

# **FINAL REPORT UCSD**

*User centered system design (Trade Extensions)*

*Group B3 - Agadagba, Efeoghene - Aji John, Pushpam - Björklund, Olof - Larsson, Anna - Shaw, John - Tawfique, Ziring*

## **TESS**

*World class eSourcing and Optimisation Platform for Business*

### **Background**

TESS is a system developed by the company Trade Extensions which was founded in 2000 by a team of recognised leaders in the field of advanced optimisation algorithms. In early 2001, Trade Extensions conducted the world's first online combinatorial auction with direct feedback to bidders. After that it quickly grew by partnering with different leading consulting firms such as Intersources and Schneider Logistics. Trade Extensions now has offices across Europe and the U.S and its sourcing platform is used by companies such as P&G, Cargill and Coca-cola.

Trade Extensions enables business and sourcing professionals to make better sourcing decisions - decisions that are strategically-aligned and optimised against operational constraints.

TESS is a flexible system that can handle projects ranging from simple reverse auctions to complex sourcing events involving goods and services worth billions of dollars, millions of data items and multiple rounds of negotiation.

TESS has several different sub-systems. For this project we will focus on one of these sub-systems, namely the one used to create new projects.

In TESS there are two major groups of participants in sourcing processes: Buyers (owners and shippers) and Suppliers (bidders or carriers). In TESS, an event (definitions, data, evaluation as well as communication, document exchange etc) is referred to as a *project*. Several projects are collected in a *market*, i.e a work area for groups of projects and project participants. A market can represent an entire company, a given department, a service, similar business units or any suitable entity.

An account is required for representatives to login to the system in order to access the platform. A user account can have different *roles* such as project manager, owner, observer or project support. To illustrate further, figure 1 presents a representation of a scenario where the user (Joe Buyer) has a TESS account with the rights of a Project Manager to build and manage the project as the buyer's representative. Bud Supplier, representing the organization Transport Express, will have an account with the *bidders* rights.

### **Details of the system**

The TESS system is quite complex and has many different areas of use. In TESS there are three kinds of different users: bidders, administrators and project managers.

- **Bidders**

Bidders have the most limited functionality in the TESS system. A bidder can basically only view different data and observe projects, not alter them. Bidders can also make bids on the different projects available to them. This works much like an auction - when a bid is won, the bidder who made the winning bid is notified. The notification usually occurs by the system sending a project-generated excel document which contains all the different constraints and specifications made by the project creator.

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- Project managers

Project managers are Trade Extensions customers, they set up their projects by specifying the parts that need to be in the procurement (Usually called LOTS), decide how the bidders form will look (usually a excel layout) and set different constraints for the project. In later stages there are optimization and analysis that the project managers can work with. Usually the project manager lets specialised analytics staff use the system to analyse the different results from TESS.

- Administrators

Our user falls in this category, he has the same power as a project manager but access to the whole system, including all project managers projects. Mainly an administrator assists with troubleshooting issues with existing projects and help setting up more complicated projects.

