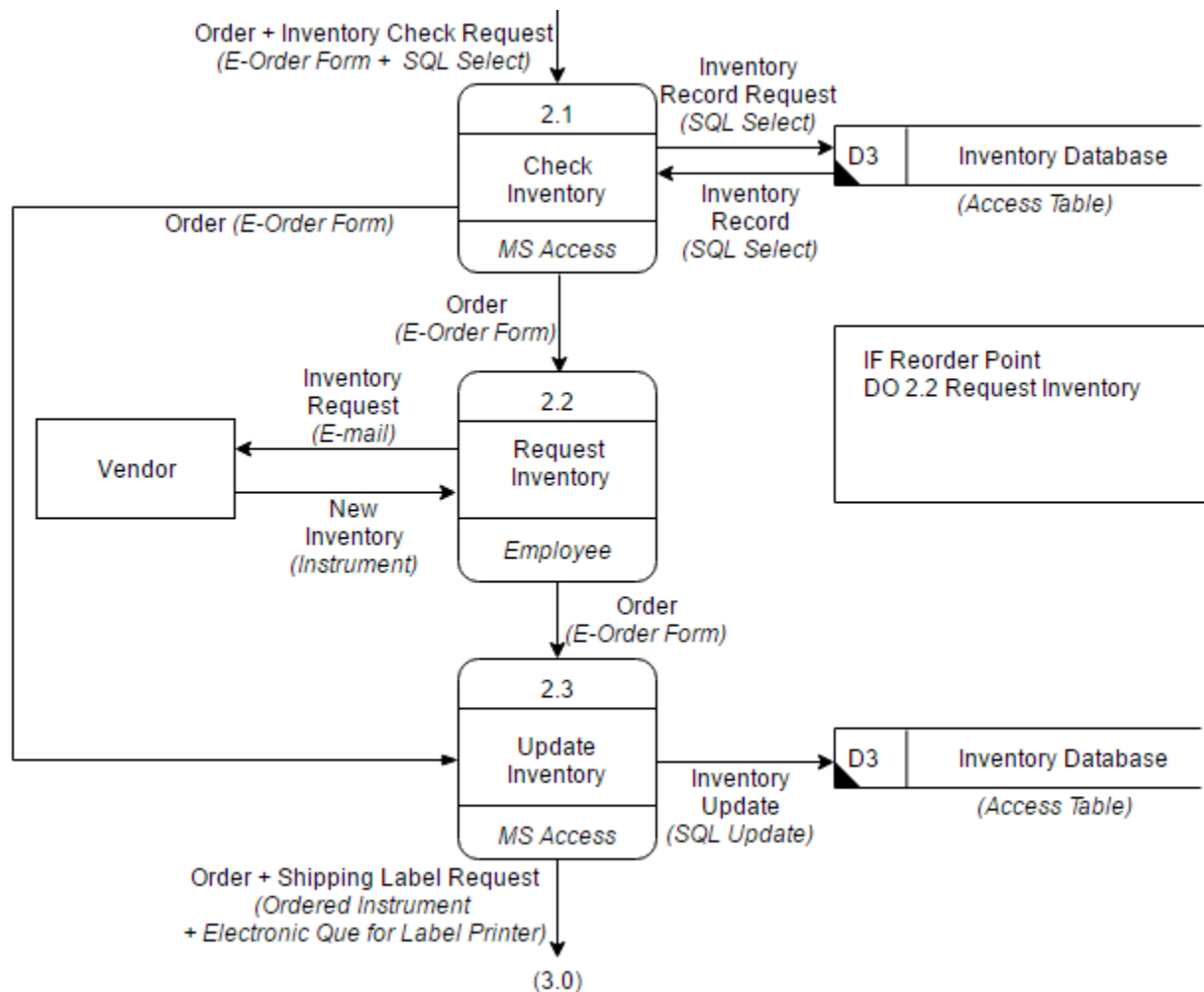
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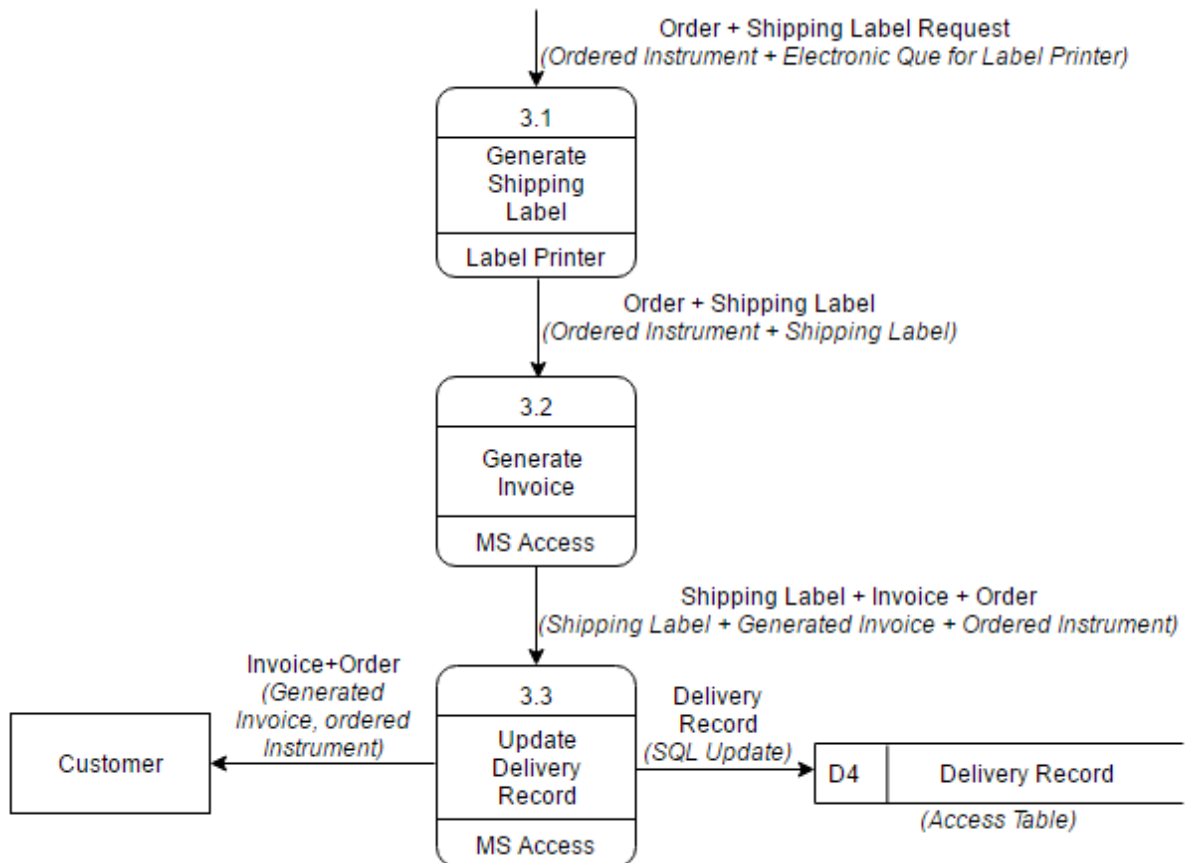
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<Level-1 DFD for “2.0 Check Stock Availability” of Inventory Management System @ ER Music Gallery>

