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# Plymouth State University Integrated Clusters Functional Requirements

Version	Description of Change	Author	Date
1.0	Initial Version	Ross Humer	12/28/2016
2.0	Updated Review	Larry Gagnon	1/9/2017
3.0	Updated Review	Ross Humer	1/16/2017



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## INTRODUCTION

Plymouth State University is undergoing a radical 3 year transformation from a traditional Regional Comprehensive University model to a modern academic institution based on an inter-disciplinary student experience. This model is based on the concept of Integrated Clusters which combine and align academic disciplines to focus on addressing real-world issues and problems. As there is no existing reference model, significant development effort is being expended in the creation of this new format. These transformational changes will impact all of the operations and structures of PSU, significant changes in functional processes.

This document has been prepared to outline the functional requirements for a new set of operational capabilities required by the PSU Office of Academic Affairs to perform the requirements of a transformational academic university model: Integrated Clusters. As this new structure has no immediate analogs nor a defined structure, the IT work required at the outset will focus on the needs of participants in the model as best as those requirements are known at the outset. Update of this Functional Requirements Document (FRD) will be required after initial release and as new details of the structure and operational capabilities are discovered over the next 3 year evolution for the Academy.

### 1.1 Purpose

The purpose of the document is to provide project resources an initial set of needs and use cases to begin to create a functional solution. These new capabilities are required to simplify operational processes and to enable the scaling of the model to the University's Faculty, Staff, Students, and external Partners.

### 1.2 Scope

The scope of the document will include all known requirements for the Office of Academic Affairs, including the seven (7) Integrated Clusters (see addenda) and the Center for Business and Community Partnerships (CBCP). The scope does not include the remaining operating centers (e.g., Finance and Administration; Admissions & Enrollment; Physical Plant; Marketing; Human Resources; etc.) of the University at this time.

**Commented [GL1]:** Identify and list within this FRD.

**Commented [GL2]:** Identify and list within this FRD

### 1.3 Description

The Integrated Cluster IT Project has been established to begin a multi-year phased approach for supporting and enabling the Office of Academic Affairs component of the PSU institutional transformation. The core of the project is to create new IT functionality required by this new model to execute the Integrated Cluster operational processes. This project will initially address the needs of faculty, staff, students, and external partners to enable participation in the model and contribute to its success. Later phases of the project will define the IT interaction and integration of this "net new" functionality with the other operational elements of the PSU institution.

### 1.4 Points of Contact

Name	Title	Role
Robyn Parker	Dean, College of Business Administration	Executive Sponsor
Richard Grossman	PSU CIO	Executive Stakeholder
Ross Humer	Faculty Member, College of Business Administration	Business Sponsor/ Product Owner/ Program Manager



Elaine Bouchard	PSU Director of Strategic Technology Services	Project Manager
Larry Gagnon	USNH Sr. IT Manager	IT/Project Management Consultant

### 1.5 Document References

All reference documentation, including use case documents, Project Charter, and meeting presentations and notes will be posted in the IT Initiatives folder on the [PSU IC Guides SharePoint site](#). Contact [Ross Humer](#) for support with access to this site.

### 1.6 Glossary

Applicable list of terms, abbreviations, and acronyms referenced in this document are included as Appendixes at the end of this document.

## 2.0 ASSUMPTIONS AND CONSTRAINTS

### 2.1 Assumptions

It is anticipated that the requirements listed in this document will exceed the budget and IT resources allocated to the project in its initial phase; any requirements that cannot be addressed will be under consideration for subsequent phases of the Integrated Cluster IT Project.

The following are the key assumptions and known constraints at the outset of this project.

#### 2.1.1 Resources Assumptions

- IT Resources for systems/applications development and sustaining support will be acquired.
- Additional incremental professional operational personnel in the Office of Academic Affairs (OoAA) will be hired and/or assigned.

#### 2.1.2 Delivery Assumptions

- External IT resources will be engaged to supplement PSU IT staff capacity to create and deliver initial high priority IT functionality.
- PSU ITS and Office of Academic Affairs will partner to provide application functionality support through training for initial deployment.
- Ongoing application functionality support will be provided by ITS support staff operations.
- Ongoing IC program support will be provided by identified and committed resources from the Office of Academic Affairs.
- The first release for Faculty and Staff functionality is targeted by end of FY17Q4.
- The first release for Business Partner functionality is targeted by beginning of FY18Q1.
- The first release for Student functionality is targeted by beginning of FY18Q2. Student engagement will include undergraduate and graduate students

#### 2.1.3 Budgetary Assumptions

- Funding for the initial IT development and deployment will be sufficient to provide basic, first release functionality.



- Subsequent application development and support will be funded by USNH Trustee financial commitment.
- Funding from external partners may occur to supplement USNH funding (in later project phases)

#### 2.1.4 Functionality Assumptions

- Development of functional capabilities will be outlined within this FRD and will constitute the highest priority elements for the first release.
- Additional functional priorities will be captured through use cases and user feedback and will be scheduled for subsequent development and releases.
- Agile-like processes will continuously look to refine the work efforts to target and prioritize high value functional capabilities.

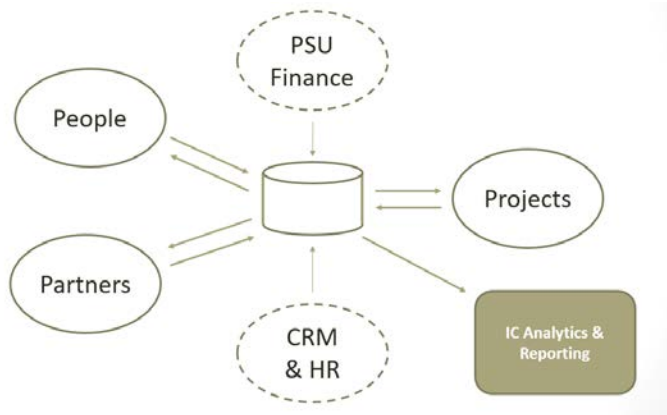
#### 2.2 Constraints

The primary constraints for this project are resources and time frames. As there is finite funding for the project and basic functionality must be completed by FY18Q1, the functionality to be delivered will be constrained to high value applications consistent with that time line.

- Limits to PSU personnel assigned to this project will require acquisition of external resources; budget and the time required to onboard these resources creates a further constraint on the project.
- While the definition of basic functional requirements is included in this FRD, it is acknowledged that the foregoing constraints may limit which of the requirements are included in delivered capabilities in the allotted time frame.

### 3.0 CONTEXT

The following context diagram is intended to represent the capabilities required to perform IC functions in the Office of Academic Affairs. It is envisioned that the systems capability will be established, for the purposes of expediency and simplicity, in tandem with existing IT systems and infrastructure at PSU.



The above illustration is a conceptualization of a database and set of user interfaces, pulling information from legacy systems on a periodic basis and be the repository of information created by and required for IC operations. The interfaces and primary workflows are described within the FRD.



## 4.0 FUNCTIONAL REQUIREMENTS

The functional requirements described below represent the core functionality of the application.

### 4.1 Overall Functional Requirements

Overall, the system shall:

- Be available to all PSU individuals 24/7/365.
- Have a user interface that provides/limits data access to IC tools and resources through a custom portal based on user roles and user-selected defined parameters in their personal/organization profile.
- Allow individuals and groups to edit and update selected elements of their personal/group information using online web-based tools.
- Provide access to non-PSU individuals and organizations on a by-exception basis.
- Import and retain selected data from other PSU legacy systems for use in combination with “net new” information in creating new standard and ad hoc Integrated Cluster reports, queries, and notifications.
- Enable IC Project Proposal development, funding approval processes, and project execution and documentation to be completed through integrated online web tools and forms.
- Have supporting tools and capabilities to enable the detailed planning, documentation, and execution of Integrated Cluster Projects.
- Allow existing and future (external) Partner Management functions to be executed using online forms and tools.
- Provide an announcement and reservation capability (“match making”) for IC Projects and activities.
- Link to communications resources (e.g., Microsoft Office 365 applications; social media applications; etc.) based on user roles and key word matches linking to academic disciplines, areas of expertise, and individual interests.
- Manage IC projects through all phases (concept ideation; proposal development; project funding approval; project team formation; project execution; project completion).

