Re-engineering CCNY's Business Process of the Non-Tax Levy Disbursements Requisitions

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Re-engineering CCNY’s Business Process of the Non-Tax Levy Disbursements Requisitions

Thesis

Submitted in partial fulfillment of the requirement for the degree

Master of Information Systems

at

The City College of New York

of the City University of New York

by

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September 2013

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Abstract

An analysis of the Non-Tax Levy Reimbursement Requisition Business Process at the City College of New York (CCNY) reveals that the flagship of the City University of New York (CUNY) could significantly improve filing and status tracking of the request forms through the deployment of an online information system. This thesis is a case study of business process reengineering based on in-depth analysis. The expected benefits to be derived from this study are a detailed documentation of a web application system facilitating online form services. Another expected outcome is the framework for a business protocol innovation: the web interface will connect to a database on a CCNY server dedicated to the Finance and Accounting Department, thus enable user groups to edit, submit, review, authorize, approve, and track various online forms. The envisioned development raises users’ satisfaction to track their submission at any time and any place via internet access. The Finance Department’s staff can quickly pull up a form and expedite the requisition easily; other staff can review the request and complete a rush job in minutes. The AVP and VP would get updated reports whenever they log into the system.
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Acknowledgement

I would like to thank the staff of CCNY’s Finance Department who provided the opportunity to create a useful product. I am grateful for the faculties and staff of the Computer Science Department along with Professor Akira Kawaguchi who supported and supervised this project; his experience was crucial in estimating the project schedule. Finally, I want to express sincere gratitude to my friends and family for moral support and encouragement.
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Introduction

The advancement of information systems made through the use of technological advancement such as the internet has allowed managers, senior staff and other organizational members to easily access and retrieve information, regardless of its location. System integration has become a paramount concern of organizations to use the internet to support business activities (Hasselbring, 2000; King, 2003; Luftman, 2004; Overby, 2006). Observation of the City College of New York (CCNY) Finance Department has revealed that it is overwhelmed with paper, spending too much time tracking forms during high volume of non-tax levy reimbursement requisition requests. A visit to CCNY’s Finance Department will reveal file cabinets and unused desk space to store stacks of non-tax levy reimbursement forms. The finance filing process requires staff members to physically move from their desk whenever there is an inquiry on a requisition request. They often have to first check a log book for the status to locate the forms in question. Each time staff members have to stop their work to check and report a requisition status there is production lost. Both storage and form tracking are the major issues to be improved by the proposed electronic based system, which is a web based application that allows different system users to edit, review, submit, authorize and approve an online form requisition request.

An analysis of this non-tax levy reimbursement requisition business process reveals that the City University of New York (CUNY) could improve filing and status tracking of the request forms. The proposed solution includes building a completely new web application that allows CCNY’s staff with the authority to submit, authorize, and track non-tax levy reimbursement requisition requests. This web interface connects to a database on a CCNY server dedicated to the Finance and Accounting Department. It allows different system users to edit, submit, review,
authorize, approve, and track online forms. Such a system is expected to increase users’ satisfaction with their abilities to track their submission at any time and any place with internet access. Finance staff can quickly pull up a form and expedite the requisition with ease. It would allow staff members to review the request and complete a rush job in minutes, thereby increasing productivity.

The successful reconstruction of the reimbursement process depends on an overall understanding of the virtual organization, which is the logical separation of requirements and satisfiers (Mowshowitz, 2002), providing a framework to interpret the changes happening in several business environments today. The goal-oriented activity is to virtually organize tasks required to submit and authorize a reimbursement request into a virtual office structure, where employees work environment dynamically changes (Giulino, 1982). Therefore, a required action is to virtually organized tasks to be employed to replace the paper-based process in the Finance Department at the CCNY. Additional considerations required in this context are the establishment of software quality analysis, system performance measurement, security, and product promotion. Software quality assurance is assessed since the need to provide confidence to the system’s user and to avoid unforeseen software crash. Performance measurement is particularly important for scheduling system upgrade. Understanding modern cryptography is vital to assure users that the system is secure. If users do not understand this concept they would be hesitant to complete online transactions, which may expose confidential information thereby posing a risk to users. This research will educate the users in modern cryptography. Lastly, since this software application is being created for a specific purpose the marketing of the product is not necessary to increase the number of users or product sales; however, the leverage of the software is mentioned because users must be confident in the system’s security, accuracy and
The main objective of this chapter is to justify the creation of an electronic system that would replace the existing paper-based process, which need several endorsements before submission. The online software form system would allow selected individuals in every department at the CCNY to edit and submit Non Tax Levy Reimbursement Requisitions. The Head of Departments would validate or appoint someone with the delegated access to request and authorize every submission. The delegated individuals in the Finance and Accounting Department would have access to the system’s database and would be able to approve or deny a request based on certain preset criteria. The system’s key features would be to track and report the status of each requisition from submission, checking to pick up through a unique identification number.
1.1. Analysis Approach: Virtual Organization

