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IMPLEMENTATION AND ANALYSIS OF A WEB SHOP IN AN
INTERNATIONAL COMPANY

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ABSTRACT

The aim of this Thesis is to test implementation of three different web shop platform candidates and provide recommendations for further testing and implementation of a web shop for the target company. All the work is done within the company. The web shop should improve the inner function of the company by making it easier to add new courses and removing unnecessary work. It should also make it easier for potential customers to register themselves to the company's courses. At the same time, the web shop should improve processing of large amounts of registration data. The web shop has to be able to process international payment methods as well as international customers. The costs have to be kept low to keep the risk low. The languages needed for the web shop are Finnish, Swedish, English, and Chinese. This thesis as well as its documentation is done in English. The project is carried out in parallel tasks, using *Lean thinking* as well as *Agile software development*.

The target company offers courses in *project management* and *lean management*. At the present, course registrations are done via an online form. The data collected by the form is stored in one database per language. In order to make invoices, the course secretary has to export the data from these databases in csv format to Microsoft Excel. The secretary then has to process the data manually and create invoices by hand for each participant using the previously mentioned program. This introduces unnecessary manual work for the course secretary.

The project was carried out by testing three good platform candidates for the web shop, which should be possible to install with minimal changes to the existing web pages of the target company. Firstly, the installation tests of the platforms were planned and carried out. Then test cases were planned, and they were carried out on the platform candidates. The administrative interfaces were also tested. Lastly, the best web shop platform was selected and the test results were presented.

The three different platforms performed similarly, but there were some differences. One of the platforms gives the most useful features and also provides good technical support. In the end, it is also the winner because its features work the most balanced, installation was quick and the administrative interface was excellent.

KEYWORDS: eMarketing, Lean management, Web shop, Black Box testing

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TIIVISTELMÄ

Tämän projektin tavoitteena on asentaa ja testata kolme verkkokauppa-alustaa kohdeyritykselle, sekä tuottaa suosituksia mitä alustaa kohdeyrityksen kannattaisi valita seuraavaa testausvaihetta sekä lopullista käyttöönottoa varten. Työ tehdään kohdeyrityksen leivissä. Verkkokaupan tulisi parantaa kohdeyrityksen sisäistä toimintaa helpottamalla uusien kurssien lisäämistä sekä pienentämällä työtaakkaa. Sen tulee myös helpottaa potentiaalisten asiakkaiden rekisteröitymistä kohdeyrityksen kursseille. Samalla verkkokaupan tulee mahdollistaa suurien tietomäärien käsittelyn. Sen tulee pystyä käsittelemään kansainvälisiä maksumenetelmiä sekä kansainvälisiä asiakkaita. Kustannusten tulee olla matalat, jotta riskit pysyvät kehitysvaiheessa hallinnassa. Verkkokaupassa tarvittavat kielivaihtoehdot ovat suomi, ruotsi, englanti, sekä kiina. Tutkielma sekä projektin dokumentointi tehdään englanniksi. Tutkimuksessa hyödynnetään *Lean - ajattelutapaa* ja projekti toteutetaan hyödyntäen *Agile software development* – menetelmää rinnakkaisilla tehtävillä.

Kohdeyritys tarjoaa projektitoimintaan ja Lean-ajatteluun liittyviä kursseja. Nykyhetkellä kurssirekisteröinnit tehdään online-lomakkeen kautta, jonka tiedot tallennetaan yhteen tietokantaan per kieli. Laskutusta varten kurssisihteeri joutuu viemään tietokannasta rekisteröintitiedot csv-tiedostoihin jotka avataan Microsoft Excelillä. Jokaisen osallistujan tiedot on käsiteltävä yksitellen edellä mainitulla ohjelmalla. Tämä teettää turhan paljon manuaalista työtä kurssisihteerille.

Projekti toteutettiin testaamalla kolme hyvää alustaa verkkokaupalle, alustan on oltava helppo asentaa yrityksen nykyiseen internetsivustoon pienin muutoksin. Alustojen asennustestaus suunniteltiin ja toteutettiin. Tämän jälkeen verkkokauppa-alustoja varten suunniteltiin testitapaukset joilla toteutettiin verkkokauppa-alustojen käyttötapaustestaus. Ylläpitokäyttöliittymää testattiin myös. Lopuksi valittiin alustoista paras, ja testitulokset esitettiin.

Kaikki kolme testatut alustat toimivat samankaltaisesti, mutta niissä oli pieniä eroja. Yksi alusta tarjoaa parhaat ominaisuudet ja sille on tarjolla hyvätasoinen käyttäjätuki. Loppupäässä tämä alusta on voittaja koska se toimii tasapainoisimmin, asennus oli nopea sekä ylläpitokäyttöliittymä toimi erinomaisesti.

AVAINSANAT: e-liiketoiminta, Lean-ajattelu, Verkkokauppa, Mustalaatikkotestaus

1. INTRODUCTION

Edupower Ltd is a Finnish-based international startup company that among other things offers education in *project management* and *Lean management*. At the present time, Edupower's course registrations are done via an online form, which stores its data in a database. Available languages on the website are: English, Finnish, Swedish, and Chinese. Due to a design limitation, the form does not handle storing data from different spoken languages into the same database. This causes the registration data to be split into one database per spoken language.

Course registrations and invoicing are handled by the course secretary. The data has to be exported from the separate databases to csv files, which are then opened in Microsoft Excel. The course secretary processes the data manually in excel and creates invoices by hand. This cumbersome process causes unnecessary manual work for the course secretary, and at the same time it also wastes time. To externalize invoicing to a bookkeeping company would on the other hand introduce unnecessary costs. The solution is to create a web shop, in which the courses that Edupower arranges are sold. For invoicing, the web shop will use one or several online payment methods that are internationally certified and accepted. The web shop will use one central database for the registrations, to keep things simple.

The aim of this thesis project is to plan and test implementation of a web shop for Edupower Ltd, and to provide conclusions and recommendations for continued development of the web shop. The thesis will thus cover the implementation planning, installation testing and Alpha testing stages of the software development process. The conclusions of this thesis will be used for planning the beta testing phase, which in its turn will lead to the implementation phase. All the work will be done for the company, within the company.

In this project, the web shop will not be created from scratch. Instead, three existing web shop platforms will be installed and tested. The platforms will be customized and adapted to work according to requirements of Edupower Ltd. For invoicing, internationally certified online payment systems will be used.

The web shop should improve Edupower's internal function, make it easier to add new courses, and make it possible to process large amounts of information related to the courses. It has to be able to handle international customers and thus also international payment Methods. To keep the initial risk low, the costs of this project have to be kept at a minimum. The necessary language alternatives in the web shop are English, Finnish, Swedish, and Chinese. The web shop should also make it easier for potential customers to register to Edupower's courses.

Because of the international nature of the company, this thesis as well as its documentation will be done in English. The thesis project takes advantage of *Lean* thinking and will be carried out in parallel tasks utilizing the *Agile Software Development* method. The project is divided into stages according to the *Gate model* designed by ABB. At the end of each stage, a *gate meeting* will be held, at which the stage is reviewed and a decision is made whether to continue with the next stage as planned, to continue with some modification to the plan, or to stop at that stage. Stopping a project occurs only if it is considered that the project will not be leading to any worthwhile results or if worthwhile results already have been achieved and no further work is deemed necessary. (Korsmo & Lucas 2012:1-3).

The project customer is Edupower Ltd. This project is carried out by first surveying the customer needs and requirements, as well as checking which web technologies are in use by the customer, so that the necessary changes to the customer's website can be kept at a minimum. In the planning phase the inputs and outputs, user interface needs, project outputs, as well as integration into the current web page are planned. The web shop platform candidates are also selected at the planning stage. In the first implementation testing phase the web shop platform candidates are installed into internal test sites, automatic course numbering is implemented and preliminary course items are inserted. At this stage, a test website will be created for alpha testing of the web shop. Usability tests and feature tests will be performed through different test cases. The result of the project will be a feasibility conclusion as well as recommendations how to proceed to the beta testing phase of the web shop project.

The project has been initiated in March 2014. The initial project plan has been delivered in March 2014, and the software testing phase was planned during April-

May 2014. Alpha testing is estimated to begin in June 2014, and last for two weeks. The installation testing will be done the first week, and the use case testing the following week. The first draft of the thesis will be ready after the testing is finished and reported, and the data analyzed.

This thesis is divided into seven main chapters. In the Introduction chapter, the business case is presented, along with the reasons to why the project has been initiated, as well as the time table of the project.

In the Methods chapter, techniques of online commerce (eMarketing) are being presented. This chapter also includes a short introduction to *Lean thinking*, how *Lean Software Development* works as well as how it fits into Online Commerce and this project. Software testing theory is also being presented in this chapter.

In the Software Definition chapter, the customer requirements and currently used technology are presented.

In the Test Planning chapter, the project technologies, time table, invoicing methodology, software testing plans, the arrangement of the tests as well as the scoring systems of the tests are being presented.

In the Testing Process chapter, the alpha testing phase of the Web shop is covered, reporting what was being done and why. There is one subchapter for each test phase.

The Test Results chapter presents the alpha testing data and results from the three different web shop implementation platform candidates. The chapter is divided into subchapters according to the different platform candidates.

In the Analysis chapter, the features and advantages of each of the three web shop platform candidates are being discussed. Changes and improvements that the web shop platform candidates will bring to the company's function are also being discussed.

In the Conclusions chapter, the best platform candidate is selected and recommended. Future improvements and development is also discussed.

Finally, in the References chapter, the project bibliography is being presented, and in the Appendices chapter the appendices will be presented.

2. METHODS

In this chapter, the testing and development methods used in this thesis are being presented. Firstly the software development method is being presented, followed by eMarketing and software testing methodology.

2.1. Lean Software Development

Lean is a *production optimization method* that originates in the automotive industry. It has since the 1950s been under constant development by Toyota Motor Manufacturing under the name *Toyota Production System*. Since early 1990s it has been adopted by the global community and the term *lean* was also coined at that point in time. (Liker 2004: 15-20, 25).

In 1950 after World War II, Eiji Toyoda, the chairman of Toyota Motor Manufacturing, and his group of managers visited several American car plants during 12 weeks to learn from their production methods. To Toyoda's surprise, the American car industry had not improved much since the 1930s. Mr. Toyoda and his managers could pinpoint problems in the American car manufacturing process such as *large inventories, slow processing, and interruptions in the manufacturing process* which caused large amounts of items sitting in storage *waiting to be processed*. Based on this information as well as Henry Ford's 1920s idea of constant material flow, Toyota Motor Manufacturing started developing their own production system, which would be called "TPS" or "Toyota Production System". (Liker 2004: 20-22).

The Toyota Production System was not widely known until 1973 when the first oil crisis sent the world into recession. Toyota was the first of the Japanese car manufacturing companies to recover from the oil crisis, and it reached profitability after the recession faster than any other of the companies. In the 1990s, the Auto Industry program of MIT did research on the Toyota Production System. Based on this research; James Womack, Daniel Jones, and Daniel Roos wrote a book called *The Machine That Changed the World*. In this book, TPS got a new name; *lean production*. (Liker 2004: 24-25).

The main idea behind *lean thinking* is to maximize output with minimal possible resource usage. This means eliminating waste: identifying and removing all possible bottlenecks, overproduction, extra processing, unnecessary waiting, as well as defects. (Poppendieck 2003: 2-4). Taiichi Ohno, who can be seen as the father of TPS, commented in 1988 on the system: “*All we are doing is looking at the time line from the moment the customer gives us an order to the point when we collect the cash. And we are reducing that time line by removing the non-value-added wastes*” (Liker 2004:7.)

Since the awakening of the global community towards *lean thinking*, lean has gained popularity and been developed and refined for different types of production. One of these production types is *software development*. Mary and Tom Poppendieck have developed a *lean-based* software development method called *Lean Software Development*, which is described in their 2003 book *Lean Software Development – An Agile Toolkit*.

In the early 2000s, Agile software development started to gain popularity. *Lean Software Development* adds several new elements into Agile Software Development that can strengthen agile practices as well as prevent the development practices from becoming hindrances to the agile projects. (Poppendieck 2003: xiii-xiv).

There are seven (of fourteen) main principles in *lean thinking* that apply to *Lean Software Development*. Since they are applied in this project, a definition of each of the seven principles follows.

The first main principle of lean is to *eliminate waste*. Mary and Tom Poppendieck present the definition of waste as “anything that does not add value to a product, value as perceived by the customer”. Basically, it boils down to finding out what the customer wants, then developing and delivering this to the customer as quickly as possible; preferably immediately. Anything which hinders the company from rapidly developing and delivering the product for the customer is considered to be waste. (Poppendieck 2003: xxv).

The second principle of lean is to *amplify learning*. This means that the software development project is not expected to come out with a perfect product on the first try, but rather to keep improving the results each time by learning from previous projects. (Poppendieck 2003: xxv-xxvi). This continuous improvement is often called *kaizen* (Liker 2004: 11.)

To *decide as late as possible* is the third lean principle. Making decisions based on fact gives better results than making hasty decisions based on speculation. Product design options also are better kept open than committing the options early and not being able to change the options later. (Poppendieck 2003: xxvi).

The fourth principle of lean thinking is to *deliver as fast as possible*. To develop quickly gives the possibility to delay decisions, before delivery has to be made. Each development cycle should be short because more can be learned from a small piece of the project rather than a larger piece. This process aids in removing waste from the development process. When development is rapid, it is also possible to deliver quickly to the customer, as long as the customer still has the need for the product that was ordered. (Poppendieck 2003: xxvi).

Principle number five is to *empower the team*. This means that developers are involved in technical decisions, because they are experts in those areas. The company leaders guide the developers to make better technical decisions, because the leaders can see the greater perspective including the business side of the project. Leaders are not directly themselves doing decisions because the development process is rapid and the developers are better equipped to make the technical decisions in the field as they progress. This is also called a *pull* mechanism in lean thinking. (Poppendieck 2003: xxvi-xxvii).

The sixth principle is to *build integrity in*. In basic terms this means to make a good product that can maintain its usefulness over time. This requires good maintainability, adaptability, and extensibility. These features usually come from wise leadership, relevant expertise, effective communication, and healthy discipline. (Poppendieck 2003: xxvii).

Seventh but not the least principle; *see the whole*. To develop a good product with integrity needs diverse expertise, and keeping this expertise together. Experts often concentrate on optimizing the part of the product that they are working on, forgetting about the overall performance of the product. This is a challenge that needs to be handled well, and it becomes even more pronounced when several companies are making joint projects. (Poppendieck 2003: xxvii).

Lean Software Development was selected for this project because it produces good results with minimal wasted effort and minimal resources. Edupower Ltd uses *lean thinking* as a standard method of doing projects as well as a standard for the internal functioning of the company itself. It is thus both practical and logical to do this project using software development practices adapted to lean thinking. Last but not least; the size and characteristics of this project are unsuitable for many of the agile development methods and Lean Software Development gives excellent ideologies for managing the project.

2.2. eMarketing

eMarketing has been around since the 1990s but it is only these days that it has become a big thing, because global transport costs are going down and it is becoming affordable to order items from remote locations in the world. Even mobile devices are beginning to support online services, and payment is becoming easier as online payment services emerge. Identification and payment can all be done using a few clicks, which saves time and effort for customers as opposed to ordering and either waiting for an invoice or doing the risky procedure of directly sending cash to the company.

Not only physical items can be sold via eMarketing; nonphysical items such as services and event registrations can also be sold online. This also gives the same practical advantage of easy identification and payment, which is why Edupower Ltd is now considering to start a web shop to provide an interface through which customers can register to courses and events arranged by the company. A web shop saves effort for both the customer as well as the company, which in theory should improve sales.

It can also be considered to be a good practice of *lean thinking*, because it improves function with minimal resources and even reduces resource usage.

