



ARTISAN'S Co-op North

Management System

System Proposal

Prepared for:

Elaine Weltz, Artisan's Co-op North

Prepared by:

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PenSoulutions

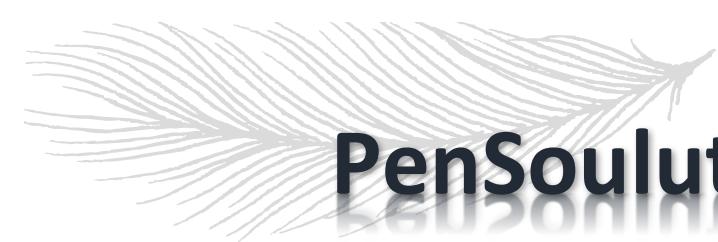
November 15, 2017



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Executive Summary

Artisan's Co-op North (ACON) has consulted PenSoulutions to design and develop a system that will automate the process of keeping track of their inventory and sales. The system will be responsible for managing all the transactions and operations of the company. The primary goal of the system is to increase productivity of ACON and reduce the workload by implementing automation.

We at PenSoulutions have put together this proposal to present what the system will look like and how it will meet all the requirement proposed by ACON. We have researched and designed a system, Arts and Sales Management System (ASMS), that will increase efficiency and availability of products by bringing automation into the business and improving the existing website.

PenSoulutions has documented all the necessary steps and conducted a feasibility analysis for development of the system. This document serves as the system proposal for ASMS that includes:

- An overview of the system
- Costs, benefits, and constraints
- System requirements
- Feasibility analysis

After conducting all the feasibility analysis, PenSoulutions has determined ASMS as feasible and expects to move forward to the completion of the system.



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1.0 Introduction and Overview

1.1 Problem Statement

Artisan's Co-op North (ACoN) is an organization where artists and craftspeople are brought together to create and sell beautiful and useful objects. Ms. Weltz, who owns and runs the business, mainly manages the operation of ACoN with Excel. She coordinates fair booths for various events, keeps track of the inventory, and makes payment to the members of ACoN. As the company is expanding, Ms. Weltz finds it difficult and inefficient to manage everything by herself without technology support.

Therefore, PenSoulutions is designing the Arts and Sales Management System (ASMS) that will reduce workload and support the business management in a more computerized way. We will be implementing automation which will give access to each artisan of ACoN to track their inventory and generate reports. ASMS will also automate data entry with the use of a barcode system and make sales available online. ASMS is meant to improve workflow efficiency by removing unnecessary delay and provide convenient environment managing the business.

1.2 Project Vision and Scope

The purpose of ASMS is to provide an efficient way to manage inventory, sales, and accounting for both customers and the members of ACoN. PenSoulutions envisions to develop the system that meets all the requirements listed by ACoN and benefits everyone who uses the system. ASMS will be supported on computers, tablets, and smartphones as an application software. The improved website with more features will be accessible by any device as well.

The ACoN customers will be able to view and order products online. They will be able to buy what they want at any time they desire without going to a specific fair or event. Also, the artisans of ACoN will be able to upload their products on the website and track their items and sales without requesting a report to Ms. Weltz. Lastly, ASMS will allow ACoN to keep track of all the details of each inventory and make payments through online payroll service.

The system will not be expanding globally in the near future. Nonetheless, we hope to build a system that will help ACoN run its business in the most efficient way within a reasonable budget and timeline.



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1.3 Requirements Summary

The following are the major business requirements for ASMS:

- ASMS must allow users create an account and to login to the system.
- ASMS must enable the members of ACoN to track their inventory and sales by generating barcodes.
- ASMS must support credit/debit card payment for transactions.
- ASMS must support payroll system and generate sales report for each artisan when requested.
- ASMS must store and maintain the user information including credit card information, email address, and payment information.
- ASMS should notify Ms. Weltz what objects she will be receiving to store in the warehouse and what artisan is sending those objects.
- ASMS should be supported on computers, tablets, and smartphones
- ASMS (the website) should be accessible on browsers such as Google Chrome, Microsoft Edge, Internet Explorer, Mozilla Firefox, and Apple Safari.
- ASMS should present a simple ordering process online. Customers should be able to add multiple products to their cart and order at once. The entire ordering process shouldn't take more than 2 minutes.
- ASMS should allow the members of ACoN upload the pictures of their selling items and edit product details using their account.
- ASMS should be user friendly. The ASMS users should be able to utilize the system without any mandatory training sessions.
- ASMS should notify the users when product is out of stock.
- ASMS could provide a 360 virtual tour for the warehouse where items are stored.

1.4 Stakeholders and Interests

- **Clients/Customers**

Clients want to have an option to shop online and view all the products available at once. It will save their travel time to events and enable them to make a quick purchase. They want a system that is easy to use and available at any time.

- **Artisan members**

Artists that are members of ACoN desire a system that will enable them to track inventory, make sales, and track sales in a more efficient and modern way.



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- **Artisan's Co-op North (Ms. Weltz and other office staff)**

Ms. Weltz and other office staff at ACoN want to implement automation into their business management. They want a system that will improve workflow efficiency and productivity.

- **PenSoulutions Development/Project Team**

PenSoulutions Development/ Project Team want to develop and successfully deliver a system that meets all of its need.

- **PenSoulutions**

PenSoulutions is interested in the success of this project of building a system for ACoN, thus satisfy their clients, and generate profit. The success of the system will reflect the company's ability and value.

1.5 Expected Costs and Benefits

1.5.1 Benefits

The following are the expected benefits of the system for stakeholders:

- Automated management of keeping track of inventory and sales for artists and business facilitators, thus providing faster, more accurate and reliable results without errors.
- Reduced paperwork. It will also save money buying papers for reports and other documentation.
- Increased availability of products through online shopping, which will increase sales.
- Increased convenience through automation.
- Increased availability to access the system. Artisans can track their inventory and sales anywhere with their phone.
- Less time spent tracking inventory and creating sales reports.
- Reduced time and money to update the system. Once the system is installed, the system can be updated easily to bring benefits of recent evolutions and bug fixes.