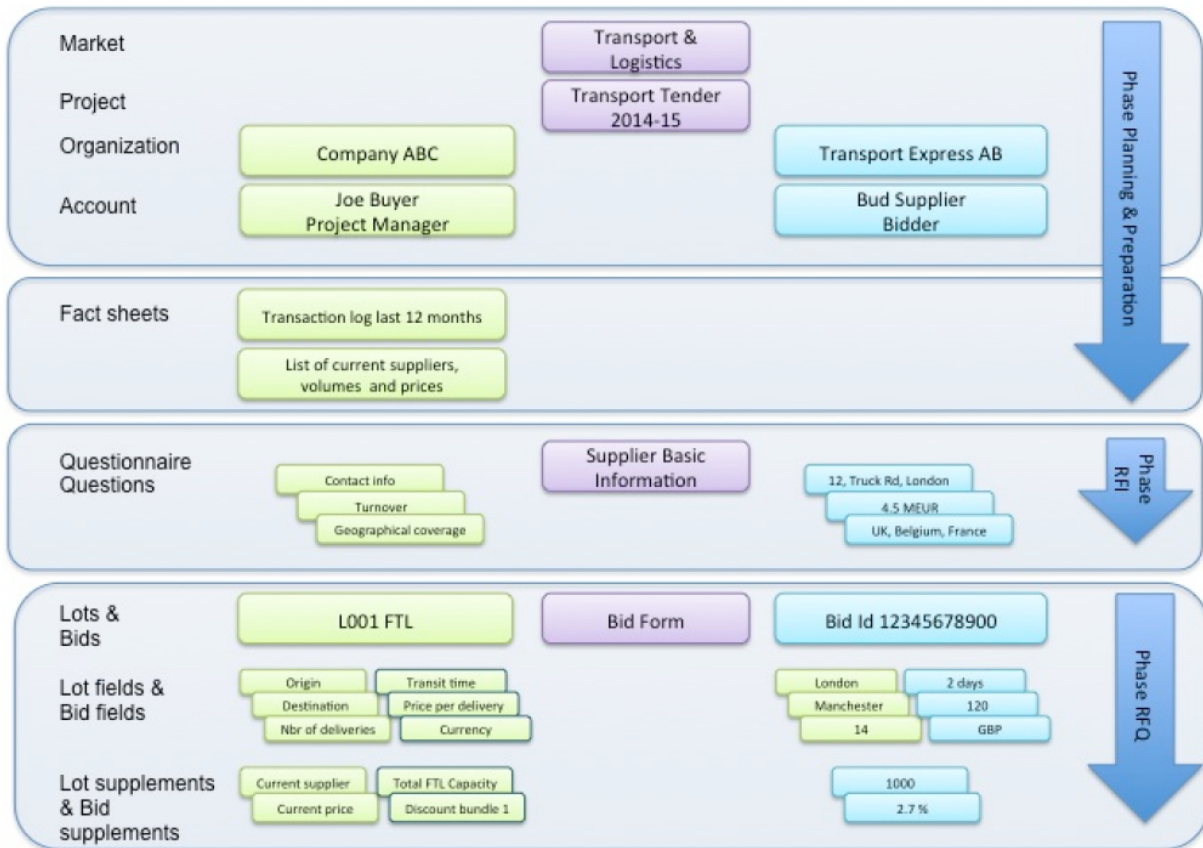


figure 1 - TESS example

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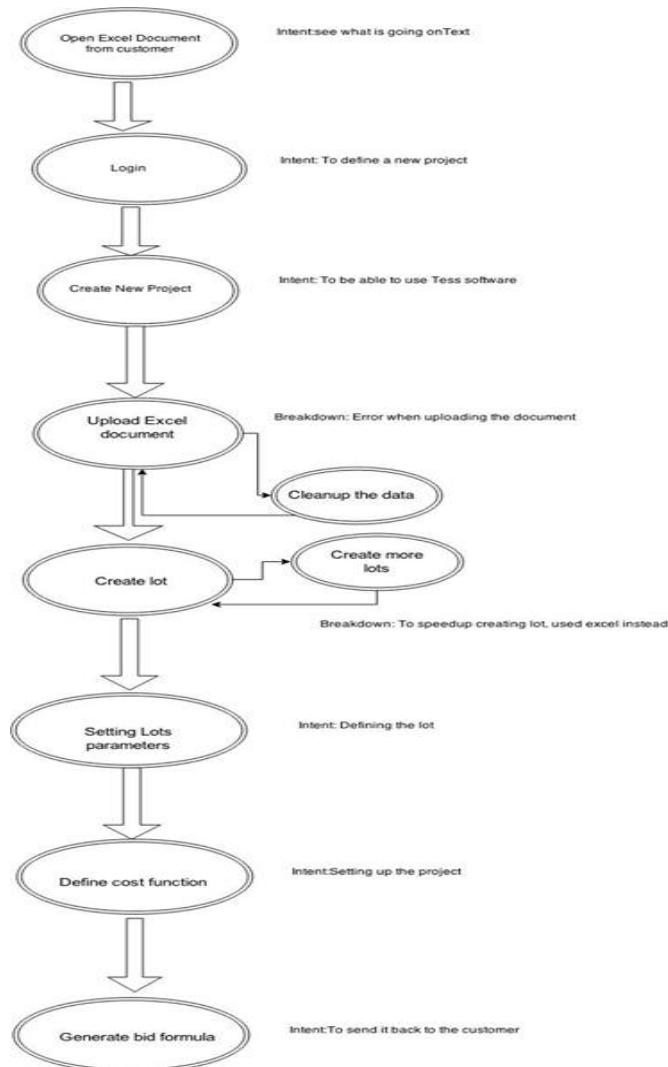
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## Working Models