**Commented [GL3]:** While reporting is an important requirement, need to review/discuss whether net new reporting functionality is developed, or whether the IC solution is a portal to existing PSU reporting capabilities.

**Commented [GL4]:** Need to specifically identify and list these for this first release.

**Commented [GL5]:** Define all project phases.

The IC solution shall be capable of delivering the following functional requirements:

### 4.2 Integrated Cluster Projects

Requirement ID	Requirement Definition
FR4.2.1	Create new IC projects.
FR4.2.2	Retrieve active IC project data for edits/updates by project participants and process administrators (e.g., scope; team membership; milestone creation and tracking; task assignment and tracking; project outcomes; project budget and expense); data visibility and editing capability based on assigned project and process roles
FR4.2.3	Retrieve non-active/archived IC projects for use in analysis by PSU personnel (e.g., academic research; PSU administrative reports; lessons learned continuous improvement projects; etc.)
FR4.2.4	Enable the documentation of all IC projects which do or do not require PSU funding (e.g., scope; objectives; leaders; participants; outcomes; etc.)

**Commented [GL6]:** Need to identify what edits/changes are acceptable which a project is active.

**Commented [GL7]:** Requires additional definition/clarity.





Requirement ID	Requirement Definition
FR4.2.5	Enable the life cycle processes of IC Projects requiring PSU funding (e.g., proposal submission; review and approval; budget allocation; expense management; activity and milestone achievement; participant profiles; closeout report data and exhibits)
FR4.2.6	Capture and ideate new project ideas for primitive conception through collaborative development and ideally reaching proposal creation stage
FR4.2.7	Create and submit a project proposal through completion of standard data fields (see Reference documents listed in the addenda)
FR4.2.8	Manage the review and approval process facilitated by the Office of Academic Affairs (IC Program Manager)
FR4.2.9	Capture all funding process inputs, target and completion dates; make visible to participating team members and stakeholders.
FR4.2.10	Provide the outcome of approval/non-approval decisions and supporting commentary onto the proposal; make visible to participating team members and stakeholders.
FR4.2.11	Move approved proposals to approved status; move non-approved proposals to either reject or rework status; projects can be resubmitted based on either initial non-approved determination.
FR4.2.12	Present status dashboards based on project review and approval process data including all activity dates, status, funding requests, faculty release requests, decision outcomes through multiple levels and financial activity code assignments.
FR4.2.13	Enable (proposal approvers, process administrators, etc.) ability to change reports/ dashboards based on role authority for the project or process; process is expected to change from the current model to an as-yet not defined model for these roles.
FR4.2.14	Assign financial activity codes to approved projects based on the primary funding IC and next available Activity Codes as allocated by PSU Finance. Identify multiple IC funding approvals for budgetary allocation and expense tracking.
FR4.2.15	Communicate financial activity codes to project leaders, OSU Finance, and OoAA staff for approved projects
FR4.2.16	Provide basic project management functionality and tracking based on phases of project. (e.g., scope statement; project marketing statement synopsis; desired and achieved project outcomes; team leaders and members; project milestones)
FR4.2.17	Provide Action Register capability; assigned actions to individuals with target due dates, outcomes and next steps
FR4.2.18	Capture participants by category (faculty, staff, students, partners) and define roles for each; provide project leaders the ability to add participants or modify their status; archive all participants involvement
FR4.2.19	Capability for Project Leaders and/or process administrative staff to announce project participation availability
FR4.2.20	Provide form for interested PSU participants to join projects. Provide form for interested external participants to join projects via exchange with the PSU Center for Business and Community Partnerships (CBCP).
FR4.2.21	Present information of related academic curricula related to the project based on criteria. (i.e. aligned course for which participation in the project results in student academic credit)

**Commented [GL8]:** Need to add life cycle process steps to this FRD.

**Commented [GL9]:** Identify functional capabilities while project is in 'idea' state.

**Commented [GL10]:** What conditions need to be met in order for a proposal to be submitted? Should reference the applicable approval and funding workflows here.

**Commented [GL11]:** State who is managing this process.

**Commented [GL12]:** Define default dashboard based on project and approval status criteria.

**Commented [GL13]:** What is the criteria?

**Commented [GL14]:** Define who these individuals are and what elements they can change, add, remove.

**Commented [GL15]:** Automatic based on criteria, or manual for first release?

**Commented [GL16]:** Define PM steps required. I believe these are outlined in the process flows.

**Commented [GL17]:** Define phases.

**Commented [GL18]:** Define.

**Commented [GL19]:** Is this the ability to add individuals to a project?

**Commented [GL20]:** Define what criteria will be used to map curricula to project. This is of specific importance to defining what will be imported from outside data sources.



Requirement ID	Requirement Definition
FR4.2.22	Present descriptions of prerequisites for project participation
FR4.2.23	Provide for identification, selection, and notification of participants by project leaders
FR4.2.24	Enable communication tools (MS Office 365; social media) based on individual or group project participation status and role
FR4.2.25	Present project financial reports based upon manually entered budget and incurred expense data provided by the OoAA process administrators
FR4.2.26	Capture project outcomes (e.g.; faculty, staff; students; partners participation and value received; learnings accomplished) and close-out documentation (see Reference Document listed in the addenda)
FR4.2.27	Present online project close-out forms (see Reference Document noted in the addenda)
FR4.2.28	Provide project participants with form to enter personal quotes based on the individual's experiences
FR4.2.29	Present participants quotes on reports and dashboards.
FR4.2.30	Ability to attach and/or link to all related project documentation: archival documents, pictures, videos, close-out presentations
FR4.2.31	Ability to extract standard set of project and process reports; ability to create ad hoc project and process queries

**Commented [GL21]:** Who gets to select?

**Commented [GL22]:** Source of participants?

**Commented [GL23]:** Define list and provide within FRD.

**Commented [GL24]:** Define statuses and roles.

**Commented [GL25]:** Manually entered, or system sourced?

**Commented [GL26]:** What are possible outcomes?

**Commented [GL27]:** Assumption: Attach documentation - yes?

**Commented [GL28]:** What is on form and where does closed-out form go?

**Commented [GL29]:** Define default data that can be presented. May want to have first release be standard set of reports and have subsequent release be more flexible (ad hoc).

**Commented [GL30]:** What data fields will be included in personal profile? Will individual be able to self identify their role?

**Commented [GL31]:** Assumption: Initial feed will be from Banner HR - yes? If so, which fields will be brought over?

**Commented [GL32]:** From source system? If pulling from source system, need to define what can be edited. Important: there will be no pass back to source system, thus this IC solution will be out-of-sync with source.

