
University of Louisville School of Nursing

SoNsys Vision (Small Project)

Version <1.0>

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SON System Vision	

Revision History

Date	Version	Description	Author
09/Sept/16	<1.0>	First pass at Vision Doc	Tim Mahan Rebecca Ludwig Ajay Singh Chris Meany

SoNsys	Version: <1.0>
Vision (Small Project)	Date: 09/Sept/16
SON System Vision	

Table of Contents

1.	Introduction	3
1.1	References	3
2.	Positioning	3
2.1	Problem Statement	3
2.2	Product Position Statement	3
3.	Stakeholder and User Descriptions	3
3.1	Stakeholder Summary	3
3.2	User Summary	3
3.3	User Environment	3
3.4	Summary of Key Stakeholder or User Needs	3
3.5	Alternatives and Competition	3
4.	Product Overview	3
4.1	Product Perspective	3
4.2	Assumptions and Dependencies	3
5.	Product Features	3
6.	Other Product Requirements	3

Vision (Small Project)

1. Introduction

The purpose of this document is to collect, analyze, and define the high level features of the SoNsys system and the needs it will fulfill for the stakeholders involved, as well as explain why these are real needs and how the proposed solution benefits all who are involved.

The current process of tracking students throughout their academic career at the School of Nursing is a complex, time consuming activity that leaves a very heavy workload for the handful of advisors that oversee the progress of hundreds of students each year at the school. Individual Excel documents need to be created and maintained for each student, meaning that not only do advisors have to create the documents and maintain them, advisors must also manually open each student's documents every time a request is made by a student for information regarding their academic progress, standing, and compliance.

The purpose of creating a new system is to improve the workflow for advisors, and make certain tasks like fulfilling a student's request for their program GPA can be met with speed, efficiency, and convenience on the part of advisors. We want to redistribute the data entry work, which would save the advisors a considerable amount of time in getting students prepared to enter the college, as well as simply tracking any given student's progression through their chosen program of study.

To start with, students should be charged with entering their own information into a web form online prior to orientation. The only information an advisor should have to enter would be a student's GPA upon entering the school, which comes from PeopleSoft. This reduces the data entry workload of advisors greatly.

Next, Professors should have access to an interface to upload student's grades (or if available we'll interface with Blackboard) so that the entry of every student's final grade for every class would not be left up to the five or six advisors, but rather the professors who already submit the grades to PeopleSoft.

SoNsys	Version: <1.0>
Vision (Small Project)	Date: 09/Sept/16
SON System Vision	

Tracking marketing efforts are also something we want implemented into the system, nothing that has to be very complicated, but rather simple so information regarding how a student heard about the program can be passed along to the University marketing department.

Finally, Advisors should also be able to access the database through their part of the site, allowing them to track each student's progress through whichever program they may enroll in. Advisors should be able to see what courses students have enrolled in, what they've passed and with what grade, as well as track students who have fallen out of compliance with such requirements as immunizations and current CPR certifications.

In order to properly track all of this information for each student, this system will also serve to centralize student information. Where currently each student has their own excel document and tracking must be done by updating the documents individually, we will provide a system that stores and tracks all student information where advisors can gather whatever information they could possibly need.

1.1 References

- 1) [Access 2016 Specifications](#), Accessed 9/10/2016, Microsoft
- 2) IT Strategic Assessment, 4/10/2016, Brett Leger

2. Positioning

2.1 Problem Statement

The problem of	Heavy data entry by advisors, data redundancy, large potential for data integrity issues
affects	School of Nursing Advisors and students
the impact of which is	Students fall through the cracks at the school, advisors spend large amounts of time entering data when they could be advising students, students and advisors can't always depend on data stored due to excel formatting issues, slower responses when students request certain information, etc.
a successful solution would be	Less data entry for School of Nursing advisors, greater data integrity, less redundancy, easier access to database for most advisors, centralized student data, accurately track student progress through program, and backed up database.

2.2 Product Position Statement

SoNsys	Version: <1.0>
Vision (Small Project)	Date: 09/Sept/16
SON System Vision	

For	School of Nursing advisors.
Who	Need a more centralized way to enter and track student data/progress through nursing programs.
The SoNsys	Is a web front end for a database which houses all relevant student information
That	Will significantly reduce the amount of time advisors spend on data entry and upkeep.
Unlike	The current system
Our product	Will store the data centrally, query easily, track student progress, and send out automatic alerts when student is out of compliance,

3. Stakeholder and User Descriptions

3.1 Stakeholder Summary

Name	Description	Responsibilities
Admissions Council	These are the people who decide who makes it into the upper division and graduate programs	Use information provided by the Advisors to decide who will progress through the school of nursing and who will not.
Students	Those who are tracked in the system	Enter initial information into the system
Marketing Team	Track efforts of University advertisement efforts	Use data provided by advisors to ensure money is being well spent on efforts to advertise the school of nursing and its programs.

