Skills Inventory Tracking System

Requirements Document

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1. Introduction

1.1. Abstract
The Skills Inventory Tracking System (SITS) tracks the progress of nursing students as they learn and develop proficiency in specific nursing skills. The system involves both PDAs and PCs. The system allows nursing faculty to confirm that students have acquired certain skills by "signing off" on the student's PDA. This verification must be secure. Students can view the list of successfully acquired skills on their PDAs. The PC component of the system will enable students to sync, view, save, and print their current skill lists, and to upload them to a central database housed on a CNHP server. Faculty and administrative staff can view individual, group or aggregate records in order to identify student learning needs.

1.2. The Purpose of This Document
This document specifies the requirements of SITS. It details all functionality that the SITS program includes, as well as all constraints on the development and use of the system.

1.3. Goals
The Skills Inventory Tracking System is an easy to use program for the College of Nursing and Health Professions to track the progress of its students. Students must be able to view their own progress from their PDA or from the SITS website. Faculty members must be able to view the progress of their students, as well as generate aggregate reports on the progress of all students. The system must be secure so that students cannot "sign off" on skills without a faculty member.

1.4. Scope
SITS is designed specifically for the Drexel University College of Nursing and Health Professions. Users of the program must be students or faculty of CNHP; it is not intended for use by other organizations. The applications will be designed for use with the students' PDAs and to run on CNHP servers.

2. Functional Requirements

2.1. Users
Every SITS user account has the following information associated with it:
2.1.1. **Name:**
The first and last name of the user.

2.1.2. **Username:**
The nickname used to log into the system. Usernames must begin with a letter but may contain both letters and numbers. Usernames must be between 6 and 16 characters in length. SITS is designed for use with Drexel usernames in order to provide consistency with other Drexel systems. However, since SITS does not have a mechanism for validating usernames with Drexel and since some instructors may not have Drexel accounts, it is possible to provide users with new usernames. Example usernames may be cso42 and jsmith.

2.1.3. **Password:**
Passwords are used to authenticate SITS users. Passwords may consist of both letters and numbers and must be between 6 and 16 characters in length.

2.1.4. **E-mail Address:**
Users' e-mail addresses are stored so that they can be notified of errors (e.g. a skill request was made for a skill that is no longer active) and so users can contact each other (e.g. an instructor can see his students' e-mail addresses in the Group Management Page).

2.1.5. **User Types:**
Each user is one of the following types:

2.1.5.1. **Student:**
Students use the SITS website to view their skill sheets and check for outstanding skill requests. They also use the PDA application to have instructor's sign off on their skills.

2.1.5.1. **Instructor:**
Instructors use the SITS website to approve students' skill requests.

2.1.5.1. **Administrator:**
Administrators have the same access as instructors. They can also add and remove users and skills from the system and view reports on student's progress.

2.2. **Skills**
SITS tracks the skills that each CNHP nursing student has demonstrated during his academic career.

2.2.1. **Category:**
A category is a logical grouping of skills. Each skill belongs to a category.

2.2.2. **Status:**
For a student to be considered proficient at a skill, he must demonstrate use of the skill five times. Thus, each student/skill pair in the system has five status fields associated with it. The possible statuses are Empty, Signed, Awaiting Approval, and Approved.

2.2.2.1. **Empty:**
When a skill or student is first created, all status fields are set to Empty. This status represents a skill that has not been demonstrated by the student.

2.2.2.2. **Signed:**
When a student demonstrates use of a skill and an instructor signs off on the skill using a PDA, the skill's
status changes from Empty to Signed.

2.2.2.3. *Awaiting Approval:*
When a student syncs his PDA with the server, the signed skills on his PDA are uploaded. These skills change from the Signed status to the Awaiting Approval status. Skills that are Awaiting Approval appear in the instructor's inbox.

2.2.2.4. *Approved:*
When an instructor approves a skill request through the SITS website, the skill's status changes from Awaiting Approval to Approved. The Approved status signifies that the student has received credit for the skill.

2.2.2.5. *Denying a Skill Request:*
The instructor has the option to deny skill requests that have the Awaiting Approval status. If he does this, the skill status changes back to Empty.

2.2.3. *Deleting Skills:*
Skills in the SITS system cannot be explicitly deleted. This is designed to prevent the deletion of a skill from eliminating information on student progress. Instead, skills can be set to Active and Inactive states. To the user, Inactive skills do not appear to exist in the system. However, the statuses of Inactive skills are retained. If an Inactive skill is changed back to Active, all skill approvals are treated as if the skill had never been in the Inactive state.

2.2.4. *Deleting Categories:*
Like skills, categories cannot be deleted. Instead, categories also have Active and Inactive states. When a category is Inactive, all skills belonging to that category are also set to Inactive.

2.3. Web Component

2.3.1. Common Pages
This section describes pages and features which are accessed by all users of the system - Students, Instructors, and Administrators - or can be reached from other pages that any of the three user types access.

2.3.1.1. Login Page
The Login page is used by the user to access his account. The following figure displays this page:
The Login Page consists of two text fields, *Username* and *Password*, and a *Login button*.

2.3.1.1.1. **Username:**
A text field accepting the user's ID.

2.3.1.1.2. **Password:**
A password field accepting the user's password.

2.3.1.1.3. **Login Button:**
The *Username* and *Password* fields are verified when the user presses this button. If the *Username* and *Password* fields are verified successfully, then the user is directed to one of the following pages:

- Students are directed to the [Student Page (2.3.2.1.)](#)
- Instructors and Administrators are directed to the [Instructor Page (2.3.3.1.)](#)

Otherwise, the user is prompted with "Authentication Failed" as shown in the following figure:
2.3.1.4. Sessions:
When a user successfully logs into the system, a session is created. If a user tries to access any page without a valid session, he is redirected to the Login Page. Likewise, if a user has a valid session but attempts to access a page that he does not have permission for, he is redirected to the default page for his user type.

Once a session is created, it can be invalidated by clicking the Log Off link in the Navigation Panel. Sessions are also automatically invalidated if the user is inactive for 20 minutes.

2.3.1.2. Page Layout:
The web site has the same general layout for each user type. The Navigation Panel is on the left side of the screen and allows users to access different pages. The Main Panel takes up the rest of the screen and contains varied content accessed through the Navigation Panel. The Message Panel displays information to the user above the Main Panel, but it is only displayed when required.

2.3.1.2.1. Navigation Panel:
The Navigation Panel contains a list of hyperlinks to the main content of the website. Which links are displayed depends on the type of user logged into the system. The hyperlink corresponding to the page currently being displayed in the Main Panel is displayed as text only, so it cannot be clicked on.

