

## **A Custom Intranet ERP System for Order Fulfillment and Inventory Management**



# **Table of Contents**

Revision History - 3
Background and Overview - 4
Time Schedule - 5
Success Criteria - 5
Stakeholder / User Analysis - 6
Scenario - 7 - 8
Persona - 9
Workflow Diagram - 10 - 11
Functional Requirements - 12
Nonfunctional Requirements - 13
Software Qualities - 14
Specifications - 15 - 16
Site Map - 17
Wireframes - 18 - 19
Mockups - 20 - 22

# Revision History

Version #	Date	Description of change	Section	Author	Approval
3.0 draft 1					
2.0 approved					
2.0 draft 4					
2.0 draft 3					
2.0 draft 2					
2.0 draft 1	2006 June 20	Added FR-03, FR-04		AP	JC
		Added NR-07	Functional Requirements		
1.0 approved	2006 May 15	Added NR-05, NR-06	Nonfunctional Requirements	AP	JC
1.0 draft 2	2006 May 10	Added NR-04	Nonfunctional Requirements	JD	JC
1.0 draft 1	2006 May 7	First version, first draft	Nonfunctional Requirements	AP	

# Background and Overview

Since the company started shipping the product a few months ago, the ordering process has been heavily paper-based with handwritten forms. Production and order status are listed on a white board and all are also handwritten. There are several problems with this system, to mention a few:

- handwriting can be hard to read which can cause misinterpretation
- paper-based documentation can only be seen in the office, in-person
- we have employees in remote locations who cannot access these information
- information on the white board can be accidentally erased
- we will soon work with an external Contract Manufacturer (CM) that we need to remotely manage for parts inventory and production schedules

It is proposed that an online, intranet system to handle order fulfillment and inventory management be created within the next 3 months (May-August) in time for the new shipments from the new CM.

# Time Schedule

Research: first findings must be completed by May 5, 2006

Design: first version must be completed by May 12, 2006

Implementation: first version must be completed by June 15, 2006

Testing: first version must be completed by June 18, 2006

Iteration, refinement (of research through testing):  
must be completed by July 28, 2006

Launch - must be completed by August 5, 2006, 5pm

## Success Criteria

This project will be successful if the time schedule, individual stakeholder/user prioritized needs, software qualities and requirements listed in this document are achieved.

# Stakeholder / User Analysis

Stakeholders / Users	Location	Description	Needs / goals
Sales	remote	Tech savvy, has access to internet, good at communicating	to place an order quickly and easily
Accounting	remote	fairly tech savvy, uses Quickbooks	to add orders in Quickbooks, create an invoice when the order ships, sort out payment issues with customers if needed
Manufacturing/Production	in-house	technical, can build computers, integrate hardware & software	to prepare the orders to customer's specification
Packing	in-house	technical, can access internet	to include all accessories and pack the order
Shipping	in-house	fairly technical, uses online shipping portals for UPS, FedEx, DHL, USPS, etc.	to create shipping documents and ship the order on time
Customer Support	in-house/ remote	technical, supports for hardware & software issues of customers	to see order specifications, date of order and shipping when customer calls to follow up on their order
CEO	in-house	technical, has lots to do	to see all orders (current, standing, shipped) at a glance

# Scenario

## Sales:

Sales gets an order from a customer. Sales gets the name, billing/shipping address, contact information, credit card information, the unit model or models being ordered, any additional software to install with authorization key, custom faceplate if preferred, if customer needs UK or EU power cord for performing abroad.

Sales puts these information in one location in the ERP system called the Work Order form.

## Accounting:

Once an order is placed online by Sales, Accounting will add a Purchase Order number that ties it to the Quickbooks records. Accounting will check that all information are there particularly the method of payment. Any additional sorting out for payment is made at this point. A flag will be set to show that this order is good to be fulfilled.