A virtual organization is a geographically distributed association whose members are bound by a long-term common interest or goal, and who communicate and coordinate their work through information technology. It is the process to break down tasks into two distinct sets of needs and associate them with the means to get the work done. It illustrates that services could be an independent set of the service providers. These disjointed sets could be modeled using bipartite graphs. The diagram below illustrates how this would be done.

According to the break down in the bipartite graph above, the software will have at most eight (8) users executing one (1) or more of the seven (7) tasks whenever they log into the system. These staffs and tasks would be virtually organized is an efficient way so the developers
would be able to keep the existing structure when creating the electronic process. In addition, virtually organizing the tasks would provide an explicit view of all the users. The role of each user would be known and the new system would be able to eliminate the person who would log the reimbursement requisition. It would also increase the number of users that could review online submissions.

The business process of CCNY’s finance department requisition request faced a dynamic and turbulent environment that required flexible and fast responses to changes in business needs. DeSanctis & Jackson, 1994 & Drucker, 1998 posit that unlike many organizations adopting decentralized, team-based, and distributed structures, the virtual structure of the non-tax levy reimbursement process remains almost the same, with slight changes to accommodate use of the communication technologies. Advances in communication technologies have enabled organizations to acquire and retain such distributed structures by supporting coordination among people working from different locations. Despite the rapid increase in the number of organizations that are becoming distributors, little is known about the structure or performance of such organizations. The proposed system would need time for empirical research in the area of virtual organizations as the electronic non-tax levy application would be in its infancy, so the next logical step in developing an understanding of this new process is to study in depth the proposed and existing structure (Eisenhardt, 1989).

Virtual Organization leveraged the use of resources, reduce cost and increase the flexibility to complete the objective. The Electronic Non-Tax Levy System (ENTL) virtual structure express that a single user might be associate with more than one action. Consequently, appropriate tracking and privileges are mandatory for all actions committed by the users. In addition, the Faces of Virtuality and their related constructs rely heavely of information
technologies: Virtual Memory (computers), Virtual Circuit and Virtual Reality (multimedia).

The virtual team is a group of staff who interact through interdependent tasks guided within the non-tax levy reimbursement requisition request. The team works across space, time, and organizational boundaries with links strengthened by webs of communication technologies (Lipnack & Stamps 1997).

Complicated issues in the decomposition of the tasks and ways to complete them must be identified and avoided, because not identifying these missing assignments would cause the system to break down or operate inefficiently. As a result, careful interviews were conducted with staff to learn their role within the non-tax levy disbursement requisitions. These interviews allowed the researcher to identify and clarify the staffs and the services that they provided.

Therefore understanding the virtual organization of the system makes it easier to gather information to measure the software quality for business solutions. Garmus & Herron state that understanding the function point cost (Garmus and Herron) that are associated with the quality of the software help the staffs, administrators, developers and engineers to decide which application would be the most economical in the long run. That is, the application should be designed to allow the plugins of new features to keep the business’ technology parallel with the time.

There should be many functioning points and scripting codes which could be difficult to obtain but there are companies that would produce a value that the product owners would be able to use to decide if they should keep and modified the existing program, or purchase a new application. Therefore understanding the need to add feature to the software application as the finance department’s business process changes could be a key component to the design. Therefore, programs written in uncommon or outdated language tend to cost a lot to modify. This is due to the lower supply of programmer.
1.2. Stakeholder’s Visions

The researcher believes that using a web based system would allow the finance department to have a central location to track requisitions from all department. Users with internet access would be able to submit, authorize and approve each request online. The system would allow each user to track his or her actions along with the status of each online requisition. For example, it would show that the form was submitted, authorized, approved and paid for, if not there would be a message stating the reason for any rejection of the request.