2.3.1.2.1.1. Student Navigation Panel:
If the user is a student the following hyperlinks are available:

<table>
<thead>
<tr>
<th>Hyperlink Text</th>
<th>Destination Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills</td>
<td>Student Page</td>
</tr>
<tr>
<td>Change Password</td>
<td>User Information Page</td>
</tr>
</tbody>
</table>
2.3.1.2.1.2. Instructor Navigation Panel:
If the user is an instructor the following hyperlinks are available:

<table>
<thead>
<tr>
<th>Hyperlink Text</th>
<th>Destination Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inbox</td>
<td>Instructor Page</td>
</tr>
<tr>
<td>Group Management</td>
<td>Group Management Page</td>
</tr>
<tr>
<td>Change Password</td>
<td>User Information Page</td>
</tr>
<tr>
<td>Log Off</td>
<td>Login Page</td>
</tr>
</tbody>
</table>

2.3.1.2.1.3. Administrator Navigation Panel:
If the user is an administrator the following hyperlinks are available:

<table>
<thead>
<tr>
<th>Hyperlink Text</th>
<th>Destination Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inbox</td>
<td>Instructor Page</td>
</tr>
<tr>
<td>Group Management</td>
<td>Group Management Page</td>
</tr>
<tr>
<td>Skill Management</td>
<td>Skill Management Page</td>
</tr>
<tr>
<td>User Management</td>
<td>User Management Page</td>
</tr>
<tr>
<td>Queries</td>
<td>Query Page</td>
</tr>
<tr>
<td>Archiving</td>
<td>Archiving Page</td>
</tr>
<tr>
<td>Change Password</td>
<td>User Information Page</td>
</tr>
<tr>
<td>Log Off</td>
<td>Login Page</td>
</tr>
</tbody>
</table>

2.3.1.2.1.4. Log Off:
The last item displayed in the list of hyperlinks is Log Off, regardless of the user type. This hyperlink displays the Login Page (2.3.1.1.) when clicked by the user. The user's session is invalidated so that he is unable to retrieve any information from the website without logging in again.
2.3.1.2.2. *Message Panel:*
The Message Panel runs along the top of the page. This panel is used to display messages to the user. If there is no message to display, this panel takes up no space and the Main Panel fills the space where it would have been.

2.3.1.2.3. *Main Panel:*
The Main Panel is the place where the content of the site is displayed. It is located to the right of the Navigation Panel. When a user clicks on one of the hyperlinks in the Navigation Panel, the corresponding page is displayed in the Main Panel.

2.3.1.2.4. *Logo:*
The SITS logo is displayed in the upper left corner of the screen.

2.3.1.2.5. *Username:*
The text "Welcome, [USER]" is displayed in the top right corner of the screen. [USER] is the first name of the user logged into the system.

2.3.1.3. *Confirmation Page*
This page is used to prompt the user regarding an action. A message is displayed and the user can choose "Continue" or "Cancel".

![Confirmation Page](image)

*Figure 2.3.1.3. Confirmation Page*

2.3.1.3.1. *Message:*
A string of text that is displayed to the user informing them of the details of the pending action.

2.3.1.3.2. *Continue Button:*
Pressing this button will continue with the pending action.

2.3.1.3.3. *Cancel Button:*
Pressing this button will return the user to the previous page without performing the pending action.
2.3.1.4. User Information Page
The User Information Page allows users to view their name, username, and e-mail as currently stored in the system. This page allows users to change their system password or stored e-mail address at any time. For changing their password, users must enter their current password and their desired new password twice to verify correctness. This page is displayed in the Main Panel and has the following layout:

DCNHP: Skills Inventory Tracking System

![User Information Page](image)

**Figure 2.3.1.4. User Information Page**

2.3.1.4.1. Current Password:
This is a password field in which the user enters their current password which is stored in the system.

2.3.1.4.2. New Password:
This is a password field in which the user enters their desired new password.

2.3.1.4.3. Repeat New Password:
This is a password field in which the user enters their desired new password again to ensure they have not mis-typed it.

2.3.1.4.4. Set Password:
Pressing this button behaves according to the following:

- If any of the three fields are empty, the message "All fields have not been filled in." is displayed in the Message Panel.
- If the entries in the New Password and Repeat New Password fields are not identical, the message "New password entries do not match. Please re-enter your new password." is displayed in the Message Panel.
- If the entries in the Current Password and New Password fields are identical, the message "New password must be different from the original. Please re-enter your new password." is displayed in the Message Panel.
- If the entry in the Current Password field does not match the password currently stored in the system for the user, the message "Incorrect password entered. Please re-enter your current password." is displayed in the Message Panel.
- If the entry in the Current Password field matches the password currently stored in the system for the
user, the entry in the New Password field is not identical to the current password, and the entry in the Repeat New Password field is identical to the new password, the message "Password successfully changed." is displayed in the Message Panel. The user’s password stored in the system will now be what they entered in the New Password field.

2.3.1.4.5. New E-mail:
This is a text field in which the user enters their desired new e-mail address.

2.3.1.4.6. Set E-mail:
Pressing this button behaves according to the following:

- If the New E-mail field is empty, the message "Please enter a desired e-mail address before pressing the Set E-mail button." is displayed in the Message Panel.
- If the text entered in the New E-mail field is not a valid e-mail address of the form [NAME]@[DOMAIN].[SUFFIX], where [NAME], [DOMAIN], and [SUFFIX] are alphanumeric strings, the message "Please enter a valid e-mail address of the form 'NAME'@'DOMAIN'. 'SUFFIX' before pressing the Set E-mail button." is displayed in the Message Panel.
- If a a valid e-mail address is entered in the New E-mail field, an e-mail is sent to the user at both their old and new e-mail addresses with the text: "Your e-mail for SITS has been changed to [E-MAIL]. If this is incorrect, please login to your account and set your e-mail address using the User Information page." In this message, [E-MAIL] is the text that was entered in the New E-mail field.

2.3.2. Student Pages
The page described in this section is only accessed by users who are identified as "Student" when they log in to the system.

2.3.2.1. Student Page
If the user is authenticated and categorized as a student, he is directed to a page that displays all skills and their current statuses. The page is displayed in the Main Panel and appears as in the following figure:

DCNHP: Skills Inventory Tracking System

![DCNHP: Skills Inventory Tracking System](image)

Figure 2.3.2.1. Student Page

2.3.2.1.1. Category Name:
Each active category is displayed in its own row down the left side of the page. Categories that contain no active skills are not displayed.

2.3.2.1.2. **Skill Name:**
The name of each active skill is listed underneath the category that contains it.

2.3.2.1.3. **Skill Status:**
The five statuses (2.2.2) assigned to each skill are displayed to the right of that skill's name. The "Empty" status is represented by a blank entry.

2.3.2.1.4. **Print Button:**
Pressing this button allows the user to print a copy of the skill sheet. The printed copy contains all the information on this page, as well as the student's name, username, and the date.

2.3.3. **Instructor Pages**
The pages in this section are accessed by users who are identified as "Instructor" or "Administrator" when they log in to the system. These pages are used to perform faculty tasks.

2.3.3.1. **Instructor Page**
If the user is authenticated and categorized as an instructor or administrator, he is directed to the Inbox, which lists any students awaiting approval for skills. This page is displayed in the Main Panel and has the following layout:

![Instructor Page](image)

**Figure 2.3.3.1. Instructor Page**

2.3.3.1.1. **Student Picture:**
The picture of the student as captured by the university.

2.3.3.1.2. **Student Name:**
A hyperlink that displays the Student Details Page (2.3.3.6) for the student when clicked by the user. The text displayed is the name of the student.

2.3.3.1.3. **Title:**
A hyperlink that displays the Authorization Page (2.3.3.2.) for the skill when clicked by the user. The text displayed is the name of the skill.

2.3.3.1.4. Checkbox:
Checking a box marks the skill associated with that checkbox as selected. Multiple skills may be selected at once.

2.3.3.1.5. Date:
The date and time the skill was signed for on the student's PDA by the instructor.

2.3.3.1.6. Group:
The text that is displayed depends upon whether or not the student is in one of the instructor's groups.