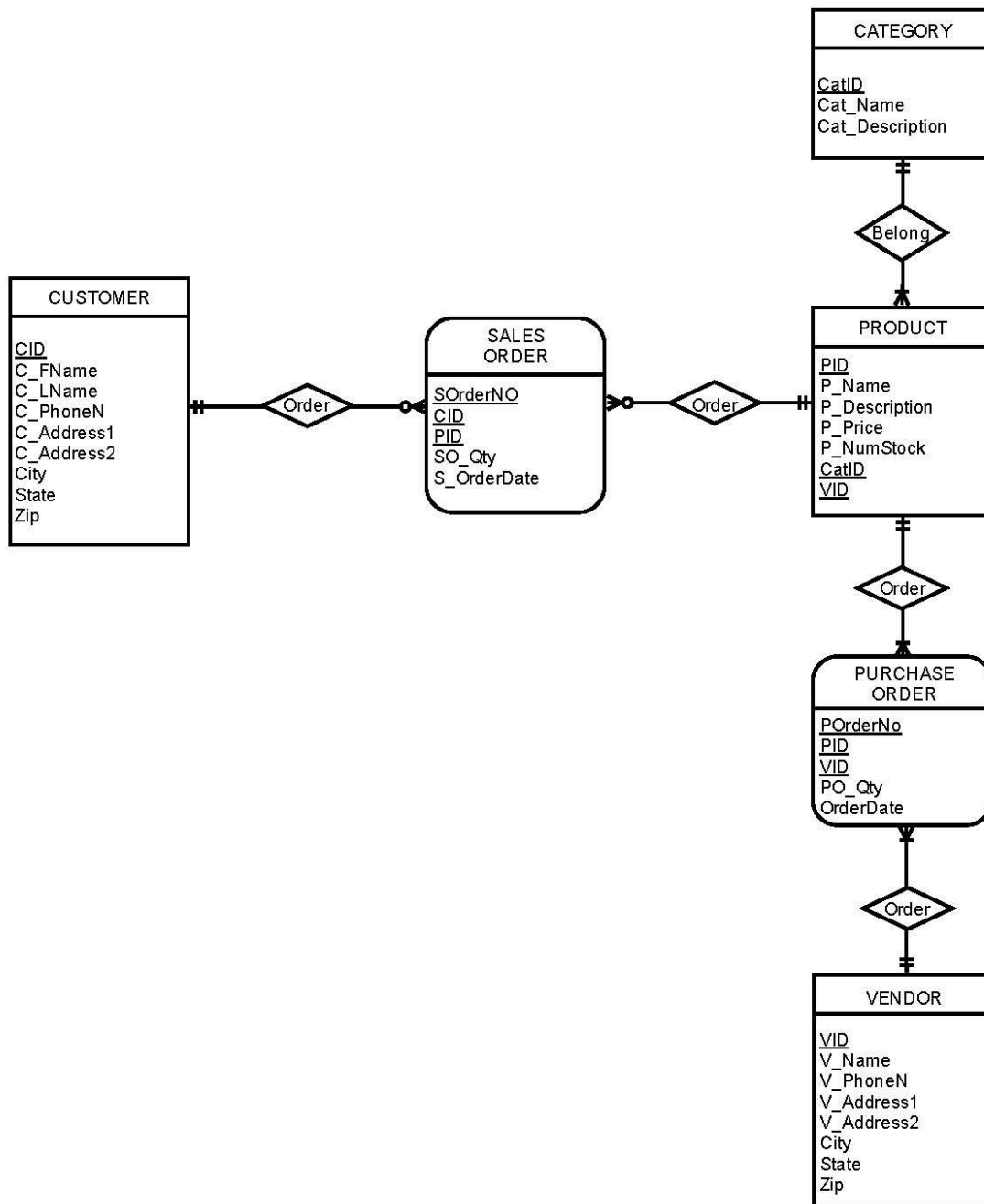


<Level-1 DFD for “3.0 Prepare Shipping” of Inventory Management System @ ER Music Gallery>



Data Modeling

<ERD for “Inventory Management System” Database @ ER Music Gallery>



Data Dictionary

Entity: CUSTOMER

Attribute	Data Type (Field Length)	Constrain	Authorization
CID	Char (6)	Primary Key	Owner
C_FName	Char (20)	Not Null	User, Owner
C_LName	Char (20)	Not Null	User, Owner
C_PhoneN	Number (10)	Not Null	User, Owner
C_Address1	Char (30)	Not Null	User, Owner
C_Address2	Char (10)	Not Null	User, Owner
City	Char (20)	Not Null	User, Owner
State	Char (2)	Not Null	User, Owner
Zip	Number (9)	Not Null	User, Owner

Entity: SALES ORDER

Attribute	Data Type (Field Length)	Constrain	Authorization
SOrderNO	Char (6)	Primary Key	Owner
CID	Char (6)	Primary Key	Owner
PID	Char (6)	Primary Key	Owner
SO_Qty	Number (3)	Not Null	User, Owner
S_OrderDate	Date	Not Null	Owner