1. The sequence model will be relevant for our project since the software used requires several step by step procedures to accomplish a user goal, for example when adding a new project. This will give us step by step details of how the work / use of the system will be done.

### Sequence model

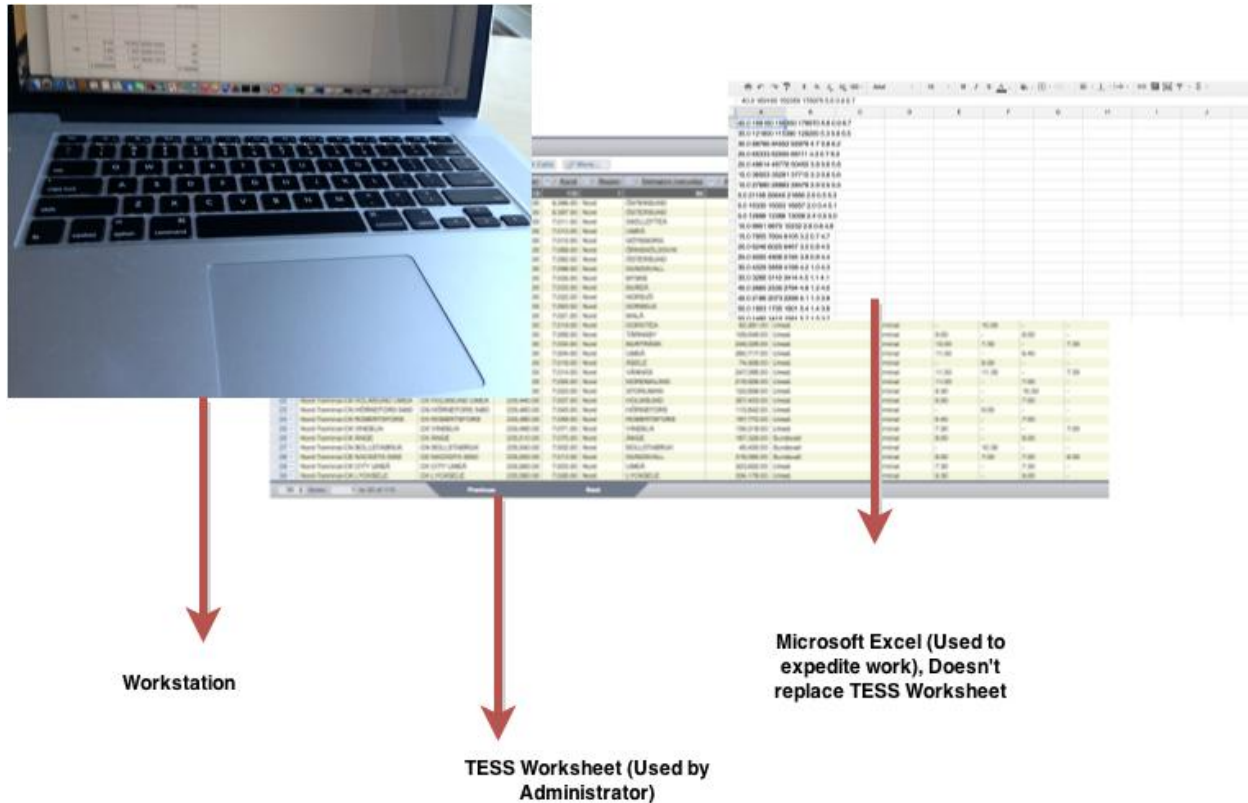


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- The artifact model is also relevant since TESS generates Excel-files from the different projects which are used by the winning bidder to determine how a project will be carried out. The document contains information about project specific constraints such as number of shipping trucks to be used, maximal number of intermediate logistic stops or the number of lots required.