The main strategy behind Edupower's web shop project is to attract customers to register to courses and events via an online form on the website. The registration process has to be quick and easy for the customers, and provide a layer of trust. If the customers feel uneasy at any step of the process or even before the registration process, they will most likely either cancel registration or not initiate registration at all. So it is important that the customers feel positive about the website and have a positive experience during the registration process, it will increase the company's reputation which will increase sales over time.

To be able to attract customers, the website has to stick to the point and provide information that the customers will be interested to know about. By doing this, the strategy stays *lean* and will not waste the customer's time.

2.3. Software testing

In the book *Software Testing and Internalization*, the authors Manfred Rätzmann and Clinton De Young define that software testing is all about proving that any program can crash under certain conditions (Rätzmann, De Young 2013: 14.) This does not imply a negative attitude towards any piece of software, but rather the realization that all programs have errors, with varying amount and severity. The sooner the errors can be found, the better. Rätzmann and De Young also point out that a program does not have to work flawlessly in all possible situations, but rather to respond predictably and its operation should be stable (Rätzmann, De Young 2013: 14, 15.) It is not possible to prove a program is completely error-free, because for any given amount of tests there is always the possibility that the error is not found within the tests.

Software testing assures product quality, but it does not improve upon it unless the errors that were found during testing are resolved. Also, the look and feel of the user interface itself plays a role in product quality. (Rätzmann, De Young 2013: 25).

One of the most valuable testing methods is to *test by using*. It will reveal the usability of the software and whether it improves or slows down the work flow of the user. (Rätzmann, De Young 2013: 43). Using this method, any errors during normal usage can and will be found. The most important part of the operation of a program is the stability of normal usage. Users should be able to perform their tasks without errors that cause the software to crash, hang, or pop up a lot of error messages.

Another common testing method which also gives good value is called *Black Box testing*. It is used to check if the software conforms to the input and output definitions of the software. (Rätzmann, De Young 2013: 49). This testing does not take into account the program code or the internal function of the software, thus it can be applied to closed source software.

When test cases are designed for Black Box testing, they have to be created both for valid and invalid inputs. Often the invalid inputs are overlooked in black box testing, and thus most of the unexpected errors caused by invalid inputs are not found. (Myers 2004: 18).

There is one testing method which should not be overlooked; *installation testing*. Installation testing tests the installation and uninstallation of the software, as well as upgradeability. It ensures that the software is easy to install, and that the software can be removed completely without any residual data. At the same time it ensures that no data is lost when updating software from one version to another. (Rätzmann, De Young 2013: 55).

One final important testing method is *security testing*. It ensures that the software is secured against online attacks and also internal attacks. Personal or corporate information must not be allowed to fall into wrong hands; only people with proper authorization should have access to information. (Rätzmann, De Young 2013: 55-56).

2.4. Project management

The software testing project, which this Thesis covers, will as stated in chapter one be carried out in parallel tasks utilizing the *Agile Software Development* method. This basically means having several small tasks going on at the same time, and they each have separate limited time spans. In this way, it is possible to switch to another task when one task is temporarily not proceeding, to keep the process flowing forward with a minimum amount of delays. Short meetings will be held with short intervals to keep track of the current status of the process.

The *Gate model* presented in chapter one is used to create stages for the software testing project. In this software testing project a stage contains a limited set of tasks, and at the end of a stage, a larger meeting is held in which the tasks of the current stage are reviewed and a decision is made about whether to proceed with the next stage as planned earlier or if the next stage needs some alteration to its task plan. Stopping at the end of a stage is considered a last resort if the project is not progressing any further or if sufficient results already have been obtained. The amount of stages can be adjusted according to needs that will change over the duration of the software testing project.

3. SOFTWARE DEFINITION

This thesis will contain test reports as well as conclusions and suggestions to Edupower Ltd about which web shop platform is the most feasible one as well as how to proceed to the next phase of the project; beta testing. The target is to keep the base technology the same as it currently is, to prevent unnecessary work, following the principles of Lean. In this chapter, the current technology as well as the technology improvements will be reviewed.

3.1. Current technology

At the present time, Edupower's website is based on a combination of custom PHP code and WordPress. Course registrations are done via a form constructed using a WordPress plugin called *Contact Form 7*. The registration data includes:

- Given name
- Family name
- Date of birth
- E-mail address
- Home address
- Zip code
- City
- Country
- Discount code
- Organization
- Phone
- Mobile phone
- Invoicing address (if applicable)
- Invoicing zip code
- Invoicing city
- Invoicing country
- Chosen course

- Multiple choice: Interested, Registration, Pre-registration
- Comments text field

This data is stored in a database which has been created by the WordPress plugin. However, the plugin is limited by the fact that it creates one separate database per chosen language, and cannot store the data in only one central database. Furthermore, the data is not straightforward to process; it has to be manually exported to CSV and reviewed in Microsoft Excel because the system itself does not produce invoices. The course secretary has to create the invoices by hand, based on the data from the exported database contents. Since the data is also split into one database per language, processing the data takes up unnecessary time.

The Contact Form 7 WordPress plugin is a simple website form provider, and it has only limited database capabilities. It does not support online payment integration. At the time when the Edupower website was designed, the possibility of implementing a web shop was not thought of; hence a simple registration plugin had been selected.

3.2. Customer requirements

Edupower Ltd needs a software platform which enables the company to provide the possibility for online registration and payment to the educational courses arranged by the company. It is also positive if the platform can provide a time table for the customers. Now follows a list of necessary features that have been requested by both Edupower's CEO as well as Edupower's course secretary.

The list of important features requested by Edupower is as follows:

- Online registration interface
- Online payment
- Payment from global locations
- Choose payment option: PayPal, Manual invoice, Online bank payment (optional)

- Support for multiple languages: at least English, Finnish, Swedish, and Chinese
- Terms and conditions for the registration process need to be displayed
- Links from course pages to the course registration interface
- Ability to process a large volume of information
- Event date and location (map)
- Possibility to add pictures, pdf's etc. to the event
- Registration time
- Deadline
- Price (+VAT 24%)
- Discount
- Able to add custom fields to compensate for missing fields, to add more information
- Export function from a common database. All languages.
- Handling of recurring events: copying or reusing
- Login for recurring participants.
- Course Secretary should be able to add bookings manually via admin interface

In addition to this list, there are a few completely optional requirements. These requirements are:

- Event categories
- Tags
- Customized reply messages
- Calendar
- Add subscription function to MailChimp
- Customer ID or Student ID. Creates new number, or picks up from existing student ID's.

4. TEST PLANNING

To successfully implement a web shop, some planning will be required. This thesis is focused on planning and performing implementation as well as *alpha testing* of three WordPress plugins, which are platform candidates to be reviewed as base for the web shop, and provide *recommendations* and *conclusions* based on the tests. These recommendations are given to Edupower Ltd, so the company can plan the following *beta test* phase as well as the *final implementation*.

In this chapter, the invoicing methods, the project technologies, software testing methods, testing arrangements as well as scoring systems are discussed and presented. The test process itself is covered in chapter five.

4.1. Invoicing

Edupower's web shop will offer several payment methods to ensure ease of payment from every corner of the world. The main payment method that has been selected is the renowned online payment service called PayPal. It offers four different international credit card types as well as direct bank account charge. The payment is done via a secured connection, and PayPal is internationally certified by *Visa*, *MasterCard*, *American Express*, *Discover*, as well as *VeriSign*.

PayPal offers customer and seller protection and can mediate disputes between the customer and the seller. This layer of protection will make the customers feel more secure about placing a payment. One key factor in successfully implementing a web shop is to make the customer feel safe while shopping; many potential customers may be lost if the web shop security seems dubious to the customer.

At the *alpha* stage, the invoicing system will not be tested but the available invoicing technologies are reviewed as criteria for selecting good test platform candidates. When the alpha testing is completed and the beta testing phase is about to begin, the invoicing system of the selected platform candidate will be integrated and activated. This is because some of the payment features are different in the commercial versions

of these platform candidates, and some payment options are not even supported in the free versions. The goal is to purchase a commercial license of the best of the three platform candidates during the *beta phase* of this project, so payment testing will be performed in the *beta testing* phase.

4.2. Technologies

For this project, three WordPress plugins have been selected as platform candidates. The first one is called *Events Manager*. It provides PayPal payment integration, an event calendar, and a customizable interface through which events can be added. The plugin stores all the data in a central database, and does not require separate databases per spoken language. It supports Google Maps, which can be used to display a map for each event to help customers find the event locations more easily.

The second platform candidate is called *Event Espresso*. It is a free web shop and event management platform. Just like Events Manager, it supports PayPal payment integration. It also has an event calendar as well as a customizable interface including customizable event designs and confirmation emails. Event Espresso features one page checkout and supports Google Maps. Manual registrations are also possible, which is highly necessary for customers that are unable to pay or register using our web shop interface. Event Espresso also has a mobile registration system.

The third platform candidate is called *Event Registration*. Like Event Espresso, it is also a free web shop and event management platform. PayPal integration is supported, as well as an event calendar. Registration forms can be customized, including the possibility to add custom fields. Google Maps is also integrated into each event description. For added security and for avoiding spam bots, Event Registration supports *captcha*. Captcha is a method to distinguish a human user from a bot using an image that only a human can decipher, asking the user to give the characters displayed in that image.

The platform candidates will be installed into three separate test environments which are copies of the current main website. The current technology will thus be used and

replaced only by the amount necessary per each test environment, and documentation of the required changes is easy to do. This also eliminates the possibility of the different platforms interfering with each other.

4.3. Software testing methods

Software testing requires good planning, because the majority of the problems with a particular piece of software need to be found before that piece of software is implemented for final use. It is easier to find problems in the software by making clear and detailed instructions for the person or the team who will be doing the testing. Since Edupower is looking for the best of three platform candidates, the software testing results will be analyzed and used to provide good platform recommendations for Edupower.

One major factor in software testing is *repeatability*. If an error is found, doing the same steps over again should yield the same result again. This will make it possible to distinguish random errors from design errors. To make a (mechanically) repeatable test, a step-by-step testing guide has to be designed and handed to the software testers.

The set of tests done during this project are called *alpha* tests because the testing is done within the company by company employees, and these are initial tests that lead to selecting a platform candidate which will then be *beta* tested. Together, the test results will give an idea of how well the platforms conform to the needs of the company. The tests are split into two parts; *installation*, *use case*. These two tests will be done in the following languages: English, Swedish, Finnish, and Chinese. After the testing, the scores of each platform candidate's test results are added together to form a final score for each platform candidate. The scores of the two different test phases are compared and the platform with the highest overall score will be recommended for Edupower for the beta testing phase.

Originally, a security test was also planned to be a part of this thesis but it had to be dropped out of the thesis due to lack of time. It will be performed by Edupower separately from this thesis, during the beta phase.

4.3.1. Installation test

The first part of the testing is the *installation test*. The software platform needs to be installed into the existing website with minimal possible changes to the website, and it should be possible to customize it to fully conform to the needs of the company. In this project, the installation testing is done by installing the web shop platforms into three separate environments, which are copies of the existing website. During the installation, the amount and description of all the changes required for successfully integrating each platform into the test environment website is recorded. The platform which requires the least changes will be the best platform candidate when integration is considered.

4.3.2. Use Case test

Another important factor to test is the function of the software. It is crucial for giving a good image of the company as well as being properly useful to the company that the platform works well. For instance; the data needs to be correctly stored to the database without any data loss. This functionality testing is done by performing a series of *Use Case* tests. Since the platforms are not open source; it means that the internal function of the platforms cannot be taken into account in the testing procedures. There is one type of Use Case testing which does not involve testing particular pieces of code. It is called Black Box testing. Black box testing only considers inputs and outputs, which makes it suitable for this project. The main idea in black box testing is to provide inputs (enter data) and look at if the outputs (results) conform to expectations according to software specifications. The inputs are varied according to testing instructions laid out in the testing plan. A strict testing plan is necessary to be able to compare the test results of different software platform candidates, in this case the three platforms. The platform that produces the best test results, which means the least amount of errors, will be the winner of the black box testing phase.

4.4. Testing arrangement

The physical test environment will be the office of Edupower Ltd. The customer interface Use Case testing will be performed by a team of four people from Edupower Ltd, and the administrative interface will be tested by Edupower's course secretary. Several testers are needed to get different views of the software, and it also speeds up the testing process and yields more test results within a given amount of time, without the need for repeating tests unless a problem is found. The testers will be doing the exact same tests concurrently, so each platform will be tested at least three times. If problems are found, the tests can then be repeated as necessary.

The testing documentation will be standardized but with some freedom for comments. The testers' comments may give insight into how the end user may think and feel about the registration interface, and if problems have been found, the comments may give clues as to what may be wrong. The individual testers may also have differing opinions about the interfaces, so their comments will be valuable although they cannot be scientifically compared to each other.

Before testing, a testing briefing will be arranged so that the team members know their responsibilities and duties, and what the goals of the testing are. The aim for the testing is to *work lean*. The tasks should be clear, with no possibility for human error or misinterpretation. The procedures need to be easy yet efficient, and the test coverage should be as large as possible without overdoing it.

4.5. Test scoring

To produce comparable results, a common scoring system is needed. The different tests need to have weighted scores to make the most important points matter the most. The final score of each of the three platform candidates will consist of three weighted sub-scores; one sub-score from each test phase.

One factor to be considered in scoring is that each of the platform candidates has a list of features available. Since most features are relevant to the usefulness of the

respective platform candidates; they will be given scores based on their features. The one with the most features will receive the highest score. If a feature is not available although it is in the list of features; that feature will not give points to the feature score. And if a feature is available which was not reported in the list of features, it will add to the feature score accordingly.

The most important test is the use case test. It will weigh the most in the final score. The second most important “test” is the feature test. It will be the second in score weight and its score is composed of features reported by the creators of the three different platform candidates. The third but not the least one is the installation test. It is the least important test score but definitely not considered to be unimportant. Thus the weight of the scores will not have a large variation, but rather a variation which will allow the strengths of each platform candidate make the difference, starting from the most important test scores.

The test results will be recorded in chapter six under the respective subchapters, and the results will be scored as well as analyzed in chapter seven. Conclusions as well as future considerations based on the result analysis will be presented in chapter eight.

Scores are given as follows; the feature score will add up to **45 points** (29 percent) of the total score, the installation testing score will be **20 points** (12.9 percent) of the total score, and the Use Case test score will be **90 points** (58.1 percent) of the total score. The grand total score will be **155 points** at maximum. Since the Use Case test is done using several browsers on all the platform candidates, the Use Case test score of each platform candidate will be an *average* of all the Use Case tests done on the respective platform candidate. This way possible browser incompatibility will affect the score.

4.5.1. Feature score

The points in the feature score come from the features presented in **Table 1**, weighted according to feature importance. If a feature is not supported, it will give zero points to the platform candidate. The maximum amount of feature points that a platform candidate can obtain is 45.

Table 1. Feature points.

Feature	Points for support
PayPal	5
Calendar	4
Item/event categories	2
Custom registration fields	3
Tax handling	5
Discount	3
Language support	5
Email confirmations	3
Google Maps / item location	3
Transaction history	4
Widgets	2
Customizable event pages	2
Captcha	4
Total score	45

4.5.2. Installation test score

The installation test score will be calculated by the duration of the procedure. The quickest installation time will receive 20 points (maximum score). An installation duration longer than 1 hour (maximum time) will receive zero points. The score of the other two platform candidates will be weighted as a percentage between the shortest

duration and the maximum time. This can be formulated as shown in *formula 1* below:

$$(1) \quad \text{points} = \text{maximum score} * \left(100\% - \left(\frac{\text{elapsed time} - \text{fastest time}}{\text{maximum time} - \text{fastest time}}\right) \%\right)$$

As an example; if the quickest installation took five minutes and one of the other candidates needed a time of six minutes to install, the score of that candidate would then be calculated using *formula 1* as follows:

$$\begin{aligned} & 20 * \left(100\% - \left(\frac{00:06:00 - 00:05:00}{01:00:00 - 00:05:00}\right) \%\right) \\ &= 20 * \left(100\% - \left(\frac{00:01:00}{00:55:00}\right) \%\right) \\ &= 20 * (100\% - 1.82\%) \\ &= 20 * 0.9818 \\ &= 19.636 \end{aligned}$$

This gives an adaptive scoring for the candidates, the only limiting factor being the maximum time of 1 hour which marks the point beyond which the test will have failed to complete in a reasonable time.