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1.5.2 Costs

The following are the expected costs of implementing and maintaining the system:

- Design and development cost for the system.
- Developer salaries.
- Ensuring the system will be compatible on a wide range of devices and browsers may take a longer development process.
- Ongoing support and maintenance of the system.
- Customer support to handle customer requests and complaints

1.6 Constraints

The following are constraints on the developments and usability of the system:

- The development and maintenance of ASMS must be cost effective. It should focus on its functionality and requirements. We will make sure there is no need to rework or extra programs that are not necessary to the system.
- ASMS needs to be available for all the users without additional costs, which means ASMS must be compatible with as many devices as possible. We want to ensure that the system is compatible with as many web browsers as possible (Apple Safari, Google Chrome, Mozilla Firefox, Microsoft Edge, Internet Explorer) on any device (computers, tablets, phones). Users should not have to buy a new device for the use of ASMS. Although this may increase development time and cost, it will be more beneficial in the long run. In order to mitigate the possible delay, we have an option to deliver the system with core functionalities first and release the complete version as the rest of the system is developed.
- ASMS must be user friendly. Since the members of ACON have different technological background, we must consider developing a system that is simple and easy to learn, use, and troubleshoot.



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1.7 Recommendation

We at PenSoulutions recommend that Artisan's Co-op North (ACoN) to review this document to ensure that all the requirements are clearly listed. As this is the beginning stage of the development, we recommend that any suggestions for modifications or additions are presented to PenSoulutions as soon as possible. We will be communicating with Ms.Weltz concerning the development of Arts and Sales Management System until the completion of the system. Moreover, we are aware that many artisans have a full time job, so we advise that Ms.Weltz inform artisans about the process and the development of the system via email. Lastly, we recommend that PenSoulutions and ACoN take an immediate action to begin regular meetings to discuss the development process and start the project without any delay.

1.8 Document Overview

This document will continue in six major sections:

1. System Initiation: Copies of the initial system request and sales letter made in response to this request.
2. Feasibility Assessment: An analysis of technical, resource, schedule, organizational and legal/contractual feasibility.
3. Requirements Definition: An overview of the functional, data and nonfunctional requirements of ASMS.
4. Requirement Model: Diagram of functions of ASMS and description for each use case
5. System Evolution: A section outlining post-installation plans, further upgrades and possible additional functionality of ASMS.
6. Conclusions and Recommendations: A summary of PenSoulutions conclusions and recommendations concerning ASMS.
7. Glossary: A list of definitions of key terms and acronyms used in this document.
8. Bibliography: A list of sources used for the creation of this document.



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2.0 System Initiation

2.1 System Request

October 4, 2017

SYSTEM REQUEST – Artisan's Co-op North

Project Sponsor

Name: Elaine Weltz

Phone: x3639 E-mail: eweltz@spu.edu

Opportunity Statement:

I have been working with a talented group of part-time artists for a while now. They create amazing objects which are then sold at various venues. Currently they either bring or send their art to my home and I store this inventory in my basement between events. I also keep track of what is available – and what has sold – in a vaguely automated way. When there were only a couple of artists and we only exhibited at a few arts and crafts fairs, this worked just fine. However, we have a lot more members now and are taking part in a lot of fairs and shows...even talking about a weekend-open store front or market stall. We are going to need some technology to make *that* happen!

Proposed Product:

Background and Context:

Artisans' Co-op North isn't a "company" per se, but rather a group of part-time artists and craftspeople brought together by a shared desire to create and sell objects that are both beautiful and useful. They are homemakers, students, grandparents, and people with other fulltime day jobs. Their talents include woodworking, jewelry making, quilting and needlework, pottery, visual art...in other words the wide range of artistic items one finds at an arts fair, craft festival or even a county fair or farmer's market.

My (Ms. Weltz) role is as a type of business facilitator. The "warehouse" of objects is located in my basement. I coordinate fair booths, keep track of the inventory and make sure each artisan is paid for what is sold. Each member artisan pays annual dues, and a percentage of what is sold remains with the Co-op to cover expenses (including a small amount for my time and effort). Costs of participating in a given show are split among those wishing to be represented therein, and all members are expected to volunteer their time "manning the booth" at a few events each year. Our record keeping and sales processing are SO last



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century. I hope you can build us a computer application that will bring us up to 2017!

Initial Vision and Scope:

☞ *Automating the Co-op* I don't see this as particularly revolutionary. We need to be able to keep track of objects by type of art/craft, description/name of the item, and name of artisan. Each piece has a current selling price. Right now I use Excel as a kind of ledger to handle that; could that all become more computerized in some way? Similarly, I'd like to explore having inventory tracking, sales and paying artisans more automated. Maybe even introduce bar codes to our operation (?).

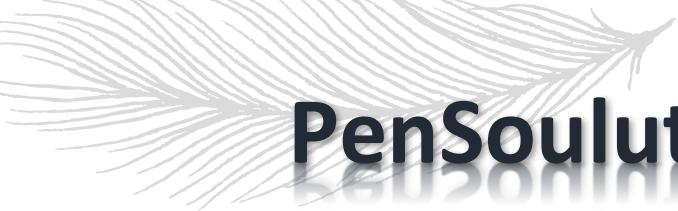
Another thing that we hope to gain by using a computer is the ability for each artisan to track their own object sales any time they want to. Currently they either need to call or email me and I have to send them a listing, or they wait until I send them a monthly update. Several have said they would like to be able to check in more often, thus being able to make more of the items that are currently most popular (and avoiding making more of things that are selling more slowly). Artisans don't need to see each other's sales and we obviously don't want outsiders seeing our private business, but I know there are ways to handle that sort of thing on the Web.

☞ *Receiving Objects* Right now I do all of the inventory check-in. What I'd like to see is some kind of app that would allow others to easily record new objects as they arrive. Or even allow artists to enter via the web what they are sending (or bringing) to the warehouse ahead of time. That way when the objects actually arrive all we'd have to do is check them in. That would save SO much time!

☞ *"In-store" Point of Sale support*

☞ *Sales Support via Tablet (and/or phone?)* We need to be able to handle cash or credit card sales at events more efficiently. It would be great to get away from writing paper receipts, and into a situation where we could use mobile computing devices to support sales transactions. It would also be helpful to have good descriptions of products available to people working in our booth. Sometimes all one can say when asked for details about someone else's art is "Gee, I really don't know!" I know there are devices and apps available. Could something like this be integrated into our processes?

☞ *Virtual Arts and Crafts Fair* – We have a web site (ACoOpNorth.com), but it is currently minimal: information on who we are, what we do and where, and how to contact us via email. Oh yes, and a few pictures to introduce us and give people an idea of what we sell. We think now might be a good time to *really* move into the 21st Century with Internet shopping, but have a feeling that some of our needs (dreams?) might be a bit unusual.