## Production:

When Production sees the order is okay to fulfill, it will change the flag to show "accepted by production". It will prepare the unit/s, install additional softwares, do tests and quality control.

Production will use the Work Order as a spec sheet for every order to make sure the hardware configuration is correct, all the softwares are installed.

## **Scenario** - *continued*

### Packing:

Once the unit/s passed all tests, it will be packed including additional purchased software discs. The status flag will be changed to “ready to ship”.

Packing will look at the Work Order to make sure all the purchased software discs, correct power cord are included in the package.

### Shipping:

Shipping will prepare the shipping documents using the shipping information on the Work Order. When the shipping label is printed and pasted on the box, the status flag is changed to “ready to invoice”. Shipping cost and tracking number are added to the Work Order and Accounting will then charge the complete amount on the credit card on file.

When the charge is cleared, Accounting sends the Customer’s Invoice to Shipping to include it in the package. The unit is then placed in the shipping pick up area and the status flag is changed to “shipped” when the order has been picked up.



# Persona - Shipping Personnel - Internal user for ERP system

## Alex



“I’ll keep an eye for the “ready-to-ship” flag for all orders so there is no delay in shipping to our customers.”

Alex is very helpful at work. He has a team spirit and wants to support the company’s effort in shipping to the customers the right product on time.

He believes the shipping process will benefit from having all orders’ information on an intranet system.

Age: 31

Department: Shipping/Receiving

### Goal:

Shipping the right product to the right customer on time or sooner than expected.

### Motivations:

Easier and faster shipping process done online.

Zero returns for wrong delivery addresses.

### Influencers:

Easy account access from various computers in the office or remote locations like the factory.

Availability of updated and correct order information all the time.

### Frustrations and Pain Points:

With the current hand written order system, handwriting are hard to read.

Misinterpretations of handwriting have led to deliveries to the wrong addresses.

Other order information that are written on the white board are sometimes erased by accident.

It is difficult to know a status of an order.

### Attributes:

**Education:** Bachelor of Applied Science Degree in Sound Arts, Ex’pression College, Emeryville, CA

**Equipment:** Desktop PC with Windows and Internet access. He uses Firefox.

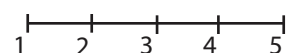
**Technical comfort level:** Alex is very tech savvy. He is comfortable using computers for shipping work and audio works which is the degree he recently finished.

He knows how to test, package and ship the products which are computer systems used for music performance.