3.2 User Summary

Name	Description	Responsibilities	Stakeholder
Advisors	These are the individuals who will utilize the system the most for tracking purposes.	Ensure data submitted by students is correct (specifically a student's GPA) Produces reports and query database to ensure students maintain minimum GPA requirements. Ensure students have valid CPR certification and are up to date on immunizations.	
Students	These are the individuals the system will track	Enter data upon registering for orientation. Maintain current immunizations and	Advisors

SoNsys	Version: <1.0>
Vision (Small Project)	Date: 09/Sept/16
SON System Vision	

		submit relevant documents to SoN upon request. Maintain CPR certifications.	
Professors	Instruct/Evaluate students	Update students grades in database at the end of each semester	

3.3 User Environment

There are currently five people who utilize the current system on a regular basis (not including IT staff at the School of Nursing). This will likely remain the same after the implementation of this system. Right now these are advisors who primarily work through the Access database, Excel Spreadsheets, and email.

Advisors create the spreadsheets for lower division students when their information comes in from the University after students register for orientation. These sheets include the classes students must take to complete the program, GPA, and any other important student information. Next the advisors meet with lower division students to help them enroll for their first semester and get students off to a start in their academic career. These sheets are updated regularly to reflect progress, semester by semester. If students later successfully enroll in the upper division program, their information gets moved to an Access database where their upper division progress is tracked. Any further education beyond the upper division is also tracked through this Access Database.

The only really unique constraint is going to be our lack of ability to directly interface our system with PeopleSoft. There is apparently a way to export excel documents (hopefully that means .csv files) which would make taking data from PeopleSoft feasible, though perhaps not convenient or automated in the terms of generating the file we would like to import to our database.

The system in place today consists of an Access database used to track upper division students and a bunch of Excel documents that each keep track of a single student's progress through the program that are all hosted on a Sharepoint server. The other major component of this system is a lot of manual effort by advisors to keep up with the students, their grades, GPAs, and compliance.

Other systems in place today are Blackboard and PeopleSoft. Blackboard is used by professors to keep up with student grades and submit the student's final grade to the PeopleSoft database. PeopleSoft is the University's database that keeps record of all students and their information. PeopleSoft is fairly closed, so we may not be able to make use of it.

3.4 Summary of Key Stakeholder or User Needs

Needs:

- Need to offset/automate data entry for Advisors
 - Currently, Advisors have to keep track of student data manually, meaning they enter data manually for each student when the student registers for orientation
 - Solution: Have the students fill out the relevant information the school will need online to keep track of before student orientation
 - Once student has filled out required information by school, create new students entity in the database and associate the relevant schedule of classes with the student
 - Advisors must also manually enter grades for each student at the end of every semester in individual spreadsheets.

SoNsys	Version: <1.0>
Vision (Small Project)	Date: 09/Sept/16
SON System Vision	

- Add tracking of student progress to the functionality of the program.
 - If a student no longer meets requirements involving CPR certification or minimum GPA requirements, advisors must manually keep track of that information in excel spreadsheets
 - Automating alerts that email students when they are out of compliance would reduce the effort required currently by nursing advisors to make sure students are compliant.
- Need to make it easier to find student program GPA
 - Currently, advisors must find each student's excel sheet and double check the GPA calculations as they have had integrity issues with the template they use in the past.
 - By creating a central location to store ALL student information, we can create the GPA calculation formula once and have a simple query advisors to run, which returns the selected student's program GPA.

3.5 Alternatives and Competition.

- Keeping the status quo
 - Strengths
 - They don't have really have a budget, so keeping the status quo means they don't have to spend anything
 - Weaknesses
 - Still have data integrity problems from bad templates and large amounts of manual data entry
 - Difficulty keeping track of student's progress
 - Difficulty determining which students remain out of compliance with immunizations and CPR certs
 - Difficulty keeping up with which students no longer meet GPA requirements
 - Slow response times getting information like program GPA to students
- Building their own system

(It's true they have an IT person, but his skill level and abilities are unknown)

 - Strengths
 - School would have complete control of the system, ultimate ability to customize as time progresses
 - Cheaper (in terms of a dollar amount) to build their own
 - Weaknesses
 - It would likely take longer to design and implement (considering it'd be one person versus the teams of people working on this in our class)
 - Difficult to actually implement and maintain when you're using one full time IT guy.
- They could simply update the Access software and migrate all programs to use a single Access database.
 - Strengths
 - Cheap

SoNsys	Version: <1.0>
Vision (Small Project)	Date: 09/Sept/16
SON System Vision	

- o Easier to implement than designing a whole new system
- o Familiarity with the Access program
- o Linking Access databases allows for more data storage

Weaknesses

- o Access databases can only be 2GB a piece in size(1)
- o Linking tables in separate Access databases opens the door for data integrity issues depending on how data is structured
- o No convenient web interface

4. Product Overview

4.1 Product Perspective

The SoNsys program will be a part of a larger system. I will likely not have any direct interface with Blackboard or Peoplesoft, but data from both of these systems will be entered into the database.