The head of the finance department would now have the option to proceed with the project or do nothing; thus making a comparative analysis of the tangible and nontangible benefits to costs. If the department chose to do nothing, then the non-tax levy disbursement requisitions would be completed within 3 days and 3 weeks depending on the volume and time of year. From a private investor point of view this project might not be selected because it would take at least thirteen years to breakeven on the investment. Private investors often want positive return by the third year. Therefore with this knowledge in mind the researcher decided to do this project as a public/student investment.

The finance senior staff recognized the need to be more efficient with the non-tax levy reimbursement process. As a result, this project was selected through a top-down source. The senior staff in the finance department considered an information system that would improve the moral of the staff while improving the efficiency of the department. The project cost, duration, complexity, and risk also influence the project selection. The tangible benefits were the main factor supporting the continuation of the ENTL information system since the real cost seems to have a negative return on the investment (Dewan et al., 1998; Luftman, 2004, Yoo, Sangwan and Qiu, 2006; Thomas and Fernandez, 2008).
There would be an initial setup cost before the system would be available. This might seem like an additional cost but a closer analysis of the proposed application would show that even though the initial cost to design and implement the electronic system is great and over time the overall benefit would outweigh the cost. To improve the business process for CCNY students, faculty and staff should complete a non-tax levy reimbursement request forms. This study is to create an electronic system that would replace the existing paper based form process used by CCNY’s finance department.

Therefore it is under the leadership of Vice President, Jerry Posman, and Assistant Vice President, Felix Lam, Masters of Information System graduate student Rodley Ferguson was employed to design and implement an online form system that would allow users to complete, authorize and submit reimbursement requests or vendors’ payments. The contents of this thesis were gathered from this case study.

1.3. **Thesis Organization**

This chapter introduces and set the stage by discussing the project. Chapter two provides a full description of the project for the owners of the ENTL system. It lists all the functions performed by the system. The third chapter evaluates the feasibility of the project. The fourth chapter discusses details of each of the system functions and actions in full. Then chapter 5 has the conclusion. Chapter 6 has references and appendix. The sections are cross-referenced by topics to increase readers understanding.

2. **Overall Description**

This task is to create an electronic system that would replace the existing paper based
process used by CCNY’s department for Non-Tax Levy (NTL) disbursement requisitions. This task is also designed to implement a web based application that allows different system users to edit, submit, review, authorize, approve and track an online form.

The following diagram shows the current process that a student, staff or faculty go through to completes the NTL paper form and it also include all supporting documents.

The document must be authorized by a department head before it gets to the finance office, where the staff members would review each submission for available funds in the account. He would also give the correct authorization of all supporting document(s) (receipts, invoice, etc.). After the finance staff reviews the document(s), the form would either be sent back or approved by the finance department. If approved a finance staff would input the form information into MIPS account software and cut the check.

2.1. **Product Perspective**

The Non-Tax Levy Funds request requires several staff members: two people in the requesting department and three people in the accounting and finance department. In the requesting department, the two staff members would be the submitters and their supervisor. In the finance and accounting department, the three staff members would be the reviewer, the accounting supervisor and the
person who issue the check. The system administrator, head of department and VP of finance would not be mentioned because their privileges supersede those of the staff members in their departments.

City College of New York Non-Tax Levy Disbursement Requisition process has a person in a CCNY department to complete a three sheet paper form. On completion one sheet is given to the department and another to the finance office. The third sheet is kept by the submitter for his/her record.

The system would reduce the time taken between submitting a disbursement request and the check being available for a one day event. Take note that currently this process could take as little as 3 days during low volume, and as much as 3 weeks during high volume.

2.1.1. Business Process Model Notation (BPMN)


2.1.2. Flow of events

In this system recommended by the researcher a designated staff of City College of New York is required to enter the username and password to log into the system. On arrival at the home page he or she would create a new form request, search for an existing form or log out. If the user chooses to create a form, he or she will enter: payee’s department, payee’s name, payee’s address, the account information, requisition purpose, amount requested and upload supporting documents. Once the form is saved and depending on the user permission level, he or she could search for form via date, authorization, department, account, payee and the unique form submission identification number. Once the search list is filtered, the user would click the selected link to open the form. The staff member would then be able to generate reports of submission on a selected time period and field categories, as name, department, etc. Depending on user level, this person could view, authorized, approved or export the data.