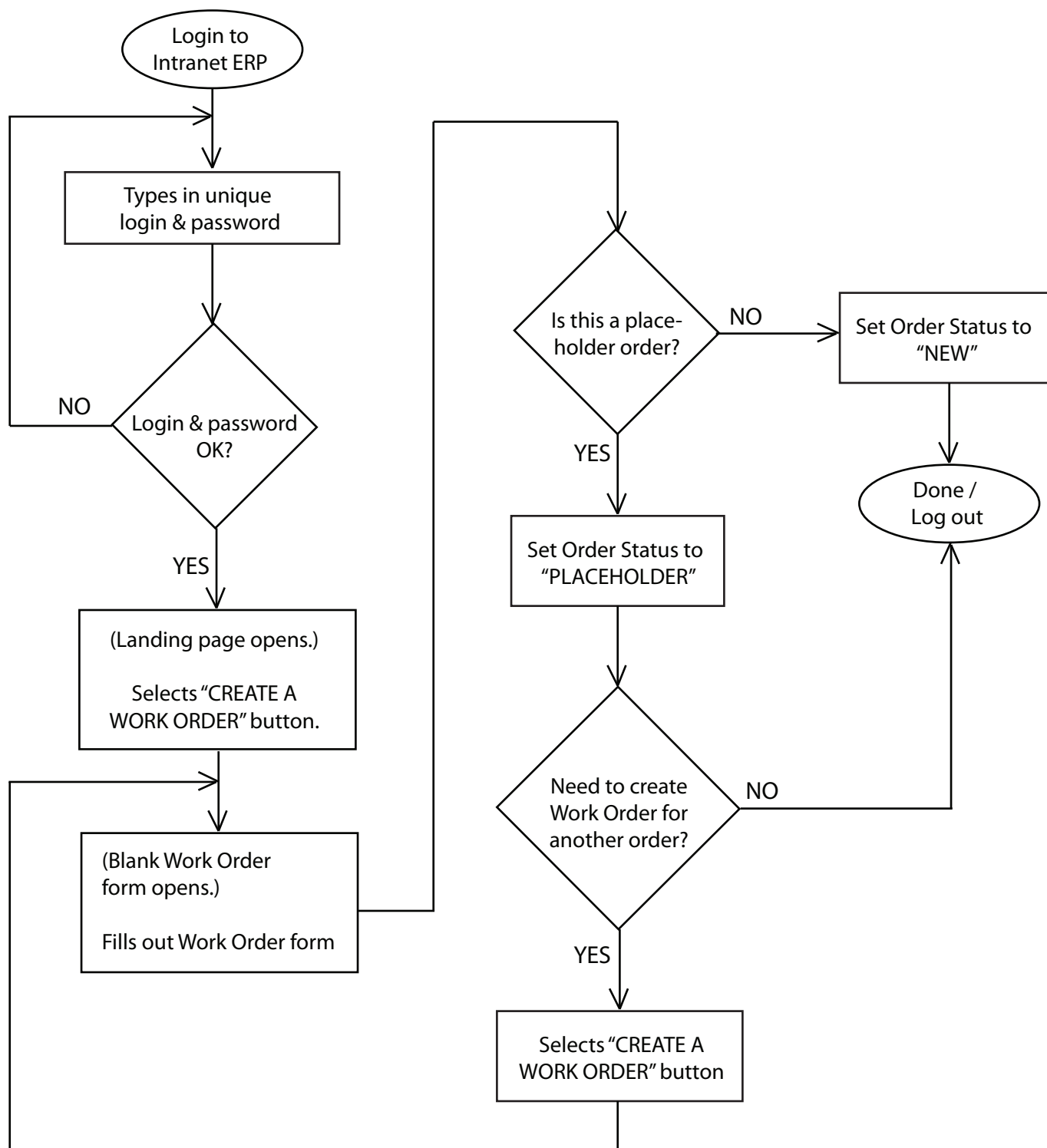
He is knowledgeable using online shipping processes for UPS, FedEx, DHL, USPS, etc. He prefers online processing than filling out paper shipping forms.