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Our shoppers are browsers. They might come to the booth hoping to see certain types of objects ("I'd love to pick up a wooden paper towel rack or some knitted dishcloths this year."), but mostly are "just looking". They want to look around the booth in a leisurely manner. If something catches their eye, well that's a sale about to be made. The problem with a lot of typical Web shopping sites is that they are geared towards looking at a single product (or product type) at a time. It seems to me they even assume shoppers know pretty much what they want to buy before they ever visit the site. That is efficient shopping, to be sure, but is just not the way an arts and crafts show works. What we're looking for is more the ability to move around the display area, view objects far away or close up, and then select what you want to buy.

What about the possibility of doing something with cameras that would allow an online customer to view the range of currently available items as if they were in the store? The room we currently use to warehouse objects can likely be used for this, although I realize things will have to be more "on display" than they are right now. (My husband and I can handle that end of things as long as we know what is important for the camera.) What I don't know is exactly how the automation would be accomplished. Would it be multiple cameras that people would control with their mouse? One of our artisans suggested small robots that could move a camera around the room. I'm not familiar with that sort of thing, but thought I'd pass along his idea. I also don't know how people would actually select an item, although I know that is done all the time with a simple mouse-click on typical Web shopping sites.

Stakeholders Identified:

- ☛ Artisan Members – who would like a more efficient and modern way to track inventory, make sales, and track sales.
- ☛ Myself and others who help out on the business end. We need to be more efficient (and accurate).
- ☛ Our customers – people who enjoy browsing through and buying beautiful things.

Expected Benefits:

- ☛ Opportunity 1 – preserve my sanity; reduce paperwork; provide better reporting to member artisans. Make it easier to reconcile inventory and payments with artists at the end of each year (for income tax purposes, for example).
- ☛ Opportunity 2 – improve our sales experience.
- ☛ Opportunity 3 – "seize the day"; widen the scope of our sales via Internet shopping.

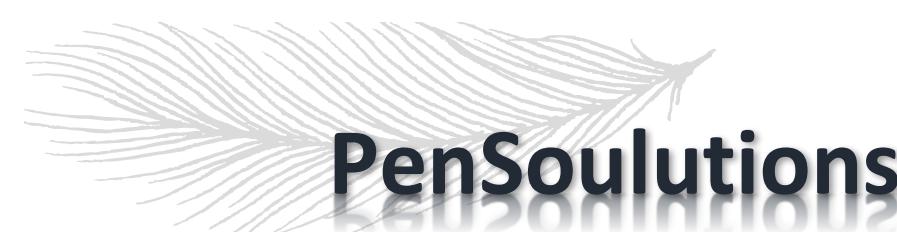


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Special Issues or Constraints:

We're not made of money. Member artisans are willing to contribute to the cost of new equipment and programs, but we're talking a few hundred (not thousand) dollars each from maybe 15 – 20 people. Similarly, I'm not sure everyone is going to be excited to run out and by a new phone or tablet computer just to manage sales or use this system. (Although maybe we could handle that with a few purchases "by the co-op".) Also, our artisans represent a wide range of computer skills and types of computers they know and use. Some are really into their smartphones and others aren't. And some are Macs and others are Windows. Pretty typical people.

I don't think we are on a particularly tight time schedule. We've missed the Christmas craft season already, so the goal for fairs and events is the Spring or Summer season. The sales-via-web piece could be more down the road if that would mean the rest could be finished sooner.



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2.2 Sales Letter

October 9, 2017

Elaine Weltz
Artisan's Co-op North
241 Miller St., Seattle, WA, 98119

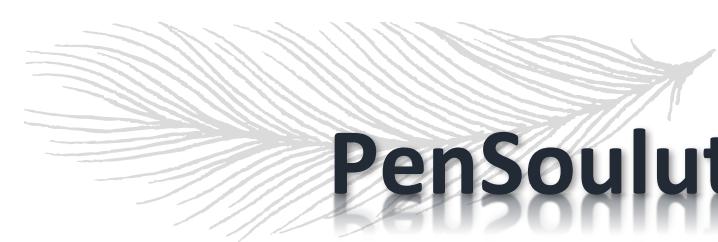
Dear Ms. Weltz,

Thank you for sending your system request to PenSoulutions. We at PenSoulutions believe that we can benefit your company Artisan's Co-op North with our services, if provided with the opportunity. We work with our clients to help them create efficient systems that are simple and easy to use. The products are designed by our developers in a systematic and organized way, which ensures that all the needs and requirements of our clients are met.

PenSoulutions has come up with several features and options of a system that could possibly work for your company. We understand that your need for a system is to minimize the paper use and increase the use of technology. The right use of technology and appropriate design of the system will increase efficiency and accuracy of tracking inventory. More importantly, we hope to help you reach more artists and potential customers who share the love of arts and thus increase your company's profit.

Considering your financial constraints, we offer to use an existing website and modify and modernize what has already been established. In order for artists to be able to track their own object sales, it is best to create a login system. In that way, artists will be able to log in to the system to track sales and inventory privately. As you mentioned in your letter, introducing bar codes to the operation would be a good way to manage inventory and record things efficiently. This will also allow administrators to make payments to each artist online, grant permissions to what artists and customers can do, generate monthly or yearly reports, and supervise all user activities.

Along with website improvements, we want to create an app that is easily accessible on smartphones and supported on both Android and iOS. These apps will help with inventory check in tasks such as reading barcode of an object and adding to the list. Even if you decide



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not to use bar codes, you will be able to use your phone to record a new object by typing its label. Moreover, it will be possible to take a 360-degree photo, which will allow users to look around in any direction from a single standing position. Customers will be able to view the range of currently available items as if they were in store. You will not need separate cameras or robots to accomplish that.

Lastly, we want to know you that there is the option of integrating other applications such as a credit card-processing application called Square. They make card readers that are very handy to carry and easy to install. Integrating their system into our system will make card transactions simpler; however, it solely depends on your company's preference. If that is not something that you would want to do, we can also use our point of sale system.

We want to assure you that you will be satisfied with our product and that we will deliver the product that will benefit your company. If you have any questions, please do not hesitate to contact us. We would like to set up a demonstration with you to make sure you have our full attention. You may call me at my direct number 206.555.5555, or respond to this email. We look forward to working with you Ms. Weltz!

Sincerely,
Sion Park
Representative of PenSoulutions
206.555.5555



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3.0 Feasibility Assessment

3.1 Introduction

PenSoulutions has conducted the feasibility analysis for Arts and Sales Management System (ASMS). It is to ensure that we are capable of completing the system within its budget and timeline at the same time fulfilling the requirements. The following section goes over several potential areas of risk including technical, resource, schedule, organizational and legal/contractual feasibility analysis. Each area is given a rating on the following scale:

Very risky – This area poses a significant risk for the development of the system. The development team must perform risk analysis to determine whether to continue the development.