Entity: CATEGORY

Attribute	Data Type (Field Length)	Constrain	Authorization
CatID	Char (6)	Primary Key	Owner

Cat_Name	Char (20)	Not Null	Owner
Cat_Description	Char (50)	Not Null	Owner

Entity: PRODUCT

Attribute	Data Type (Field Length)	Constrain	Authorization
PID	Char (6)	Primary Key	Owner
P_Name	Char (30)	Not Null	Owner
P_Description	Char (50)	Not Null	Owner
P_Price	Number (12)	Not Null	Owner
P_NumStock	Number (3)	Not Null	Owner
CatID	Char (6)	Foreign Key	Owner
VID	Char (6)	Foreign Key	Owner

Entity: PURCHASE ORDER

Attribute	Data Type (Field Length)	Constrain	Authorization
POrderNo	Char (6)	Primary Key	Owner
PID	Char (6)	Primary Key	Owner
VID	Char (6)	Primary Key	Owner
PO_Qty	Number (3)	Not Null	Owner
OrderDate	Date	Not Null	Owner

Entity: VENDOR

Attribute	Data Type (Field Length)	Constrain	Authorization
VID	Char (6)	Primary Key	Owner
V_Name	Char (20)	Not Null	Owner

V_PhoneN	Number (10)	Not Null	Owner
V_Address1	Char (30)	Not Null	Owner
V_Address2	Char (10)	Not Null	Owner
City	Char (20)	Not Null	Owner
State	Char (2)	Not Null	Owner
Zip	Number (9)	Not Null	Owner

Candidate Tech Solutions

Candidate Systems-Solutions Matrix

Characteristics	Candidate 1	Candidate 2	Candidate 3
Portion of System Computerized	Access 2016 from Microsoft would be purchased to satisfy inventory functionality without customization required	QuickBooks 2016 from Intuit would be purchased to satisfy inventory functionality without customization required	Stitch from Stitch Labs is a cloud-based monthly subscription software solution to satisfy inventory functionality without customization required
Benefits	This solution can be implemented quickly because it is a purchased solution. Fully supports user's business process requirements.	This solution can be implemented quickly because it is a purchased solution. Fully supports user's business process requirements.	This solution can be implemented quickly because it is a purchased solution. Fully supports user's business process requirements.
Workstation	Current office computer	Current office computer	Current office computer
Software Tools Needed	Web browser (e.g. Google Chrome, Internet Explorer) MS Office 2016 upgrade Anti-Virus software MS Office 365 ProPlus	Web browser (e.g. Google Chrome, Internet Explorer) Anti-Virus software	Web browser (e.g. Google Chrome, Internet Explorer) Anti-Virus software
Application Software	Package solution of Microsoft Access 2016	Package solution of Intuit QuickBooks 2016	Package Solution of Stitch Labs Stitch
Method of Data Processing	Client	Client	Client
Output Devices and Implications	(1) Sharp laser printer	(1) Sharp laser printer	(1) Sharp laser printer
Input Devices and Implications	Keyboard and mouse	Keyboard and mouse	Keyboard and mouse

Storage Devices and Implications	OneDrive Cloud services	Intuit Cloud services	Stitch Labs Cloud Services
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Cost-Benefit Analysis

Estimated Costs for Candidate 1

MICROSOFT - ACCESS 2016

DEVELOPMENT COSTS:

Personnel:

2	System Analysts (69 hours/ea \$100.00/hr)	\$13,800.00
1	Project Manager (35 hours/ea \$150.00/hr)	\$5,250.00

Expenses:

1	Lynda.com training sessions	\$500.00
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New Hardware and Software:

1	Upgrade to Microsoft Office Professional 2016	\$399.99
1	Yearly Subscription to Anti-Virus Software	\$28.00
Total Developmental Costs		\$19,977.99

PROJECTED ANNUAL OPERATING COSTS:

Expenses:

1	Yearly Subscription to Anti-Virus Software	\$28.00
1	Microsoft Office 365 ProPlus	\$144.00
Total Projected Annual Costs:		\$172.00

Estimated Costs for Candidate 2

INTUIT - QUICKBOOKS ENTERPRISE 2016

DEVELOPMENT COSTS:

Personnel:

2	System Analysts (69 hours/ea \$100.00/hr)	\$13,800.00
1	Project Manager (35 hours/ea \$150.00/hr)	\$5,250.00

Expenses:

1	Lynda.com training sessions	\$500.00
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New Hardware and Software:

1	Yearly Subscription to QuickBooks Enterprise 2016	\$2,136.00
1	Yearly Subscription to Anti-Virus Software	\$28.00
Total Developmental Costs		\$21,714.00

PROJECTED ANNUAL OPERATING COSTS:

Expenses:

1	Yearly Subscription to QuickBooks Enterprise 2016	\$2,136.00
1	Yearly Subscription to Anti-Virus Software	\$28.00
Total Projected Annual Costs:		\$2,164.00

Estimated Costs for Candidate 3

STITCH LABS - STITCH

DEVELOPMENT COSTS:

Personnel:

2	System Analysts (69 hours/ea \$100.00/hr)	\$13,800.00
1	Project Manager (35 hours/ea \$150.00/hr)	\$5,250.00

New Hardware and Software:

1	Yearly Subscription to Anti-Virus Software	\$28.00
1	Yearly Subscription to Stitch Inventory Labs	\$5,988.00
Total Developmental Costs		\$25,066.00

PROJECTED ANNUAL OPERATING COSTS:

Expenses:

1	Yearly Subscription to Anti-Virus Software	\$28.00
1	Yearly Subscription to Stitch Inventory Labs	\$5,988.00
Total Projected Annual Costs:		\$6,016.00

Payback Analysis: Candidate 1

Payback Analysis for Inventory System Alternative - Microsoft Access 2016

(Numbers rounded to nearest \$1)