2.1.3. Basic Flow

If the user log in successfully he/she would have the option to create a new form or search the database. Once the form is saved to the database the user can do a list of actions. He/she could view it, submit it, authorize it, approve it or export data. The user could then navigate to the home page once logged in.

2.1.4. Alternative Flows

However if users fail to enter the correct log in information after five attempts, he or she must contact the administrator or reset the password. Non-finance staff user cannot view any
form that does not belong to their department. Also, CCNY staff can only view forms that they submit. Staff supervisors on the other hand can only see submission within their departments.

2.1.5. Preconditions

User must have access to the internet through a device that uploads and views pdf documents and different image files to the web server when submitting a requisition.

2.1.6. Post Conditions

The system would log every action made after the form have been created and saved by a user. The system would automatically log out users after being idle for 180 seconds. The system would then return to the log in page after the user logs out.

2.1.7. System Interface

The ENTL system would be hosted on a City College Server assigned to the Finance department. The user would need a computer and internet service to access the web. The graphical user would interface to submit, review, authorize, approve and get action/ status report for selected requisition(s).
2.1.8. Use Case

This diagram shows that there could be eight (8) different types of users accessing the system at the same time.

**User 1:** The system administrator who would manage and maintain the database.

**User 2:** The designated requisition form submission staff in each department. This user would complete the online form, but he/she cannot edit the document once it is submitted.

**User 3:** Staff Supervisor, an employee of the submitting department would need to complete the Finance Department’s signature card. This user would then indicate whether he or she has checked and verified the originals of the documents that is uploaded to the form and review the submission. If this user should make a submission, he or she would not be able authorize it, as it
would require the head of the department to make this authorization. This user though could edit user 2’s submitted form, but he/she could not edit once the form is submitted or authorized.

**User 4**: Head of the Department this would be the dean or chair if the requisition department is academic or administrative. This user must approve any request of $5000.00 and above. He or she would be able to submit and authorize other staffs’ request, but not his/her own submissions. A senior finance and accounting staff must authorize the requisition of any head of department. This user would be able to edit user 2’s, and user 3’s submitted form, but would not be able edit once the form was submitted or authorized.

**User 5**: Finance staff would be the designated user of the requisition account. He/she would review the uploaded documents and account detail. The user would then edit user 2’s, user 3’s and user 4’s submitted form.

**User 6**: Finance staff supervisor, would then review the uploaded document and account detail before approving the requisitions.

**User 7**: AVP and VP of Finance would review the uploaded document and detail before approving the requisitions.

**User 8**: Account Payable staff, would then access the system to export the information need to process the check. This user can export forms containing the entire signatures for each authorization level.

### 2.1.9. User Interface

The interface is a GUI. This is easy-to-use, accessible, and navigable. A new page
should only load where it is necessary. It should be easy to use in the sense that the web page elements would be noticeable. This should make the determined purpose easily identifiably to the user. For example, the html online form should look like the current paper non-tax levy disbursement requisition form. Page elements should load upon request, within 1 second of user action.

All images should have an "Alternate Text" value so that if the image does not load, then the Alternate Text value would be displayed instead. The navigation for each page should rely only on the elements in the page, and not the navigation of the browser. For example, if a user wanted to go to the previous page, there would be a link or button on the page for him/her to go back so the browser's back button might never be used.

Below is a detailed description of each user screen with the general description of the User interface (UI):

i. Login Page

This page should have three form elements: A username textbox, a password textbox and login button. There should be a link to a registration form page that allows new users to create
an account.

ii. Home Page (Dashboard)

![Home Page Diagram]

After users login they would be forwarded to this dashboard page where they would have an option to create a new submission or query actions and results of existing submissions.
iii. Create Form Page

This page should have all the fields of the paper form listed as textbox or checkbox options in an html form. Find detail description in the story board.
iv. Query Page

This page should have a search textbox that allow the user to pull up a list of related submission by entering form field information like Date, Vendor/Payee Name, Submitter Name, Submitted Form Number, Department, Account Number, Amount Requested. Each search should list the related submissions as a database instance with the most recent submission on top.