**Commented [GL33]:** IC Role?

**Commented [GL34]:** From source system?

**Commented [GL35]:** All users? If not, who will have this functionality?

**Commented [GL36]:** Define list of activities?

### 4.3 Personal Profile

Requirement ID	Requirement Definition
FR4.3.1	Web form to create a personal profile. (see Reference Document in the addenda for profile fields; project data currently captured in that form will not be included in the personal profile online tool)
FR4.3.2	Ability to edit selected personal information and IC subscription preferences.
FR4.3.3	The system shall define the primary/default function of the PSU individuals (faculty; staff; student) from data obtained from legacy PSU systems
FR4.3.4	Permit individuals with multiple functions (faculty; staff; student) to select the primary function for participation in IC engagements
FR4.3.5	Present the individual's email address and phone number from the database (imported/updated periodically from legacy PSU systems)
FR4.3.6	Enable individuals to identify (select and/or input) academic interests
FR4.3.7	Enable individuals to identify (select and/or input) special interests, skills, or talents
FR4.3.8	Provide Faculty members and students a default IC assignment based on Academic Affiliation or Major
FR4.3.9	Present provide faculty academic program or department assignment from "net new" data inputs Office of Academic Affairs
FR4.3.10	Enable faculty to identify (select and/or input) areas of research
FR4.3.11	Permit selection or modification of IC subscription (secondary affiliations) for one or more ICs (faculty; staff; students)
FR4.3.12	Present the status of currently active IC activities (e.g., projects; events; IC academic courses; topical conversations)
FR4.3.13	Present the status of external partner activities



#### 4.4 Topical Discussions

Requirement ID	Requirement Definition
FR4.4.1	Enable the posting and tracking of topical discussions regarding Integrated Clusters at PSU and IC levels for faculty, staff, and students
FR4.4.2	Provide individuals and groups with advisories of topical discussions related to key word matches to profile criteria (e.g., IC affiliations; IC subscriptions; Project memberships; match to interests or research areas)
FR4.4.3	Link topical discussions to IC-coded curricula (courses identified as linked to an IC project and/or interdisciplinary design)
FR4.4.4	Link topical discussions to IC Communications and Projects based on key word matches between Project meta tags and key word profile library

**Commented [GL37]:** This is forum-like functionality. Is there also a requirement to connect topical discussions to projects? Do all users have this capability?

**Commented [GL38]:** Need clarity

**Commented [GL39]:** What constitutes the link?

#### 4.5 Partner Profiles

Requirement ID	Requirement Definition
FR4.5.1	Enable role-based access to selected PSU IC material
FR4.5.2	Base level access to be provided via links to PSU website; advanced access to be provided by CBCP-granted registration and permissions access
FR4.5.3	Present Summary IC data based on CBCP approval
FR4.5.4	Present project data based on CBCP approval
FR4.5.5	Provide tools to import and display partner information from PSU legacy CRM system and "net new" data provided by CBCP
FR4.5.6	The system shall provide tools to capture and display key CBCP contact data for specific partners
FR4.5.7	Partner operational data (e.g., type of business or organizational functions performed)
FR4.5.8	Partner's mission or business purpose
FR4.5.9	Partner's locations and employees
FR4.5.10	Partner's prior history of engagements with PSU
FR4.5.11	Partner's current engagements with PSU
FR4.5.12	Partner's current interests in future IC projects and activities

**Commented [GL40]:** Is this for the partner to update their information?

**Commented [GL41]:** Is this information in the following rows?

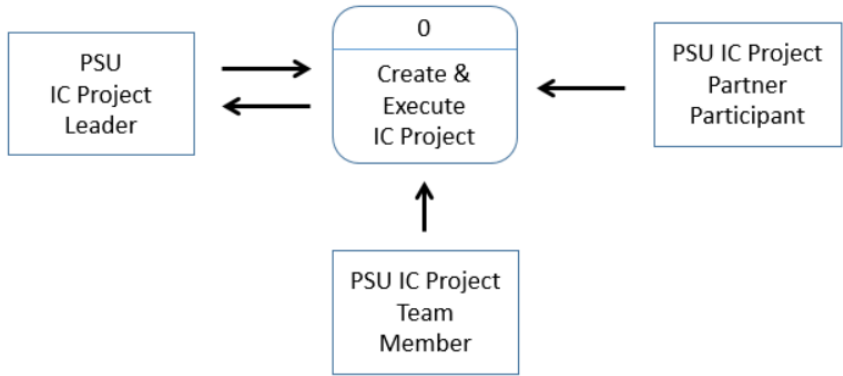
#### 4.6 Process (Workflows) Requirements

These Data Work Flow diagrams and comments are intended to supplement other information provided in this document. It is recognized these are high level workflows and are not, by themselves, sufficient to fully characterize the specific needs of the supporting IT systems functionality.

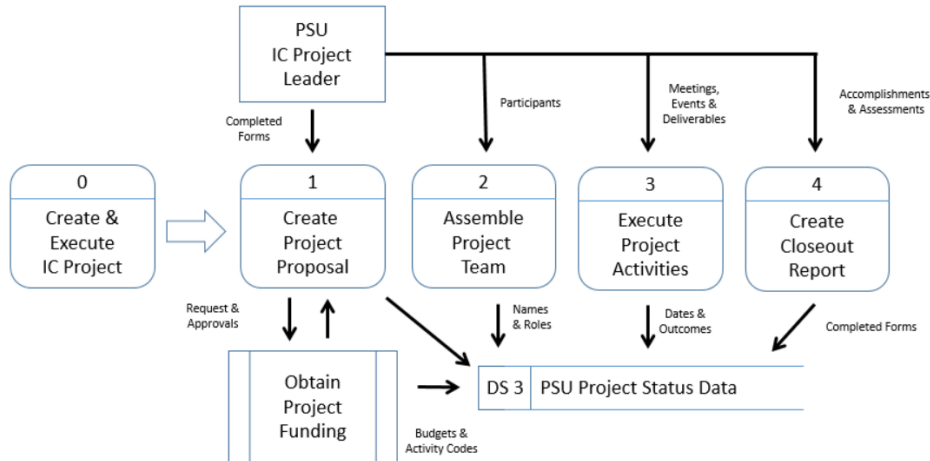
**Commented [GL42]:** Ideally, the following workflows would be depicted in Visio diagrams. Additionally, this section should include the required input fields as depicted in the workflows e.g. "Project-Proposal-Planning-Guidelines-V2-2.docx"

##### 4.6.1 Project Execution Flow Diagrams

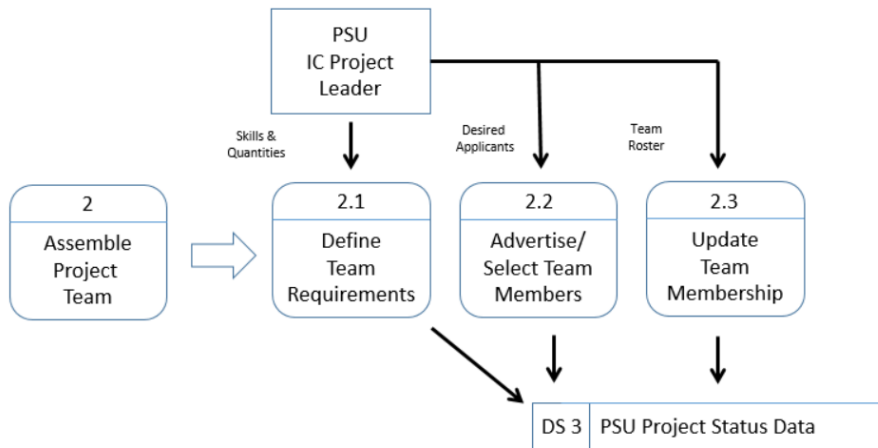
All PSU IC projects, whether funded or non-funded, will need to comply with a process to define the scope, activities, accomplishments, and lessons learned from their experiences. Such material is useful to the internal PSU faculty, staff, students, and administration, as well as by PSU Marketing/PR functions to effectively communicate with external constituents, such as partners, prospective students and their families, PSU Alumni, and academic and institutional colleagues.



