# Feasibility Evidence Description (FED)

**We Are Trojans (WAT) Network**

**Team 01**

| Team members | Roles |
|---|---|
| **Eirik Skogstad** | Project Manager, Life Cycle Planner |
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| **Ameer Elkordy** | IIV&V, Quality Focal Point |
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**10/19/2014**

# Version History

| Date | Author | Version | Changes made | Rationale |
|---|---|---|---|---|
| 09/28/14 | ML,PP | 1.0 | • Create initial a FED document from a template, updating the risk assessment section. | • For use VCP package submission of the project. |
| 10/11/14 | ML,PP | 1.5 | • Finish all from section 1 to 5 | • For use VCP package submission of the project. |
| 10/19/14 | ML,PP | 2.0 | • Updated all section<br>• Make consistent with the ARB and FCR presentation<br>• Some NDI was evaluated | • Use in next phase (Foundation phase)<br>• To be consistent with ABR presentation |

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# 1. Introduction

## 1.1 Purpose of the FED Document

This document reports our analysis about the feasibility evidence of the We Are Trojans (WAT) Network project. We use risk assessment to identify and come up with a way to mitigate those risks. We will analyze NDI items and evaluate the risk if whether they fit our project.

## 1.2 Status of the FED Document

- Complete all section in the document
- Evaluate CMS NDI
- Updated the risk list

# 2. Process Feasibility

**Table 1: Rationales for Selecting NDI/NCS Model**

| Criteria | Importance | Project Status | Rationales |
|---|---|---|---|
| 30 % of NDI/NCS features | 3 | 3 | In the We Are Trojans, we will use NDI for the forum component and a core module to manage user's login |
| Single NDI/NCS | 1 | 1 | We may be using more than one NDI. |
| Unique/ inflexible business process | 1 | 1 | The business aspects of the project are very flexible. |
| Need control over upgrade / maintenance | 3 | 3 | The project has to be upgraded in future after the client negotiating with the USC. |
| Rapid deployment | 0 | 0 | Currently we are just building a dummy system. The system initially will not be deployed. |
| Critical on compatibility | 0 | 0 | The system has no compatibility issue. We will built the system and then look for a web hosting for our system. |
| Internet connection independence | 1 | 1 | Internet connection is important as the application developed is a web-based application. |
| Need high level of services / performance | 2 | 1 | High level of services and performance is important |
| Need high security | 2 | 2 | The system will be used only by USC students |
| Asynchronous communication | 2 | 2 | The system requires asynchronous communication to communicate with the web-hosting. |
| Be accessed from anywhere | 3 | 3 | The system is an online community. |
| Critical on mass schedule constraints | 0 | 0 | No, the system is not critical on mass schedule constraints. |
| Lack of personnel | 0 | 0 | The group consists of highly |

| | | | |
|---|---|---|---|
| capability | | | competent graduate software engineers and because We Are Trojans! |
| Require little upfront costs | 3 | 3 | The budget for our project is $0, as per our client specifications. |
| Require low total cost of ownership | 2 | 2 | Requires no cost of ownership |
| Not-so-powerful local machines | 3 | 3 | We have minimal cost and we also have no infrastructure right now. We will be using free left over 8 year old laptops. |

# 3. Risk Assessment

**Table 2: Risk Assessment**

| Risks | Risk Exposure | | | Risk Mitigations |
|---|---|---|---|---|
| | Potential Magnitude | Probability Loss | Risk Exposure | |
| Undefined Plan to accommodate a crucial system feature: We still have to figure out how to manage the three "WAT" point system. | 7 | 9 | 63 | Consult with the clients to find more details as to how he would like WAT point system to be implemented. |
| Lack of Involvement by success-critical-stakeholders: Do not understand clearly enough the success-critical Stakeholder positions | 5 | 10 | 50 | Further understanding of needs and system scoping is needed |
| User Risk: users may not accept to use the system even if all the specification are met by the system | 5 | 10 | 50 | We need to have certain level of discussion with the actual users as to whether they are willing to learn and use the new system we are developing |
| Architecture/Reuse/Non-Development Item conflict: The COTS/NDI used may be poorly matched. A database system may be needed in order to keep the accounts, logs and forum information. | 5 | 8 | 40 | The team is reviewing the essential features of the possible NDI:<br>-Cost<br>-Scalability<br>-Compatibility<br>-Maturity<br>-Functionality |
| Human-System integration shortfalls: We do not have human factors expertise and need to come up with the user-friendly interface | 5 | 7 | 35 | Research on the existing apps and see which designs is easily used by users |

# 4. NDI/NCS Feasibility Analysis

## 4.1 Assessment Approach

We will select an NDI that provide the features needed in our project, such as a forum with like and dislike functionalities, a CMS that allow the development team to specify roles for the users. We will look for the following features to make an appropriate NDI selection:

- Cost
- Scalability
- Compatibility
- Maturity
- Functionality
- Familiarity

## 4.2 Assessment Results

### 4.2.1 NDI/NCS Candidate Components (Combinations)

**Table 3: NDI/NCS Products Listing**

| NDI/NCS Products | Purposes |
|---|---|
| CMS (Joomla, Drupal, Wordpress) | Provide general functions for manage content on website |
| DBMS (MySQL) | For keeping, managing, and retrieving data storage used in the system |
| Webserver (PHP based) | Infrastructure for our system |
| JQuery | Provide DOM manipulation methods |
| CSS framework (ex. bootstrap, foundation) | CSS API to customize user interface on website |

### 4.2.2 Evaluation Criteria

**Table 4: Evaluation Criteria – NDI /NCS Attributes**

| No. | Evaluation Criteria – NDI/NCS attributes | Weight |
|---|---|---|
| 1 | Cost | 30 |

| | | |
|---|---|---|
| 2 | Maturity | 15 |
| 3 | Compatibility | 15 |
| 4 | Functionality | 10 |
| 5 | Scalability | 10 |
| 6 | Familiarity | 20 |
| | Total | 100 |

**Table 5: Evaluation Criteria - NDI/NCS features**

| No. | NDI/NCS Features/ sub features | Weight |
|---|---|---|
| 1 | Forum with basic Like/Dislike system | 50 |
| 2 | Search function | 30 |
| 3 | Authentication | 15 |
| 4 | Online Store | 5 |
| | Total | 100 |

### 4.2.3 Evaluation Results Screen Matrix

| No | W | Joomla | | | | AVG | Total | Drupal | | | | AVG | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | R1 | R2 | R3 | R4 | | | R1 | R2 | R3 | R4 | | |
| 1(cost) | 30 | 10 | 10 | 10 | 8 | 9.5 | 285 | 10 | 10 | 10 | 10 | 10 | 300 |
| 2(familiarity) | 20 | 9 | 9 | 8 | 6 | 8 | 160 | 7 | 7 | 6 | 1 | 5.25 | 105 |
| 2 (Maturity) | 15 | 10 | 9 | 9 | 5 | 8.25 | 123.75 | 8 | 7 | 9 | 7 | 7.75 | 116.25 |
| 3 (Compatibility) | 15 | 9 | 10 | 8 | 10 | 9.25 | 138.75 | 9 | 10 | 8 | 8 | 8.75 | 131.25 |
| 4 (Functionality) | 10 | 8 | 10 | 9 | 10 | 9.25 | 925 | 8 | 9 | 8 | 10 | 8.75 | 87.5 |
| 5 (Scalability) | 10 | 10 | 9 | 9 | 10 | 9.5 | 95 | 10 | 9 | 10 | 9 | 9.5 | 95 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 100 | | | | | | 895 | | | | | | 835 |

| No | W | Joomla | | | | AVG | Total | Drupal | | | | AVG | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | R1 | R2 | R3 | R4 | | | R1 | R2 | R3 | R4 | | |
| 1(Forum with basic Like/Dislike system) | 50 | 8 | 9 | 5 | 5 | 6.75 | 337.5 | 8 | 8 | 6 | 6 | 7 | 350 |
| 2(Search function) | 30 | 8 | 8 | 8 | 10 | 8.5 | 252 | 8 | 7 | 8 | 7 | 7.5 | 225 |
| 3 (Authentication) | 15 | 10 | 10 | 10 | 10 | 10 | 150 | 10 | 9 | 10 | 9 | 9.5 | 142.5 |
| 4 (Online Store) | 5 | 8 | 9 | 8 | 9 | 8.5 | 42.5 | 8 | 8 | 9 | 9 | 8.5 | 42.5 |
| Total | 100 | | | | | | 782 | | | | | | 760 |

# 4.3 Feasibility Evidence

## 4.3.1 Level of Service Feasibility

**Table 5: Level of Service Satisfiability Evidence**

| Level of Service Win Condition | Rationale |
|---|---|
| LOS-1: The system shall not be down more than 24 hours in one month. | Almost all of the web services available right now can achieve this level of service easily. Moreover, our project can have maintenance at night so that it will not cause the system to be down more than 24 hours. |

**Table 6: Level of Service Implementation Strategy**

| Level of Service Win Condition | Product Satisfaction |
|---|---|
| LOS-1: The system shall notify users about special events/ campaigns so that user | Product Strategies: Joomla plugin, Joomla CMS, email client. web browser. |
| | Process Strategies: Prototyping, analysis and evaluate NDI |
| | Analysis: Find Joomla plugin that most suitable to use in our system then create prototype and get feedback from our clients to modify and adjust according to the feedback. |