### Job activities:

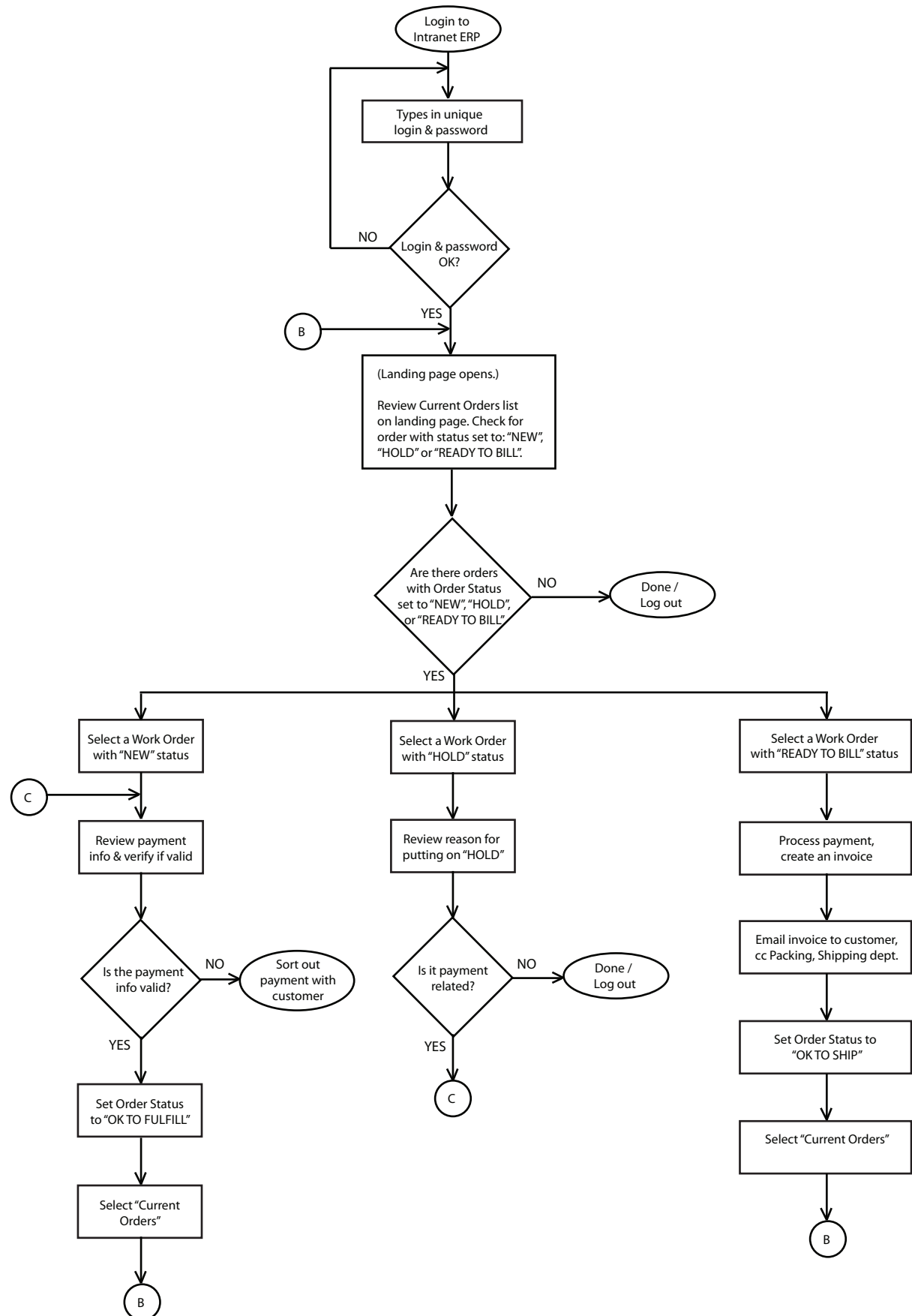
Preparing shipping labels	<div></div>
Packing orders	<div></div>
Testing	<div></div>
Software installation	<div></div>
Resolve shipping issues	<div></div>
Upkeep shipping materials	<div></div>



# Workflow Diagram - Sales with new orders



# Workflow Diagram - Accounting



# Functional Requirements

Requirement Number	Description of Requirement	Reason of Requirement	Assumptions	Requirement Source	Dependencies	Reference Documents	History of Changes
FR-01	The intranet ERP system should be accessible to authorized users only and should authenticate users with login and password.	There is an entry for credit card and contact information of customers who are high profile music artists. It is critical to keep these information safe and secure.	It is assumed that the server is kept safe and secure by the host at all times.	CEO, Accounting, Sales	The intranet is hosted by a remote host and offshore developer / maintenance engineer.	n/a	Created 5/5/2006 by AP.
FR-02	A summary list of all orders with status, tracking number and ship date (actual or expected) should be easily seen.	Customers call for status of their order and this information should be easily accessible to give them a quick response.	Some customers will call before ship date even though automatic notification is sent out to customers when order has shipped.	Support, Sales	Shipping needs to get the tracking numbers from UPS, FedEx, USPS, or DHL online systems. If online systems are down, use paper shipping form but still get the tracking number.	n/a	Created 5/5/2006 by AP.
FR-03	The Work Order form should be accepted and saved in the system only when required fields are filled. It is a must to notify the user filling out the form when fields are missing.	It causes great delay in production when work is started on an order and then the process is stopped due to missing information.	It is assumed that 70% or higher are custom orders.	Production	Credit card information and 3rd-party software authorization keys must be available when creating a Work Order form.	Sales reports 5/2006 and 6/2006	Added 6/20/2006 by AP - custom orders increased from 60% to 80%.
FR-04	The "Create Work Order" button should be accessible.	Work Order creation and order fulfillment should be fast.	n/a	Sales	none	n/a	Added 6/20/2006 by AP.