Risky – This area poses a minor risk for the development of the system. With careful mitigation planning and analysis, it should not hinder the development.

Feasible – This area does not pose any significant risk. PenSoulutions is capable of fulfilling the system requirement.

Ideal – This means that PenSoulutions can easily achieve the specific requirement in this part of the system and there is no risk involved.

3.2 Feasibility Analysis

3.2.1 Technical Feasibility –Feasible

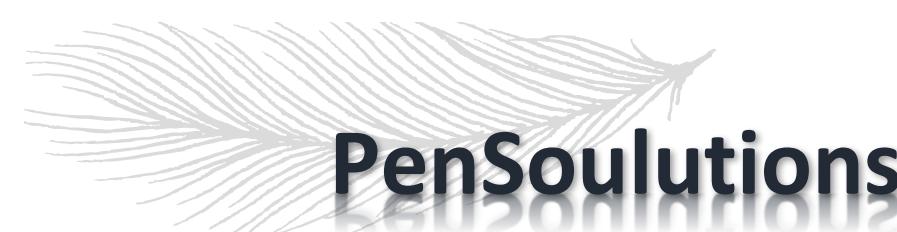
- Users' familiarity with the application area

Customers - **Feasible**

Customers will likely have some experience with web based shopping and ordering. However, it might take some time for the customers to realize that it is possible to purchase products online. We will need an advertisement plan to foster the use of the website.

ACoN and its members - **Risky**

Ms. Weltz and the artisans of ACoN have little or no experience with internet based inventory management and sales. Automating the system and introducing a new barcode system can cause miscommunication between users. Although many of the features ASMS provides are not entirely new, some of them may require training sessions to manage the inventory smoothly. -



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- Analysts' familiarity with the application area – **Feasible**

As a company that focuses on system development, our analysts have a large amount of experience planning and analyzing different kinds of projects about software and hardware. As far as examining the system requirements and designing, the process should go smoothly. One thing to consider is having continuous communication and meeting all the requirements listed by ACoN.

- Development group's familiarity with the target technology – **Ideal**

Our development group has a significant background of developing, integrating, and implementing various systems. The team members are experts at programming and incorporating different functions.

- Project size – **Feasible**

ACoN is a relatively small organization, though it is growing. There is no strict due date that the system must be completed. PenSoulutions has to develop a new management system for ACoN but the system structure will be similar to the ones that we have built before. The improvement of the website would not affect the project size since the website already exists.

- Project structure – **Risky**

There is no current system in place that automates the business management, which means all interfaces and features need to be discussed and planned beforehand.

Although it is a relatively small project, it will have different components that need to get developed and improved such as payroll system, inventory management system, and the website.

- Overall, we concluded that Technical Feasibility is **feasible**.

3.2.2 Resource Feasibility – Feasible

PenSoulutions has been developing systems for seven years and it has established a firm foundation of development team. Our developers and programmers are proficient in quickly determining the steps and necessities of the development. Most of the members of ACoN own personal computers and phones where the system can be installed. They will not have to purchase any other personal devices.

As to developing and implementing ASMS, our development team has all the resources and tools fulfilling the requirements of the system. However, purchasing the resources such as a card reader and a barcode scanner will be needed once the system is deployed. The risk of the development getting affected by not having resources on time is very low. However, ACoN and PenSoulutions must conduct a careful research to get the needed resources with the most efficiency within a given budget.



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3.2.3 Schedule Feasibility – Ideal

ACoN has not provided us with a specific due date of the development. Our goal is to complete the system before Spring. However, the system completion date overall is very flexible. ACoN also suggested that the sales-via-web piece gets released after all the core functionality of the system is finished. Our development has done analysis of the proposed system and its structure and prepared to get started on the development. PenSolutions is confident that ASMS will be fully developed by the end of Spring for ACoN to use. The constant support and maintenance will be followed after the deployment of the system.

3.2.4 Organizational Feasibility – Feasible

This section assesses the organizational feasibility of the system, how well the system ultimately will be accepted by its users and incorporated into the ongoing operations of the organization.

- **Champion – Ideal**

The project sponsor, Ms. Weltz, created the system request with a very high interest of implementing automation into her business. She has been supportive of the design and planning of the system and she is willing to make a presentation about the objectives and the proposed benefits of the system to those who will benefit directly from the system. Ms. Weltz has a high expectation of what ASMS can do to increase sales experience for ACoN. She is highly invested in the success of the system.

- **System Users (Artisans) – Risky**

Since a lot of members of ACoN have a full-time or part-time job at another place, they are not fully devoted to ACoN. Although they will gain benefits such as easy access to the system, being able to track their inventory on their personal devices, and possible increase of sales, they could be hesitant to pay the cost of implementing the system.

- **System Users (Customers) – feasible**

The users of the system, customers, will likely support the idea of being able to use their credit cards to purchase products and access ACoN online store to view available products whenever they want to. PenSolutions expects that most of the customers are familiar with the online shopping idea. Customers will benefit from the new updated website and the automated management without any loss.

Overall, there is a low risk associated with incorporating ASMS into the organization. We will mitigate the opposition by informing the stakeholders about the benefits of ASMS. The objective of the system, which is to reduce the workload and quicken the sales process, is aligned well with the management's goal of increasing efficiency of the organization. The provision of online shopping options also aligns with marketing's goal of increasing availability of products, thus increasing sales.



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3.2.5 Legal and Contractual Feasibility - Feasible

PenSoulutions retains the rights to all software manufactured. However, ACoN and PenSoulutions have We will be responsible for continuous post-implementation and maintenance support for the first six months. Since the system is customized, PenSoulutions will hand over the ownership to ACoN after the six months. The source code will only be available for PenSoulutions and ACoN. As the developers of ASMS, PenSoulutions will still be able to access the backend of the system to fix bugs and update the system based on the users' requirements.

Concerning the users' privacy and the system security, PenSoulutions and ACoN are responsible for keeping the account information only within the system. All the important information will be encrypted to prevent information leakage.

3.3 Comments

- We recommend ACoN to hire or train staff who will maintain and oversee the operation of ASMS since the organization is growing.
- Some advertisement will be needed as the users will not be aware of the improvement of the website and the addition of the new features unless they go on the ACoN website.

3.3 Conclusion

After assessing the feasibility analysis thoroughly, we concluded the development of ASMS is feasible. While major risks lie in user familiarity and developing different components of the system at once, we believe that over time these issues will be resolved as ACoN gets more experience working with ASMS. The benefits outweigh the risks associated with this system. Our analysts will be designing and researching a way to mitigate these risks throughout the whole development as we move forward to the completion of ASMS. We will be in close contact with ACoN project sponsor to discuss any occurring or potential risks of the system.