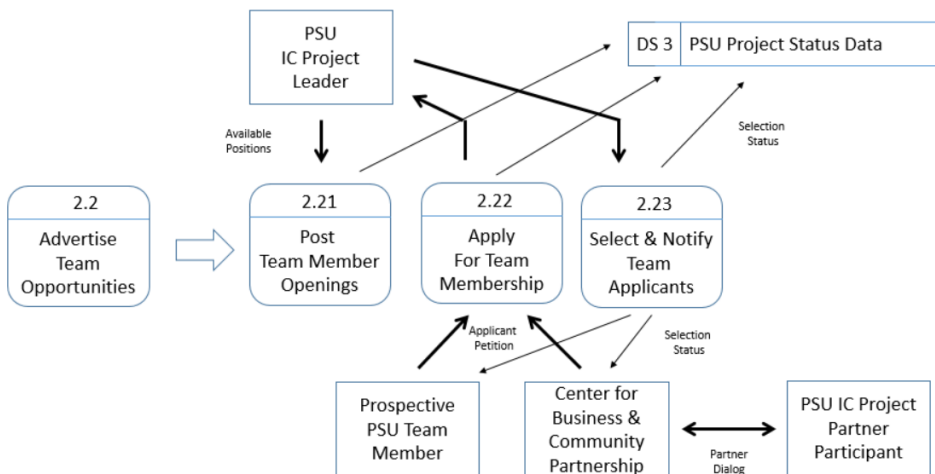
This exhibit represents the highest level Context data flow diagram (DFD) for Project Creation and Execution.



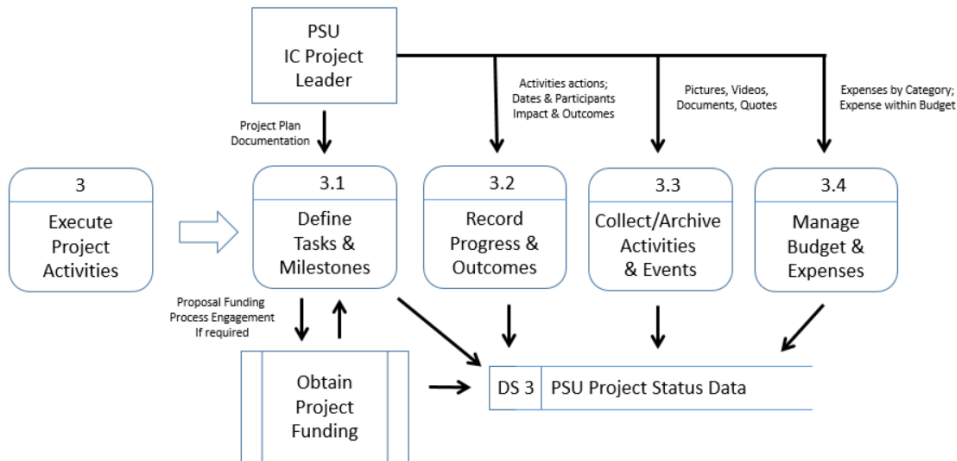
PSU Leaders will own the responsibility of managing their project to a successful completion based on its lifecycle. The four (4) primary stages as noted above are used to represent the major processes required for project success.



PSU Project leaders own the responsibility of defining the skills and abilities which are collectively required to design and create an effective team to execute their project to its scope and desired outcomes.

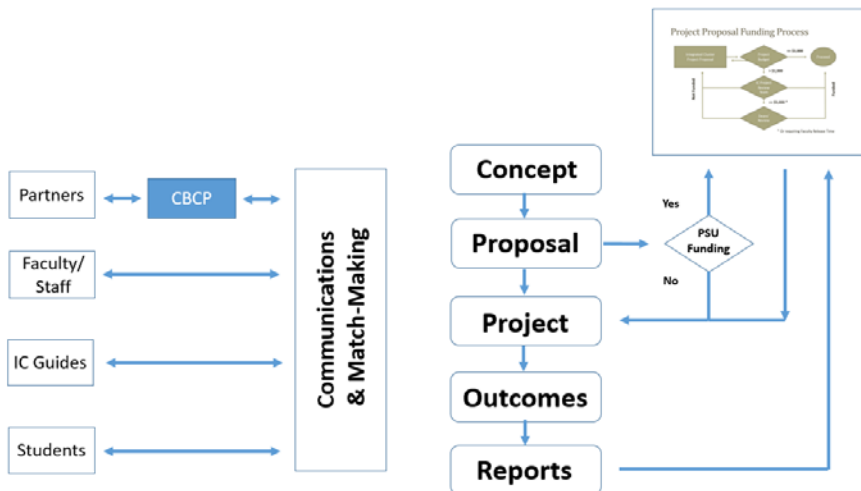


Project Leaders will be assembling teams of faculty, staff members, and students from across the University. While some individuals might be engaged as team members from the outset of the proposal development stage, most projects will require additional internal PSU resources to execute the full scope of the work. The ability to advertise such opportunities, solicit requests for participation, and notify the applicants will be essential for IT system functionality. In addition, the Center for Business and Community Partnership (CBCP) will act as the PSU agent in brokering opportunities for participation by external partners. Reports on various combinations of each of the data elements in the Data Store will be required.



PSU project leaders will be responsible for successfully completing all aspects of the execution phase of the project lifecycle. Basic project management tools and capabilities (milestone and activity tracking; exhibit archiving; financial data) will be required in executing this set of responsibilities.

Project concepts can be created by any PSU individual/group or by external Partners. Once the idea has become a proposal, it can then be initiated with Faculty/Staff leadership if it does not require funding or faculty release time. If supplement funding is required, it must engage in the Project Proposal Funding Process (see below). Once the project is completed and outcomes are captured, a Project Completion Report is generated and submitted to the Office of Academic Affairs (the funding agency).

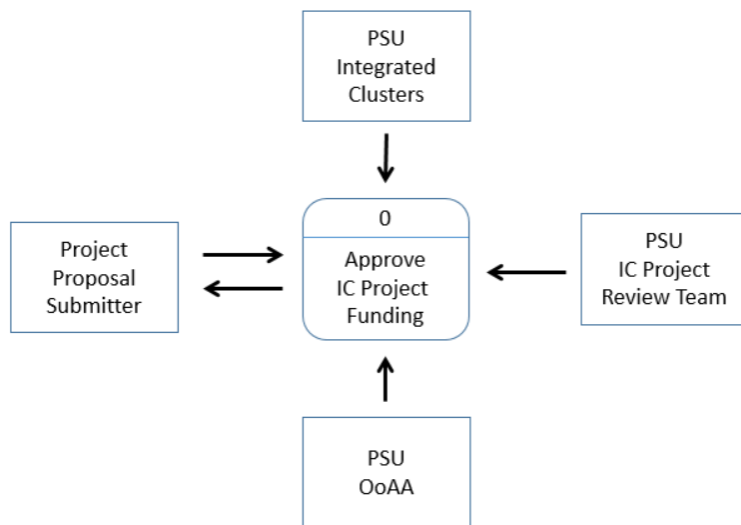


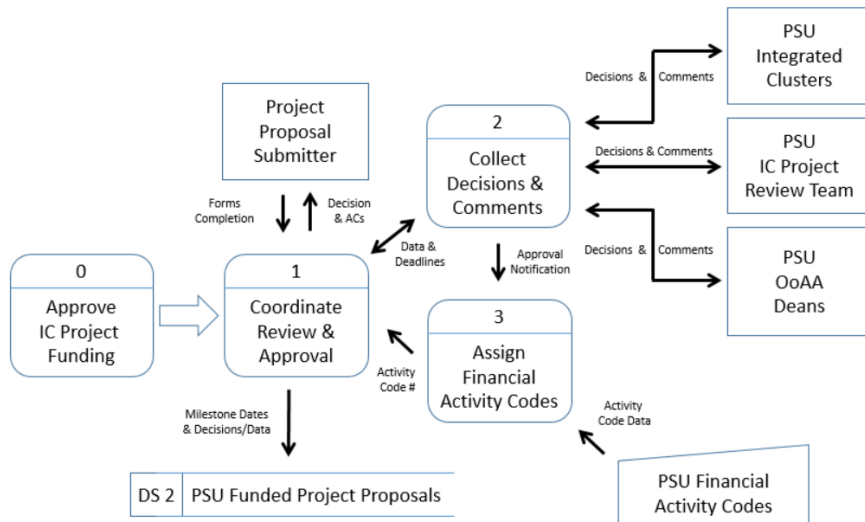


#### 4.6.2 Project Funding Flow Diagrams

A key aspect of the PSU Integrated Cluster Model is the use of inter-disciplinary projects to engage faculty, staff, students and external partners in addressing real world issues or problems. Many of these IC projects will require supplementary funding to engage resources and achieve desired outcomes. PSU Faculty and/or Staff can become the leaders of such projects and they alone can request funding from the OoAA in a prescribed process (more completely described in documents referenced in the Addenda of this paper).