## 4.3.2 Capability Feasibility

**Table 7: Capability Feasibility Evidence**

| Capability Requirement | Product Satisfaction |
|---|---|
| CR-1: Start/Edit/Delete a thread: Users are able to start/edit/delete threads | Software/Technology used: Joomla, Joomla plugin, MySQL, Bootstrap, Webserver, JQuery |
| | Feasibility Evidence: We will analyze and evaluate Joomla plugin that is the most suitable to use with our system. then use the plugin as the base code to modify and adjust to create prototype to show to our clients. Then we will modify this feature based on the feedback of our clients. |
| | Referred use case diagram: Figure 3 in SAAD file. |
| CR-2: Calculate the WAT points: The system should correctly calculate three types of WAT points. | Software/Technology used: Joomla, Joomla plugin, MySQL, Bootstrap, Webserver, JQuery |
| | Feasibility Evidence: Firstly, we will make prototype by come up with algorithms to handle WAT points system. Show the prototype to our client to gain more information about the WAT points then refine the prototype until it satisfied our clients which make need to make some survey to get feedback from real users. then create the WAT point system based on feedback and continue gain more feedback from our client to make sure we are not misunderstand anything. |
| | Referred use case diagram: Figure 3 in SAAD file. |
| CR-3: Like/Dislike: Users are able to like or dislike threads and posts | Software/Technology used: Joomla, Joomla plugin, MySQL, Bootstrap, Webserver, JQuery |
| | Feasibility Evidence: We will analyze and evaluate Joomla plugin that is the most suitable to use with our system. Then use the plugin as the base code to modify and adjust to create prototype to show to our clients. Then we will modify this feature based on the feedback of our clients. |
| | Referred use case diagram: Figure 3 in SAAD file. |

| | |
|---|---|
| CR-4: Make a post: Users could post on the thread. | Software/Technology used: Joomla, Joomla plugin, MySQL, Bootstrap, Webserver, JQuery |
| | Feasibility Evidence: We will analyze and evaluate Joomla plugin that is the most suitable to use with our system. Then use the plugin as the base code to modify and adjust to create prototype to show to our clients. Then we will modify this feature based on the feedback of our clients. |
| | Referred use case diagram: Figure 3 in SAAD file. |
| CR-5: Redeem the gift card: Users could use the usable points to redeem the gift card | Software/Technology used: Joomla, Joomla plugin, MySQL, Bootstrap, Webserver, JQuery |
| | Feasibility Evidence: We will analyze and evaluate Joomla plugin that is the most suitable to use with our system. Then use the plugin as the base code to modify and adjust to create prototype. Show the prototype to our clients and real user. Then we will modify this feature based on the feedback of our clients and real user. |
| | Referred use case diagram: Figure 3 in SAAD file. |
| CR-6 Automated useless threads/posts deletion: The system is capable of deleting the useless threads/posts | Software/Technology used: Joomla, Joomla plugin, MySQL, Bootstrap, Webserver, JQuery |
| | Feasibility Evidence: This capability might not fully develop, as we can discuss with our client to show alternate options that can use in our system that is.<br>• detect high ratio between dislike and like on threads and posts<br>• the threads/posts age is longer than 1 month.<br>• notify the suspicious threads/posts to the maintainer and let him justify that the threads/post is useless or not |
| | Referred use case diagram: Figure 3 in SAAD file. |
| CR-7 Automated notification: The system is able to notify the users the number of likes/dislikes/posts on their threads and posts and recent events. | Software/Technology used: Joomla, Joomla plugin, MySQL, Bootstrap, Webserver, JQuery |
| | Feasibility Evidence: We will analyze and evaluate Joomla plugin that is the most suitable to use with our system. Then use the plugin as the base code to modify and adjust to create prototype to show to our clients. Then we will modify this feature based on the feedback of our clients. |
| | Referred use case diagram: Figure 3 in SAAD file. |
| CR-8 Create/Edit/Delete the event: The maintainer is able to create/edit the event on the event activity board. | Software/Technology used: Joomla, Joomla plugin, MySQL, Bootstrap, Webserver, JQuery |
| | Feasibility Evidence: We will analyze and evaluate Joomla plugin that is the most suitable to use with our system. Then use the plugin as the base code to modify and adjust to create prototype to show to our clients. Then we will modify this feature based on the feedback of our clients. |
| | Referred use case diagram: Figure 3 in SAAD file. |
| CR-9 Categorize the threads | Software/Technology used: Joomla, Joomla plugin, MySQL, Bootstrap, Webserver, JQuery |

| | |
|---|---|
| | Feasibility Evidence: We will analyze and evaluate Joomla plugin that is the most suitable to use with our system. Then use the plugin as the base code to modify and adjust to create prototype to show to our clients. Then we will modify this feature based on the feedback of our clients. |
| | Referred use case diagram: Figure 3 in SAAD file. |