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4.0 Requirements Definition

4.1 Introduction

This section gives a more in-depth view of the functionality and characteristics of Arts and Sales Management System (ASMS). This includes functional, data, and nonfunctional requirements.

Functional Requirements: what the system must do to add value for stakeholders. It describes requirements of processes or services the system must function and output. It also focuses on the performance of the system.

Data Requirements: covers the system's interaction with the data that includes the specification about data entry, format, and storage.

Nonfunctional Requirements: what the system must be to add value for stakeholders. Nonfunctional requirements also include limitations or boundaries of the system.

4.2 Functional Requirements

- **Account Management**
 - User must be able to create an account and log into the system.
(See Use case 1)
 - User must be able to input their information into the system.
(See Use case 1)
 - ASMS must store the user information in the database. (See Use case 1)
 - User must be assigned to one of the account types (administrator, artisan, and consumer) and be presented only the information pertinent to them.
(See Use case 1)
 - Administrator must be granted a permission from the system or from the other administrators. (See Use case 1.1)
- **Inventory Management**
 - The system must generate barcodes for each item and automatically enter the data. (See Use case 3)
 - The system must store the barcodes and match the item with its barcode.
(See Use case 3)
 - The system must let the artisan edit their item description and view their inventory. (See Use case 2)
 - The system must keep track of the products that are sold and that are still in stock. (See Use case 2)
 - The system must let artisan to remove items that no longer on sale. (See Use case 4).



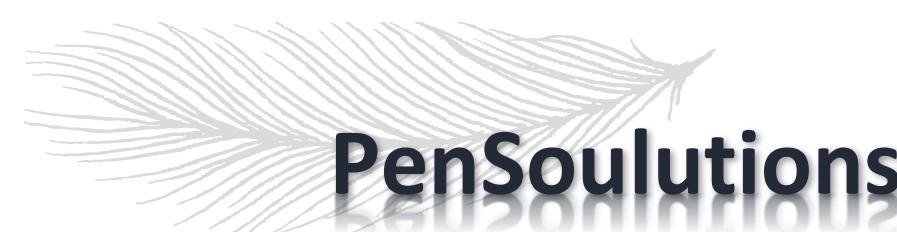
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- The system must automate inventory check-in. When an object arrives the warehouse, the user must be able to enter the data using a barcode scanner. The system must process the information and list them in a orderly manner. (See Use case 3)
 - User must be able to track their own object sales any time they want to. (See Use case 2)
 - The system should keep track of the location of products. It should let the user know if the product is available in the warehouse or in the artisan's house. (See Use case 2)
 - The system should notify the artisan if their items are out of stock.
 - The system should generate, for each artisan, a list of items that are sold and sent to the warehouse. (See Use case 5)
- **Payment Management**
 - The system must automatically pay the artisan when the payment is requested by the certain administrative members. (See Use case 6)
 - The system must calculate how much each artisan is getting paid depending on their sales. (See Use case 6)
 - The system should generate account statement and a report of sales when requested. (See Use case 5)
 - The system should alert the user when the card transaction has failed or the payment did not go through. (See Use case 7)
 - **Customer online order (Website Management)**
 - User must be able to order products using the ACoN website.(See Use case 7)
 - User must be able to view all the products posted by the ACoN artisans. (See Use case 7)
 - User should be able to select multiple products at once. (See Use case 7)
 - The system should allow the user to search for available items on a given topic. (See Use case 7)
 - The system should automatically notify users via e-mail when order has been completed. (See Use case 7)

4.3 Data Requirements

Account Information:

- The system must store account information for all users. Information stored will include username, password, first and last name, address, any credit card information the customer wishes to save, an email address, and the account type (administrator, artisan, and consumer).
 - Address will include street, city, state, zip code and country.



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- They system must store the order history for all customers registered on the website providing the date, price, and the card used to purchase an item.

Inventory Information:

- The system must store an item's owner (artisan), barcode, image, description, price, and its location.
- User must be able to track their inventory based on different categories such as alphabetical order, input date, status (sold or in stock), and type of the item.

Payment Information:

- The system must compute the total sales of an artisan by listing the number of items sold, the price, and the date it was sold.
 - Dates in all reports should be in the MM/DD/YYYY format.
- The system must generate a report of the sales including artisan's name, the amount the artisan needs to get paid given the period.
- The payment details could include statistics of how the artisan is doing in terms of their sales.

4.3 Nonfunctional Requirements

- **User interface and Human factors**
 - User must be able to order items through the website without having to contact the customer service.
 - The website must be easy to follow and supported on any web based devices such as computers, tablets, smartphones and hat users own currently.
 - The system should be flexible, being accessible to users of many skill levels and on a variety of systems.
 - ASMS should include a clear and simple sign up/login.
- **Documentation**
 - Documentation should be written concerning the use of the system.
 - Documentation could be written concerning possible questions and how to troubleshoot small errors.
- **Hardware Requirements**
 - The hardware that ASMS is installed must be connected to Wi-Fi or cellular data to run the system.



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- A barcode scanner and a card reader system must be incorporated to the system.
- The system must be portable, meaning it should be able to move to different hardware or operating system environment since ACoN will be opening booths at events or fairs.
- **Security and control Requirements**
 - All user data must be protected and passwords must be encrypted.
 - All the payment information must be confidential and only accessible to those who are associated with it.
- **Performance Requirements**
 - The system must perform quickly enough to provide an enjoyable user experience.
 - The system should not take longer than 30 seconds to be connected to a device.
 - The system must process data efficiently without any errors.
- **Operational Requirements**
 - The system must support printing barcodes
 - ASMS (the website) should be accessible on browsers such as Google Chrome, Microsoft Edge, Internet Explorer, Mozilla Firefox, and Apple Safari.
- **Quality Issues**
 - The system must be reliable and consistently perform according to its specification.
 - The system should sort out uncorrected and corrupted data.
 - The system should restart within an hour after a failure.
- **Resource and Management Issues**
 - PenSoulutions must be responsible for the system maintenance.
 - The system must automatically store and back up the data every 8 hours.
 - The system should delete unnecessary information when requested.

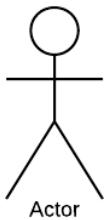
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5.0 Requirements Model

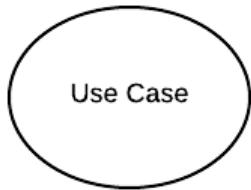
5.1 Introduction

The following section contains a use-case diagram of Arts and Sales Management System (ASMS). A use case diagram serves as a guide to how users interact with a system and what core functions a system provides. The use case description section will provide details about each use-case.