### Tools for interpreting

Once all the information has been gathered we will be conducting an affinity diagram to organise our ideas and the data. However, due to the limited number of interviews that will be made, we might try to think about possible scenarios and add them to the affinity diagram. This would however risk that the result would be biased towards our interpretation of the user's behaviour. Before considering this alteration we have to consider the possible cases very thoroughly and the necessity of them.

### Visioning

We will try to create a system vision out of the material we have gathered in earlier models. This vision will give us a rough overview of the system and possible user cases. This will make it possible for us as a group to discuss different visions of the system before making an actual prototype of them.

### Storyboarding

When we have settled on a vision we will create a storyboard with the different user stories. This will be necessary to map the different possible user scenarios and needed to test an actual paper prototype.

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This will ensure we have a solid foundation for the UI in the paper prototype since we have a limited amount of interviews where we can test the paper prototype.

### **Paper prototyping**

As for the final stage of the project, we will be providing a prototype of the system. This will be shown for the user and they will have the possibility to interact with it. The paper prototype demonstration will be handled similar as the contextual interview so we can address issues of the first paper prototype directly after the demonstration.

### **Reviewed prototype**

Finally we will present the user a reviewed paper prototype where we have addressed all the issues discovered in the first prototype demonstration.

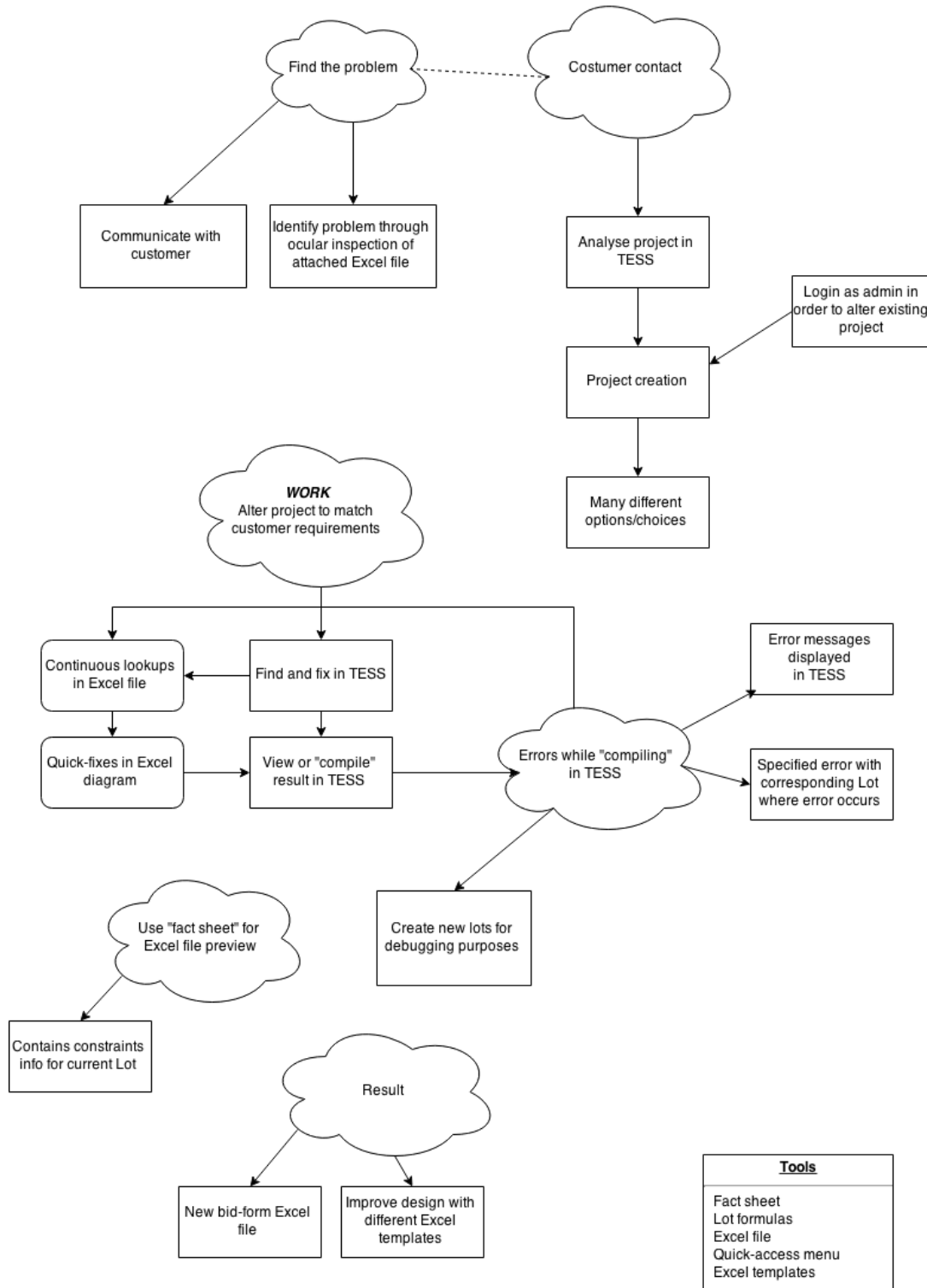
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## Affinity Diagram