4.5.3. Use Case test score

The use case test score comes from six sets of erroneous and non-erroneous inputs being tested. For each successful test round, the platform candidate in question will be given five points. For those tests where the designed errors remain undetected, the platform candidate receives zero points. In tests where multiple erroneous values are tested, all the errors add up to five points. As an example; for one detected error of three, the points will be $5 * (1/3) = 1.67$.

Since some inputs are slightly different, and two of the candidates support only English as input language, the test scores will be calculated based on the input features common to all the platform candidates and the rest will be ignored as far as score is concerned. Unique input features that are not common among all the platform

candidates will be taken into consideration in chapter eight. The following **Table 2** presents the common features that are tested and scored. The values in brackets are the ones used for Event Espresso and Event Registration, since their inputs differ slightly from Events Manager.

Table 2. Use Case scores.

Field	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Total points
Name (First name + Last name)	Correct value	No value (first name)	Long input (last name)	Correct value (long first name)	Value with numbers	Value is only numbers	30
Phone	Correct value	Correct value	Value with letters	No value	Correct value	Value is only letters	30
E-mail	Correct value	Correct value	Correct value	No value	Value lacks @-sign	Correct value	30
							90

The second part of the Use Case test; the *administrative interface* test is not possible to score because each platform candidate has a different interface, but the observations and comments of the tester of the administrative interface will be considered when analyzing the results in chapter seven. The results of the administrative interface test will be presented along with the other Use Case results in chapter six.

5. TESTING PROCESS

In this chapter, the entire testing process of the project is presented. Let's begin by examining the installation testing procedure, followed by the use case testing procedures, and finally the security testing procedures.

5.1. Installation testing

The installation tests are carried out by first downloading the WordPress plugins one by one from the WordPress plugins website. After this the plugins are installed (uploaded in the installation procedure), and finally the plugins are configured to work with the website; links added to website, plugin page types adjusted, etc. The time it takes for the plugins to be fully configured is recorded and will be one factor in evaluating the installation test score.

5.2. Use Case testing

For this project; Use Case testing is performed as Black Box testing, because the web shop platforms are not open source. Black box testing only considers inputs and outputs, and does not involve testing of particular pieces of code. The main idea in black box testing is to provide *inputs* (enter data) and look at if the *outputs* (results) conform to expectations according to software specifications. The inputs are varied according to testing instructions laid out in the testing plan. Due to differences in browser compatibility, a wide base of browsers has to be tested. Browser compatibility plays a large role in the scoring, because the initial impression the customer gets will depend largely on that Edupower's website loads and works correctly regardless of which browser the customer is using.

5.2.1. Test team

For the Use Case test, a testing team is required since this test needs coverage. A test team has been put together consisting of a group of four people. Three of these testers;

Ying, Zuzana and Yashar are international students, working as interns at Edupower at the time of these tests. One tester, Simon, is working at Edupower as a project engineer and has some experience in working on the content on Edupower's website. However, none of the testers are familiar with the WordPress plugins that are being tested and so they do not have inside experience in configuring and working with these three WordPress plugins. This makes them a suitable group of testers; they do not have a bias from inside knowledge of the different platform candidates.

5.2.2. Test procedure

The testers are handed an electronic step-by-step instruction sheet which also serves as testing protocol and it includes a short electronic questionnaire about the test experience of the individual testers.

The questionnaire gives valuable information that can be used to select a good platform candidate which does not give customers the incentive to cancel the registration process or to avoid starting the registration process. The experience of the testers will provide insight into how potential customers will perceive Edupower's website with any of these web shop platforms. The last thing a company wants is to scare off its online customers by providing a non-trustworthy website.

The instruction sheet as well as the questionnaire can also be printed on paper, if the testers prefer. The instruction sheet is designed so that the testers will report any error messages they see, and they are asked to enter certain given information from tables in the instruction sheet. This ensures repeatability of the tests, which is important for reliable results. These instruction sheets are found in appendices 1-3.

Since different web browsers do not work exactly the same; the most common browsers have to be tested. The Black Box tests will thus be repeated for a selected list of the browsers. To ensure repeatability, the tests will be done at least twice by two separate persons.

The browsers to be compatibility tested are:

- Google Chrome

- Mozilla Firefox
- Internet Explorer
- Opera
- Safari

Google Chrome and Mozilla Firefox are among the most popular browsers. Internet Explorer comes together with Microsoft Windows and is commonly used because of that fact. Opera is also a popular browser; it is probable that some customers will be using that browser as well. Safari is a browser that comes with Apple's operating systems; MacOS X and iOS. Safari has been included in the tests to make sure that Apple users will have a good customer experience. The software testers of this project all have Windows computers but Safari is also available on the Windows platform, which enables them to test the web shop platforms using Safari.

The Black Box testing will be performed using the Boundary Value Analysis technique; the input fields will be given proper and improper values, and the interface's reactions to the inputs are recorded. The input fields are all of text format although some fields have custom format requirements, so only text length and incorrect characters can be tested. This will be done rigorously for each input field, to give good test coverage.

There are six main test steps in the protocol. In the first test, only correct information is given. This registration should always succeed. The second test leaves the *name* field empty, which should not succeed and the interface is supposed to notify the user about it. The third test gives an unusually long name as well as a phone number with a character, which should also not succeed. The fourth test leaves *phone* and *e-mail* fields empty; this is supposed to cause an error message. The fifth test includes an e-mail address without the "at" sign, which is supposed to cause the validation to fail. The sixth and final test gives numbers in the *name* field, which is also supposed to fail because nobody can have numbers as their name.

After the test steps, a questionnaire follows. It first asks for the tester's name and browser, including version, for the record. The second question asks for the tester's

overall impression of the test platform candidate on a scale of *below average, average, good, very good, excellent*. The third question regards ease of use, the tester is asked to evaluate it using the same scale as the first question. The fourth question prompts the tester to evaluate on a scale of *yes, no* if the test platform candidate according to the tester did provide all necessary information related to the test event. If the answer was no, the tester can give an explanation to why he or she does not think all the necessary information is there. The fifth question is related to trustworthiness; asking the tester to evaluate (using a scale of *yes/no*) whether the registration process felt trustworthy or not. Again, if the answer is no, the tester can explain why. The final question is an optional one where the tester may express any views, comments or suggestions they have about the test and the test platform candidates. This information will be taken into account but does not affect the score of the test platform candidates since there is no scientific basis for the (subjective) information.

The second part of the Use Case tests is the *Administration interface* testing. It will be done using *Black Box* techniques and involves testing the *course secretary's interface*. This testing will be performed by the secretary himself because he knows what features and properties are needed for entering course or event information. In this case prior WordPress experience is highly useful, since the plugin administration interface is part of the WordPress administrative interface of EduPower's website.

6. TEST RESULTS

The results of the software tests are presented in this chapter. The raw data will be looked upon more closely and analyzed in chapter seven.

6.1. Feature scores

The following feature scores in **Table 3** are obtained without any testing, based solely on the features that are reported by the respective software developers' websites to be supported in the respective platform candidate.

Table 3. Points for individual features.

Feature	Events Manager	Event Espresso	Event Registration
PayPal	Free: No (0) Pro: Yes (5)	Yes (5)	Yes (5)
Calendar	Yes (4)	Free: Only basic (2) Pro: Full calendar (4)	Yes (4)
Item/event categories	Yes (2)	Yes (2)	Yes (2)
Custom registration fields	Free: No (0) Pro: Yes (3)	Yes (3)	Yes (3)
Tax handling	Yes (5)	Yes (5)	Yes (5)
Discount	Free: No (0) Pro: Yes (3)	Free: No (0) Pro: Yes (3)	No information
Language support	Yes (5)	Yes (5)	No information
Email confirmations	Yes (3)	Yes (3)	Yes (3)
Google Maps / item location	Yes (3)	Yes (3)	Yes (3)

Transaction history	Free: No (0) Pro: Yes (4)	Yes (4)	No information
Widgets	Yes (2)	Yes (2)	Yes (2)
Customizable event pages	Yes (2)	Free: No (0) Pro: Yes (2)	Yes (2)
Captcha	Free: No (0) Pro: Yes (4)	Yes (4)	Yes (4)
Total score	Free: 26 Pro: 45	Free: 29 Pro: 45	Free: 33

6.2. Events Manager

Events Manager is the first test platform candidate, its' test results from the three different stages are presented below. This test platform candidate supports entering data in multiple languages using a separate non-affiliated plugin called mqTranslate.

6.2.1. Installation test

The first phase of the testing procedure is to test the installation process itself. The raw data of the installation test follows:

Table 4. Events Manager installation duration.

Installation time	Configuration time	Total duration
1:16 min	3 hours, 28 minutes	3 hours, 30 minutes

As seen in **Table 4** above, the installation time was quick but it took a rather long time to configure it. The total duration goes well beyond the one-hour limit; it is not a good result for the maintenance side of this platform candidate.

6.2.2. Customer interface Use Case test

In this section, the raw data of the Use Case test for Events Manager is presented. The first data to look at is the input data that the software testers have to input to the online registration form. Since the Use Case test is done as a black box test, the data values have been created to test the limits of the input fields without taking the underlying software code into account. The input data is shown in the instruction sheet in **appendix 1** due to the amount of data.

The software test has been done on several web browsers, the test results have been recorded in separate tables for each browser. Now follows a set of tables that contain the results.

Table 5. Events Manager test output data from Google Chrome.

Tester	Ying	Yashar	Simon
Test 1	Successful	Successful	Successful
Test 2	Successful	Successful	Successful
Test 3	Successful	Successful	Successful
Test 4	ERROR: Please enter a username ERROR: Please type your e-mail address	ERROR: Please enter a username. ERROR: Please type your e-mail address.	ERROR: Please enter a username. ERROR: Please type your e-mail address.
Test 5	ERROR: The email address isn't correct.	ERROR: The email address isn't correct.	ERROR: The email address isn't correct.
Test 6	Successful	There is no space dropdown list.	Successful

In **Table 5** above it can be seen that Events Manager is not detecting all the designed errors. *Test one* is the only test that should be successful, the other tests should result in errors or warnings. Also, in *test six* Yashar misinterpreted the instructions and only reported the missing dropdown list. But overall *tests four and five* were giving errors as expected so Events Manager does have a working system for detecting erroneous input.

Table 6. Events Manager test output data from Mozilla Firefox.

Tester	Ying	Yashar	Simon
Test 1	Successful	Successful	Successful
Test 2	Successful	Successful	Successful
Test 3	Successful	Successful	Successful
Test 4	ERROR: Please enter a username ERROR: Please type your e-mail address	ERROR: Please enter a username. ERROR: Please type your e-mail address.	ERROR: Please enter a username. ERROR: Please type your e-mail address.
Test 5	ERROR: The email address isn't correct.	ERROR: The email address isn't correct.	ERROR: The email address isn't correct.
Test 6	Successful	There is no space dropdown list.	Successful

In **Table 6** above the results are the same for Mozilla Firefox as they are for Google Chrome. This is good; variation in results depending on browser would indicate some software design issues that need to be resolved.

Table 7. Events Manager test output data from Safari.

Tester	Yashar	Simon
Test 1	Successful	Successful
Test 2	Successful	Successful
Test 3	Successful	Successful
Test 4	ERROR: Please enter a username. ERROR: Please type your e-mail address.	ERROR: Please enter a username. ERROR: Please type your e-mail address.
Test 5	ERROR: The email address isn't correct.	ERROR: The email address isn't correct.
Test 6	There is no space dropdown list.	Successful

In **Table 7** above, the results are completely identical to Google Chrome and Mozilla Firefox. This browser is tested only by two people because there is a four people team, three candidates to test and five browsers to cover. The less common browsers are tested by two testers and the common browsers are tested by three testers. Same goes for **Table 8** below; Internet Explorer also works identically to the other browsers.

Table 8. Events Manager test output data from Internet Explorer.

Tester	Ying	Yashar
Test 1	Successful	Successful
Test 2	Successful	Successful
Test 3	Successful	Successful
Test 4	ERROR: Please enter a username ERROR: Please type your e-mail address	ERROR: Please enter a username. ERROR: Please type your e-mail address.
Test 5	ERROR: The email address isn't correct.	ERROR: The email address isn't correct.
Test 6	Successful	There is no space dropdown list.

Events Manager works perfectly in Opera as seen in **Table 9**, being the most uncommon browser of the browsers tested. It is giving the exact same output as the other browsers.

Table 9. Events Manager test output data from Opera.

Tester	Yashar	Ying
Test 1	Successful	Successful
Test 2	Successful	Successful
Test 3	Successful	Successful
Test 4	ERROR: Please enter a username. ERROR: Please type your e-mail address.	ERROR: Please enter a username ERROR: Please type your e-mail address
Test 5	ERROR: The email address isn't	ERROR: The email address isn't

	correct.	correct.
Test 6	There is no space dropdown list.	Successful

6.2.3. Administrator interface Use Case test

In this section, the Administrator interface test results are presented. The input data is presented in **appendix 10**. Presented in **Table 10** below are results from the administrator test, including comments about the test experience. As it seems

Table 10. Events Manager administrator test output data.

Step	Result
Step 1	Daniel Lindström, 16.10.2014, Safari 6.1.6 (7537.78.2)
Step 6	Post published shown in the top of the page.
Step 7	The frontpage is missing the event on the right side of the page (widget). Event column has some extra symbols. Opened the event. The link to the pdf isn't working properly. Finnish, Swedish, English and Chinese is missing in the top section. The map has only English text. Booking section has all languages visible (places and comments)
Step 11	Name, Phone and Email-address is missing in the interface.
Step 13	- Export bookings popup window: Is it possible to have the fields pre-selected to the left? - The format of the CSV-file is not good. The list is exploded into several rows. - The event name has strange symbols

The course secretary discovered quite a few problems in the administrative interface. In short, the problems are rather substantial. There are symbol glitches, pdf issues, information is missing, and the database export to CSV is not working nicely. This is not good for either administering courses or marketing them.

6.3. Event Espresso

Event Espresso is the second test platform candidate, its' test results from the three different stages are presented below. This test platform candidate does not support entering data in multiple languages, but it has been announced to be coming to the commercial version.

6.3.1. Installation test

Table 11 below presents the raw data of the Installation test. As it can be seen, the installation time was rather short and the configuration time was also rather short so overall the total duration was well within the one-hour time limit. It is a rather good result considering it from a perspective of maintenance. Reconfiguring and doing maintenance on Event Espresso will probably not be very time-consuming.

Table 11. Event Espresso installation duration.

Installation time	Configuration time	Total duration
3 min	24 min	27:23 minutes

6.3.2. Customer interface Use Case test

Here follows a set of result tables from the Use Case test. The input data used for the test is shown in the instruction sheet in **appendix 2**. Firstly, in **Table 12** below we can see that Event Espresso detects errors in all tests except for *tests one, three, and six*. Test one is supposed to be error-free, but tests three and six should yield errors. Overall, it is a good result; it detects missing data as well as incorrect email address input. **Table 13** displays virtually the same results, as do the other tables **14-16**. Based on this it can be concluded that Event Espresso does not have any browser-related issues.

Table 12. Event Espresso test output data from Google Chrome.