Use-Case Diagram Key:

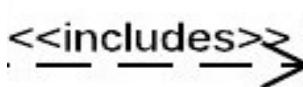


Actor - Represented with stick figures. Each actor represents a role a user of the ASMS can play. The roles include: user-without-account, customer, seller, and administrator.

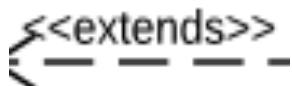


Use-case – Represented as an ellipse, each with number and title. Its title shows what function it is describing.

Association – Represented by a non-directed line. It links an actor with a use case with which it interacts.



Includes – Includes represents another relationship between use cases. It represents required functionality and are drawn from the base use case to the included use case. Sometimes simpler use cases are included as part of more complex use cases.

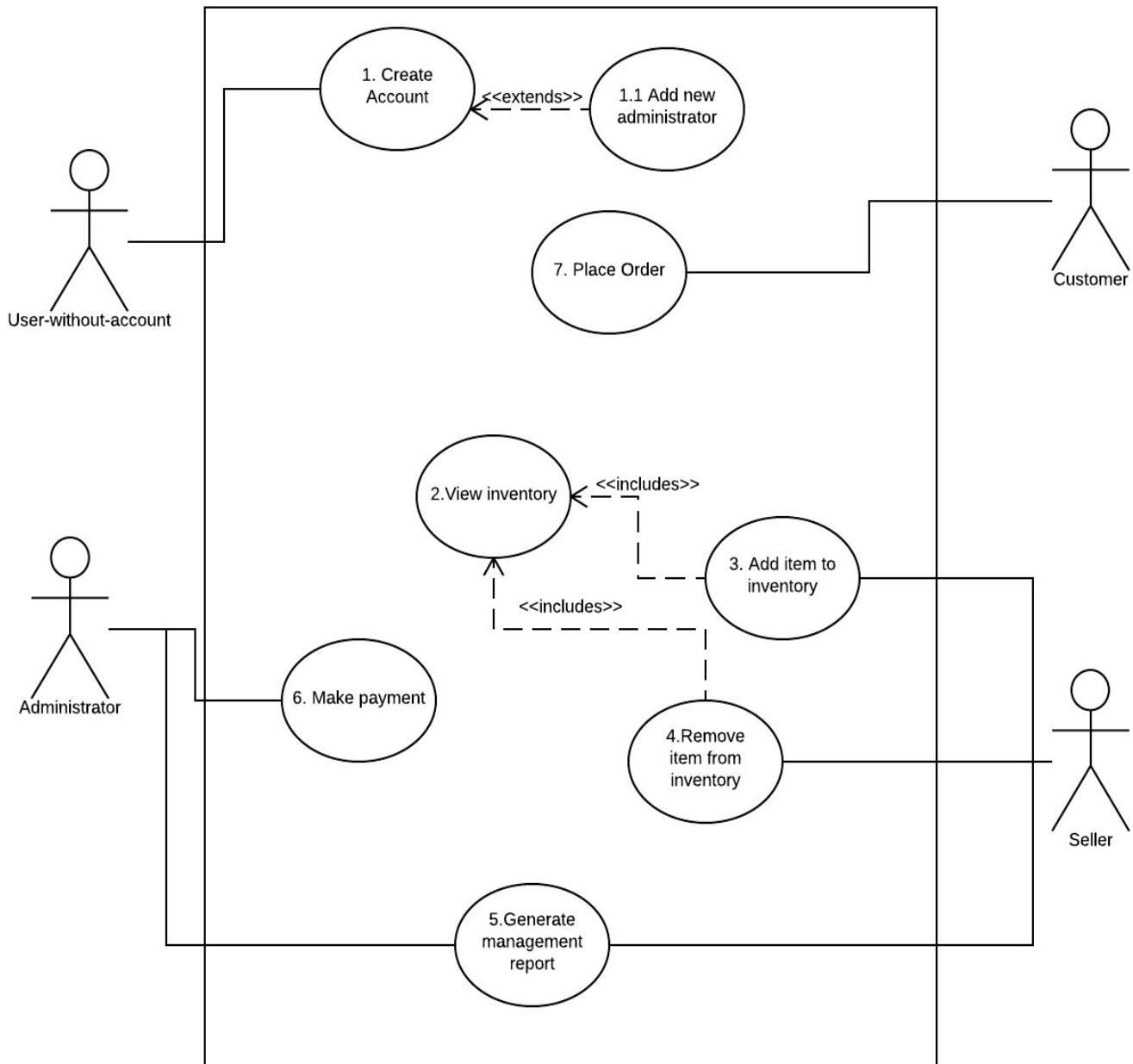


Extends – Extends represent a specific relationship between use cases. It

Comment on the diagram: User-without-account is any potential user of ASMS. Anyone who is a part of Artisan's Co-op North (ACoN) will also start with User-without-account role since this function is being integrated into the system for the first time.

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5.2 Use Case Diagram



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5.3 Use Case Descriptions

Use-Case name: Create Account	ID: 1	Importance: High		
Primary actor: User-without-account	Use-Case type: Detail - Essential			
Stakeholders and interests: User-without-Account – wants to interact with Artisan's Co-op North.				
Brief description: This use case describes the process of creating account and storing their information into the system.				
Trigger: User-without-account clicks “create account” button. Type (circle one): <input checked="" type="radio"/> External <input type="radio"/> Temporal				
Relationships: Association: User-without-account Include: -- Extend: 1.1 – Add new Administrator Generalization: --				
Normal flow of events: <ol style="list-style-type: none">1. User-without-account clicks “Sign up” button.2. User-without-account inputs their information.3. The system stores their information, sends a validation code to the entered email address.4. The system displays a text box for user-without-account to input the validation with “Resend Validation code” and “Cancel Registration” button.5. User-without-account enters the validation code.6. The system opens a window for user-without-account to choose their role. (Customer, Seller, Administrator)7. The screen displays the information of what the role can do.8. User-without-account clicks “Confirm” button.9. The system stores the account information.				
Subflows: S-2: Input information <ol style="list-style-type: none">1. Enter first and last name.2. Enter login id and password.3. Add home and email address.4. Click “Submit”				
Alternate / exceptional flows: 4-a:1. If user-without-account selects “Resend validation code”, disable the previous code and send a new validation code. 2. If user-without-account selects “Cancel Registration”, stop the registration process and remove all the information entered. 6-a: If user-without-account selects Administrator, perform 1.1-Add new Administrator				