The following exhibit represents the highest level Context framework for the associated Data Flow Diagrams.



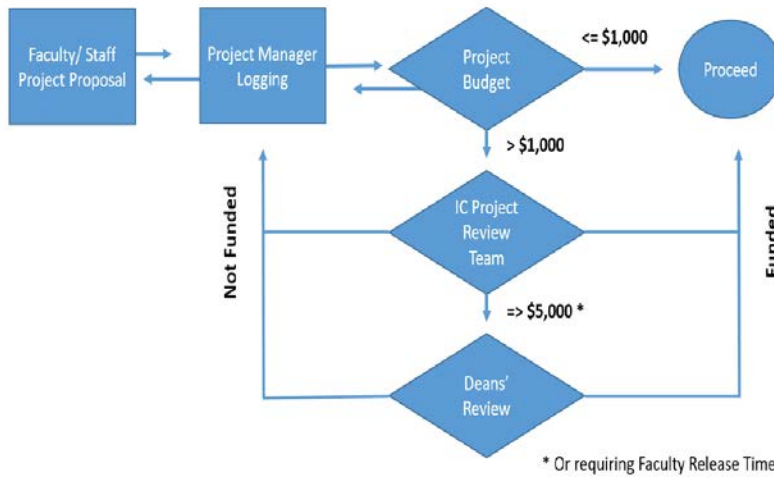


Project teams will require one Leader to act as the Submitter for Proposed Project Funding requests.

Examples of standard reports on the status and history of proposed project funding requests are referenced in Reference Documents noted in the Addenda of this paper.

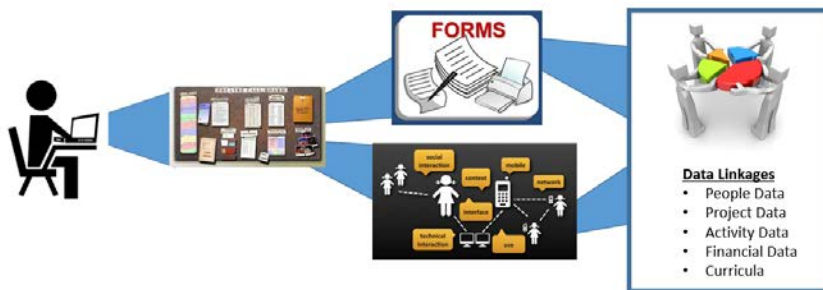
Faculty and Staff initiate Project Proposal requests for funding which are currently routed to the OoAA IC Program Manager for logging and tracking purposes. Depending on the funding amount being requested and the need for faculty release time, an IC can either approve a proposal or endorse it for approval by the IC Guides Project Review Team or the Academic Deans. ICs, the IC Project Review Team, and the Deans can also determine that a project proposal can be rejected or be reworked depending on their engagement in the project funding process. For all decisions, comments are required to accompany these decisions. Final notification and financial Activity Codes (if approved) are provided by the Project Manager.





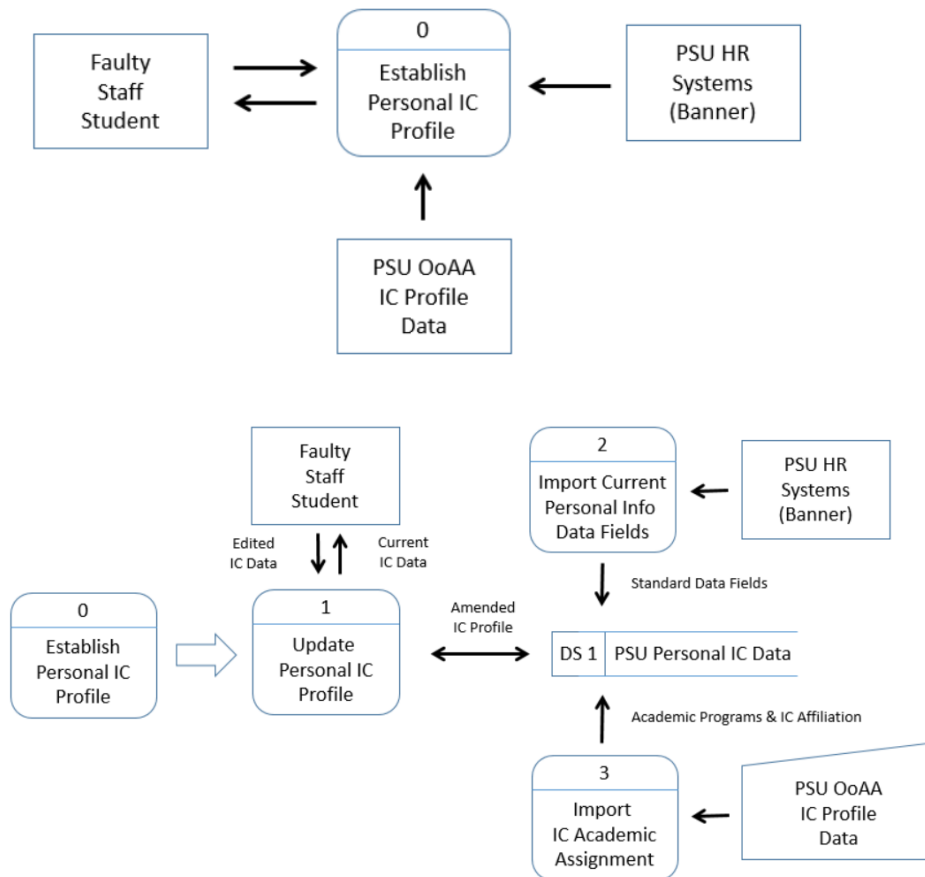
4.6.3 Personal Access Information and Communications Flow Diagram

It is envisioned that individuals access the Integrated Cluster IT tools and applications through a portal which is customized to their roles. Standard and structured online query forms will be used for information input/output functions. Communications tools will link to the common data structures to provide enhanced functionality.



Personal Profiles of individuals within PSU (faculty; staff; students) and their association with Integrated Clusters and IC Projects are required for the functionality of the IT system. Such profile data will retain basic information (name, email address, telephone number) as are available from existing PSU internal online search functions. In addition, individuals may be assigned a primary affiliation with one (or more) ICs based on policies and procedures created by the Office of Academic Affairs (OoAA). Individuals will have the capability of “subscribing” their affiliation to other ICs at their choosing; they also may designate areas of academic focus or other interests that may be advantageous to be engaged in IC projects and Activities.