  • If the student is in one of the instructor's groups, the name of the group they are in is displayed. This text is a hyperlink that displays the Group Page (2.3.3.4.) for that group when clicked by the user.
  • If the student is not in any of the instructor's groups, the text "NONE" is displayed. This text is not a hyperlink.

2.3.3.1.7. Authorize button:
Pressing this button behaves according to the following:

  • If no skills are selected, the message "You must select skills by marking their checkboxes before pressing the Authorize button." is displayed in the Message Panel.
  • If exactly one skill is selected, the Authorization Page (2.3.3.2.) is displayed for that skill.
  • If multiple skills are selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to authorize the selected skills: ", followed by a list of [STUDENT]:[SKILLS] pairs.
    • If the user presses the "Continue" button, the statuses (2.2.2) of the selected skills are changed from Awaiting Approval to Approved, the skills are removed from the Inbox and the message: "The following skills have been approved: ", followed by a list of [STUDENT]:[SKILLS] pairs, is displayed in the Message Panel.
    • If the user presses the "Cancel" button, the selected skills' status are not updated, their entries remain in the Inbox and the message: "Authorization canceled. No skills were approved." is displayed in the Message Panel.

In the above messages, [SKILL] is the name of a requested skill, [STUDENT] is the first and last name of the student who made the skill request, and [SKILLS] is a comma-separated list of skill names. A [STUDENT]:[SKILLS] pair displays the first and last name of a student followed by a list of all skill requests made by that student.

2.3.3.1.8. Deny button:
Pressing this button behaves according to the following:

  • If no skills are selected, the message "You must select skills by marking their checkboxes before pressing the Deny button." is displayed in the Message Panel.
  • If exactly one skill is selected, the Authorization Page (2.3.3.2.) is displayed for that skill.
  • If multiple skills are selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to deny the selected skills: ", followed by a list of [STUDENT]:[SKILLS] pairs.
    • If the user presses the "Continue" button, the statuses (2.2.2) of the selected skills are changed from Awaiting Approval to Empty, the skills are removed from the Inbox and the message: "The following skills have been denied: ", followed by a list of [STUDENT]:[SKILLS] pairs, is
displayed in the Message Panel. E-mail is sent to the instructor and the students notifying them that the skill requests were denied. Each user receives only one e-mail listing every skill request that relates to him.

- If the user presses the "Cancel" button, the selected skills' status are not updated, their entries remain in the Inbox and the message: "Deny canceled. No skills were denied." is displayed in the Message Panel.

In the above messages, [SKILL] is the name of a requested skill, [STUDENT] is the first and last name of the student who made the skill request, and [SKILLS] is a comma-separated list of skill names. A [STUDENT]:[SKILLS] pair displays the first and last name of a student followed by a list of all skill requests made by that student.

2.3.3.2. Authorization Page
When the instructor clicks a skill name (2.3.3.1.3.) the Authorization Page is opened. This page displays the details of the selected skill approval request in the Main Panel and has the following layout:

DCNHP: Skills Inventory Tracking System

![Figure 2.3.3.2. Authorization Page](image)

2.3.3.2.1. Student Picture:
The picture of the student as captured by the university.

2.3.3.2.2. Student Name:
The name of the student and his CNHP username.

2.3.3.2.3. Details:
A message including the student's name, the requested skill, and the date and time at which the request was made.

2.3.3.2.4. Digital Signature:
The signature of the instructor, as signed on the PDA of the student when approving for acquisition of the skill.

2.3.3.2.5. Authorize Button:
Pressing this button approves the skill request. The skill's status (2.2.2) is changed from Awaiting Approval to Approved. After pressing this button, the Instructor Page (2.3.3.1.) is displayed with the entry for that skill removed and the message: "The skill [SKILL] has been approved for [STUDENT]." is displayed in the Message Panel.

2.3.3.2.6. Deny Button:
Pressing this button denies the skill request. The skill's status (2.2.2) is changed from Awaiting Approval to Empty. An e-mail is sent to the student and instructor notifying them that the skill request was denied. After pressing this button, the Instructor Page (2.3.3.1.) is displayed with the entry for that skill removed and the message: "The skill [SKILL] has been denied for [STUDENT]." is displayed in the Message Panel.

In the above messages, [SKILL] is the name of the requested skill and [STUDENT] is the first and last name of the student who made the skill request.

2.3.3.2.7. Back Button:
Pressing this button returns the user to the Instructor Page (2.3.3.1.) if they do not wish to Authorize or Deny the skill request. Pressing this button does not change the skill's status.

2.3.3.3. Group Management Page
This page allows instructors and administrators to create and delete groups of students. This page is displayed in the Main Panel and has the following layout:

![Group Management Page](image)

**Figure 2.3.3.3. Group Management Page**

2.3.3.3.1. Group Name:
A hyperlink that displays the Group Page (2.3.3.4.) for the group. The text displayed is the name of the group.

2.3.3.3.2. Students Enrolled:
The number of students the instructor has added to the group.

2.3.3.3.3. Checkbox:
Checking a box marks the group associated with that checkbox as selected. Multiple groups may be selected at once.
2.3.3.3.4. **New Group Name:**
A text field in which the user enters the name of the group to be created.

2.3.3.3.5. **Create New Group:**
Pressing this button adds a new group to the list. The text entered in the New Group Name (2.3.3.3.4.) text box is used as the name of the group. A message is displayed in the Message Panel according to the following:

- If the text box is empty, the message reads: "Enter the name of the new group in the text box before pressing the Create New Group button."
- If the text box contains the name of a group which already exists, the message reads: "The group [GROUP] already exists. Group not created."
- Otherwise, the message reads: "The group [GROUP] has been created."

In the message, [GROUP] is the name of the group that is being created.

2.3.3.3.6. **Delete Groups:**
Pressing this button behaves according to the following:

- If no groups are selected, the message "You must select groups by marking their checkboxes before pressing the Delete Groups button." is displayed in the Message Panel.
- If exactly one group is selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to delete the group [GROUP]?")
  - If the user presses the "Continue" button, the selected group is deleted and the message: "The group [GROUP] has been deleted." is displayed in the Message Panel. [GROUP] is the name of the selected group.
  - If the user presses the "Cancel" button, the selected group is not deleted and the message: "Deletion canceled. No groups have been deleted." is displayed in the Message Panel.
- If multiple groups are selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to delete the following groups: [GROUPS]?")
  - If the user presses the "Continue" button, the selected groups are deleted and the message: "The following groups have been deleted: [GROUPS]."
  - If the user presses the "Cancel" button, the selected groups are not deleted and the message: "Deletion canceled. No groups have been deleted." is displayed in the Message Panel.

In the above messages, [GROUP] is the name of a single selected group and [GROUPS] is a comma-separated list of all selected groups.

2.3.3.4. **Group Page**
This page allows instructors to view the students that they have added to a specific group. Instructors can also remove students from a specific group using this page and go to the Add Students to Group Page from this page to add additional students to the group. This page is displayed in the Main Panel and has the following layout:
2.3.3.4.1. **Group Name:**
The name of the group is displayed at the top of the page.

2.3.3.4.2. **Student Name:**
A hyperlink that displays the [Student Details Page (2.3.3.6.)](#). The text displayed is the name of the student.

2.3.3.4.3. **Student ID:**
The username of the student in the system.

2.3.3.4.4. **Checkbox:**
Checking a box marks the student associated with that checkbox as selected. Multiple students may be selected at once.

2.3.3.4.5. **Add Students:**
Pressing this button brings the user to the [Add Students to Group Page (2.3.3.5.)](#).