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We appended pictures of the current system where these non visual prototypes will be implemented.

## Lot Page

Enter the new information and click on save.

Type:  
Text Formula

Name:  
 (required)

Rating name:  
 (required) [Generate](#)

Description:

Formula Definition    Basic Editor (no highlighting)    Graphical Dependency View

[AutoFormat](#)

```
1 blad1.region+"-"+blad1.leveranss_tt+"-"+blad1.butik_kundnamn
```

Press **Ctrl-Space** (or **Alt-Z on Mac**) to activate autocompletion of field names.  
Press **Ctrl-Shift-Space** to activate autocompletion of functions and constants.

Context Help:

[Operators](#)    [Functions](#)    [Available Fields](#)

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## Cost Formula Defining Area

The screenshot shows a web-based interface for defining cost formulas. At the top, there is a navigation bar with buttons for Overview, Bidders, RFX Definitions, Documents, Project Messages, Log, RFX Replies, Settings, and Help. Below this is a secondary navigation bar with buttons for General Settings, Cost Formula (which is selected), Bidding Rules, Feedback, Scenario Publication List, Auction Settings, and Project Cloning. The main content area has three tabs: Formula Definition, Basic Editor (no highlighting), and Graphical Dependency View. The Basic Editor tab is active, showing a text area with the formula: `1 max(1, lot.rsvolym_kg)*pris_per_kg`. Above the text area is a blue instruction box: "Edit the computation of the formula. The expression may contain mathematical operations and the rating names of lot fields, bid fields, supplements and questionnaires." Below the text area, there are two lines of instructions: "Press **Ctrl-Space** (or **Alt-Z** on Mac) to activate autocompletion of field names." and "Press **Ctrl-Shift-Space** to activate autocompletion of functions and constants." At the bottom left, there is a "Context Help:" label.

Overview Bidders RFX Definitions Documents Project Messages Log RFX Replies Settings Help Back

General Settings Cost Formula Bidding Rules Feedback Scenario Publication List Auction Settings Project Cloning

Formula Definition Basic Editor (no highlighting) Graphical Dependency View

AutoFormat

Edit the computation of the formula. The expression may contain mathematical operations and the rating names of lot fields, bid fields, supplements and questionnaires.

```
1 max(1, lot.rsvolym_kg)*pris_per_kg
```

Press **Ctrl-Space** (or **Alt-Z** on Mac) to activate autocompletion of field names.  
Press **Ctrl-Shift-Space** to activate autocompletion of functions and constants.