# Nonfunctional Requirements

Requirement Number	Description of Requirement	Reason of Requirement	Requirement Source	Category (External design, Performance, Maintenance, Safety & Security, Regulatory)	History of Changes
NR-01	Labels, especially form labels, should be easy to understand, not abbreviated.	Avoid wrong entries, wrong interpretation. Work Order form is used by Production as the specification for orders.	Production	External design	Created 5/5/2006 by AP.
NR-02	Work Order form should fit in 8.5 x 11 paper for printing in portrait format.	Accounting needs a printed version of the order when order is completed.	Accounting	Shipping needs to get the tracking numbers from UPS, FedEx, USPS, or DHL online systems. If online systems are down, use paper shipping form but still get the tracking number.	Created 5/5/2006 by AP.
NR-03	This custom ERP system should operate 24/7 to be available for access by remotely located Sales and Accounting personnel.	Sales and Accounting are remotely located, in the east coast, Canada and California. People work round the clock.	Sales	Performance	Created 5/5/2006 by AP.
NR-04	The web pages, especially the login page should have the company logo.	To indicate that user is in the correct website.	Production	External design	Created 5/5/2006 by AP.
NR-05	Time out from active page within the ERP system if no activity on the page or the computer within 5 minutes. Authentication process should restart after timing out.	Avoid display of critical information.	Production	Safety & security	Created 5/5/2006 by AP.
NR-06	All errors should be handled correctly, i.e. feedback messages explaining what information is incorrect should be stated clearly.	To get proper feedback if user entered wrong information; for seamless work flow, ease of use.	Production, Accounting	Performance	Created 5/5/2006 by AP.
NR-07	For Parts Inventory, the short parts should be distinguished and seen prominently.	Parts that are short should call attention so there will be no delay in procurement and production.	Production	External design	Created 5/5/2006 by AP.

# Software Qualities

**User-friendliness** – This ERP system will be a daily work environment for Music Company hardworking staff, this system must be easy to use and user-friendly.

**Correctness** – As this system will have critical information and mathematical calculations for orders, production schedules and parts inventory, it is imperative that this system performs correctly.

**Reliability** – To support on-time shipments of orders, it is a must for this system to be reliably working at all times.

**Extensibility** – Additional sections to support other future products and processes should be allocated. This system should be extensible.

**Robustness** – All error handling is expected to run properly to prevent crashes. All links are expected to connect to correct pages.

**Maintainability** – The system should be easily maintainable. (Maintenance role currently assigned to developer).

**Repairability** – In case of discovery of any bugs in the future, repairs should be easily performed.

**Safety & security** – Customer credit card information and contact information of high profile music artists will be in this system. It is imperative to have the system safe and secure.

**Understandability** – To support extensibility, repairability, and maintainability, it is imperative that all aspects of this ERP system (design, code, test cases and documentation) be easily understandable, even to future developers who are not currently involved in the creation of the system.