2.2. Product Function

The product functions should allow users to complete Non-Tax Levy disbursement requisition in the online html form online, upload any supporting documents and submit them to the database hosted on a CCNY secure server allocated to the finance and account. Designated staffs in each department would be able to logon to the ENTL site and view status of previous submission. The finance department receives the requisition almost instantaneously once the
requests are approved.

2.3. **User Characteristics**

Users who have completed the Finance Department Signature Card should be able to authorize requests and select the two submission staff members in their department.

A submitting staff member is only allowed to access his/ her previous submissions. If the user is a department head or an approver, then he or she would see all submissions within the department. Submitters should be able to edit their requisition at any time prior to the request being authorized. The department supervisor (authorizer) should be allowed to access all submission that went through their department. The supervisor should be able to edit requisition within their department at any time prior to the request being reviewed and approved. The finance and accounting staff should be able to access and edit all submission from all departments.

Errors should be prevented in the first place rather than allow errors to happen and then use error messages to correct them. On this system only fatal system-related errors will be displayed. This would be confined in dialog boxes.

2.4. **Constraints, Assumptions and Dependencies**

The only constraint is network access to login into the ENTL system. To avoid this constraint the end location must have internet access and a supporting device.
3. Feasibility Assessment

Recall that filing system require staff to get up from their desk whenever there is an inquiry on a non-tax levy requisition request. They often have to first check a log book for the status and location of the forms in question. This could not be productive because each time a staff member has to stop his/her work to check and report a requisition status time is being wasted.

Time spent searching for a form in transition would be significantly reduced with the information becoming accessible on the staff’s computer. The social return would be seen once the system becomes available to users. The office would have more space and the department would have made a small contribution to the environment. The electronic system could be delivered within 3 months. Users would be able to track their own submissions; depending on their level of access. Users can also view and edit documents submitted on his/her computer from his/her desk.

The prototype production would take roughly 10 people-months to develop and another twelve months using two (2) persons to stabilize the system.

3.1. Economic

Assuming that constant salaries amount and staff size can impact the department and the IT department financially, support should therefore be given to all technical requirements. Therefore a fix staff training/ system service fee of $2000 each month and an initial cost of $20,000 to design and implement. This would be affordable and dependable for further savings. It would take over a decade before the department would see tangible and positive return on this investment (see appendix). More importantly if the graduate student did not get any money for
his design and implementation now then the benefits would begin for him in year zero (0).

An alternative to using graduate student developers would be to purchase an existing software application that is available on the market. Though, the product could be costly to install and configured. Companies such as Agile Point and K2 provide similar applications; however, the initial costs of Agile Point would be $136,000 with unlimited access and K2 for $285,000 with limited access. This kind of money might seem kind of steep for a nonprofit organization like CCNY to make an investment.

3.2. Technical

CCNY have the information technologies and the staff in house to assist with the installation and management of the on campus server on which it would host the web application.
The difference therefore between the software testing and software quality assurance is that testing only look at performance and functionality while accuracy, reliability and efficiency are factors of the quality of the software application. The proposed system would have both automation and manual testing: The use of the automation testing would save time, help with speed, accuracy also and help the software development staff to avoid writing test for all the features within their products. Manual testing would then be necessary because the application would have at least one new feature that must be tested. Sometimes codes must be written to test the new component, but the proposed system prototype would be manually tested by users in a selected department. There could be an automated test script written to test the system functions when a new user is created. Nonetheless, there would be manual tests that would focus on the accuracy of the selected functions that must be executed by the system.