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Use-Case name: Add new administrator	ID: 1.1	Importance: High		
Primary actor: User-without-account	Use-Case type: Detail - Essential			
Stakeholders and interests: Administrator – wants to secure the system by going through the process of adding a new administrator Sellers – wants the system to be reliable and their information to be kept safe.				
Brief description: This use case describes the process of adding a new administrator.				
Trigger: User selects a role “Administrator” Type (circle one): External <input checked="" type="radio"/> Temporal				
Relationships: Association: Administrator Include: -- Extend: -- Generalization: --				
Normal flow of events: <ol style="list-style-type: none">1. User selects the role “Administrator” in their account creation.2. The system sends the alert message to administrator to approve the user’s request to be an administrator.3. Display “pending for approval” with message “An email will be sent when administrator makes a response”.4. The administrator approves the user’s request to be an administrator.5. The system sends an email to the user.6. User opens the email.7. The screen displays “Your request has been approved please go to the link” message.8. User clicks the provided link.9. User is directed to the page to complete their account creation.				
Subflows: --				
Alternate / exceptional flows: 4-a: If the administrator disapproves the user’s request to be an administrator, display “your request has been disapproved” message. User case ends here.				

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Use-Case name: View inventory	ID: 2	Importance: High		
Primary actor: Seller	Use-Case type: Detail - Essential			
Stakeholders and interests:				
Seller – wants to view their sales and their products any time they want to. Administrator – wants to reduce manual work of having to create inventory report for seller every time seller wants to view inventory.				
Brief description: This use case describes the process of seller and administrator viewing their inventory through the system.				
Trigger: Seller clicks “Inventory” button.				
Type (circle one): <input checked="" type="radio"/> External <input type="radio"/> Temporal				
Relationships:				
Association: Seller Include: -- Extend: -- Generalization: --				
Normal flow of events:				
<ol style="list-style-type: none"> 1. Seller clicks “Inventory” button. 2. The system displays three options: “My Inventory”, “Sales Inventory”, and “Edit Inventory”. 3. The system displays inventory information depending on the seller’s choice. 				
Subflows:				
S-4: Inventory information <ol style="list-style-type: none"> 1. Display names of all the items in the system. 2. Display the date on which each item is added to the system and sold. 3. Display the number of items in stock, in the warehouse and in the seller’s house, respectively. 4. Display the items out of stock in red. 				
Alternate / exceptional flows:				
2-a: <ol style="list-style-type: none"> 1. If seller selects “Sales Inventory”, display all the inventory information that are on sale. 2. If seller selects “Edit Inventory”, the system lets seller to change inventory information including each item’s description recorded in the system. 				

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Use-Case name: Add item to inventory		ID: 3	Importance: High		
Primary actor: Seller		Use-Case type: Detail – Essential			
Stakeholders and interests:					
Seller – wants to be able to add item to inventory. Administrator – wants to automate the process of adding a new item to the system.					
Brief description: This use case describes the process of adding a new item to inventory.					
Trigger: Seller chooses to add item to the inventory.					
Type (circle one): <input checked="" type="radio"/> External <input type="radio"/> Temporal					
Relationships:					
Association: Seller Include: 2. View inventory Extend: -- Generalization: --					
Normal flow of events:					
<ol style="list-style-type: none"> 1. Perform use case 2 – View Inventory. 2. Seller clicks the “Add Item” button. 3. Item information page is displayed. 4. Seller inputs item information. 5. Seller saves the item information. 6. The system displays the item information and the items that need to be sent to the warehouse. 7. The system generates a barcode for the item and makes it available to be printed as well. 8. Seller clicks “confirm” button. 9. The system stores the created barcode with the item description. 					
Subflows:					
S-4: Item information <ol style="list-style-type: none"> 1. Seller inputs the item name, the number of the item available and how many will be sent to the warehouse. 2. Seller adds the item’s description if there is any. 3. Seller clicks “Upload picture” button if they want to upload a picture of the item. 4. The system displays a window where user can import their picture. 5. Seller selects a picture. 					
S-6: The system marks the items that seller need to send to the warehouse as “to be sent”.					
Alternate / exceptional flows:					
7-a: If the system is not connected to a printer, display “There is no printer connected to the system”.					



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Use-Case name: Remove item from inventory		ID: 4	Importance: High		
Primary actor: Seller		Use-Case type: Detail - Essential			
Stakeholders and interests: Seller – wants to be able to remove items they are no longer selling from their inventory.					
Brief description: This use case describes the process of removing item from inventory.					
Trigger: Seller chooses to remove item from inventory. Type (circle one): <input checked="" type="radio"/> External <input type="radio"/> Temporal					
Relationships: Association: Seller Include: 2. View inventory Extend: Generalization:					
Normal flow of events: <ol style="list-style-type: none">1. Perform use case 2 – View Inventory.2. Seller clicks “Select” button.3. The system displays check box next to each item in the inventory.4. Seller uses the check boxes to select items they want to remove from the inventory.5. Seller clicks “Remove item” button.6. The system display message “Are you sure you want to remove this item?” with “Confirm” and “Cancel” buttons.7. Seller clicks “Confirm” button.8. The system removes the selected items from the inventory and displays “Items are successfully removed”.					
Subflows: --					
Alternate / exceptional flows: 6-a: If seller chooses “Cancel” button, return to step 1 and use case ends there.					

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Use-Case name: Generate management report	ID: 5	Importance: High		
Primary actor: Administrator, Seller	Use-Case type: Detail - Essential			
Stakeholders and interests:				
Seller – wants to view their sales and their products any time they want to. Administrator – wants to reduce manual work of having to create inventory report for seller.				
Brief description: This use case describes the process of generating inventory and sales report.				
Trigger: Administrator or Seller click “Generate report” button.				
Type (circle one): External <input checked="" type="radio"/> Temporal				
Relationships:				
Association: Administrator, Seller Include: -- Extend: -- Generalization: --				
Normal flow of events:				
<ol style="list-style-type: none"> 1. Actor clicks “Generate management report” button. 2. The system displays options to choose from: Payment report and Sales report. 3. Actor selects one option. 4. The screen displays “From: “and “To: “asking to enter the period of start and end date of the report is generated for. 5. Actor enters the dates. 6. The system then displays all the names of sellers that actor can request a report for. 7. Actor clicks on the name of seller to get a report. 8. The system creates a report for the assigned period and displays message “Report has been successfully generated”. 				
Subflows: --				
Alternate / exceptional flows:				
4-a: If actor inputs invalid dates, display “Invalid dates entered. Please re-enter start and end date”.				