Tester	Ying	Zuzana	Simon
Test 1	Successful	Successful	Successful
Test 2	First Name: This field is required	First Name: This field is required	First Name: This field is required
Test 3	Successful	Successful	Successful
Test 4	First Name, email: This field is required	First Name: This field is required	Email: This field is required
Test 5	Email: Please enter a valid email address	Email: Please enter a valid email address	Email: Please enter a valid email address
Test 6	Successful	Successful	Successful

Table 13. Event Espresso test output data from Mozilla Firefox.

Tester	Ying	Zuzana	Simon
Test 1	Successful	Successful	Successful
Test 2	First Name: This field is required	First Name: This field is required	First Name: This field is required
Test 3	Successful	Successful	Successful
Test 4	Email: This field is required.	Email: This field is required.	Email: This field is required.
Test 5	Email: Please enter a valid email address	Email: Please enter a valid email address	Email: Please enter a valid email address
Test 6	Successful	Successful	Successful

Table 14. Event Espresso test output data from Safari.

Tester	Zuzana	Simon
Test 1	Successful	Successful
Test 2	First Name: This field is required	First Name: This field is required
Test 3	Successful	Successful
Test 4	Email: This field is required.	Email: This field is required.
Test 5	Email: Please enter a valid email address	Email: Please enter a valid email address
Test 6	Successful	Successful

Table 15. Event Espresso test output data from Internet Explorer.

Tester	Ying	Zuzana
Test 1	Successful	Successful
Test 2	First Name: This field is required	First Name: This field is required
Test 3	Successful	Successful
Test 4	Email: This field is required.	Email: This field is required.
Test 5	Email: Please enter a valid email address	Email: Please enter a valid email address
Test 6	Successful	Successful

Table 16. Event Espresso test output data from Opera.

Tester	Ying	Zuzana
Test 1	Successful	Successful
Test 2	First Name: This field is required.	First Name: This field is required.
Test 3	Successful	Successful
Test 4	Email: This field is required.	Email: This field is required.
Test 5	Email: Please enter a valid email address	Email: Please enter a valid email address
Test 6	Successful	Successful

6.3.3. Administrator interface Use Case test

Let us examine the administrator interface of Event Espresso. The related input data is presented in **appendix 11**. Event Espresso seems according to **Table 17** be working well. Some small visual issues with the event list going on the front page of Edupower's website, and PDF attachment is malfunctioning. All in all Event Espresso has a good administrator interface and the course secretary had a positive test experience with this platform candidate.

Table 17. Event Espresso administrator test output data.

Step 1	Daniel Lindström, 16.10.2014, Safari Version 6.1.6
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Step 6	The event Edupower Admin Test Event has been added for 10/16/2014
Step 8	The widget has some errors. - PDF attachment isn't working - All the info for registration is visible.
Step 12	No.
Step 13	Looking good! Easy to use! Is it possible to reorganize the columns, e.g. with personal and address information closer to the left. Exact registration time is missing, clock.

6.4. Event Registration

Event Espresso is the third test platform candidate, its' test results from the three different stages are presented below. This test platform candidate does not support entering data in multiple languages, and it is the only platform candidate of the three that does not have a commercial edition.

6.4.1. Installation test

Let us begin by examining **Table 18** below. It presents the raw data of the Installation test. This platform candidate has a good installation time and a very quick configuration time. This is an excellent result considering it from a perspective of maintenance. Reconfiguring and doing maintenance on Event Registration will most probably not be time-consuming.

Table 18. Event Registration installation duration.

Installation time	Configuration time	Total duration
2 min	15 min	17:58 minutes

6.4.2. Customer interface Use Case test

In the Use Case test of Event Registration, it can be noted when looking at **Table 19** that it successfully detects errors in each of the tests which contain erroneous input. Only *test one* is successful, as it is supposed to be. This is an excellent result. The related input data is shown in the instruction sheet in **appendix 3**.

Table 19. Event Registration test output data from Google Chrome.

Tester	Yashar	Ying	Zuzana
Test 1 (step 6)	Successful	Successful	Successful
Test 2 (step 8)	Dialog Box: Please enter your first name.	Dialog Box: Please enter your first name.	Dialog Box: Please enter your first name.
Test 3 (step 10)	Dialog Box: Please enter a proper (correct format) phone number. Please enter your ZIP/postal code.	Dialog Box: Please enter your ZIP/postal code.	Dialog Box: Please enter your ZIP/postal code.
Test 4 (step 12)	Dialog Box: Email format not correct! Please enter your phone number. Please use correct format for your phone number.	Dialog Box: Email format not correct! Please enter your phone number. Please use correct format for your phone number.	Dialog Box: Email format not correct! Please enter your phone number. Please use correct format for your phone number.
Test 5 (step 14)	Dialog Box: Email format not correct! Please enter your city. Please enter your state.	Dialog Box: Email format not correct! Please enter your city. Please enter your state.	Dialog Box: Email format not correct! Please enter your city. Please enter your state.
Test 6 (step 16)	Dialog Box: Please enter your address. Country	Dialog Box: Please enter your address. Country	Dialog Box: Please enter your address. Country

It seems that there has been a typo in *test three* with Google Chrome for Yashar, since it complains about the phone number format. Mozilla Firefox in **Table 20** below is

giving the same output as Google Chrome, however, in test 5 it seems Yashar did not get the “Country” error. It seems probable that it is a typing error or slight misunderstanding of the instructions. In test 6 his output also states “please enter your city” which the other testers’ outputs do not.

Table 20. Event Registration test output data from Mozilla Firefox.

Tester	Ying	Zuzana	Yashar
Test 1 (step 6)	Successful	Successful	Successful
Test 2 (step 8)	Dialog Box: Please enter your first name.	Dialog Box: Please enter your first name.	Dialog Box: Please enter your first name.
Test 3 (step 10)	Dialog Box: Please enter your ZIP/postal code.	Dialog Box: Please enter your ZIP/postal code.	Dialog Box: Please enter your ZIP/postal code.
Test 4 (step 12)	Dialog Box: Email format not correct! Please enter your phone number. Please use correct format for your phone number.	Dialog Box: Email format not correct! Please enter your phone number. Please use correct format for your phone number.	Dialog Box: Email format not correct! Please enter your phone number. Please use correct format for your phone number.
Test 5 (step 14)	Dialog Box: Email format not correct! Please enter your city. Please enter your state. Country	Dialog Box: Email format not correct! Please enter your city. Please enter your state. Country	Dialog Box: Email format not correct! Please enter your city. Please enter your state.
Test 6 (step 16)	Dialog Box: Please enter your address. Country	Dialog Box: Please enter your address. Country	Dialog Box: Please enter your address. Please enter your city. Country

In **Table 21** below, the results are identical to the output from Firefox and Chrome. This is good, many Safari users are using Apple computers so we now have some certainty that Event Registration works reliably on Apple computers.

Table 21. Event Registration test output data from Safari.

Tester	Zuzana	Yashar
Test 1 (step 6)	Successful	Successful
Test 2 (step 8)	Dialog Box: Please enter your first name.	Dialog Box: Please enter your first name.
Test 3 (step 10)	Dialog Box: Please enter a proper (correct format) phone number. Please enter your ZIP/postal code.	Dialog Box: Please enter a proper (correct format) phone number. Please enter your ZIP/postal code.
Test 4 (step 12)	Dialog Box: Email format not correct! Please enter your phone number. Please use correct format for your phone number.	Dialog Box: Email format not correct! Please enter your phone number. Please use correct format for your phone number.
Test 5 (step 14)	Dialog Box: Email format not correct! Please enter your city. Please enter your state.	Dialog Box: Email format not correct! Please enter your city. Please enter your state.
Test 6 (step 16)	Dialog Box: Please enter your address. Country	Dialog Box: Please enter your address. Please enter your city. Country

In **Table 22** below, the results are almost identical to the other tests, however in test 3 Yashar gets a phone number format error which may be caused by a typing error. All in all, Event Registration works with Internet Explorer as it should regarding the output.

Table 22. Event Registration test output data from Internet Explorer.

Tester	Ying	Yashar
Test 1 (step 6)	Successful	Successful
Test 2 (step 8)	Dialog Box: Please enter your first name.	Dialog Box: Please enter your first name.
Test 3 (step 10)	Dialog Box: Please enter your ZIP/postal code.	Dialog Box: Please enter a proper (correct format) phone number. Please enter your ZIP/postal code.
Test 4 (step 12)	Dialog Box: Email format not correct! Please enter your phone number. Please use correct format for your phone number.	Dialog Box: Email format not correct! Please enter your phone number. Please use correct format for your phone number.
Test 5 (step 14)	Dialog Box: Email format not correct! Please enter your city. Please enter your state.	Dialog Box: Email format not correct! Please enter your city. Please enter your state.
Test 6 (step 16)	Dialog Box: Please enter your address. Country	Dialog Box: Please enter your address. Country

In **Table 23** below the data from Opera is once again almost identical with previous results, but here in *test six* Yashar’s result includes “please enter your city”, whereas Ying’s result does not. Since previous browser tests do not include such an error, it seems likely that this differing result is the result of a mistake in user input.

Table 23. Event Registration test output data from Opera.

Tester	Ying	Yashar
Test 1 (step 6)	Successful	Successful
Test 2 (step 8)	Dialog Box: Please enter your first name.	Dialog Box: Please enter your first name.
Test 3 (step 10)	Dialog Box: Please enter your ZIP/postal code.	Dialog Box: Please enter your ZIP/postal code.
Test 4 (step 12)	Dialog Box: Email format not correct! Please enter your phone number. Please use correct format for your phone number.	Dialog Box: Email format not correct! Please enter your phone number. Please use correct format for your phone number.
Test 5 (step 14)	Dialog Box: Email format not correct! Please enter your city. Please enter your state.	Dialog Box: Email format not correct! Please enter your city. Please enter your state.
Test 6 (step 16)	Dialog Box: Please enter your address. Country	Dialog Box: Please enter your address. Please enter your city. Country

6.4.3. Administrator interface Use Case test

Finally let us look at the administrator interface of Event Registration. The related input data is presented in **appendix 12**. Looking at

Table 24, it seems that Event Registration's administrative interface is working rather well. As one might expect; the interface is not quite as tidy as the other candidates' administrative interfaces; Event Registration is a free platform which does not have a commercial edition available. There is some missing information in the administrative interface, but it does have a visible registration clock time.

Table 24. Event Registration administrator test output data.

Step 1	Daniel Lindström, 16.10.2014, Safari Version 6.1.6
Step 6	The event was successfully created, now returning to..
Step 7	- The interface for the customers looks a little bit messy - Price information missing - Discount
Step 13	Point 9 and 11, Country is missing.
Step 14	Looking good! Here is also the exact clock time visible

7. ANALYSIS

7.1. Features

In this section, the feature scores of each platform candidate will be analyzed. While the scores have been obtained without testing, their significance is large because they determine how well the platform candidates can be integrated into Edupower's current website, as well as how detailed information and how expandable the candidates really are.

Table 25. Final feature scores.

	Events Manager	Event Espresso	Event Registration
Total score	Free: 26 Pro: 45	Free: 29 Pro: 45	Free: 33

Table 25 presents the final feature scores of the platform candidates. Looking at the results from the free editions, it would seem that Event Registration is at an advantage. However, Events Manager and Event Espresso are expandable to professional licenses and they both outfeature Event Registration which does not have a commercial edition. Since expandability is of high importance to Edupower, the scores of Events Manager and Event Espresso will be counted from the commercial edition feature scores, they get 45 points each. There is no clear winner at this point; Events Manager and Event Espresso are both strong platform candidates.

7.2. Installation test

In this section, the Installation test results will be analyzed and scored. This test is important for maintenance reasons; if a platform candidate is cumbersome to configure on installation, it will most probably require more maintenance work later and at the very least it makes the installation procedure cumbersome later, if the platform needs to be removed and reinstalled from scratch due to server hardware upgrades or other unforeseeable reasons. The goal is to find out how well the platform

candidates perform during the installation test phase, and pick the strongest platform candidate which requires the least amount of installation and thus the least amount of maintenance work.

Let us begin by examining the time it took to install and configure each platform candidate. This will give a rough idea about how much work is necessary to configure the platform candidate. The more work, the more details need to be entered. This is both good and bad; if the details are unnecessary they are a waste of time. Important details can be defined as being absolutely necessary variables for properly adjusting the platform candidate to work with our existing website. Other variables are considered to be waste, if they don't bring any value to the function of the platform candidate.

Table 26. Installation test durations side by side.

	Events Manager	Event Espresso	Event Registration
Installation time	00:01:00	00:03:00	00:02:00
Configuration time	03:28:00	00:24:00	00:15:00
Total duration	03:30:00	00:27:00	00:18:00

In **Table 26** we see the installation test durations of each candidate side by side. It can be seen that the installation time of each plugin takes a negligible time. However, the configuration times differ considerably. Here Event Registration excels by a time of 18 minutes, and Event Espresso is not far behind. But Events Manager took a considerable time to configure; its total installation duration is appalling, exceeding the maximum time of 1 hour. The installation test scores of the three platform candidates are shown in **Table 27**. They have been calculated using the formula described in **chapter 4.5.2**.

Table 27. Installation test scores.

	Events Manager	Event Espresso	Event Registration
Total duration	03:30:00	00:27:00	00:18:00
Score	-71.43 (= 0 points)	15.71	20

Since Events Manager exceeded the time limit of 1 hour, it receives a negative score. It means that it has failed this test and will be awarded **zero** points. Event Registration is the strongest candidate in this test, Event Espresso being a good second place.

7.3. Use Case test

In this section, the test results of the Use Case tests will be analyzed and scored. This is the most important test because it will define the customer experience as well as administrative experience. Let us begin by first examining the customer interface tests, after which the administrator interface will be assessed.

The software testers are asked to fill out the registration form using values specified in the test instructions. The values are designed to be long, missing, or otherwise having incorrect format such as numbers instead of letters and vice versa. The registration form is supposed to react to the erroneous data entered into the form and give information back to the user about what went wrong. Any kind of failure of detecting errors is considered to be a weakness of the platform candidate in question.

Let us look at the result scores of the different candidates and how the browser has affected the scores. In **Table 28** below we can see the results of Events Manager.

Table 28. Events Manager average test scores per browser.

Browser	Google Chrome	Mozilla Firefox	Internet Explorer	Opera	Safari	Avg. Score
Test 1	5	5	5	5	5	5
Test 2	0	0	0	0	0	0
Test 3	0	0	0	0	0	0
Test 4	5	5	5	5	5	5
Test 5	5	5	5	5	5	5
Test 6	0	0	0	0	0	0
Total						15

As one can see from **Table 28** above, the results were uniform. Browser choice does not affect the functioning of Events Manager, which is good. However, Events Manager has failed in *tests two, three, and six*. Not a very good error detection rate. Then again in **Table 29** below, Event Espresso also has uniform browser results but the error detection is even worse. It fails only in *tests three and five*, but *tests four and five* produce incomplete error detections and thus the total score is even less than that of Events Manager.

Table 29. Event Espresso average test scores per browser.

Browser	Google Chrome	Mozilla Firefox	Internet Explorer	Opera	Safari	Avg. Score
Test 1	5	5	5	5	5	5
Test 2	5	5	5	5	5	5
Test 3	0	0	0	0	0	0
Test 4	1.67	1.67	1.67	1.67	1.67	1.67
Test 5	2.5	2.5	2.5	2.5	2.5	2.5
Test 6	0	0	0	0	0	0
Total						14.17

Looking at

Table 30, it can be noted that Event Registration only fails in the final test. It does detect errors in that final test but not such errors that are comparable with the other platforms. Event Registration produces uniform results except for *test three* which for some reason produces different results depending on browser. All in all, the result is rather good.

Table 30. Event Registration average test scores per browser.