2.3.3.4.7. **Remove Students:**
Pressing this button behaves according to the following:

- If no students are selected, the message "You must select students by marking their checkboxes before pressing the Remove Students button." is displayed in the Message Panel.
- If exactly one student is selected, the [Confirmation Page (2.3.1.3.)](#) is displayed with the message: "Are you sure you wish to remove the student [STUDENT] from group [GROUP]?"
  - If the user presses the "Continue" button, the selected student is removed from the group and the message: "The student [STUDENT] has been removed from the group [GROUP]." is displayed in the Message Panel.
  - If the user presses the "Cancel" button, the selected student is not removed from the group and the message: "Removal canceled. No students have been removed." is displayed in the Message Panel.
- If multiple students are selected, the [Confirmation Page (2.3.1.3.)](#) is displayed with the message: "Are you sure you wish to remove the following students from the group [GROUP]: [STUDENTS]?"
  - If the user presses the "Continue" button, the selected students are removed from the group and...
The message: "The following students have been removed from the group [GROUP]: [STUDENTS]." is displayed in the Message Panel.

- If the user presses the "Cancel" button, the selected students are not removed from the group and the message: "Removal canceled. No students have been removed." is displayed in the Message Panel.

In the above messages, [STUDENT] is the name of a single selected student, [STUDENTS] is a comma-separated list of all selected students, and [GROUP] is the name of the group being displayed on the page.

2.3.3.4.8. Back Button:
Pressing this button returns the user to the Group Management page (2.3.3.3) for the current group.

2.3.3.5. Add Students to Group Page
This page allows instructors to add students to a group they have created. Only students who are currently active in the system and not already in the current group are listed on this page. This page is displayed in the Main Panel and has the following layout:

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![Figure 2.3.3.5. Add Students to Group Page](image)

2.3.3.5.1. Checkbox:
A checkbox is displayed to the left of each student's name. Checking a checkbox marks the associated user as selected.

2.3.3.5.2. Photo:
The photo of the student, as captured by Drexel, is displayed next to their information.

2.3.3.5.3. Name:
The name of each listed student is displayed in alphabetical order by last name.

2.3.3.5.4. Username:
The SITS username of each student is displayed next to the student's name.

2.3.3.5.5. Add Student(s) to [GROUP]:
Pressing this button behaves according to the following:

- If no students are selected, the message "You must select students by marking their checkboxes before pressing the Add Students button." is displayed in the Message Panel.
- If exactly one student is selected, the Confirmation Page (2.3.1.3) is displayed with the message: "Are you sure you wish to add the student [STUDENT] to the group [GROUP]?"
  - If the user presses the "Continue" button, the selected student is added to the current group, the Group Page (2.3.3.4) for the current group is displayed, and the message: "The student [STUDENT] has been added to the group." is displayed in the Message Panel.
  - If the user presses the "Cancel" button, the selected user is not added to the group, the Add Students to Group Page remains displayed and the message: "Add canceled. No students have been added to the group." is displayed in the Message Panel.
- If multiple students are selected, the Confirmation Page (2.3.1.3) is displayed with the message: "Are you sure you wish to add the following students to the group [GROUP]: [STUDENTS]?"
  - If the user presses the "Continue" button, the selected students are added to the current group, the Group Page (2.3.3.4) for the current group is displayed, and the message: "The following students were added to the group: [STUDENTS]" is displayed in the Message Panel.
  - If the user presses the "Cancel" button, the selected users are not added to the group, the Add Students to Group Page remains displayed and the message: "Add canceled. No students have been added to the group." is displayed in the Message Panel.

In the above messages, [GROUP] is the name of the current group to which the user wishes to add students, [STUDENT] is the name of a single selected student, and [STUDENTS] is a comma-separated list of all selected students.

2.3.3.5.6. Back:
Pressing this button returns the user to the Group Page (2.3.3.4) for the current group.

2.3.3.6. Student Details Page
This page provides information about students for faculty and administrators. It shows a student's name, user ID, and picture at the top of the page. Beneath this user information, it shows the student's skill sheet, which is identical to what the student sees on the Student Page (2.3.2.1).

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2.3.3.6.1. *Picture*: The picture of the student as captured by the university is displayed in the upper left corner of the page.

2.3.3.6.2. *Name*: The name of the student and his/her e-mail address are displayed to the right of the picture.

2.3.3.6.3. *Category Name*: Each skill category is displayed in its own row down the left side of the page.

2.3.3.6.4. *Skill Name*: The name of each skill is listed underneath the category that contains it.

2.3.3.6.5. *Skill Status*: The five statuses (2.2.2) assigned to each skill are displayed to the right of that skill's name. The "Empty" status is represented by a blank entry.

2.3.3.6.6. *Print Button*: Pressing this button allows the user to print a copy of the student's skill sheet. The printed copy contains all the information on this page.

2.3.3.6.7. *Back Button*: Pressing this button returns the user to the previously displayed page. This can be either the Instructor Page (2.3.3.1.), the Group Page (2.3.3.4.), or the User Management Page (2.3.4.2.).

2.3.4. Administrator Pages
The pages in this section are accessed by users who are identified as "Administrator" when they log in to the system. These pages are used to perform administrative tasks.

2.3.4.1. Skill Management Page
This page allows administrators to make changes to the skill list. This page is displayed in the Main Panel and has the following layout:
2.3.4.1.1. *Category Name:*  
The name of each skill category is displayed down the left side of the page.

2.3.4.1.2. *Skill Name:*  
The name of each skill is displayed underneath its appropriate category heading. The skill names are indented.

2.3.4.1.3. *Active/Inactive:*  
The activity status of each skill and category is displayed to the right of its name. The status is either Active or Inactive.

2.3.4.1.3. *Category Checkbox:*  
There is a checkbox to the left of each category name. Checking a box marks the category associated with that checkbox as selected. Multiple categories may be selected at once.

2.3.4.1.4. *Skill Checkbox:*  
There is a checkbox to the left of each skill name. Checking a box marks the skill associated with that checkbox as selected. Multiple skills may be selected at once.

2.3.4.1.5. *New Skill Name:*  
A textbox is displayed within each category. The user enters the name of the skill he wishes to add in this textbox. This textbox is disabled if the category is inactive.

2.3.4.1.6. *Add Skill:*  
An Add Skill button appears next to each New Skill Name textbox. Pressing this button verifies the skill name in the associated textbox, and if successful, adds it to the list of skills for the associated category. This button is disabled if the category is inactive. A message is displayed in the Message Panel according to the following:

- If the textbox is empty or contains only spaces, the message reads: "Enter a skill name into the text
box before pressing the Add Skill button."
• If the textbox contains a skill name that already exists, the message reads: "There is already a skill named [SKILL] in that category."
• Otherwise, the message reads: "The skill [SKILL] has been added to the category [CATEGORY]."

In the above messages, [SKILL] is the name of the skill being created and [CATEGORY] is the name of the category this skill is being added to.