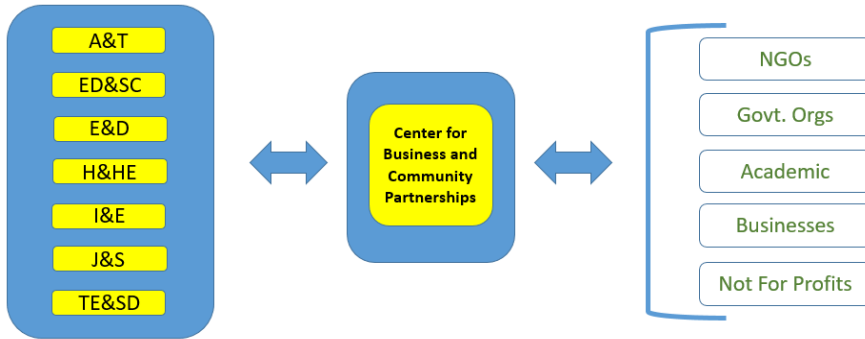
The following exhibit represents the high level Context chart for Personal Profile Data Flow Diagrams.



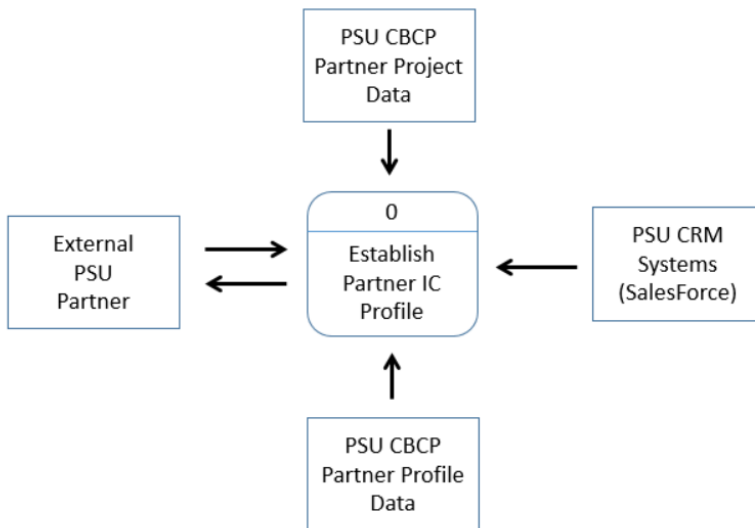
Personal data will be made available from a variety of existing information resident to the University and will be supplemented by 'net new' information provided by the individual. Data contained in the Data Store will be viewable and searchable by anyone within PSU and will be used in other processes supporting the IC Model. Standard extract reports will be required based on the data elements contained in the DS.

#### 4.6.4 Partner Engagement Flow Diagram

Partner engagement in activities and/or projects can be initiated by one of the 7 Integrated Clusters or by the Partner organization. The Center for Business and Community Partnerships performs the match-making function and supports the development of a positive engagement and mutually beneficial outcomes.



The following exhibit represents the highest level Context chart used in the Data Flow Diagrams for external Partner Engagement.



Involvement of external Partners will be an essential element of success for the Integrated Clusters and the associated activities and projects. Data will be imported/created to provide a data set for each partner registered by the Center for Business and Community Partnership (CBCP). As such, the creation of a searchable profile for these partners will be required for selecting and engaging these resources for PSU IC activities and projects.



## 5.0 INTERFACE REQUIREMENTS

All interface responsibilities are directly, or indirectly, managed by PSU IT team. The PSU IT team will be lead and point-of-contact for interface requirements to PSU-external systems, such as USNH Banner HR and Finance.

### 5.1 User Interface

User interfaces are optimally to be controlled by a user portal based on a roles and responsibilities model. Each user would have a uniquely customizable selection of tools that could be accessed from this front-end GUI interface. Each tool or resource accessed would be customized based on the role assigned to the individual for the type of engagement.

Access to online tools and resources must be created to utilize the most common appliances: a personal computer; a tablet; a mobile phone.

### 5.2 Hardware Interfaces

It is anticipated this system will be resident at the PSU Data Center with access to other resident systems and cloud-based systems as required.

### 5.3 Software Interfaces

Currently identified applications to be included:

- USNH Banner HR
- USNH Banner Finance
- Microsoft Office 365
- Salesforce

### 5.4 Communications Interfaces

Access to the system is required to be provided by the internal PSU LAN with single sign-on authentication using PSU credentials.

## 6.0 DATA REQUIREMENTS

### 6.1 Data Model/Data Dictionary

The system will be required to access and store selected data from legacy PSU and USNH systems to complement the “net new” data required to operationalize the Integrated Cluster model. Such data will need to be refreshed on an ongoing basis. For the foreseeable future, the system will not be required to provide the “net new” data to legacy PSU or USNH systems.

#### 6.1.1 Integrated Cluster

Academic structure for interdisciplinary activities and experiences

- Activity – Any engagement involving Integrated Cluster resources
- Project – Activity engaging external partners/constituents on real-world problems and providing an experiential student learning opportunity
- Open Lab – real or virtual environment for engaging in Integrated Cluster projects and activities
- Event – One time or recurring activity to provide an IC experience
- Curricula – Faculty-led coursework that is inter-disciplinary in nature and/or has a specific relationship to an IC Project



### 6.1.2 PSU Participant

Members of the PSU campus engaging in Integrated Clusters

- Faculty – PSU academic personnel (Tenure Track; Contract Faculty; Teaching Lecturers)
- Staff – Operating and Professional Services personnel employed by PSU
- Students – Matriculated undergraduate and graduate PSU students

### 6.1.3 Partners

External People or Organizations collaborating in or contributing to PSU activities

### 6.1.4 User Portal

Role-based user interface providing access to applications and communications tools

- Roles – Category of an individual’s participation in an organization construct, event, or project (see Section 7.2 of this FRD)

## 6.2 Data Conversion Requirements

Import and conversion of data from legacy PSU and USNH systems is under investigation.

## 6.3 Data Flow

The primary data flow requirements are based on the management and execution of projects. See Section 4.5 Process (Workflows) Requirements.

# 7.0 USER CLASSES AND MODES OF OPERATION

Data access by role type is enabled by the policies and procedures embedded in applications is to be created. Said policies and procedures and acceptable exceptions are managed by the administrators in the Office of Academic Affairs.

Individuals will have different role types depending on their involvement in an activity or project. These must be granted explicitly (and withdrawn) based upon an individual’s type of participation in a project. Changes in participation roles will be controlled by the Project Leader/Leaders and/or administrators in the Office of Academic Affairs.

Security must be in place to ensure that information appropriate to the roles defined above is safe-guarded and not shared publicly without the explicit concurrence of the OoAA.

External partners will have limited access to information available within the Academy; Access to project and activity information can be granted by the CBCP organization.

Flow diagrams for the Project Funding Approval process are to be found in this document and more detailed information is available in the Sharepoint archive mentioned above.

## 7.1 Primary Classes

The following presents the major classes/categories of users that will interact with the system. There will be 5 primary classes of users:

- Faculty
- Staff
- Students



- External Partners
- IT/Process Administrators

## 7.2 User Roles

The application will support the following roles and responsibilities based requirements. Roles will established applicable access rights to important and relevant information and preclude access to data/information that is not appropriate for the situational role of the individual.

Roles are evident in the three categories of experience.