Context Help:



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## Revised Paper-Pen Prototype

### Lot Page

Lot Type:

Lot Name:

Rating Name:

Multiple Formula

Formula Definition Basic Editor Graphical Dependency View

MON Copy To All ?

Formula Definition Basic Editor Graphical Dependency View

TUE ?

Available Fields Operators

This is were you should define your cost formula defintion

Lot creation is significant part of creating a project in Tess. Lots can be seen as a sub-project of the entire project. For example, if you consider an entire project to be transporting milk from the farm to the local supermarket. One lot would be transporting the milk from the farm to a terminal, and this lot can be done by a specific company. Another lot can be picking up that same milk from the terminal and continue the transportation to another terminal and the same goes here, this can be done by another company.

Once a lot has been created, a cost formula must be defined for each lot. This formula can be basically anything, like calculating the cost for a certain amount of kilos of something. Essentially, this was a huge part of the project creation and our user spend most of his time in this subsection of the software. Since the chance of lots having similar cost function formulas is fairly high he had to duplicate his

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work. Thus, we introduced the “Multiple formula” functionality. The user writes the name of all the lots which the cost formula should apply to in curly brackets separated by a comma and the software will create multiple formula definition fields. There is also a button called “copy to all”, which once clicked will automatically copy the cost formula the user has written in the field to all other fields. Just for additional assistance to explain what the user should include in the formula definition, a help button is included which will provide text information to the user explaining it.

Other non-functionality is auto compiling, to check for error as an attempt to notify the user of the error when it's made, not in a much later stage.

Below is a figure containing further modification to the same lot page as specified above. However, here we concentrate only on the Formula Definition area.

Tess uses an external excel spreadsheet, which contains data which will be used to create the cost formula definition. The columns/fields, which are visible in the “Available Field” tab in TESS, in the excel spreadsheet are used in the function to do the calculation. As the user was currently writing this all manually in the text area, this was considered to be very time consuming. By taking in consideration of modern user interfaces, we decided to include a drag and drop functionality. Tess will now, list all available functions that can be used and the user can simply drag and drop the functions and columns/fields to the text area and the cost formula will be defined. A search function is also available for the user to quickly find the function they want for the cost formula. In case a user is not sure of what the function will do, clicking on it, a dialogue with assistance information describing the function will be provided.

### ***Puzzle piece DnD interface***

The idea is that the puzzle pieces in the image below represent the different functionalities of the TESS-defined formula creation language. The interface should be implemented in such a way that certain puzzle pieces fit together and others do not. For example, if the user begins by dragging a Storage puzzle piece onto the formula field the system would react by prompting the user for some corresponding puzzle pieces to complete the formula arguments, for example number of units to store or storage space, these pieces could typically be a Math-piece and another Storage-piece. Furthermore, they should ‘snap’ into place in a graphical manner giving the user the sensation that the piece fits right in place.

In this sense the user carries on to ‘lay the puzzle’ until it is complete. Naturally, to support previous users and backwards compatibility, the user should always have the option of switching back to the original text-based formula definitions. The main idea here is to make it easier for users to define formulas which are of a simpler nature. For more complex formulas the visual representation could become overwhelming and even non-functional since relations between different functions could quickly mount to become too much for such a representation to be useful and appear cluttered.

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### Cost Formula Defining Area

### TESS

Drag and drop functions to create a formula!

Math Logistics Pricing Storage

PolyFunc CargoW Click

Ship Dist FuelCost

Function details:  
Arguments \* Values \* bla bla bla

Drag and drop!

Search for a function...