Cash flow description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Development cost:	(\$19,978)						
Operation & maintenance cost:		(\$172)	(\$172)	(\$172)	(\$172)	(\$172)	(\$172)
Discount factors for 12%	1.000	0.893	0.797	0.712	0.636	0.567	0.507
Time-adjusted costs (adjusted to present value):	(\$19,978)	(\$154)	(\$137)	(\$122)	(\$109)	(\$98)	(\$87)
Cumulative time-adjusted costs over lifetime:	(\$19,978)	(\$20,132)	(\$20,269)	(\$20,391)	(\$20,501)	(\$20,598)	(\$20,685)

Benefits derived from operation of new system:	\$0	\$147,000	\$167,000	\$187,000	\$207,000	\$227,000	\$247,000
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	0.507
Time-adjusted benefits (current of present value):	\$0	\$131,271	\$133,099	\$133,144	\$131,652	\$128,709	\$125,229
Cumulative time-adjusted benefits over lifetime:	\$0	\$131,271	\$264,370	\$397,514	\$529,166	\$657,875	\$783,104
	0	1	2	3	4	5	6
Cumulative lifetime time-adjusted costs + benefits:	(\$19,978)	\$111,139	\$244,101	\$377,123	\$508,665	\$637,277	\$762,419

Payback Analysis: Candidate 2

Payback Analysis for Inventory System Alternative - Intuit QuickBooks Enterprise 2016

(Numbers rounded to nearest \$1)

Cash flow description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Development cost:	(\$21,714)						
Operation & maintenance cost:		(\$2,164)	(\$2,164)	(\$2,164)	(\$2,164)	(\$2,164)	(\$2,164)
Discount factors for 12%	1.000	0.893	0.797	0.712	0.636	0.567	0.507
Time-adjusted costs (adjusted to present value):	(\$21,714)	(\$1,932)	(\$1,725)	(\$1,541)	(\$1,376)	(\$1,227)	(\$1,097)
Cumulative time-adjusted costs over lifetime:	(\$21,714)	(\$23,646)	(\$25,371)	(\$26,912)	(\$28,288)	(\$29,515)	(\$30,612)

Benefits derived from operation of new system:	\$0	\$147,000	\$167,000	\$187,000	\$207,000	\$227,000	\$247,000
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	0.507
Time-adjusted benefits (current of present value):	\$0	\$131,271	\$133,099	\$133,144	\$131,652	\$128,709	\$125,229
Cumulative time-adjusted benefits over lifetime:	\$0	\$131,271	\$264,370	\$397,514	\$529,166	\$657,875	\$783,104
	0	1	2	3	4	5	6
Cumulative lifetime time-adjusted costs + benefits:	(\$21,714)	\$107,625	\$238,999	\$370,602	\$500,878	\$628,360	\$752,492

Payback Analysis: Candidate 3

Payback Analysis for Inventory System Alternative - Stitch

(Numbers rounded to nearest \$1)

Cash flow description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Development cost:	(\$25,066)						
Operation & maintenance cost:		(\$6,016)	(\$6,016)	(\$6,016)	(\$6,016)	(\$6,016)	(\$6,016)
Discount factors for 12%	1.000	0.893	0.797	0.712	0.636	0.567	0.507
Time-adjusted costs (adjusted to present value):	(\$25,066)	(\$5,372)	(\$4,795)	(\$4,283)	(\$3,826)	(\$3,411)	(\$3,050)
Cumulative time-adjusted costs over lifetime:	(\$25,066)	(\$30,438)	(\$35,233)	(\$39,516)	(\$43,343)	(\$46,754)	(\$49,804)

Benefits derived from operation of new system:	\$0	\$147,000	\$167,000	\$187,000	\$207,000	\$227,000	\$247,000
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	0.507
Time-adjusted benefits (current of present value):	\$0	\$131,271	\$133,099	\$133,144	\$131,652	\$128,709	\$125,229
Cumulative time-adjusted benefits over lifetime:	\$0	\$131,271	\$264,370	\$397,514	\$529,166	\$657,875	\$783,104
	0	1	2	3	4	5	6
Cumulative lifetime time-adjusted costs + benefits:	(\$25,066)	\$100,833	\$229,137	\$357,998	\$485,823	\$611,121	\$733,300

Net Present Value Analysis: Candidate 1

Net Present Value Analysis for Inventory System Alternative - Microsoft Access 2016

(Numbers rounded to nearest \$1)

Cash flow description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Development cost:	(\$19,978)							
Operation & maintenance cost:		(\$172)	(\$172)	(\$172)	(\$172)	(\$172)	(\$172)	
Discount factors for 12%	1.000	0.893	0.797	0.712	0.636	0.567	0.507	
Present value of annual costs:	(\$19,978)	(\$154)	(\$137)	(\$122)	(\$109)	(\$98)	(\$87)	

Total present value of lifetime costs:								(\$20,685)
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Benefits derived from operation of new system:	\$0	\$34,900	\$39,900	\$44,900	\$49,900	\$54,900	\$59,900	\$284,400
Discount factors for 12%:	1	0.893	0.797	0.712	0.636	0.567	0.507	
Present value of annual benefits:	\$0	\$31,166	\$31,800	\$31,969	\$31,736	\$31,128	\$30,369	
Total present value of lifetime benefits:								\$188,169
NET PRESENT VALUE OF THIS ALTERNATIVE:								\$167,484

Net Present Value Analysis: Candidate 1

Net Present Value Analysis for Inventory System Alternative - Intuit QuickBooks Enterprise 2016

(Numbers rounded to nearest \$1)

Cash flow description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Development cost:	(\$21,714)							
Operation & maintenance cost:		(\$2,164)	(\$2,164)	(\$2,164)	(\$2,164)	(\$2,164)	(\$2,164)	
Discount factors for 12%	1.000	0.893	0.797	0.712	0.636	0.567	0.507	
Present value of annual costs:	(\$21,714)	(\$1,932)	(\$1,725)	(\$1,541)	(\$1,376)	(\$1,227)	(\$1,097)	
Total present value of lifetime costs:								(\$30,612)