SoNsys will also have a web interface for at least two groups of people, these will be the Professors who will use the system to upload students' grades at the end of each semester, and the advisors who maintain the data once the students have been enrolled. For professors, the interface will be simply for uploading the student's final grade. The advisors will then be able to log into the web client to view and update student information as needed.

Another interface will be provided for system admins. This interface will allow for changes to the internal components of our system. This will not be intended for the advisors, but rather their IT person or the person responsible for maintaining the system we create once implemented. This interface will allow for several features, including storage maintenance, adding/removing users, and updating the system (should we implement third party software such as mysql or SQL server that benefit from regular security updates.)

4.2 Assumptions and Dependencies

We will not be able to directly import data from PeopleSoft.

Advisors will be doing a majority of student data entry

We are also assuming that there is an extremely limited budget for purchasing hardware and software. Currently the hardware we'd like to use is just the server they already have, which should run the software our system will use with no problems.

If there is a budget, it would be best if we spent the money on some hardware and bought a desktop server and any needed plugins for Joomla to make integration with our database easier.

The server has some form of current Windows or Debian based Linux operating system, if this is not the case, we'll have to reevaluate whether or not our system will run on it properly.

5. Product Features

- 1) Login pages for advisors, students, and professors
- 2) Interface for professors to submit grades
- 3) Premade queries
- 4) Ability to create adhoc queries (for advisors)
- 5) Ability to import data from .csv files and other excel files to database (profs and advisors)

SoNsys	Version: <1.0>
Vision (Small Project)	Date: 09/Sept/16
SON System Vision	

- 6) Reporting that can detail GPA violations, CPR certs out of compliance, which students aren't enrolled
- 7) Automatic report generation that goes out to certain advisors during the week before open enrollement closes
- 8) Ability to export reports into Excel files
- 9) Update student records
- 10) Advisors can add students into the database from their interface (in case one needs to be added later on)
- 11) Ability for system administrators to create new users/give specific permissions
- 12) Password reset email process
- 13) Automatically generate emails that go out to student and advisor when a student falls out of compliance
- 14) Email templates
- 15) Tracking for students' progress through selected program
- 16) Upon program completion, students will be automatically marked as "Graduated" and a list will be emailed to advisors to review
- 17) School admission application submission
- 18) Scholarship application submission
- 19) Track if scholarships are renewable and whether or not student is eligible to receive
- 20) Track marketing efforts
- 21) Help documentation
- 22) Change how reports are viewed (graphs, lists, etc)
- 23) Automatic email is generated when admission application is submitted
- 24) Expandable storage for database growth
- 25) Link to main admission page for the University
- 26) Generate automatic email to ask alumni for donations

6. Other Product Requirements

HARDWARE

- Server – specs unknown (save for 3 TB hard drive), location unknown, existence unconfirmed (2)

PLATFORM REQUIREMENTS

Operating System	Windows 7, 8, 8.1, or 10 Linux Mint 17.1 ,17.2, 17.3, Ubuntu14.04 or greater Ubuntu Server
Processor	Intel i5 or i7
Memory	8GB
Storage	1TB for data storage

SoNsys	Version: <1.0>
Vision (Small Project)	Date: 09/Sept/16
SON System Vision	

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PERFORMANCE REQUIREMENTS

- Response time must be 5 seconds or less for any transaction over the network.
- There will be 1000 simultaneous users at peak use times
- Typical transaction will require the transmission of 500k of data
- The system should be available 24/7 with the exception of scheduled maintenance periods
- System will have 95% uptime performance or better.
- System database will be scalable up to 2 TB at the least.

CONSTRAINTS

- We cannot interface directly with PeopleSoft
- FERPA may prevent us from actually hosting student academic information on a non-university server.
- There isn't really a budget we're aware of, so we don't know how much we can spend.
- HIPAA regulations will prevent us from storing student medical information.

DOCUMENTATION

- Help for students getting started with initial data entry
- Help for Advisors with data queries, entry and updates. As well as clear error codes and an online "book" for advisors to search through in order to determine what the cause of certain errors are.
- Help for professors getting grades entered at the end of the semester
- Detailed system documentation for administrators such as the IT personnel at the school of nursing who may be charged with the upkeep of the system.