2.3.4.1.7. Set Skills Inactive:
A Set Skills Inactive button appears within each category. This button is disabled if the category is inactive. Pressing this button behaves according to the following:

• If no skills are selected for the category, the message "You must select skills by marking their checkboxes." is displayed in the Message Panel.
• If exactly one skill is selected for the category, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to inactivate the skill [SKILL] from the category [CATEGORY]?
  • If the user presses the "Continue" button, the selected skill is set to inactive and the message: "The skill [SKILL] from the category [CATEGORY] has been inactivated." is displayed in the Message Panel.
  • If the user presses the "Cancel" button, the selected skill is not set to inactive and the message: "Action canceled. No skills have been inactivated." is displayed in the Message Panel.
• If multiple skills are selected for the category, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to inactivate the following skills from the category [CATEGORY]: [SKILLS]?
  • If the user presses the "Continue" button, the selected skills are set to inactive and the message: "The following skills from the category [CATEGORY] have been inactivated: [SKILLS]." is displayed in the Message Panel.
  • If the user presses the "Cancel" button, the selected skills are not set to inactive and the message: "Action canceled. No skills have been inactivated." is displayed in the Message Panel.

In the above messages, [SKILL] is the name of a single selected skill, [SKILLS] is a comma-separated list of all selected skills in the category in question, and [CATEGORY] is the name of the category the skill(s) belong to.

2.3.4.1.8. Set Skills Active:
A Set Skills Active button appears within each category. This button is disabled if the category is inactive. Pressing this button behaves according to the following:

• If no skills are selected for the category, the message "You must select skills by marking their checkboxes." is displayed in the Message Panel.
• If exactly one skill is selected for the category, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to activate the skill [SKILL] from the category [CATEGORY]?
  • If the user presses the "Continue" button, the selected skill is set to active and the message: "The skill [SKILL] from the category [CATEGORY] has been activated." is displayed in the Message Panel.
  • If the user presses the "Cancel" button, the selected skill is not set to active and the message: "Action canceled. No skills have been activated." is displayed in the Message Panel.
• If multiple skills are selected for the category, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to activate the following skills from the category [CATEGORY]:
If the user presses the "Continue" button, the selected skills are set to active and the message: "The following skills from the category [CATEGORY] have been activated: [SKILLS]." is displayed in the Message Panel.

If the user presses the "Cancel" button, the selected skills are not set to active and the message: "Action canceled. No skills have been activated." is displayed in the Message Panel.

In the above messages, [SKILL] is the name of a single selected skill, [SKILLS] is a comma-separated list of all selected skills in the category in question, and [CATEGORY] is the name of the category the skill(s) belong to.

2.3.4.1.9. New Category Name:
This textbox is displayed at the top of the screen. The user enters the name of the category he wishes to add in this textbox.

2.3.4.1.10. Add Category:
Pressing this button creates a new category with the name entered in the New Category Name textbox (2.3.4.1.9.). A message is displayed in the Message Panel according to the following:

- If the textbox is empty or contains only spaces, the message reads: "Enter a category name into the textbox before pressing the Add Category button."
- If the textbox contains a category name that already exists, the message reads: "There is already a category named [CATEGORY]."
- Otherwise, the message reads: "The category [CATEGORY] has been created successfully.

In the above messages, [CATEGORY] is the name of the category being created.

2.3.4.1.11. Set Category Inactive:
Whenever a category is set to inactive, all skills in that category are also set to inactive. Pressing this button behaves according to the following:

- If no categories are selected, the message "You must select categories by marking their checkboxes." is displayed in the Message Panel.
- If exactly one category is selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to inactivate the category [CATEGORY]?"
  - If the user presses the "Continue" button, the selected category is set to inactive and the message: "The category [CATEGORY] has been inactivated." is displayed in the Message Panel.
  - If the user presses the "Cancel" button, the selected category is not set to inactive and the message: "Action canceled. No categories have been inactivated." is displayed in the Message Panel.
- If multiple categories are selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to inactivate the following categories: [CATEGORIES]?
  - If the user presses the "Continue" button, the selected categories are set to inactive and the message: "The following categories have been inactivated: [CATEGORIES]." is displayed in the Message Panel.
  - If the user presses the "Cancel" button, the selected categories are not set to inactive and the message: "Action canceled. No categories have been inactivated." is displayed in the Message Panel.
In the above messages, [CATEGORY] is the name of a single selected category and [CATEGORIES] is a comma-separated list of all selected categories.

2.3.4.1.12. Set Category Active:
Pressing this button behaves according to the following:

- If no categories are selected, the message "You must select categories by marking their checkboxes." is displayed in the Message Panel.
- If exactly one category is selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to activate the category [CATEGORY]?"
  - If the user presses the "Continue" button, the selected category is set to active and the message: "The category [CATEGORY] has been activated." is displayed in the Message Panel.
  - If the user presses the "Cancel" button, the selected category is not set to active and the message: "Action canceled. No categories have been activated." is displayed in the Message Panel.
- If multiple categories are selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to activate the following categories: [CATEGORIES]"
  - If the user presses the "Continue" button, the selected categories are set to active and the message: "The following categories have been activated: [CATEGORIES]." is displayed in the Message Panel.
  - If the user presses the "Cancel" button, the selected categories are not set to active and the message: "Action canceled. No categories have been activated." is displayed in the Message Panel.

In the above messages, [CATEGORY] is the name of a single selected category and [CATEGORIES] is a comma-separated list of all selected categories.

2.3.4.2. User Management Page
The User Management page allows administrators to add and delete users to and from the system. Users are added by uploading a text file which includes their user information on an individual row in a tab-delimited format. This page is displayed in the Main Panel and has the following layout:

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![Figure 2.3.4.2. User Management Page](image-url)
2.3.4.2.1. *Filename:*
This textbox accepts the full path and name of a local file containing the users to be added to the system. These users will be added as the same type as the currently selected radio button.

2.3.4.2.2. *Browse:*
Pressing this button displays a file chooser that the user can use to locate a local file on his/her computer. When a file is selected, its path and name are entered into the Filename textbox.

2.3.4.2.3. *Add [USER-TYPE](s):*
Pressing this button adds the [USER-TYPE]s in the file specified by the user to the system. The file of user information must be a text file with individual users' information listed on unique lines in a tab-delimited format. The list of information necessary to add each user is their first name, last name, e-mail address, username, and, if the user is a student, class level. (If no class level is entered into the list, it defaults to 1 for 'Freshman'). The user type of the new users depends on which radio button is currently selected.

- If the text box is empty, the message "Enter the path and name of the file containing the new user IDs in the textbox. You can use the browse button to help you locate the file." is displayed in the Message Panel.
- If the text box contains text that is not a valid file, the message "The file [FILENAME] could not be found. You can use the browse button to help you locate the file." is displayed in the Message Panel.
- If the file exists, and it contains tab-delimited lists of users' information, they are added to the system. A message is displayed in the Message Panel according to the following:
  - If one or more users are successfully added, the message reads: "The following [USER-TYPE] have been added: " followed by a comma-separated list of those user's names and usernames.
  - If one or more users are already in the database, the message reads: "The following [USER-TYPE] are already in the database: " followed by a comma-separated list of those user's names and usernames. Any combination of the above messages may be displayed simultaneously.
  - If the file exists, but it is not in the correct format, the message "The file [FILENAME] is not in the correct format. The file must contain a tab-delimited list of user information: first name, last name, e-mail, username, and optional class-level (1-6)."

In the above messages, [USER-TYPE] is either "student", "instructor", or "adminstrator" or the plural and [FILENAME] is the text the user entered into the textbox.

When Users are added, all of their user information is added to the system as well as a password which is auto-generated. An e-mail is then sent to the user at their entered e-mail address which informs them they have been added to SITS and gives them thier SITS username and system-generated password. After logging in, users may change their password and stored e-mail address using the User Information Page (2.3.1.4).