Software quality assurance would also be vital to company’s relying on a software application that satisfies its business rule. The goal therefore would be to catch any error in the application before it would go to production where the cost increases significantly. For example, each submission would have a unique identification to avoid query error. More importantly, a software quality assurance would decide whether or not to upgrade the application’s scripting language; that is, change the language or integrate other languages. This would rely heavily on the cost to modify the system. So a solution to this is to have programmers who would be familiar with the dated script, as well as more recent scripts, to assess the efficiency of the language. By doing this the user would be using the language that would require the lease amount of code to execute the application’s commands. This would help him/her to secure the code and physical components of the system. He would also get an understanding of the possible treats to the users’ interface, physical connection and the related database.
The researcher has agreed with other researchers that encryption schemes are the practice of controlling information, which began centuries ago with ad hoc methods without specific definition to create obscurity. Today’s scheme had come a long way from the ancient method to shift letters in the alphabet to the application in the computational use of mathematical equations to create more complexity. The finance system needs to be secure on multiple layers, where the physical, link, switch and network layers would be protected by the university’s information technology department. Therefore, the developers must secure the application from malicious the threat that would steal information or corrupt the system. It would therefore be beneficial on the part of CUNY to have the application as a part of its operational machinery.

3.3. Operational

The system would be user friendly and would not require a manual. The system would be tested by the Masters in Public Administration Program. Staff would use the web application for a few weeks to discover any bug. The system would be fully tested before the application is launched college wide.

Even though it is impossible to have perfect security, the electronic non-tax levy system would be protected from users wanting to query the database with malicious intent. Having a secure system allow the users to trust that their information is protected. This would be a feature when marketing the application. City College would be a testing site for the prototype. The expectation would be to release similar versions of the application to the City University of New York campuses thus creating a demand for the system.

Advertising would be good medium to increase the product usages, so that more people who need the item but would not know that it existed would be able to learn of the new or
upgraded application. The use of an Application Programming Interface (API) Management would be helpful to train and collect metric. This would track the system’s usage. This would also allow appropriate scheduling and provide selected amount of bandwidth and cut operating cost. Deployment is based on the scalability of the system. This would be built on-premise that this set-up would be the best and ideal system. This system would also provide a cloud set-up optimal data usage which would make the mountains of paper stacked up on top of desks in the finance department a thing of the past since all the files would be electronic.

A thorough assessment should be done to ensure that the product be advertised and that developers build or integrate software applications that would create the most efficient system. To avoid problems that arise in using multiple platforms to secure the data everything should be done to secure the system when using Application Programming Interface (API). This would integrate into another system that would be accessed by multiple users. The finance department should then get a local server. This would also create a database and a web interface for each user to have a secure login. This would track the users’ actions until they logout.

3.4. Scheduling

By using Nintex Work Flow (http://www.nintex.com/en-US/Pages/default.aspx) integrated with Microsoft SharePoint Foundation (http://office.microsoft.com/en-us/sharepoint-foundation-help/what-is-sharepoint-HA010378184.aspx), the delivery time of the project would be estimated to begin in three months. In a few weeks staff would be interviewed and they would be given special instructions. The remainder of the time would be used for design, installation and testing. This project would be completed within the semester. However, for the system to be created without the aid of outside applications, it would take roughly 10 people-
months to develop and another 12 months to stabilize the product. Therefore, graduate student developers would be ideal to use to avoid the cost of $82,959\(^1\) for each of the ten developers.

4. **Specific Requirement**

All submission should include electronic support documents. Any user who authorize online forms should complete a signature card for the finance department’s record. The submitting staff members should be designated by the department head or the authorizing staff.

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**Use Case Name**: ENTL Login Page

<table>
<thead>
<tr>
<th>Use Case Name</th>
<th>ENTL Login Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority</td>
<td>Required</td>
</tr>
<tr>
<td>Trigger</td>
<td>None</td>
</tr>
<tr>
<td>Precondition</td>
<td>Complete Signature Card (finance department)</td>
</tr>
<tr>
<td>Basic Path</td>
<td>Wed Address</td>
</tr>
<tr>
<td>Alternate Path</td>
<td>Email link</td>
</tr>
<tr>
<td>Post Condition</td>
<td>Log out user if system idles for 10 minutes</td>
</tr>
</tbody>
</table>