Browser	Google Chrome	Mozilla Firefox	Internet Explorer	Opera	Safari	Avg. Score
Test 1	5	5	5	5	5	5
Test 2	5	5	5	5	5	5
Test 3	1.67	0	2.5	0	5	1.834
Test 4	3.33	3.33	3.33	3.33	3.33	3.33
Test 5	2.5	2.5	2.5	2.5	2.5	2.5
Test 6	0	0	0	0	0	0
Total						17.664

Comparing the platform candidates side-by-side, it is possible to see the strengths of the three candidates. *Test one* succeeds on all platforms, *test two* succeeds on Event Espresso and Event Registration. *Test three* only succeeds on Event Registration, and it is only a partial success. *Test four* yields good results on Events Manager, as does *test five*. Overall, the scores are rather even but *Event Registration* is clearly the winner in error detection.

Table 31. Platform candidate use case test score side-by-side.

Platform candidate	Events Manager	Event Espresso	Event Registration
Test 1	5	5	5
Test 2	0	5	5
Test 3	0	0	1.834
Test 4	5	1.67	3.33
Test 5	5	2.5	2.5
Test 6	0	0	0
Total	15	14.17	17.664

7.3.1. Administration test

Events Manager's multi-language support is not working well. There is a bug in the code which has been known for years by the creators of *Events Manager* but it has not

been corrected yet. This bug causes the title of events being displayed in the sidebar as raw *WordPress mqTranslate multi-language code* instead of a correct title for each language. Some custom coding work is necessary to correct this problem. **Figure 1** and

Figure 2. Multi-language problem in event list below show how the language problem manifests itself on the website; there are tags such as “<!--:en-->” scattered throughout the list of courses, events and workshops. And beside the tags all the different language versions of the event titles are displayed all at once. Note that for the top two events in **Figure 1** there are no problems because the events are written only in English. The bottom three test events in **Figure 1** have been created using multiple languages per event, and the end result is not very convincing.



Figure 1. Multi-language problem.

Date/Time	Event
17.10.2014 - 20.10.2014 All Day	<!--en-->test<!--fi-->testttt<!--sv-->tesejsdalkjs<!--zh-->sjdfölskdjölfk<!--> asdaerfeaawdea, edrgtdergdrgrts ertert
16.11.2014 - 17.11.2014 00:00	<!--en-->Edupower Admin Test Event<!--fi-->Edupower Admin Kokeilutapahtuma<!--><!--sv-->Edupower Admin Testevenemang<!--zh-->Edupower Admin TE<!--> Edupower Office, Vaasa Länsi-Suomen lääni

Powered by Events Manager

[Edit](#)

Figure 2. Multi-language problem in event list.

Figure 3 shows what a PDF looks like after it has been inserted into an event. It does not seem to be working very well at all.

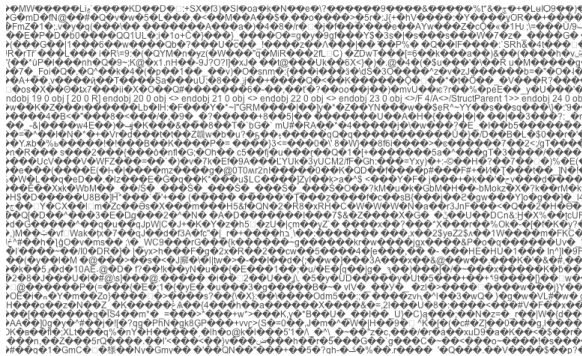


Figure 3. PDF problem.

In Event Espresso there is a small glitch in the front page event list. **Figure 4** below shows that Event Espresso's event list aligns the event numbers on the bottom row instead of the top row. This is only a minor graphical error but it is not very appealing to customers to see visual errors on the website.



Figure 4. Vertical alignment problem.

7.4. Total score

Looking at the test scores of the three candidates in **Table 32**, it can be seen that Event Registration excelled in the Use Case test, as well as in the installation test, but since it lacks a lot of features, its final score is less than that of Event Espresso. Event Espresso succeeded well in the installation and it has a full set of features so although it did not perform as well as Events Manager and Event Registration in the Use Case test, it still gets the best final score. It is noteworthy that Event Registration had a lot of variation in the error detection depending on which web browser was used. Also it seems that the testers sometimes were not paying enough attention because some testers' results indicate that an error was not found, whereas other testers' results of the same test indicate that the error was found. This occurs only in a very few cases, but those errors are taken into account by taking average values of the testers' results for each test, before calculating the average scores between the different browsers.

Table 32. Test scores.

Test	Events Manager	Event Espresso	Event Registration
Features	45	45	33
Installation	-71.43 (= 0 points)	15.71	20
Use Case	15	14.17	17.664
Final Score	60	74.88	70.664

7.5. Questionnaires

The questionnaire results bring additional value to evaluating how well the candidates work in different browsers. The individual experiences of each tester have been translated into average values for each browser. Only the two first questions in the questionnaire can numerically be evaluated, the other values are for further development in the *beta phase*, so they will not be taken into account at this point. At the same time, it also shows which platform candidates the testers liked the most. The scale of the two questions has been converted into numerical points as follows:

Below Average = 1 points, Average = 2 points, Good = 3 points, Very good = 4 points, Excellent = 5 points.

Let us take a look at Events Manager in **Figure 5**. It is rather clear that it works the best in Firefox and Opera, and it is easy to use regardless of browser, which means it has very few bugs. It is most probable that the dips in *overall impression* are related to performance issues, visual problems would affect *ease of use* as well.

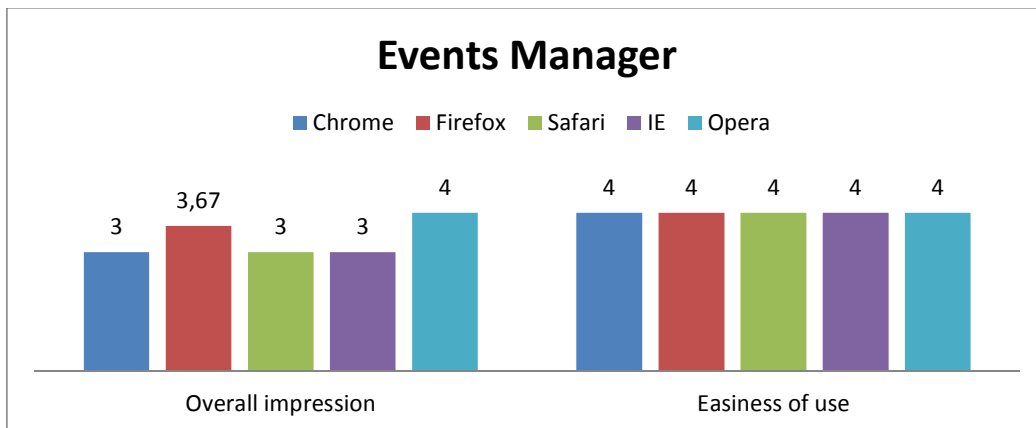


Figure 5. Events Manager browser performance.

In Figure 6 we can see the performance of Event Espresso is quite different. It seems to be working quite differently depending on browser. It works the best in Opera, and the three major browsers Chrome, Firefox, and Safari lag behind. However, since ease of use is good on both Chrome and Firefox, it must be assumed that the overall impression has been affected by browser speed performance rather than bugs in the functions. Both Safari and Internet Explorer have suffered because of bugs.

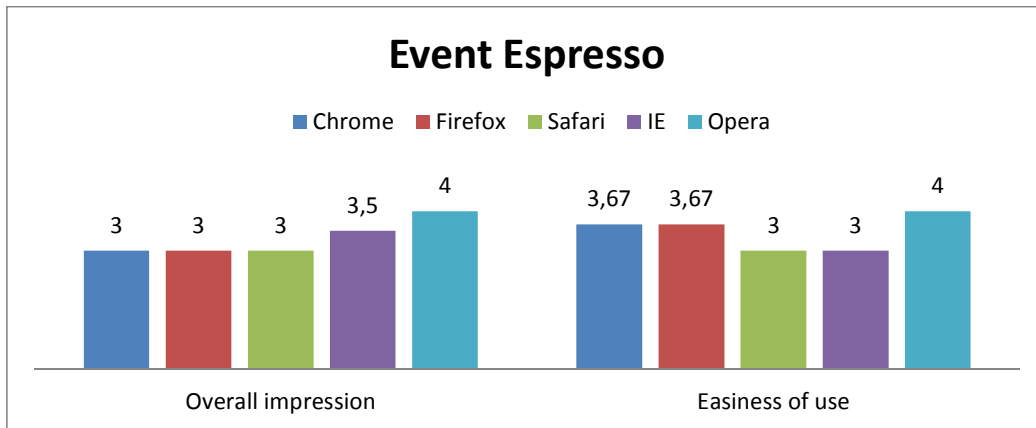


Figure 6. Event Espresso browser performance.

Let us look at Event Registration in **Figure 7**. It shows a very even overall impression but some variation in ease of use. This platform candidate is performing well, apart from Safari and Internet Explorer which both have issues in *ease of use*, and Internet Explorer suffers from performance issues. This means it must suffer from bugs in the design. The testers reported some issues regarding autofill not working on Safari and Internet Explorer, which are the probable causes for dissatisfaction in *ease of use*.

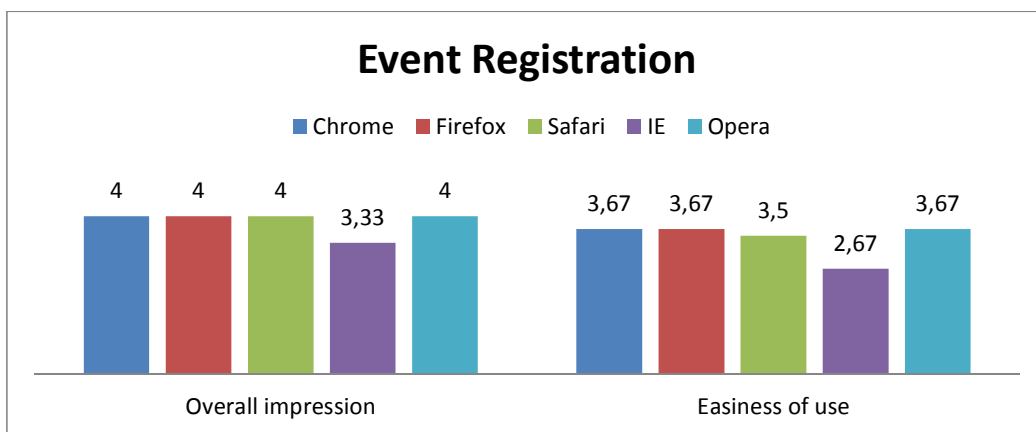


Figure 7. Event Registration browser performance.

Overall, the most stable overall impression is given by *Event Registration*, and the most stable ease of use is given by *Events Manager*. *Event Espresso* suffers from both speed issues as well as bugs.

Let us look at the questionnaire results for Events Manager in **Figure 8**. It is clear that Event Espresso is the winner on the administration side, it gets the best scores both in overall impression as well as easiness of use. This is an important result to consider, because it the administration interface determines the workload of the course secretary, which was one of the reasons this software testing project got started.

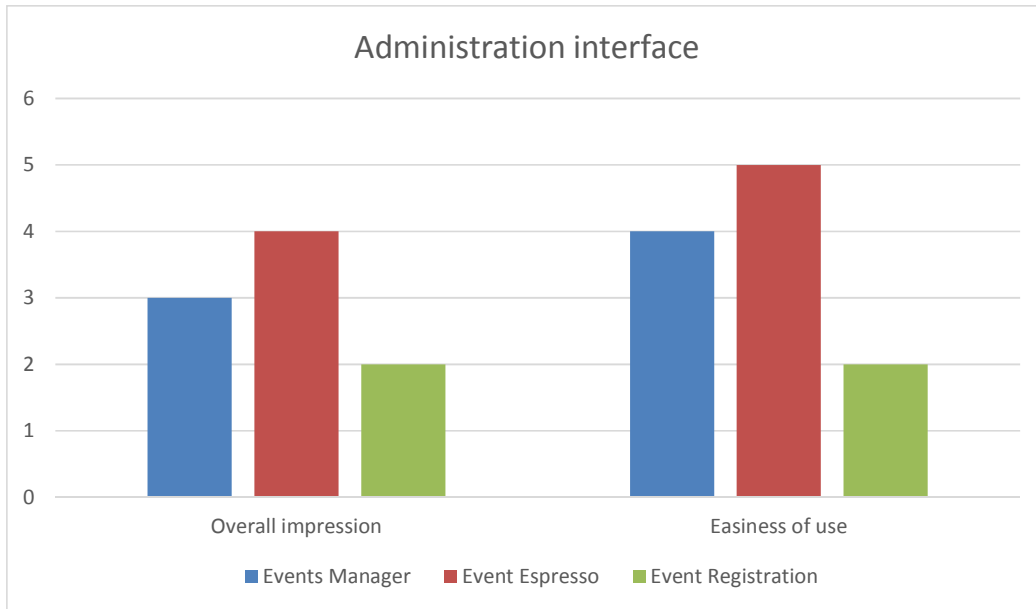


Figure 8. Administration interface performance.

8. CONCLUSIONS

In this chapter, conclusions are drawn and discussed to give recommendations for which platform candidate to choose, and why. Let us begin by an overall conclusion of the results. This is followed by a discussion about the improvements of the best platform candidate over the existing system. The last subchapter features a discussion about possible future expansions and improvements to the best platform candidate.

8.1. Overview

The three platform candidates are good in general, but their adaptability in their free editions to Edupower's website layout was limited. The commercial editions provide better adaptability, so the aim is to find the best one of the platform candidates to give an indication of which platform candidate's commercial edition could be purchased for the *beta testing* phase (a phase which is not covered in this thesis) which follows after the *alpha testing* covered in this thesis. To keep costs low, commercial editions of each platform candidate will not be purchased for the *alpha testing* phase.

All platform candidates had rather good functionality and two candidates, namely *Event Registration* and *Event Espresso* are both getting good scores. Looking at the testers' personal evaluations, it turns out that the most stable *overall impression* is given by *Event Registration*, and the most stable *ease of use* is given by *Events Manager*. *Event Espresso* suffers from both speed issues as well as bugs. This is surprising, considering that *Event Espresso* has the highest total score. However, taking into account that both *Events Manager* and *Event Espresso* have received a score boost from the fact that they have more supported features in the commercial editions, it can be concluded that *Event Registration* is the best free platform candidate and *Events Manager* has the best working free version of the two candidates that do have commercial editions. This does not negate the final scores; *Event Espresso* has shown the best total score, it has good expandability and the course secretary gave it the best scores in the administrator test questionnaire.

Expandability is important because an IT system which already is running at its maximum output and cannot be expanded will have to be replaced if the company needs more functions.

Event Registration comes in as a good second place both in score and in test experiences, but it is not expandable beyond its current features. *Events Manager* gets third place in score, but only because it has a cumbersome installation process from which it can be assumed that maintenance work will be tedious.

Event Registration did work as intended but due to lack of expandability, it does not quite fill the requirements of a good web shop & events management system for a commercial organization. *Event Registration* lacks multi-language support, and since it is a free platform it is hard to know whether multi-language support will be implemented and when that would be. Judging by all known factors, *Event Registration* is a good free platform, but due to these aforementioned reasons it is not a very good candidate for Edupower.

Events Manager is good and easy to use and partially supports multiple languages but it suffers greatly on the maintenance side. That single factor makes it unsuitable for Edupower, since Edupower is giving education in *lean thinking*, in which it is taught that all wastes need to be eliminated. A cumbersome maintenance process is considered to be a waste.

Event Espresso has good expandability, and good maintainability. Although it suffers slightly from bugs and performance issues in the free edition, these bugs are easily repaired by the company that is (constantly) developing *Event Espresso*. The company may have repaired those bugs in the commercial edition, and if not they have a paid team of developers to whom any issues can be reported. A free platform such as *Event Registration* does not have a team that is being paid to correct problems so the response time to repairing problems will suffer with a rather high probability.