### 7.2.1 Project Engagement

- Project Leaders (Leader; Co-Leader; Funding Proposal Submitter; Sponsor)
- Project Participants (Project Team Member; Activity Participant)
- Project Funding Decision-makers (IC Guides; IC Guide Project Review Team; Academic Deans)
- Project Prospective Participants (Faculty; Staff; Students; Partners)
- Project Document Editors (IC OoAA Administrators; Marketing/PR professionals)
- Project Information Followers (Data/Information recipients)

### 7.2.2 Personal Profiles

- Faculty Type (Tenure Track; Contract; Teaching Lecturers)
- Staff (Administrative Support; Functional Experts)
- Students (Individual Student; Student Group member; IC Project participant; Academic participant)
- IT/Administrators (IT development & support; Process administrators)

### 7.2.3 Partner Profiles

- Partner Querents
- Project Followers
- Activity Participants
- Project Sponsors
- Funding Agents

## 7.3 Data Topics

Data access and/or the ability to modify/edit existing data is limited to specific user roles

### 7.3.1 Data Topics – IC Projects

Examples of data topics for an IC Project are shown below. Access to data topics is limited by the specific role of the individual requesting access.

- Project Scope and Rationale Statement (Synopsis and Full Detail)
- Funding Source Integrated Cluster(s)
- Proposal Documentation (Papers; Exhibits; Pictures; Videos)
- Project Guideline Alignment Rubric
- Project Outcome Statement (Proposed Results; Value Achieved)
- Project Engagement Opportunities (based on availability for skills & interests)
- Project Participants (Names, Titles, Project Roles, Academic curricula engagement)
- Project Milestones
- Project Action Registers
- Project Curricula Alignment (Courses; FYS; GenEd)

**Commented [GL43]:** This section should include a "CRUD" table e.g. "PSU IC Role-Based Requirements.xlsx"



- Project Financials (Budget and Expenses)
- Proposal Funding Request status (Proposal, Submission, Review, Approval/Rework/Reject)

#### 7.3.2 Data Topics – Personal Profile

Examples of data topics for a Personal Profile are shown below. Access to data topics is limited by the specific role of the individual requesting access. Data topics can differ based upon the role in the University (Faculty; Staff; Students).

- Name
- Category (Faculty; Staff; Student)
- Title
- Email Address
- Department
- IC Academic Affiliation
- IC Interest Subscription
- Areas of Academic interest and/or research
- Areas of Skills or non-academic interest

#### 7.3.3 Data Topics – Partners

Examples of data topics for Partners are shown below. Access to data topics is limited by the specific role of the individual requesting access.

- Partner Name (company or organization)
- Partner contact(s) (name, title, relationship to PSU)
- PSU Contact liaison in CBCP
- Current PSU Activities
- Partner Integrated Cluster Engagements
- Partner Profile (individual/organization; Mission Statement; Key facts)
- History of PSU/Partner activities (Project, Activity and Funding)
- PSU Partner Liaison Manager

### 7.2 User Classes Mapped to Functional Features

This section presents what functions each user organization can access or use. Any variations in the user work processes by different classes of users are also identified within this section.

### 7.3 Operational Scenarios

This section presents use scenarios for each major user class. System functionality, system interactions, and what outputs are expected to be generated by the system are listed here. The scenarios should be comprehensive, to the extent that all user types and all major functions are covered.

## 8.0 OPERATIONAL REQUIREMENTS

Provide the operational requirements in this section. Operational requirements describe how the system will run and communicate with operations personnel.

Do not state how these requirements will be satisfied. For example, in the Reliability section, answer the question, “How reliable must the system be?” Do not state what steps will be taken to provide reliability.

Distinguish preferences from requirements. Requirements are based on business needs. Preferences are not.



## 8.1 Security

The Security Section describes the need to control access to the data. This includes controlling who may view and alter application data. Use the following criteria:

- State the consequences of the following breaches of security in the subject application:
- Erasure or contamination of application data
- Disclosure of Government secrets
- Disclosure of privileged information about individuals
- State the type(s) of security required. Include the need for the following as appropriate:
- State if there is a need to control access to the facility housing the application.
- State the need to control access by class of users. For example, "No user may access any part of this application who does not have at least a (specified) clearance."
- State the need to control access by data attribute. State, for example, if one group of users may view an attribute but may not update it while another type of user may update or view it.
- State the need to control access based on system function. State, for example, if there is a need to grant access to certain system functions to one type of users, but not to others. For example, "The system shall make Function N available to the System Administrator only."

### 8.1.1 Security Breaches

Consequences of the following breaches of security:

- Loss or corruption of data – impedes the operation of the university's operation model
- Disclosure of secrets or sensitive information – potentially damaging to reputation and may have legal and/or financial consequences
- Disclosure of privileged/privacy information about individuals – data in the system should not contain privileged or private information about individuals
- Corruption of software or introduction of malware, such as viruses - impedes the operation of the university's operation model

### 8.1.2 Security Types

State the type(s) of security required. Include the need for the following as appropriate:

- Physical security – comparable to other legacy PSU systems would be appropriate
- Access by user role or types – to be built into the systems data access model with override control by assigned administrators
- State access control requirements by data attribute. Ability to view data will be designed into the system on an application-specific basis. There will be requirements to limit data accessibility based on specific roles by individuals or groups accessing this data.
- State access requirements based on system function. User groups will have defined access to categories of data. In a broad sense, the user groups are: faculty; Staff; Students; Partners; Administrators. Specific rules for assigning access will be developed concurrently with applications and systems development.
- There is no currently identifiable need for certification and accreditation of the security measures adopted for this system.





## 8.2 Audit Trail

List the activities that will be recorded in the application's audit trail. For each activity, list the data to be recorded.

Audit trail will require archiving all project data including Project Proposal Funding process steps and decisions, budget and expense accounting, and project execution steps and documentation. Authors or decision-makers for each element will be required for each data element recorded.

## 8.3 Data Currency

Data currency is a measure of how recent data are. This section answers the question, "When the application responds to a request for data, how current must the data be?" Answer that question for each type of data request.

## 8.4 Reliability

Reliability is the probability that the system will be able to process all work correctly and completely without being aborted. Reliability is evaluated as follows:

- State the following in this section:
  - What damage can result from failure of this system?
  - Loss of human life
  - Complete or partial loss of the ability to perform a mission-critical function
  - Loss of revenue
  - Loss of employee productivity
- What is the minimum acceptable level of reliability?
- State required reliability in any of the following ways:
  - Mean Time Between Failure is the number of time units the system is operable before the first failure occurs.
  - Mean Time To Failure is computed as the number of time units before the system is operable divided by the number of failures during the time period.
  - Mean Time To Repair is computed as the number of time units required to perform system repair divided by the number of repairs during the time period.

## 8.5 Recoverability

Recoverability is the ability to restore function and data in the event of a failure.

Answer the following questions in this section:

- In the event the application is unavailable to users (down) because of a system failure, how soon after the failure is detected must function be restored?
- In the event the database is corrupted, to what level of currency must it be restored? For example "The database must be capable of being restored to its condition of no more than 1 hour before the corruption occurred."
- If the processing site (hardware, data, and onsite backup) is destroyed, how soon must the application be able to be restored?
- In the event the application is unavailable to users (down) because of a system failure, system functionality must be restored within one working day after the failure is detected.
- In the event the database is corrupted, the database must be capable of being restored to its condition of no more than 12 hours before the corruption occurred.



- If the processing site (hardware, data, and onsite backup) is destroyed, the system be able to be restored within 3 working days.

#### 8.6 System Availability

System must be available during anticipated peak demand Monday through Friday between the hours of 6:30 a.m. and 5:30 p.m. EST.

It is important that the system be available for all other non-peak demand times as it is expected that users will require this access to pursue their interests and complete their responsibilities.

#### 8.7 Fault Tolerance

Fault tolerance is the ability to remain partially operational during a failure. Describe the following in this section:

- Which functions do not need to be available at all times?
- If a component fails, what (if any) functions must the application continue to provide?
- What level of performance degradation is acceptable?

For most applications, there are no fault tolerance requirements. When a portion of the application is unavailable, there is no need to be able to use the remainder of the application.