### 4.3.3 Evolutionary Feasibility

**Table 8: Evolutionary Feasibility Evidence**

| Evolutionary Win Condition | Rationale |
|---|---|
| ER-1: Data Integration | The clients will negotiate with the USC to integrate the system with USC system/database. Therefore, the team may need to integrate the WAT system with the USC system. |

# 5. Business Case Analysis

Benefits are added to the program model:

<table>
<tr><td colspan="4">Assumptions<br>• USC students need a central platform to connect, share, and like information with each other<br>• Reward point system will work as the important incentives for users to join the network</td></tr>
<tr><td>Stakeholders (Who is accountable for the initiatives)</td><td>Initiatives (What to do to realize benefits)</td><td>Value Propositions (Benefits i.e Why)</td><td>Beneficiaries (Who derives value)</td></tr>
<tr><td>• Developers<br>• Maintainers<br>• Clients<br>• Gift/Book stores</td><td>• Develop the system<br>• Monitor the system<br>• Advertize the system to USC community<br>• Partner with schools<br>• Negotiate deals with on-campus bookstore/gift store</td><td>• Increase camaraderie between Trojans<br>• One-stop shop to answer any USC related queries<br>• Increase communications between students across schools</td><td>• USC students<br>• USC alumni<br>• USC faculties</td></tr>
<tr><td colspan="2">Cost (Cost factors)<br>• Development costs<br>• Maintenance costs<br>• Advertising/Marketing costs<br>• Web server, Web hosting, Domain name</td><td colspan="2">Benefits (Key performance indicators – KPIs)<br>• The number of active users in “WAT” network increases.</td></tr>
</table>

## 5.1 Market Trend and Product Line Analysis

**Table 9: Market Trend and Product Line Analysis**

| | Joomla |
|---|---|
| Market Trend | Joomla is one of the most widely used CMS systems in the market, even though it's popularity has decreased the last five years. |
| Product Line | There are many plug-ins available to integrate with Joomla |

# 5.2 Cost Analysis

## 5.2.1 Personnel Costs

| Activities | Time Spent (Hours) |
|---|---|
| **Development Period (24 weeks)** | |
| **Valuation and Foundations Phases: Time Invested (CSCI577a, 12 weeks)** | |
| Client and team: Meeting via email, phone, and other channels [3 hrs/week * 12 weeks * 2 people] | 72 |
| winwin sessions [2 winwin session * 1 hours * 2 people] | 4 |
| Architecture review boards [ 1.5 hours * 2 session * 2 people ] | 6 |
| **Development and Operation Phases: Time Invested (CSCI577b, 12 weeks)** | |
| Client: Meeting via email, phone, and other channels [3 hrs/week * 12 weeks * 2 people] | 72 |
| Architecture Review Boards and Core Capability Drive-through session [ 1.5 hours * 2 session * 2 people ] | 6 |
| Deployment of system in operation phase and training<br>- Installation & Deployment [5 hrs * 2 times *2 people]<br>- Training & Support [5 hrs * 2 times * 2 people] | 40 |
| Total | 200 |

### 5.2.2 Hardware and Software Costs

**Table 13: Hardware and Software Costs**

| Type | Cost of COTS |
|---|---|
| Ownership cost | 0 |
| Maintenance cost | 0 |
| Hardware | 0 |
| Total | 0 |

## 5.3 Benefit Analysis

The benefits of the project are

- **Increase camaraderie between Trojans**
- **One-stop shop to answer any USC related queries**
- **Increase communication between students across school**

**Table 10: Benefits of xxx System**

| Current activities & resources used | % Reduce | Time Saved (Hours/Year) |
|---|---|---|
| | | |
| | | |
| **Total** | | |

## 5.4 ROI Analysis

**Table 15: ROI Analysis**

| Year | Cost | Benefit (Effort Saved) | Cumulative Cost | Cumulative Benefit | ROI |
|---|---|---|---|---|---|
| **2014** | 194 | 0 | 0 | 0 | -1 |
| **2015** | 0 | Unknown | 0 | unknown | |

# 6. Conclusion and Recommendations

Currently, we have evaluated Joomla and Drupal as our NDI. This conclusion was drawn by doing a comparative evaluation between Joomla and Drupal based on the following criteria:

- Cost
- Functionality
- Compatibility
- Functionality
- Scalability
- Familiarity

Drupal and Joomla were selected as NDI for comparative study as these CMS provide the following features:

- Forum with basic Like/Dislike system
- Search Functionality
- Authentication
- Online Store