8.2. The best platform candidate

In the end, *Event Espresso* is the recommended candidate for Edupower Ltd as replacement for the current course, workshop and event registration system. *Event Espresso* does not currently support multi-language entries, but multi-language support is according to *Event Espresso*'s developers being planned for a later release of the commercial version. *Event Espresso* is easy to configure, maintain, provides all the necessary functions, and most importantly it is very much expandable in its commercial edition.

8.3. Improvements over existing situation

A point to make here is that a web shop & events manager will be highly useful to Edupower. It will substantially decrease the work load of the course secretary, because the secretary will no longer need to process every single course registration manually, nor does he need to send bills manually in such quantities as before since the majority of customer payments will occur online via the web shop.

At the same time, the web shop will streamline the procedure to add courses to the website, because the courses are then added to only one place instead of several places. At the present moment, the courses have to be added to several places. This causes an unnecessary addition to the work load for the course secretary. It is currently also possible to do mistakes by forgetting to add the courses to one or more places, which causes that some information is missing on some pages or in some languages. The need for several databases will be eliminated because the web shop can store the input from different languages in the same database, and the language selection is stored as one variable in each registration entry.

The project thus also shows the strength of *Lean thinking*; the web shop maximizes the usability and ease of the registration, at the same time reducing resource usage and also reduces the chance for human error in the process. These are desirable goals in *Lean thinking*.

8.4. Future improvements

In this section, possible improvements for the future are considered and discussed. These improvements are presented because they may help in seeing how the best platform candidate could be developed in the future; practical extensions to the system as well as seeing current lacks.

8.4.1. Multi-language support

The commercial edition of *Event Espresso* currently lacks multi-language support, but it is planned for a later release. As soon as this feature is released, it would be good to purchase or otherwise obtain this feature. Until then, it is best to keep events listed in English only on the website.

8.4.2. Captcha

The free edition of *Event Espresso* does not feature *captcha* but the commercial edition does. Since *captcha* is a method to prevent spam, this feature would be of highest importance to add immediately when the commercial edition is purchased and implemented on the website.

8.4.3. Mobile registration

Mobile registration is a feature which could be useful to add to *Event Espresso* at a later point in time, if registration counts are getting a lot larger than the current level. Mobile devices can be used for both registration and proof of registration and payment, this could be an interesting and practical feature later on.

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APPENDIX 1. Events manager testing instruction sheet



Web shop Black Box testing

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26.08.2014
Jan Buss

The purpose of this sheet is to provide step by step testing instructions, as well as to collect information from the test procedure. You will also be given the possibility to write down personal comments about anything regarding the test procedure. The information you provide will be used to assist in selecting a good platform for our coming web shop which will be used to sell our *events, courses and workshops*.

The goal of this test is to find errors. The more errors that can be found, the more predictable will the function of the test candidate be, because the errors are then known and users can be instructed to avoid doing the specific things that cause errors. If the interface is working predictably, the customer experience is better than if the interface works unpredictably. Your task in this test phase is to focus on finding errors, and try to be as specific as possible when reporting them in this instruction & result form.

1. Please give the following information: your name, today's date, and which browser (including browser version) you have used. For each browser you use for testing, please use separate copies of these test protocols and the questionnaire.

2. Start by going to <http://test1.edupower.fi/> (please use the English version of the site)
3. Click on "Courses and Events"
4. Select the course "Edupower Test Event"
5. Input the following information:

Field	Value
Spaces	1
Name	Anthony Tester
Phone	123-4567890
E-mail	anthony@tester.com
Comment	Edupower Test

6. Press "Send your booking". Do you see any error messages (popups or otherwise)? If you do, please write them in the box.



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11. Redo steps 2-5 using this information:

Field	Value
Spaces	1
Name	Anthony Tester
Phone	(leave empty)
E-mail	(leave empty)
Comment	Edupower Test

12. Do you see any error messages now? If yes, please write them in the box below.

13. Redo steps 2-5 using this information:

Field	Value
Spaces	1
Name	Anthony Tester123
Phone	123-4567890
E-mail	anthonytester.com
Comment	Edupower Test

14. Do you see any error messages now? If yes, please write them in the box below.



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15. Redo steps 2-5 using this information:

Field	Value
Spaces	0
Name	123
Phone	asdf
E-mail	anthony@tester.com
Comment	Edupower Test

16. Do you see any error messages now? If yes, please write them in the box below.

17. Please answer the following questionnaire before you go on to test the next browser.



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QUESTIONNAIRE

1. Which browser (including version) did you test?

2. What is your overall impression of the test candidate using this browser?

- Excellent
- Very Good
- Good
- Average
- Below Average

3. How would you describe easiness of use?

- Excellent
- Very Good
- Good
- Average
- Below Average

4. Does the test candidate provide all necessary information regarding the event?

- Yes
- No

If not, why?



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5. Does the test candidate provide a trustworthy feeling?

Yes

No

If not, why?

6. If you have any comments about your testing experience, feel free to express them here.

Thank you for your time.

APPENDIX 2. Event espresso testing instruction sheet



Web shop Black Box testing

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27.08.2014
Jan Buss

The purpose of this sheet is to provide step by step testing instructions, as well as to collect information from the test procedure. You will also be given the possibility to write down personal comments about anything regarding the test procedure. The information you provide will be used to assist in selecting a good platform for our coming web shop which will be used to sell our *events, courses and workshops*.

The goal of this test is to find errors. The more errors that can be found, the more predictable will the function of the test candidate be, because the errors are then known and users can be instructed to avoid doing the specific things that cause errors. If the interface is working predictably, the customer experience is better than if the interface works unpredictably. Your task in this test phase is to focus on finding errors, and try to be as specific as possible when reporting them in this instruction & result form.

1. Please give the following information: your name, today's date, and which browser (including browser version) you have used. For each browser you use for testing, please use separate copies of these test protocols and the questionnaire.

2. Start by going to <http://test2.edupower.fi/> (please use the English version of the site)
3. Click on "Courses and Events"
4. Select the course "Edupower Test Event"
5. Input the following information:

Field	Value
First Name	Anthony
Last Name	Tester
E-mail	anthony@tester.com
Phone	123-4567890
Address	Test Street 123
City	Testcity
State	Teststate
Country	Testcountry
Zip	12345



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6. Press "Submit". Do you see any error messages (popups or otherwise)? If you do, please write them in the box.

7. Now redo steps 2-5, but input this information instead:

Field	Value
First Name	(leave empty)
Last Name	Tester
E-mail	anthony@tester.com
Phone	123-4567890
Address	Test Street 123
City	Testcity
State	Teststate
Country	Testcountry
Zip	12345

8. Do you see any error messages now? If yes, please write them in the box below.



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11. Redo steps 2-5 using this information:

Field	Value
First Name	AnthonyYYYYYYYYYYYYYYYYYYYYYYYYYYY (Please note that there are 25 Y's, to make sure that the name entered is too long)
Last Name	Tester
E-mail	(leave empty)
Phone	(leave empty)
Address	Test Street 123
City	TestcityYYYYYYYYYYYYYYYYYYYYYYYYYYY (Please note that there are 25 Y's, to make sure that the city name entered is too long)
State	Teststate
Country	Testcountry
Zip	12345000000000000000000000000000 (Please note that there are 25 0's, to make sure that the Zip code entered is too long)

12. Do you see any error messages now? If yes, please write them in the box below.



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13. Redo steps 2-5 using this information:

Field	Value
First Name	Anthony123
Last Name	Tester123
E-mail	anthonytester.com
Phone	123-4567890
Address	Test Street 123
City	(leave empty)
State	(leave empty)
Country	TestcountryYYYYYYYYYYYYYYYYYYYYYYYYYYY (Please note that there are 25 Y's, to make sure that the name entered is too long)
Zip	12345

14. Do you see any error messages now? If yes, please write them in the box below.

15. Redo steps 2-5 using this information:

First Name	123
Last Name	456
E-mail	anthony@tester.com
Phone	123-4567890
Address	(leave empty)
City	Testcity
State	TeststateEEEEEEEEEEEEEEEEEEEEEEEEEE (Please note that there are 25 E's, to make sure that the state name entered is too long)
Country	(leave empty)
Zip	12345



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16. Do you see any error messages now? If yes, please write them in the box below.

17. Please answer the following questionnaire before you go on to test the next browser.



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QUESTIONNAIRE

1. Which browser (including version) did you test?

2. What is your overall impression of the test candidate using this browser?

- Excellent
- Very Good
- Good
- Average
- Below Average

3. How would you describe easiness of use?

- Excellent
- Very Good
- Good
- Average
- Below Average

4. Does the test candidate provide all necessary information regarding the event?

- Yes
- No

If not, why?



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5. Does the test candidate provide a trustworthy feeling?

Yes

No

If not, why?

6. If you have any comments about your testing experience, feel free to express them here.

Thank you for your time.

APPENDIX 3. Event registration testing instruction sheet



Web shop Black Box testing

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Jan Buss

The purpose of this sheet is to provide step by step testing instructions, as well as to collect information from the test procedure. You will also be given the possibility to write down personal comments about anything regarding the test procedure. The information you provide will be used to assist in selecting a good platform for our coming web shop which will be used to sell our *events, courses and workshops*.

The goal of this test is to find errors. The more errors that can be found, the more predictable will the function of the test candidate be, because the errors are then known and users can be instructed to avoid doing the specific things that cause errors. If the interface is working predictably, the customer experience is better than if the interface works unpredictably. Your task in this test phase is to focus on finding errors, and try to be as specific as possible when reporting them in this instruction & result form.

1. Please give the following information: your name, today's date, and which browser (including browser version) you have used. For each browser you use for testing, please use separate copies of these test protocols and the questionnaire.

2. Start by going to <http://test3.edupower.fi/> (please use the English version of the site)
3. Click on "Courses and Events"
4. Select the course "Edupower Test Event" and click "Register"
5. Input the following information:

Field	Value
First Name	Anthony
Last Name	Tester
E-mail	anthony@tester.com
Phone	123-4567890
Address	Test Street 123
City	Testcity
State	Teststate
Country	Testcountry
Zip	12345



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6. Press "Submit". Do you see any error messages (popups or otherwise)? If you do, please write them in the box.

7. Now redo steps 2-5, but input this information instead:

Field	Value
First Name	(leave empty)
Last Name	Tester
E-mail	anthony@tester.com
Phone	123-4567890
Address	Test Street 123
City	Testcity
State	Teststate
Country	Testcountry
Zip	12345

8. Do you see any error messages now? If yes, please write them in the box below.



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11. Redo steps 2-5 using this information:

Field	Value
First Name	AnthonyYYYYYYYYYYYYYYYYYYYYYYYYYYY (Please note that there are 25 Y's, to make sure that the name entered is too long)
Last Name	Tester
E-mail	(leave empty)
Phone	(leave empty)
Address	Test Street 123
City	TestcityYYYYYYYYYYYYYYYYYYYYYYYYYYY (Please note that there are 25 Y's, to make sure that the city name entered is too long)
State	Teststate
Country	Testcountry
Zip	12345000000000000000000000000000 (Please note that there are 25 0's, to make sure that the Zip code entered is too long)

12. Do you see any error messages now? If yes, please write them in the box below.



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13. Redo steps 2-5 using this information:

Field	Value
First Name	Anthony123
Last Name	Tester123
E-mail	anthonytester.com
Phone	123-4567890
Address	Test Street 123
City	(leave empty)
State	(leave empty)
Country	TestcountryYYYYYYYYYYYYYYYYYYYYYYYYYYY (Please note that there are 25 Y's, to make sure that the name entered is too long)
Zip	12345

14. Do you see any error messages now? If yes, please write them in the box below.

15. Redo steps 2-5 using this information:

First Name	123
Last Name	456
E-mail	anthony@tester.com
Phone	123-4567890
Address	(leave empty)
City	Testcity
State	TeststateEEEEEEEEEEEEEEEEEEEEEEEEEE (Please note that there are 25 E's, to make sure that the state name entered is too long)
Country	(leave empty)
Zip	12345



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16. Do you see any error messages now? If yes, please write them in the box below.

17. Please answer the following questionnaire before you go on to test the next browser.



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QUESTIONNAIRE

1. Which browser (including version) did you test?

2. What is your overall impression of the test candidate using this browser?

- Excellent
- Very Good
- Good
- Average
- Below Average

3. How would you describe easiness of use?

- Excellent
- Very Good
- Good
- Average
- Below Average

4. Does the test candidate provide all necessary information regarding the event?

- Yes
- No

If not, why?



Web shop Black Box testing

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5. Does the test candidate provide a trustworthy feeling?

Yes

No

If not, why?

6. If you have any comments about your testing experience, feel free to express them here.

Thank you for your time.

APPENDIX 4. Events manager customer interface results

Table 1. Google Chrome

Tester	Ying	Yashar	Simon
Test 1	<p>Still the email address problem: because I already used the email address in the first time. I use anthony3@tester.com</p> <p>Booking successful</p>	<p>Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.</p>	<p>anthony@tester.com ;</p> <p>This email already exists in our system, please log in to register to proceed with your booking.</p> <p>Tried with anthony9@tester.com; same message</p> <p>Tried with anthony174@tester.com; Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.</p>
Test 2	<p>This email already exists in our system, please log in to register to proceed with your</p>	<p>Booking successful, pending confirmation (you will also receive an email once</p>	<p>anthony@tester.com;</p> <p>This email already exists in our system, please log in to register</p>

	<p>booking.</p> <p>I use anthony4@tester.com booking successful</p>	<p>confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.</p>	<p>to proceed with your booking.</p> <p>Anthony175@tester.com; Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.</p>
Test 3	<p>This email already exists in our system, please log in to register to proceed with your booking</p> <p>I think the test might need to change the e- mail address, I just changed as anthony5@tester.com the result is Booking successful</p>	<p>Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.</p>	<p>Anthony176@tester.com; Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.</p>
Test 4	ERROR: Please enter a	ERROR: Please enter a	ERROR: Please enter a

	username ERROR: Please type your e-mail address	username. ERROR: Please type your e-mail address.	username. ERROR: Please type your e-mail address.
Test 5	ERROR: The mail address isn't correct	ERROR: The email address isn't correct.	ERROR: The email address isn't correct.
Test 6	This email already exists in our system, please log in to register to proceed with your booking. I change the e-mail address: anthony6@tester.com Booking successful	There is no space dropdown list.	anthony@tester.com; Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.

Table 2. Mozilla Firefox

Tester	Ying	Yashar	Simon
Test 1	I changed the email address anthony7@tester.com Booking successful	Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact	anthony@tester.com; This email already exists in our system, please log in to register to proceed with your booking. Booking successful, pending confirmation (you will also receive an email once

		<p>person. You may want to contact them directly and letting them know of this error.</p>	<p>confirmed). anthony100@tester.com; However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.</p>
Test 2	<p>This email already exists in our system, please log in to register to proceed with your booking. I changed the email address: anthony8@tester.com Booking successful</p>	<p>Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.</p>	<p>anthony101@tester.com; Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.</p>
Test 3	<p>This email already exists in our system, please log in to register to proceed with your booking</p>	<p>Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some</p>	<p>anthony102@tester.com; Booking successful, pending confirmation (you will also receive an email once confirmed). However,</p>

	I think the test might need to change the e-mail address, I just changed as anthony9@tester.com the result is Booking successful	problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.	there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.
Test 4	ERROR: Please enter a username ERROR: Please type your e-mail address	ERROR: Please enter a username. ERROR: Please type your e-mail address.	ERROR: Please enter a username. ERROR: Please type your e-mail address.
Test 5	ERROR: The mail address isn't correct	ERROR: The email address isn't correct.	ERROR: The email address isn't correct.
Test 6	This email already exists in our system, please log in to register to proceed with your booking. I change the e-mail address: anthony10@tester.com Booking successful	There is no space dropdown list.	Anthony103@tester.com; Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.