2.3.4.2.4. *'Name' Label:*
Clicking this column label will refresh the page and order all users in alphabetical order by their last name.

2.3.4.2.5. *'Class Level' Label:*
Clicking this column label will refresh the page and order all users in ascending order of class level (Freshman, Sophomore, Junior, Senior, Graduated, Dropped). This label is only clickable when the "Student" radio button is selected, displaying Student users.

2.3.4.2.6. *'Active/Inactive' Label:*
Clicking this column label will refresh the page and order all users according to their status. All 'Active' users
will be listed first, followed by all 'Inactive' users; within both of these groups, users will be listed alphabetically by last name.

2.3.4.2.7. **Checkbox:**
A checkbox is displayed to the left of each user's name. Checking a checkbox marks the associated user as selected.

2.3.4.2.8. **Photo:**
The photo of every user of the currently selected type, as captured by Drexel, is displayed next to their information. A photo for a user can be added to the system using the Add Picture button and accompanying file chooser in the same row.

2.3.4.2.9. **Name:**
The name of every user of the currently selected type is displayed in alphabetical order by last name in a list down the page. The name is a hyperlink that displays the Student Details Page (2.3.3.6.) for that user when clicked.

2.3.4.2.10. **Username:**
The SITS username of each user is displayed next to the user's name.

2.3.4.2.11. **E-mail:**
The e-mail address of each user, as stored in the system, is displayed next to their username.

2.3.4.2.12. **Class Level:**
If a user is a student, their current class level is displayed next to their e-mail address. Possible class levels include Freshman, Sophomore, Junior, Senior, Graduated, and Dropped. A student's class level can be set by selecting a class level from the Class Level Drop Down selection field and pressing the Set Class Level button.

2.3.4.2.13. **Active/Inactive:**
The user's status in the system is displayed next to their e-mail address. A user can be either "Active" or "Inactive". An "Active" user is able to log in to the system and, if they are a student, will be able to have requests show in their instructor's Inbox and will appear on the Group Page for all groups they belong to. An "Inactive" user is not able to log in to the system and, if they are a student, will not have any requests show up in a faculty or administrator Inbox and will not be listed on the Group Page for any groups they belong to. A user's status can be set using the Set Active and Set Inactive buttons.

2.3.4.2.14. **Add Picture:**
Pressing this button uploads the picture file listed in the accompanying textbox to the appropriate folder in the system and matches it to the user in the same row. The Browse button can be used to display a file chooser that the user can use to locate a local file on his/her computer. When a file is selected, its path and name are entered into the textbox. A picture file must be a JPG and will be renamed to '[USERNAME].jpg' and stored in the appropriate location on the server ([USERNAME] is the username of the user in row corresponding to the 'Add Picture' button that is pressed.)

- If the text box is empty, the message "Enter the path and name of the file containing the picture file for [USER] in the textbox. You can use the browse button to help you locate the file." is displayed in the Message Panel.
- If the text box contains text that is not a valid file, the message "The file [FILENAME] could not be found. You can use the browse button to help you locate the file." is displayed in the Message Panel.
If the file exists, and it contains a JPG, this file is uploaded to the system. The picture in this file will then be displayed as the user photo for the user in that row.

If the file exists, but it is not a JPG, the message "The file [FILENAME] is not a valid picture file. The file must have the extension '.jpg'."

In the above messages, [USER] is the first name, last name, and username of the user in that row and [FILENAME] is the text entered in the textbox.

2.3.4.2.15. Set Active:
Pressing this button sets the selected users' status in the system as 'Active'.

- If no users are selected, the message "You must select users by marking their checkboxes before pressing the Set Active button." is displayed in the Message Panel.
- If exactly one user is selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to activate the [USER-TYPE] [USER]?
  - If the user presses the "Continue" button, the selected user is set to 'Active' and the message: "The [USER-TYPE] [USER] has been set to Active." is displayed in the Message Panel.
  - If the user presses the "Cancel" button, the selected user is not set to 'Active' and the message: "Activation canceled. No [USER-TYPE] have been set to Active." is displayed in the Message Panel.
- If multiple users are selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to activate the following [USER-TYPE]: [USERS]?
  - If the user presses the "Continue" button, the selected users are set to 'Active' and the message: "The following [USER-TYPE] have been set to Active: [USERS]."
  - If the user presses the "Cancel" button, the selected users are not set to 'Active' and the message: "Activation canceled. No [USER-TYPE] have been set to Active." is displayed in the Message Panel.

In the above messages, [USER] is the name of a single selected user, [USERS] is a comma-separated list of all selected users, and [USER-TYPE] is either "student", "instructor", or "administrator" or the plural.

2.3.4.2.16. Set Inactive:
Pressing this button sets the selected users' status in the system as 'Inactive'.

- If no users are selected, the message "You must select users by marking their checkboxes before pressing the Set Inactive button." is displayed in the Message Panel.
- If exactly one user is selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to inactivate the [USER-TYPE] [USER]?
  - If the user presses the "Continue" button, the selected user is set to 'Inactive' and the message: "The [USER-TYPE] [USER] has been set to Inactive." is displayed in the Message Panel.
  - If the user presses the "Cancel" button, the selected user is not set to 'Inactive' and the message: "Inactivation canceled. No [USER-TYPE] have been set to Inactive." is displayed in the Message Panel.
- If multiple users are selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to inactivate the following [USER-TYPE]: [USERS]?
  - If the user presses the "Continue" button, the selected users are set to 'Inactive' and the message: "The following [USER-TYPE] have been set to Inactive: [USERS]."
  - If the user presses the "Cancel" button, the selected users are not set to 'Inactive' and the message: "Inactivation canceled. No [USER-TYPE] have been set to Inactive." is displayed in the Message Panel.
In the above messages, [USER] is the name of a single selected user, [USERS] is a comma-separated list of all selected users, and [USER-TYPE] is either "student", "instructor", or "administrator" or the plural.

2.3.4.2.17. User Type:
Three radio buttons labeled Student, Instructor, and Administrator are displayed. Selecting a radio button switches the type of user the page is handling and automatically re-displays the page. The "Student" radio button is selected by default.

2.3.4.3. Query Page
The Query Page allows administrators to search the student and professor databases. The user can add constraints to the query. All constraints are connected by a logical AND by default. The user can specify a data field, an operator, and a value. The user can save queries that can then be re-executed at a later date. This page is displayed in the Main Panel and has the following layout:

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![Figure 2.3.4.3. Query Building](image)

2.3.4.3.1. Saved Queries:
This section lists the names of queries the user has previously saved.

2.3.4.3.1.1. Query Name:
This is the name of the saved query as provided by the user when they saved the query.

2.3.4.3.1.2. Checkbox:
A checkbox is displayed to the left of each query name. Checking a checkbox marks the associated query as selected.

2.3.4.3.1.3. Delete Queries:
Pressing this button removes the selected queries.

- If no queries are selected, the message "You must select queries by marking their checkboxes before pressing the Delete Queries button." is displayed in the Message Panel.
- If exactly one query is selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to delete the query [QUERY]?


• If the user presses the "Continue" button, the selected query is removed and the message: "The query [QUERY] has been deleted" is displayed in the Message Panel.
• If the user presses the "Cancel" button, the selected query is not removed and the message: "Delete canceled. No queries were deleted." is displayed in the Message Panel.
• If multiple users are selected, the Confirmation Page (2.3.1.3.) is displayed with the message: "Are you sure you wish to delete the following queries: [QUERIES]?
  • If the user presses the "Continue" button, the selected queries are removed and the message: "The following queries have been deleted: [QUERIES]"
  • If the user presses the "Cancel" button, the selected queries are not removed and the message: "Delete canceled. No queries were deleted." is displayed in the Message Panel.