SoNsys	Version: <1.0>
Vision (Small Project)	Date: 09/Sept/16
SON System Vision	

Appendix A

The following sections of this Vision Document detail the feasibility of the SONsys project in three aspects. First, we will describe the technological feasibility, including the project's size, compatibility of this project with other systems currently in place, and how our system will work alongside the systems currently in place.

Next we will describe the economic feasibility of the project. This will include a cost/benefit analysis which will detail all costs, and all benefits over the next 5 years starting from year 0 (which will be the year we develop/implement this new system).

Finally, we will discuss how we perceive the completed project will be received by the end users. This will really boil down to whether or not we think people will actually use the new system, and why we believe they will find the new system

Technological Feasibility:

From a technological standpoint, the project looks good. It's going to be a mid-size project, which includes a database that we will create on already existing hardware, and web pages that will access the database, allowing multiple users to utilize the database from whatever machine they choose on the school's network.

This will be a self-contained system that will not directly interface with any existing systems (due to the nature of currently existing systems in the University). This means a simpler implementation process in the system (as we don't have to worry about connecting directly to PeopleSoft). We will use a Windows Server and the latest Microsoft SQL server, as well as Microsoft's web server (IIS) to host all of the web pages utilized by the School of Nursing. Backing up data is also a huge concern, as currently, there are no backups for the data created by the school of nursing team. In order to provide offsite backups of critical student data, we will utilize a cloud based backup service in Microsoft Azure. The data will be stored offsite in the same region in which the school resides. This will

SoNsys	Version: <1.0>
Vision (Small Project)	Date: 09/Sept/16
SON System Vision	

be relatively simple to implement as Azure is a Microsoft product with a tool specifically designed to generate backups of SQL servers and whole servers if need be.

Our team is also (at least for the most part) fairly familiar with the functions of a database and how to put one together. The users are also familiar with database concepts, which should bode well in terms of

Organizational Feasibility:

Organizationally speaking, this system should be an overall success. It is specifically designed to assist with tracking students as they progress through the nursing programs offered by the School of Nursing, which is the biggest obstacle advisors seem to face in retaining and graduating students. Because the School is so student focused, a system such as ours will align perfectly with their current business strategy.

The end users of the system will be able to more quickly view any particular students' data when they receive an inquiry from the student about a particular aspect of their progress. The system will also allow advisors (end users) to pull reports on student data, they should be able to view all students who have failed a class in a given semester, as well view students who enrolled in the previous semester, but not the current semester. What our end users gain is the ability to reach out to students who haven't re-enrolled sooner than they were able to do previously, see who is failed what class, and finally, they will be able to generate reports to aid in future decision making, that may lead to a greater retention of students.

The management of the School of Nursing will have access to more data with our system. This data can be used to aid in the determination of possible causes of attrition at the school, and could help management take steps to minimize attrition as much as possible. With attrition minimized, the revenue generated from tuition is increased, meaning more funding for expanding the program, funding for tutoring programs, or funding for more supplies at the school.

Finally, students will benefit from our new system. If a student decides to take a semester off, this can set their graduation from the school nursing back by as much as a full calendar year as certain classes are only offered during certain parts of the year. If a student is unaware and takes a semester off, then later discovers their graduation has been pushed back an entire year, it may be enough to make any given student drop out of nursing to pursue another degree that could be obtained sooner. With this system, advisors will be able to intervene before this potential problem becomes reality for nursing students, allowing the students to graduate with their preferred degree.

Economic Feasibility

Iteration 2							
Economic Feasibility							
Benefits	0	1	2	3	4	5	Total
Students	60,000	60,600	61,206	61,818	62,436	63,061	\$ 369,121
Grants	15,000	15,150	15,302	15,455	15,609	15,765	\$ 92,280
Total	75,000	75,750	76,508	77,273	78,045	78,826	\$ 461,401
PV of benefits	75,000	71,127	67,454	63,970	60,666	57,533	\$ 395,750
PV of all benefits	\$ 75,000	\$ 146,127	\$ 213,580	\$ 277,550	\$ 338,217	\$ 395,750	
Costs							
Licenses	-	1,620	1,782	1,960	2,156	2,372	\$ 9,890
PV of Op	-	1,521	1,673	1,840	2,024	2,227	\$ 9,286
Labor	23,800	-	-	-	-	-	\$ 23,800
Total	\$ 23,800	\$ 3,141	\$ 3,455	\$ 3,800	\$ 4,180	\$ 4,599	\$ 42,976
PV of Op	\$ 23,800	\$ 2,949	\$ 3,046	\$ 3,146	\$ 3,250	\$ 3,357	\$ 39,548
ROI	215.13%	2311.56%	2114.25%	1933.29%	1766.93%	1613.89%	
Yearly NPV	\$ 51,200	\$ 68,177	\$ 64,407	\$ 60,824	\$ 57,417	\$ 54,177	