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Use-Case name: Make payment		ID: 6	Importance: High		
Primary actor: --	Use-Case type: Detail - Essential				
Stakeholders and interests: Seller – wants to receive payment for their sold items. Administrator – wants to reduce manual work of having to pay					
Brief description: This use case describes the process of making payment to seller					
Trigger: The first day of every month at 9:00 am.					
Type (circle one): External <input checked="" type="radio"/> Temporal					
Relationships: Association: Administrator Include: -- Extend: -- Generalization: --					
Normal flow of events: <ol style="list-style-type: none">1. The system alerts administrator to make payment to seller on the first day of the month at 9:00 am.2. Administrator clicks “Review payment” button.3. The system displays the payment detail for each seller.4. Administrator clicks “Pay all seller” button.5. The system initiates payment process and displays “Payment has been initiated”.					
Subflows: S-3: Payment details. <ol style="list-style-type: none">1. The screen displays the amount of total sales of seller, the amount that seller is getting paid, the amount that is going to be remained with the organization. S-5: Payment Process. <ol style="list-style-type: none">1. The system sends a request for transfer to the bank that Artisan's Co-op North has account with.					
Alternate / exceptional flows: 3-a: If the amount of payment is incorrect, click “Edit amount” and correct the amount that is paid to seller. 4-a: If Administrator doesn't want to pay all the seller, click the payment detail of seller then choose “Pay seller”.					

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Use-Case name: Place order		ID: 7	Importance: medium		
Primary actor: Customer	Use-Case type: Detail - Essential				
Stakeholders and interests: Customer – wants to buy products online. Seller – wants to sell as many as items possible. Administrator – wants to increase sales of items available in the organization.					
Brief description: This use case describes the process of customer placing an order.					
Trigger: Customer selects an item to purchase.					
Type (circle one): External Temporal					
Relationships: Association: Customer Include: -- Extend: -- Generalization: --					
Normal flow of events: <ol style="list-style-type: none"> Customer selects an item to view. The screen displays item details with “Proceed to order”. Customer submits an order to be processed. (Clicks “Proceed to order” button). The system displays the shipping and payment information of customer. Customer clicks “Confirm”. The system generates an order confirmation notice indicating the status of the order. The system notifies seller of the item purchased and administrator. The system sends email confirmation notice to the customer. 					
Subflows: S-1: Selecting item <ol style="list-style-type: none"> Customer adds the item to their shopping cart. The system displays items relative to the customer's viewed items and search history. Repeat step 1 and 2 until Customer is done shopping. When done, go to step 2 in normal flow. S-4: Customer information <ol style="list-style-type: none"> System verifies customer information. (existing email address, valid credit card number) 					
Alternate / exceptional flows: <p>4-a: 1. If there is no shipping information entered, ask the customer to enter their address.</p> <p>2. If there is no payment information entered, ask the customer to enter their credit card information.</p> <p>3. If credit card number is invalid or the payment did not go through, notify customer and ask for another credit card information.</p>					



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6. System Evolution

The following are post-installation plans for support and maintenance of the system. As Artisans North Co-op (ACoN) grows in terms of their sales and its members, Arts and Sales Management System (ASMS) will need to adjust its requirements and expand its performance boundaries. This section includes ideas and plans about upgrades, maintenance, and extra features of the system. There are not to be integrated into the first version of the system.

6.1 Upgrades and Maintenance

- 1) Upgrading the website: As we release the first version of the system, we will be working on the second version of the system which will include online shopping feature. This will enable customers not only view the items available but also order items without having to visit events or craft fairs. We will also be responsible for making the website available on smartphones and tablets.
- 2) Improving the system by feedback: We value our users' comments and feedback and we will seriously take those to improve our system. It could be adding new features or altering the way the system functions. Our goal is to provide a system that is user-friendly and useful for the system users.
- 3) Maintaining the system: we will have a group of developers who can focus on maintenance of the system. We will be maintaining the system from fixing bugs to coming up preventive plans for possible failure of the system. Also, we will be adjusting the system up-to-date so that the system remains compatible.

6.2 Additional Features

The following features are additional features that could enhance the business. It is only suggested, but not required by Artisan's Co-op North. PenSolutions has identified the following possible enhancements for ASMS:

- 1) 360 live Camera – for the warehouse where the products are stored, 360 live camera can be installed and used to take a live video or picture. Customers will be able to view the place as if they are in the warehouse and enable them to look every side of products.
- 2) Integration of delivery system – The system can have a feature that connects the customer's order to a delivery company. It will reduce the work of having to use mailing service to send every item ordered.



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- 3) Customer management system – The system can manage and summarize each customer's activities to improve the relationship with loyal customers. The system can also find what items customer tend to look for and provide recommendations based on their search history.

7.0 Conclusions and Recommendations

7.1 Conclusions

PenSoulutions is confident that, after performing feasibility analysis and figuring out its requirements, the development and implementation of Arts and Sales Management System (ASMS) will benefit Artisan's Co-op North (ACoN). The risks of the development have been measured and there should not be major risks involved during the development process if the risks are handled and prevented as recommended. PenSoulutions and ACoN have together successfully laid out all the necessary requirement of the first version of the system and completed the detailed use case descriptions. We also have post-installation support plans to ensure the success of the system. Our stakeholders have shown support for the development of the system and we believe that the system will fulfill the vision of ACoN and at the same time contributing to the organization's growth.

7.2 Recommendations

We here at PenSoulutions recommend the immediate development of ASMS for ACoN. Also, consider following recommendations:

- Ensure that the system is secured at any point of the development. We want to make sure that the system is reliable so that clients are comfortable with handing over the personal information to the system.
- Continually evaluate risk throughout the development process. Even though we assessed initial and potential risks, keep in mind that risks can appear in an unplanned way.
- Keep communicating with our client Ms. Weltz and other stakeholders. As the system develops, their requirements might change or new requirements might appear.
- Ms. Weltz and ACoN should present any suggestions for modifications or additional features as soon as possible.
- Once the system is approved by Ms. Weltz, initiate further design and development and perform risk analysis.



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Glossary

1. ACoN – Artisan's Co-op North
2. ASMS, Arts and Sales Management System - the name of the proposed system
3. System – a collection of interconnected parts, with an identifiable boundary that work together to achieve a desired outcome
4. Software – vehicle that delivers information. a part of a computer system that consists of data or computer instructions, in contrast to the physical hardware from which the system is built.
5. Application Software - also known as an application or an "app", is computer software designed to help the user to perform singular or multiple related specific tasks.
6. Web-based System – A system that its core functions are built through web pages, using web technology.
7. Stakeholder – Anyone who may be affected by either the success or failure of the system
8. Browser – A software application used to access and navigate the world wide web



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