# Specifications - Sections

- 1.) Current Orders List
  - 1.1) Work Order Form
- 2.) Shipping Summary
- 3.) Production Schedule
- 4.) Parts Inventory

**Current Orders List** - is a one page table that lists of all active orders, with the most recent order listed on top. List items:

Item #	Work Order #	P.O. #	Order Date	Order Status	Customer Name	Order Description

**Work Order Form** - is a form with the details about an order. Most are form fields that user will type in information except for ***bold and italicized items*** that have selectable choices listed next page:

Customer Name  
Billing Address  
Shipping Address (if different from Billing)  
Order Date  
***Model***  
***Custom Power Cord***  
Shipping Method  
Comments / Notes  
Email  
Phone Number  
Credit Card Info  
Ship Date  
***Custom Faceplate***  
Additional Software to Install  
Tracking Number  
Work Order Author  
***Order Status***  
Work Order #  
Purchase Order #  
Expected Ship Date  
***Custom CPU***  
Accessories  
Additional Shipping Documents

***Form field items with selectable choices:***

***Model:***

- Model 1
- Model 2
- Model 3

***Custom Power Cord:***

- UK
- EU
- US

***Order Status:***

- NEW
- HOLD
- OK TO FULFILL
- IN PRODUCTION
- READY TO BILL
- READY TO SHIP
- SHIPPED

***Custom Faceplate:***

- LIGHT GRAY
- ELECTRIC BLUE
- BLACK

***Custom CPU:***

- AMD 34
- AMD 40
- AMD 45

# Specifications - Sections - *continued*

**Shipping Summary** - is a list of all orders that have shipped. Recent shipment on top. Sortable and searchable by customer name, model (in order description), order date or ship date. List items:

Item #	Work Order #	P.O. #	Ship Date	Order Date	Customer Name	Order Description	Tracking Number

**Production Schedule** - is a list of quantities per model located in various stations. It also lists the weekly build quantity based on the P.O. submitted to the Contract Manufacturer (CM). List items:

**Unit Inventory:**

	QTY. in-house	QTY. at CM	QTY. of WIP	QTY. to build for current P.O.
Model 1				
Model 2				
Model 3				

**Weekly Build Schedule:**

Month 1				Month 2			
WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 1	WEEK 2	WEEK 3	WEEK 4

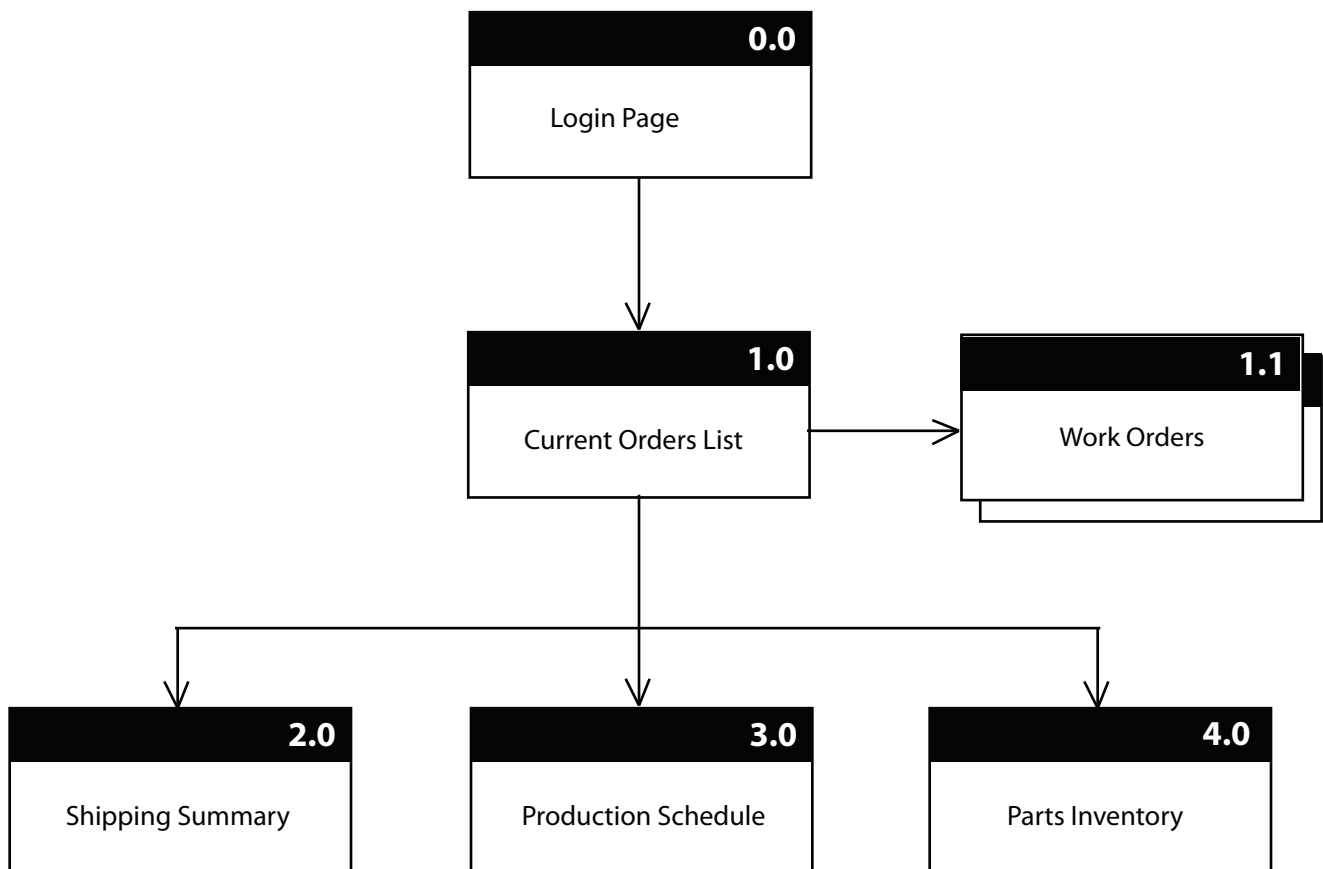
*(use actual calendar months, expand to a year)*