#### 8.8 General Performance

Describe the requirements for the following:

- Response time for queries and updates
- Throughput
- Expected rate of user activity (for example, number of transactions per hour, day, or month)

#### 8.9 Capacity

Expected volumes of "net new" data for this system are expected to low at the outset (less than 1 GB). The requirements for imported data from legacy PSU and USNH systems are to be determined. As the use of this systems scales to hundreds of faculty/staff and thousands of students, the data requirements are expected to grow significantly. Without further characterization of data requirements, it is extremely difficult to estimate data capacity requirements at the outset of this project.

It is expected, as an assumption for this IT project, that project and activity picture and videos will be archived separately from this system but that the system will be able to link to access those materials.

#### 8.10 Data Retention

The system shall retain application information for a minimum of 3 years. It is also expected this to apply to system documentation, audit records, database records, and access records.

There is a parallel project which is intending to archive documents, pictures and videos relating to the overall transformation of the institution which will have its own retention requirements.

### 9.0 ATTACHMENTS OR APPENDICES

Note: Attachments are listed as shown in the outline at the end of this document. They are numbered in sequence here as part of the descriptive text.



## 9.1 Appendix A—Glossary

### Integrated Cluster (IC) –

An organizational unit comprised of Plymouth State University faculty, staff and students who come together with the intention to engage in collaborative, interdisciplinary work that transcends or takes advantage of individual disciplines and aligns with the specific Cluster focus.

An organizational unit comprised of Plymouth State University faculty, staff and students who come together with the intention to engage in collaborative, interdisciplinary work that transcends or takes advantage of individual disciplines and aligns with the specific Cluster focus. Additional Cluster participants are Partners and other external stakeholders (for example, alumni, governmental agencies, businesses, other academic institutions, etc.), as well as internal stakeholders such as PSU Centers and student organizations. Academic programs are affiliated with specific Integrated Clusters, but individual faculty members and students can choose to be active participants in multiple Clusters. Each Cluster has an individual identity, as defined in its Mission Statement. Cluster participation can occur through Projects, Activities, curriculum and other teaching and pedagogical activities, and through service.

The current design of the Integrated Cluster model at PSU is comprised of seven (7) Integrated Clusters. Each is comprised of faculty assigned to the academic programs associated with the mission of each cluster. In addition, some staff personnel are directly aligned with specific ICs; other PSU staff are aligned to support the various operations centers across the academy. Incoming students for Fall 2017 will be able to select a specific Integrated Cluster upon matriculation. The remaining student population at PSU, both undergraduate and graduate, will have the option to affiliate with a specific IC or ICs during AY 2017-2018.

The list of PSU Integrated Clusters is shown below.

- Arts & Technologies
- Education, Democracy, and Social Change
- Exploration & Discovery
- Health & Human Enrichment
- Innovation & Entrepreneurship
- Justice & Security
- Tourism, Environment & Sustainable Development

### Open Lab –

Physical or virtual space that supports Integrated Clusters by enabling engagement and collaborations between PSU faculty, staff, students and external Partners and stakeholders.

Physical or virtual space that supports Integrated Clusters by enabling engagement and collaborations between PSU faculty, staff, students and external Partners and stakeholders in order to identify, discuss, and address real-world issues and problems. Open Labs do not belong to a specific Cluster, nor do they necessitate a physical space on campus. Several collaborative spaces have been developed across campus.

### Cluster Project –

A well-defined activity or group of activities that together have clear scope, duration, resource commitment, objectives and measurable high impact outcomes.



A well-defined activity or group of activities that together have clear scope, duration, resource commitment, objectives and measurable high impact outcomes. Cluster Projects are endorsed by one or more Integrated Clusters; they are interdisciplinary in nature, and they involve a team of different types of participants (appropriate combinations of students, faculty, staff, and external partners) collaboratively leveraging service, scholarship and research activities. Projects provide students with experiential, high impact learning activities and real-world experience beyond their classes. Projects might address specific needs of the University, the local or regional community, external Partners, or other stakeholders, and support and reflect the mission of the endorsing Clusters.

#### Cluster Activities –

Teaching, service, outreach, or scholarly activities that support an Integrated Cluster.

Teaching, service, outreach, or scholarly activities that support an Integrated Cluster. Cluster Activities occur outside the context of a specific Cluster Project but can be involved in supporting such projects. Cluster Activities do not have a clearly defined timeframe and can be ongoing, but must have a clear relationship with the Cluster or Clusters within which they occur.

#### Cluster Partners –

External, non-PSU, stakeholders with interests, values, needs and/or resources that align with PSU and the Integrated Cluster with which they have a relationship.

External, non-PSU, stakeholders whose interests, values, needs and/or resources that align with PSU and the Integrated Cluster with which they have a relationship. Partners can serve in advisory roles or can be contributors to Projects or other Activities (service, curricular, etc.). Partners are active participants; they contribute to the Cluster (with information, expertise, funding, etc.) and in turn receive value from the relationship (experiences, problem solutions, increased knowledge, understanding, etc.). This distinguishes Partners from other potential external stakeholders with whom there might only be one-way informational relationships.

#### Academic Affiliation –

Faculty will be assigned an Academic Affiliation to a specific Integrated Cluster based on the course topics they teach.

#### Integrated Cluster Subscription –

Faculty and Staff will have the option to participate in one or more Integrated Clusters as they chose based on a subscription model; these choices can change as needed throughout the course of the Academic Year.

### 10.2 Attachment/Appendix B—Other

Additional Reference Documents are available for access by PSU/USNH ITS Project participants and are located at the [PSU Guides SharePoint Site](#). For the purposes of limiting the length of this document, the key supplemental reference documents are noted below:

#### **IT Planning**

**Folder:** <https://plymouthstate.sharepoint.com/sites/IntegratedClusters/Shared%20Documents/Forms/AllItems.aspx?id=%2Fsites%2FIntegratedClusters%2FShared%20Documents%2FIT%20Planning>



Reference Document: Integrated Cluster IT Requirements – Draft 9-6-16.pptx

Reference Document: Integrated Cluster Information Technology Systems Journey.docx

Reference Document: WIP-PSU Project Charter V1c 1-12-17.docx

**Project Document**

**Folder:** <https://plymouthstate.sharepoint.com/sites/IntegratedClusters/Shared%20Documents/Forms/AllItems.aspx?id=%2Fsites%2FIntegratedClusters%2FShared%20Documents%2FProject%20Documents>

Reference Document: Cluster Project Quick Ideas 11-5-16.xlsx

Reference Document: IC Funding and Proposal Process.pptx

Reference Document: IC Project Proposal Process Milestone Dates AY 2016-2017.docx

Reference Document: Project Review and Approval Process.mp4

Reference Document: Proposed Project Tracking Register 1-15-17.xlsx

Reference Document: Project Completion Report Template v2 1-12-17.docx

**Inventory Documents Folder:**

<https://plymouthstate.sharepoint.com/sites/IntegratedClusters/Shared%20Documents/Forms/AllItems.aspx?id=%2Fsites%2FIntegratedClusters%2FShared%20Documents%2FInventory%20Documents>

Reference Document: December Cluster Master List 12.19.16.xlsx

Reference Document: PSU IC Personnel Profiles 1-6-17.xlsx

Reference Document: Majors by Clusters final as of 12-13-16.docx

Reference Document: Graduate degrees in Clusters rev4 12-9-16.docx

**Cluster Resource Documents Folder:**

<https://plymouthstate.sharepoint.com/sites/IntegratedClusters/Shared%20Documents/Forms/AllItems.aspx?id=%2Fsites%2FIntegratedClusters%2FShared%20Documents%2FCluster%20Resource%20Documents>

Reference Document: Definitions Final.pdf

Reference Document: Integrated Cluster Guide Role and reappointment letter.docx

Reference Document: Mission Statement 10-5-16.docx