Table 3. Safari

Tester	Yashar	Simon
Test 1	Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.	anthony110@tester.com; Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.
Test 2	Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.	anthony111@tester.com; Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.
Test 3	Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.	anthony112@tester.com; Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.
Test 4	ERROR: Please enter a username. ERROR: Please type your e-mail address.	ERROR: Please enter a username. ERROR: Please type your e-mail address.

Test 5	ERROR: The email address isn't correct.	ERROR: The email address isn't correct.
Test 6	There is no space dropdown list.	Anthony113@tester.com; Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.

Table 4. Internet Explorer

Tester	Ying	Yashar
Test 1	Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.	Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.
Test 2	This email already exists in our system, please log in to register to proceed with your booking.	Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.
Test 3	This email already exists in our system, please log in to register to proceed with your booking	Booking successful, pending confirmation (you will also receive an email once confirmed). However,

	I think the test might need to change the e-mail address, I just changed as anthony1@tester.com the result is Booking successful	there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.
Test 4	ERROR: Please enter a username ERROR: Please type your e-mail address	ERROR: Please enter a username. ERROR: Please type your e-mail address.
Test 5	ERROR: The mail address isn't correct	ERROR: The email address isn't correct.
Test 6	This email already exists in our system, please log in to register to proceed with your booking. I change the e-mail address: anthony2@tester.com Booking successful	There is no space dropdown list.

Table 5. Opera

Tester	Yashar	Ying
Test 1	Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.	Email address changed: anthony11@tester.com, booking successful
Test 2	Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you	Email address changed: anthony12@tester.com, booking successful

	and/or the event contact person. You may want to contact them directly and letting them know of this error.	
Test 3	Booking successful, pending confirmation (you will also receive an email once confirmed). However, there were some problems whilst sending confirmation emails to you and/or the event contact person. You may want to contact them directly and letting them know of this error.	This email already exists in our system, please log in to register to proceed with your booking I think the test might need to change the e-mail address, I just changed as anthony13@tester.com the result is Booking successful
Test 4	ERROR: Please enter a username. ERROR: Please type your e-mail address.	ERROR: Please enter a username ERROR: Please type your e-mail address
Test 5	ERROR: The email address isn't correct.	ERROR: The mail address isn't correct
Test 6	There is no space dropdown list.	This email already exists in our system, please log in to register to proceed with your booking. I change the e-mail address: anthony14@tester.com Booking successful

APPENDIX 5. Event espresso customer interface results

Table 1. Google Chrome

Tester	Ying	Zuzana	Simon
Test 1	<p>There are two pieces of information: verify registration and Anthony Tester, both with confirm registration button</p> <p>Thank you! Your registration is confirmed for Edupower Test Event Your Registration ID: 3-540403042c7c8 A confirmation email has been sent with additional details of your registration.</p>	<p>No problems to register (same comments as for Firefox, + the email address issue still present - I can use the same email address over and over again without any notification that it's been used already).</p>	<p>Thank you! Your registration is confirmed for Edupower Test Event Your Registration ID: 3-54080672c5f22 A confirmation email has been sent with additional details of your registration.</p>
Test 2	<p>First Name: This field is required</p>	<p>After clicking "Submit", it keeps you on the page, highlighting "First name" field in red, and showing red text "This field is required".</p>	<p>First Name* This field is required.</p>
Test 3	<p>Also two confirm registration buttons</p> <p>Thank you! Your registration is</p>	<p>No problems to register</p>	<p>Thank you! Your registration is confirmed for Edupower Test Event Your Registration ID:</p>

	<p>confirmed for Edupower Test Event Your Registration ID: 3-540404666d0db A confirmation email has been sent with additional details of your registration.</p>		<p>3-54080b473e08f A confirmation email has been sent with additional details of your registration.</p>
Test 4	<p>First Name is red. And email: this field is required.</p>	<p>After clicking "Submit", it keeps you on the page, highlighting "First name" field in red, and showing red text "This field is required".</p>	<p>Email* This field is required.</p>
Test 5	<p>Email: Please enter a valid email address</p>	<p>Instantly after typing in email address, the field gets highlighted in red and red text "Please enter a valid email address" is displayed. After clicking "Submit" it takes you back to the "Email" field, where the same error text is still displayed.</p>	<p>Email* Please enter a valid email address.</p>
Test 6	<p>Two confirm registration buttons, register successfully.</p>	<p>No problems to register</p>	<p>Thank you! Your registration is confirmed for Edupower Test Event Your Registration ID: 3-54081079216a0 A confirmation email</p>

			has been sent with additional details of your registration.
--	--	--	---

Table 2. Mozilla Firefox

Tester	Ying	Zuzana	Simon
Test 1	<p>No</p> <p>Your Registration ID: 3-540408ce6c346</p> <p>A confirmation email has been sent with additional details of your registration.</p>	<p>There is another screen after pressing "Submit" which shows a section named "Verify Registration" that has an overview of course you are registering to, and another section named "Anthony Tester" (or whichever name you enter) with your information, and then you have to press "Confirm registration". However, there are two "Confirm registration" buttons, one after each section. It is confusing which one to press (both register to course, though). Afterwards, there is a screen confirming your registration, sending confirmation email to your address, and giving you your</p>	<p>Thank you! Your registration is confirmed for Edupower Test Event</p> <p>Your Registration ID: 3-540816d5201ca</p> <p>A confirmation email has been sent with additional details of your registration.</p>

		registration ID. No problems to register.	
Test 2	First Name: This field is required	After clicking "Submit", it keeps you on the page, highlighting "First name" field in red, and showing red text "This field is required".	First Name* This field is required.
Test 3	Your Registration ID: 3-540409b0a951a A confirmation email has been sent with additional details of your registration.	Same result as in step 6.: There is another screen after pressing "Submit" which shows a section named "Verify Registration" that has an overview of course you are registering to, and another section named "Anthony Tester" (or whichever name you enter) with your information, and then you have to press "Confirm registration". However, there are two "Confirm registration" buttons, one after each section. It is confusing which one to press (both register to course, though). Afterwards, there is a screen confirming your	Thank you! Your registration is confirmed for Edupower Test Event Your Registration ID: 3-54081777b6ffc A confirmation email has been sent with additional details of your registration.

		registration, sending confirmation email to your address, and giving you your registration ID. No problems to register.	
Test 4	Email: This field is required.	After clicking "Submit", it keeps you on the page, highlighting "Email" field in red, and showing red text "This field is required".	Email* This field is required.
Test 5	Email: Please enter a valid email address	Instantly after typing in email address, the field gets highlighted in red and red text "Please enter a valid email address" is displayed. After clicking "Submit" it takes you back to the "Email" field, where the same error text is still displayed.	Email* Please enter a valid email address.
Test 6	Your Registration ID: 3-54040aee2cd20 A confirmation email has been sent with additional details of your registration.	Same result as in steps 6. and 10.: There is another screen after pressing "Submit" which shows a section named "Verify Registration" that has an overview of course you are registering to,	Thank you! Your registration is confirmed for Edupower Test Event Your Registration ID: 3-5408185984cb3 A confirmation email has been sent with additional details of

		<p>and another section named "Anthony Tester" (or whichever name you enter) with your information, and then you have to press "Confirm registration". However, there are two "Confirm registration" buttons, one after each section. It is confusing which one to press (both register to course, though). Afterwards, there is a screen confirming your registration, sending confirmation email to your address, and giving you your registration ID. No problems to register.</p>	your registration.
--	--	--	--------------------

Table 3. Safari

Tester	Zuzana	Simon
Test 1	Registration ok. Any comments same as with previous browsers.	TACK! Din registrering är bekräftad för Edupower Test Event Ditt Registrerings ID: 3-54082c517f3df Ett bekräftelsemail har skickats med ytterligare information om din registrering
Test 2	After clicking "Submit", it keeps you	First Name*

	on the page, highlighting "First name" field in red, and showing red text "This field is required".	This field is required.
Test 3	Same as in step 6.	TACK! Din registrering är bekräftad för Edupower Test Event Ditt Registrerings ID: 3-54082d6e03470 Ett bekräftelsemail har skickats med ytterligare information om din registrering.
Test 4	After clicking "Submit", it keeps you on the page, highlighting "Email" field in red, and showing red text "This field is required".	Email* This field is required.
Test 5	Instantly after typing in email address, the field gets highlighted in red and red text "Please enter a valid email address" is displayed. After clicking "Submit" it takes you back to the "Email" field, where the same error text is still displayed.	Email* Please enter a valid email address.
Test 6	Same as in steps 6 and 10.	TACK! Din registrering är bekräftad för Edupower Test Event Ditt Registrerings ID: 3-54082edbb3ca7 Ett bekräftelsemail har skickats med ytterligare information om din registrering.

Table 4. Internet Explorer

Tester	Ying	Zuzana
Test 1	Thank you! Your registration is confirmed for Edupower Test Event	No problems to register (same comments as for Firefox, + the email

	<p>Your Registration ID: 3-5403fba1b19b5</p> <p>A confirmation email has been sent with additional details of your registration.</p> <p>I am not very sure why on the left it is the registration form, but on the right, there is also some forms to fill in.</p>	<p>address issue still present - I can use the same email address over and over again without any notification that it's been used already).</p>
Test 2	<p>Under the first name: This field is required</p> <p>P.S. when I write in the Last Name and Email, the color of the words is red</p>	<p>After clicking "Submit", it keeps you on the page, highlighting "First name" field in red, and showing red text "This field is required".</p>
Test 3	<p>Thank you! Your registration is confirmed for Edupower Test Event</p> <p>Your Registration ID: 3-5403fff07a1a0</p> <p>A confirmation email has been sent with additional details of your registration.</p>	<p>Same as in step 6.</p>
Test 4	<p>Under Email, there is this field is required. First Name and Last name is red.</p>	<p>After clicking "Submit", it keeps you on the page, highlighting "Email" field in red, and showing red text "This field is required".</p>
Test 5	<p>Under Email, it said: please enter a valid email address</p>	<p>Instantly after typing in email address, the field gets highlighted in red and red text "Please enter a valid email address" is displayed. After clicking "Submit" it takes you back to the "Email" field, where the same error text is still displayed.</p>
Test 6	<p>Thank you! Your registration is</p>	<p>Same as in steps 6 and 10.</p>

	<p>confirmed for Edupower Test Event</p> <p>Your Registration ID: 3-5404015592722</p> <p>A confirmation email has been sent with additional details of your registration.</p>	
--	---	--

Table 5. Opera

Tester	Ying	Zuzana
Test 1	<p>Your Registration ID: 3-54040c5de5a09</p> <p>A confirmation email has been sent with additional details of your registration.</p>	Registration ok, looks and behaves the same as with all other browsers.
Test 2	<p>First Name:</p> <p>This field is required.</p>	After clicking "Submit", it keeps you on the page, highlighting "First name" field in red, and showing red text "This field is required".
Test 3	No	Same as in step 6.
Test 4	Email: This field is required.	After clicking "Submit", it keeps you on the page, highlighting "Email" field in red, and showing red text "This field is required".
Test 5	Email: Please enter a valid email address	Instantly after typing in email address, the field gets highlighted in red and red text "Please enter a valid email address" is displayed. After clicking "Submit" it takes you back to the "Email" field, where the same error text is still displayed.
Test 6	No	Same result as in steps 6 and 10.

APPENDIX 6. Event registration customer interface results

Table 1. Google Chrome

Tester	Yashar	Ying	Zuzana
Test 1 (step 6)	Your information has been received.	Shown: Your information has been received.	Works ok, same comments as for Firefox.
Test 2 (step 8)	It asks me to enter my first name.	A dialog box appeared : The following fields need to be completed before you can submit Please enter your first name.	Pop-up window: The following fields need to be completed before you can submit. Please enter your first name.
Test 3 (step 10)	Please enter a proper (correct format) phone number. Please enter ZIP code.	A dialog box appeared : The following fields need to be completed before you can submit Please enter your zip/postal code.	Pop-up window: The following fields need to be completed before you can submit. Please enter your zip/postal code.
Test 4 (step 12)	Email format not correct! Please enter your phone number. Please use correct format for your phone number.	The following fields need to be completed before you can submit. Email format not correct! Please enter your phone number Please use correct format for your phone number.	Pop-up window: The following fields need to be completed before you can submit. Email format not correct! Please enter your phone number. Please use correct format for your phone number.
Test 5	Email format not	The following fields	Pop-up window:

(step 14)	correct! Please enter your city. Please enter your state.	need to be completed before you can submit. Email format not correct! Please enter your city. Please enter your state.	The following fields need to be completed before you can submit. Email format not correct! Please enter your city. Please enter your state.
Test 6 (step 16)	Please enter your address. Country	The following fields need to be completed before you can submit. Please enter your address. Country	Pop-up window: The following fields need to be completed before you can submit. Please enter your address. Country

Table 2. Mozilla Firefox

Tester	Ying	Zuzana	Yashar
Test 1 (step 6)	Showed: Your information has been received.	The registration still works well, even though I've been using the same email address throughout all registrations, and it still gets accepted (which it shouldn't). The screen with confirmation of registration is less informative as in second platform (here it just says that the	Your information has been received.

		information has been received, but nothing more, such as to check the email address for more info, etc.)	
Test 2 (step 8)	Please enter your first name.	Please enter your first name.	Please enter your first name.
Test 3 (step 10)	Please enter your zip/postal code.	Please use correct format for your phone number. Please enter your zip/postal code.	Please enter your ZIP Postal Code.
Test 4 (step 12)	Email format not correct! Please enter your phone number Please use correct format for your phone number.	Email format not correct! Please enter your phone number. Please use correct format for your phone number.	Email format not correct! Please enter your phone number. Please use correct format for your phone number.
Test 5 (step 14)	Email format not correct! Please enter your city. Please enter your state. Country	Email format not correct! Please enter your city. Please enter your state. Country	Email format not correct! Please enter your city. Please enter your state.
Test 6 (step 16)	Please enter your address. Country	Please enter your address. Country	Please enter your address. Please enter your city. Country

Table 3. Safari

Tester	Zuzana	Yashar
Test 1 (step 6)	Your information has been received.	Your information has been received.

Test 2 (step 8)	Please enter your first name	Please enter your first name.
Test 3 (step 10)	Please use correct format for your phone number. Please enter your ZIP Postal Code.	Please use correct format for your phone number. Please enter your ZIP Postal Code.
Test 4 (step 12)	Email format not correct! Please enter your phone number. Please use correct format for your phone number.	Email format not correct! Please enter your phone number. Please use correct format for your phone number.
Test 5 (step 14)	Email format not correct! Please enter your city. Please enter your state.	Email format not correct! Please enter your city. Please enter your state.
Test 6 (step 16)	Please enter your address. Country	Please enter your address. Please enter your city. Country

Table 4. Internet Explorer

Tester	Ying	Yashar
Test 1 (step 6)	Your information has been received.	Your information has been received.
Test 2 (step 8)	Please enter your first name.	Please enter your first name.
Test 3 (step 10)	Please enter your zip/postal code.	Please use correct format for phone number. Please enter ZIP code.
Test 4 (step 12)	Email format not correct! Please enter your phone number Please use correct format for your phone number.	E-mail format not correct. Please enter your phone number. Please use correct format for your phone number.
Test 5 (step 14)	Email format not correct! Please enter your city. Please entry your state.	E-mail format not correct. Please enter your state. Please enter your city.
Test 6	Please enter your address.	Please enter your address.