Benefits derived from operation of new system:	\$0	\$34,900	\$39,900	\$44,900	\$49,900	\$54,900	\$59,900	\$284,400
Discount factors for 12%:	1	0.893	0.797	0.712	0.636	0.567	0.507	
Present value of annual benefits:	\$0	\$31,166	\$31,800	\$31,969	\$31,736	\$31,128	\$30,369	
Total present value of lifetime benefits:								\$188,169

NET PRESENT VALUE OF THIS ALTERNATIVE:								\$157,556
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Net Present Value Analysis: Candidate 3

Net Present Value Analysis for Inventory System Alternative - Stitch

(Numbers rounded to nearest \$1)

Cash flow description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Development cost:	(\$25,066)							
Operation & maintenance cost:		(\$6,016)	(\$6,016)	(\$6,016)	(\$6,016)	(\$6,016)	(\$6,016)	
Discount factors for 12%	1.000	0.893	0.797	0.712	0.636	0.567	0.507	
Present value of annual costs:	(\$25,066)	(\$5,372)	(\$4,795)	(\$4,283)	(\$3,826)	(\$3,411)	(\$3,050)	
Total present value of lifetime costs:								(\$49,804)

Benefits derived from operation of new system:	\$0	\$34,900	\$39,900	\$44,900	\$49,900	\$54,900	\$59,900	\$284,400
Discount factors for 12%:	1	0.893	0.797	0.712	0.636	0.567	0.507	
Present value of annual benefits:	\$0	\$31,166	\$31,800	\$31,969	\$31,736	\$31,128	\$30,369	
Total present value of lifetime benefits:								\$188,169
NET PRESENT VALUE OF THIS ALTERNATIVE:								\$138,365

Return-on-Investment (ROI): Candidate 1

MICROSOFT OFFICE ACCESS 2016

Estimated Lifetime Costs	\$26,790
Estimated Lifetime Benefits	\$284,400
Lifetime ROI	962%
Annual ROI	160%

Return-on-Investment (ROI): Candidate 2

INTUIT QUICKBOOKS ENTERPRISE 2016

Estimated Lifetime Costs	\$284,000
Estimated Lifetime Benefits	\$34,698
Lifetime ROI	720%
Annual ROI	120%

Return-on-Investment (ROI): Candidate 3

Stitch

Estimated Lifetime Costs	\$284,000
Estimated Lifetime Benefits	\$61,162
Lifetime ROI	365%
Annual ROI	61%

Critical Success Factors

Success factors are aids to ensure the proposed solution will help ER Music Gallery reach its goals by ensuring the system will run smoothly eliminating redundancies in inventory. In the highly competitive musical instrument retail space, having a well managed inventory is crucial to everyday sales.

- Implementation
 - Proposed solution
- Employee Training
 - Proposed solution manual
 - Practice test
- Data Storing
 - Real time inventory levels
 - Customer data storage
 - Vendor data storage
 - Delivery data storage
 - Customer order data storage

Risk Management

Risk management is identifying potential risks in advance, analyzing them and taking precautionary steps to reduce the risk. Risk management also allows goals to be maximize and ensure sustainability.

Risk Type	Risk Conditions	Risk Consequences
Scope	Missing over stating of scope	Costs to change system
Hardware / Software	Malfunction, breakage, or intrusion breaches	Replacement costs and customer/vendor privacy issues
Cost	Incorrect calculations of total amount of proposed solution implementation	Unacceptable ROI

Feasibility Analysis Matrix

Feasibility Criteria	Weight	Candidate 1	Candidate 2	Candidate 3
Operational Feasibility	30%	Fully supports user required functionality Score: 100	Fully supports user required functionality Score: 100	Fully supports user required functionality Score: 100
Technical Feasibility	30%	Current product release of MS Access is 2016 and has been in the market since the fall of the 2015. MS Access 2016 is a mature technology. Score: 100	Current product release of Intuit QB Enterprise is 2016 and has been in the market since the fall of the 2015. Intuit QB Enterprise is a mature technology. Score: 100	Current product release of Stitch is 2011 with constant updates since it a cloud-based application. Stitch is semi-mature technology. Score: 80

Economic Feasibility Cost to Develop: Payback period (discounted): Net Present Value: Detailed Calculations:	30%	Approx. \$20,000 Approx. \$762,500 Approx. \$167,500 See Cost-Benefit Analysis Score: 100	Approx. \$22,00 Approx. \$752,500 Approx. \$157,500 See Cost-Benefit Analysis Score: 80	Approx. \$25,000 Approx. \$733,300 Approx. \$138,400 See Cost-Benefit Analysis Score: 50
Schedule Feasibility	10%	Less than 4 months Score: 100	Less than 4 months Score: 100	6 months Score: 50
Ranking	100%	100	94	74