In the above messages, [QUERY] is the name of a single selected query and [QUERIES] is a comma-separated list of all selected queries.

2.3.4.3.2 Query Builder:
This section is where the user can create a new query to run.

2.3.4.3.2.1 Add Constraint:
When this button is pressed it will add one new line to the list of constraints.

2.3.4.3.2.2 Remove Constraint:
When this button is pressed it will remove one new line from the list of constraints. If this button is pressed when only one constraint is listed, an error message will appear stating, "A query must contain at least one constraint."

2.3.4.3.2.3 Data Field:
This is the type of data the user wishes to constrain. Possible values are "Clinical Location", "Student Level", "Student Name", "Skill", "Clinical Instructor", etc.

2.3.4.3.2.4 Operator:
This is the relationship of the constraint. Possible values are "is"/"is not" and "has"/"does not have".

2.3.4.3.2.5 Value:
This is the value that should be matched. Possible values are "Children's Hospital of Pennsylvania", "Sophomore", "Wound Irrigation", etc.

2.3.4.3.2.6 Sample Constraint Structure:
A constraint might be to restrict data to students whose "Clinical Location" "is not" "Children's Hospital of Pennsylvania".

2.3.4.3.2.7 Query:
A query is defined as a set of constraints combined by a logical AND. A student must match all of the constraints in order to be returned by a query.

2.3.4.3.2.8 Query Name:
The user enters text in this textbox for the name of the current query.

2.3.4.3.2.9 Save Query:
When the user presses the "Save Query" button the name entered in the Query Name (2.3.4.3.8) textbox is
stored along with all constraints. When the query is saved a message stating "[QUERY NAME] has been successfully saved." will appear to the user and [QUERY NAME] will appear at the top of the page in the list of saved queries. [QUERY NAME] matches the text entered in the textbox.

2.3.4.3.3. Query Results:
When the user has run a query they will see the following screen listing query results:

![Query Results Screen]

**Figure 2.3.4.3.3. Query Results**

2.3.4.3.3.1. Export Query Results:
Clicking this button will export the query results into a tab-delimited file that can be read by almost all spreadsheet and graphing applications, including Microsoft Excel.

2.3.4.3.3.2. Save Query:
When the user clicks the "Save Query" button the query will be stored with the entered name and the user will arrive at Query Page in figure 2.3.4.3

2.3.4.3.3.3. Back:
When the user clicks the "Back" button the page will return to the Query Page in figure 2.3.4.3

2.3.4.4. Archiving Page
The Archiving Page allows administrators to create archive files of students who have been set to inactive to keep on record and clear room in the database. The screen only contains three button: one to archive records, one to purge archived students, and one to restore students from an archive file. If a student is set back to active after having been archived they will no longer be considered archived and will not be purged.
2.3.4.4.1. **Delete Archived Students:**
This button clears all students who are inactive and archived in the database. The user is sent to the Confirmation Page (2.3.1.3) with the message "This action will remove all archived users from the database. Please make sure that archives are stored in a secure location. The only way to restore this user data in the future will be from the archive files. Are you sure you want to proceed?"

2.3.4.4.2. **Archive Inactive Students:**
When clicked, this button will generate a tab-delimited file that can be stored or printed to preserve the graduate’s record.

2.3.4.4.3. **Restore Students From Archive File:**
This button is user in conjunction with a file selector to upload a previously generated archive file and restore the students in that file to active status in the system.

2.4. **PDA Component**
This application is a program to be run on the Personal Digital Assistant. Students, with the help of faculty members, will use this application to initiate the process of approving a skill. Separate functionality to synchronize the applications and student data to the CNHP server is explained in section 2.5.

2.4.1. **Login Page**
The Login Page is displayed when the application is started. It allows the student to enter his username and log into the system. The Login Page has the following layout:
Figure 2.4.1. Login Page

2.4.1. **Student ID:**
A text field accepting the user’s ID.

2.4.1.2. **Login Button:**
The **Student ID** is verified when the user presses this button. If the verification is successful, the Categories Page (2.4.2.) is opened. If verification is not successful, the Login Page remains open and the message "Invalid Student ID" is displayed.

2.4.1.3. **Sync Button:**
Pressing this button will redirect you to the Synchronization Application (2.5). If a Student ID is entered in the Student ID Box the Student ID (2.5.1.1) box in the Synchronization Application will then be populated with that value.

2.4.1.4. **Exit Button:**
Pressing this button closes the application.

2.4.2. **Categories Page**
The Categories Page displays a list of all skill categories and allows the student to select a category to display its individual skills. The Categories Page has the following layout:
2.4.2.1. *Categories*:  
A list of all skill categories displayed in lexicographical order. Only one category may be selected at a time.

2.4.2.2. *Select Button*:  
If no category is selected, this button will be disabled. If a category in the Categories List is selected, pressing this button opens the [Skills Page](#) for the currently selected category.

2.4.2.3. *Quit Button*:  
Pressing this button returns the user to the [Login Page](#).

2.4.3. *Skills Page*  
The Skills Page displays a list of the skills in a given category. The student's progress for each skill is displayed and a faculty member can sign off on a newly acquired skill. The Skills Page has the following layout:
2.4.3.1. *Category Name*:  
The name of the category being displayed is shown at the top of the page.

2.4.3.2. *Skill Name*:  
The name of each skill in the category is displayed in a list down the left side of the page.

2.4.3.3. *Skill Status*:  
The status (2.2.2) of the selected skill is displayed to the right of the skill's name. Each skill has five status fields associated with it.

2.4.3.4. *Back Button*:  
The back button displays the Categories Page (2.4.2) when pressed by the user.

2.4.3.5. *Select Button*:  
If no skills are selected, this button will be disabled. If one or more skills are selected, pressing this button displays the Signature Page (2.4.4).

2.4.4. Signature Page  
The Signature Page allows a faculty member to sign off on the selected skills by entering his user ID and signature. The Signature Page has the following layout:
2.4.4.1. **Student ID:**
The ID of the student currently logged into the device is displayed to verify which user is being approved.

2.4.4.2. **Skill Name:**
The skill that is currently being approved is displayed.

2.4.4.3. **Instructor ID:**
A text field accepting the instructor's ID.

2.4.4.4. **Signature Area:**
The instructor signs his name in the area provided.

2.4.4.5. **Pen Color:**
This list is a drop down menu that will allow the instructor to change the color of the pen used to sign the digital signature.

2.4.4.6. **Submit Button:**
The Instructor ID is verified when the user presses this button.

- If the verification is successful and the Signature Area is not empty, the submit button changes the status of all the selected skills to Requested (2.4.3.3.) and displays the Categories Page (2.4.2.).
- If the Instructor ID is empty, the message "Approving a skill requires an Instructor ID" is displayed.

2.4.4.7. **Clear Button:**
Pressing this button will clear the any signature currently entered in the signature area (2.4.4.4).

2.4.4.8. *Back Button*: Pressing this button displays the *Skills Page (2.4.3.*)* without changing the status of any skills.

2.5. PDA Synchronization Application
This application is a program to be run on the Personal Digital Assistant. This will be used to allow the students to synchronize their data with the CNHP Server. This application sends a file of pending skill requests to the server and receives a user's updated skill sheet. This application requires an active internet connection.