(step 16)	Country	Country
--------------	---------	---------

Table 5. Opera

Tester	Ying	Yashar
Test 1 (step 6)	Your information has been received.	Your information has been received.
Test 2 (step 8)	Please enter your first name.	Please enter your first name.
Test 3 (step 10)	Please enter your zip/postal code.	Please enter your ZIP Postal Code.
Test 4 (step 12)	Email format not correct! Please enter your phone number Please use correct format for your phone number.	Email format not correct! Please enter your phone number. Please use correct format for your phone number.
Test 5 (step 14)	Email format not correct! Please enter your city. Please entry your state.	Email format not correct! Please enter your city. Please enter your state.
Test 6 (step 16)	Please enter your address. Country	Please enter your address. Please enter your city. Country

APPENDIX 7. Events Manager questionnaire results

Below Average = 1 points, Average = 2 points, Good = 3 points, Very good = 4 points, Excellent = 5 points

Table 1. Google Chrome

Simon	Yashar	Ying	Avg. Score
3	3	3	3
4	4	4	4

Table 2. Mozilla Firefox

Simon	Yashar	Ying	Avg. Score
3	4	4	3.67
4	4	4	4

Table 3. Safari

Simon	Yashar	Avg. Score
3	3	3
4	4	4

Table 4. Internet Explorer

Yashar	Ying	Avg. Score
3	3	3
4	4	4

Table 5. Opera

Yashar	Ying	Avg. Score
4	4	4
4	4	4

APPENDIX 8. Event Espresso questionnaire results

Below Average = 1 points, Average = 2 points, Good = 3 points, Very good = 4 points, Excellent = 5 points

Table 1. Google Chrome

Simon	Ying	Zuzana	Avg. Score
2	4	3	3
3	4	4	3.67

Table 2. Mozilla Firefox

Simon	Ying	Zuzana	Avg. Score
2	4	3	3
3	4	4	3.67

Table 3. Safari

Simon	Zuzana	Avg. Score
2	4	3
3	3	3

Table 4. Internet Explorer

Ying	Zuzana	Avg. Score
4	3	3.5
4	2	3

Table 5. Opera

Ying	Zuzana	Avg. Score
4	4	4
4	4	4

APPENDIX 9. Event Registration questionnaire results

Below Average = 1 points, Average = 2 points, Good = 3 points, Very good = 4 points, Excellent = 5 points

Table 1. Google Chrome

Yashar	Ying	Zuzana	Avg. Score
4	3	5	4
4	2	5	3.67

Table 2. Mozilla Firefox

Yashar	Ying	Zuzana	Avg. Score
4	3	5	4
4	2	5	3.67

Table 3. Safari

Yashar	Zuzana	Avg. Score
4	4	4
4	3	3.5

Table 4. Internet Explorer

Yashar	Ying	Zuzana	Avg. Score
4	3	3	3.33
4	2	2	2.67

Table 5. Opera

Yashar	Ying	Zuzana	Avg. Score
4	3	5	4
4	2	5	3.67

APPENDIX 10. Events Manager administrator test instruction sheet



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The purpose of this sheet is to provide step by step testing instructions, as well as to collect information from the test procedure. You will also be given the possibility to write down personal comments about anything regarding the test procedure. The information you provide will be used to assist in selecting a good platform for our coming web shop which will be used to sell our *events, courses and workshops*.

The goal of this test is to find errors. The more errors that can be found, the more predictable will the function of the test candidate be, because the errors are then known and users can be instructed to avoid doing the specific things that cause errors. If the interface is working predictably, the customer experience is better than if the interface works unpredictably. Your task in this test phase is to focus on finding errors, and try to be as specific as possible when reporting them in this instruction & result form.

1. Please give the following information: your name, today's date, and which browser (including browser version) you have used. For this test, use the same browser you selected also for all the other test candidates.

2. Start by going to <http://test1.edupower.fi/admin>
3. Log on using Edupower's admin credentials
4. Click on "Events", "Add Event"
5. Input the following information:

Field	Value (English)	Value (Swedish)	Value (Finnish)	Value (Chinese)
Title	Edupower Admin Test Event	Edupower Admin Testevenemang	Edupower Admin Kokeilutapahtuma	Edupower Admin TE
Description	This is a test event.	Detta är ett testevenemang.	Tämä on kokeilutapahtuma.	This is a test event (ZH).
Location Name	Edupower Office	Edupowers Kontor	Edupowerin Konttori	Edupower Office (ZH)
Address	Wolffintie 36	Wolffskavägen 36	Wolffintie 36	Wolffintie 36
City/Town	Vaasa	Vasa	Vaasa	Vaasa
State/County	Länsi-Suomen Lääni	Västra Finlands Län	Länsi-Suomen Lääni	Länsi-Suomen Lääni
Postcode	65200	65200	65200	65200
Region	Leave empty	N/A	N/A	N/A
Country	Finland	Finland	Suomi	Finland
Bookings/registration	Enable registration for this event	N/A	N/A	N/A

Vaasa Science Park, F2-209
Wolffintie 36 | Wolffskavägen 36
FI - 65200 Vaasa | Vaasa, Finland

Tel. +358 6 72200 20
info@edupower.fi
www.edupower.fi

FO-nummer 2493321-9
IBAN FI13 1789 3000 001254
BIC NDEAFIHH



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Name	Standard Ticket	N/A	N/A	N/A
Description	Leave empty	N/A	N/A	N/A
Price	Leave empty	N/A	N/A	N/A
Spaces	10	N/A	N/A	N/A
Show advanced options	(Click)	N/A	N/A	N/A
Available from	Today's date	N/A	N/A	N/A
Available until	16.11.2014	N/A	N/A	N/A
Available for	Everyone	N/A	N/A	N/A
When	From 16.11.2014 to 17.11.2014	N/A	N/A	N/A
Event starts at	00:00 to 00:00	N/A	N/A	N/A
Event tags	Tag (click <i>Add</i> after writing)	N/A	N/A	N/A
Event categories	Events	N/A	N/A	N/A
Add media	Make sure Description is set to visual, then add a picture	Make sure Description is set to visual, then add a picture	Make sure Description is set to visual, then add a picture	Make sure Description is set to visual, then add a picture
Add media	Make sure Description is set to visual, then add a PDF	Make sure Description is set to visual, then add a PDF	Make sure Description is set to visual, then add a PDF	Make sure Description is set to visual, then add a PDF

6. Press "Publish". Do you see any messages (popups or otherwise)? If you do, please write them in the box. Were you able to perform all the actions presented in the table above?



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7. Open another web browser (not a new tab in the present one), and go to <http://test1.edupower.fi> and go to the Courses & Events page. Select the course you just created. Are all the data present and presented correctly on the page? If not, please write in the box what's missing or incorrectly presented. Please report which browser you used for this step.

8. This candidate does not provide the possibility to add attendees manually in the free version; you will have to add the attendee via the customer interface which you are looking at. Please
9. Click *Add New Attendee*. Enter the following info:

Field	Value (English)
Spaces	1
Name	Richard Tester
Phone	012-3456789
E-mail Address	rtester@tester.com
Comment	EduTest

10. Click *Send your booking*.
11. Did you see any errors or notices before and after steps 9-10? If you did, please write them in the box.



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12. Go back to the admin interface and move your mouse on top of *Events* in the left sidebar, and click *Bookings*. You will now see a list of available courses. Click *View Attendees* (the third from the left under *Actions*) for the event you just created in steps 4-6.
13. Click on the CSV icon on top of the topmost list, then drag all the grayed out boxes to the left, underneath "Actions". Finally click *Export Bookings* to download the list of attendees from the event you created. Does the list contain data for all the fields? Are there any visible errors in data? Does the attendee you have added appear in the list? Feel free to comment any observations in the field below.

14. Please answer the following questionnaire before you go on to test the next browser.



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QUESTIONNAIRE

1. Which browser (including version) did you use for the test?

2. What is your overall impression of the test candidate?

- Excellent
 Very Good
 Good
 Average
 Below Average

3. How would you describe easiness of use?

- Excellent
 Very Good
 Good
 Average
 Below Average

4. Does the test candidate provide all necessary information regarding the event?

- Yes
 No

If not, why?



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5. Does the test candidate provide a trustworthy feeling?

Yes

No

If not, why?

6. If you have any comments about your testing experience, feel free to express them here.

Thank you for your time.

APPENDIX 11. Event Espresso administrator test instruction sheet



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The purpose of this sheet is to provide step by step testing instructions, as well as to collect information from the test procedure. You will also be given the possibility to write down personal comments about anything regarding the test procedure. The information you provide will be used to assist in selecting a good platform for our coming web shop which will be used to sell our *events, courses and workshops*.

The goal of this test is to find errors. The more errors that can be found, the more predictable will the function of the test candidate be, because the errors are then known and users can be instructed to avoid doing the specific things that cause errors. If the interface is working predictably, the customer experience is better than if the interface works unpredictably. Your task in this test phase is to focus on finding errors, and try to be as specific as possible when reporting them in this instruction & result form.

1. Please give the following information: your name, today's date, and which browser (including browser version) you have used. For this test, use the same browser you selected also for all the other test candidates.

2. Start by going to <http://test2.edupower.fi/admin>
3. Log on using Edupower's admin credentials
4. Click on "Event Espresso", "Events", "Add New Event"
5. Input the following information:

Field	Value (English)
Event Title	Edupower Admin Test Event
Unique Event Identifier	edutest001_23
Event Description	This is a test event.
Registration Start	Today's date
Registration End	16.11.2014
Reg Start Time	00:00
Reg End Time	00:00
Event Start Date	16.11.2014
Event End Date	17.11.2014
Start	00:00
End	00:00
Name 1	General Admission
Price	0.00
Surcharge	Leave empty
Surcharge Type	Flat Rate
Address	Wolffintie 36



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City	Vaasa
State	Länsi-Suomen Lääni
Zip/Postal Code	65200
Country	Finland
Title	Edupower Office
Website	http://www.edupower.fi
Phone	123-4567890
Image	Leave Empty
Attendee Limit	Leave Empty
Allow Group Registrations	No
Max Group Registrants	Leave Empty
Is this an active event?	Yes
Display description?	Yes
Display registration form?	Yes
Event Category	Events
Question Groups	Tick "Address Information"
Add media	Make sure Description is set to visual, then add a picture
Add media	Make sure Description is set to visual, then add a PDF

6. Press "Submit New Event". Do you see any messages (popups or otherwise)? If you do, please write them in the box.



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7. Open another web browser (not a new tab in the present one), and go to <http://test2.edupower.fi> and go to the Courses & Events page. Select the course you just created. Are all the data present and presented correctly on the page? If not, please write in the box what's missing or incorrectly presented. Please report which browser you used for this step.

8. Move your mouse on top of *Event Espresso* in the left sidebar, and click *Event Overview*. You will now see a list of available courses. Click *View Attendees* (the third from the left under *Actions*) for the event you just created in steps 4-6.
9. Click *Add New Attendee*. Enter the following info:

Field	Value (English)
First Name	Richard
Last Name	Tester
E-mail Address	rtester@tester.com
Phone	012-3456789
Address	Teststreet 45B
City	Cityville
State	Everstate
Country	Neverland
Zip	13245
Number of Tickets	1

10. Click *Submit*.



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11. Did you see any errors or notices before and after steps 9-10? If you did, please write them in the box.

12. Scroll down the page and click *Export to Excel* to download the list of attendees from the event you created. Does the list contain data for all the fields? Are there any visible errors in data? Does the manually added attendee appear in the list? Feel free to comment any observations in the field below.

13. Please answer the following questionnaire before you go on to test the next candidate.



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QUESTIONNAIRE

1. Which browser (including version) did you use for the test?

2. What is your overall impression of the test candidate?

- Excellent
 Very Good
 Good
 Average
 Below Average

3. How would you describe easiness of use?

- Excellent
 Very Good
 Good
 Average
 Below Average

4. Does the test candidate provide all necessary information regarding the event?

- Yes
 No

If not, why?



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5. Does the test candidate provide a trustworthy feeling?

Yes

No

If not, why?

6. If you have any comments about your testing experience, feel free to express them here.

Thank you for your time.

APPENDIX 12. Event Registration administrator test instruction sheet



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The purpose of this sheet is to provide step by step testing instructions, as well as to collect information from the test procedure. You will also be given the possibility to write down personal comments about anything regarding the test procedure. The information you provide will be used to assist in selecting a good platform for our coming web shop which will be used to sell our *events, courses and workshops*.

The goal of this test is to find errors. The more errors that can be found, the more predictable will the function of the test candidate be, because the errors are then known and users can be instructed to avoid doing the specific things that cause errors. If the interface is working predictably, the customer experience is better than if the interface works unpredictably. Your task in this test phase is to focus on finding errors, and try to be as specific as possible when reporting them in this instruction & result form.

1. Please give the following information: your name, today's date, and which browser (including browser version) you have used. For this test, use the same browser you selected also for all the other test candidates.

2. Start by going to <http://test3.edupower.fi/admin>
3. Log on using Edupower's admin credentials
4. Click on "EVNTRG_6.01.07", "Events", "Add Event"
5. Input the following information:

Field	Value (English)
Event Name/Title	Edupower Admin Test Event
Unique Event Identifier	edutest001_23
Display description on registration form page?	Yes (radio button)
Detailed Event Description	This is a test event.
Event Categories	Events
Event Seating Capacity	Leave Empty
Event Location/Venue	Edupower Office
Street	Wolffintie 36
City	Vaasa
State	Länsi-Suomen Lääni
Postcode	65200
Use Google Maps On	Yes

Vaasa Science Park, F2-209
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FI - 65200 Vaasa | Vaasa, Finland

Tel. +358 6 72200 20
info@edupower.fi
www.edupower.fi

FO-nummer 2493321-9
IBAN FI13 1789 3000 001254
BIC NDEAFIHH



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Registration Page	
Start Date	Today's date
End Date	16.11.2014
Start Time	00:00
End Time	00:00
Close Registration on	Start of Event
Will you accept checks/cash for this event?	No (radio button)
Are you using an external registration?	No (radio button)

6. Go to the Confirmation email tab and press "Submit New Event". Do you see any messages (popups or otherwise)? If you do, please write them in the box.

7. Open another web browser (not a new tab in the present one), and go to <http://test3.edupower.fi> and go to the Courses & Events page. Select the course you just created. Are all the data present and presented correctly on the page? If not, please write in the box what's missing or incorrectly presented. Please report which browser you used for this step.



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8. Click on *EVNTRG_6.01.07* in the left sidebar, and click *Attendees*. You will now see a list of available courses. Click *View Attendees* for the event you just created in steps 4-6.
9. Click *Add Attendee*. Enter the following info:

Field	Value (English)
First Name	Richard
Last Name	Tester
E-mail Address	rtester@tester.com
Country	Neverland
Dropdown list ("Registration EUR zzz")	1

10. Click *Submit*.
11. Click *View Attendees*. Click *Edit* on the attendee you just added. Add the following info:

Field	Value (English)
Phone number	012-3456789
Address	Teststreet 45B
City	Cityville
Country	Neverland
State/Province	Everstate
Zip/Postal Code	13245

12. Click *Submit*, then click *Select Another Attendee*.
13. Did you see any errors or notices before and after step 11? If you did, please write them in the box.



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14. Click on the "XLS" button to download the list of attendees from the event you created. Does the list contain data for all the fields? Are there any visible errors in data? Does the manually added attendee appear in the list? Feel free to comment any observations in the field below.

15. To conclude this part of the test, please answer the following questionnaire.



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QUESTIONNAIRE

1. Which browser (including version) did you use for the test?

2. What is your overall impression of the test candidate?

- Excellent
 Very Good
 Good
 Average
 Below Average

3. How would you describe easiness of use?

- Excellent
 Very Good
 Good
 Average
 Below Average

4. Does the test candidate provide all necessary information regarding the event?

- Yes
 No

If not, why?



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5. Does the test candidate provide a trustworthy feeling?

Yes

No

If not, why?

6. If you have any comments about your testing experience, feel free to express them here.

Thank you for your time.