Proposed Solution

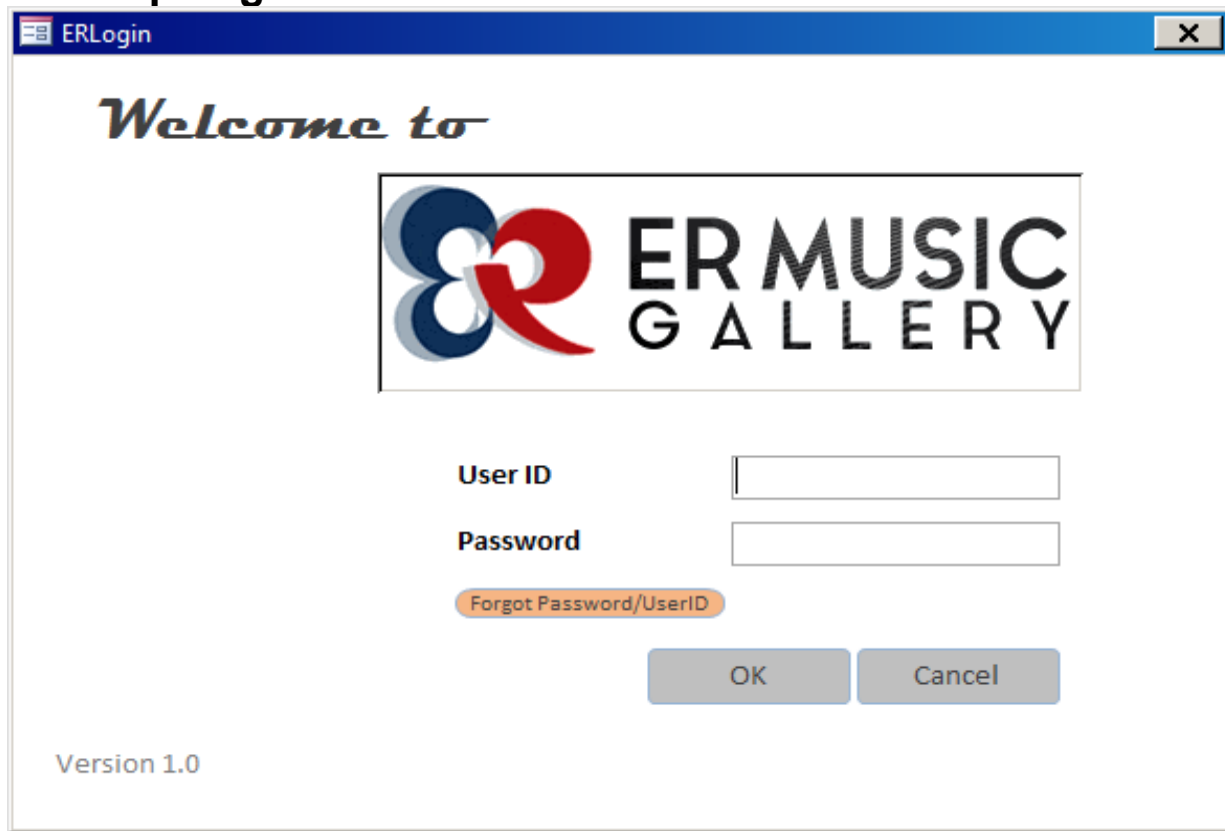
All three candidates are suitable to aid ER Music Gallery with supporting the management of inventory. However, the best solution out the three candidates is Microsoft Access. Microsoft Access has the best payback rate and return-on-investment compared to Intuit QuickBooks and Stitch Labs Stitch.

Microsoft Access is one of the most trusted databases with the first version released in 1992 the product has continued to improve. By purchasing the subscription based edition ER Music Gallery does not need to be concerned with upgrading the software every few years or that technical support will cease. The initial training for the software will be handled by two consultants, for continual training Lynda.com will be utilized. Lynda.com has an abundance of training videos for Microsoft Access.

Two consultants are required to construct the database (e.g. data-entry of inventory, vendors, customers) by either using a blank database or an existing template.

System Design

Desktop Login:



The image shows a desktop login window titled "ERLogin". The window has a blue title bar with a close button (X) in the top right corner. The main content area is white and features the text "Welcome to" in a stylized, italicized font. Below this is the ER Music Gallery logo, which consists of a stylized "ER" in blue and red, followed by the text "ERMUSIC GALLERY" in a bold, sans-serif font. Under the logo are two input fields: "User ID" and "Password". Below the "Password" field is a link that says "Forgot Password/UserID". At the bottom right of the window are two buttons: "OK" and "Cancel". In the bottom left corner, the text "Version 1.0" is displayed.

ERLogin

Welcome to

ERMUSIC GALLERY

User ID

Password

[Forgot Password/UserID](#)

OK Cancel

Version 1.0

Homepage - Administrator:

ER Music Gallery

Hello, Anne Hellung-Larsen [Not you?](#)

[Dashboard](#)

[Products](#)

[Orders](#)

[Purchases](#)

[Report Center](#)

[Advanced](#)

[Getting Started](#)

New Customer Order

New Purchase Order

Active Orders

ID	Order Date	Status	Salesperson	Customer Name	Customer	Sub Total	Order Total
1	11/20/2010	Invoiced	Robert Zare	Bernard Tham	Company U	\$477.20	\$551.06
2	11/25/2010	Invoiced	Jan Kotas	Carlos Grilo	Company N	\$637.50	\$719.38
3	12/10/2010	Shipped	Steven Thorpe	Helena Kupkova	Company O	\$586.25	\$665.56
5	12/20/2010	New	Laura Giussani	Anna Bedecs	Company A	\$334.00	\$334.00
6	12/21/2010	Invoiced	Robert Zare	Christina Lee	Company D	\$172.50	\$201.13
7	12/22/2010	New	Jan Kotas	Anna Bedecs	Company A	\$1,468.75	\$1,542.19
* (New)							

Record: 14 1 of 6 No Filter Search

Inventory To Reorder

ID	Product Name	Available	Current Level	Target Level	Below Target	Restock
20	Yamaha Digital Piano	100	100	120	20	Restock
26	Becker Cello Symphony Series	50	50	60	10	Restock
28	Casio Celviano Digital Piano	120	120	125	5	Restock
29	Stagg Electric Violin Set	50	50	100	50	Restock
30	Roland Piano	50	50	200	150	Restock
38	Selmer Prelude Tenor Saxophone	0	0	40	40	Restock
43	William Lewis & Son Violin	0	0	200	200	Restock
44	Ludwig Education Drum/Bell Combo	120	120	200	80	Restock

Customer New Order:

Customer Order Form

Order #**(New)**

Status: **New**

Invoice Order > Ship Order > Mark as Completed


Save & Close

Customer [New](#) Salesperson

Order Details

Shipping Information

Payment Information

	Product	Quantity	Unit Price	Discount	Total Price	Status
	<input type="text"/>	0	\$0.00	0%		None

Record: 14 1 of 1 No Filter Search

Sub Total: \$0.00

Freight: \$0.00

Tax: \$0.00

Order Total:

Update

Cancel Order

Record: 14 1 of 1 No Filter Search

Customer Order Update:

Order #8

Status: New

Invoice Order

Ship Order

Mark as Completed

Save & Close

Customer

Dat Dao Nguyen

New

Salesperson

Anne Hellung-Larsen

Order Details

Shipping Information

Payment Information

	Product	Quantity	Unit Price	Discount	Total Price	Status
	Casio Celviano Digital Piano	0	\$2.99	0%	\$0.00	None
	Stagg Electric Violin Set	0	\$4.00	0%	\$0.00	None
	Becker Cello Symphony Series	0	\$13.00	0%	\$0.00	None
		0	\$0.00	0%		None