\(^1\) This number was calculated using ten months of the Bureau of Labor Statistics’ 2010 median salary of $90,530 for software developers ([http://www.bls.gov/ooh/Computer-and-Information-Technology/Software-developers.htm](http://www.bls.gov/ooh/Computer-and-Information-Technology/Software-developers.htm)).
Use Case Name | ENTL Home Page/ Main menu/ Dashboard
---|---
Priority | Required
Trigger | None
Precondition | Already Logged In
Basic Path | From log in
Alternate Path | None
Post Condition | Log out user if system idles for 10 minutes
<table>
<thead>
<tr>
<th>Use Case Name</th>
<th>ENTL Search Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority</td>
<td>Required</td>
</tr>
<tr>
<td>Trigger</td>
<td>None</td>
</tr>
<tr>
<td>Precondition</td>
<td>Already Logged In</td>
</tr>
<tr>
<td>Basic Path</td>
<td>Button on Home Page</td>
</tr>
<tr>
<td>Alternate Path</td>
<td>Click “Search” link from any page</td>
</tr>
<tr>
<td>Post Condition</td>
<td>Provide a list satisfying the query / log out if idle 10 min.</td>
</tr>
<tr>
<td>Use Case Name</td>
<td>ENTL Result Page</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Priority</td>
<td>Required</td>
</tr>
<tr>
<td>Trigger</td>
<td>None</td>
</tr>
<tr>
<td>Precondition</td>
<td>Already Logged In</td>
</tr>
<tr>
<td>Basic Path</td>
<td>Button on Home Page</td>
</tr>
<tr>
<td>Alternate Path</td>
<td>from email link</td>
</tr>
<tr>
<td>Post Condition</td>
<td>Provide a list satisfying the query / log out if idle 10 min.</td>
</tr>
</tbody>
</table>
### Use Case Name
ENTL Form Page

### Priority
Required

### Trigger
Update Database;

### Precondition

### Basic Path

### Alternate Path

### Post Condition
Maintain a log of the user and every from action made
### Use Case Name

Log out Page

<table>
<thead>
<tr>
<th>Priority</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trigger</td>
<td>Message to “save form changes”</td>
</tr>
<tr>
<td>Precondition</td>
<td>Already Logged in</td>
</tr>
<tr>
<td>Basic Path</td>
<td>Click “log out” link from any page</td>
</tr>
<tr>
<td>Alternate Path</td>
<td>Click “log out” link from any page</td>
</tr>
<tr>
<td>Post Condition</td>
<td>Return to log in page</td>
</tr>
</tbody>
</table>
4.1. **External interfaces**

Submitters should have access to a scanner or a device that could convert supporting paper work to an electronic version to be included with the requisition.

4.2. **Functions**

The system should:

- provide a secure online form for the user to create an account with login identification and password.
- require a valid CCNY email address to create an account.
- provide a unique identifier to track each submission instance.
- allow account holders three login attempts to input user id and password before locking the account.
- save a log/message of the submitters, authorizers, reviews and approvers after every action from the beginning to the end of the requisition process.

4.3. **Performance requirements**

The system should be up and accessible 99.9999% of the time. Users should be able to access the web form and send information to the database hosted on CCNY server on click. The system should be unavailable during maintenance and upgrade.

4.4. **Online form design**

The online form would look similar to the paper version with about 38
fields as textboxes or checkboxes (see appendix b). The online form would have an additional field to allow users to upload electronic files into the system. The expenditure account number would be preset to show the related accounts for the Fund, General Ledger, Department, Project, Source and J-code. The Fund would have a 2 numerical character requirement. The General Ledger would have a 4 numerical character requirement. The Department would have a 5 numerical character requirement. The Project would have a 6 numerical character requirement. The Source would have a 2 numerical character requirement. The J-code would have a 1 numerical character requirement.

4.5. Logical database requirement

The system user not including the administrator would need to access special forms on the server. These forms would be used to view all the actions taken since the initial submission to the distribution of the check.
4.6. **Design constraints**

User should be able to use most internet device like computers, Ipad, Tablet etc., mobile phone to access the online form via any web browser. Users should also be able to attached and view image files (jpg, png, pdf, etc.) on many devices with internet access.

4.7. **Key features**

Users should be able to login, complete and submit an online reimbursement requisition form. Users should have access to historic transaction in online log report. All users’ actions would be logged when submitting, editing, authorizing and approving a request.

5. **Conclusion**

The proposed non-tax levy reimbursement requisition process is not a new system, only an iteration of the existing process.