2.5.1. Synchronization Page
The Synchronization Page is displayed when the application is started. It allows the student to send his data to the CNHP server. The Synchronization Page has the following layout:

![Synchronization Page Diagram](image)

*Figure 2.5.1. Synchronization Page*

2.5.1.1. *Student ID*: A text field accepting the user's ID.

2.5.1.2. *Password*: A text field accepting the user's password.

2.5.1.3. *Status Area*: Status Bar, Username, Password, Exit Button, Sync Button.
This area will contain text to inform the user of any messages. This will include confirmations, errors, and the status of the application.

2.5.1.4. **Sync Button:**
The *Student ID* and *Password* is verified when the user presses this button. If the verification is successful, the users data will begin to transfer to the CNHP server. If this process fails and error message will be displayed in status area(2.5.1.3).
Types of errors include:

- There is no active internet connection.
- The username or password does not exist.
- The Instructor does not exist in the database.

2.5.1.5. **Exit Button:**
This button will exit the application.

2.5.1.6. **Status Bar:**
This is a progress bar that will be moving while the data is being transmitted to the CNHP servers. Upon completion this bar will stop moving.

2.6. **PDA User Creation**
This is a section of the PDA application that will only be invoked the first time the application is run. This will be what the student uses to create a user and set the PDA up for personal use. NOTE: An internet connection will be required to create a user.

2.6.1. **User Creation Page**
This is the page used to create a user and retrieve the users skill data from the CNHP server.
Figure 2.6.1. User Creation Page

2.6.1.1. Preferred Name:
A text field accepting the user’s preferred or first name.

2.6.1.2. Username:
A text field accepting the user’s ID.

2.6.1.3. Password:
A text field accepting the user’s password. This text will replace with asterics.

2.6.1.4. Confirm Password:
A text field accepting the user’s password, this will make sure the password entered above is correct.

2.6.1.5. Create User Button:
When the user presses this button, the username and password of the student entered in the Username and Password text field is sent to the server. The server then verifies the username and password of the student, and if the username and password is correct, the student skill sheet is sent back as a response. This skill sheet is then stored on the PDA for future usage. If the username and password provided is incorrect, then an error message is displayed in a message box on the screen, which says that the username and password provided is incorrect.

2.6.1.6. Exit Button:
This button will exit the application.
3. Non-Functional Requirements

3.1. PDA Component

3.1.1. Software Requirements:
The PDA application must run on the Windows Mobile 5 Operating System.

3.2. Web Component

3.2.1. Server:
The server-based applications must run on Windows Server 2003.

3.2.2. Database:
Student progress must be stored in CNHP’s Microsoft SQL Server database.

3.2.3. Performance:
The system must be able to track 1,000 students and 200 faculty members.

4. Usage Diagrams

The following diagrams illustrate the processes the user takes to accomplish tasks in the SITS program. In the diagrams, each gray state corresponds to one of the PDA Component's pages and each red state corresponds to a background process handled by the application (no user action is required).

4.1. PDA Usage
The following diagram shows the steps the user takes to use the PDA Component (2.4.):
Figure 4.1. PDA Usage
4.2. Web Login
The following diagram shows the procedure for logging into the Web Component (2.3.):

START

LOGIN PAGE

CANCEL

LOGIN

DISPLAY 'AUTHENTICATION FAILED' ON LOGIN PAGE

MATCH NOT FOUND

ELSE

CATEGORIZE USER

STUDENT

INSTRUCTOR

STUDENT PAGE

INSTRUCTOR PAGE

Figure 4.2. Web Usage
4.3. Skill Approval
The following diagrams show the procedure for a faculty user to approve student skills through the Web Component (2.3.) from the Instructor Page (2.3.3.1.).

4.3.1. Individual Skill Approval:
The following diagram shows how a faculty member views the information associated with a skill request and approves or denies the request:

![Diagram](image)

*Figure 4.3.1. Individual Skill Approval*
4.3.2. Aggregate Skill Approval:
The following diagram shows how a faculty member approves multiple skill requests simultaneously:

**Figure 4.3.2. Aggregate Skill Approval**
4.3.3. Accept/Deny Approval:
When the instructor visits the Login Page, the user is asked to enter his/her username and password. After entering the username and password, the username and password is verified and if the combination of username and password is invalid, then "Login Failed" is displayed on the Login Page above the username and password fields. Otherwise, the instructor is routed to the Instructor’s Page, which displays instructor's data. If there are any approvals waiting, the instructor can view the Authorization Page for the waiting approval and select either to Accept or Deny. If the instructor opts to Accept the waiting approval, the word "Approved" is displayed instead of "Awaiting Approval" for that particular skill on the student’s page. If the instructor opts to Deny the waiting approval, the word "Approved" is displayed instead of "Awaiting Approval" for that particular skill on the student’s page.

Figure 4.3.3. Accept/Deny Approval
4.4. Query Usage
The following diagram shows the steps the user takes to use the Query Page to both run and save queries (2.3.4.3):

![Query Usage Diagram]

*Figure 4.4. Query Usage*
4.5 Adding Skills  
The following diagram displays how an administrator can add skills to a category.
4.6 Adding Categories
The following diagram displays how an administrator can add categories.

Figure 4.6
4.9 User Management
The following diagram displays how an administrator can add users.

Figure 4.9
5. Writing Tutor Suggested Changes

In the Winter Quarter, a meeting was held with a writing tutor to review the requirements document in terms of organization and style. At this meeting, the writing tutor revealed his thoughts on the document and what changes he thought were necessary. For the most part, he could not find any areas which needed revision or any additions which should be made. The only improvement he suggested was to make the list of contents at the top of the page easier to navigate by grouping sections in the Web Component together based on the type of user who accessed the functionality they described. We made this change to the document by adding another sub-grouping to the web component section and placing previously listed sections into the "Common", "Student", "Instructor", or "Administrator" groups. All sections describing functions which all types of users access were placed in the "Common" group. The Student Page section was placed in the "Student" group. Although there are no sections describing functionality that is exclusive to instructors, all sections relating to functions which both instructors and administrators access was placed in the "Instructor" group. All sections describing functions which solely administrators access were placed in the "Administrator" group. An introductory section for each group was created which explained that group and links were added to the contents at the top of the page for each group. The entire document was then re-structured so that each section of the web component is now organized under the appropriate group and the sections were all re-numbered to reflect the new structure of the document.

6. Glossary

6.1. Checkbox:
A field which allows the user to select an item by clicking inside a box. Multiple checkboxes may be selected at once.

6.2. CNHP:
College of Nursing and Health Professions.

6.3. Digital Signature:
A digital signature is an image containing a captured signature.

6.4. Hyperlink:
Text that produces a desired effect when clicked with a mouse.

6.5. Password Field:
A text field where an asterisk is displayed in place of each character.

6.6. PDA:
Personal Digital Assistant. All CNHP students are required to carry a PDA with them at their clinical site(s).

6.7. Radio Button:
A list of buttons that allows the user to select among a set of options by clicking on a button. One button is selected by default, and only one button may be selected at a time.

6.8. SITS:
Skills Inventory Tracking System.

6.9. Skill:
Refers to a nursing skill. CNHP students are required to acquire instructor approval of every skill on the current skills list by exhibiting proficiency in these skills and receiving an instructor's signature for each skill
on their PDA.

6.10. **Text Field:**
An area where the user can enter alphanumeric characters and spaces that are displayed as the user types.