Record: 3 of 3

No Filter

Search

Sub Total: \$0.00

Freight: \$0.00

Tax: \$0.00

Cancel Order


Order Total: \$0.00

Update

Inventory Snapshot:

ER Music Gallery

Hello, Jan Kotas [Not you?](#)

Dashboard		Products	Orders	Purchases	Report Center	Advanced	Getting Started			
 New Product		Inventory Levels	Needs Restocking	Discontinued Products	Categories	Suppliers				
ID	Product Name	On Hand	Allocated	Available	Shrinkage	On Order	Current Level	Target Level	Below Target	Purchase
1	Yamaha Piano	200	75	125	0	0	125	40	0	Purchase
2	Drum Set	284	6	278	0	0	278	100	0	Purchase
3	Kurzweil MP-20 Digital Piano Ebony Polish	400	1	399	0	0	399	40	0	Purchase
4	Ludwig Education Drum / Bell Combo Kits	200	0	200	0	0	200	40	0	Purchase
5	Prelude FL711 Flute - C foot, Offset G, Split	145	10	135	0	0	135	100	0	Purchase
6	Selmer TS711 Prelude Bb Tenor Saxophone	95	0	95	0	0	95	40	0	Purchase
7	William Lewis & Son BWL11E4CH Violin Outfit	100	0	100	0	0	100	40	0	Purchase
8	Bach TR200 Bb Trumpet Standard	50	13	37	0	0	37	40	3	Purchase
9	Bach LR180S37 Bb Trumpet 37 Bell, Silver-plated	40	0	40	0	0	40	40	0	Purchase

Delivery Slip:

InvoiceClientOnly



Thursday, May 12, 2016

INVOICE #7

Ship To: Company A
18111 Nordhoff Street
Northridge CA 91330

Bill To: Company A
123 1st Street
Seattle WA 98052

Invoice # 7
Invoice Date 5/12/2016
Order # 7
Order Date 12/22/2010

Sales person Jan Kotas
Ship Via Shipping Company A
Shipped Date 5/12/2016

Product	Quantity	Unit Price	Discount	Price
Prelude FL711 Flute - C foot, Offset G, Split E	10	\$329.00	0.00%	\$3,290.00
Roland Piano	5	\$1.80	0.00%	\$9.00
Drum Set	2	\$500.00	0.00%	\$1,000.00
SubTotal				\$4,299.00
Taxes				\$214.95
Freight				\$0.00
Invoice Total				\$4,513.95

Print Invoice

Inventory Request:

Product Detail

Casio Celviano Digital Piano

Save & Close

Product Details

Order History

Purchase History

Inventory

Inventory Settings

Initial Level

120

Min Reorder Quantity

25

Reorder Level

100

Target Level

125

Inventory Shrinkage

	Date	Quantity	Reason
*	5/12/2016		

Record: 1 of 1 No Filter Search

Inventory History Totals

Received	0	On Hand	120
On Order	0	Available	120
Shipped	0	Below Target Level	5
Back Ordered	0	Total Shrinkage	0

Purchase Product

Hardware

Microsoft Access as a desktop database saves a lot of time and resources. ER Music Gallery currently has hardware that supports the minimum requirements, which are listed below:

Required Processor

1 gigahertz (Ghz) or faster x86- or x64-bit processor with SSE2

Required Operating System

Windows 7 Service Pack 1 or later, Windows Server 2008 R2, or Windows Server 2012

Required Memory

1 GB RAM (32 bit); 2 GB RAM (64 bit)

Required Hard Disk Space

3.0 GB available disk space

Required Display

1280 x 800 resolution

Graphics

Graphics hardware acceleration requires a DirectX 10 graphics card.

Multi-touch

A touch-enabled device is required to use any multi-touch functionality. However, all features and functionality are always available by using a keyboard, mouse, or other standard or accessible input device. Note that new touch features are optimized for use with Windows 8 or later.

Additional System Requirements

Internet functionality requires an Internet connection.

Microsoft account required.