Many companies such as Adobe ([https://www.acrobat.com/formscentral/en/home.html](https://www.acrobat.com/formscentral/en/home.html)) and Google ([http://support.google.com/drive/bin/answer.py?hl=en&answer=49008](http://support.google.com/drive/bin/answer.py?hl=en&answer=49008)) have online forms that collect entries into a related database; however, these forms do not include the business logics when they are to be reviewed and authorized by multiple parties. The virtual organization’s structure remains the same with at most eight (8) actors performing any selection of seven tasks. That is, changing the paper-based form to an electronic application does not change the structure, but it modifies the way in which the process is completed, thereby
improving efficiency. Understanding the actions and tasks of the existing system provide insight on possible threats and ways to prevent them using encryptions on multiple layers. In addition, it is useful to identify each component of the system to provide an optimal cost analysis of the software. Advertisements, API Management, Deployment and Scalability should be considered in the benefit to cost feasibility of the project. The Life Cycle of the software applications and that of the Finance Department must devise schemes on how to deliver the product to the population on campus.

The methodology of the System Development Life Cycle (SDLC) has been employed to develop and maintain the non-tax levy reimbursement request systems, which would replace the existing paper-based process. This paper contains three of the five SDLC phase of the project; that is, the planning, analysis and design that make up the written documentation for the electronic non-tax levy project. The implementation and testing of the web application follows this paper; where the system is installed on a server dedicated the CCNY’s Finance Department and tested by developers and users of the system.

From an economic perspective, this project may seem as if it is not feasible because the tangible costs outweigh the benefits for 13 years; however, the intangible benefit is priceless. The system would give time back to CCNY’s staff to do actual work rather than spending an enormous amount of time tracking a requisition request. In addition, having a competent graduate student in the information system programme tasked with the assignment of designing and possible implementation of the project for a course grade would reduce the initial costs significantly. The completion of this project would save CCNY’s Finance and Accounting Department time and physical resources (space) that could be redistributed within the office, thereby improving efficiency and cost savings.
6. References


6.1. Appendix a

Nine-Month Table (total represents the 12 months calculations)

<table>
<thead>
<tr>
<th>Number of sheet been processed per month</th>
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<tbody>
<tr>
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</table>

<table>
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<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
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<td>Carbon Paper stocks</td>
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<td>$459.98</td>
<td>$459.98</td>
<td>$459.98</td>
<td>$459.98</td>
<td>$459.98</td>
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</table>

<table>
<thead>
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<table>
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<table>
<thead>
<tr>
<th>Total</th>
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6.2. Appendix b

<table>
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<tr>
<th>Year of Project</th>
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<th>7</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
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<tbody>
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<td>Net Economic Benefit</td>
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<td>$5,519.76</td>
<td>$5,519.76</td>
<td>$5,519.76</td>
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<td>$5,519.76</td>
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<tr>
<td>Discount rate (7.5 %)</td>
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<td>0.419854129</td>
<td>0.390561981</td>
<td>0.363313471</td>
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<td>PV of Benefit</td>
<td>$3,679.84</td>
<td>$3,327.06</td>
<td>$2,317.49</td>
<td>$2,155.81</td>
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<td>NPV of all Benefits</td>
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<td>$32,915.81</td>
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<tr>
<td>One-time Costs</td>
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<tr>
<td>Reoccurring Costs</td>
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<td>$2,000</td>
<td>$2,000</td>
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<tr>
<td>Discount rate (7.5 %)</td>
<td>1.00</td>
<td>0.602754901</td>
<td>0.419854129</td>
<td>0.390561981</td>
<td>0.363313471</td>
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<tr>
<td>PV of Reoccurring Costs</td>
<td>$0.00</td>
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<td>NPV of all Costs</td>
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<tr>
<td>Overall NPV</td>
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<td></td>
<td></td>
<td></td>
<td>$28,571.53</td>
</tr>
<tr>
<td>Overall ROI -- (Overall NPV/ NPV of all Costs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.76</td>
</tr>
</tbody>
</table>

Break-Even Analysis

Yearly NPV Cash Flow | ($16,320.16) | $2,322.61 | $10,906.16 | $12,280.85 | $13,559.62 | $14,749.18 |
Overall NPV Cash Flow | ($16,320.16) | ($50,620.55) | ($12,018.12) | $262.73 | $13,822.35 | $28,571.53 |

Project break-even occurs in the 13th year
Use the first year of positive cash flow to calculate break-even fraction -- 0.98
Actual break-even occurred close to the 14th year (13.98 years)
6.3. Appendix c