**Parts Inventory** -is a list of all parts based on current BOM showing quantities. List items:

Item #	MFG P/N	Company P/N	Part Description	QTY. in-hand	MOQ	Ld. Time	QTY. for PO1	QTY. for PO2



# Site Map



# Wireframes

## Login Page

1

LOGO IMG

Company Name: Intranet ERP System

Login ID:

Password:

LOG IN

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1 - The company logo. This is just an image of the logo to indicate to the user that they are in the company's intranet site. It is not a link.

## Current Orders List Page

1

LOGO IMG

Company Name: Intranet ERP System

8 Log out

2

CREATE A WORK ORDER

3

Current Orders List | Shipping Summary | Production Schedule | Parts Inventory

4

CURRENT ORDERS LIST

5

Item #	Work Order #	P.O. #	Order Date	Order Status	Customer Name	Order Description
	6 nnnnnnn				6 Michael J.	

7

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1 - The company logo. This is only an image to indicate to the user that they are in the company's intranet site. It is not a link.

2 - The "Create a Work Order" button. Make this prominent and easily accessible for logged-in users to add a new work order.

3 - The navigation area to access the different sections of the ERP site. The section being accessed should be distinguished visually so the user will know where they are in the site.

4 - The title of the section. This should also be visually prominent so the user which part of the site they are in.

5 - The table with the headings and information about each current orders.

6 - The "Work Order #" and "Customer Name" are clickable links to open related Work Order form associated with the "Work Order #" and "Customer Name".

7 - The part of the table listing all existing current orders. It will be populated with the information from each of the Work Order forms that are created.

8 - When a user is done working on this site, they click on this link to log out of the site.

sorter button  
NOTE: Sorter button will sort entries based on field header

NOTE: Entries for Work Order # and Customer Name are links to open individual Work Order form associated with the Work Order # and Customer Name.