There are no management personnel in this project. You should have at least one user in one of the following groups: Owner, Project Manager or Project Support. At the moment, no (Hide) one will receive emails for bidder requests. (FAQ / Contact Project Managers)

Overview Bidders RFX Definitions Documents Project Messages Log RFX Replies Settings Help Back

New Phase

Name: Uppsala Universitet - John Shaw Corp

Visibility (State): Hidden from bidders (Setup) Show State History

Reference number:

Information (Visible to Bidders):  
Created by: Carl Lindgren  
Project created: 2015-02-18 13:10 GMT+01:00

Active Lots: 115

Analysis: Perform scenario based analysis for bids and questions from different phases. Get Analysis

Contract Management: Create Contract

Notification Center: Notification Center

Project Management Personnel:  
Project Manager: (0) Manage  
Owner: (Hidden Project Manager) (0) Manage  
Observer: (0) Manage  
Project Support: (0) Manage

Bidder Accounts: 0 Manage  
Custom User Groups: 0 Manage  
Frequently Asked Questions (FAQ) 0 Manage

Management Tasks

2015-02-18 2015-03-02 2015-03-13 2015-03-25

Planning RFQ Evaluation

Current Project Time: 2015-02-18 14:21 GMT+01:00

Next Deadline: 2015-03-04 13:00 GMT+01:00 (in 1 week 6 days)

Phase Info

Phase	Planning	RFQ	Evaluation
Type:	Planning	RFQ	Evaluation
Information to bidders about the phase:	The Project is c... the time being	The Project is c... For Quote Phase.	The Project is c... being evaluated.
Deadline:	2015-03-04 13:00 GMT+01:00	2015-03-18 13:00 GMT+01:00	2015-03-25 13:00 GMT+01:00
Tasks:		Dashboard	0 (0 / 0)
Standing bids (Active / Invalid):			1
Removed bids:			0
Lots with Bids:			0
Organizations in phase:			0
Organizations with Bids:			0
Organizations fulfilling all mandatory tasks:			0
Completed tasks:			0

Chat Function

Annie Woolf User  
TESS project: #1234

Hogarth Huges System admin. TESS support

Hello!  
How can I help you? :)

Damn it!  
It is not working! :(

Type your question here... Clear Send

Click here to chat with a system administrator!

### Chat Function

Essentially, the job of our user who we have been observing is to help customers who are creating a project and are stuck. This involves a communication path between our user and the customer and this is currently done via email. Email is bad for several reasons, for example, it is not the fastest way to get an answer. Thus, we introduce a chatting function to TESS.

A customer will see all available users that are online which can help them. Email can still be an alternative way of communication in case no system administrator / staff is online to assist you.

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The chat system would work much like any other supportive chat system out there with capabilities such as sending entire conversation via email, possibility of changing to another assistant or a 'bot-assistant' for automated answers to frequently asked questions.

### **Small hotfixes**

Since the system we analyse is very complex it requires a lot of work to be able to define prototype that considers the system as a whole. However we were able to define small breakdowns that can be translated into hotfixes, small changes that are not really large enough to consider a prototype. Here follows some hotfixes we suggest:

- Placing the chat functionality closer to the problem. We can't pinpoint where this location might be since we lack the domain knowledge required to find an optimal placement but the idea is that the customer should be able to access the chat where the problems might occur. One obvious location is at the lot creation where the majority of work was made during the contextual interview.
- Allowing drag & drop reordering at the Lot & Bid fields tab. Currently when the order of lot's need to be changed the users download the project as an excel document and reorder it in excel by copy and paste. After that they upload the excel project to TESS again. Allowing drag & drop in this location for reordering would save the users some time and might reduce stress.
- In the lot creation the current default tab is "Operators". This is a list of the built in operators in TESS, about 20 in total. These operators never change and they are limited in number, so the users might learn these quite fast. We suggest changing the default tab to "Available fields" that contains the names of currently defined data fields that are specific for this project. A novice user might lookup some operators but all users might need to check the current projects data fields.

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### **Minutes of Last User Interview**

- Inhouse chat system exists , but its not very popular with clients , however this prompted the idea that maybe having it next to issue/problem will help with its usage
- Positive feedback on reordering of lots by drag and drop
- Visual representation of lots by ‘puzzle icons’ was received well, but the value proposition weak per the customer. Nevertheless, applying the same concept to represent the data would be an interesting application per the customer.
- Restoring to the visual composition state after the edit has been done would be a foreseeable challenge.