Software

Purchase from: office.com

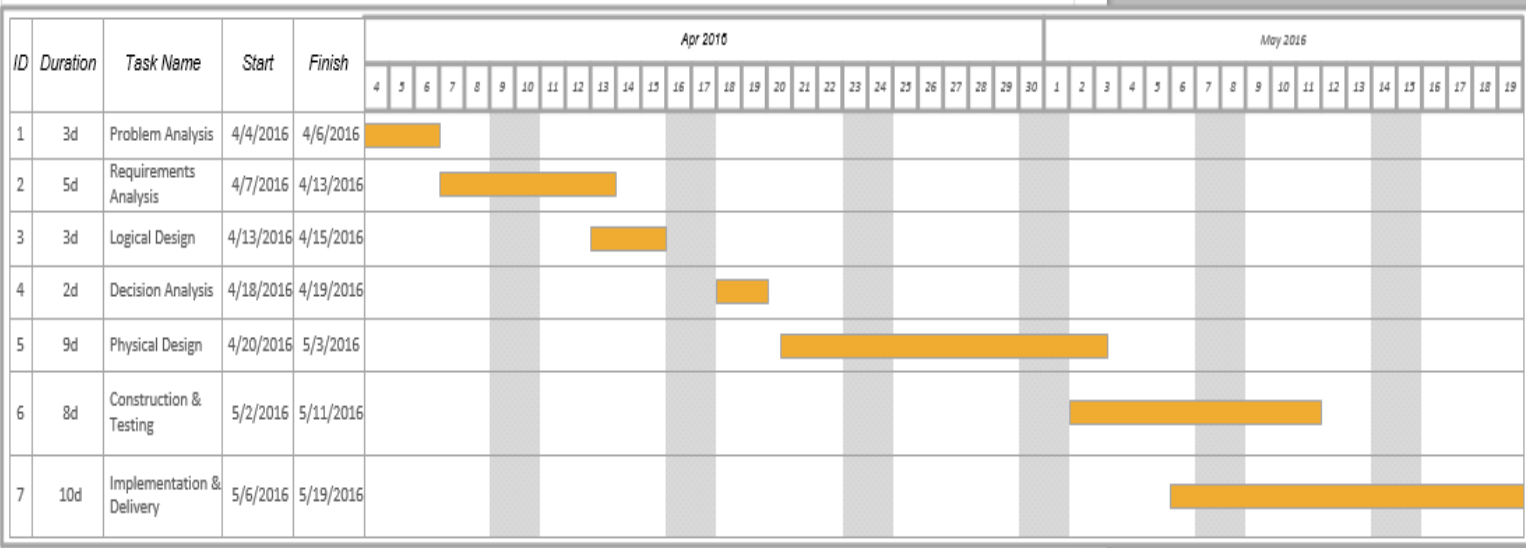
Office 365 ProPlus

Initial Purchase 1 computer: \$12/month-Annual commitment

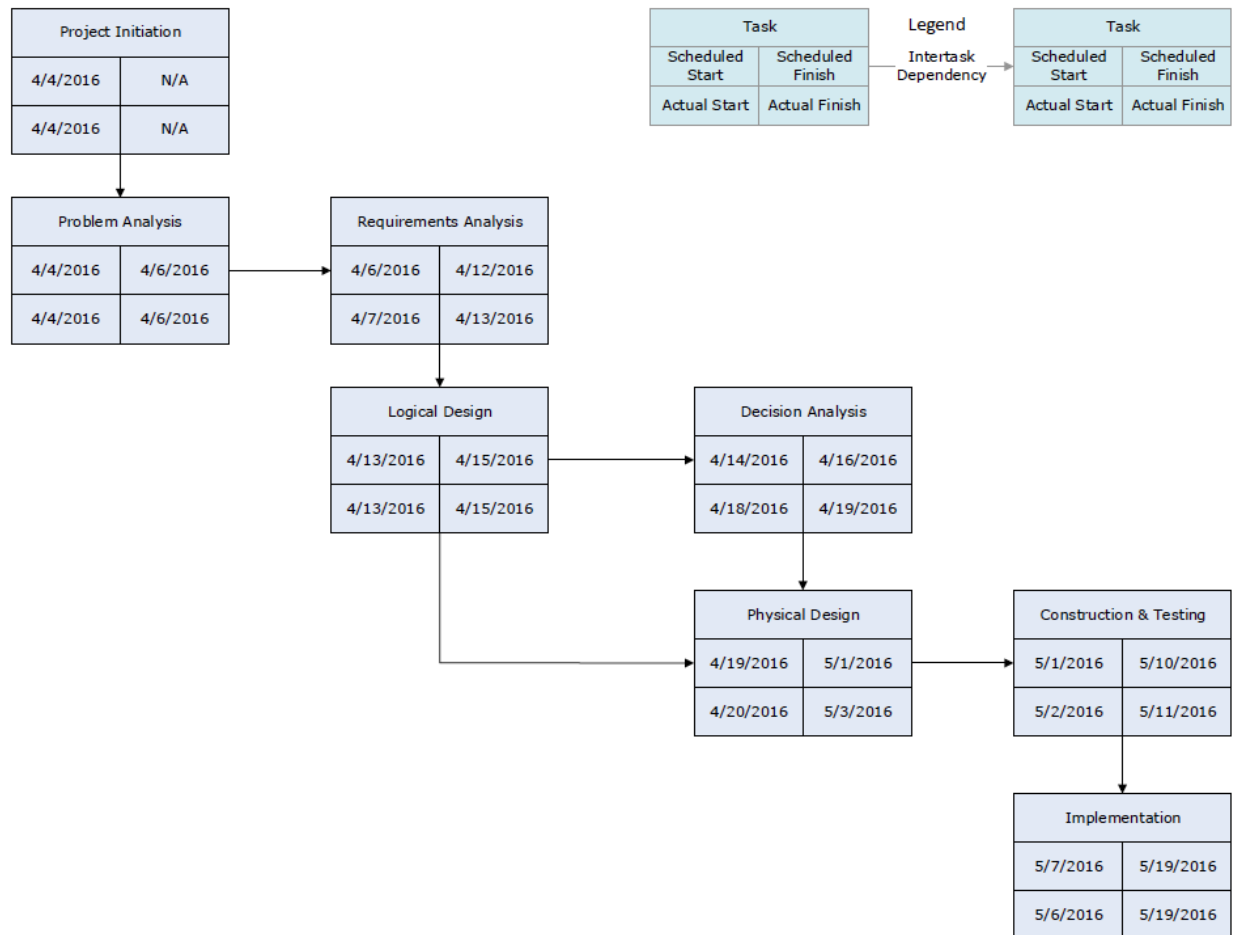
Upgrade Additional User: \$12/month-Annual commitment

Implementation Schedule

GANNT Chart



PERT Chart



Conversion Plan

Since manual works have been a big issue in tracking inventories to ER Music Gallery, we carefully decided to proceed with abrupt cutover conversion. The advantages of taking the conversion plan are it is low cost, the benefits will be achieved at earliest possible time, and it also ensures that every user to use the new system. Usually, abrupt cutover conversion is at the highest risk among the other conversion strategies. However, since our proposed solutions are all user friendly and have their own technical support team, there will not be any big trouble in learning or using the system.

Once the owner of the business, David accepts the proposal, there will not be any looking back of old system. We are planning on providing brief training on Microsoft Access 2016 and its data tables within. After Access is implemented, they will not need to use excel anymore.

Inevitably data issues will be uncovered and the number of data issues may be greater than originally anticipated. We are gladly willing to assist during post-conversion

Other Recommendations

- **POS system:** A POS system that is synchronized with the proposed inventory system for in-store sales will also prevent manual updates of inventories.
- **Permission/Access Control:** Currently, ER Music Gallery's employees have administrative access to the office computers. By creating employee accounts this will limit the employee's access to certain functions of the system, and this will lower the risk of errors.
- **CRM:** CRM is a good tool to manage and analyze customer-related resources. They can use the information from CRM for their marketing and future campaigns. It is also possible for ER Music Gallery to measure their performance through CRM.