# Wireframes

## New Work Order Form Page

1

LOGO IMG

Company Name: Intranet ERP System

9 Log out

2

Current Orders List | Shipping Summary | Production Schedule | Parts Inventory

3

WORK ORDER FORM

4

Customer Name:

Email:

Phone number:

Billing address:

Shipping address:  
(if different from billing)

Credit card number:

Order date:

Expected ship date:

Shipping method:

Tracking number:

Model:

Model 1

Custom faceplate:

Light gray

Custom CPU:

AMD 34

Custom power cord:

EU

Additional software:

Accessories:

Additional shipping documents:

6

Order status:

New

Work order #:

Purchase order #:

Work order author:

Comments / notes:

8

5

5

5

6

5

7

SUBMIT

CLEAR

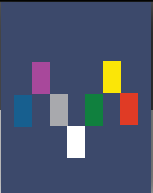
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- 1 - The company logo. This is only an image to indicate to the user that they are in the company's intranet site. It is not a link.
- 2 - The navigation area to access the different sections of the ERP site. The section being accessed should be distinguished visually so the user will know where they are in the site. When creating or accessing a Work Order Form, none of the sections is being accessed so none of the navigation links should be highlighted.
- 3 - The title of the form. This should also be visually prominent so the user will know where they are in the site.
- 4 - The labels for each form field. There should be labels for each form field.
- 5 - The form fields. Most are blank and needs input from the user creating the Work Order.
- 6 - Form fields with drop down s electable choices. The drop down choices will be revealed when the field is clicked. The user points to the selected item and clicks it to save the choice.
- Model: Model 1, Model 2, Model 3
- Custom Faceplate: Light gray, Electric blue, Black
- Custom CPU: AMD 34, AMD 40, AMD 45
- Custom Power Cord: UK, EU, US
- Order Status: NEW, HOLD, OK TO FULFILL, IN PRODUCTION, READY TO BILL, READY TO SHIP, SHIPPED
- 7 - 'Submit' and 'Clear' buttons. When the user is ready to save and add the form to the ERP system, the 'Submit' button is clicked. When the user wants to clear out the whole form and start anew, the 'Clear' button is clicked.
- 8 - The comment area. This is where a logged-in user can add notes about this order for other internal users to read.
- 9 - When a user is done working on this site, they click on this link to log out of the site.

# Mockups

## Login Page



Company Name: Internal ERP SYSTEM

Login ID

Password

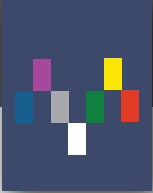
LOG IN

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# Mockups - *continued*

## Current Orders List Page



Company Name: Internal ERP SYSTEM

Log out

CREATE A WORK ORDER

Current Orders List

 | 

Shipping Summary








 | 

Production Schedule

 | 

Parts Inventory

CURRENT ORDERS LIST

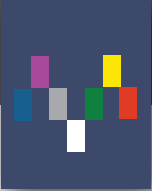
Item # 	Work Order # 	P.O. # 	Order Date 	Order Status 	Customer Name 	Order Description 
2001	540	9879	04/06/2006	Ready to ship	Michael T.	Model 1
2002	550	1002	04/06/2006	In production	Diana R.	Model 2
2003	567	230	04/07/2006	Ready to bill	Band Europa	Model 3

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# Mockups - *continued*

## New Work Order Form Page



Company Name: Internal ERP SYSTEM

Log out

Current Orders List | Shipping Summary | Production Schedule | Parts Inventory

WORK ORDER FORM

Customer Name:

Email:

Phone number:

Billing address:

Shipping address:  
(if different from billing)

Credit card number:

Order date:

Expected ship date:

Shipping method:

Tracking number:

Model:

Model 1

Custom faceplate:

Light gray

Custom CPU:

AMD 34

Custom power cord:

EU

Additional software:

Accessories:

Additional shipping documents:

Order status:

New

Work order #:

Purchase order #:

Work order author:

Comments / notes:

SUBMIT

CLEAR

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